



August 10, 2012

Mr. Chuck Cornell  
Shell Exploration and Production Company  
4582 South Ulster Street Parkway, Suite 1400  
Denver, Colorado 80237

**RE: Second Quarter 2012 Groundwater Monitoring Report  
WT Durham #4 Flowline Release  
Remediation #4990  
Moffat County, Colorado**

Dear Mr. Cornell:

LT Environmental, Inc. (LTE) was retained by Shell Exploration and Production Company (SEPCO) to conduct quarterly groundwater monitoring activities and to evaluate geochemical indicators to assess the potential for natural attenuation at the WT Durham #4 Flowline Release (Site).

Site history and remediation activities were outlined in the Form 27 - Site Investigation and Remediation Workplan (Remediation #4990) submitted to the Colorado Oil and Gas Conservation Commission (COGCC) on June 17, 2010. The Site Location Map is provided as Figure 1.

## **QUARTERLY GROUNDWATER MONITORING ACTIVITIES**

### **Depth to Groundwater Measurements**

LTE surveyed the top of casing elevations for each monitoring well on September 16, 2010. Calculating the difference in the top of casing and depth to groundwater, LTE determined the groundwater elevation in each monitoring well and generated a groundwater elevation map (Figure 2). Based on the groundwater elevation map, groundwater flow during this monitoring event was generally to the north-northeast, toward Waddle Creek.

Depth to groundwater was measured in monitoring wells MW01 through MW11 on June 27, 2012, and recorded to calculate potentiometric surfaces and purge volumes. During the second quarter 2012 sampling event, the depths to static groundwater level ranged from 4.59 feet below top of casing (BTOC) in MW04 to 6.53 feet BTOC in MW11 (Table 1).



## **Groundwater Sampling Procedures**

Each monitoring well was purged of a minimum of three well casing volumes prior to collection of groundwater samples. Groundwater samples were collected from each monitoring well utilizing disposable 1.6-inch diameter polyethylene bailers. Groundwater samples were collected in laboratory-prepared sample bottles, placed on ice, and delivered under chain-of-custody (COC) protocol to Origins Laboratory (Origins) in Denver, Colorado. Samples were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) by United States Environmental Protection Agency (EPA) Method 8260C.

Additionally, monitoring wells MW02, MW06, and MW11 were sampled for geochemical indicators and analyzed for dissolved manganese and total iron by EPA Method 6020C and sulfate and nitrate by EPA Method 300.

The groundwater samples were collected for dissolved manganese analysis by advancing disposable 3/16-inch diameter polyethylene tubing into groundwater within the 2-inch diameter polyvinyl chloride (PVC) well casing. A peristaltic pump was utilized to collect the groundwater samples. LTE filtered the manganese samples with a 0.45 micron cartridge-style filter prior to placement into the laboratory-prepared sample bottles.

## **Groundwater Analytical Results**

The Colorado Department of Public Health and Environmental (CDPHE) Water Quality Control Commission (WQCC) has established Regulation 41-The Basic Standards for Ground Water for BTEX of 5.0 micrograms per liter ( $\mu\text{g/L}$ ), 560  $\mu\text{g/L}$ , 700  $\mu\text{g/L}$ , and 1,400  $\mu\text{g/L}$ , respectively.

Eleven groundwater samples were collected and submitted to Origins for BTEX analysis during the June 2012 groundwater monitoring event. Groundwater analytical results indicate benzene was detected in exceedance of the CDPHE-WQCC Regulation 41 standard in monitoring wells MW05 and MW06 at concentrations of 30  $\mu\text{g/L}$  and 109  $\mu\text{g/L}$ , respectively. BTEX compounds were not detected above the laboratory method detection limits or were in compliance with CDPHE-WQCC Regulation 41 in the nine remaining groundwater samples. Groundwater analytical results for the June 2012 monitoring event are depicted on Figure 3 and summarized in Table 1 with historical sampling data for all sampling events. The laboratory analytical report, laboratory quality assurance/quality control data, and COC documentation are attached.

## **MONITORED NATURAL ATTENUATION EVALUATION**

LTE utilized groundwater quality parameters and geochemical indicators to determine if natural attenuation of petroleum hydrocarbon compounds is occurring at the Site and whether monitored natural attenuation (MNA) remains an effective remedial method to achieve site cleanup goals.



## **Groundwater Quality Parameter Results**

LTE personnel collected general water quality parameters during sampling activities to establish whether the appropriate site conditions existed for biodegradation of residual dissolved phase hydrocarbons. General water quality parameters included pH, temperature, conductivity, dissolved oxygen (DO), total dissolved solids (TDS), and oxidation reduction potential (ORP). General water quality parameters are summarized in Table 2.

Initial field screening results indicated pH readings are within a range for optimal biodegradation. Differences in temperature readings are attributable to seasonal groundwater fluctuations and ambient weather conditions. General water quality parameters are summarized in Table 2.

The COGCC standard for TDS in groundwater should be less than 1.25 times the background concentration. The TDS concentrations observed in monitoring wells MW01 through MW11 ranged from 0.797 grams per liter (g/L) to 1.274 g/L. LTE believes the TDS concentrations observed at the Site are representative of background conditions.

Dissolved oxygen concentrations within the plume are similar to those concentrations outside of the plume, indicating that the mass flux of DO to the groundwater from ambient air has exceeded biological oxygen demand as the aerobic microbes are likely being stimulated. All of the DO concentrations remain greater than 1 milligram per liter (mg/L) which indicates that oxygen is available and being utilized within the plume to promote biodegradation and natural attenuation. The data also indicate that DO concentrations have generally decreased in all monitoring wells with the exception of MW03 and MW04. This indicates that oxygen is being used by microbes and that aerobic biodegradation is occurring. Aerobic biodegradation of dissolved phase hydrocarbons appears to be the principle means of natural attenuation at the site. LTE believes biodegradation will continue to occur at the Site.

## **Geochemical Indicators**

In order to further evaluate secondary lines of evidence to detail subsurface biodegradation processes, LTE collected groundwater samples for geochemical indicators that included manganese, total iron (representative of ferrous iron), sulfate, and nitrate. In the absence or near absence of DO, microorganisms metabolize petroleum contaminants through the use of these alternate electron acceptors. General groundwater quality parameters indicate DO is available throughout the Site, establishing an aerobic environment. However, the secondary or anaerobic microbes can potentially contribute to biodegradation. Geochemical data is summarized in Table 3.

As indicated in Table 3, monitoring wells MW02, MW06, and MW11 were sampled for these secondary electron acceptors in downgradient, in-plume, and upgradient locations, respectively. The data indicate that iron, manganese, and sulfate are available as electron acceptors. The increase of ferrous iron in downgradient monitoring well MW02 indicates the microbial reduction of iron as a result of anaerobic conditions. Therefore, anaerobic biodegradation is also



occurring at the site, even though aerobic biodegradation of dissolved phase hydrocarbons is the major means of MNA. Nitrate results indicate that there is no significant presence of nitrate upgradient, in-plume, or downgradient. In summary, subsurface anaerobic processes are occurring but are secondary in nature due to the presence of DO.

### **Summary and Conclusions**

On the average since March 2012, groundwater elevations have decreased between 1.84 feet and 3.15 feet. Based on the groundwater elevation map, groundwater generally flows to the north-northeast toward Waddle Creek.

As indicated in Table 1, the benzene concentrations in monitoring wells MW05 and MW06 exceed the CDPHE-WQCC Regulation 41 standard. Since the March 2012 monitoring event, the benzene concentration in well MW05 has increased from 22.2 µg/L to 30 µg/L, and the benzene concentration in MW06 has increased from 92.9 µg/L to 109 µg/L.

LTE utilized groundwater quality parameters and geochemical indicators to determine if biodegradation of hydrocarbon concentrations is occurring and whether MNA is an effective remedial method to achieve site cleanup goals. Based on general water quality data, the biodegradation of benzene in groundwater appears to be naturally occurring; therefore MNA remains as the current remedial action occurring at the Site. LTE recommends continuing quarterly groundwater monitoring at the Site. The next sampling event is scheduled for September 2012.

### **Limitations**

No investigation is infallible. Some uncertainty will always exist concerning the presence or absence of potential contaminants at a particular property, irrespective of the rigor of the investigation. Accordingly, LTE does not warrant that contaminants, other than those identified in this report, do not exist at the subject property or may not exist there in the future.



LTE believes that it has performed the services summarized in this report in a manner consistent with the level of care and skill ordinarily exercised by members of the environmental profession practicing at the same time and under similar conditions in the area of the project.

Sincerely,

LT ENVIRONMENTAL, INC.

A handwritten signature in black ink, appearing to read "Chris McKisson".

Chris McKisson  
Staff Environmental Scientist

A handwritten signature in black ink, appearing to read "Robert D. Fishburn".

Robert D. Fishburn C.P.G, P.G.  
Senior Hydrogeologist

Attachments:

Figure 1- Site Location Map  
Figure 2 - Groundwater Elevation Map  
Figure 3 – Groundwater Analytical Results  
Table 1 - Groundwater Analytical Data  
Table 2 - General Water Quality Data  
Table 3 - Geochemical Data  
Attachment 1 - Laboratory Analytical Reports



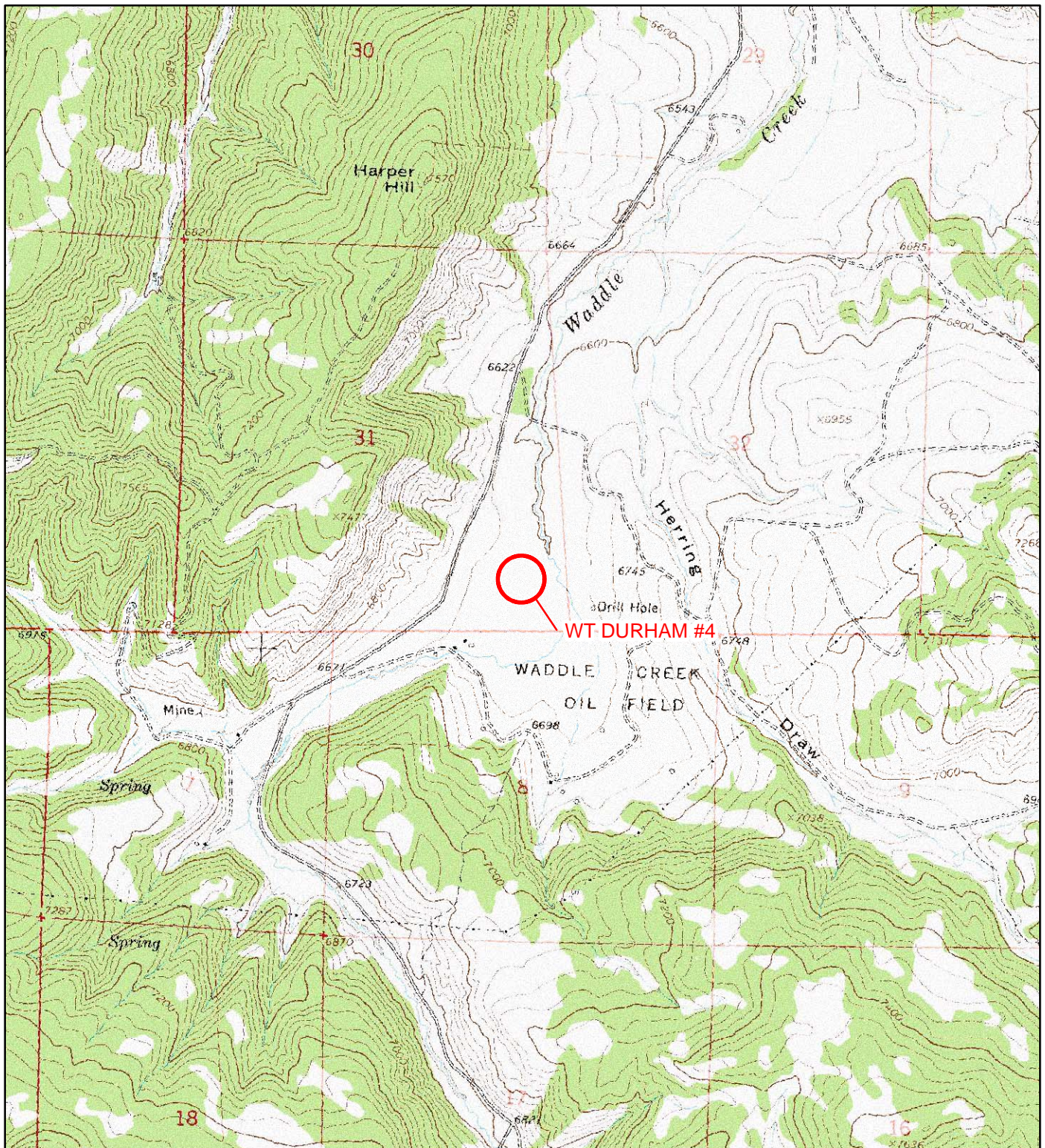
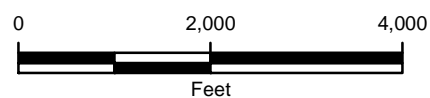


IMAGE COURTESY OF USDA/NRCS, VARIOUS DATES

# LEGEND

 SITE LOCATION



**FIGURE 1**  
**SITE LOCATION MAP**  
 WT DURHAM #4 FLOWLINE RELEASE  
 SESE SEC 31 T5N R90W 6PM  
 MOFFAT COUNTY, COLORADO  
 SHELL EXPLORATION AND PRODUCTION COMPANY







## LEGEND

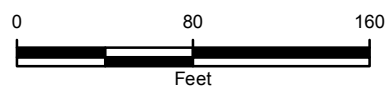
⊗ MONITORING WELL WITH RELATIVE GROUNDWATER ELEVATION IN FEET IMAGE COURTESY OF USDA/NRCS, VARIOUS DATES

✗ RELEASE

— RELATIVE GROUNDWATER ELEVATION CONTOUR

CONTOUR INTERVAL = 0.5 FEET

SECTION



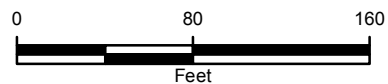
**FIGURE 2**  
GROUNDWATER ELEVATION MAP  
WT DURHAM #4 (API 05-081-06935)  
SESE SEC 31 T5N R90W 6PM  
MOFFAT COUNTY, COLORADO  
**SHELL EXPLORATION AND PRODUCTION COMPANY**





# LEGEND

- ⊗ MONITORING WELL
- X RELEASE
- SECTION



**FIGURE 3**  
**GROUNDWATER ANALYTICAL RESULTS**  
**WT DURHAM #4 (API 05-081-06935)**  
**SESE SEC 31 T5N R90W 6PM**  
**MOFFAT COUNTY, COLORADO**  
**SHELL EXPLORATION AND PRODUCTION COMPANY**





TABLE 1  
GROUNDWATER ANALYTICAL RESULTS  
WT DURHAM #4 FLOWLINE RELEASE  
MOFFAT COUNTY, COLORADO  
SHELL EXPLORATION AND PRODUCTION COMPANY

Well ID	Date	Depth to Water (ft btoc)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
MW01	5/4/10	3.52	3.1	<2	<2	<2
	7/14/10	4.21	9	<1	<1	<3
	9/16/10	9.15	10.1	<1	<1	<3
	12/28/10	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM
	5/3/11	2.25	<1	<1	<1	<3
	8/24/11	5.15	<1	<1	<1	<3
	11/23/11	NM	NM	NM	NM	NM
	3/29/12	3.72	<1.0	<1.0	<1.0	<1.0
MW02	6/27/12	5.96	<1.0	<1.0	<1.0	<1.0
	5/4/10	2.86	<2	<2	<2	<2
	7/14/10	3.65	<1	<1	<1	<3
	9/16/10	9.81	<1	<1	<1	<3
	12/28/10	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM
	5/3/11	3.00	<1	<1	<1	<3
	8/24/11	4.82	<1	<1	<1	<3
	11/23/11	NM	NM	NM	NM	NM
MW03	3/29/12	2.97	<1.0	<1.0	<1.0	<1.0
	6/27/12	5.78	<1.0	<1.0	<1.0	<1.0
	5/4/10	3.30	<2	2	<2	3.3
	7/14/10	3.66	<1	<1	<1	<3
	9/16/10	9.81	<1	<1	<1	<3
	12/28/10	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM
	5/3/11	3.05	<1	<1	<1	<3
	8/24/11	5.54	<1	<1	<1	<3
MW04	11/23/11	NM	NM	NM	NM	NM
	3/29/12	3.37	<1.0	<1.0	<1.0	<1.0
	6/27/12	6.52	<1.0	<1.0	<1.0	<1.0
	5/4/10	2.69	<2	2.4	<2	<2
	7/14/10	3.16	1.12	1.71	<1	<3
	9/16/10	9.83	<1	<1	<1	<3
	12/28/10	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM
	5/3/11	2.97	<1	<1	<1	<3
MW05	8/24/11	4.32	<1	1	<1	<3
	11/23/11	NM	NM	NM	NM	NM
	3/29/12	2.50	<1.0	<1.0	<1.0	<1.0
	6/27/12	4.59	<1.0	<1.0	<1.0	<1.0
	7/14/10	2.70	<1	<1	<1	<3
	9/16/10	10.01	<1	<1	<1	<3
	12/28/10	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM
	5/3/11	3.24	<1	<1	<1	<3
MW06	8/24/11	4.09	26.1	<1	<1	<3
	11/23/11	NM	NM	NM	NM	NM
	3/29/12	2.54	22.2	<1.0	<1.0	<1.0
	6/27/12	5.23	30	<1.0	<1.0	<1.0
	7/14/10	3.61	1,520	78.1	88.1	198.1
	9/16/10	9.96	354	<1	44.4	16.3
	12/28/10	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM
	5/3/11	2.88	651	<1	10.7	12.2
MW06	8/24/11	4.71	475	1.5	1.6	3
	11/23/11	NM	NM	NM	NM	NM
	3/29/12	3.35	92.9	<1.0	<1.0	<1.0
	6/27/12	5.58	109	<1.0	7.49	12.4



TABLE 1  
GROUNDWATER ANALYTICAL RESULTS  
WT DURHAM #4 FLOWLINE RELEASE  
MOFFAT COUNTY, COLORADO  
SHELL EXPLORATION AND PRODUCTION COMPANY

Well ID	Date	Depth to Water (ft btoc)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
MW07	7/14/10	3.99	<b>58.7</b>	<1	1.52	8.16
	9/16/10	9.73	<1	<1	<1	<3
	12/28/10	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM
	5/3/11	2.97	<b>280</b>	<1	4.4	11.6
	8/24/11	4.89	<1	<1	<1	<3
	11/23/11	NM	NM	NM	NM	NM
	3/29/12	3.66	<1.0	<1.0	<1.0	<1.0
	6/27/12	5.71	<1.0	<1.0	<1.0	<1.0
MW08	9/16/10	10.13	<1	<1	<1	<3
	12/28/10	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM
	5/2/11	2.84	<1	<1	<1	<3
	8/24/11	5.00	<1	<1	<1	<3
	11/23/11	NM	NM	NM	NM	NM
	3/29/12	3.86	<1.0	<1.0	<1.0	<1.0
	6/27/12	5.70	<1.0	<1.0	<1.0	<1.0
MW09	9/16/10	10.30	<1	<1	<1	<3
	12/28/10	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM
	5/3/11	3.10	<1	<1	<1	<3
	8/24/11	4.43	<1	<1	<1	<3
	11/23/11	NM	NM	NM	NM	NM
	3/29/12	2.90	2.03	<1.0	<1.0	<1.0
	6/27/12	5.60	1.88	<1.0	<1.0	<1.0
MW10	9/16/10	9.93	<1	<1	<1	<3
	12/28/10	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM
	5/3/11	3.22	<1	<1	<1	<3
	8/24/11	5.10	<1	<1	<1	<3
	11/23/11	NM	NM	NM	NM	NM
	3/29/12	3.70	<1.0	<1.0	<1.0	<1.0
	6/27/12	5.85	<1.0	<1.0	<1.0	<1.0
MW11	9/16/10	10.05	<1	<1	<1	<3
	12/28/10	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM
	5/3/11	3.07	<1	<1	<1	<3
	8/24/11	5.41	<1	<1	<1	<3
	11/23/11	NM	NM	NM	NM	NM
	3/29/12	3.91	<1.0	<1.0	<1.0	<1.0
	6/27/12	6.53	<1.0	<1.0	<1.0	<1.0
GW01	5/11/10	-	<b>1,370</b>	<b>1,730</b>	72.3	752
GW02	5/18/10	-	<b>332</b>	319	12.8	258
CDPHE WQCC Reg 41			<b>5</b>	<b>560</b>	<b>700</b>	<b>1,400</b>

**NOTES:**

ft btoc - feet below top of well casing

µg/L - micrograms per liter

< - indicates result is less than the stated laboratory method reporting limit

**BOLD** - indicates result exceeds the applicable standard

Benzene, toluene, ethylbenzene, and total xylenes analyzed by EPA Method 8260B

CDPHE WQCC Reg 41 - Colorado Department of Public Health and Environment-

Water Quality Control Commission Regulation 41 covering The Basic Standards

for Ground Water

NM - Not Monitored due to frozen groundwater



**TABLE 2**  
**GENERAL WATER QUALITY RESULTS**  
**WT DURHAM #4 FLOWLINE RELEASE**  
**MOFFAT COUNTY, COLORADO**  
**SHELL EXPLORATION AND PRODUCTION COMPANY**

Well ID	Date	pH	Temp (C°)	Conductivity (µ-S)	DO (mg/L)	ORP (mV)	TDS (g/L)
MW01	9/16/10	6.93	13.30	2,331	2.80	-49.6	1.515
	12/28/10	NM	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM	NM
	5/2/11	7.43	4.65	1,100	2.23	199.5	1.169
	8/24/11	6.73	13.40	3,724	2.02	228	3.243
	11/23/11	NM	NM	NM	NM	NM	NM
	3/28/12	7.35	2.58	2,403	2.17	-64.9	1.559
	6/27/12	7.32	10.13	1,553	1.27	-39.4	1.010
MW02	9/16/10	7.17	12.48	2,126	2.04	-89.4	2.4
	12/28/10	NM	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM	NM
	5/3/11	7.27	5.05	1,396	3.37	198.6	1.190
	8/24/11	6.76	12.64	3,500	1.85	226.8	2.971
	11/23/11	NM	NM	NM	NM	NM	NM
	3/28/12	7.19	2.93	2,333	3.42	-59.4	1.517
	6/27/12	7.23	9.36	1,476	3.01	-60.5	0.960
MW03	9/16/10	6.42	13.88	3,341	2.41	-84.8	2.171
	12/28/10	NM	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM	NM
	5/2/11	7.35	4.80	1,251	3.01	199.3	1.324
	8/24/11	6.75	11.91	1,313	2.56	227.4	1.144
	11/23/11	NM	NM	NM	NM	NM	NM
	3/28/12	7.31	2.13	3,176	3.07	-54.1	2.067
	6/27/12	7.27	9.04	1,958	3.28	-78.9	1.274
MW04	9/16/10	6.55	12.75	2,058	2.17	-75.5	1.338
	12/28/10	NM	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM	NM
	5/2/11	7.35	5.45	1,042	2.49	199.1	1.081
	8/24/11	6.86	12.11	932	6.86	227.2	0.805
	11/23/11	NM	NM	NM	NM	NM	NM
	3/28/12	7.36	3.76	1,886	2.48	-38.8	1.226
	6/27/12	7.40	9.67	1,311	3.36	-38.1	0.853
MW05	9/16/10	6.56	15.70	2,581	1.56	-107.5	1.677
	12/28/10	NM	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM	NM
	5/2/11	7.17	5.25	1,371	2.64	199.1	1.430
	8/24/11	6.71	17.17	3,011	4.21	228.1	3.061
	11/23/11	NM	NM	NM	NM	NM	NM
	3/28/12	7.30	3.49	2,552	2.56	-81.9	1.659
	6/27/12	7.24	12.74	1,674	1.62	-96.4	1.088
MW06	9/16/10	7.15	16.79	2,711	1.38	-102.3	2.4
	12/28/10	NM	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM	NM
	5/3/11	7.19	5.88	1,436	2.47	199.0	1.213
	8/24/11	6.72	16.94	3,071	4.03	228.0	3.073
	11/23/11	NM	NM	NM	NM	NM	NM
	3/28/12	7.33	3.49	2,340	2.53	-70.1	1.519
	6/27/12	7.27	14.21	1,618	2.03	-79.3	1.051
MW07	9/16/10	6.42	13.22	2,456	1.34	-53.5	1.596
	12/28/10	NM	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM	NM
	5/2/11	7.30	4.81	1,134	2.72	199.4	1.210
	8/24/11	6.74	13.80	3,813	1.94	228.3	3.153
	11/23/11	NM	NM	NM	NM	NM	NM
	3/28/12	7.40	2.74	2,386	2.71	-26.8	1.551
	6/27/12	7.43	10.17	1,534	1.77	-5.8	0.998





**TABLE 2**  
**GENERAL WATER QUALITY RESULTS**  
**WT DURHAM #4 FLOWLINE RELEASE**  
**MOFFAT COUNTY, COLORADO**  
**SHELL EXPLORATION AND PRODUCTION COMPANY**

Well ID	Date	pH	Temp (C°)	Conductivity (µ-S)	DO (mg/L)	ORP (mV)	TDS (g/L)
MW08	9/16/10	6.53	13.28	1,916	2.40	6.9	1.246
	12/28/10	NM	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM	NM
	5/2/11	7.22	5.16	977	3.15	198.5	1.022
	8/24/11	6.78	13.35	3,158	2.02	228.6	2.638
	11/23/11	NM	NM	NM	NM	NM	NM
	3/28/12	7.48	3.11	2,027	3.05	4.4	1.318
	6/27/12	7.45	10.14	1,226	1.73	27.0	0.797
MW09	9/16/10	6.50	14.55	2,566	3.26	-49.0	1.668
	12/28/10	NM	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM	NM
	5/2/11	7.14	4.88	1,361	2.97	200.4	1.437
	8/24/11	6.68	14.79	4,140	2.32	227.6	3.339
	11/23/11	NM	NM	NM	NM	NM	NM
	3/28/12	7.13	2.77	2,543	2.92	-37.8	1.653
	6/27/12	7.13	11.23	1,683	2.45	-67.8	1.092
MW10	9/16/10	6.56	12.85	2,017	1.90	38.6	1.311
	12/28/10	NM	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM	NM
	5/2/11	7.53	5.01	995	2.17	197.8	1.061
	8/24/11	6.73	13.48	3,485	2.92	228.1	2.908
	11/23/11	NM	NM	NM	NM	NM	NM
	3/28/12	7.43	2.71	2,176	2.51	-13.1	1.414
	6/27/12	7.38	10.06	1,337	2.32	-1.7	0.870
MW11	9/16/10	6.99	13.29	2,488	2.2	7.3	1.618
	12/28/10	NM	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM	NM
	5/3/11	7.46	4.84	1,382	2.74	198.4	1.169
	8/24/11	6.72	14.46	3,313	2.23	229	3.262
	11/23/11	NM	NM	NM	NM	NM	NM
	3/28/12	7.42	2.77	2,215	2.86	11.5	1.440
	6/27/12	7.38	10.84	1,605	1.60	-43.3	1.044
CDPHE WQCC Reg 41		NA	NA	NA	NA	NA	<1.25 x background

**NOTES:**

C° - degrees celcius

µ-S - micro siemens

DO - dissolved oxygen

mg/L - milligrams per liter

ORP - oxygen reduction potential

mV - milli volts

TDS - total dissolved solids

g/L - grams per liter

CDPHE WQCC Reg 41 - Colorado Department of Public Health and Environment - Water Quality

Control Commission Regulation 41 covering The Basic Standards for Ground Water

NA - Not Applicable

NM - Not Monitored due to frozen groundwater



**TABLE 3**  
**GEOCHEMICAL RESULTS**  
**WT DURHAM #4 FLOWLINE RELEASE**  
**MOFFAT COUNTY, COLORADO**  
**SHELL EXPLORATION AND PRODUCTION COMPANY**

Well ID	Date	Manganese (µg/l)	Total Iron (µg/l)	Nitrate (mg/L)	Sulfate (mg/L)
MW02	9/16/10	356	3,310	<0.05	292
	12/28/10	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM
	5/3/11	360	2,190	<0.05	316
	8/24/11	409	1,070	<0.05	347
	11/23/11	NM	NM	NM	NM
	3/29/12	390	1,600	<0.23	400
	6/27/12	370	13,000	<0.23	340
MW06	9/16/10	829	3,560	<0.05	465
	12/28/10	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM
	5/3/11	942	644	<0.05	384
	8/24/11	926	1,590	0.185	411
	11/23/11	NM	NM	NM	NM
	3/29/12	840	2,500	<0.23	350
	6/27/12	840	2,100	<0.23	323
MW11	9/16/10	317	<200	0.119	376
	12/28/10	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM
	5/3/11	171	<200	<0.05	259
	8/24/11	277	<200	0.193	292
	11/23/11	NM	NM	NM	NM
	3/29/12	120	650	<0.23	290
	6/27/12	440	130	<0.23	371

**NOTES:**

µg/L - micrograms per liter

mg/L - milligrams per liter

< - indicates result is less than the stated laboratory method reporting limit

NM - Not Monitored due to frozen groundwater





July 19, 2012

LT Environmental, Inc.

Rob Fishburn

4600 West 60th Avenue

Arvada CO 80003

Project Name - WT Durham #4

Project Number - MS1007

Attached are you analytical results for WT Durham #4 received by Origins Laboratory, Inc. June 28, 2012. This project is associated with Origins project number X206129-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.  
303.433.1322  
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645



LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO 80003

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

### CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW01	X206129-01	Water	June 27, 2012 15:00	06/28/2012 11:50
MW02	X206129-02	Water	June 27, 2012 14:30	06/28/2012 11:50
MW03	X206129-03	Water	June 27, 2012 14:10	06/28/2012 11:50
MW04	X206129-04	Water	June 27, 2012 14:20	06/28/2012 11:50
MW05	X206129-05	Water	June 27, 2012 15:10	06/28/2012 11:50
MW06	X206129-06	Water	June 27, 2012 15:50	06/28/2012 11:50
MW07	X206129-07	Water	June 27, 2012 15:20	06/28/2012 11:50
MW08	X206129-08	Water	June 27, 2012 15:30	06/28/2012 11:50
MW09	X206129-09	Water	June 27, 2012 14:40	06/28/2012 11:50
MW10	X206129-10	Water	June 27, 2012 14:50	06/28/2012 11:50
MW11	X206129-11	Water	June 27, 2012 15:40	06/28/2012 11:50
Trip Blank	X206129-12	Water	June 27, 2012 0:00	06/28/2012 11:50

Origins Laboratory, Inc.



Noelle E Doyle, President

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

LT Environmental, Inc.

4600 West 60th Avenue

Arvada CO 80003

Rob Fishburn

Project Number: MS1007

Project: WT Durham #4

**ORIGINS**  
LABORATORY, INC

LABORATORY, INC

X206129

Page 1 of 2

1725 Elk Place, Denver, CO 80211

Laboratory # - 303.433.1322

Client: LT Environmental, Inc.  
Project: WT Durham #4  
Project Manager: Chris Shepherd / Rob Fishburn  
Project Number: MS1007

Number	Sample Identification	Matrix	Sample Date	Sample Time	Sampled By	Container	Qty	Analyses
01-001	MW01	Water	6/27/12	1500	SS/DH	01_40mL Amber VOA Vial - HCL	3	BTEX by EPA 8260C
02-001	MW02	Water	6/27/12	1430	SS/DH	01_40mL Amber VOA Vial - HCL	3	BTEX by EPA 8260C Manganese Dissolved EPA 353.2/300.0 Sulfate by 300.0 Field Filtered
03-001	MW03	Water	6/27/12	1410	SS/DH	01_40mL Amber VOA Vial - HCL	3	BTEX by EPA 8260C
04-001	MW04	Water	6/27/12	1420	SS/DH	01_40mL Amber VOA Vial - HCL	3	BTEX by EPA 8260C
05-001	MW05	Water	6/27/12	1510	SS/DH	01_40mL Amber VOA Vial - HCL	3	BTEX by EPA 8260C
06-001	MW06	Water	6/27/12	1550	SS/DH	01_40mL Amber VOA Vial - HCL	6	BTEX by EPA 8260C Iron Total EPA 6010B Manganese Dissolved EPA 353.2/300.0 Sulfate by 300.0 Field Filtered
07-001	MW07	Water	6/27/12	1520	SS/DH	01_40mL Amber VOA Vial - HCL	3	BTEX by EPA 8260C
08-001	MW08	Water	6/27/12	1530	SS/DH	01_40mL Amber VOA Vial - HCL	3	BTEX by EPA 8260C

Relinquished By: Charles Doyle Date/Time: 6/28/12 11:50  
Received By: Jeff Smith Date/Time: 6/28/12 11:50  
Temperature on Receipt: 72-hr ☐ Standard ☒

Origins Laboratory, Inc.

*Noelle E Doyle*

Noelle E Doyle, President

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

LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO 80003

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

**ORIGINS**  
LABORATORY, INC

X206129

Page 2 of 2

1725 Elk Place, Denver, CO 80211  
Laboratory # - 303.433.1322

09-001	MW09	Water	6/27/12	1440	SS/DH	01_40mL Amber VOA Vial - HCL	3	BTEX by EPA 8260C
10-001	MW10	Water	6/27/12	1450	SS/DH	01_40mL Amber VOA Vial - HCL	3	BTEX by EPA 8260C
11-001	MW11	Water	6/27/12	1540	SS/DH	01_40mL Amber VOA Vial - HCL	6	BTEX by EPA 8260C Manganese Dissolved EPA 353.2/300.0 Nitrate by Sulfate by 300.0 F-ald 6:1 Hired
12-001	Trip Blank	Water	-	-	-	40 mL Amber Vial	1	BTEX by EPA 8260C

Received By: Steve Siskin Date / Time: 6/28-1000  
 Relinquished By: Charles Doyle Date / Time: 6/28/12 11:10  
 Received By: Amel Date / Time: 6/28/12 11:50  
 Relinquished By: Amel Date / Time: 6/28/12 11:50  
 Temperature on Receipt: ☐ 72-hr ☒ Standard  
 Turn Around Time: ☐ Same Day ☐ 24-hr

Origins Laboratory, Inc.

*Noelle E Doyle*

Noelle E Doyle, President

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



LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO 80003

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

Origins Laboratory

F-012207-01-R1  
Effective Date: 01/09/12

## Sample Receipt Checklist

Origins Work Order: X206129

Client: LTE

Client Project ID: WT Durham #4

Checklist Completed by: Jeff Smith

Shipped Via: TRUCK  
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 6/28/12 12:27

Airbill #: N/A

Matrix(s) Received: (Check all that apply): Soil/Solid Water Other: (Describe)

Cooler Number/Temperature: 1 5.7 °C 1 °C 1 °C 1 °C

Thermometer ID: T201

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Nitrate</u>
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water — is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are samples preserved that require preservation and was it checked <sup>(1)</sup> ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/(pH <2 for samples preserved with HNO <sub>3</sub> , HCL, H <sub>2</sub> SO <sub>4</sub> ) / (pH >10 for samples preserved with NaAsO <sub>2</sub> +NaOH, ZnAc+NaOH)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>HNO<sub>3</sub></u> <u>4CL</u> <u>6/28/12</u>
Additional Comments (if any): <u>Transferred Nitrate from 1L Poly to 250ml poly</u> <u>Added Trip Blank to COC that had been Included with Samples</u>				

<sup>(1)</sup>If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

Reviewed by (Project Manager)

Date/Time Reviewed: 6-28-12 17:05

Origins Laboratory, Inc.

Noelle E Doyle, President

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

LT Environmental, Inc.

4600 West 60th Avenue

Arvada CO 80003

Rob Fishburn

Project Number: MS1007

Project: WT Durham #4

MW01

6/27/2012 3:00:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	-------

Origins Laboratory, Inc.  
X206129-01 (Water)

## BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	2G03006	07/03/2012	07/03/2012
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4

107 % 70-130

" " "

Surrogate: Toluene-d8

100 % 70-130

" " "

Surrogate: 4-Bromofluorobenzene

97.1 % 70-130

" " "

Origins Laboratory, Inc.



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

Noelle E Doyle, President

LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO 80003

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

MW02  
6/27/2012 2:30:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	-------

**RTI Laboratories**  
X206129-02 (Water)

**Anions by EPA 300**

Sulfate	340	10	mg/L	1	R4988	07/06/2012	07/06/2012
---------	-----	----	------	---	-------	------------	------------

**BTEX by EPA 8260C**

Benzene	ND	1.0	ug/L	1	2G03006	07/03/2012	07/06/2012
Toluene	ND	1.0	"	"	"	"	07/05/2012
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	103 %	70-130			"	"	"
Surrogate: Toluene-d8	101 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	97.2 %	70-130			"	"	"

**Dissolved Metals by SW6020A**

Manganese, dissolved	370	10	µg/L	10	R49886	07/06/2012	07/06/2012
----------------------	-----	----	------	----	--------	------------	------------

**Total Metals by SW6020A**

Iron	13,000	200	µg/L	5	26607	07/02/2012	07/05/2012
------	--------	-----	------	---	-------	------------	------------

Origins Laboratory, Inc.



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

Noelle E Doyle, President

LT Environmental, Inc.

4600 West 60th Avenue

Arvada CO 80003

Rob Fishburn

Project Number: MS1007

Project: WT Durham #4

MW03

6/27/2012 2:10:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

Origins Laboratory, Inc.  
X206129-03 (Water)

## BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	2G03006	07/03/2012	07/06/2012
Toluene	ND	1.0	"	"	"	"	07/05/2012
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	105 %	70-130			"	"	"
Surrogate: Toluene-d8	99.8 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	98.3 %	70-130			"	"	"

Origins Laboratory, Inc.



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

Noelle E Doyle, President



LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO 80003

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

MW04

6/27/2012 2:20:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	-------

Origins Laboratory, Inc.  
X206129-04 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	2G03006	07/03/2012	07/05/2012
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	104 %	70-130			"	"	"
Surrogate: Toluene-d8	101 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	100 %	70-130			"	"	"

Origins Laboratory, Inc.



Noelle E Doyle, President

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

LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO 80003

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

MW05  
6/27/2012 3:10:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

Origins Laboratory, Inc.  
X206129-05 (Water)

## BTEX by EPA 8260C

Benzene	30	1.0	ug/L	1	2G03006	07/03/2012	07/05/2012
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	105 %	70-130			"	"	"
Surrogate: Toluene-d8	98.9 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	98.8 %	70-130			"	"	"

Origins Laboratory, Inc.



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

Noelle E Doyle, President

LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO 80003

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

MW06  
6/27/2012 3:50:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	-------

RTI Laboratories  
X206129-06 (Water)

### Anions by EPA 300

Sulfate	323	10	mg/L	1	R4988	07/06/2012	07/06/2012
---------	-----	----	------	---	-------	------------	------------

### BTEX by EPA 8260C

Benzene	109	1.0	ug/L	1	2G03006	07/03/2012	07/05/2012
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	7.49	1.0	"	"	"	"	"
Xylenes, total	12.4	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	112 %	70-130			"	"	07/05/2012
Surrogate: Toluene-d8	97.9 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	97.3 %	70-130			"	"	"

### Dissolved Metals by SW6020A

Manganese, dissolved	840	10	µg/L	10	R49886	07/06/2012	07/06/2012
----------------------	-----	----	------	----	--------	------------	------------

### Total Metals by SW6020A

Iron	2,100	800	µg/L	20	26607	07/02/2012	07/05/2012
------	-------	-----	------	----	-------	------------	------------

Origins Laboratory, Inc.



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

Noelle E Doyle, President

LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO 80003

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

MW07  
6/27/2012 3:20:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

Origins Laboratory, Inc.  
X206129-07 (Water)

## BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	2G03006	07/03/2012	07/05/2012
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	113 %	70-130			"	"	"
Surrogate: Toluene-d8	98.8 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	97.9 %	70-130			"	"	"

Origins Laboratory, Inc.



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

Noelle E Doyle, President



LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO 80003

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

MW08

6/27/2012 3:30:00PM

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

Origins Laboratory, Inc.  
X206129-08 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	2G03006	07/03/2012	07/05/2012
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4  
Surrogate: Toluene-d8  
Surrogate: 4-Bromofluorobenzene

114 % 70-130  
99.0 % 70-130  
97.8 % 70-130

" " "  
" " "  
" " "

Origins Laboratory, Inc.



Noelle E Doyle, President

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

LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO 80003

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

MW09  
6/27/2012 2:40:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

Origins Laboratory, Inc.  
X206129-09 (Water)

## BTEX by EPA 8260C

Benzene	1.88	1.0	ug/L	1	2G03006	07/03/2012	07/05/2012
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	115 %	70-130			"	"	"
Surrogate: Toluene-d8	98.9 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	97.8 %	70-130			"	"	"

Origins Laboratory, Inc.



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

Noelle E Doyle, President

LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO 80003

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

MW10  
6/27/2012 2:50:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

Origins Laboratory, Inc.  
X206129-10 (Water)

## BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	2G03006	07/03/2012	07/05/2012
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	112 %	70-130			"	"	"
Surrogate: Toluene-d8	98.7 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	98.1 %	70-130			"	"	"

Origins Laboratory, Inc.



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

Noelle E Doyle, President

LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO 80003

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

MW11  
6/27/2012 3:40:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	-------

**RTI Laboratories**  
X206129-11 (Water)

**Anions by EPA 300**

Sulfate	371	10	mg/L	1	R4988	07/06/2012	07/06/2012
---------	-----	----	------	---	-------	------------	------------

**BTEX by EPA 8260C**

Benzene	ND	1.0	ug/L	1	2G03006	07/03/2012	07/05/2012
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	114 %	70-130			"	"	"
Surrogate: Toluene-d8	98.9 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	99.4 %	70-130			"	"	"

**Dissolved Metals by SW6020A**

Manganese, dissolved	440	10	µg/L	10	R49886	07/06/2012	07/06/2012
----------------------	-----	----	------	----	--------	------------	------------

**Total Metals by SW6020A**

Iron	130	200	µg/L	5	26607	07/02/2012	07/05/2012
------	-----	-----	------	---	-------	------------	------------

J

Origins Laboratory, Inc.



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

Noelle E Doyle, President



LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO 80003

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

**Trip Blank****6/27/2012 12:00:00AM**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**  
**X206129-12 (Water)****BTEX by EPA 8260C**

Benzene	ND	1.0	ug/L	1	2G03006	07/03/2012	07/05/2012
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

*Surrogate: 1,2-Dichloroethane-d4*  
*Surrogate: Toluene-d8*  
*Surrogate: 4-Bromofluorobenzene*

113 % 70-130  
99.6 % 70-130  
97.8 % 70-130

" " "  
" " "  
" " "

Origins Laboratory, Inc.



Noelle E Doyle, President

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

LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO 80003

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control  
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 2G03006 - EPA 5030B (Water)

Blank (2G03006-BLK1)

Prepared: 07/03/2012 Analyzed: 07/03/2012

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	67		"	62.5	107		70-130			
Surrogate: Toluene-d8	63		"	62.5	101		70-130			
Surrogate: 4-Bromofluorobenzene	61		"	62.5	98.2		70-130			

Origins Laboratory, Inc.



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

Noelle E Doyle, President

LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO 80003

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control  
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 2G03006 - EPA 5030B (Water)

LCS (2G03006-BS1)

Prepared: 07/03/2012 Analyzed: 07/03/2012

Benzene	96.8	1.0	ug/L	100		96.8	70-130			
Toluene	105	1.0	"	100		105	70-130			
Ethylbenzene	106	1.0	"	100		106	70-130			
m,p-Xylene	220	2.0	"	200		110	70-130			
o-Xylene	97.6	1.0	"	100		97.6	70-130			
Surrogate: 1,2-Dichloroethane-d4	66		"	62.5		106	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.6	70-130			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		99.7	70-130			

Origins Laboratory, Inc.



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

Noelle E Doyle, President

LT Environmental, Inc.

4600 West 60th Avenue

Arvada CO 80003

Rob Fishburn

Project Number: MS1007

Project: WT Durham #4

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 2G03006 - EPA 5030B (Water)

Matrix Spike (2G03006-MS1)		Source: X206129-01			Prepared: 07/03/2012 Analyzed: 07/03/2012					
Benzene	95.8	1.0	ug/L	100	0.4	95.3	70-130			
Toluene	104	1.0	"	100	ND	104	70-130			
Ethylbenzene	105	1.0	"	100	ND	105	70-130			
m,p-Xylene	218	2.0	"	200	ND	109	70-130			
o-Xylene	96.8	1.0	"	100	0.6	96.2	70-130			
Surrogate: 1,2-Dichloroethane-d4	66		"	62.5		105	70-130			
Surrogate: Toluene-d8	63		"	62.5		100	70-130			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		99.1	70-130			

Origins Laboratory, Inc.



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

Noelle E Doyle, President



LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO 80003

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 2G03006 - EPA 5030B (Water)

Matrix Spike Dup (2G03006-MSD1)		Source: X206129-01			Prepared: 07/03/2012 Analyzed: 07/03/2012					
Benzene	99.0	1.0	ug/L	100	0.4	98.6	70-130	3.30	20	
Toluene	107	1.0	"	100	ND	107	70-130	3.22	20	
Ethylbenzene	110	1.0	"	100	ND	110	70-130	4.44	20	
m,p-Xylene	226	2.0	"	200	ND	113	70-130	4.02	20	
o-Xylene	98.8	1.0	"	100	0.6	98.2	70-130	2.00	20	
Surrogate: 1,2-Dichloroethane-d4	66		"	62.5		106	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.9	70-130			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	70-130			

Origins Laboratory, Inc.



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

Noelle E Doyle, President

LT Environmental, Inc.

4600 West 60th Avenue

Arvada CO 80003

Rob Fishburn

Project Number: MS1007

Project: WT Durham #4

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

**Dissolved Metals by SW6020A - Quality Control**  
RTI Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch R49886 -

<b>MS (1206B42-001BMS)</b>		<b>Source: 1206B42-001B</b>			<b>Prepared: Analyzed: 07/06/2012</b>					
Manganese, dissolved	580	10	µg/L	200.0	108	80-120		0		
<b>MSD (1206B42-001BMSD)</b>		<b>Source: 1206B42-001B</b>			<b>Prepared: Analyzed: 07/06/2012</b>					
Manganese, dissolved	580	10	µg/L	200.0	107	80-120	0.361	20		
<b>LCS (LCS-DIS-070612-1)</b>		<b>Source: LCS-DIS-0706</b>			<b>Prepared: Analyzed: 07/06/2012</b>					
Manganese, dissolved	48	1.0	µg/L	50.00	96.9	80-120		0		
<b>MBLK (MB-DIS-070612-1)</b>		<b>Source: MB-DIS-07061</b>			<b>Prepared: Analyzed: 07/06/2012</b>					
Manganese, dissolved	0.062	1.0	µg/L			-		0		J

Origins Laboratory, Inc.



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

Noelle E Doyle, President

LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO 80003

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

## Total Metals by SW6020A - Quality Control RTI Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 26607 -										
MS (1206B42-001AMS)	Source: 1206B42-001A				Prepared: 07/02/2012 Analyzed: 07/05/2012					
Iron	26,000	800	µg/L	10,000	126	80-120		0		
MSD (1206B42-001AMSD)	Source: 1206B42-001A				Prepared: 07/02/2012 Analyzed: 07/05/2012					
Iron	24,000	800	µg/L	10,000	103	80-120	9.36	20		
LCS (LCS-26607)	Source: LCS-26607				Prepared: 07/02/2012 Analyzed: 07/05/2012					
Iron	11,000	800	µg/L	10,000	111	80-120		0		
MBLK (MB-26607)	Source: MB-26607				Prepared: 07/02/2012 Analyzed: 07/05/2012					
Iron	ND	40	µg/L			-		0		

Origins Laboratory, Inc.



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

Noelle E Doyle, President

LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO 80003

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

### Notes and Definitions

S Spike Recovery outside accepted recovery limits

J Estimated concentration

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

Origins Laboratory, Inc.



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

Noelle E Doyle, President



07/10/12

## Technical Report for

### Origins Laboratory

X206129

Accutest Job Number: D35955

Sampling Date: 06/27/12

#### Report to:


Origins Laboratory  
1725 Elk Place  
Denver, CO 80211  
ndoyle@oelabinc.com

ATTN: Noelle Doyle

Total number of pages in report: **16**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

  
**Brad Madadian**  
Laboratory Director

Client Service contact: Renea Jackson 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW), UT (NELAP CO00049), TX (T104704511-12-1)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories.

Test results relate only to samples analyzed.



# Table of Contents

-1-

<b>Section 1: Sample Summary .....</b>	<b>3</b>
<b>Section 2: Case Narrative/Conformance Summary .....</b>	<b>4</b>
<b>Section 3: Summary of Hits .....</b>	<b>5</b>
<b>Section 4: Sample Results .....</b>	<b>6</b>
<b>4.1:</b> D35955-1: X206129-02 .....	7
<b>4.2:</b> D35955-2: X206129-06 .....	8
<b>4.3:</b> D35955-3: X206129-11 .....	9
<b>Section 5: Misc. Forms .....</b>	<b>10</b>
<b>5.1:</b> Chain of Custody .....	11
<b>Section 6: General Chemistry - QC Data Summaries .....</b>	<b>13</b>
<b>6.1:</b> Method Blank and Spike Results Summary .....	14
<b>6.2:</b> Matrix Spike Results Summary .....	15
<b>6.3:</b> Matrix Spike Duplicate Results Summary .....	16



Sample Summary

Origins Laboratory  
X206129

Job No: D35955

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
D35955-1	06/27/12	14:30	06/28/12	AQ	Ground Water	X206129-02
D35955-2	06/27/12	15:10	06/28/12	AQ	Ground Water	X206129-06
D35955-3	06/27/12	15:40	06/28/12	AQ	Ground Water	X206129-11



## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** Origins Laboratory

**Job No** D35955

**Site:** X206129

**Report Date** 7/10/2012 1:32:15 PM

On 06/28/2012, 3 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 4.0 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D35955 was assigned to the project. The lab sample IDs, client sample IDs, and date of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

### Wet Chemistry By Method EPA 300/SW846 9056

**Matrix** AQ

**Batch ID:** GP7600

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D35924-2MS, D35924-2MSD were used as the QC samples for the Nitrogen, Nitrate analysis.
- All samples for Nitrogen, Nitrate: Elevated detection limit due to matrix interference.

AMS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting AMS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

AMS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by AMS indicated via signature on the report cover.

Summary of Hits

Job Number: D35955  
Account: Origins Laboratory  
Project: X206129  
Collected: 06/27/12



Lab Sample ID	Client Sample ID	Result/ Analyte	RL	MDL	Units	Method
---------------	------------------	--------------------	----	-----	-------	--------

D35955-1      X206129-02

< no hits reported in this sample>

D35955-2      X206129-06

< no hits reported in this sample>

D35955-3      X206129-11

< no hits reported in this sample>

Sample Results

Report of Analysis

Report of Analysis

<b>Client Sample ID:</b>	X206129-02	<b>Date Sampled:</b>	06/27/12
<b>Lab Sample ID:</b>	D35955-1	<b>Date Received:</b>	06/28/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Project:</b>	X206129		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Nitrogen, Nitrate <sup>a</sup>	< 0.23	0.23	mg/l	5	06/28/12 17:13	GH	EPA 300/SW846 9056

(a) Elevated detection limit due to matrix interference.

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	X206129-06	<b>Date Sampled:</b>	06/27/12
<b>Lab Sample ID:</b>	D35955-2	<b>Date Received:</b>	06/28/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Project:</b>	X206129		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Nitrogen, Nitrate <sup>a</sup>	< 0.23	0.23	mg/l	5	06/28/12 17:24	GH	EPA 300/SW846 9056

(a) Elevated detection limit due to matrix interference.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	X206129-11	<b>Date Sampled:</b>	06/27/12
<b>Lab Sample ID:</b>	D35955-3	<b>Date Received:</b>	06/28/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Project:</b>	X206129		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Nitrogen, Nitrate <sup>a</sup>	< 0.23	0.23	mg/l	5	06/28/12 17:35	GH	EPA 300/SW846 9056

(a) Elevated detection limit due to matrix interference.

RL = Reporting Limit

## Misc. Forms

5

### Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody

035955

Client: Origins Laboratory  
Address: 1725 Elk Place, Denver, CO 80211

Project Manager: Noelle Doyle

Project Name: X206129

Project Number: NA

Telephone Number: (303) 433-1322

Samples Collected By: NA

Email Address: ndoyle@oelabinc.com

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix				Analysis				Sample Instructions		
				Unpreserved	HCl	HNO <sub>3</sub>	Other	Groundwater	Soil	Air Summa Canister #	Other	Nitrate						
X206129-02	6/27/12	14:30	1	X				X					X				01	1
X206129-06	6/27/12	15:10	1	X				X					X				02	2
X206129-11	6/27/12	15:40	1	X				X					X				03	3
																	04	4
																	05	5
																		6
																		7
																		8
																		9
																		10
Relinquished By: <u>Jeff Smith</u>	Date: <u>6/28/12</u>	Time: <u>13:27</u>	Received By: <u>Jacob Brown</u>				Date: <u>6/28/12</u>	Time: <u>13:27</u>	Turnaround Time: Same Day <input type="checkbox"/> 24 Hr <input type="checkbox"/>									
Relinquished By:	Date:	Time:	Received By:				Date:	Time:	48 Hr <input type="checkbox"/> 72 Hr <input type="checkbox"/>									
									Standard <input checked="" type="checkbox"/>									

HD 4.0

Date Results Needed

D35955: Chain of Custody

Page 1 of 2

# Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D35955

Client: ORIGINS LAB

Immediate Client Services Action Required: No

Date / Time Received: 6/28/2012 1:27:00 PM

No. Coolers: 1

Client Service Action Required at Login: No

Project: X206129

Airbill #'s: HD

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>		<input type="checkbox"/>

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Cooler temp verification:			Infrared gun
3. Cooler media:			Ice (bag)

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	<input type="checkbox"/>		<input type="checkbox"/>	
2. Trip Blank listed on COC:	<input type="checkbox"/>		<input type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. VOCs headspace free:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		<input type="checkbox"/>

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Condition of sample:			Intact

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
3. Sufficient volume rec'd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments

Accutest Laboratories  
V:(303) 425-6021

4036 Youngfield Street  
F: (303) 425-6854

Wheat Ridge, CO  
www.accutest.com

## General Chemistry

### QC Data Summaries

---

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries



METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D35955  
Account: ORIGLCOD - Origins Laboratory  
Project: X206129

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Bromide	GP7600/GN15628	0.20	0.0	mg/l	20	20.1	100.5	90-110%
Chloride	GP7600/GN15628	0.50	0.0	mg/l	20	19.8	99.0	90-110%
Fluoride	GP7600/GN15628	0.10	0.0	mg/l	10	9.38	93.8	90-110%
Nitrogen, Nitrate	GP7600/GN15628	0.045	0.0	mg/l	4.52	4.32	95.6	90-110%
Nitrogen, Nitrite	GP7600/GN15628	0.010	0.0	mg/l	6.09	6.16	101.1	90-110%
Sulfate	GP7600/GN15628	0.50	0.0	mg/l	30	29.4	98.0	90-110%

Associated Samples:

Batch GP7600: D35955-1, D35955-2, D35955-3

(\*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D35955  
Account: ORIGLCOD - Origins Laboratory  
Project: X206129

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Bromide	GP7600/GN15628	D35924-2	mg/l	0.0	2.5	2.5	100.0	80-120%
Chloride	GP7600/GN15628	D35924-2	mg/l	0.32	10	10.0	96.8	80-120%
Fluoride	GP7600/GN15628	D35924-2	mg/l	0.073	2.5	2.5	97.1	80-120%
Nitrogen, Nitrate	GP7600/GN15628	D35924-2	mg/l	0.0	0.565	0.57	100.9	80-120%
Nitrogen, Nitrite	GP7600/GN15628	D35924-2	mg/l	0.0	0.305	0.31	101.8	80-120%
Sulfate	GP7600/GN15628	D35924-2	mg/l	1.5	10	11.5	100.0	80-120%

Associated Samples:

Batch GP7600: D35955-1, D35955-2, D35955-3

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

MATRIX SPIKE DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D35955  
Account: ORIGLCOD - Origins Laboratory  
Project: X206129

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Bromide	GP7600/GN15628	D35924-2	mg/l	0.0	2.5	2.6	3.9	20%
Chloride	GP7600/GN15628	D35924-2	mg/l	0.32	10	10.0	0.0	20%
Fluoride	GP7600/GN15628	D35924-2	mg/l	0.073	2.5	2.5	0.0	20%
Nitrogen, Nitrate	GP7600/GN15628	D35924-2	mg/l	0.0	0.565	0.57	0.0	20%
Nitrogen, Nitrite	GP7600/GN15628	D35924-2	mg/l	0.0	0.305	0.31	0.0	20%
Sulfate	GP7600/GN15628	D35924-2	mg/l	1.5	10	11.6	0.9	20%

Associated Samples:

Batch GP7600: D35955-1, D35955-2, D35955-3

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits