

# GROUNDWATER MONITORING REPORT

## NOVEMBER 2008

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### ANGELINA ROMERO #1 WELL SITE

On November 10, 2008, LT Environmental, Inc. (LTE) conducted groundwater sampling on behalf of Noble Energy, Inc. (Noble), at the Angelina Romero #1 Tank Battery (Site). This sampling event constitutes the second post remediation monitoring event at this site. Site history and remediation activities were described in the preceding *Remediation Summary* and *Well Installation and Sampling Reports* dated August 2008 and September 2008, respectively.

Groundwater level measurements were collected from the monitoring wells and are summarized in Table 1. The monitoring wells (MW01, MW02, and MW03) were installed surrounding the flowline excavation on August 1, 2008. A site map is presented on Figure 1.

Depth to groundwater, which ranged from 2.55 feet below top of casing (btoc) in monitoring wells MW01 and MW03 to 2.42 feet btoc in monitoring well MW02, was used to calculate well-specific purge volumes. Following purging, groundwater samples were collected and preserved on ice. Samples were then submitted under strict chain of custody protocol to Origins Laboratory, Inc. of Denver, Colorado for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by United States Environmental Protection Agency Method 8260B.

Analytical results from the monitoring wells, presented in Table 1, indicate BTEX concentrations are below Colorado Groundwater Quality Standards (CGWQS) and laboratory method detection limits for all samples. The laboratory analytical report is attached as an appendix.

LTE will continue to conduct quarterly groundwater monitoring events with the goal of observing four consecutive quarters of analytical results in compliance with applicable regulatory standards. The next quarterly groundwater sampling event is scheduled for February 2009.



**TABLE**



**TABLE 1**

**GROUNDWATER ANALYTICAL DATA  
ANGELINA ROMERO #1  
WELD COUNTY, COLORADO  
NOBLE ENERGY, INC.**

<b>MONITORING WELL</b>	<b>DATE</b>	<b>DEPTH TO WATER (feet btoc)</b>	<b>BENZENE (ug/L)</b>	<b>TOLUENE (ug/L)</b>	<b>ETHYLBENZENE (ug/L)</b>	<b>XYLENES (ug/L)</b>
MW01	8/20/2008	0.50	<1.0	<1.0	<1.0	<3.0
	11/10/2008	2.55	<1.0	<1.0	<1.0	<3.0
MW02	8/20/2008	0.40	<1.0	<1.0	<1.0	<3.0
	11/10/2008	2.42	<1.0	<1.0	<1.0	<3.0
MW03	8/20/2008	0.40	<1.0	<1.0	<1.0	<3.0
	11/10/2008	2.55	<1.0	<1.0	<1.0	<3.0
<b>CGWQS</b>			<b>5.0</b>	<b>1,000</b>	<b>700</b>	<b>1,400</b>

**NOTES:**

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

btoc - below top of casing

ug/L - micrograms per liter

< indicates result is less than the stated laboratory method detection limit

CGWQS - Colorado Groundwater Quality Standards



**FIGURE**



COUNTY ROAD 43

M

SEPARATOR

CATTLE GUARD

AST

MW01

MW02

MW03

ACCESS ROAD

### LEGEND

MW01



MONITORING WELL LOCATION



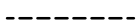
METER HOUSE



BERM

AST

ABOVEGROUND STORAGE TANK



EXTENT OF EXCAVATION



ESTIMATED GROUNDWATER FLOW DIRECTION



0 10 20 40

FEET  
APPROXIMATE SCALE

FIGURE 1  
SITE MAP  
ANGELINA ROMERO #1  
WELD COUNTY, CO  
NOBLE ENERGY, INC.



NEP082501 7/08

**APPENDIX**  
**ANALYTICAL REPORT**





4640 Pecos Street | Unit C | Denver, Colorado 80211  
303.433.1322 Phone 303.265.9645 Fax

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November 15, 2008

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

Brian Dodek  
Project Number: NEP0825.02  
Project: Angelina Romero #1

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Attached are the analytical results for Angelina Romero #1 received by Origins Laboratory, Inc. 11/11/2008 3:33:00PM. Please let us know if you have any questions, or if we can help with anything at all.

Laboratory Manager  
Noelle E Doyle

The analytical results in the following report were analyzed under the guidelines of EPA Methods specified in SW-846. The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. This laboratory report is intended solely for the above addressee and it is only to be used and or reproduced in its entirety.

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LT Environmental, Inc.  
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Brian Dodek  
Project Number: NEP0825.02  
Project: Angelina Romero #1

#### CROSS REFERENCE REPORT

Laboratory ID	Sample ID	Matrix	Sampled	Date Received
MW01	X811045-01	Water	11/10/2008 3:10:00PM	11/11/2008 15:33
MW02	X811045-02	Water	11/10/2008 3:25:00PM	11/11/2008 15:33
MW03	X811045-03	Water	11/10/2008 3:31:00PM	11/11/2008 15:33

Origins Laboratory, Inc.

Noelle E Doyle, Laboratory Manager

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Project Number: NEP0825.02  
Project: Angelina Romero #1

X811045

page 1 of 1



originslaboratory.com

Client: LTE  
Address: 4600 W 60th Ave  
Arvada CO 80003  
Telephone Number: ON FILE  
E-Mail Address: ON FILE

Project Manager: BDD  
Project Name: Angelina Romero #1  
Project Number: NEP0825  
Samples Collected by: TED

Sample ID - Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix			Analysis	Sample Instructions
				Unpreserved	HCl	HNO <sub>3</sub>	Other: <u>TEP</u>	Soil	Groundwater	Air - Summa Canister #		
MW01	11/10	1510	3		X	X	X					1
MW02	11/10	1525	3		X	X	X					2
MW03	11/10	1531	3		X	X	X					3
												4
												5
												6
												7
												8
												9
												10
Relinquished by: <u>SED</u>	Date: <u>11/10/08</u>	Time: <u>1533</u>	Received by: <u>[Signature]</u>	Date: <u>11/10/08</u>	Time: <u>1533</u>	Temperature Upon Receipt: <u>85°C</u>	Turn Around Time: <u>24 hr</u>	Standard: <u>72 hr</u>				

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MW01

X811045-01 (Water)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

Origins Laboratory, Inc.

BTEX by EPA 8260B

Benzene	ND	0.00100	mg/L	1	8K13002	11/13/2008	11/13/2008
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	104 %	70.3-123	"	"	"
Surrogate: Toluene-d8	95.9 %	75.9-123	"	"	"
Surrogate: 4-Bromofluorobenzene	104 %	83-123	"	"	"

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**MW02**

**X811045-02 (Water)**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**

**BTEX by EPA 8260B**

Benzene	ND	0.00100	mg/L	1	8K13002	11/13/2008	11/13/2008
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	120 %	70.3-123	"	"	"
Surrogate: Toluene-d8	98.1 %	75.9-123	"	"	"
Surrogate: 4-Bromofluorobenzene	108 %	83-123	"	"	"

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**MW03**

**X811045-03 (Water)**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**

**BTEX by EPA 8260B**

Benzene	ND	0.00100	mg/L	1	8K13002	11/13/2008	11/13/2008
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	111 %	70.3-123	"	"	"
Surrogate: Toluene-d8	91.5 %	75.9-123	"	"	"
Surrogate: 4-Bromofluorobenzene	98.3 %	83-123	"	"	"

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**Volatile Organic Compounds by EPA Method 8260B – Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 8K13002 – EPA 5030B**

**Blank (8K13002–BLK1)**

Prepared: 11/13/2008 Analyzed: 11/13/2008

Benzene	ND	0.001	mg/L
Toluene	ND	0.001	"
Ethylbenzene	ND	0.001	"
o-Xylene	ND	0.001	"
m,p-Xylene	ND	0.002	"

Surrogate: 1,2-Dichloroethane-d4	68.3	ug/L	62.5	109	70.3-123
Surrogate: Toluene-d8	60.4	"	62.5	96.6	75.9-123
Surrogate: 4-Bromofluorobenzene	67.5	"	62.5	108	83-123

**LCS (8K13002–BS1)**

Prepared: 11/13/2008 Analyzed: 11/13/2008

Benzene	0.05	0.001	mg/L	0.0500	91.6	64.2-124
Toluene	0.04	0.001	"	0.0500	88.2	63.9-119
Surrogate: 1,2-Dichloroethane-d4	68.4		ug/L	62.5	109	70.3-123
Surrogate: Toluene-d8	61.8		"	62.5	98.9	75.9-123
Surrogate: 4-Bromofluorobenzene	62.6		"	62.5	100	83-123

**Matrix Spike (8K13002–MS1)**

Source: X811047-03

Prepared: 11/13/2008 Analyzed: 11/13/2008

Benzene	0.05	0.001	mg/L	0.0500	ND	103	64.2–124
Toluene	0.05	0.001	"	0.0500	ND	104	63.9–119
Surrogate: 1,2-Dichloroethane-d4	69.6		ug/L	62.5		111	70.3–123
Surrogate: Toluene-d8	61.5		"	62.5		98.4	75.9–123
Surrogate: 4-Bromofluorobenzene	66.0		"	62.5		106	83–123

**Matrix Spike Dup (8K13002–MSD1)**

Source: X811047-03

Prepared: 11/13/2008 Analyzed: 11/13/2008

Benzene	0.05	0.001	mg/L	0.0500	ND	101	64.2-124	1.10	25
Toluene	0.05	0.001	"	0.0500	ND	96.2	63.9-119	8.04	25
Surrogate: 1,2-Dichloroethane-d4	69.3		ug/L	62.5		111	70.3-123		
Surrogate: Toluene-d8	58.5		"	62.5		93.6	75.9-123		
Surrogate: 4-Bromofluorobenzene	65.3		"	62.5		104	83-123		

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### Notes and Definitions

ND Analyte NOT DETECTED at or above the reporting limit  
RPD Relative Percent Difference

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