

WELL INSTALLATION AND GROUNDWATER MONITORING REPORT MAY 2010

DUPPER 26-6 TANK BATTERY

LT Environmental, Inc. (LTE) was retained by Noble Energy, Inc. (Noble) to install post-remediation monitoring wells and to conduct sampling activities at the Dupper 26-6 Tank Battery (Site). Monitoring well installation activities and groundwater sampling occurred on April 19, 2010 and April 22, 2010, respectively. Site history and remediation activities were described in the preceding *Remediation Summary Report*, dated April 2010. This well installation and groundwater monitoring event constitutes the first post remediation performance groundwater monitoring event.

LTE personnel were onsite April 19, 2010 to install four monitoring wells (MW01 through MW04) to determine if impacted groundwater exists at the Site. The monitoring wells were installed using a direct-push drill rig operated by Alpine Field Services of Golden, Colorado. The monitoring wells were advanced to a depth of 7.5 feet below ground surface (bgs) and were completed with a 2.5 foot stickup. Each monitoring well has 5 feet of 1-inch diameter, 0.010-inch slotted, schedule 40, poly-vinyl chloride screens. Boreholes were filled with 10-20 silica sand from total depth to one foot above the screened interval. Bentonite chips were then placed from the top of the sand pack to ground surface and hydrated.

Lithology observed at the Site was generally gray clay from ground surface to 5 feet bgs and brown, medium grained sand from 5 to 7.5 feet bgs. Field identified impact (soil staining/odor) was not observed in any of the borings. Groundwater was observed during drilling activities at approximately 2 feet bgs. Monitoring well MW03 was installed south of the excavation as an upgradient well. The remaining three monitoring wells (MW01, MW02, and MW04) were installed north of the excavation footprint (downgradient). The locations of the four monitoring wells relative to the excavation are presented as Figure 1. Borehole lithologic logs are included as Appendix A.

Groundwater level measurements and samples were collected from the monitoring wells on April 22, 2010 and are summarized in Table 1. The depth to groundwater ranged from 2.90 feet below top of casing (btoc) in MW02 to 4.85 feet btoc in MW03 and was used to calculate a well-specific purge volume. Samples were collected and 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 8260B.

Analytical results from the monitoring wells, presented in Table 1, indicate BTEX concentrations are in compliance with Colorado Department of Public Health and Environment Water Quality Control Commission Regulation 41 (WQCC Reg. 41). The laboratory analytical report is included as Appendix B.

LTE 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 2010.

TABLE

TABLE 1

**GROUNDWATER ANALYTICAL DATA
DUPPER 26-6 TANK BATTERY
WELD COUNTY, COLORADO
NOBLE ENERGY, INC.**

MONITORING WELL	SAMPLE DATE	DEPTH TO WATER (feet btoc)	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYLBENZENE (µg/L)	XYLENES (µg/L)
MW01	4/22/2010	4.15	<1.00	<1.00	<1.00	<1.00
MW02	4/22/2010	2.90	<1.00	<1.00	<1.00	<1.00
MW03	4/22/2010	4.85	<1.00	<1.00	<1.00	<1.00
MW04	4/22/2010	4.25	<1.00	<1.00	<1.00	<1.00
CDPHE WQCC Reg 41			5.0	560	700	1,400

NOTES:

btoc - below top of casing

µg/L - micrograms per liter

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

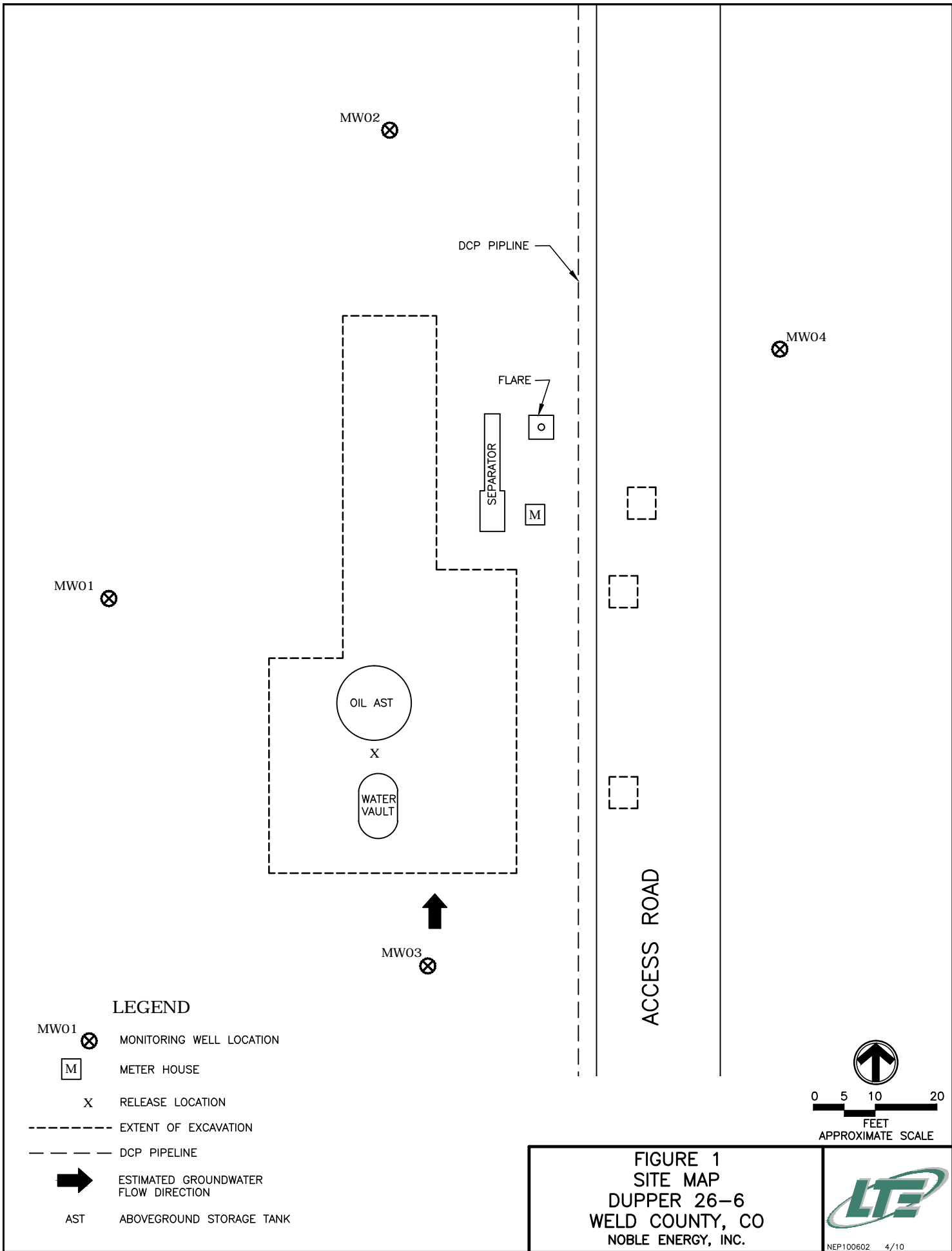
CDPHE WQCC Reg 41 - Colorado Department of Public Health and Environment - Water Quality Control

Commission Regulation 41 covering Basic Standards for Groundwater

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



FIGURE



APPENDIX A
BOREHOLE LITHOLOGIC LOGS

Location Map:

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

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MLW01 Project: Dupper 26-6Date: 4/19/2010 Project Number: NEP1006
NEP1001Logged By: M. Harrison Drilled By: AlpineDrilling Method: Direct Push Sampling Method: ContinuousGravel Pack: 10-20 Silica Sand Seal: Bentonite Chips Grout: NACasing Type: Schedule 40 PVC Diameter: Length: 5' Hole Diameter: 2" Depth to Liquid: —Screen Type: Schedule 40 PVC Slot: 0.010" Diameter: Length: 5' Total Depth: 7.5' Depth to Water: 1.5'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample Time	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Moist	0	No		1				gray, clay.	
	Wet	0	No		2			CL	no staining/odor	
	Wet	0	No		3					
	Wet	0	No		4			SW	sand, Brown, no stain/odor (mod)	
	Wet	9	No		5					
	Wet	0	NO		6					
					7					
					8					
					9					
					10					
					11				Total Depth @ 7.5'	
					12					
					13					
					14					
					15					
					16					
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					22					
					23					
					24					

Notes:

Location Map:

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N

@ MW02

SEP



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 4600 W. 60th Avenue
 Arvada, Colorado 80003

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW02 Project: Dupper 26-6

Date: 4/19/2010 Project Number: NEPI006
NEP1001

Logged By: M. Harrison Drilled By: Alpine

Elevation: Detector: Mini RAE 2000 Drilling Method: Direct Push Sampling Method: Continuous

Gravel Pack: 10-20 Silica Sand Seal: Bentonite Chips Grout: NA

Casing Type: Schedule 40 PVC Diameter: 1" Length: 5' Hole Diameter: 2" Depth to Liquid: -

Screen Type: Schedule 40 PVC Slot: 0.010" Diameter: 1" Length: 5' Total Depth: 7.5' Depth to Water: 2.0

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample Time	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Moist	0	No		1				Gray/Brown Sand, w/ organics	
	wet	0	No		2			SP	no staining/odor	
	wet	0	No		3					
	wet	0	No		4			CL	clay red/brown	
	wet	0	No		5				no staining/odor	
	wet	0	No		6			SW	brown, sand (med)	
	wet	0	No		7				No staining/odor	
					8					
					9					
					10					
					11					
					12					
					13					
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					22					
					23					
					24					

Total Depth @ 7.5'

NOTES:

Location Map:

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 LT Environmental, Inc.
 4600 W. 60th Avenue
 Arvada, Colorado 80003

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

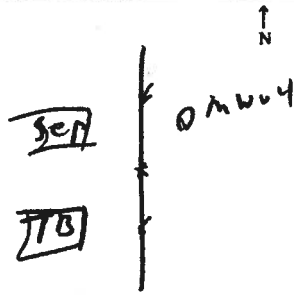
Boring/Well Number: MW03 Project: Upper 26-6Date: 4/19/2010 Project Number: NEP1006Logged By: M. Harrison Drilled By: AlpineDrilling Method: Direct Push Sampling Method: ContinuousGravel Pack: 10-20 Silica Sand Seal: Bentonite Chips Grout: NACasing Type: Schedule 40 PVC Diameter: 1" Length: 5' Hole Diameter: 2" Depth to Liquid:Screen Type: Schedule 40 PVC Slot: 0.010" Diameter: 1" Length: 5' Total Depth: 2" Depth to Water: 2"

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample Time	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	moist	0	NO		1				black organics	
	wet	0	NO		2			CL	gray, clay, no staining/odor	
	wet	0	NO		3					
	wet	0	NO		4					
	wet	0	NO		5			SP	Brown, Sand (fine-med)	
	wet	0	NO		6				no staining/odor	
	wet	0	NO		7					
					8					
					9					
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Total Depth @ 7.5

NOTES:

Location Map:



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 4600 W. 60th Avenue
 Arvada, Colorado 80003

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW04	Project: Dipper 266
Date: 4/19/2010	Project Number: NEP1006
Logged By: M. Harrison	Drilled By: Alpine
Drilling Method: Direct Push	Sampling Method: Continuous
Seal: Bentonite Chips	Cement: NA
Diameter: 2" Length: 5'	Hole Diameter: 2" Depth to Liquid: —
Diameter: 2" Length: 5'	Total Depth: 7.5' Depth to Water: 2'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample Time	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	moist	0	No		1				gray, clay, no staining/odor	
	wet	0	No		2			CL		
					3					
	wet	0	No		4					
	wet	0	No		5			SW	Brown/red, sand (fine-med)	
	wet	0	No		6				no staining/odor	
	wet	0	No		7					
					8					
					9					
					10					
					11					
					12					
					13					
					14					
					15					
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					22					
					23					
					24					

Total Depth @ 7.5'

Notes:

APPENDIX B
LABORATORY ANALYTICAL REPORT



4/27/2010

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

Project Name- Noble - Dupper 26-6

Project Number- NEP1006

Attached are your analytical results for Noble - Dupper 26-6 received by Origins Laboratory, Inc. April 22, 2010 4:15 pm. This project is associated with Origins project number X004169-01.

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: NEPI006
Project: Noble - Dupper 26-6

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Sampled	Date Received
MW01	X004169-01	Water	4/19/2010 10:40:00AM	04/22/2010 16:15
MW02	X004169-02	Water	4/19/2010 11:25:00AM	04/22/2010 16:15
MW03	X004169-03	Water	4/19/2010 10:15:00AM	04/22/2010 16:15
MW04	X004169-04	Water	4/19/2010 12:00:00PM	04/22/2010 16:15

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, Laboratory Manager

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

Matthew Harrison
Project Number: NEP1006
Project: Noble - Dupper 26-6

MW01

4/19/2010 10:40:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X004169-01 (Water)

BTEX by EPA 8260B

Benzene	ND	1.00	ug/L	1	OD23002	04/23/2010	04/27/2010
Toluene	ND	1.00	"	"	"	"	"
Ethylbenzene	ND	1.00	"	"	"	"	"
Xylenes, total	ND	1.00	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	98.9 %	73.5-130	"	"	"
Surrogate: Toluene-d8	100 %	79.3-113	"	"	"
Surrogate: 4-Bromofluorobenzene	99.6 %	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: NEP1006
Project: Noble - Dupper 26-6

MW02

4/19/2010 11:25:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X004169-02 (Water)

BTEX by EPA 8260B

Benzene	ND	1.00	ug/L	1	OD23002	04/23/2010	04/23/2010
Toluene	ND	1.00	"	"	"	"	"
Ethylbenzene	ND	1.00	"	"	"	"	"
Xylenes, total	ND	1.00	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	119 %	73.5-130	"	"	"
Surrogate: Toluene-d8	92.8 %	79.3-113	"	"	"
Surrogate: 4-Bromofluorobenzene	106 %	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: NEP1006
Project: Noble - Dupper 26-6

MW03**4/19/2010 10:15:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X004169-03 (Water)

BTEX by EPA 8260B

Benzene	ND	1.00	ug/L	1	OD23002	04/23/2010	04/23/2010
Toluene	ND	1.00	"	"	"	"	"
Ethylbenzene	ND	1.00	"	"	"	"	"
Xylenes, total	ND	1.00	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	118 %	73.5-130	"	"	"
Surrogate: Toluene-d8	91.3 %	79.3-113	"	"	"
Surrogate: 4-Bromofluorobenzene	109 %	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: NEP1006
Project: Noble - Dupper 26-6

MW04

4/19/2010 12:00:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X004169-04 (Water)

BTEX by EPA 8260B

Benzene	ND	1.00	ug/L	1	OD23002	04/23/2010	04/23/2010
Toluene	ND	1.00	"	"	"	"	"
Ethylbenzene	ND	1.00	"	"	"	"	"
Xylenes, total	ND	1.00	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	117 %	73.5-130	"	"	"
Surrogate: Toluene-d8	92.1 %	79.3-113	"	"	"
Surrogate: 4-Bromofluorobenzene	106 %	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: NEP1006
Project: Noble - Dupper 26-6

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 OD23002 - EPA 5030B										
Blank (OD23002-BLK1)					Prepared: 04/23/2010 Analyzed: 04/23/2010					
Benzene	ND	1.00	ug/L							
Toluene	ND	1.00	"							
Ethylbenzene	ND	1.00	"							
o-Xylene	ND	1.00	"							
m,p-Xylene	ND	2.00	"							
Surrogate: 1,2-Dichloroethane-d4	61.8		"	62.5		98.9	73.5-130			
Surrogate: Toluene-d8	62.4		"	62.5		99.9	79.3-113			
Surrogate: 4-Bromofluorobenzene	68.2		"	62.5		109	81.5-117			
LCS (OD23002-BS1)					Prepared: 04/23/2010 Analyzed: 04/23/2010					
Benzene	45.4	1.00	ug/L	50.0		90.8	77.3-128			
Toluene	50.1	1.00	"	50.0		100	81.7-118			
Surrogate: 1,2-Dichloroethane-d4	63.1		"	62.5		101	73.5-130			
Surrogate: Toluene-d8	63.9		"	62.5		102	79.3-113			
Surrogate: 4-Bromofluorobenzene	70.3		"	62.5		113	81.5-117			
Matrix Spike (OD23002-MS1)					Source: X004157-13	Prepared: 04/23/2010 Analyzed: 04/23/2010				
Benzene	43.3	1.00	ug/L	50.0	1.02	84.6	74.5-132			
Toluene	45.3	1.00	"	50.0	ND	90.5	74.2-116			
Surrogate: 1,2-Dichloroethane-d4	65.7		"	62.5		105	73.5-130			
Surrogate: Toluene-d8	55.7		"	62.5		89.1	79.3-113			
Surrogate: 4-Bromofluorobenzene	64.8		"	62.5		104	81.5-117			
Matrix Spike Dup (OD23002-MSD1)					Source: X004157-13	Prepared: 04/23/2010 Analyzed: 04/23/2010				
Benzene	42.2	1.00	ug/L	50.0	1.02	82.4	74.5-132	2.55	13.1	
Toluene	47.9	1.00	"	50.0	ND	95.8	74.2-116	5.69	21.2	
Surrogate: 1,2-Dichloroethane-d4	67.9		"	62.5		109	73.5-130			
Surrogate: Toluene-d8	60.0		"	62.5		96.0	79.3-113			
Surrogate: 4-Bromofluorobenzene	67.6		"	62.5		108	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: NEP1006
Project: Noble - Dupper 26-6

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