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Suite 2200.  
Denver, CO 80202



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www.nobleenergyinc.com

North America Division

July 5, 2012

Mr. John Axelson  
Department Of Natural Resources  
Oil & Gas Conservation Commission  
1120 Lincoln St., Suite 801  
Denver CO 80203-2136

RE: Ground water Monitoring Report and Request for No Further Action  
Lorenz F22-1, 2  
API 05-123-15139  
Remediation #5465  
Sec. 22, T5N R65W  
Weld County, Colorado

Dear Mr. Axelson:

Please find attached the Ground Water Monitoring Report for the Lorenz F22-1,2. Based on the site remedial activities and the attached laboratory analytical results, Noble Energy Inc. is requesting that the COGCC consider this location closed, requiring no further action.

Noble Energy Inc. would like to claim business confidentiality protection for the information submitted in this letter, the supporting materials attached and all previous and subsequent correspondence related to this matter. Please contact the Noble Energy Environmental Department at (303) 228-4158 if you have any questions or require additional information.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Ryan Bruner'.

Ryan Bruner  
Environmental and Regulatory Supervisor

Attachments



## **GROUNDWATER MONITORING REPORT/ NO FURTHER ACTION REQUEST MAY 2012**

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### **LORENZ F 22-1 TANK BATTERY COGCC TRACKING #2522902 & REMEDIATION #5465**

LT Environmental, Inc. (LTE), under the direction of Noble Energy, Inc. (Noble), conducted groundwater monitoring at the Lorenz F 22-1 Tank Battery (Site) on May 11, 2012. This monitoring event constitutes the fifth post-remediation monitoring event at this Site. Site history, remediation activities, well installation, and historical performance monitoring results have been described in preceding reports.

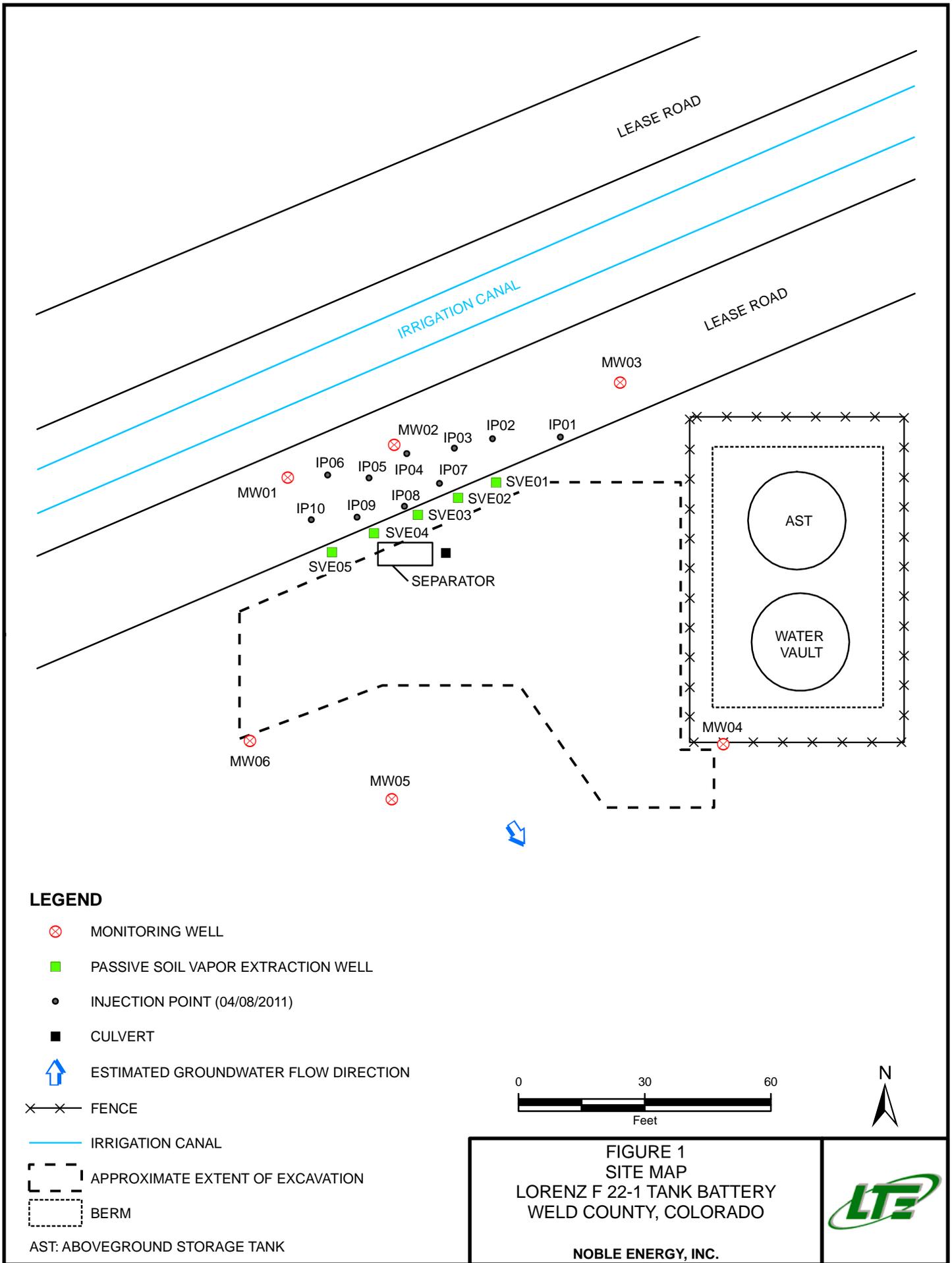
Monitoring wells (MW01 through MW06) were installed at the Site on April 22, 2011. The site map is presented as Figure 1. Groundwater level measurements were collected from the monitoring wells and are summarized in Table 1.

Depth to groundwater, which ranged from 4.25 feet below top of casing (btoc) in MW05 to 6.11 feet btoc in MW02, was used to calculate well-specific purge volumes. Following purging, groundwater samples were collected and then submitted to Origins Laboratory, Inc. of Denver, Colorado, for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by United States Environmental Protection Agency Method 8260C.

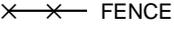
Groundwater analytical results, presented in Table 1, indicate BTEX concentrations are in compliance with Colorado Department of Public Health and Environment-Water Quality Control Commission Regulation 41-The Basic Standards for Ground Water (WQCC Reg 41). The laboratory analytical report is attached.

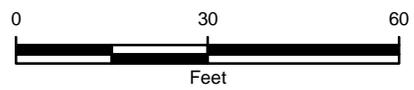
The May 2012 groundwater monitoring event constitutes the fourth consecutive quarterly monitoring event in which groundwater analytical results have been in compliance with WQCC Reg 41. As soil and groundwater have been remediated to achieve cleanup goals, Noble respectively requests that the Colorado Oil and Gas Conservation Commission grant a No Further Action status for the Lorenz F 22-1 Tank Battery.

**FIGURE**



**LEGEND**

-  MONITORING WELL
-  PASSIVE SOIL VAPOR EXTRACTION WELL
-  INJECTION POINT (04/08/2011)
-  CULVERT
-  ESTIMATED GROUNDWATER FLOW DIRECTION
-  FENCE
-  IRRIGATION CANAL
-  APPROXIMATE EXTENT OF EXCAVATION
-  BERM
- AST: ABOVEGROUND STORAGE TANK



**FIGURE 1**  
**SITE MAP**  
 LORENZ F 22-1 TANK BATTERY  
 WELD COUNTY, COLORADO

**NOBLE ENERGY, INC.**



## **TABLE**

TABLE 1

**GROUNDWATER ANALYTICAL RESULTS  
LORENZ F 22-1 TANK BATTERY  
WELD COUNTY, COLORADO  
NOBLE ENERGY, INC.**

Well ID	Date	Depth to Water (feet btoc)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
MW01	4/26/2011	6.25	<1.0	<1.0	<1.0	<3.0
	7/12/2011	4.69	<1.0	<1.0	<1.0	<3.0
	11/9/2011	5.51	<1.0	<1.0	<1.0	<3.0
	2/9/2012	5.98	<1.0	<1.0	<1.0	<1.0
	5/11/2012	5.85	<1.0	<1.0	<1.0	<1.0
MW02	4/26/2011	6.69	<b>44.3</b>	<1.0	7.4	52.4
	7/12/2011	5.33	<1.0	<1.0	<1.0	<3.0
	11/9/2011	5.96	<1.0	<1.0	<1.0	<3.0
	2/9/2012	6.4	<1.0	<1.0	<1.0	<1.0
	5/11/2012	6.11	<1.0	<1.0	<1.0	<1.0
MW03	4/26/2011	5.81	<1.0	<1.0	<1.0	<3.0
	7/12/2011	4.20	<1.0	<1.0	<1.0	<3.0
	11/9/2011	5.05	<1.0	<1.0	<1.0	<3.0
	2/9/2012	5.51	<1.0	<1.0	<1.0	<1.0
	5/11/2012	5.43	<1.0	<1.0	<1.0	<1.0
MW04	4/26/2011	5.13	<1.0	<1.0	<1.0	<3.0
	7/12/2011	3.52	<1.0	<1.0	<1.0	<3.0
	11/9/2011	4.42	<1.0	<1.0	<1.0	<3.0
	2/9/2012	4.95	<1.0	<1.0	<1.0	<1.0
	5/11/2012	4.83	<1.0	<1.0	<1.0	<1.0
MW05	4/26/2011	5.00	<1.0	<1.0	<1.0	<3.0
	7/12/2011	2.90	<1.0	<1.0	<1.0	<3.0
	11/9/2011	3.76	<1.0	<1.0	<1.0	<3.0
	2/9/2012	4.36	<1.0	<1.0	<1.0	<1.0
	5/11/2012	4.25	<1.0	<1.0	<1.0	<1.0
MW06	4/26/2011	4.59	<1.0	<1.0	1.7	8.6
	7/12/2011	3.03	<1.0	<1.0	<1.0	<3.0
	11/9/2011	3.86	<1.0	<1.0	<1.0	<3.0
	2/9/2012	4.40	<1.0	<1.0	<1.0	<1.0
	5/11/2012	4.27	<1.0	<1.0	<1.0	<1.0
<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

µg/L - micrograms per liter

&lt; - indicates result is less than the stated laboratory reporting limit

**BOLD** - indicates result exceeds the applicable standard

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

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

Control Commission Regulation 41 covering The Basic Standards for Ground Water

**ATTACHMENT**  
**LABORATORY ANALYTICAL REPORT**



May 16, 2012

LT Environmental, Inc.

Rob Rebel

4600 West 60th Avenue

Arvada CO 80003

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Project Name - Noble - Lorenz F22-1

Project Number - NEP1047.01

Attached are you analytical results for Noble - Lorenz F22-1 received by Origins Laboratory, Inc. May 11, 2012. This project is associated with Origins project number X205056-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

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

Rob Rebel  
Project Number: NEP1047.01  
Project: Noble - Lorenz F22-1

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1	X205056-01	Water	May 11, 2012 13:00	05/11/2012 15:08
MW-2	X205056-02	Water	May 11, 2012 13:05	05/11/2012 15:08
MW-3	X205056-03	Water	May 11, 2012 13:10	05/11/2012 15:08
MW-4	X205056-04	Water	May 11, 2012 13:15	05/11/2012 15:08
MW-5	X205056-05	Water	May 11, 2012 13:20	05/11/2012 15:08
MW-6	X205056-06	Water	May 11, 2012 13:25	05/11/2012 15:08

Origins Laboratory, Inc.



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Noelle E Doyle, President



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

Rob Rebel  
 Project Number: NEP1047.01  
 Project: Noble - Lorenz F22-1

Origins Laboratory

F-012207-01-R1  
 Effective Date: 01/09/12

**Sample Receipt Checklist**

Origins Work Order: X2005056 Client: 51  
 Checklist Completed by: [Signature] Client Project ID: LORENZ  
 Date/time completed: 5/11/12 13:10 Shipped Via: H/D HTRK  
 (UPS, FedEx, Hand Delivered, Pick-up, etc.)  
 Airbill #: \_\_\_\_\_  
 Matrix(s) Received: (Check all that apply):  Soil/Solid  Water  Other: \_\_\_\_\_  
 Cooler Number/Temperature: 1 16.7 °C 1 °C 1 °C 1 °C (Describe)  
 Thermometer ID: 1001

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C <sup>(1)</sup> ?		X		Sampled same day as receipt - Jpl 05-16-12
Is there ice present (document if blue ice is used)	X			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		X		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		X		
Were all samples received intact <sup>(1)</sup> ?	X			
Was adequate sample volume provided <sup>(1)</sup> ?	X			
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?		X		
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	X			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	X			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	X			
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	X			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.		X		
Are samples preserved that require preservation and was it checked <sup>(1)</sup> ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/(pH <2 for samples preserved with HNO3, HCL, H2SO4) / (pH >10 for samples preserved with NaAsO2+NaOH, ZnAc+NaOH)		X		Analyzed w/in 7 days of collection - Jpl 05-16-12
Additional Comments (if any):				

<sup>(1)</sup>If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

[Signature]  
 Reviewed by (Project Manager)

05-16-12 1306  
 Date/Time Reviewed

Origins Laboratory, Inc.

[Signature]

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Noelle E Doyle, President

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

Rob Rebel  
 Project Number: NEP1047.01  
 Project: Noble - Lorenz F22-1

MW-1

5/11/2012 1:00:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
 X205056-01 (Water)

**BTEX by EPA 8260C**

Benzene	ND	1.0	ug/L	1	2E14010	05/14/2012	05/15/2012	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	106 %	70-130			"	"	"	
Surrogate: Toluene-d8	92.4 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	83.2 %	70-130			"	"	"	

Origins Laboratory, Inc.



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Noelle E Doyle, President

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

Rob Rebel  
 Project Number: NEP1047.01  
 Project: Noble - Lorenz F22-1

MW-2  
 5/11/2012 1:05:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
 X205056-02 (Water)

**BTEX by EPA 8260C**

Benzene	ND	1.0	ug/L	1	2E14010	05/14/2012	05/15/2012	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	109 %	70-130			"	"	"	
Surrogate: Toluene-d8	92.3 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	84.1 %	70-130			"	"	"	

Origins Laboratory, Inc.



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

Rob Rebel  
 Project Number: NEP1047.01  
 Project: Noble - Lorenz F22-1

MW-3  
 5/11/2012 1:10:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
 X205056-03 (Water)

**BTEX by EPA 8260C**

Benzene	ND	1.0	ug/L	1	2E14010	05/14/2012	05/15/2012	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	109 %	70-130			"	"	"	
Surrogate: Toluene-d8	92.7 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	83.1 %	70-130			"	"	"	

Origins Laboratory, Inc.



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

Rob Rebel  
 Project Number: NEP1047.01  
 Project: Noble - Lorenz F22-1

MW-4  
 5/11/2012 1:15:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
 X205056-04 (Water)

**BTEX by EPA 8260C**

Benzene	ND	1.0	ug/L	1	2E14010	05/14/2012	05/16/2012	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	109 %	70-130			"	"	"	
Surrogate: Toluene-d8	92.1 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	81.6 %	70-130			"	"	"	

Origins Laboratory, Inc.



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 4600 West 60th Avenue  
 Arvada CO 80003

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 Project Number: NEP1047.01  
 Project: Noble - Lorenz F22-1

MW-5  
 5/11/2012 1:20:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
 X205056-05 (Water)

**BTEX by EPA 8260C**

Benzene	ND	1.0	ug/L	1	2E14010	05/14/2012	05/16/2012	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	110 %	70-130			"	"	"	
Surrogate: Toluene-d8	91.7 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	84.4 %	70-130			"	"	"	

Origins Laboratory, Inc.



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

Rob Rebel  
 Project Number: NEP1047.01  
 Project: Noble - Lorenz F22-1

MW-6  
 5/11/2012 1:25:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
 X205056-06 (Water)

**BTEX by EPA 8260C**

Benzene	ND	1.0	ug/L	1	2E14010	05/14/2012	05/16/2012	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	111 %	70-130			"	"	"	
Surrogate: Toluene-d8	91.1 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	84.3 %	70-130			"	"	"	

Origins Laboratory, Inc.



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LT Environmental, Inc.  
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 Arvada CO 80003

Rob Rebel  
 Project Number: NEP1047.01  
 Project: Noble - Lorenz F22-1

**Volatile Organic Compounds by GC/MS SW846 8260C - 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 2E14010 - EPA 5030B (Water)

Blank (2E14010-BLK1)

Prepared: 05/14/2012 Analyzed: 05/15/2012

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>60</i>		<i>"</i>	<i>62.5</i>	<i>95.6</i>	<i>70-130</i>				
<i>Surrogate: Toluene-d8</i>	<i>60</i>		<i>"</i>	<i>62.5</i>	<i>95.3</i>	<i>70-130</i>				
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>52</i>		<i>"</i>	<i>62.5</i>	<i>83.1</i>	<i>70-130</i>				

Origins Laboratory, Inc.



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**Volatile Organic Compounds by GC/MS SW846 8260C - 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 2E14010 - EPA 5030B (Water)

LCS (2E14010-BS1)

Prepared: 05/14/2012 Analyzed: 05/15/2012

Benzene	102	1.0	ug/L	100		102	70-130			
Toluene	97.9	1.0	"	100		97.9	70-130			
Ethylbenzene	101	1.0	"	100		101	70-130			
m,p-Xylene	219	2.0	"	200		109	70-130			
o-Xylene	106	1.0	"	100		106	70-130			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>59</i>		<i>"</i>	<i>62.5</i>		<i>94.2</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>59</i>		<i>"</i>	<i>62.5</i>		<i>95.1</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>52</i>		<i>"</i>	<i>62.5</i>		<i>83.8</i>	<i>70-130</i>			

Origins Laboratory, Inc.



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

Rob Rebel  
 Project Number: NEP1047.01  
 Project: Noble - Lorenz F22-1

**Volatile Organic Compounds by GC/MS SW846 8260C - 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 2E14010 - EPA 5030B (Water)

Matrix Spike (2E14010-MS1)	Source: X205041-03			Prepared: 05/14/2012 Analyzed: 05/15/2012						
Benzene	112	1.0	ug/L	100	ND	112	70-130			
Toluene	106	1.0	"	100	ND	106	70-130			
Ethylbenzene	110	1.0	"	100	ND	110	70-130			
m,p-Xylene	234	2.0	"	200	ND	117	70-130			
o-Xylene	113	1.0	"	100	ND	113	70-130			
Surrogate: 1,2-Dichloroethane-d4	60		"	62.5		95.6	70-130			
Surrogate: Toluene-d8	60		"	62.5		96.0	70-130			
Surrogate: 4-Bromofluorobenzene	54		"	62.5		85.7	70-130			

Origins Laboratory, Inc.



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Noelle E Doyle, President

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

Rob Rebel  
 Project Number: NEP1047.01  
 Project: Noble - Lorenz F22-1

**Volatile Organic Compounds by GC/MS SW846 8260C - 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 2E14010 - EPA 5030B (Water)

Matrix Spike Dup (2E14010-MSD1)	Source: X205041-03			Prepared: 05/14/2012 Analyzed: 05/15/2012						
Benzene	109	1.0	ug/L	100	ND	109	70-130	3.33	20	
Toluene	102	1.0	"	100	ND	102	70-130	3.36	20	
Ethylbenzene	106	1.0	"	100	ND	106	70-130	3.19	20	
m,p-Xylene	222	2.0	"	200	ND	111	70-130	4.89	20	
o-Xylene	109	1.0	"	100	ND	109	70-130	4.15	20	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>59</i>		<i>"</i>	<i>62.5</i>		<i>94.1</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>60</i>		<i>"</i>	<i>62.5</i>		<i>95.5</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>53</i>		<i>"</i>	<i>62.5</i>		<i>85.1</i>	<i>70-130</i>			

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, President

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

Rob Rebel  
Project Number: NEP1047.01  
Project: Noble - Lorenz F22-1

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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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Noelle E Doyle, President