



COMPLIANCE / ENGINEERING / REMEDIATION

*LT Environmental Inc.*  
4600 West 60<sup>th</sup> Avenue  
Arvada, Colorado 80003  
T 303.433.9788 / F 303.433.1432

July 1, 2009

Mr. Mike Cox  
Environmental Coordinator  
Noble Energy, Inc.  
804 Grand Avenue  
Platteville, Colorado 80651

Mr. Bill Farmer  
Foundation Energy Company  
444 South 2nd Street  
La Salle, Colorado 80645

RE: Second Quarter 2009 Remediation and Monitoring Report  
Becky #2-6 Natural Gas Wellhead Site  
Weld County, Colorado

Dear Mr. Cox and Mr. Farmer:

LT Environmental, Inc. (LTE) was retained by Noble Energy, Inc. (Noble) and Foundation Energy Company (Foundation) to conduct corrective actions at the Becky #2-6 natural gas wellhead site (Site) located approximately 3.5 miles west of the intersection of Interstate 25 and Weld County Road (WCR) 52 in Weld County, Colorado. A Site Map is provided as Figure 1.

LTE, on behalf of Noble, has completed system design, installation, and startup of the air sparging/soil vapor extraction (AS/SVE) remediation system. LTE is continuing to conduct groundwater monitoring at the Site to evaluate previously documented groundwater impact. This correspondence is provided as the second quarter 2009 remediation and monitoring report, and summarizes activities conducted at the Site from April 1, 2009 through June 30, 2009. Activities conducted during the reporting period and summarized in this report include operation and maintenance (O&M) of the remediation system and the results of the groundwater sampling event conducted May 27 and 28, 2009.

### **Remediation System Description**

The AS system is designed to introduce ambient air into the subsurface water column for dissolved hydrocarbon volatilization and to promote aerobic microbial decomposition of petroleum constituents (Figure 2). The SVE system is designed to volatilize petroleum constituents adsorbed onto soil particles and to remove petroleum vapors released from the groundwater by the AS process (Figure 3). AS and SVE wells are connected to a remediation equipment trailer housing the equipment for the AS/SVE systems. The distribution and spacing of these wells are based on site-specific soil analytical data, groundwater quality data, contamination profiles, geological characteristics, experience with similar systems, and the location and influence area of remediation



wells (Figure 4). Additional details of the remediation system design and installation was presented in the previously submitted report *Remediation System Installation, Startup, and Groundwater Sampling Results* dated January 9, 2009. The remediation system began operation at the Site on November 17, 2008.

### **Remediation System Operation and Maintenance**

The AS/SVE remediation system has been in a static evaluation period with no system operation throughout most the reporting period. Remediation system operation was reinitiated in June 2009.

O&M activities conducted in the reporting period included:

- System transport from another Noble facility (Frick 18 – 2 & 8 natural gas wellhead site) and startup on June 8, 2009. The system is expected to be returned to the Noble Frick site in August 2009;
- Completion routine, weekly, monthly, and quarterly O&M checks to monitor and adjust system performance;
- Field screening the exhaust for air emissions;
- Collecting air samples for emissions analysis;
- AS and SVE system maintenance, which included changing oil; and
- Generator maintenance, which included changing oil and oil filters.

Operation of the remediation system will continue to alternate between continuous operation for an approximate three month period and a three month static evaluation with no remediation system operation occurring. This program will allow for continued removal of hydrocarbon impact along with static evaluations to determine which areas of the Site require continued operations.

### **Groundwater Sampling Procedures**

Twenty-one groundwater monitoring wells were sampled at the Site on May 27 and 28, 2009 to determine the current plume extent following a three month static evaluation period with no remediation system operation. Prior to sampling each well, the groundwater was evaluated for the presence of free-phase hydrocarbons, the down well dissolved oxygen (DO) concentration was collected, and the depth to groundwater was measured and recorded for calculating purge volumes (Table 1). DO data was collected to evaluate the influence of the remediation system.

Each well was purged of three casing volumes prior to collection of groundwater samples. Groundwater samples were collected from the well points by advancing disposable 3/16-inch diameter polyethylene tubing inside the 1-inch diameter polyvinyl chloride (PVC) well casing and extending the tubing to below the groundwater table. A peristaltic pump was utilized to collect the



groundwater samples prior to placement into laboratory prepared sample bottles. Groundwater samples were collected in 40-milliliter vials, placed on ice, and delivered under chain-of-custody (COC) protocol to Origins Laboratory located in Denver, Colorado. Samples were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) by Environmental Protection Agency Method 8260B.

## **Hydrogeology**

During the May 2009 sampling event, the depths to static groundwater level ranged from 6.59 feet below top of casing (TOC) in MW-8 to 10.95 feet below TOC in MW-17 (Table 1). The groundwater flow direction was to the north with an average hydraulic gradient of approximately 0.0120 feet per foot, which is similar to historical values.

## **Groundwater Analytical Results**

The Colorado Department of Public Health and Environmental (CDPHE) Water Quality Control Commission (WQCC) has established Regulation 41 - The Basic Standards for Groundwater for BTEX of 5.0 micrograms per liter (ug/L), 560 ug/L, 700 ug/L, and 1,400 ug/L, respectively. Table 1 summarizes groundwater analytical results for samples collected during all monitoring events. The laboratory analytical report, laboratory quality assurance/quality control data, and COC documentation are attached.

Twenty-one groundwater samples were collected and submitted to Origins Laboratory for BTEX analysis during the May 27 and 28, 2009 sampling event. Free-phase petroleum hydrocarbons were not identified in any of the monitoring wells. Groundwater analytical results indicated that benzene was detected above the CDPHE-WQCC Regulation 41 Groundwater Standards in monitoring wells MW-7, MW-9, MW-10, MW-13, and MW-25, at concentrations ranging from 10.4 ug/L at MW-7 to 500 ug/L at MW-13. Detectable concentrations of BTEX compounds below the regulatory standards were also found in MW-3, MW-16, and MW-26. BTEX compounds were not detected above the laboratory method detection limits in the remaining samples. Groundwater analytical results for the May 2009 sampling event are summarized in Table 1 and illustrated on Figure 5.

## **Summary and Conclusions**

As seen in Figure 6 and Table 1, the effectiveness of the AS/SVE system is evident by the 61% reduction in the hydrocarbon impacted area from November 2008 (startup) to May 2009. All of the monitoring wells that previously contained benzene concentrations below groundwater standards remained below groundwater standards, even during the static period. This includes the five monitoring wells where remediation system operation previously decreased the benzene concentrations to below the groundwater standards (MW-3, MW-16, MW-23, MW-26, and MW-34), indicating cleanup has been achieved in those areas.

The minimal increase in benzene concentrations during the static evaluation period to above the February 2009 levels (collected during system operation), but below the November 2008 values



(collected prior to system startup), suggests that the remediation system has successfully decreased benzene concentrations at the Site. Analytical data indicate that MW-7, MW-9, MW-10, MW-13, and MW-25 remained above groundwater standards. Of these five wells, only MW-9 indicated a significant increase in benzene concentration (12.8 ug/L to 99.4 ug/L); while MW-7, MW-13, and MW-25 remained stable. Data from MW-9 indicates that the remediation system is positively influencing this area. Data from MW-7, MW-10, MW-13, and MW-25 indicates stability and that a large mass of source no longer exists in these areas, and hydrocarbon impact in the groundwater is not expected to increase. Free product was not present in any of the monitoring wells as previously observed (MW-10 and MW-16), indicating remediation progress and product removal. As summarized in the attached Table 1, benzene is still present at the Site and continued remediation system operation is recommended to achieve cleanup goals.

The next groundwater sampling event will be conducted in August 2009. Groundwater monitoring will continue to be conducted at the Site on a quarterly basis until site closure status is received from the Colorado Oil and Gas Conservation Commission. A three month static evaluation period with no remediation system operation will be initiated at the site in August 2009.

LTE appreciates the opportunity to provide environmental services to Noble. Please call us at 303-433-9788 if you have any questions or comments regarding this report.

Sincerely,

LT ENVIRONMENTAL, INC.

A handwritten signature in black ink, appearing to read "Matthew Vielhaber".

Matthew R. Vielhaber, P.E.  
Project Manager

A handwritten signature in black ink, appearing to read "Steve Kahn".

Steve D. Kahn, P.E.  
Senior Engineer

#### Attachments

Table 1: Groundwater Quality Data

Figure 1: Site Map

Figure 2: Air Sparging System Layout

Figure 3: Soil Vapor Extraction System Layout

Figure 4: Radius of Influence Map

Figure 5: Groundwater Analytical Results – May 27 & 28, 2009

Figure 6: Groundwater Analytical Summary

Attachment: Laboratory Analytical Reports

**TABLE**



TABLE 1

## GROUNDWATER QUALITY DATA

BECKY #2-6

WELD COUNTY, COLORADO

NOBLE ENERGY, INC.

Well ID	Date	Depth to Product (feet btoc)	Depth to Water (feet btoc)	Product Thickness (feet)	DO (mg/L)	PID (ppm)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
MW-1	6/24/2008		7.92				3.52	<1.00	55.05	25.16
	11/10/2008		7.66		2.74	0.0	<1.00	<1.00	<1.00	<3.00
	2/23/2009		7.46		1.42		<1.00	<1.00	<1.00	<3.00
	5/27/2009		6.74		0.78	48.6	<1.00	<1.00	<1.00	<3.00
MW-2	6/24/2008		8.01				<1.00	<1.00	<1.00	<3.00
MW-3	6/24/2008		8.09				<b>6.43</b>	<1.00	<1.00	5.15
	11/10/2008		7.83		0.28	0.0	1.26	<1.00	<1.00	<3.00
	2/23/2009		7.68		0.18		<1.00	<1.00	<1.00	<3.00
	5/27/2009		6.98		0.78	89.8	2.31	<1.00	<1.00	<3.00
MW-4	6/24/2008		7.88				<1.00	<1.00	<1.00	<3.00
	11/10/2008		7.73		1.20	0.0	<1.00	<1.00	<1.00	<3.00
	2/23/2009		7.59		1.38		<1.00	<1.00	<1.00	<3.00
	5/27/2009		6.82		3.72	11.7	<1.00	<1.00	<1.00	<3.00
MW-5	6/24/2008		8.08				<1.00	<1.00	<1.00	<3.00
MW-6	6/24/2008		7.85				<1.00	<1.00	<1.00	<3.00
MW-7	6/24/2008		8.10				<b>358.40</b>	1.02	277.60	<b>3,120.29</b>
	11/10/2008		7.98		0.17	325	<b>725</b>	<1.00	493	<b>6,008.8</b>
	2/23/2009		7.36		0.07		<b>5.03</b>	<1.00	9.04	141
	5/27/2009		7.09		0.31	112.2	<b>10.4</b>	1.16	362	498.2
MW-8	6/24/2008		7.60				<1.00	<1.00	<1.00	<3.00
	11/10/2008		7.59		0.36	0.0	<1.00	<1.00	<1.00	<3.00
	2/23/2009		7.34		0.18		<1.00	<1.00	<1.00	<3.00
	5/27/2009		6.59		0.45	0.4	<1.00	<1.00	<1.00	<3.00

TABLE 1

## GROUNDWATER QUALITY DATA

BECKY #2-6

WELD COUNTY, COLORADO

NOBLE ENERGY, INC.

Well ID	Date	Depth to Product (feet btoc)	Depth to Water (feet btoc)	Product Thickness (feet)	DO (mg/L)	PID (ppm)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
MW-9	6/24/2008		8.45				<b>430.20</b>	<1.00	35.57	396.80
	11/10/2008		8.32		1.13	94.5	<b>175</b>	<1.00	24.7	77.90
	2/23/2009		8.29		0.10		<b>12.8</b>	<1.00	1.56	3.70
	5/27/2009		7.46		0.40	0.5	<b>99.4</b>	<1.00	15.0	77.3
MW-10	6/24/2008		8.26				<b>1,254.2</b>	1.84	223.60	<b>2,373.80</b>
	11/10/2008	8.13	8.63	0.50	NM	305	NA	NA	NA	NA
	11/13/2008	8.21	8.44	0.23	NM		NA	NA	NA	NA
	2/23/2009	8.09	8.01	0.08	NM		NA	NA	NA	NA
	5/27/2009		7.30	0.00	0.51	91.4	<b>145</b>	<1.00	86.6	1,145.8
MW-11	6/24/2008		7.52				<1.00	<1.00	1.35	14.70
	11/10/2008		7.48		0.78	0.0	<1.00	<1.00	<1.00	5.00
	2/23/2009		7.25		1.71		<1.00	<1.00	<1.00	<3.00
	5/28/2009		6.60		0.71	0.2	<1.00	<1.00	<1.00	<3.00
MW-12	6/24/2008		7.70				<1.00	<1.00	<1.00	<3.00
MW-13	6/24/2008		8.68				<b>1,616.2</b>	<1.00	249.20	<b>3,551.0</b>
	11/10/2008		8.85		0.46	0.0	<b>684</b>	<1.00	84.0	152.11
	2/23/2009		8.72		3.34		<b>390</b>	<1.00	26.7	86.5
	5/28/2009		8.75		1.22	0.3	<b>500</b>	<1.00	69.8	120
MW-14	6/24/2008		9.35				3.66	1.26	1.69	21.65
	11/10/2008		9.56		0.34	0.0	<1.00	<1.00	<1.00	<3.00
	2/23/2009		9.48		0.62		<1.00	<1.00	<1.00	<3.00
	5/27/2009		8.65		0.29	0.9	<1.00	<1.00	<1.00	<3.00
MW-15	6/24/2008		9.34				<1.00	<1.00	<1.00	4.31
	11/10/2008		9.89		2.16	0.0	<1.00	<1.00	<1.00	<3.00
	2/23/2009		9.66		1.32		<1.00	<1.00	<1.00	<3.00
	5/28/2009		8.89		0.61	0.5	<1.00	<1.00	<1.00	<3.00

TABLE 1

## GROUNDWATER QUALITY DATA

BECKY #2-6

WELD COUNTY, COLORADO

NOBLE ENERGY, INC.

Well ID	Date	Depth to Product (feet btoc)	Depth to Water (feet btoc)	Product Thickness (feet)	DO (mg/L)	PID (ppm)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
MW-16	6/24/2008	9.83	9.19				<b>6.28</b>	<1.00	170.65	<b>1,998.36</b>
	11/10/2008		9.84	0.01	NM	634	NA	NA	NA	NA
	11/13/2008		9.88	0.00			<1.00	<1.00	<1.00	220.86
	2/23/2009		9.62	0.00	0.39		<1.00	<1.00	9.12	89.0
	5/27/2009		8.81	0.00	0.42	559.2	<1.00	<1.00	14.3	152
MW-17	6/24/2008		9.16				<1.00	<1.00	<1.00	13.46
	11/10/2008		10.27		4.11	0.0	<1.00	<1.00	<1.00	<3.00
	2/23/2009		9.98		4.18		<1.00	<1.00	<1.00	<3.00
	5/27/2009		10.95			0.1	WELL DRY			
MW-18	6/24/2008		9.37				<1.00	<1.00	<1.00	3.24
	11/10/2008		10.13		0.36	0.0	<1.00	<1.00	<1.00	3.36
	2/23/2009		9.92		2.97		<1.00	<1.00	<1.00	<3.00
	5/28/2009		9.14		0.37	0.2	<1.00	<1.00	<1.00	<3.00
MW-19	6/24/2008		8.73				<1.00	<1.00	<1.00	3.53
MW-20	6/24/2008		8.52				<1.00	<1.00	<1.00	<3.00
MW-21	6/24/2008		8.20				<1.00	<1.00	<1.00	<3.00
MW-22	6/24/2008		8.66				<1.00	<1.00	<1.00	<3.00
MW-23	6/24/2008		9.14				<b>83.13</b>	1.43	164.46	1,283
	11/10/2008		8.95		4.12	1.8	1.46	<1.00	1.54	<3.00
	2/23/2009						WELL DRY			
MW-24	6/24/2008		9.00				<1.00	<1.00	<1.00	<3.00
	11/10/2008		8.85		4.31	0.0	<1.00	<1.00	<1.00	6.27
	2/23/2009		8.84		2.35		<1.00	<1.00	<1.00	<3.00
	5/27/2009		8.00			6.9	<1.00	<1.00	<1.00	<3.00



TABLE 1

## GROUNDWATER QUALITY DATA

BECKY #2-6

WELD COUNTY, COLORADO

NOBLE ENERGY, INC.

Well ID	Date	Depth to Product (feet btoc)	Depth to Water (feet btoc)	Product Thickness (feet)	DO (mg/L)	PID (ppm)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
MW-25	6/24/2008		8.86				<b>120.95</b>	<1.00	17.52	602.10
	11/10/2008		8.85		4.12	0.0	<b>47.5</b>	<1.00	7.73	28.8
	2/23/2009		8.71		1.10		<b>20.3</b>	<1.00	1.64	3.86
	5/27/2009		7.95		0.39	1.4	<b>29.9</b>	<1.00	7.40	7.13
MW-26	6/24/2008		8.35				<b>75.72</b>	<1.00	71.24	598.70
	11/10/2008		8.47		0.60	0.0	<b>57.4</b>	<1.00	36.4	47.60
	2/23/2009		8.26		1.23		<1.00	<1.00	<1.00	<3.00
	5/27/2009		7.50		0.31	0.2	2.02	<1.00	1.97	<3.00
MW-27	6/24/2008		8.73				<1.00	<1.00	<1.00	<3.00
	11/10/2008		9.07		0.87	0.0	1.72	<1.00	<1.00	18.4
	2/23/2009		8.87		2.70		<1.00	<1.00	<1.00	<3.00
	5/27/2009		8.03		1.24	0.1	<1.00	<1.00	<1.00	<3.00
MW-28	6/24/2008		8.85				<1.00	<1.00	<1.00	2.97
MW-29	6/24/2008		8.89				<1.00	<1.00	<1.00	<3.00
	11/10/2008		9.69		0.17	0.0	<1.00	<1.00	<1.00	<3.00
	2/23/2009		9.46		0.46		<1.00	<1.00	4.18	5.23
	5/27/2009		8.65		0.40	0.1	<1.00	<1.00	<1.00	<3.00
MW-30	6/24/2008		8.57				<1.00	<1.00	<1.00	<3.00
	11/10/2008		8.56		1.52	0.0	<1.00	<1.00	<1.00	2.88
	2/23/2009		8.46		1.76		<1.00	<1.00	<1.00	<3.00
	5/27/2009		7.69			0.1	<1.00	<1.00	<1.00	<3.00
MW-31	6/24/2008		7.94				<1.00	<1.00	<1.00	<3.00
MW-32	7/7/2008						<1.0	<1.0	<1.0	<1.0
	11/10/2008		9.57		0.86	0.0	<1.00	<1.00	<1.00	<3.00
	2/23/2009		9.42		1.54		<1.00	<1.00	<1.00	<3.00
	5/27/2009		8.70		0.46	0.7	<1.00	<1.00	<1.00	<3.00

TABLE 1

**GROUNDWATER QUALITY DATA**  
**BECKY #2-6**  
**WELD COUNTY, COLORADO**  
**NOBLE ENERGY, INC.**

Well ID	Date	Depth to Product (feet btoc)	Depth to Water (feet btoc)	Product Thickness (feet)	DO (mg/L)	PID (ppm)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
MW-33	7/7/2008						1.4	<1.0	10	5.9
	11/10/2008						WELL DESTROYED			
MW-34	7/7/2008						<b>160</b>	<1.00	370	<b>2,800</b>
	11/10/2008		8.13		0.71	215	<b>85.7</b>	<1.00	89.4	108
	2/23/2009		7.98		0.68		<1.00	<1.00	<1.00	<3.00
	5/27/2009		7.26		0.32	11.0	<1.00	<1.00	<1.00	<3.00
<b>CDPHE-WQCC Regulation 41 Groundwater Standards</b>							<b>5.0</b>	<b>560</b>	<b>700</b>	<b>1,400</b>

**NOTES:**

CDPHE-WQCC - Colorado Department of Public Health and Environmental Water Quality Control Commission

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

btoc - below top of casing

mg/L - milligrams per liter

ppm - parts per million

ug/L - micrograms per liter

DO - dissolved oxygen

PID - photoionization detector

< indicates result is less than the stated laboratory method detection limit

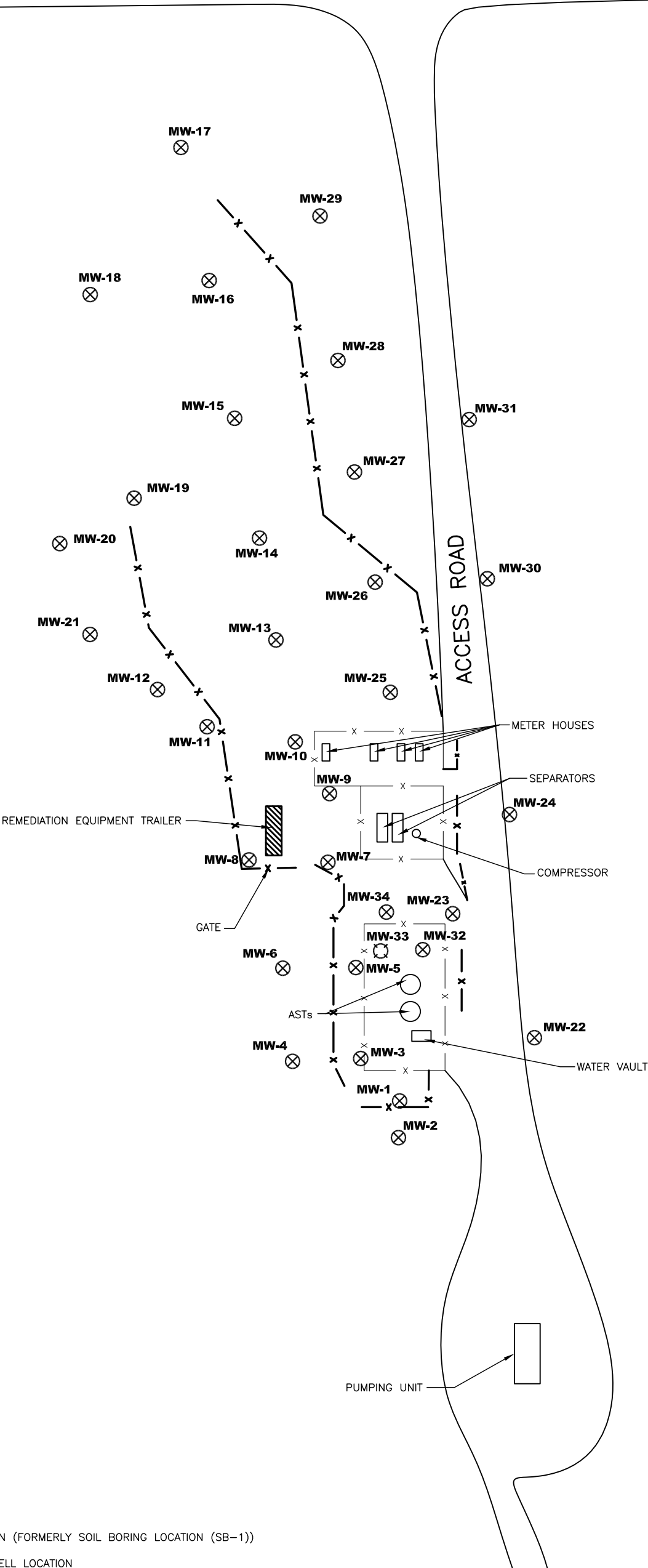
NA - not analyzed

NM - not measured due to free-phase hydrocarbons in monitoring well

## FIGURES



COUNTY ROAD 52

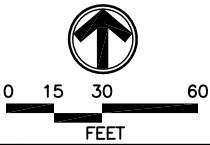


LEGEND

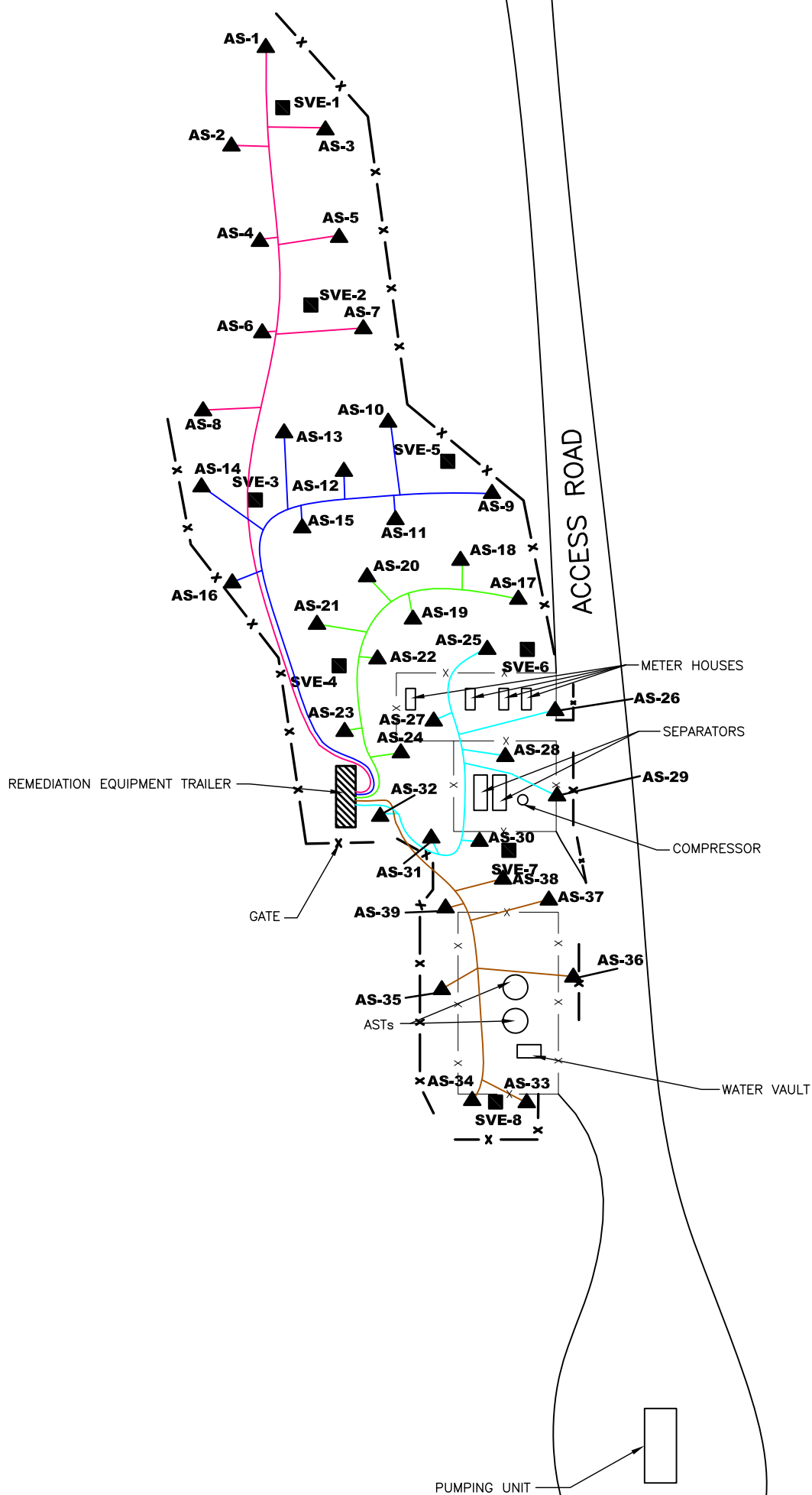
- MW-1** MONITORING WELL LOCATION (FORMERLY SOIL BORING LOCATION (SB-1))
- MW-33** DESTROYED MONITORING WELL LOCATION
- EXISTING FENCE
- NEW FENCE
- AST ABOVEGROUND STORAGE TANK

SOURCE:  
LTE SITE SKETCH

FIGURE 1  
SITE MAP  
BECKY #2-6  
WELD COUNTY, COLORADO  
NOBLE ENERGY, INC.



COUNTY ROAD 52

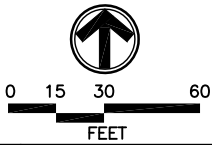


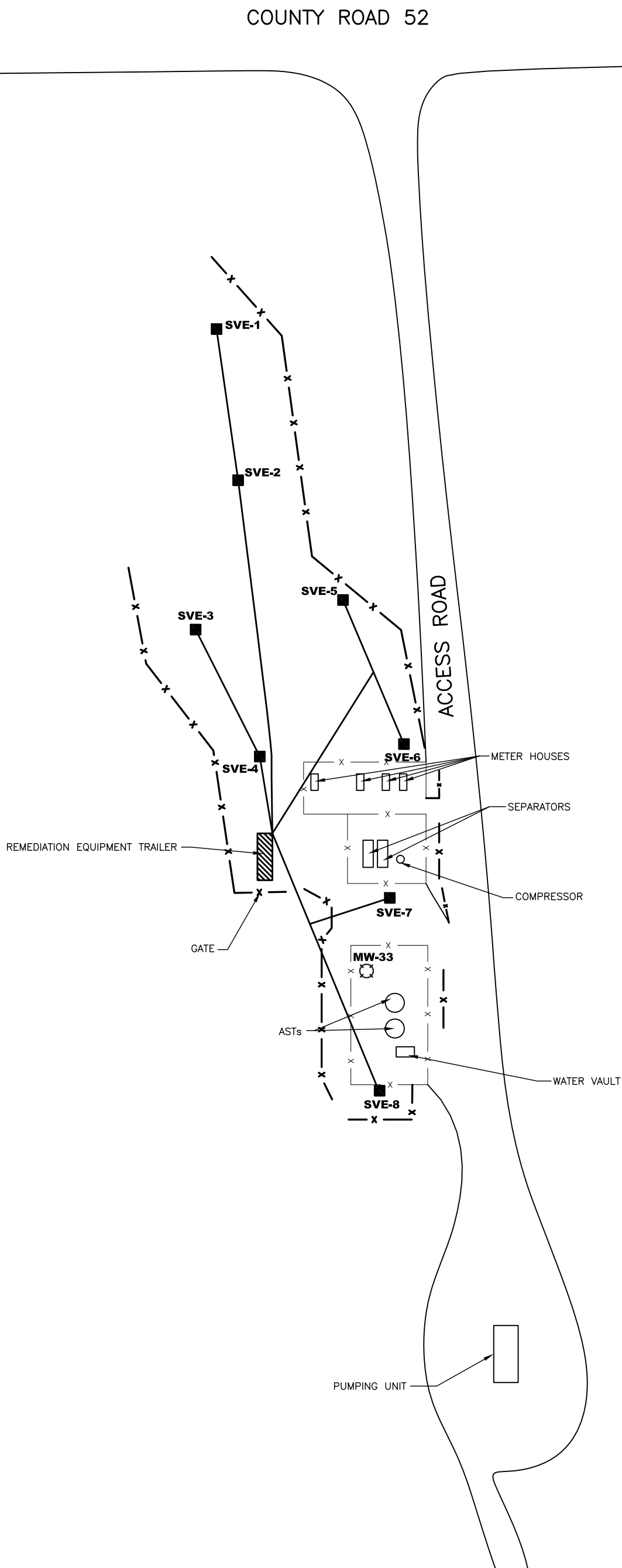
LEGEND

- x — EXISTING FENCE
- x — NEW FENCE
- AS-1 ▲ AIR SPARGING WELL LOCATION
- SYSTEM PIPING (ZONE 1)
- SYSTEM PIPING (ZONE 2)
- SYSTEM PIPING (ZONE 3)
- SYSTEM PIPING (ZONE 4)
- SYSTEM PIPING (ZONE 5)
- AST ABOVEGROUND STORAGE TANK

SOURCE:  
LTE SITE SKETCH

FIGURE 2  
AIR SPARGING SYSTEM LAYOUT  
BECKY #2-6  
WELD COUNTY, COLORADO  
NOBLE ENERGY, INC.



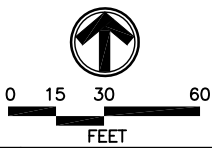


**LEGEND**

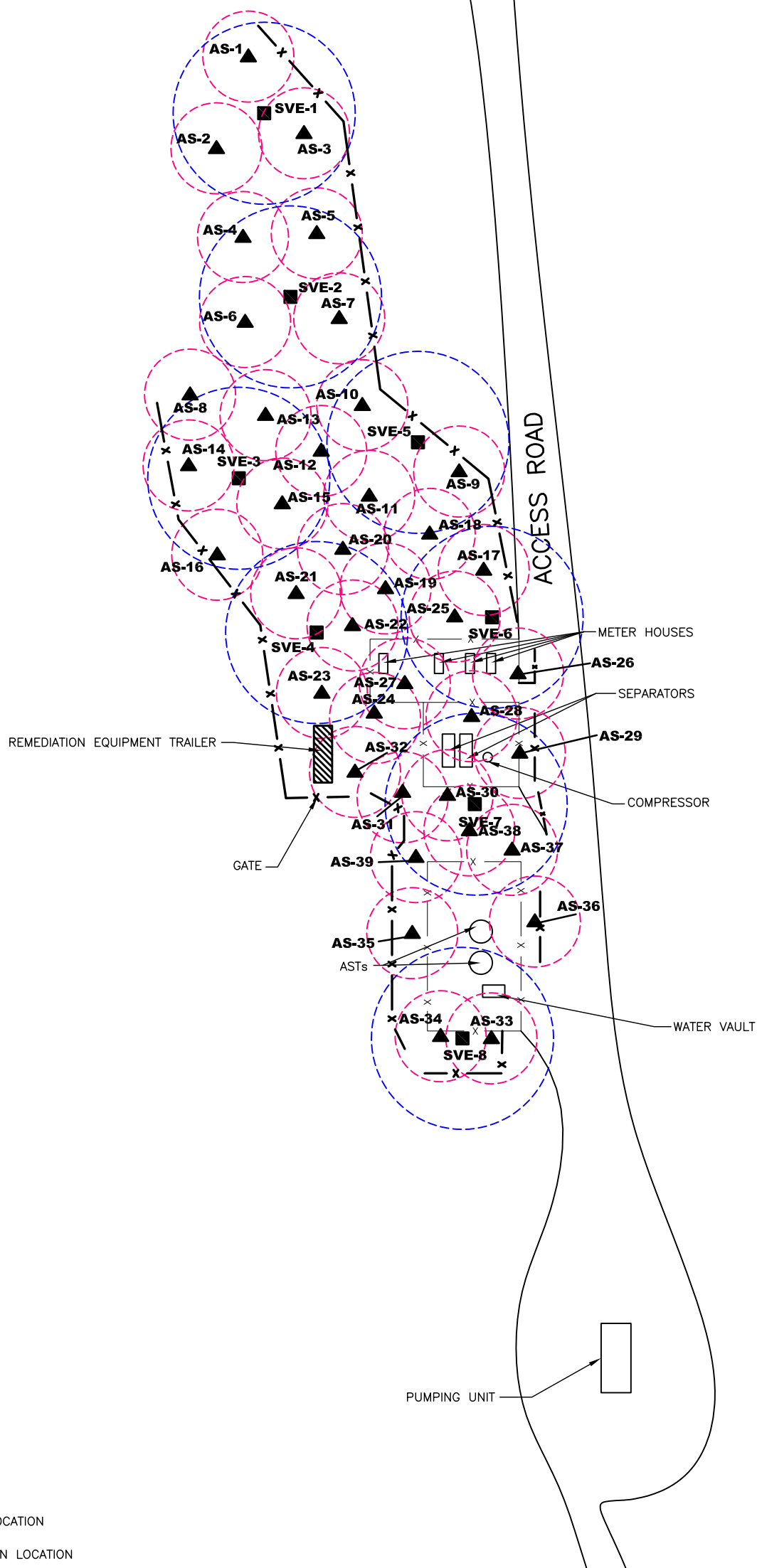
- x — EXISTING FENCE
- x — NEW FENCE
- SVE-1** ■ SOIL VAPOR EXTRACTION WELL LOCATION
- SYSTEM PIPING
- AST ABOVEGROUND STORAGE TANK

SOURCE:  
LTE SITE SKETCH

**FIGURE 3**  
**SOIL VAPOR EXTRACTION SYSTEM LAYOUT**  
**BECKY #2-6**  
**WELD COUNTY, COLORADO**  
**NOBLE ENERGY, INC.**



COUNTY ROAD 52

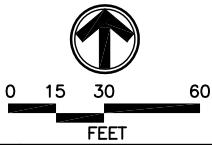


LEGEND

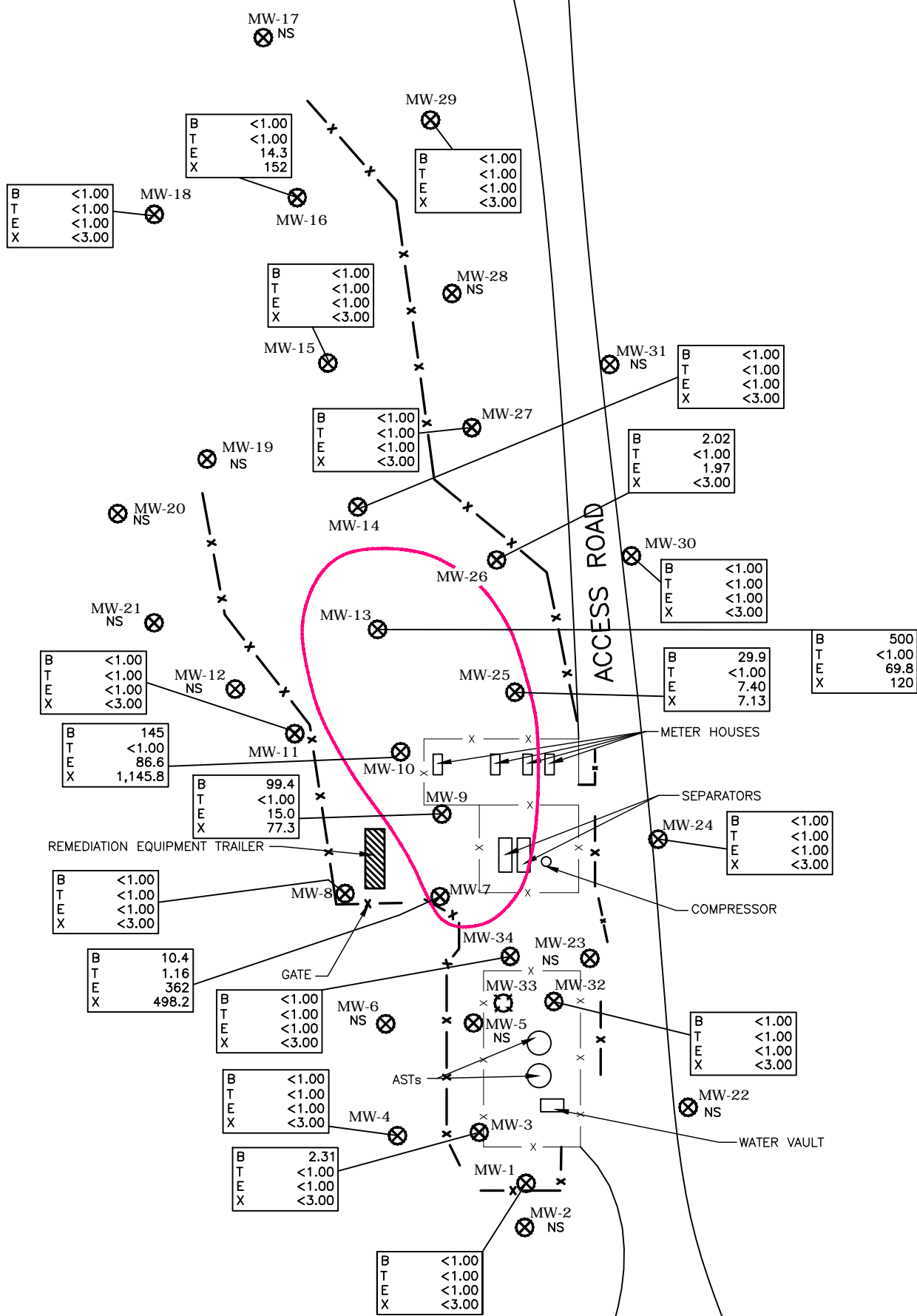
- x — EXISTING FENCE
- x — NEW FENCE
- AS-1 ▲ AIR SPARGING WELL LOCATION
- SVE-1 ■ SOIL VAPOR EXTRACTION LOCATION
- AIR SPARGING RADIUS OF INFLUENCE (20 FEET)
- SOIL VAPOR RADIUS OF INFLUENCE (40 FEET)
- AST ABOVEGROUND STORAGE TANK

SOURCE:  
LTE SITE SKETCH

FIGURE 4  
RADIUS OF INFLUENCE MAP  
BECKY #2-6  
WELD COUNTY, COLORADO  
NOBLE ENERGY, INC.



COUNTY ROAD 52



LEGEND

MW-1 MONITORING WELL LOCATION (FORMERLY SOIL BORING LOCATION (SB-1))  
MW-33 DESTROYED MONITORING WELL LOCATION

— x — EXISTING FENCE

— x — NEW FENCE

AST ABOVEGROUND STORAGE TANK

5.0 MICROGRAMS PER LITER (µg/L)  
BENZENE ISOCONCENTRATION LINE

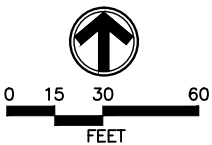
B	BENZENE
T	TOLUENE
E	ETHYLBENZENE
X	TOTAL XYLENES

ANALYTICAL RESULTS ARE REPORTED IN µg/L

NS NOT SAMPLED

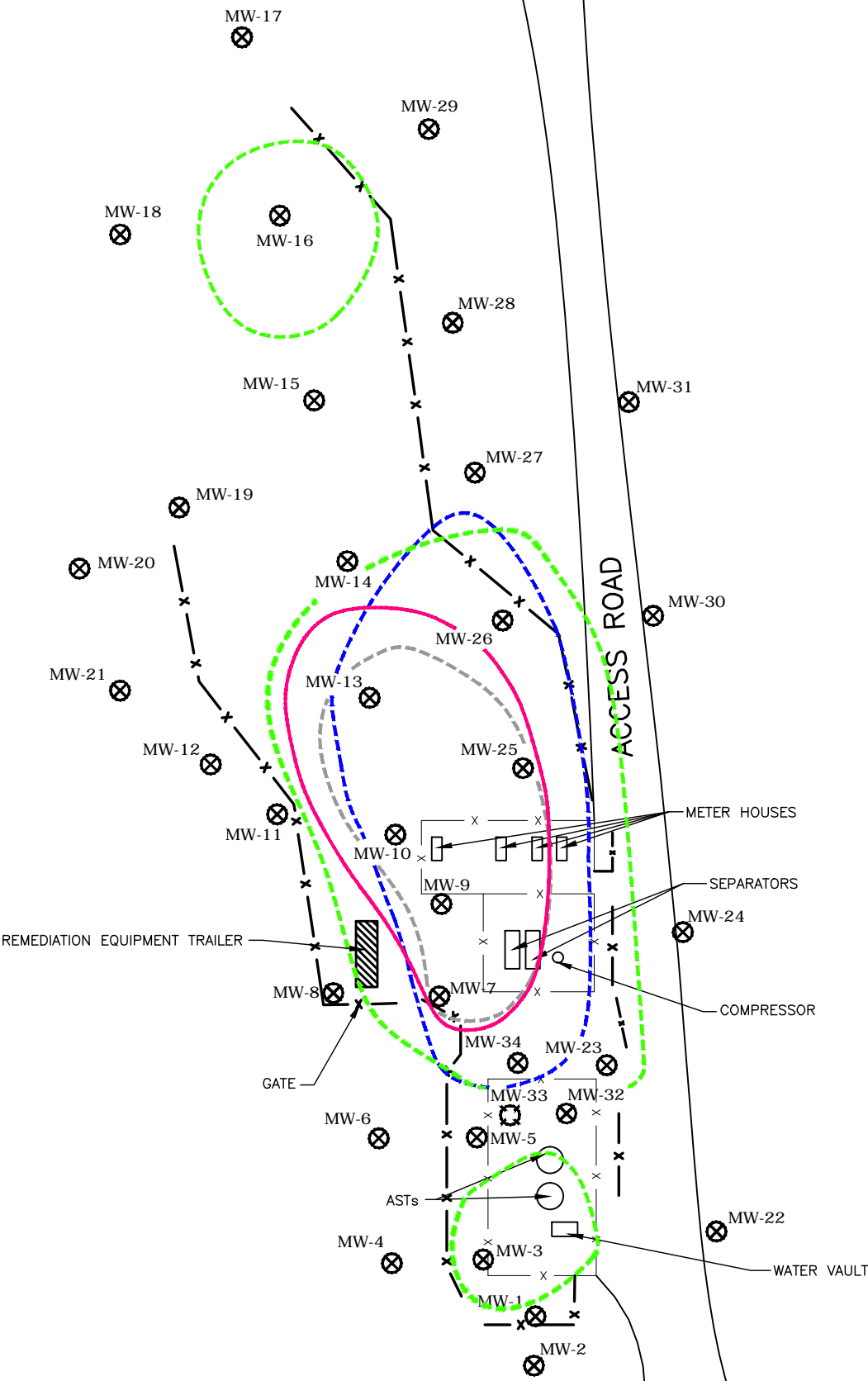
SOURCE:  
LTE SITE SKETCH

FIGURE 5  
GROUNDWATER ANALYTICAL RESULTS  
MAY 27 & 28, 2009  
BECKY #2-6  
WELD COUNTY, COLORADO  
NOBLE ENERGY, INC.





COUNTY ROAD 52

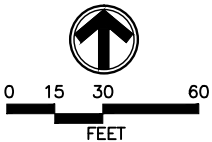


LEGEND

- MW-1 MONITORING WELL LOCATION (FORMERLY SOIL BORING LOCATION (SB-1))
- MW-33 DESTROYED MONITORING WELL LOCATION
- x — EXISTING FENCE
- x — NEW FENCE
- AST ABOVEGROUND STORAGE TANK
- 5.0 MICROGRAMS PER LITER (µg/L) BENZENE ISOCONCENTRATION LINE (MAY 2009)
- 5.0 µg/L BENZENE ISOCONCENTRATION LINE (MAY 2009)
- 5.0 µg/L BENZENE ISOCONCENTRATION LINE (NOVEMBER 2008)
- 5.0 µg/L BENZENE ISOCONCENTRATION LINE (JUNE 2008)

SOURCE:  
LTE SITE SKETCH

FIGURE 6  
GROUNDWATER ANALYTICAL SUMMARY  
BECKY #2-6  
WELD COUNTY, COLORADO  
NOBLE ENERGY, INC.



2/09\NEP082602

**ATTACHMENT**  
**LABORATORY ANALYTICAL REPORTS**





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

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June 01, 2009

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

Matt Vielhaber  
Project Number: NEP0826.01  
Project: Noble – Becky #2–6

---

Attached are the analytical results for Noble – Becky #2–6 received by Origins Laboratory, Inc. 5/27/2009 2:08:00PM. Please let us know if you have any questions, or if we can help with anything at all.

Noelle E Doyle  
Laboratory Manager

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

Matt Vielhaber  
Project Number: NEP0826.01  
Project: Noble – Becky #2–6

### CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Sampled	Date Received
MW01	X905114-01	Water	5/27/2009 9:40:00AM	05/27/2009 14:08
MW03	X905114-02	Water	5/27/2009 9:50:00AM	05/27/2009 14:08
MW04	X905114-03	Water	5/27/2009 10:00:00AM	05/27/2009 14:08
MW07	X905114-04	Water	5/27/2009 10:30:00AM	05/27/2009 14:08
MW08	X905114-05	Water	5/27/2009 10:40:00AM	05/27/2009 14:08
MW09	X905114-06	Water	5/27/2009 10:50:00AM	05/27/2009 14:08
MW10	X905114-07	Water	5/27/2009 11:10:00AM	05/27/2009 14:08
MW14	X905114-08	Water	5/27/2009 11:50:00AM	05/27/2009 14:08
MW16	X905114-09	Water	5/27/2009 12:10:00PM	05/27/2009 14:08
MW24	X905114-10	Water	5/27/2009 11:00:00AM	05/27/2009 14:08
MW25	X905114-11	Water	5/27/2009 11:20:00AM	05/27/2009 14:08
MW26	X905114-12	Water	5/27/2009 11:30:00AM	05/27/2009 14:08
MW27	X905114-13	Water	5/27/2009 12:00:00PM	05/27/2009 14:08
MW29	X905114-14	Water	5/27/2009 12:20:00PM	05/27/2009 14:08
MW30	X905114-15	Water	5/27/2009 11:40:00AM	05/27/2009 14:08
MW32	X905114-16	Water	5/27/2009 12:30:00PM	05/27/2009 14:08
MW34	X905114-17	Water	5/27/2009 10:10:00AM	05/27/2009 14:08

Origins Laboratory, Inc.

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Arvada CO 80003

Matt Vielhaber  
Project Number: NEP0826.01  
Project: Noble – Becky #2–6

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Sampled	Date Received
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Matt Vielhaber  
Project Number: NEP0826.01  
Project: Noble - Becky #2-6

X905/14

page 1 of 3



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Project Manager: Matt Vielhaber  
Project Name: Becky #2-6  
Project Number: NEP0826  
Samples Collected by: LSV/TB

Client: LT Environmental  
Address: 4600 W 60th Ave  
Arvada CO 80003  
Telephone Number: 303-433-9788  
E-Mail Address: mviehaber@ltenv.com

Sample ID - Description	Date Sampled	Time Sampled	Number of Containers				Preservative			Matrix			Analysis	Sample Instructions
			Unpreserved	HCl	HNO <sub>3</sub>	Other -	Groundwater	Soil	Air - Summa Canister #	Other -				
MW01	5-27-09	0940	3											
MW03		0950	1											
MW04		1000	1											
MW07		1030	1											
MW08		1040	1											
MW09		1050	1											
MW10		1110	1											
MW14		1150	1											
MW16		1200	1											
Relinquished by: [Signature]			Date: 5-27-09	Time: 1408	Received by: [Signature]			Date: 5-27-09	Time: 1408	Temperature Upon Receipt: 33			Turn Around Time: Same Day 48-hr 72-hr	
Relinquished by: [Signature]			Date: 5-27-09	Time: 1408	Received by: [Signature]			Date: 5-27-09	Time: 1408	Standard: X				

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Origins Laboratory, Inc.

[Signature]

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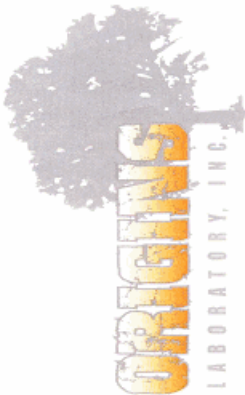
LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO 80003

Matt Vielhaber  
Project Number: NEP0826.01  
Project: Noble - Becky #2-6

X90S114

page 2 of 2

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Client: LT Environmental  
Address: 4600 W 60th Ave  
Arvada, CO 80003  
Telephone Number: 303-433-9788  
E-Mail Address: mviehaber@ltenv.com

Project Manager: Matt Vielhaber  
Project Name: Becky #2-6  
Project Number: NEP0826  
Samples Collected by: KEV/JD

Sample ID - Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix			Analysis	Sample Instructions
				Unpreserved	HCl	HNO <sub>3</sub>	Other	Groundwater	Soil	Air - Summa Canister #		
MW27	5-27-09	1100	3					X				1
MW25		1130						X				2
MW26		1130						X				3
MW27		1200						X				4
MW29		1220						X				5
MW30		1140						X				6
MW32		1230						X				7
MW34		1010						X				8
												9
												10

Relinquished by: [Signature] Date: 5-27-09 Time: 1400  
Received by: [Signature] Date: 5-27-09 Time: 1405  
Temperature Upon Receipt: 33  
Turn Around Time: Same Day 24-hr 48-hr 72-hr Standard X

X90S114

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[Signature]

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Arvada CO 80003

Matt Vielhaber  
Project Number: NEP0826.01  
Project: Noble – Becky #2–6

MW01

X905114–01 (Water)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

Origins Laboratory, Inc.

BTEX by EPA 8260B

Benzene	ND	0.00100	mg/L	1	9E29003	05/29/2009	05/30/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	98.4 %	85.7–134	"	"	"
Surrogate: Toluene-d8	101 %	81.4–121	"	"	"
Surrogate: 4-Bromofluorobenzene	103 %	74.7–127	"	"	"

Origins Laboratory, Inc.

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Arvada CO 80003

Matt Vielhaber  
Project Number: NEP0826.01  
Project: Noble – Becky #2–6

**MW03**

**X905114–02 (Water)**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**

**BTEX by EPA 8260B**

Benzene	0.00231	0.00100	mg/L	1	9E29003	05/29/2009	05/30/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	97.9 %	85.7–134	"	"	"
Surrogate: Toluene-d8	101 %	81.4–121	"	"	"
Surrogate: 4-Bromofluorobenzene	105 %	74.7–127	"	"	"

Origins Laboratory, Inc.

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Project: Noble – Becky #2–6

**MW04**

**X905114–03 (Water)**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**

**BTEX by EPA 8260B**

Benzene	ND	0.00100	mg/L	1	9E29003	05/29/2009	05/30/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	98.3 %	85.7–134	"	"	"
Surrogate: Toluene-d8	101 %	81.4–121	"	"	"
Surrogate: 4-Bromofluorobenzene	104 %	74.7–127	"	"	"

Origins Laboratory, Inc.

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Arvada CO 80003

Matt Vielhaber  
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Project: Noble – Becky #2–6

**MW07**

**X905114–04 (Water)**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**

**BTEX by EPA 8260B**

Benzene	0.0104	0.00100	mg/L	1	9E29003	05/29/2009	05/30/2009
Toluene	0.00116	0.00100	"	"	"	"	"
Ethylbenzene	0.362	0.0200	"	20	"	"	05/31/2009
o-Xylene	0.0342	0.00100	"	1	"	"	"
m,p-Xylene	0.464	0.0400	"	20	"	"	"

Surrogate: 1,2-Dichloroethane-d4	97.9 %	85.7–134	"	"	"
Surrogate: Toluene-d8	101 %	81.4–121	"	"	"
Surrogate: 4-Bromofluorobenzene	105 %	74.7–127	"	"	"

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Project Number: NEP0826.01  
Project: Noble – Becky #2–6

**MW08**

**X905114–05 (Water)**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**

**BTEX by EPA 8260B**

Benzene	ND	0.00100	mg/L	1	9E29003	05/29/2009	05/30/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	97.1 %	85.7–134	"	"	"
Surrogate: Toluene-d8	100 %	81.4–121	"	"	"
Surrogate: 4-Bromofluorobenzene	102 %	74.7–127	"	"	"

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Arvada CO 80003

Matt Vielhaber  
Project Number: NEP0826.01  
Project: Noble – Becky #2–6

**MW09**

**X905114–06 (Water)**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**

**BTEX by EPA 8260B**

Benzene	0.0994	0.00100	mg/L	1	9E29003	05/29/2009	05/30/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	0.0150	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	0.0773	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	98.5 %	85.7–134	"	"	"
Surrogate: Toluene-d8	99.4 %	81.4–121	"	"	"
Surrogate: 4-Bromofluorobenzene	102 %	74.7–127	"	"	"

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Arvada CO 80003

Matt Vielhaber  
Project Number: NEP0826.01  
Project: Noble – Becky #2–6

**MW10**

**X905114–07 (Water)**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**

**BTEX by EPA 8260B**

Benzene	0.145	0.00100	mg/L	1	9E29003	05/29/2009	05/30/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	0.0866	0.00100	"	"	"	"	"
o-Xylene	0.0558	0.00100	"	"	"	"	"
m,p-Xylene	1.09	0.0400	"	20	"	"	05/31/2009

Surrogate: 1,2-Dichloroethane-d4	98.3 %	85.7–134	"	"	05/30/2009
Surrogate: Toluene-d8	99.0 %	81.4–121	"	"	"
Surrogate: 4-Bromofluorobenzene	97.0 %	74.7–127	"	"	"

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Arvada CO 80003

Matt Vielhaber  
Project Number: NEP0826.01  
Project: Noble – Becky #2–6

**MW14**

**X905114–08 (Water)**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**

**BTEX by EPA 8260B**

Benzene	ND	0.00100	mg/L	1	9E29003	05/29/2009	05/30/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	99.5 %	85.7–134	"	"	"
Surrogate: Toluene-d8	99.5 %	81.4–121	"	"	"
Surrogate: 4-Bromofluorobenzene	104 %	74.7–127	"	"	"

Origins Laboratory, Inc.

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303.265.9645 | Fax



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4600 West 60th Avenue  
Arvada CO 80003

Matt Vielhaber  
Project Number: NEP0826.01  
Project: Noble – Becky #2–6

**MW16**

**X905114–09 (Water)**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**

**BTEX by EPA 8260B**

Benzene	ND	0.00100	mg/L	1	9E29003	05/29/2009	05/30/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	<b>0.0143</b>	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	<b>0.152</b>	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	99.3 %	85.7–134	"	"	"
Surrogate: Toluene-d8	100 %	81.4–121	"	"	"
Surrogate: 4-Bromofluorobenzene	103 %	74.7–127	"	"	"

Origins Laboratory, Inc.

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Noelle E Doyle, Laboratory Manager



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Denver, Colorado 80211  
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303.265.9645 | Fax



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

Matt Vielhaber  
Project Number: NEP0826.01  
Project: Noble – Becky #2–6

**MW24**

**X905114–10 (Water)**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**

**BTEX by EPA 8260B**

Benzene	ND	0.00100	mg/L	1	9E29003	05/29/2009	05/30/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	99.5 %	85.7–134	"	"	"
Surrogate: Toluene-d8	101 %	81.4–121	"	"	"
Surrogate: 4-Bromofluorobenzene	102 %	74.7–127	"	"	"

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4600 West 60th Avenue  
Arvada CO 80003

Matt Vielhaber  
Project Number: NEP0826.01  
Project: Noble – Becky #2–6

**MW25**

**X905114–11 (Water)**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**

**BTEX by EPA 8260B**

Benzene	0.0299	0.00100	mg/L	1	9E29003	05/29/2009	05/30/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	0.00740	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	0.00713	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	98.5 %	85.7–134	"	"	"
Surrogate: Toluene-d8	99.3 %	81.4–121	"	"	"
Surrogate: 4-Bromofluorobenzene	104 %	74.7–127	"	"	"

Origins Laboratory, Inc.

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Noelle E Doyle, Laboratory Manager

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

Matt Vielhaber  
Project Number: NEP0826.01  
Project: Noble – Becky #2–6

**MW26**

**X905114–12 (Water)**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**

**BTEX by EPA 8260B**

Benzene	0.00202	0.00100	mg/L	1	9E29003	05/29/2009	05/31/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	0.00197	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	100 %	85.7–134	"	"	"
Surrogate: Toluene-d8	100 %	81.4–121	"	"	"
Surrogate: 4-Bromofluorobenzene	103 %	74.7–127	"	"	"

Origins Laboratory, Inc.

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Matt Vielhaber  
Project Number: NEP0826.01  
Project: Noble – Becky #2–6

**MW27**

**X905114–13 (Water)**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**

**BTEX by EPA 8260B**

Benzene	ND	0.00100	mg/L	1	9E29003	05/29/2009	05/31/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	98.9 %	85.7–134	"	"	"
Surrogate: Toluene-d8	101 %	81.4–121	"	"	"
Surrogate: 4-Bromofluorobenzene	103 %	74.7–127	"	"	"

Origins Laboratory, Inc.

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Matt Vielhaber  
Project Number: NEP0826.01  
Project: Noble – Becky #2–6

**MW29**

**X905114–14 (Water)**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**

**BTEX by EPA 8260B**

Benzene	ND	0.00100	mg/L	1	9E29003	05/29/2009	05/31/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	99.9 %	85.7–134	"	"	"
Surrogate: Toluene-d8	101 %	81.4–121	"	"	"
Surrogate: 4-Bromofluorobenzene	105 %	74.7–127	"	"	"

Origins Laboratory, Inc.

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Arvada CO 80003

Matt Vielhaber  
Project Number: NEP0826.01  
Project: Noble – Becky #2–6

**MW30**

**X905114–15 (Water)**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**

**BTEX by EPA 8260B**

Benzene	ND	0.00100	mg/L	1	9E29003	05/29/2009	05/31/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	99.3 %	85.7–134	"	"	"
Surrogate: Toluene-d8	102 %	81.4–121	"	"	"
Surrogate: 4-Bromofluorobenzene	106 %	74.7–127	"	"	"

Origins Laboratory, Inc.

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Project Number: NEP0826.01  
Project: Noble – Becky #2–6

**MW32**

**X905114–16 (Water)**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**

**BTEX by EPA 8260B**

Benzene	ND	0.00100	mg/L	1	9E29003	05/29/2009	05/31/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	99.2 %	85.7–134	"	"	"
Surrogate: Toluene-d8	100 %	81.4–121	"	"	"
Surrogate: 4-Bromofluorobenzene	104 %	74.7–127	"	"	"

Origins Laboratory, Inc.

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Project Number: NEP0826.01  
Project: Noble – Becky #2–6

**MW34**

**X905114–17 (Water)**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**

**BTEX by EPA 8260B**

Benzene	ND	0.00100	mg/L	1	9E29003	05/29/2009	05/31/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	97.4 %	85.7–134	"	"	"
Surrogate: Toluene-d8	99.8 %	81.4–121	"	"	"
Surrogate: 4-Bromofluorobenzene	103 %	74.7–127	"	"	"

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Matt Vielhaber  
Project Number: NEP0826.01  
Project: Noble – Becky #2–6

**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
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**Batch 9E29003 – EPA 5030B**

**Blank (9E29003–BLK1)**

Prepared: 05/29/2009 Analyzed: 05/30/2009

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	"							
Surrogate: 1,2-Dichloroethane-d4	60.7		ug/L	62.5		97.1	85.7–134			
Surrogate: Toluene-d8	63.2		"	62.5		101	81.4–121			
Surrogate: 4-Bromofluorobenzene	65.8		"	62.5		105	74.7–127			

**Blank (9E29003–BLK2)**

Prepared: 05/29/2009 Analyzed: 05/30/2009

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	"							
Surrogate: 1,2-Dichloroethane-d4	61.4		ug/L	62.5		98.3	85.7–134			
Surrogate: Toluene-d8	63.2		"	62.5		101	81.4–121			
Surrogate: 4-Bromofluorobenzene	64.6		"	62.5		103	74.7–127			

**LCS (9E29003–BS1)**

Prepared: 05/29/2009 Analyzed: 05/30/2009

Benzene	0.04	0.001	mg/L	0.0500		78.4	74.9–126			
Toluene	0.04	0.001	"	0.0500		86.6	73.3–128			
Surrogate: 1,2-Dichloroethane-d4	60.6		ug/L	62.5		96.9	85.7–134			
Surrogate: Toluene-d8	62.8		"	62.5		100	81.4–121			
Surrogate: 4-Bromofluorobenzene	65.3		"	62.5		105	74.7–127			

**LCS (9E29003–BS2)**

Prepared: 05/29/2009 Analyzed: 05/30/2009

Benzene	0.04	0.001	mg/L	0.0500		78.3	74.9–126			
Toluene	0.04	0.001	"	0.0500		84.5	73.3–128			

Origins Laboratory, Inc.

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Matt Vielhaber  
 Project Number: NEP0826.01  
 Project: Noble – Becky #2–6

**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
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**Batch 9E29003 – EPA 5030B**

**LCS (9E29003–BS2)**

Prepared: 05/29/2009 Analyzed: 05/30/2009

Surrogate: 1,2-Dichloroethane-d4	61.2		ug/L	62.5		98.0	85.7–134			
Surrogate: Toluene-d8	62.6		"	62.5		100	81.4–121			
Surrogate: 4-Bromofluorobenzene	64.5		"	62.5		103	74.7–127			

**Matrix Spike (9E29003–MS1)**

Source: X905114–01

Prepared: 05/29/2009 Analyzed: 05/30/2009

Benzene	0.04	0.001	mg/L	0.0500	0.0008	79.9	78.1–132			
Toluene	0.05	0.001	"	0.0500	ND	91.3	71.7–124			
Surrogate: 1,2-Dichloroethane-d4	61.2		ug/L	62.5		97.8	85.7–134			
Surrogate: Toluene-d8	63.2		"	62.5		101	81.4–121			
Surrogate: 4-Bromofluorobenzene	64.8		"	62.5		104	74.7–127			

**Matrix Spike (9E29003–MS2)**

Source: X905114–02

Prepared: 05/29/2009 Analyzed: 05/30/2009

Benzene	0.04	0.001	mg/L	0.0500	0.002	78.0	78.1–132			QM-07
Toluene	0.04	0.001	"	0.0500	ND	82.5	71.7–124			
Surrogate: 1,2-Dichloroethane-d4	61.4		ug/L	62.5		98.2	85.7–134			
Surrogate: Toluene-d8	63.1		"	62.5		101	81.4–121			
Surrogate: 4-Bromofluorobenzene	64.6		"	62.5		103	74.7–127			

**Matrix Spike Dup (9E29003–MSD1)**

Source: X905114–01

Prepared: 05/29/2009 Analyzed: 05/30/2009

Benzene	0.04	0.001	mg/L	0.0500	0.0008	80.5	78.1–132	0.685	24.8	
Toluene	0.04	0.001	"	0.0500	ND	87.6	71.7–124	4.09	25	
Surrogate: 1,2-Dichloroethane-d4	60.9		ug/L	62.5		97.4	85.7–134			
Surrogate: Toluene-d8	62.9		"	62.5		101	81.4–121			
Surrogate: 4-Bromofluorobenzene	64.6		"	62.5		103	74.7–127			

**Matrix Spike Dup (9E29003–MSD2)**

Source: X905114–02

Prepared: 05/29/2009 Analyzed: 05/30/2009

Benzene	0.04	0.001	mg/L	0.0500	0.002	83.6	78.1–132	6.63	24.8	
Toluene	0.04	0.001	"	0.0500	ND	86.0	71.7–124	4.13	25	
Surrogate: 1,2-Dichloroethane-d4	63.7		ug/L	62.5		102	85.7–134			

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Arvada CO 80003

Matt Vielhaber  
Project Number: NEP0826.01  
Project: Noble – Becky #2–6

**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
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**Batch 9E29003 – EPA 5030B**

**Matrix Spike Dup (9E29003–MSD2)**

**Source: X905114–02**

Prepared: 05/29/2009 Analyzed: 05/30/2009

Surrogate: Toluene-d8	62.9		ug/L	62.5		101	81.4–121			
Surrogate: 4–Bromofluorobenzene	65.4		"	62.5		105	74.7–127			

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Matt Vielhaber  
Project Number: NEP0826.01  
Project: Noble – Becky #2–6

### Notes and Definitions

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

Origins Laboratory, Inc.

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---

June 01, 2009

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

Brian Dodek  
Project Number: NEP0826.01  
Project: Noble – Becky #2–6

---

Attached are the analytical results for Noble – Becky #2–6 received by Origins Laboratory, Inc. 5/28/2009 4:38:00PM. Please let us know if you have any questions, or if we can help with anything at all.

Noelle E Doyle  
Laboratory Manager

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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Arvada CO 80003

Brian Dodek  
Project Number: NEP0826.01  
Project: Noble – Becky #2–6

#### CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Sampled	Date Received
MW-11	X905122-01	Water	5/28/2009 11:00:00AM	05/28/2009 16:38
MW-13	X905122-02	Water	5/28/2009 10:50:00AM	05/28/2009 16:38
MW-15	X905122-03	Water	5/28/2009 10:40:00AM	05/28/2009 16:38
MW-18	X905122-04	Water	5/28/2009 10:20:00AM	05/28/2009 16:38

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LT Environmental, Inc.  
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Brian Dodek  
Project Number: NEP0826.01  
Project: Noble - Becky #2-6

221509122  
page 1 of 1



originslaboratory.com

Client: LT Environmental  
Address: 4600 W 60th Ave  
Arvada, CO 80003  
Telephone Number: 303-433-5788  
E-Mail Address: mlvelhaber@ltenv.com

Project Manager: Matt Velhaber  
Project Name: Becky #2-6  
Project Number: NEP0826  
Samples Collected by: Lindsay Voss

Sample ID - Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix			Analysis	Sample Instructions
				Unpreserved	HCl	HNO <sub>3</sub>	Other	Groundwater	Soil	Air - Summa Canister #		
MW11	5/28/09	1100	3		3							1
MW13	↓	1050	3		3							2
MW15	↓	1040	3		3							3
MW18	↓	1020	3		3							4
												5
												6
												7
												8
												9
												10

Relinquished by:	Date	Time	Received by:	Date	Time	Temperature Upon Receipt:		
						Same Day	24-hr	72-hr
<u>Lindsay Voss</u>	<u>5/28/09</u>	<u>11:58</u>	<u>MLV</u>	<u>5/28/09</u>	<u>11:58</u>			<input checked="" type="checkbox"/>
Relinquished by:	Date	Time	Received by:	Date	Time	Turn Around Time:		

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Origins Laboratory, Inc.

Noelle E Doyle, Laboratory Manager

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Arvada CO 80003

Brian Dodek  
Project Number: NEP0826.01  
Project: Noble – Becky #2–6

**MW-11**

**X905122-01 (Water)**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**

**BTEX by EPA 8260B**

Benzene	ND	0.00100	mg/L	1	9E29003	05/29/2009	05/31/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	97.8 %	85.7-134	"	"	"
Surrogate: Toluene-d8	101 %	81.4-121	"	"	"
Surrogate: 4-Bromofluorobenzene	104 %	74.7-127	"	"	"

Origins Laboratory, Inc.

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Brian Dodek  
Project Number: NEP0826.01  
Project: Noble – Becky #2–6

**MW-13**

**X905122-02 (Water)**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**

**BTEX by EPA 8260B**

Benzene	0.500	0.0100	mg/L	10	9E29003	05/29/2009	06/01/2009
Toluene	ND	0.00100	"	1	"	"	05/31/2009
Ethylbenzene	0.0698	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	0.120	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	100 %	85.7-134	"	"	"
Surrogate: Toluene-d8	100 %	81.4-121	"	"	"
Surrogate: 4-Bromofluorobenzene	101 %	74.7-127	"	"	"

Origins Laboratory, Inc.

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Brian Dodek  
Project Number: NEP0826.01  
Project: Noble – Becky #2–6

**MW-15**  
**X905122-03 (Water)**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**

**BTEX by EPA 8260B**

Benzene	ND	0.00100	mg/L	1	9E29003	05/29/2009	05/31/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	97.8 %	85.7-134	"	"	"
Surrogate: Toluene-d8	101 %	81.4-121	"	"	"
Surrogate: 4-Bromofluorobenzene	106 %	74.7-127	"	"	"

Origins Laboratory, Inc.

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

Brian Dodek  
Project Number: NEP0826.01  
Project: Noble – Becky #2–6

**MW-18**

**X905122-04 (Water)**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**

**BTEX by EPA 8260B**

Benzene	ND	0.00100	mg/L	1	9E29003	05/29/2009	05/31/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	99.0 %	85.7-134	"	"	"
Surrogate: Toluene-d8	101 %	81.4-121	"	"	"
Surrogate: 4-Bromofluorobenzene	103 %	74.7-127	"	"	"

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**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
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**Batch 9E29003 – EPA 5030B**

**Blank (9E29003–BLK1)**

Prepared: 05/29/2009 Analyzed: 05/30/2009

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	"							
Surrogate: 1,2-Dichloroethane-d4	60.7		ug/L	62.5		97.1	85.7–134			
Surrogate: Toluene-d8	63.2		"	62.5		101	81.4–121			
Surrogate: 4-Bromofluorobenzene	65.8		"	62.5		105	74.7–127			

**Blank (9E29003–BLK2)**

Prepared: 05/29/2009 Analyzed: 05/30/2009

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	"							
Surrogate: 1,2-Dichloroethane-d4	61.4		ug/L	62.5		98.3	85.7–134			
Surrogate: Toluene-d8	63.2		"	62.5		101	81.4–121			
Surrogate: 4-Bromofluorobenzene	64.6		"	62.5		103	74.7–127			

**LCS (9E29003–BS1)**

Prepared: 05/29/2009 Analyzed: 05/30/2009

Benzene	0.04	0.001	mg/L	0.0500		78.4	74.9–126			
Toluene	0.04	0.001	"	0.0500		86.6	73.3–128			
Surrogate: 1,2-Dichloroethane-d4	60.6		ug/L	62.5		96.9	85.7–134			
Surrogate: Toluene-d8	62.8		"	62.5		100	81.4–121			
Surrogate: 4-Bromofluorobenzene	65.3		"	62.5		105	74.7–127			

**LCS (9E29003–BS2)**

Prepared: 05/29/2009 Analyzed: 05/30/2009

Benzene	0.04	0.001	mg/L	0.0500		78.3	74.9–126			
Toluene	0.04	0.001	"	0.0500		84.5	73.3–128			

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Brian Dodek  
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 Project: Noble – Becky #2–6

**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
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**Batch 9E29003 – EPA 5030B**

**LCS (9E29003–BS2)**

Prepared: 05/29/2009 Analyzed: 05/30/2009

Surrogate: 1,2-Dichloroethane-d4	61.2		ug/L	62.5		98.0	85.7–134			
Surrogate: Toluene-d8	62.6		"	62.5		100	81.4–121			
Surrogate: 4-Bromofluorobenzene	64.5		"	62.5		103	74.7–127			

**Matrix Spike (9E29003–MS1)**

**Source: X905114–01**

Prepared: 05/29/2009 Analyzed: 05/30/2009

Benzene	0.04	0.001	mg/L	0.0500	0.0008	79.9	78.1–132			
Toluene	0.05	0.001	"	0.0500	ND	91.3	71.7–124			
Surrogate: 1,2-Dichloroethane-d4	61.2		ug/L	62.5		97.8	85.7–134			
Surrogate: Toluene-d8	63.2		"	62.5		101	81.4–121			
Surrogate: 4-Bromofluorobenzene	64.8		"	62.5		104	74.7–127			

**Matrix Spike (9E29003–MS2)**

**Source: X905114–02**

Prepared: 05/29/2009 Analyzed: 05/30/2009

Benzene	0.04	0.001	mg/L	0.0500	0.002	78.0	78.1–132			QM-07
Toluene	0.04	0.001	"	0.0500	ND	82.5	71.7–124			
Surrogate: 1,2-Dichloroethane-d4	61.4		ug/L	62.5		98.2	85.7–134			
Surrogate: Toluene-d8	63.1		"	62.5		101	81.4–121			
Surrogate: 4-Bromofluorobenzene	64.6		"	62.5		103	74.7–127			

**Matrix Spike Dup (9E29003–MSD1)**

**Source: X905114–01**

Prepared: 05/29/2009 Analyzed: 05/30/2009

Benzene	0.04	0.001	mg/L	0.0500	0.0008	80.5	78.1–132	0.685	24.8	
Toluene	0.04	0.001	"	0.0500	ND	87.6	71.7–124	4.09	25	
Surrogate: 1,2-Dichloroethane-d4	60.9		ug/L	62.5		97.4	85.7–134			
Surrogate: Toluene-d8	62.9		"	62.5		101	81.4–121			
Surrogate: 4-Bromofluorobenzene	64.6		"	62.5		103	74.7–127			

**Matrix Spike Dup (9E29003–MSD2)**

**Source: X905114–02**

Prepared: 05/29/2009 Analyzed: 05/30/2009

Benzene	0.04	0.001	mg/L	0.0500	0.002	83.6	78.1–132	6.63	24.8	
Toluene	0.04	0.001	"	0.0500	ND	86.0	71.7–124	4.13	25	
Surrogate: 1,2-Dichloroethane-d4	63.7		ug/L	62.5		102	85.7–134			

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**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
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**Batch 9E29003 – EPA 5030B**

**Matrix Spike Dup (9E29003–MSD2)**

**Source: X905114–02**

Prepared: 05/29/2009 Analyzed: 05/30/2009

Surrogate: Toluene-d8	62.9	ug/L	62.5	101	81.4–121
Surrogate: 4–Bromofluorobenzene	65.4	"	62.5	105	74.7–127

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### Notes and Definitions

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

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