

GROUNDWATER MONITORING REPORT JANUARY 2010

COLLINS 14-20 TANK BATTERY

On December 8, 2009, LT Environmental, Inc. (LTE) conducted groundwater sampling on behalf of Noble Energy, Inc., at the Collins 14-20 Tank Battery (Site). This sampling event constitutes the third post remediation monitoring event at this Site. Site history, assessment, and remediation activities have been described in preceding reports.

Groundwater level measurements were collected from the monitoring wells and are summarized in Table 1. Monitoring wells SB08 and SB09 were installed after excavation activities on October 27, 2008, and November 3, 2008, respectively. On February 12, 2009, monitoring wells SB11 and SB12 were installed, and on February 26, 2009, monitoring wells SB13 and SB14 were installed during injection and sampling activities. A Site map is present on Figure 1.

Depth to groundwater, which ranged from 18.59 feet below top of casing (btoc) in SB12 to 19.89 feet btoc in SB09, was used to calculate well-specific purge volumes. Following purging, samples were collected and submitted following strict chain of custody protocol to Origins Laboratory, Inc. (Origins) 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 in all wells, except SB14, are in compliance with Colorado Department of Public Health and Environment Water Quality Control Commission Regulation 41 (WQCC Reg 41). Monitoring well SB14 exhibited a benzene concentration of 14.3 micrograms per liter ($\mu\text{g/L}$) and a total xylenes concentration of 3,107 $\mu\text{g/L}$. WQCC Reg 41 concentration limits for benzene and total xylenes are 5.0 $\mu\text{g/L}$ and 1,400 $\mu\text{g/L}$, respectively.

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 March 2010.

TABLE

TABLE 1

**GROUNDWATER ANALYTICAL DATA
COLLINS 14-20 TANK BATTERY
ADAMS COUNTY, COLORADO
NOBLE ENERGY, INC.**

MONITORING WELL	DATE	DEPTH TO	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL
		WATER (feet btoc)	(ug/L)	(ug/L)	(ug/L)	XYLENES (ug/L)
SB08	10/29/2008	22.56	<1.0	<1.0	<1.0	<3.0
	2/17/2009	22.49	<1.0	<1.0	<1.0	<3.0
	2/27/2009	22.71	<1.0	<1.0	<1.0	<3.0
	7/1/2009	22.63	<1.0	<1.0	<1.0	<3.0
	9/21/2009	21.03	<1.0	<1.0	<1.0	<3.0
	12/8/2009	19.52	<1.0	<1.0	<1.0	<3.0
SB09	11/5/2008	19.65	<1.0	<1.0	<1.0	<3.0
	2/17/2009	21.95	<1.0	<1.0	<1.0	<3.0
	2/27/2009	22.04	<1.0	<1.0	<1.0	<3.0
	7/1/2009	22.11	<1.0	<1.0	<1.0	<3.0
	9/21/2009	20.05	<1.0	<1.0	<1.0	<3.0
	12/8/2009	19.89	<1.0	<1.0	<1.0	<3.0
SB11	2/17/2009	20.70	<1.0	<1.0	<1.0	<3.0
	2/27/2009	21.07	<1.0	<1.0	<1.0	<3.0
	7/1/2009	20.98	1.36	<1.0	<1.0	<3.0
	9/21/2009	19.70	<1.0	<1.0	<1.0	<3.0
	12/8/2009	18.79	<1.0	<1.0	<1.0	<3.0
SB12	2/17/2009	20.45	<1.0	<1.0	1.32	<3.0
	2/27/2009	20.78	<1.0	<1.0	<1.0	<3.0
	7/1/2009	20.70	<1.0	<1.0	<1.0	<3.0
	9/21/2009	19.85	<1.0	<1.0	<1.0	<3.0
	12/8/2009	18.59	<1.0	<1.0	<1.0	<3.0
SB13	2/27/2009	21.27	2.18	16.3	182	1,037
	7/1/2009	21.31	14.2	66.4	218	1,517
	9/21/2009	19.34	1.92	7.67	<1.0	521
	12/8/2009	19.18	<1.0	15.0	37.8	384.0
SB14	2/27/2009	19.71	17.9	486	240	2,335
	7/1/2009	20.77	2.5	<1.0	4.59	74.8
	9/21/2009	19.68	<1.0	<1.0	1.46	3.18
	12/8/2009	18.61	14.3	388	298	3,107
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 CDPHE WQCC Reg 41

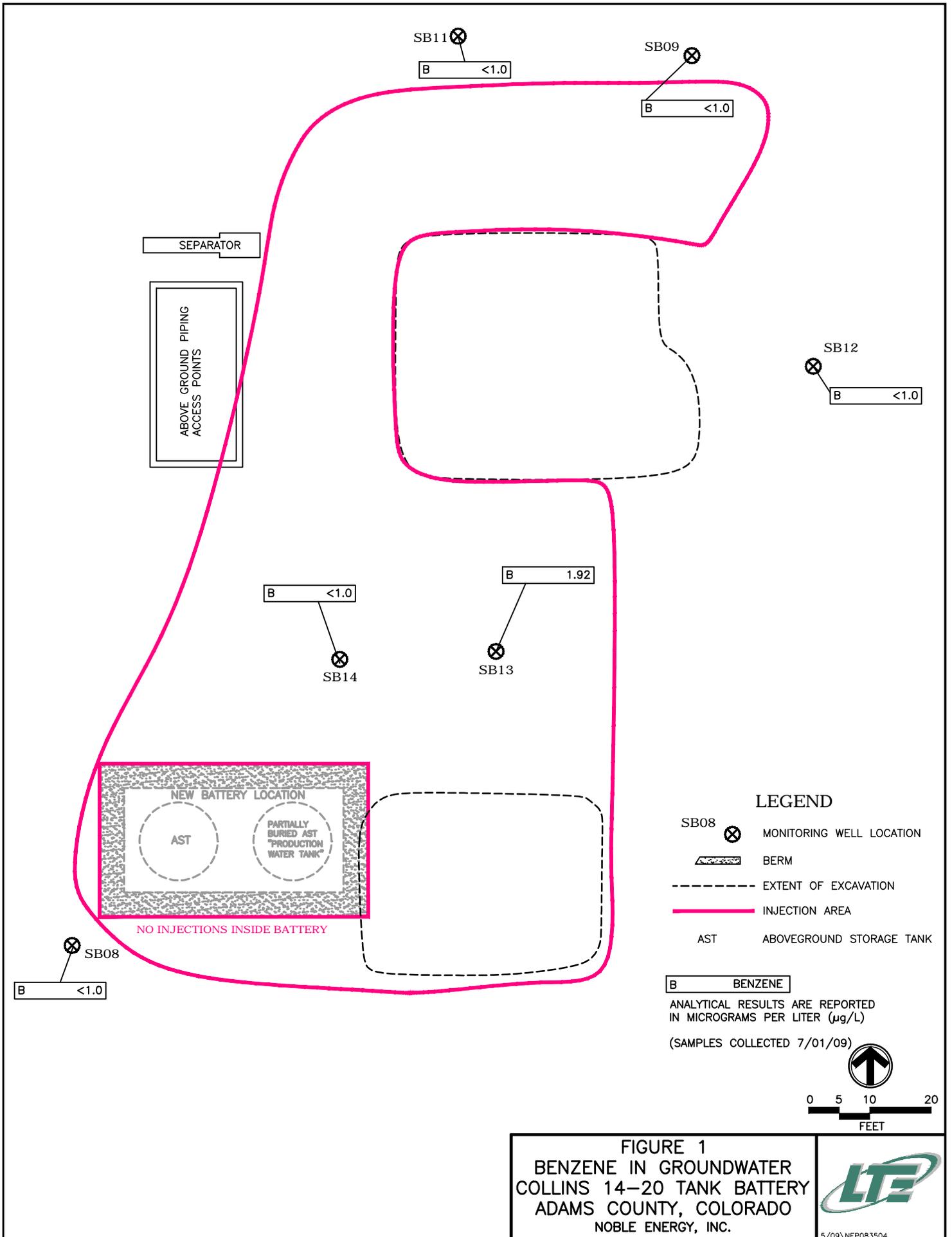
Benzene, toluene, ethylbenzene, and total xylenes analyzed by EPA Method 8260B

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

Commission Regulation 41 covering Basic Standards for Groundwater



FIGURE



APPENDIX
ANALYTICAL REPORT



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

December 15, 2009

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

Brian Dodek
Project Number: NEP0835
Project: Noble - Collins 14-20

Attached are the analytical results for Noble - Collins 14-20 received by Origins Laboratory, Inc. 12/8/2009 4:17:00PM. 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", is written in a cursive style.

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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Denver, Colorado 80211
303.433.1322 | Laboratory
303.265.9645 | Fax



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

Brian Dodek
Project Number: NEP0835
Project: Noble - Collins 14-20

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Sampled	Date Received
SB08	X912026-01	Water	12/8/2009 2:00:00PM	12/08/2009 16:17
SB09	X912026-02	Water	12/8/2009 3:40:00PM	12/08/2009 16:17
SB11	X912026-03	Water	12/8/2009 2:55:00PM	12/08/2009 16:17
SB12	X912026-04	Water	12/8/2009 2:50:00PM	12/08/2009 16:17
SB13	X912026-05	Water	12/8/2009 2:30:00PM	12/08/2009 16:17
SB14	X912026-06	Water	12/8/2009 2:10:00PM	12/08/2009 16:17

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

Brian Dodek

Project Number: NEP0835

Project: Noble - Collins 14-20

X912026

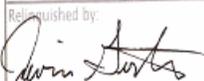
page ___ of ___

originslaboratory.com



Client: LT Environmental
 Address: 4600 W. 10th Ave.
Arvada, CO 80003
 Telephone Number: 303-433-9788
 E-Mail Address: blabel@ltenv.com

Project Manager: Brian Dodek
 Project Name: Collins 14-20
 Project Number: NEP0835
 Samples Collected by: Devin Gartin

Sample ID - Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix		Analysis		Sample Instructions
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air - Summa Canister #	Other	
SB08	12/8/09	1400	3	X				X				* Lab Filter Samples!
SB09		1540		X				X				
SB11		1455		X				X				
SB12		1450		X				X				
SB13		1430		X				X				
SB14		1410		X				X				
												
Relinquished by:	Date	Time	Received by:	Date	Time	Temperature Upon Receipt:						
	12-8-09	1417				Turn Around Time:						
Relinquished by:	Date	Time	Received by:	Date	Time	Same Day	24-hr					
				12-8-09	1417	48-hr	72-hr	<input checked="" type="checkbox"/>				
						Standard						

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Origins Laboratory, Inc.



Noelle E Doyle, Laboratory Manager

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

Brian Dodek
 Project Number: NEP0835
 Project: Noble – Collins 14–20

SB08
X912026-01 (Water)
12/8/2009 2:00:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.

BTEX by EPA 8260B

Benzene	ND	0.00100	mg/L	1	9L10001	12/10/2009	12/10/2009	
Toluene	ND	0.00100	"	"	"	"	"	
Ethylbenzene	ND	0.00100	"	"	"	"	"	
o-Xylene	ND	0.00100	"	"	"	"	"	
m,p-Xylene	ND	0.00200	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	110 %	76.8-127			"	"	"	
Surrogate: Toluene-d8	103 %	71.4-123			"	"	"	
Surrogate: 4-Bromofluorobenzene	108 %	87.6-133			"	"	"	

Origins Laboratory, Inc.

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Noelle E Doyle, Laboratory Manager



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

Brian Dodek
 Project Number: NEP0835
 Project: Noble – Collins 14–20

SB09
X912026–02 (Water)
12/8/2009 3:40:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.

BTEX by EPA 8260B

Benzene	ND	0.00100	mg/L	1	9L10001	12/10/2009	12/10/2009	
Toluene	ND	0.00100	"	"	"	"	"	
Ethylbenzene	ND	0.00100	"	"	"	"	"	
o-Xylene	ND	0.00100	"	"	"	"	"	
m,p-Xylene	ND	0.00200	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	108 %	76.8–127			"	"	"	
Surrogate: Toluene-d8	99.8 %	71.4–123			"	"	"	
Surrogate: 4-Bromofluorobenzene	103 %	87.6–133			"	"	"	

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Brian Dodek
 Project Number: NEP0835
 Project: Noble – Collins 14–20

SB11
X912026–03 (Water)
12/8/2009 2:55:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.

BTEX by EPA 8260B

Benzene	ND	0.00100	mg/L	1	9L10001	12/10/2009	12/10/2009	
Toluene	ND	0.00100	"	"	"	"	"	
Ethylbenzene	ND	0.00100	"	"	"	"	"	
o-Xylene	ND	0.00100	"	"	"	"	"	
m,p-Xylene	ND	0.00200	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	105 %	76.8–127			"	"	"	
Surrogate: Toluene-d8	96.6 %	71.4–123			"	"	"	
Surrogate: 4-Bromofluorobenzene	98.7 %	87.6–133			"	"	"	

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LT Environmental, Inc.
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Brian Dodek
 Project Number: NEP0835
 Project: Noble – Collins 14–20

SB12
X912026–04 (Water)
12/8/2009 2:50:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.

BTEX by EPA 8260B

Benzene	ND	0.00100	mg/L	1	9L10001	12/10/2009	12/10/2009	
Toluene	ND	0.00100	"	"	"	"	"	
Ethylbenzene	ND	0.00100	"	"	"	"	"	
o-Xylene	ND	0.00100	"	"	"	"	"	
m,p-Xylene	ND	0.00200	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	106 %	76.8–127			"	"	"	
Surrogate: Toluene-d8	101 %	71.4–123			"	"	"	
Surrogate: 4-Bromofluorobenzene	100 %	87.6–133			"	"	"	

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Brian Dodek
 Project Number: NEP0835
 Project: Noble – Collins 14–20

SB13
X912026-05 (Water)
12/8/2009 2:30:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.

BTEX by EPA 8260B

Benzene	ND	0.00100	mg/L	1	9L10001	12/10/2009	12/10/2009	
Toluene	0.0150	0.00100	"	"	"	"	"	
Ethylbenzene	0.0378	0.00100	"	"	"	"	"	
o-Xylene	0.0640	0.00100	"	"	"	"	"	
m,p-Xylene	0.320	0.00200	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	104 %	76.8-127			"	"	"	
Surrogate: Toluene-d8	101 %	71.4-123			"	"	"	
Surrogate: 4-Bromofluorobenzene	114 %	87.6-133			"	"	"	

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Brian Dodek
 Project Number: NEP0835
 Project: Noble – Collins 14–20

SB14
X912026-06 (Water)
12/8/2009 2:10:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.

BTEX by EPA 8260B

Benzene	0.0143	0.00100	mg/L	1	9L10001	12/10/2009	12/10/2009	
Toluene	0.388	0.0100	"	10	"	"	12/11/2009	
Ethylbenzene	0.298	0.0100	"	"	"	"	"	
o-Xylene	0.617	0.0100	"	"	"	"	"	
m,p-Xylene	2.49	0.0200	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	100 %	76.8-127			"	"	12/10/2009	
Surrogate: Toluene-d8	96.2 %	71.4-123			"	"	"	
Surrogate: 4-Bromofluorobenzene	109 %	87.6-133			"	"	"	

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Brian Dodek
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 Project: Noble – Collins 14-20

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 9L10001 – EPA 5030B										
Blank (9L10001–BLK1)										
					Prepared: 12/10/2009 Analyzed: 12/10/2009					
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	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>68.4</i>		<i>ug/L</i>	<i>62.5</i>		<i>109</i>	<i>76.8-127</i>			
<i>Surrogate: Toluene-d8</i>	<i>62.1</i>		<i>"</i>	<i>62.5</i>		<i>99.3</i>	<i>71.4-123</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>64.0</i>		<i>"</i>	<i>62.5</i>		<i>102</i>	<i>87.6-133</i>			
LCS (9L10001–BS1)										
					Prepared: 12/10/2009 Analyzed: 12/10/2009					
Benzene	0.05	0.001	mg/L	0.0500		98.3	79.3-122			
Toluene	0.04	0.001	"	0.0500		78.5	73.4-130			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>68.0</i>		<i>ug/L</i>	<i>62.5</i>		<i>109</i>	<i>76.8-127</i>			
<i>Surrogate: Toluene-d8</i>	<i>58.2</i>		<i>"</i>	<i>62.5</i>		<i>93.2</i>	<i>71.4-123</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>60.5</i>		<i>"</i>	<i>62.5</i>		<i>96.8</i>	<i>87.6-133</i>			
Matrix Spike (9L10001–MS1)										
					Source: X912025-01		Prepared: 12/10/2009 Analyzed: 12/10/2009			
Benzene	0.05	0.001	mg/L	0.0500	ND	103	80.2-129			
Toluene	0.04	0.001	"	0.0500	ND	83.2	74.8-126			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>66.9</i>		<i>ug/L</i>	<i>62.5</i>		<i>107</i>	<i>76.8-127</i>			
<i>Surrogate: Toluene-d8</i>	<i>59.7</i>		<i>"</i>	<i>62.5</i>		<i>95.5</i>	<i>71.4-123</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>63.1</i>		<i>"</i>	<i>62.5</i>		<i>101</i>	<i>87.6-133</i>			
Matrix Spike Dup (9L10001–MSD1)										
					Source: X912025-01		Prepared: 12/10/2009 Analyzed: 12/10/2009			
Benzene	0.05	0.001	mg/L	0.0500	ND	98.8	80.2-129	4.49	18.7	
Toluene	0.04	0.001	"	0.0500	ND	81.8	74.8-126	1.70	21.9	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>65.4</i>		<i>ug/L</i>	<i>62.5</i>		<i>105</i>	<i>76.8-127</i>			
<i>Surrogate: Toluene-d8</i>	<i>59.5</i>		<i>"</i>	<i>62.5</i>		<i>95.1</i>	<i>71.4-123</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>66.1</i>		<i>"</i>	<i>62.5</i>		<i>106</i>	<i>87.6-133</i>			

Origins Laboratory, Inc.

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

Brian Dodek
Project Number: NEP0835
Project: Noble – Collins 14-20

Notes and Definitions

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

Origins Laboratory, Inc.

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Noelle E Doyle, Laboratory Manager