

GROUNDWATER MONITORING REPORT MARCH 2010

PHILLIPS L30-6JI

On February 18, 2010, LT Environmental, Inc. (LTE) conducted groundwater sampling on behalf of Noble Energy, Inc., at the Phillips L30-6JI Tank Battery (Site). This sampling event constitutes the third post remediation monitoring event at this 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 SB06, SB08, SB10, SB12, and SB13 were installed on May 21, 2009. Monitoring wells SB18 and SB19 were installed on May 26, 2009. Monitoring well SB06 was destroyed prior to the November 20, 2009 sampling event and was reinstalled January 15, 2010 as SB06R. Monitoring well SB08 could not be located. It is assumed that SB08 is destroyed. A Site Map is presented in Figure 1.

Depth to groundwater ranged from 2.51 feet below top of casing (btoc) in SB19 to 3.93 feet btoc in SB12 and was used to calculate well-specific purge volumes. Following purging, groundwater samples were collected and preserved on ice. Samples were 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, presented in Table 1, indicate BTEX concentrations in SB06R, SB10, SB12, SB13, and SB18 are in compliance with the Colorado Department of Public Health and Environment Water Quality Control Commission Regulation 41 (WQCC Reg 41). SB19 exhibited a benzene concentration of 58.5 micrograms per liter ($\mu\text{g/L}$), which is above the WQCC Reg 41 standard of 5.0 $\mu\text{g/L}$. The laboratory analytical report is included in the 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 June 2010.

TABLE

TABLE 1

GROUNDWATER ANALYTICAL DATA
PHILLIPS L30-6JI
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)
SB06	5/29/2009	3.53	<1.00	9.71	20.5	30.81
	8/4/2009	2.03	33.7	<1.00	33.4	231.6
	11/20/2009	----- Destroyed -----				
SB06R	2/18/2010	3.78	<1.00	<1.00	<1.00	<3.00
SB10	5/29/2009	2.77	<1.00	<1.00	<1.00	<3.00
	8/4/2009	2.37	2.35	<1.00	9.88	89.5
	11/20/2009	2.79	<1.00	<1.00	<1.00	<3.00
	2/18/2010	3.22	<1.00	<1.00	<1.00	<3.00
SB12	5/29/2009	3.46	103	281	69.2	861
	8/4/2009	2.75	130	31.4	15.3	174.6
	11/20/2009	3.47	3.71	62.3	12.8	115.4
	2/18/2010	3.93	3.29	<1.00	37.4	279.0
SB13	5/29/2009	3.1	<1.00	<1.00	<1.00	<3.00
	8/4/2009	2.39	<1.00	<1.00	<1.00	<3.00
	11/20/2009	3.11	<1.00	<1.00	<1.00	<3.00
	2/18/2010	3.60	<1.00	<1.00	<1.00	<3.00
SB18	5/29/2009	3.06	2.52	<1.00	<1.00	<3.00
	8/4/2009	2.4	<1.00	<1.00	<1.00	<3.00
	11/20/2009	3.10	<1.00	<1.00	<1.00	<3.00
	2/18/2010	3.55	<1.00	<1.00	<1.00	<3.00
SB19	5/29/2009	2.97	17.1	<1.00	<1.00	<3.00
	8/4/2009	2.34	<1.00	<1.00	<1.00	<3.00
	11/20/2009	2.02	<1.00	<1.00	<1.00	<3.00
	2/18/2010	2.51	58.5	<1.00	18.68	<3.00
CDPHE WQCC Reg 41			5.0	560	700	1,400

NOTES:

btoc - below top of casing

ug/L - micrograms per liter

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

Bold - indicates concentration exceeds the CDPHE WQCC Reg 41 standard

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, total xylenes analyzed by EPA Method 8260B



FIGURE



LEGEND

- PRODUCTION WELLHEAD
- ⊗ MONITORING WELL
- ⊗ DESTROYED MONITORING WELL
- PERMEABLE REACTIVE BARRIER (PRB)
- EXCAVATION EXTENT

GROUNDWATER SAMPLES WERE
COLLECTED ON FEBRUARY 18, 2010

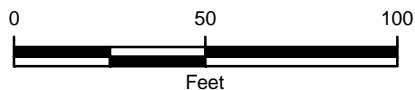


FIGURE 1
BENZENE CONCENTRATION IN GROUNDWATER
PHILLIPS L30-6JI
SEC30 - 3N - 66W
WELD COUNTY, COLORADO
NOBLE ENERGY, INC.



APPENDIX
ANALYTICAL REPORT



2/19/2010

LT Environmental, Inc.

Matthew Harrison

4600 West 60th Avenue

Arvada

CO

80003

Project Name- Noble - Phillips L30-6JI

Project Number- NEP0909

Attached are your analytical results for Noble - Phillips L30-6JI received by Origins Laboratory, Inc. February 18, 2010 2:40 pm. This project is associated with Origins project number X002072-01 .

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.

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



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

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6JI

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Sampled	Date Received
SB06	X002072-01	Water	2/18/2010 9:50:00AM	02/18/2010 14:40
SB12	X002072-02	Water	2/18/2010 10:00:00AM	02/18/2010 14:40
SB13	X002072-03	Water	2/18/2010 10:05:00AM	02/18/2010 14:40
SB18	X002072-04	Water	2/18/2010 10:10:00AM	02/18/2010 14:40
SB19	X002072-05	Water	2/18/2010 10:15:00AM	02/18/2010 14:40
SB10	X002072-06	Water	2/18/2010 10:20:00AM	02/18/2010 14:40

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, Laboratory Manager

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

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6JI

www.originslaboratory.com

page 1 of 1

X002072

Client: LT
Address: 4600 W 60th Ave
Telephone Number: 303-433-9788
Email Address: m.harrison@ltenv.com

Project Manager: Matthew Harrison
Project Name: Phillips L30-6JI
Project Number: NEP0909
Samples Collected By: BF + GC

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix				Analysis	Sample Instructions	
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Summa #	Other			
SB06	2/18/10	9:50	2		X			X						1
SB12	2/18/10	10:00	2		X			X						2
SB13	2/18/10	10:05	2		X			X						3
SB18	2/18/10	10:10	2		X			X						4
SB19	2/18/10	10:15	2		X			X						5
SB10	2/18/10	10:20	2		X			X						6
														7
														8
														9
														10
Relinquished By: <u>Gick</u>	Date: <u>2/18/10</u>	Time: <u>14:40</u>		Received By: <u>[Signature]</u>				Time: <u>14:40</u>				Turnaround Time: <input type="checkbox"/> Same Day <input type="checkbox"/> 24 Hr <input checked="" type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input type="checkbox"/> Standard		
Relinquished By:	Date:	Time:		Received By:				Time:						

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

Origins Laboratory, Inc.

Noelle E Doyle

Noelle E Doyle, Laboratory Manager

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

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6JI

SB06

2/18/2010 9:50:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X002072-01 (Water)

BTEX by EPA 8260B

Benzene	ND	0.00100	mg/L	1	OB18001	02/18/2010	02/19/2010
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 %	73.5-130	"	"	"
Surrogate: Toluene-d8	85.8 %	79.3-113	"	"	"
Surrogate: 4-Bromofluorobenzene	96.0 %	81.5-117	"	"	"

Origins Laboratory, Inc.



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Noelle E Doyle, Laboratory Manager

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

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6Jl

SB12

2/18/2010 10:00:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X002072-02 (Water)

BTEX by EPA 8260B

Benzene	0.00329	0.00100	mg/L	1	OB18001	02/18/2010	02/19/2010	
Toluene	ND	0.00100	"	"	"	"	"	
Ethylbenzene	0.0374	0.00100	"	"	"	"	"	
o-Xylene	0.0920	0.00100	"	"	"	"	"	
m,p-Xylene	0.187	0.00200	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	112 %	73.5-130			"	"	"	
Surrogate: Toluene-d8	87.4 %	79.3-113			"	"	"	
Surrogate: 4-Bromofluorobenzene	92.6 %	81.5-117			"	"	"	

Origins Laboratory, Inc.



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Noelle E Doyle, Laboratory Manager

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

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6JI

SB13

2/18/2010 10:05:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X002072-03 (Water)

BTEX by EPA 8260B

Benzene	ND	0.00100	mg/L	1	OB18001	02/18/2010	02/19/2010
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	110 %	73.5-130	"	"	"
Surrogate: Toluene-d8	87.0 %	79.3-113	"	"	"
Surrogate: 4-Bromofluorobenzene	97.6 %	81.5-117	"	"	"

Origins Laboratory, Inc.



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

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6JI

SB18

2/18/2010 10:10:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X002072-04 (Water)

BTEX by EPA 8260B

Benzene	ND	0.00100	mg/L	1	OB18001	02/18/2010	02/19/2010
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	112 %	73.5-130	"	"	"
Surrogate: Toluene-d8	85.7 %	79.3-113	"	"	"
Surrogate: 4-Bromofluorobenzene	97.4 %	81.5-117	"	"	"

Origins Laboratory, Inc.



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SB19**2/18/2010 10:15:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X002072-05 (Water)

BTEX by EPA 8260B

Benzene	0.0585	0.00100	mg/L	1	OB18001	02/18/2010	02/19/2010
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	0.00848	0.00100	"	"	"	"	"
o-Xylene	0.0102	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	113 %	73.5-130	"	"	"
Surrogate: Toluene-d8	84.4 %	79.3-113	"	"	"
Surrogate: 4-Bromofluorobenzene	95.3 %	81.5-117	"	"	"

Origins Laboratory, Inc.



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4600 West 60th Avenue
Arvada CO 80003

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6JI

SB10

2/18/2010 10:20:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X002072-06 (Water)

BTEX by EPA 8260B

Benzene	ND	0.00100	mg/L	1	OB18001	02/18/2010	02/19/2010
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	112 %	73.5-130	"	"	"
Surrogate: Toluene-d8	84.5 %	79.3-113	"	"	"
Surrogate: 4-Bromofluorobenzene	95.3 %	81.5-117	"	"	"

Origins Laboratory, Inc.



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Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6JI

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
Batch OB18001 - EPA 5030B										
Blank (OB18001-BLK1)					Prepared: 02/18/2010 Analyzed: 02/18/2010					
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	63.3		ug/L	62.5		101	73.5-130			
Surrogate: Toluene-d8	58.6		"	62.5		93.8	79.3-113			
Surrogate: 4-Bromofluorobenzene	60.1		"	62.5		96.2	81.5-117			
LCS (OB18001-BS1)					Prepared: 02/18/2010 Analyzed: 02/18/2010					
Benzene	0.05	0.001	mg/L	0.0500		102	77.3-128			
Toluene	0.05	0.001	"	0.0500		98.1	81.7-118			
Surrogate: 1,2-Dichloroethane-d4	63.1		ug/L	62.5		101	73.5-130			
Surrogate: Toluene-d8	58.6		"	62.5		93.7	79.3-113			
Surrogate: 4-Bromofluorobenzene	60.6		"	62.5		97.0	81.5-117			
Matrix Spike (OB18001-MS1)					Source: X002063-02	Prepared: 02/18/2010 Analyzed: 02/18/2010				
Benzene	0.05	0.001	mg/L	0.0500	ND	101	74.5-132			
Toluene	0.05	0.001	"	0.0500	ND	96.7	74.2-116			
Surrogate: 1,2-Dichloroethane-d4	63.4		ug/L	62.5		102	73.5-130			
Surrogate: Toluene-d8	57.7		"	62.5		92.4	79.3-113			
Surrogate: 4-Bromofluorobenzene	61.0		"	62.5		97.7	81.5-117			
Matrix Spike Dup (OB18001-MSD1)					Source: X002063-02	Prepared: 02/18/2010 Analyzed: 02/18/2010				
Benzene	0.05	0.001	mg/L	0.0500	ND	99.9	74.5-132	1.02	13.1	
Toluene	0.05	0.001	"	0.0500	ND	95.1	74.2-116	1.69	21.2	
Surrogate: 1,2-Dichloroethane-d4	64.5		ug/L	62.5		103	73.5-130			
Surrogate: Toluene-d8	57.7		"	62.5		92.4	79.3-113			
Surrogate: 4-Bromofluorobenzene	60.6		"	62.5		96.9	81.5-117			

Origins Laboratory, Inc.



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Noelle E Doyle, Laboratory Manager

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

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6JI

Notes and Definitions

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

Origins Laboratory, Inc.



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