

804 Grand Avenue  
Platteville, CO 80651

Tel: 970-785-5000  
Fax: 970-785-5099  
www.nobleenergyinc.com



June 6, 2011

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

RE: Groundwater Monitoring Results  
Lorenze F22-1, 2  
API 05-123-15139  
NENE Sec. 22, T5N, R65W  
Weld County, Colorado

Dear Mr. Axelson:

Please find attached the Quarterly Groundwater Report for the Lorenze F22-1, 2. Noble Energy 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, Inc. Environmental Department at (970) 785-5025 if you have any questions or require additional information.

Sincerely,

A handwritten signature in black ink that reads 'Mikel Cox'.

Mikel Cox  
Environmental Coordinator

A handwritten signature in blue ink that reads 'Todd Cullum'.

Todd Cullum  
Environmental Specialist

Attachments



## REMEDICATION, WELL INSTALLATION, AND MONITORING REPORT MAY 2011

---

### LORENZ F 22-1 TANK BATTERY

LT Environmental, Inc. (LTE), under the direction of Noble Energy, Inc. (Noble), conducted additional groundwater amendment injections, installed post-remediation monitoring wells, installed passive soil vapor extraction (SVE) wells, and conducted groundwater monitoring at the Lorenz F 22-1 Tank Battery (Site). This monitoring event constitutes the first post-remediation monitoring event at this Site. Site history and previous remediation activities (Phase I) were described in the *Remediation Summary Report*, dated January 2011.

Phase I of the remediation plan consisted of source removal activities. During Phase I, a limited amount of impacted soil and groundwater was inaccessible due to access restrictions and was left *in situ*. To remediate the remaining impacted soil and groundwater, LTE under the direction of Noble, conducted Phase II of the remediation plan. Phase II consisted of *in situ* remediation using activated carbon injections as a groundwater amendment and passive SVE as an unsaturated soil amendment. A *Remediation Injection Rule Authorization Application* was submitted to the United States Environmental Protection Agency (EPA), Region 8, on February 18, 2011, that detailed the injection plan. The EPA authorized the application on March 21, 2011.

On April 8, 2011, LTE personnel were on site with Remington Technologies of Loveland, Colorado, to conduct groundwater amendment injection activities. A total of 1,500 pounds of an activated carbon remediation amendment and 5 gallons of cultured bacteria were injected at alternating intervals of 3 and 5 feet below ground surface (bgs) and 4 and 5 feet bgs. There were ten closely spaced injection points in the area where impacted soil and groundwater remained after initial source removal activities, as illustrated on Figure 1.

Monitoring wells (MW01 through MW06) were installed at the Site on April 22, 2011. On April 26, 2011, LTE personnel, under the direction of Noble, developed and sampled monitoring wells MW01 through MW06. Depth to groundwater ranged from 4.59 feet below top of casing (btoc) in MW06 to 6.69 feet btoc in MW02. Depth to groundwater was used to calculate well-specific purge volumes. Each monitoring well was purged of ten well casing volumes prior to sample collection. 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 EPA Method 8260C. Groundwater level measurements and laboratory analytical results are summarized in Table 1.

Passive SVE wells (SVE01 through SVE05) were installed on May 9 and 11, 2011. The distribution and spacing of these wells are based on site-specific soil analytical data, geological

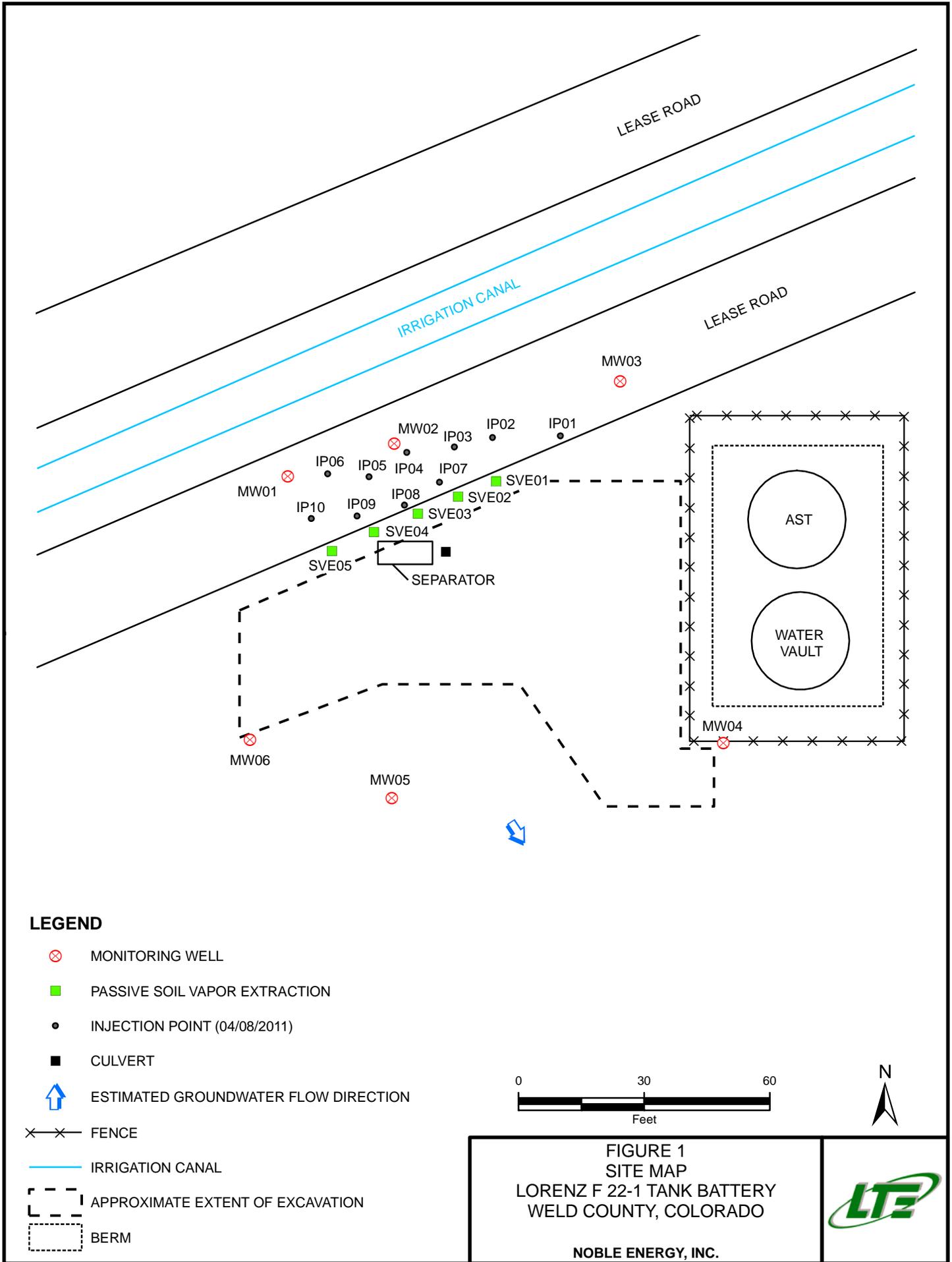
characteristics, and experience with similar systems. Monitoring well and SVE well locations are illustrated on Figure 1. Well completion diagrams are included as Attachment 1.

The SVE system includes five vertical passive SVE wells constructed of a 4-inch diameter schedule 40 polyvinyl chloride (PVC) pipe screened with a 36-inch length of 0.01-inch slot well screen placed in the impacted soil interval. The SVE wells were installed to a depth of 5 feet bgs and have an 8-foot stickup. Wind driven turbines were affixed to the SVE wells to induce air flow in the soil subsurface. The induced air flow promotes volatilization of hydrocarbons entrained on the soil and provides oxygen to indigenous and augmented microbes, thereby remediating the impacted unsaturated soils.

Groundwater analytical results indicate BTEX concentrations are in compliance with Colorado Department of Public Health and Environment-Water Quality Control Commission Regulation 41 (WQCC Reg 41) for all monitoring wells, except MW02. Monitoring well MW02 exhibits a benzene concentration of 44.3 micrograms per liter ( $\mu\text{g/L}$ ). Prior to initiating remediation work, hydrocarbon concentrations in the MW01 and MW02 area exceeded 1,000  $\mu\text{g/L}$  dissolved benzene. Groundwater sampling results are illustrated on Figure 2. The laboratory analytical report is included as Attachment 2.

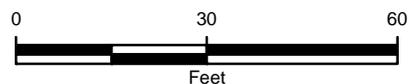
Noble will continue to conduct quarterly groundwater monitoring events with the goal of observing four consecutive quarters with analytical results in compliance with WQCC Reg 41. The next quarterly groundwater sampling event is scheduled for July 2011.

## **FIGURES**



**LEGEND**

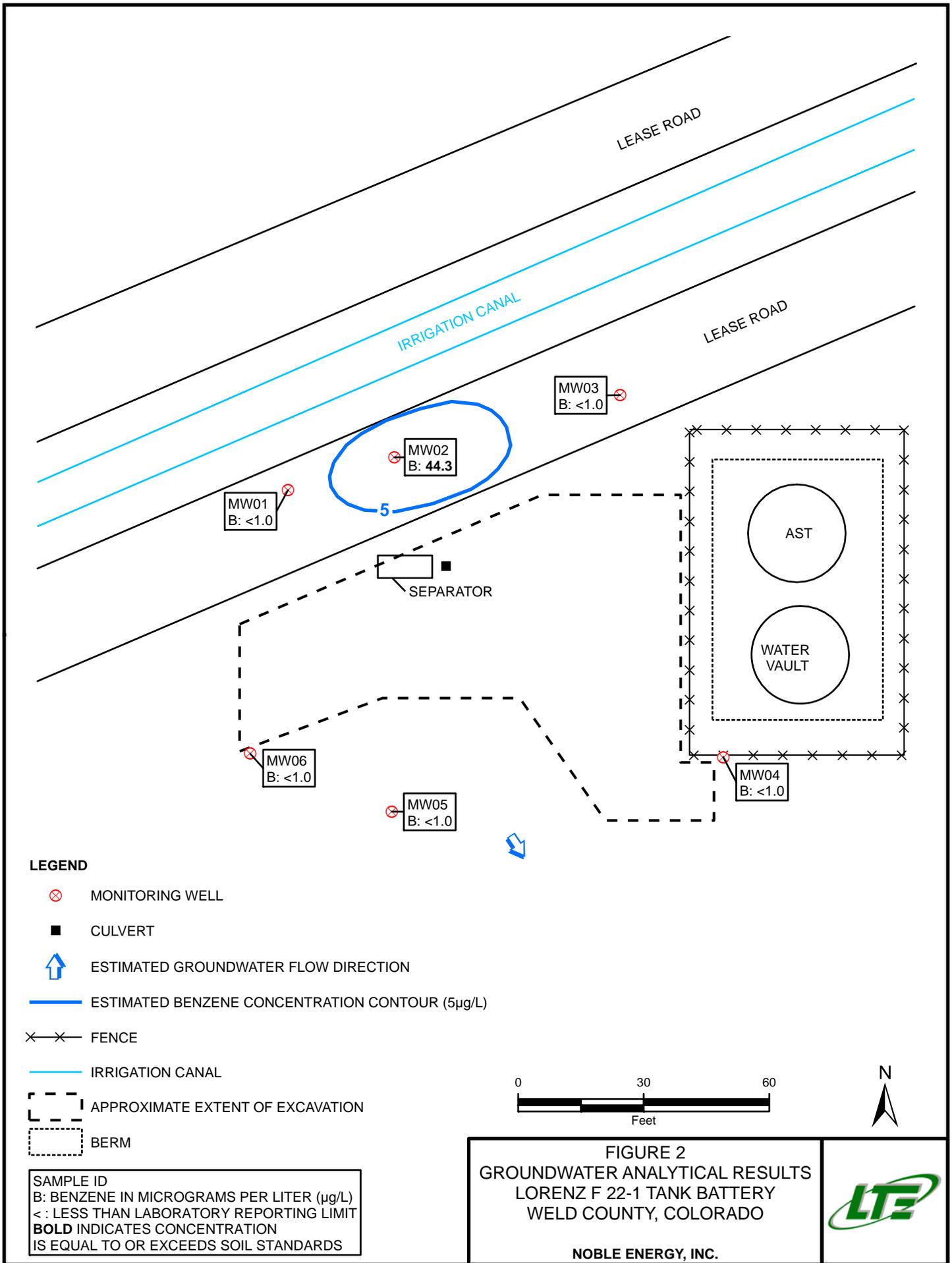
-  MONITORING WELL
-  PASSIVE SOIL VAPOR EXTRACTION
-  INJECTION POINT (04/08/2011)
-  CULVERT
-  ESTIMATED GROUNDWATER FLOW DIRECTION
-  FENCE
-  IRRIGATION CANAL
-  APPROXIMATE EXTENT OF EXCAVATION
-  BERM



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

**NOBLE ENERGY, INC.**

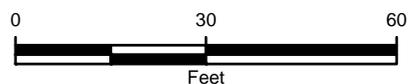




**LEGEND**

- MONITORING WELL
- CULVERT
- ESTIMATED GROUNDWATER FLOW DIRECTION
- ESTIMATED BENZENE CONCENTRATION CONTOUR (5µg/L)
- FENCE
- IRRIGATION CANAL
- APPROXIMATE EXTENT OF EXCAVATION
- BERM

SAMPLE ID  
 B: BENZENE IN MICROGRAMS PER LITER (µg/L)  
 < : LESS THAN LABORATORY REPORTING LIMIT  
**BOLD INDICATES CONCENTRATION IS EQUAL TO OR EXCEEDS SOIL STANDARDS**



**FIGURE 2**  
**GROUNDWATER ANALYTICAL RESULTS**  
**LORENZ F 22-1 TANK BATTERY**  
**WELD COUNTY, COLORADO**

**NOBLE ENERGY, INC.**



## **TABLE**

TABLE 1

**GROUNDWATER ANALYTICAL DATA  
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
MW02	4/26/2011	6.69	<b>44.3</b>	<1.0	7.4	52.4
MW03	4/26/2011	5.81	<1.0	<1.0	<1.0	<3.0
MW04	4/26/2011	5.13	<1.0	<1.0	<1.0	<3.0
MW05	4/26/2011	5.00	<1.0	<1.0	<1.0	<3.0
MW06	4/26/2011	4.59	<1.0	<1.0	1.7	8.6
<b>CDPHE WQCC Reg 41</b>			<b>5</b>	<b>560</b>	<b>700</b>	<b>1,400</b>

**NOTES:**

btoc - below top of casing

µg/L - micrograms per liter

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

**BOLD** - indicates result is above the applicable standard

Benzene, toluene, ethylbenzene, 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 Basic Standards for Ground Water

**ATTACHMENT 1**

**WELL COMPLETION DIAGRAMS**

Location Map:



Compliance « Engineering « Remediation  
 LT Environmental, Inc.  
 4600 W. 60th Avenue  
 Arvada, Colorado 80003

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number: **MW01** Project: **Lorenz F 22-1**

Date: **4/22/11** Project Number: **NEP1047**

Logged By: **D. Burns** Drilled By: **High Plains**

Elevation: \_\_\_\_\_ Detector: **PID** Drilling Method: **Direct Push** Sampling Method: **Continuous**

Gravel Pack: **10-20 Silica Sand 8'-2'** Seal: **Bentonite chips 2'-0'** Grout: \_\_\_\_\_

Casing Type: **Sch 40 PVC** Diameter: **1"** Length: **5'** Hole Diameter: **2"** Depth to Liquid: \_\_\_\_\_

Screen Type: **Sch 40 PVC** Slot: **0.010"** Diameter: **1"** Length: **5'** Total Depth: **8'** Depth to Water: **3'**

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
low	dry	/	no	/	0		CL	Road base	
	moist	/			2			sandy clay, organic, black/gray	
	wet	/			4		G-P/GW	no s/s	
low	wet	/	no	/	6		GW	gravelly sand, little clay	
					8		GW		
					10				
					12				
					14				
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				

Location Map:



Compliance « Engineering « Remediation  
 LT Environmental, Inc.  
 4600 W. 60th Avenue  
 Arvada, Colorado 80003

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number: **MW02** Project: **Lorenz F22-1**

Date: **4/22/01** Project Number: **NEP1047**

Logged By: **D. Burns** Drilled By: **High Plains**

Elevation: \_\_\_\_\_ Detector: **PID** Drilling Method: **Direct Push** Sampling Method: **Continuous**

Gravel Pack: **10-20 Silica Sand 8' 2'** Seal: **Benbrite chips 2' 0'** Grout: \_\_\_\_\_

Casing Type: **Sch 40 PVC** Diameter: **1"** Length: **5'** Hole Diameter: **2"** Depth to Liquid: \_\_\_\_\_

Screen Type: **Sch 40 PVC** Slot: **0.010"** Diameter: **1"** Length: **5'** Total Depth: **8'** Depth to Water: **3'**

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
low	dry				0			roadbase / topsoil	
	moist				2		CL	sandy clay no sld	
	wet	/	no	/	4		GW	gravelly sand, no clay	
					6			Activated carbon - black, no odor	
low	wet	/	no	/	8				
					10				
					12				
					14				
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				

Location Map:



Compliance <sup>™</sup> Engineering <sup>™</sup> Remediation  
 LT Environmental, Inc.  
 4600 W. 60th Avenue  
 Arvada, Colorado 80003

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number: **MW03** Project: **Lorenz F 22-1**

Date: **4/22/11** Project Number: **NEP1047**

Logged By: **D. Burns** Drilled By: **High Plains**

Elevation: \_\_\_\_\_ Detector: **PID** Drilling Method: **Direct Push** Sampling Method: **Continuous**

Gravel Pack: **10-20 Silica Sand 8L2'** Seal: **Bentonite chips 2'-0'** Grout: \_\_\_\_\_

Casing Type: **Sch 40 PVC** Diameter: **1"** Length: **5'** Hole Diameter: **2"** Depth to Liquid: \_\_\_\_\_

Screen Type: **Sch 40 PVC** Slot: **0.010"** Diameter: **1"** Length: **5'** Total Depth: **8'** Depth to Water: **3'**

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
					0			using expendable pts. no logging.	
					2				
					4				
					6				
					8				
					10				
					12				
					14				
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				

Location Map:



Compliance • Engineering • Remediation  
 LT Environmental, Inc.  
 4600 W. 60th Avenue  
 Arvada, Colorado 80003

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number: **MW04** Project: **Lorenz F22-1**

Date: **4/22/11** Project Number: **NEP1047**

Logged By: **D. Burns** Drilled By: **High Plains**

Elevation: \_\_\_\_\_ Detector: **PID** Drilling Method: **Direct Push** Sampling Method: **Continuous**

Gravel Pack: **10-20 Silica Sand 8'-2'** Seal: **Bentonite chips 2'-0'** Grout: \_\_\_\_\_

Casing Type: **Sch 40 PVC** Diameter: **1"** Length: **5'** Hole Diameter: **2"** Depth to Liquid: \_\_\_\_\_

Screen Type: **Sch 40 PVC** Slot: **0.010"** Diameter: **1"** Length: **5'** Total Depth: **8'** Depth to Water: **3'**

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
					0			using expendable points no logging	
					2				
					4				
					6				
					8				
					10				
					12				
					14				
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				

Location Map:



Compliance « Engineering « Remediation  
 LT Environmental, Inc.  
 4600 W. 60th Avenue  
 Arvada, Colorado 80003

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number: **MW05** Project: **Lorenz F 22-1**

Date: **4/22/11** Project Number: **NEP1047**

Logged By: **D. Burns** Drilled By: **High Plains**

Elevation: Detector: **PID** Drilling Method: **Direct Push** Sampling Method: **Continuous**

Gravel Pack: **10-20 Silica Sand** Seal: **Bentonite chips 2'-0"** Grout: **\_\_\_\_\_**

Casing Type: **Sch 40 PVC** Diameter: **1"** Length: **5'** Hole Diameter: **2"** Depth to Liquid: **\_\_\_\_\_**

Screen Type: **Sch 40 PVC** Slot: **0.010"** Diameter: **1"** Length: **5'** Total Depth: **81** Depth to Water: **31**

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
					0			using expendable points no logging	
					2				
					4				
					6				
					8				
					10				
					12				
					14				
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				

Location Map:



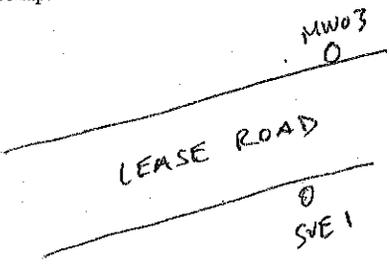
**Compliance « Engineering « Remediation**  
**LT Environmental, Inc.**  
 4600 W. 60th Avenue  
 Arvada, Colorado 80003

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number: <b>MW06</b>	Project: <b>Lorenz F 22-1</b>				
Date: <b>4/22/11</b>	Project Number: <b>NEP1047</b>				
Logged By: <b>D. Burns</b>	Drilled By: <b>High Plains</b>				
Elevation:	Detector: <b>PID</b>	Drilling Method: <b>Direct Push</b>	Sampling Method: <b>Continuous</b>		
Gravel Pack: <b>10-20 Silica Sand</b>	<b>8'-2'</b>	Seal: <b>Bentonite chips 2'-0'</b>	Grout:		
Casing Type: <b>Sch 40 PVC</b>	Diameter: <b>1"</b>	Length: <b>5'</b>	Hole Diameter: <b>2"</b>	Depth to Liquid:	
Screen Type: <b>Sch 40 PVC</b>	Slot: <b>0.010"</b>	Diameter: <b>1"</b>	Length: <b>5'</b>	Total Depth: <b>8'</b>	Depth to Water: <b>3'</b>

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
					0			using expendable points no logging	
					2				
					4				
					6				
					8				
					10				
					12				
					14				
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				

Location Map:



**LTE** Compliance « Engineering « Remediation  
 LT Environmental, Inc.  
 4600 W. 60th Avenue  
 Arvada, Colorado 80003

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number: **SVE01** Project: **Lorenz F22-1**  
 Date: **5/19/11** Project Number: **NEP1047**  
 Logged By: **L. Houle** Drilled By: **LTE**

Elevation: \_\_\_\_\_ Detector: \_\_\_\_\_ Drilling Method: **Auger** Sampling Method: \_\_\_\_\_

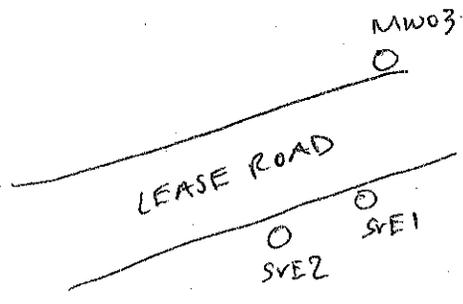
Gravel Pack: **10-20 Silica Sand ~~NA~~ 5' - 1.5'** Seal: **Bentonite Chips 1.5' - 0'** Grout: \_\_\_\_\_

Casing Type: **5ch 40 PVC** Diameter: **4"** Length: **10'** Hole Diameter: **6"** Depth to Liquid: \_\_\_\_\_

Screen Type: **5ch 40 PVC** Slot: **0.010"** Diameter: **4"** Length: **3'** Total Depth: **5'** Depth to Water: **4.5'**

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
	moist		yes		0	4	CL	Roadbase / Topsoil sandy clay	8' slump
					2				
					4				
					6				
					8				
					10				
					12				
					14				
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				

Location Map:



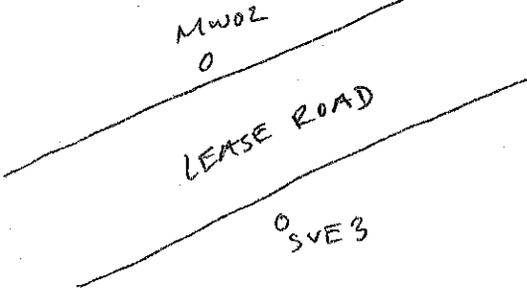
**LTE** Compliance « Engineering » Remediation  
 LT Environmental, Inc.  
 4600 W. 60th Avenue  
 Arvada, Colorado 80003

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number: <b>SVE02</b>	Project: <b>Lorenz F22-1</b>				
Date: <b>5/19/11</b>	Project Number: <b>NEPI047</b>				
Logged By: <b>L. Houle</b>	Drilled By: <b>LTE</b>				
Elevation:	Drilling Method: <b>Auger</b>				
Detector:	Sampling Method:				
Gravel Pack: <b>10-20 Silica Sand 5'-1.5'</b>	Seal: <b>Bentonite Chips 1.5'-0'</b>				
Casing Type: <b>Sch 40 PVC</b>	Diameter: <b>4"</b>	Length: <b>10'</b>	Hole Diameter: <b>6"</b>	Depth to Liquid:	
Screen Type: <b>Sch 40 PVC</b>	Slot: <b>0.010"</b>	Diameter: <b>4"</b>	Length: <b>3'</b>	Total Depth: <b>5'</b>	Depth to Water: <b>4.5'</b>

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
					0			Roadbase / Topsoil	8' Stackup
	moist		yes		2		CL	Sandy clay	
					4				
					6				
					8				
					10				
					12				
					14				
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				

Location Map:



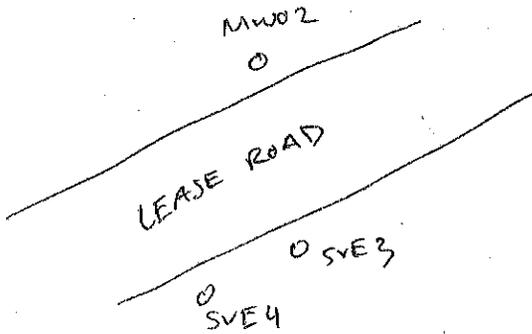
Compliance « Engineering « Remediation  
 LT Environmental, Inc.  
 4600 W. 60th Avenue  
 Arvada, Colorado 80003

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number: <b>SVE03</b>	Project: <b>Lorenz F22-1</b>				
Date: <b>5/19/11</b>	Project Number: <b>NEP1047</b>				
Logged By: <b>L. Howe</b>	Drilled By: <b>LTE</b>				
Elevation:	Detector:	Drilling Method: <b>Auger</b>	Sampling Method:		
Gravel Pack: <b>10-20 Silica Sand 5'-1.5'</b>	Seal: <b>Bentonite Chips 1.5'-0'</b>	Grout:			
Casing Type: <b>Sch 40 PVC</b>	Diameter: <b>4"</b>	Length: <b>10'</b>	Hole Diameter: <b>6"</b>	Depth to Liquid:	
Screen Type: <b>Sch 40 PVC</b>	Slot: <b>0.010"</b>	Diameter: <b>4"</b>	Length: <b>3'</b>	Total Depth: <b>5'</b>	Depth to Water: <b>4.5'</b>

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
					0			Roadbase / Topsoil	
	moist		yes		2		CL	Sandy Clay	
					4				
					6				
					8				
					10				
					12				
					14				
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				

Location Map:



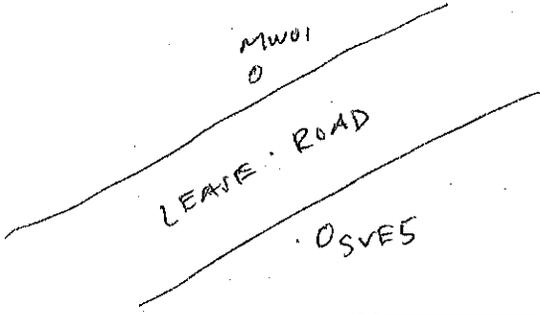
Compliance • Engineering • Remediation  
 LT Environmental, Inc.  
 4600 W. 60th Avenue  
 Arvada, Colorado 80003

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number: <b>SVE04</b>	Project: <b>Lorenz F22-1</b>				
Date: <b>5/9/11</b>	Project Number: <b>NEP1047</b>				
Logged By: <b>L. Houle</b>	Drilled By: <b>LTE</b>				
Elevation:	Detector:	Drilling Method: <b>Auger</b>	Sampling Method:		
Gravel Pack: <b>20 Silica Sand 5' - 1.5'</b>	Seal: <b>Bentonite Chips 1.5' - 0'</b>	Grout:			
Casing Type: <b>Sch 40 PVC</b>	Diameter: <b>4"</b>	Length: <b>10'</b>	Hole Diameter: <b>6"</b>	Depth to Liquid:	
Screen Type: <b>Sch 40 PVC</b>	Slot: <b>0.010"</b>	Diameter: <b>4"</b>	Length: <b>3'</b>	Total Depth: <b>5'</b>	Depth to Water: <b>4.5'</b>

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
					0			Roadbase / Top Soil	
	Moist		NO		2		CL	Sandy clay	
					4				
					6				
					8				
					10				
					12				
					14				
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				

Location Map:



Compliance « Engineering » Remediation  
 LT Environmental, Inc.  
 4600 W. 60th Avenue  
 Arvada, Colorado 80003

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number: <b>SVE05</b>	Project: <b>Lorenz</b>				
Date: <b>5/19/11</b>	Project Number: <b>NEP1047</b>				
Logged By: <b>L. Houle</b>	Drilled By: <b>LTE</b>				
Elevation:	Detector:	Drilling Method: <b>Auger</b>	Sampling Method:		
Gravel Pack: <b>10-20 Silica Sand 5'-1.5'</b>	Seal: <b>Bentonite Chips 1.5'-0'</b>	Grout:			
Casing Type: <b>Sch 40 PVC</b>	Diameter: <b>4"</b>	Length: <b>10'</b>	Hole Diameter: <b>6"</b>	Depth to Liquid:	
Screen Type: <b>Sch 40 PVC</b>	Slot: <b>0.010"</b>	Diameter: <b>4"</b>	Length: <b>3'</b>	Total Depth: <b>5'</b>	Depth to Water: <b>4.5'</b>

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
					0			Roadbase / Topsoil	
	Moist		NO		2		CL	Sandy Clay	
					4				
					6				
					8				
					10				
					12				
					14				
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				

**ATTACHMENT 2**

**LABORATORY ANALYTICAL REPORT**



April 29, 2011

LT Environmental, Inc.

Rob Rebel

4600 West 60th Avenue

Arvada CO 80003

---

Project Name - Noble - Lorenz F22-1

Project Number - NEP1047

Attached are you analytical results for Noble - Lorenz F22-1 received by Origins Laboratory, Inc. April 26, 2011. This project is associated with Origins project number X104157-01.

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

Project Number: NEP1047  
Project Name: Noble - Lorenz F22-1

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1	X104157-01	Water	April 26, 2011 12:45	04/26/2011 14:15
MW-2	X104157-02	Water	April 26, 2011 12:55	04/26/2011 14:15
MW-3	X104157-03	Water	April 26, 2011 13:05	04/26/2011 14:15
MW-4	X104157-04	Water	April 26, 2011 12:10	04/26/2011 14:15
MW-5	X104157-05	Water	April 26, 2011 12:20	04/26/2011 14:15
MW-6	X104157-06	Water	April 26, 2011 12:35	04/26/2011 14:15

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

Project Number: NEP1047  
 Project Name: Noble - Lorenz F22-1

MW-1

4/26/2011 12:45:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

Origins Laboratory, Inc.  
 X104157-01 (Water)

**BTEX by EPA 8260C**

Benzene	ND	1.0	ug/L	1	1D27003	04/27/2011	04/28/2011	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	3.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	108 %	70-130			"	"	"	
Surrogate: Toluene-d8	91.2 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	106 %	70-130			"	"	"	

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

Project Number: NEP1047  
 Project Name: Noble - Lorenz F22-1

MW-2

4/26/2011 12:55:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

Origins Laboratory, Inc.  
 X104157-02 (Water)

**BTEX by EPA 8260C**

Benzene	44.3	1.0	ug/L	1	1D27003	04/27/2011	04/28/2011	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	7.4	1.0	"	"	"	"	"	
Xylenes, total	52.4	3.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	108 %	70-130			"	"	"	
Surrogate: Toluene-d8	91.3 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	106 %	70-130			"	"	"	

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

Project Number: NEP1047  
 Project Name: Noble - Lorenz F22-1

MW-3

4/26/2011 1:05:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

Origins Laboratory, Inc.  
 X104157-03 (Water)

**BTEX by EPA 8260C**

Benzene	ND	1.0	ug/L	1	1D27003	04/27/2011	04/28/2011	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	3.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	107 %	70-130			"	"	"	
Surrogate: Toluene-d8	91.8 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	106 %	70-130			"	"	"	

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

Project Number: NEP1047  
 Project Name: Noble - Lorenz F22-1

MW-4

4/26/2011 12:10:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

Origins Laboratory, Inc.  
 X104157-04 (Water)

**BTEX by EPA 8260C**

Benzene	ND	1.0	ug/L	1	1D27003	04/27/2011	04/28/2011	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	3.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	108 %	70-130			"	"	"	
Surrogate: Toluene-d8	92.3 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	106 %	70-130			"	"	"	

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

Project Number: NEP1047  
 Project Name: Noble - Lorenz F22-1

MW-5

4/26/2011 12:20:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

Origins Laboratory, Inc.  
 X104157-05 (Water)

**BTEX by EPA 8260C**

Benzene	ND	1.0	ug/L	1	1D27003	04/27/2011	04/28/2011	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	3.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	109 %	70-130			"	"	"	
Surrogate: Toluene-d8	92.1 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	105 %	70-130			"	"	"	

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

Project Number: NEP1047  
 Project Name: Noble - Lorenz F22-1

MW-6

4/26/2011 12:35:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

Origins Laboratory, Inc.  
 X104157-06 (Water)

**BTEX by EPA 8260C**

Benzene	ND	1.0	ug/L	1	1D27003	04/27/2011	04/29/2011	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	1.7	1.0	"	"	"	"	"	
Xylenes, total	8.6	3.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	107 %	70-130			"	"	04/28/2011	
Surrogate: Toluene-d8	91.9 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	105 %	70-130			"	"	"	

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

Project Number: NEP1047  
 Project Name: 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
Batch 1D27003 - EPA 5030B										
Blank (1D27003-BLK1) <span style="float: right;">Prepared: 04/27/2011 Analyzed: 04/27/2011</span>										
Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
m,p-Xylene	ND	2.0	"							
o-Xylene	ND	1.0	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>64</i>		<i>"</i>	<i>62.5</i>		<i>103</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>59</i>		<i>"</i>	<i>62.5</i>		<i>93.9</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>66</i>		<i>"</i>	<i>62.5</i>		<i>105</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

Project Number: NEP1047  
 Project Name: 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
Batch 1D27003 - EPA 5030B										
Blank (1D27003-BLK2) <span style="float: right;">Prepared: 04/27/2011 Analyzed: 04/27/2011</span>										
Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
m,p-Xylene	ND	2.0	"							
o-Xylene	ND	1.0	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>65</i>		<i>"</i>	<i>62.5</i>		<i>104</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>59</i>		<i>"</i>	<i>62.5</i>		<i>93.8</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>66</i>		<i>"</i>	<i>62.5</i>		<i>106</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

Project Number: NEP1047  
 Project Name: 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
Batch 1D27003 - EPA 5030B										
LCS (1D27003-BS1) <span style="float: right;">Prepared: 04/27/2011 Analyzed: 04/27/2011</span>										
Benzene	53.2	1.0	ug/L	50.0		106	70-130			
Toluene	45.4	1.0	"	50.0		90.8	70-130			
Ethylbenzene	42.9	1.0	"	50.0		85.7	70-130			
m,p-Xylene	91.7	2.0	"	100		91.7	70-130			
o-Xylene	47.6	1.0	"	50.0		95.3	70-130			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>63</i>		<i>"</i>	<i>62.5</i>		<i>101</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>59</i>		<i>"</i>	<i>62.5</i>		<i>94.4</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>60</i>		<i>"</i>	<i>62.5</i>		<i>95.9</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

Project Number: NEP1047  
 Project Name: 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
<b>Batch 1D27003 - EPA 5030B</b>										
<b>LCS (1D27003-BS2)</b>					Prepared: 04/27/2011 Analyzed: 04/27/2011					
Benzene	58.3	1.0	ug/L	50.0		117	70-130			
Toluene	50.8	1.0	"	50.0		102	70-130			
Ethylbenzene	49.2	1.0	"	50.0		98.5	70-130			
m,p-Xylene	104	2.0	"	100		104	70-130			
o-Xylene	51.2	1.0	"	50.0		102	70-130			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>62</i>		<i>"</i>	<i>62.5</i>		<i>100</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>58</i>		<i>"</i>	<i>62.5</i>		<i>93.4</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>60</i>		<i>"</i>	<i>62.5</i>		<i>95.4</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

Project Number: NEP1047  
 Project Name: 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
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 1D27003 - EPA 5030B

Matrix Spike (1D27003-MS1)	Source: X104146-01			Prepared: 04/27/2011 Analyzed: 04/27/2011						
Benzene	58.4	1.0	ug/L	50.0	0.2	116	70-130			
Toluene	50.1	1.0	"	50.0	0.2	99.8	70-130			
Ethylbenzene	49.3	1.0	"	50.0	0.2	98.2	70-130			
m,p-Xylene	105	2.0	"	100	0.4	104	70-130			
o-Xylene	51.6	1.0	"	50.0	0.2	103	70-130			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>63</i>		<i>"</i>	<i>62.5</i>		<i>101</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>59</i>		<i>"</i>	<i>62.5</i>		<i>94.1</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>60</i>		<i>"</i>	<i>62.5</i>		<i>95.8</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

Project Number: NEP1047  
 Project Name: 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
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 1D27003 - EPA 5030B

Matrix Spike (1D27003-MS2)	Source: X104147-02			Prepared: 04/27/2011 Analyzed: 04/27/2011						
Benzene	59.9	1.0	ug/L	50.0	0.2	119	70-130			
Toluene	52.0	1.0	"	50.0	ND	104	70-130			
Ethylbenzene	51.3	1.0	"	50.0	ND	103	70-130			
m,p-Xylene	104	2.0	"	100	ND	104	70-130			
o-Xylene	51.9	1.0	"	50.0	ND	104	70-130			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>63</i>		<i>"</i>	<i>62.5</i>		<i>100</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>59</i>		<i>"</i>	<i>62.5</i>		<i>94.1</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>60</i>		<i>"</i>	<i>62.5</i>		<i>95.7</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

Project Number: NEP1047  
 Project Name: 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
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 1D27003 - EPA 5030B

Matrix Spike Dup (1D27003-MSD1)	Source: X104146-01			Prepared: 04/27/2011 Analyzed: 04/27/2011						
Benzene	58.2	1.0	ug/L	50.0	0.2	116	70-130	0.343	20	
Toluene	51.9	1.0	"	50.0	0.2	103	70-130	3.53	20	
Ethylbenzene	50.7	1.0	"	50.0	0.2	101	70-130	2.82	20	
m,p-Xylene	108	2.0	"	100	0.4	107	70-130	2.78	20	
o-Xylene	52.2	1.0	"	50.0	0.2	104	70-130	1.19	20	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>62</i>		<i>"</i>	<i>62.5</i>		<i>99.0</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>59</i>		<i>"</i>	<i>62.5</i>		<i>94.1</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>59</i>		<i>"</i>	<i>62.5</i>		<i>94.6</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

Project Number: NEP1047  
 Project Name: 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
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 1D27003 - EPA 5030B

Matrix Spike Dup (1D27003-MSD2)	Source: X104147-02			Prepared: 04/27/2011 Analyzed: 04/27/2011						
Benzene	57.1	1.0	ug/L	50.0	0.2	114	70-130	4.77	20	
Toluene	49.8	1.0	"	50.0	ND	99.6	70-130	4.28	20	
Ethylbenzene	48.4	1.0	"	50.0	ND	96.7	70-130	5.84	20	
m,p-Xylene	101	2.0	"	100	ND	101	70-130	2.93	20	
o-Xylene	50.0	1.0	"	50.0	ND	100	70-130	3.59	20	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>62</i>		<i>"</i>	<i>62.5</i>		<i>99.8</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>59</i>		<i>"</i>	<i>62.5</i>		<i>94.0</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>60</i>		<i>"</i>	<i>62.5</i>		<i>95.8</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

Project Number: NEP1047  
Project Name: Noble - Lorenz F22-1

**Notes and Definitions**

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

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