

# **GROUNDWATER MONITORING REPORT**

## **NOVEMBER 2008**

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### **FEIT 1, 1-4 TANK BATTERY SITE**

On November 10, 2008, LT Environmental, Inc. (LTE) conducted groundwater sampling on behalf of Noble Energy, Inc., at the Feit 1, 1-4 Tank Battery Site. Figure 1 illustrates the site layout and monitoring well locations. This sampling event constitutes the third post remediation monitoring event at this site. Site history, remediation activities, well installation and performance monitoring have been described in preceding reports.

Groundwater level measurements were collected from the monitoring wells and are summarized in Table 1. Depth to groundwater, which ranged from 7.82 feet below top of casing (btoc) in MW-1 to 7.27 feet btoc in MW-3, 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 regulatory limits 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  
FEIT 1, 1-4 TANK BATTERY  
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>
MW-1	5/22/2008	10.56	<1.0	<1.0	<1.0	<2.0
	8/18/2008	7.96	<1.0	<1.0	<1.0	<3.0
	11/10/2008	7.82	<1.0	<1.0	<1.0	<3.0
MW-2	5/22/2008	9.72	<1.0	<1.0	<1.0	<2.0
	8/18/2008	7.42	<1.0	<1.0	<1.0	<3.0
	11/10/2008	7.33	<1.0	<1.0	<1.0	<3.0
MW-3	5/22/2008	9.62	<1.0	<1.0	<1.0	<2.0
	8/18/2008	7.53	<1.0	<1.0	<1.0	<3.0
	11/10/2008	7.27	<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

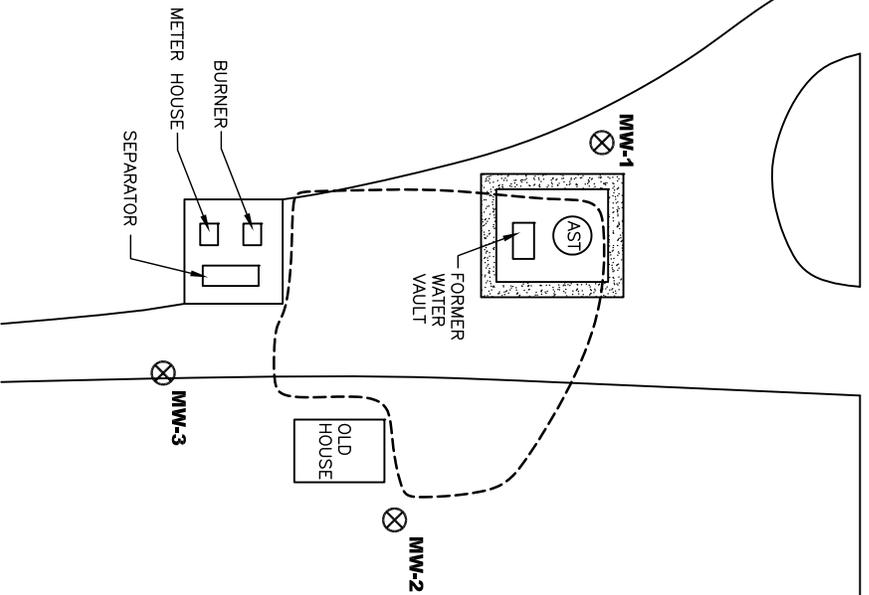
CGWQS - Colorado Groundwater Quality Standards



**FIGURE**



WELD COUNTY ROAD 50



**LEGEND**

MW-1 ⊗ MONITORING WELL LOCATION

▭ BERM

- - - - - EXTENT OF EXCAVATION

SOURCE:  
GOOGLEMAP.COM

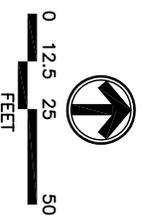


FIGURE 1  
SITE MAP  
FEET 1, 1-4  
WELD COUNTY, COLORADO  
NOBLE ENERGY, INC.



NEP072404 6/08

**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: NEP0724.01  
Project: Feit 1,1-4

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Attached are the analytical results for Feit 1,1-4 received by Origins Laboratory, Inc. 11/11/2008 3:32:00PM. Please let us know if you have any questions, or if we can help with anything at all.

A handwritten signature in black ink, appearing to read "Noelle E Doyle".

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: NEP0724.01  
Project: Feit 1,1-4

CROSS REFERENCE REPORT

Laboratory ID	Sample ID	Matrix	Sampled	Date Received
MW-1	X811047-01	Water	11/10/2008 1:55:00PM	11/11/2008 15:32
MW-2	X811047-02	Water	11/10/2008 2:27:00PM	11/11/2008 15:32
MW-3	X811047-03	Water	11/10/2008 2:07:00PM	11/11/2008 15:32

Origins Laboratory, Inc.

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Noelle E Doyle, Laboratory Manager



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Brian Dodek  
 Project Number: NEP0724.01  
 Project: Feit 1,1-4

**MW-1**  
**X811047-01 (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	"	"	"	"	"	

<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>114 %</i>	<i>70.3-123</i>			<i>"</i>	<i>"</i>	<i>"</i>	
<i>Surrogate: Toluene-d8</i>	<i>93.5 %</i>	<i>75.9-123</i>			<i>"</i>	<i>"</i>	<i>"</i>	
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>105 %</i>	<i>83-123</i>			<i>"</i>	<i>"</i>	<i>"</i>	

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**MW-2**  
**X811047-02 (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	"	"	"	"	"	

<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>110 %</i>	<i>70.3-123</i>			"	"	"	
<i>Surrogate: Toluene-d8</i>	<i>89.5 %</i>	<i>75.9-123</i>			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>99.3 %</i>	<i>83-123</i>			"	"	"	

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**MW-3**  
**X811047-03 (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	"	"	"	"	"	

<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>112 %</i>	<i>70.3-123</i>			<i>"</i>	<i>"</i>	<i>"</i>
<i>Surrogate: Toluene-d8</i>	<i>97.9 %</i>	<i>75.9-123</i>			<i>"</i>	<i>"</i>	<i>"</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>102 %</i>	<i>83-123</i>			<i>"</i>	<i>"</i>	<i>"</i>

Origins Laboratory, Inc.

Noelle E Doyle, Laboratory Manager

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 Project: Feit 1,1-4

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

**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			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>68.4</i>		<i>ug/L</i>	<i>62.5</i>		<i>109</i>	<i>70.3-123</i>			
<i>Surrogate: Toluene-d8</i>	<i>61.8</i>		<i>"</i>	<i>62.5</i>		<i>98.9</i>	<i>75.9-123</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>62.6</i>		<i>"</i>	<i>62.5</i>		<i>100</i>	<i>83-123</i>			

**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			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>69.6</i>		<i>ug/L</i>	<i>62.5</i>		<i>111</i>	<i>70.3-123</i>			
<i>Surrogate: Toluene-d8</i>	<i>61.5</i>		<i>"</i>	<i>62.5</i>		<i>98.4</i>	<i>75.9-123</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>66.0</i>		<i>"</i>	<i>62.5</i>		<i>106</i>	<i>83-123</i>			

**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	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>69.3</i>		<i>ug/L</i>	<i>62.5</i>		<i>111</i>	<i>70.3-123</i>			
<i>Surrogate: Toluene-d8</i>	<i>58.5</i>		<i>"</i>	<i>62.5</i>		<i>93.6</i>	<i>75.9-123</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>65.3</i>		<i>"</i>	<i>62.5</i>		<i>104</i>	<i>83-123</i>			

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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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