



## **GROUNDWATER MONITORING REPORT MAY 2009**

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### **RICE #1**

On May 13, 2009, LT Environmental, Inc. (LTE) conducted groundwater sampling on behalf of Noble Energy, Inc. (Noble) at the Rice #1 Tank Battery (Site). This sampling event constitutes the third post remediation monitoring event at the Site. Site history, remediation activities, and groundwater monitoring results have been described in preceding reports.

Groundwater level measurements were collected from the monitoring wells and are summarized in Table 1. Monitoring wells (MW01, MW02, and MW03) were installed surrounding the tank battery excavation on October 29, 2008. A Site Map is presented on Figure 1.

Depth to groundwater, which ranged from 12.28 feet below top of casing (btoc) in MW01 to 14.98 feet btoc in MW03, 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.

Groundwater analytical results indicate BTEX concentrations at monitoring wells MW01, MW02, and MW03 were in compliance with the Colorado Department of Public Health and Environment Water Quality Control Commission Regulation 41 (WQCC Reg 41). Analytical results are summarized in Table 1. 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 WQCC Reg 41. The next quarterly groundwater sampling event is scheduled for August 2009.



## TABLE

TABLE 1

**GROUNDWATER ANALYTICAL DATA  
RICE #1 TANK BATTERY  
WELD COUNTY, COLORADO  
NOBLE ENERGY, INC.**

MONITORING WELL	DATE	DEPTH TO				
		WATER (feet btoc)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYLBENZENE (ug/L)	XYLENES (ug/L)
MW01	11/5/2008	11.48	<1.0	<1.0	2.96	8.92
	2/6/2009	13.55	<1.0	<1.0	3.59	4.58
	5/13/2009	12.28	<1.0	<1.0	<1.0	<3.0
MW02	11/5/2008	12.03	<1.0	<1.0	5.79	52.27
	2/6/2009	13.95	<1.0	<1.0	12.6	16.1
	5/13/2009	13.38	<1.0	<1.0	8.81	12.7
MW03	11/5/2008			Well Dry		
	2/6/2009	14.05	4.06	1.74	1.63	15.12
	5/13/2009	14.98	1.81	<1.0	<1.0	2.89
<b>CDPHE WQCC Reg 41</b>			<b>5.0</b>	<b>560</b>	<b>700</b>	<b>1,400</b>

## NOTES:

btoc - below top of casing

ug/L - micrograms per liter

&lt; indicates result is less than the stated laboratory method detection limit

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

Commission Regulation 41 covering Basic Standards for Groundwater

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



**FIGURE**



COUNTY ROAD 13

FORMER AST

MW01

MW02

M

SEPARATOR


MW03

## LEGEND

MW01  MONITORING WELL LOCATION

 METER HOUSE

 BERM

 EXTENT OF EXCAVATION

 ESTIMATED GROUNDWATER FLOW DIRECTION

AST ABOVEGROUND STORAGE TANK

SOURCE:  
GOOGLEMAP.COM

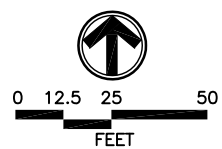


FIGURE 1  
SITE MAP  
RICE #1 TANK BATTERY  
WELD COUNTY, COLORADO  
NOBLE ENERGY, INC.



NEP083401 10/08

**APPENDIX**  
**ANALYTICAL REPORT**





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

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May 19, 2009

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

Brian Dodek  
Project Number: NEP0834  
Project: Noble – Rice 1

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Attached are the analytical results for Noble – Rice 1 received by Origins Laboratory, Inc. 5/13/2009 1:33:00PM. Please let us know if you have any questions, or if we can help with anything at all.

Noelle E Doyle  
Laboratory Manager

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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303.433.1322 | Laboratory  
303.265.9645 | Fax



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

Brian Dodek  
Project Number: NEP0834  
Project: Noble – Rice 1

#### CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Sampled	Date Received
MW01	X905050-01	Water	5/13/2009 12:10:00PM	05/13/2009 13:33
MW02	X905050-02	Water	5/13/2009 12:15:00PM	05/13/2009 13:33
MW03	X905050-03	Water	5/13/2009 12:20:00PM	05/13/2009 13:33

Origins Laboratory, Inc.

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Noelle E Doyle, Laboratory Manager



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Brian Dodek  
Project Number: NEP0834  
Project: Noble - Rice 1

1905050  
page 1 of 1



originslaboratory.com

Client: LT E  
Address: LT E  
Telephone Number: ON FILE  
E-Mail Address: ON FILE  
Project Manager: BDD  
Project Name: Rice #1  
Project Number: NEP0834  
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 - ICE	Groundwater	Soil	Air - Summa Canister #	Other -		
MW01	5/13/09	12:10	3										1
MW02		12:15	1										2
MW03		12:20	1										3
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Relinquished by: SSD Date: 5/13/09 Time: 1333  
Relinquished by: [Signature] Date: 5/13/09 Time: 1333  
Turn Around Time: 24-hr 48-hr 72-hr X

4640 North Pecos Street | Unit C | Denver, Colorado 80211 | Laboratory: 303.433.1322 | Fax: 303.265.9645

Origins Laboratory, Inc.

*Noelle E Doyle*

Noelle E Doyle, Laboratory Manager

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Arvada CO 80003

Brian Dodek  
Project Number: NEP0834  
Project: Noble – Rice 1

MW01

X905050-01 (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	9E15003	05/15/2009	05/19/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	109 %	70.3-128	"	"	"
Surrogate: Toluene-d8	93.8 %	78.8-125	"	"	"
Surrogate: 4-Bromofluorobenzene	94.6 %	75.5-131	"	"	"

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**MW02**

**X905050-02 (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	9E15003	05/15/2009	05/19/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	<b>0.00881</b>	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	<b>0.0127</b>	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	112 %	70.3-128	"	"	"
Surrogate: Toluene-d8	95.8 %	78.8-125	"	"	"
Surrogate: 4-Bromofluorobenzene	99.1 %	75.5-131	"	"	"

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**MW03**

**X905050-03 (Water)**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**

**BTEX by EPA 8260B**

Benzene	0.00181	0.00100	mg/L	1	9E15003	05/15/2009	05/19/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	0.00289	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	114 %	70.3-128	"	"	"
Surrogate: Toluene-d8	96.9 %	78.8-125	"	"	"
Surrogate: 4-Bromofluorobenzene	99.1 %	75.5-131	"	"	"

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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 9E15003 – EPA 5030B**

**Blank (9E15003-BLK1)**

Prepared: 05/15/2009 Analyzed: 05/18/2009

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	63.8	ug/L	62.5	102	70.3-128
Surrogate: Toluene-d8	62.4	"	62.5	99.8	78.8-125
Surrogate: 4-Bromofluorobenzene	65.0	"	62.5	104	75.5-131

**LCS (9E15003-BS1)**

Prepared: 05/15/2009 Analyzed: 05/18/2009

Benzene	0.06	0.001	mg/L	0.0500	110	64.2-124
Toluene	0.05	0.001	"	0.0500	108	63.9-119
Surrogate: 1,2-Dichloroethane-d4	64.6		ug/L	62.5	103	70.3-128
Surrogate: Toluene-d8	64.2		"	62.5	103	78.8-125
Surrogate: 4-Bromofluorobenzene	60.4		"	62.5	96.7	75.5-131

**Matrix Spike (9E15003-MS1)**

Source: X905049-02

Prepared: 05/15/2009 Analyzed: 05/18/2009

Benzene	0.06	0.001	mg/L	0.0500	ND	112	64.2–124
Toluene	0.05	0.001	"	0.0500	ND	110	63.9–119
Surrogate: 1,2-Dichloroethane-d4	64.2		ug/L	62.5		103	70.3–128
Surrogate: Toluene-d8	64.1		"	62.5		103	78.8–125
Surrogate: 4-Bromofluorobenzene	61.4		"	62.5		98.3	75.5–131

**Matrix Spike Dup (9E15003-MSD1)**

Source: X905049-02

Prepared: 05/15/2009 Analyzed: 05/18/2009

Benzene	0.05	0.001	mg/L	0.0500	ND	106	64.2-124	5.47	25
Toluene	0.05	0.001	"	0.0500	ND	98.8	63.9-119	10.6	25
Surrogate: 1,2-Dichloroethane-d4	60.1		ug/L	62.5		96.2	70.3-128		
Surrogate: Toluene-d8	63.6		"	62.5		102	78.8-125		
Surrogate: 4-Bromofluorobenzene	59.5		"	62.5		95.1	75.5-131		

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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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