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2013 AGWMR

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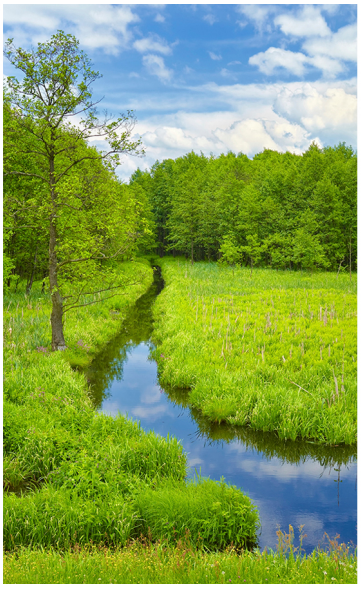

2013 Annual Groundwater Monitoring Report

Former New Mexico "F" State Tank Battery
Case NO. 1R258
OGRID NO. 4323
NE/4, SE, SECTION 24, T-19-S, R-36-E
Latitude: N 32 38’ 34.9” Longitude: W 103 18’ 0.49”
Lea County, New Mexico

Prepared for: Chevron Environmental Management Company

Conestoga-Rovers & Associates
6320 Rothway, Suite 100
Houston, Texas 77040

April 2014 • 039122 • Report No. 10

Partners in Sustainability

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Section 1.0 Introduction

This Annual Groundwater Monitoring Report presents groundwater data collected during the 2013 reporting period by Conestoga-Rovers & Associates (CRA) on behalf of Chevron Environmental Management Company (CEMC) at the former New Mexico State "F" Tank Battery (Site). Groundwater gauging and sampling events were performed in March, June, September and November 2013.

The Site is located on Lea County Road 41 (Maddox Road), approximately 3.1 miles northwest of Monument, New Mexico and situated in the northeast quarter (NE/4) of the southeast quarter (SE/4), Section 24, Township 19 South, Range 36 East, Lea County, New Mexico. Site Location and Site Details maps are illustrated on Figures 1 and 2, respectively. Historically, Texaco Exploration and Production, Inc. (Texaco) operated the Site as an oil field tank battery. An earthen emergency reserve pit was located approximately 175 feet north of the tank battery. The tank battery and reserve pit are visible in aerial photographs dated February 1949, July 1983, and June 1986. Sometime after 1986, the tank battery and associated equipment were removed from the Site. The former reserve pit was subsequently unearthed during construction of a production facility immediately south of the pit by the Amerada-Hess Corporation.

The former pit was excavated and approximately 7,400 cubic yards of soil and caliche rock were stockpiled adjacent to the excavated pit. In 1998, Highlander Environmental Corporation (Highlander) performed a subsurface assessment at the Site. The assessment activities included collection of soil samples from the sidewalls and bottom of the excavation and from the stockpiled soil generated during excavation activities. Chemical analyses of the soil samples confirmed that concentrations of all constituents of concern were below the New Mexico Oil Conservation Division (NMOCD) recommended remediation action levels for the Site. The soil sampling activities and laboratory analyses are documented in the *Subsurface Investigation Report, New Mexico "F" State Tank Battery, Lea County, New Mexico* (Highlander, September 1998). The *Annual Groundwater Monitoring Report, New Mexico "F" State Tank Battery, Lea County, New Mexico* (Larson and Associates, Inc., 2005) indicates that the pit was closed between September 1998 and November 2003 according to closure requirements stipulated by the NMOCD in correspondence dated January 20, 1999. The bottom of the excavated pit was lined with two feet of compacted clay, the stockpiled soil was returned to the excavation and the backfilled excavation was contoured to natural grade.

In addition to the soil assessment activities, nine monitor wells (MW-1 through MW-9) were installed at the Site between 1998 and 1999. Light non-aqueous phase liquid (LNAPL) was observed in wells MW-1 and MW-2. In November 1999, monitor wells (MW-1, MW-2 and MW-9) were plugged and abandoned and replaced with recovery wells (RW-1, RW-2 and RW-3). On

February 17, 2003, New Mexico Office of the State Engineer (NMOSE) approved applications (File No. L-11029, L-11030 and L-11031) submitted by Texaco to divert underground water for remediation of LNAPL. The remediation system was installed from October 2004 through February 2005 and was activated on February 14, 2005. Excluding brief periods for routine maintenance, the groundwater recovery/gradient control system operated from February 14, 2005 to November 20, 2006. In November 2006, LNAPL recovery methods were re-evaluated and the total fluids groundwater recovery/gradient control system was shut down. An LNAPL skimmer pump system was installed in RW-1 and absorbent socks were installed in RW-2 and RW-3 on November 28, 2006. This system is currently in operation at the Site. In addition, two Mobile Dual Phase Extraction (MDPE) events were conducted in 2012 using the newly installed RW-4. A skimmer pump was installed in RW-4 in October 2012. Semi-annual groundwater monitoring and weekly operation and maintenance (O&M) activities have been performed by CRA since 2005 along with annual reporting to the NMOCD for this Site.

Section 2.0 Regulatory Framework

The NMOCD guidelines require groundwater to be analyzed for potential contaminants as defined by the New Mexico Water Quality Control Commission (NMWQCC) regulations. In addition, the NMWQCC regulations provide the Human Health Standards for Groundwater. The constituent of concern (COC) in affected groundwater at the Site is LNAPL in the form of crude oil. In this report, groundwater analytical results for benzene, toluene, ethylbenzene, total xylenes (BTEX) and chloride are compared to the NMWQCC standards as shown in the following table:

Analyte	***NMWQCC Standard for Groundwater (mg/L)***
Benzene[1]	0.01
Toluene[1]	0.75
Ethylbenzene[1]	0.75
Total Xylenes[1]	0.62
Chloride[2]	250

Notes:
1) [1]NMWQCC Human Health Standards per NMAC 20.6.2.3103A
2) [2]NMWQCC Other Standards for Domestic Water Supply per NMAC 20.6.2.3103B

Section 3.0 Groundwater Sampling and Analysis

The Site is monitored with a network of six monitor wells (MW-3, MW-4, MW-5, MW-6, MW-7 and MW-8), two offsite water wells (WW-1 and WW-2) and four recovery wells (RW-1, RW-2, RW-3 and RW-4). Two semi-annual monitoring and sampling events were performed during the 2013 calendar year. The first (June) and second (November) semi-annual 2013 events included the collection of static fluid levels and LNAPL thicknesses (if present) in the six monitor wells and the four recovery wells and the collection of groundwater samples from all six monitor wells and the two offsite water wells. Static fluid levels are not collected from the two offsite water wells (WW-1 and WW-2). In addition, monitor well MW-6 was sampled in March and September 2013 to ensure the plume is not moving toward the offsite water wells (WW-1 and WW-2). At the request of the NMOCD, groundwater samples are collected from beneath the LNAPL in the recovery wells annually. This was conducted during the monitoring event for the first half of 2013 in June.

The semi-annual monitoring and sampling activities were performed on June 14 and November 27, 2013. Monitor well MW-6 was also sampled on March 14 and September 13, 2013. Prior to purging, static fluid levels and LNAPL thicknesses were measured and recorded from top of casing (TOC) with an electronic oil/water interface probe to the nearest hundredth of a foot. Purging was considered complete when three well volumes had been removed or the wells were purged dry. Geochemical field parameters including pH, temperature and conductivity were collected during the purging/sampling process. All non-disposable groundwater sampling equipment was decontaminated with a soap (Liquinox®) and potable water wash, a potable water rinse and a final deionized water rinse to minimize potential cross-contamination between each monitor well. Subsequent to the purging process, groundwater samples were collected using clean, disposable PVC bailers. During the third and fourth quarters, samples were collected using a non-purge method of Hydrosleeves™. Laboratory-supplied sample containers were then filled directly from the disposable PVC bailers or Hydrosleeve™.

Wells that contained measurable (>0.01 foot) LNAPL were not purged or sampled during the sampling events. Recovery wells were sampled beneath the product using Hydrosleeve™ to ensure that only water was collected rather than product. The groundwater samples were placed on ice in an insulated cooler and chilled to a temperature of approximately 4°C (40°F). The coolers were sealed for shipment and proper chain-of-custody documentation accompanied the samples to the laboratory (Xenco Laboratories located in Odessa, Texas) for analyses of BTEX by EPA Method 8021B and chlorides by EPA-approved methods. The fluids recovered and generated during the sampling events were containerized onsite in labeled drums and subsequently managed at an NMOCD-permitted salt water disposal (SWD) facility by Nabors Well Services LTD. (Nabors).

3.1 Potentiometric Surface Elevation and Gradient

Groundwater elevation data are presented in Table I. Groundwater gradient maps for each event (March, June, September and November 2013) are presented on Figures 3, 4, 5 and 6, respectively. Depth to groundwater ranged from 51.02 feet (RW-3) to 65.96 feet (MW-6) below TOC on March 14, 2013; from 51.41 feet (RW-3) to 67.08 (MW-6) feet below TOC on June 14, 2013; from 51.70 feet (RW-3) to 66.75 feet (MW-6) below TOC on September 13, 2013; and from 50.93 feet (RW-3) to 65.94 feet (MW-6) below TOC on November 20, 2013. Groundwater elevations at the Site appear to be consistent with historical levels with groundwater flow to the southeast. The maximum gradient observed during the 2013 calendar year was 0.007 feet/foot.

LNAPL was detected in monitor well MW-3 during the first semi-annual monitoring period in June 2013. LNAPL was detected in the four onsite recovery wells. Recovery wells RW-1 and RW-4 were not gauged in November and June, respectively, but historically contained measurable amounts of LNAPL. LNAPL was not detected in recovery wells RW-2 and RW-3 in March 2013. LNAPL thickness during the 2013 monitoring period ranged from 0.03 feet in RW-2 during the November event to 4.12 feet in RW-4 during the September event. LNAPL thickness maps for March, June, September and November 2013 are presented as Figures 7, 8, 9, and 10, respectively. LNAPL thickness data are summarized in Table I.

3.2 Analytical Results

Analytical results are summarized in Table II. Groundwater BTEX and chloride concentration maps for March, June, September and November 2013 are presented as FIGURES 11, 12, 13, and 14, respectively. BTEX and chloride concentrations were below the NMWQCC standards in the samples collected from the monitor wells, recovery wells and offsite water wells (WW-1 and WW-2) during the 2013 monitoring events with the exception of benzene in RW-4 during the June event (0.0245 mg/L). This data indicates any dissolved phase hydrocarbon plume at the site is small and stable in nature. It should be noted that the off-site water wells were sampled during the June event only.

Overall precision for both the sample collection and laboratory procedures were monitored using the results of the field duplicate samples. The relative percent differences (RPDs) between the results for the duplicate samples must be less than 30 percent. Two duplicate samples were collected during the 2013 monitoring period – one during the June event and one during the November event. All duplicate RPDs were within the 30 percent criterion. Duplicate and parent sample results are summarized on Table III. Copies of the certified analytical reports and chain-of-custody documentation are attached in Appendix A.

Section 4.0 Corrective Action

Excluding brief periods for routine maintenance, the Xitech® LNAPL skimmer pump system installed in RW-1 has operated continuously since installation. A Xitech® LNAPL skimmer pump was installed in RW-4 in October 2012 and, excluding brief periods for routine maintenance, has operated continuously from October to present. The best course of action for the two other recovery wells (RW-2 and RW-3) was determined to be absorbent socks based on trace amounts of LNAPL observed in both wells.

Operation and maintenance (O&M) activities were performed on a semi-monthly basis. Approximately 174 gallons of LNAPL were recovered in 2013 from the LNAPL recovery system connected to RW-1 and RW-4. Additionally, approximately 2,284 gallons of LNAPL have been recovered since November 28, 2006 when the skimmer system was installed in recovery well RW-1.

Eight 8-hour Mobile Dual Phase Extraction (MDPE) events were conducted in 2013 (February 14, March 22, April 9, May 15, June 14, July 10, October 21 and November 25) by AcuVac Remediation Inc. (AcuVac) to assist in reduction of LNAPL. The events were conducted on recovery well RW-1. Groundwater and LNAPL samples were frequently taken in 2,000 ml beakers to determine average LNAPL percentage of total volume.

During the eight MDPE events conducted throughout 2013, approximately 15,576 gallons of fluid were recovered, including 1,006 gallons of LNAPL. A total of 43 gallons of LNAPL vapors were recovered and burned as internal combustion engine fuel. This resulted in a total LNAPL recovery of 1,049 gallons. AcuVac reports for each event are located in Appendix B.

Collectively, approximately 3,779 gallons of LNAPL has been recovered through the remediation system and the MDPE events.

Section 5.0 Planned Activities

The Xitech® skimmer pump system will continue to be utilized for LNAPL recovery at the Site in 2014. The recovered product will be pumped into the 225-gallon tank which is situated inside a secondary containment structure. The remedial system will be analyzed to assess the potential benefit of enhancing the LNAPL recovery with the aid of a soil vapor extraction unit (SVE).

Semi-annual groundwater sampling events are scheduled to be performed during June and December 2014. Groundwater samples will be collected from all wells that do not contain measurable LNAPL and from the two offsite water wells (WW-1 and WW-2) during the semi-

annual groundwater sampling events. In addition, quarterly gauging and monitor well (MW-6) sampling activities will be performed to monitor the groundwater gradient and the potential for offsite plume migration. Semi-monthly O&M activities will also be performed to monitor the performance of the LNAPL recovery system and to periodically replace the absorbent socks in the other two recovery wells (RW-2 and RW-3) as necessary.

Section 6.0 Summary of Findings

Based on groundwater monitoring activities performed at the Site, CRA presents the following summary:

- Depth to groundwater ranged from 51.02 feet to 65.96 feet below TOC on March 14; from 51.41 feet to 67.08 feet below TOC on June 14; from 51.70 feet to 66.75 feet below TOC on September 13; and from 50.93 feet to 65.94 feet below TOC on November 20. Groundwater elevations at the Site appear to be consistent with historical levels with groundwater flow to the southeast. The maximum gradient observed during the 2013 calendar year was 0.007 feet/foot.

- LNAPL was detected in monitoring well MW-3 during June 2013 monitoring period. Historically, four onsite recovery wells have contained measurable amounts of LNAPL. LNAPL thickness during the 2013 monitoring period ranged from 0.03 feet in RW-2 during the November event to 4.12 feet in RW-4 during the September event.

- BTEX and chloride concentrations were below the NMWQCC standards in all samples collected from the monitor wells, recovery wells and offsite water wells (WW-1 and WW-2) during the 2013 monitoring events with the exception of benzene in RW-4 during the June event (0.0245 mg/L). This data indicates any dissolved phase hydrocarbon plume at the site is small and stable in nature.

- Approximately 174 gallons of LNAPL were recovered in 2013 from RW-1 and RW-4. Additionally, approximately 2,284 gallons of LNAPL have been recovered since November 28, 2006 when the skimmer system was installed in recovery well RW-1.

- MDPE events conducted in 2013 resulted in approximately 15,576 gallons of fluid recovery, including 1,006 gallons of liquid LNAPL. A total of 43 gallons of LNAPL vapors were recovered and burned as internal combustion engine fuel. This resulted in a total LNAPL recovery of 1,049 gallons.

- Collectively, approximately 3,779 gallons of LNAPL has been recovered through the remediation system and the MDPE events.

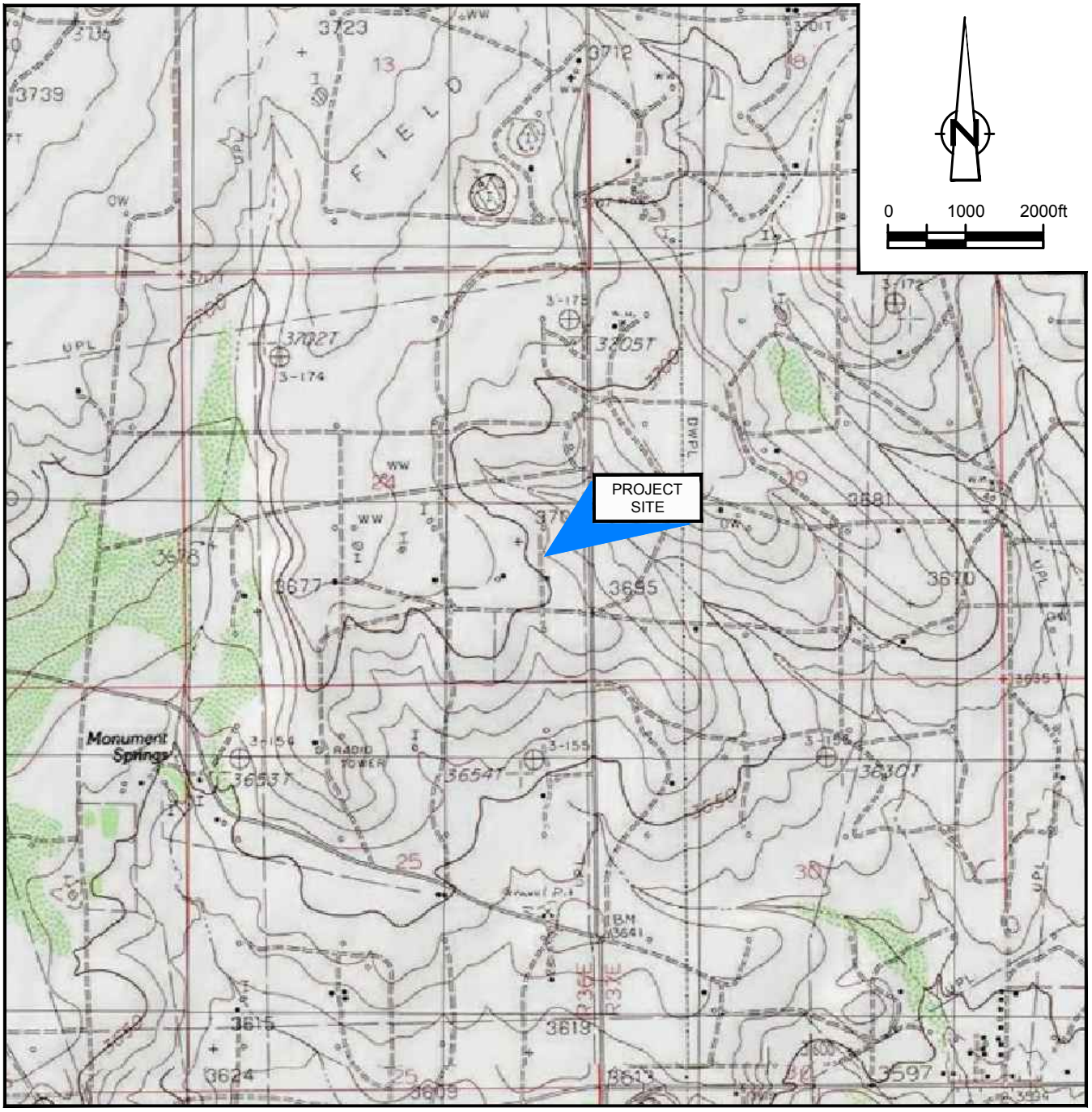
Respectfully Submitted,

CONESTOGA – ROVERS & ASSOCIATES

J. Scott Christ
Project Manager

Joe Cruseturner
Principal

FIGURES



SOURCE: USGS 7.5 MINUTE QUAD
"MONUMENT NORTH, NEW MEXICO"

LAT/LONG: 32.6429° NORTH, 103.3013° WEST
COORDINATE: NAD83 DATUM, U.S. FOOT
STATE PLANE ZONE - NEW MEXICO EAST

figure 1

SITE LOCATION MAP
NEW MEXICO "F" STATE
GROUNDWATER REMEDIATION PROJECT
LEA COUNTY, NEW MEXICO
Chevron Environmental Management Company

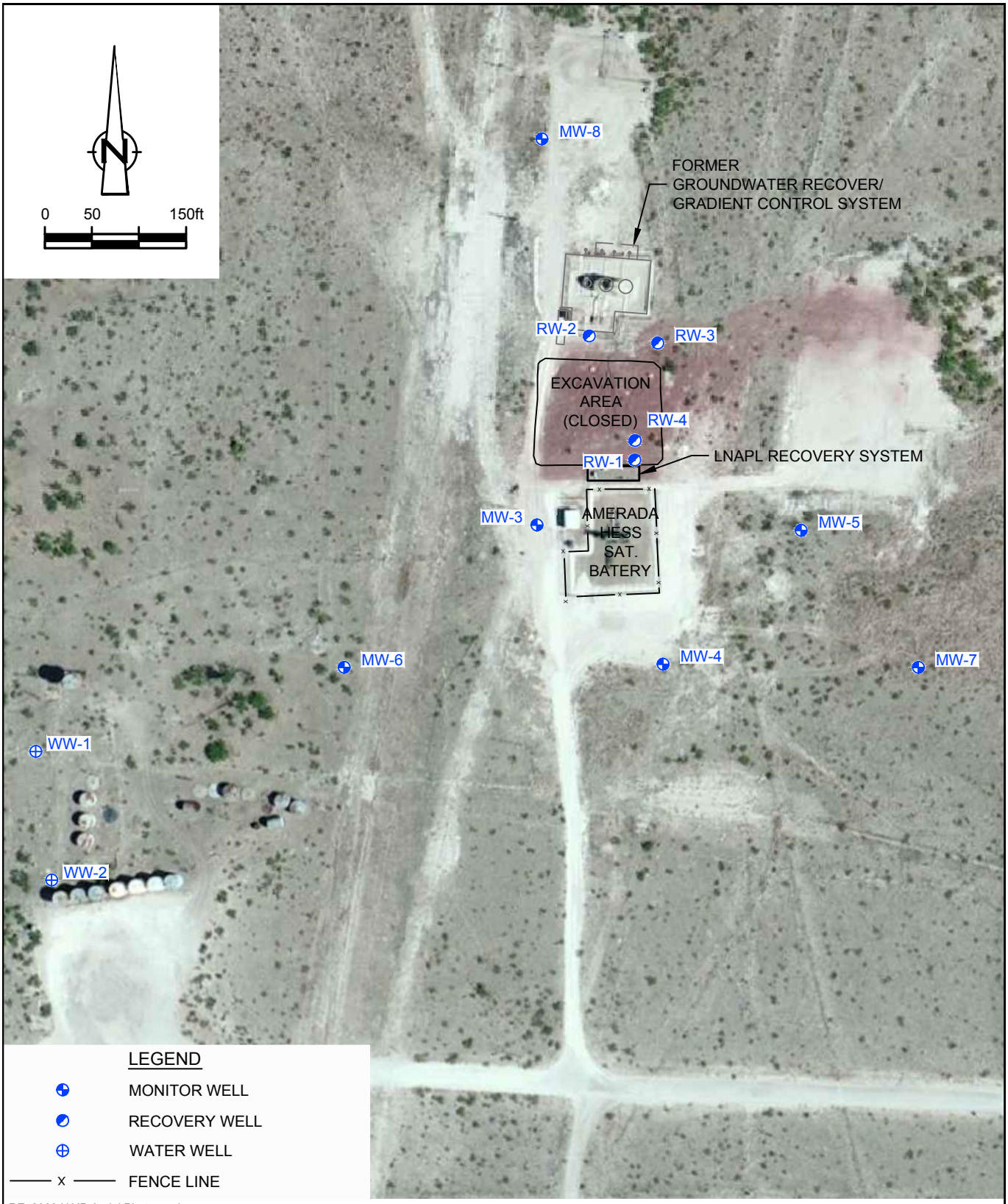


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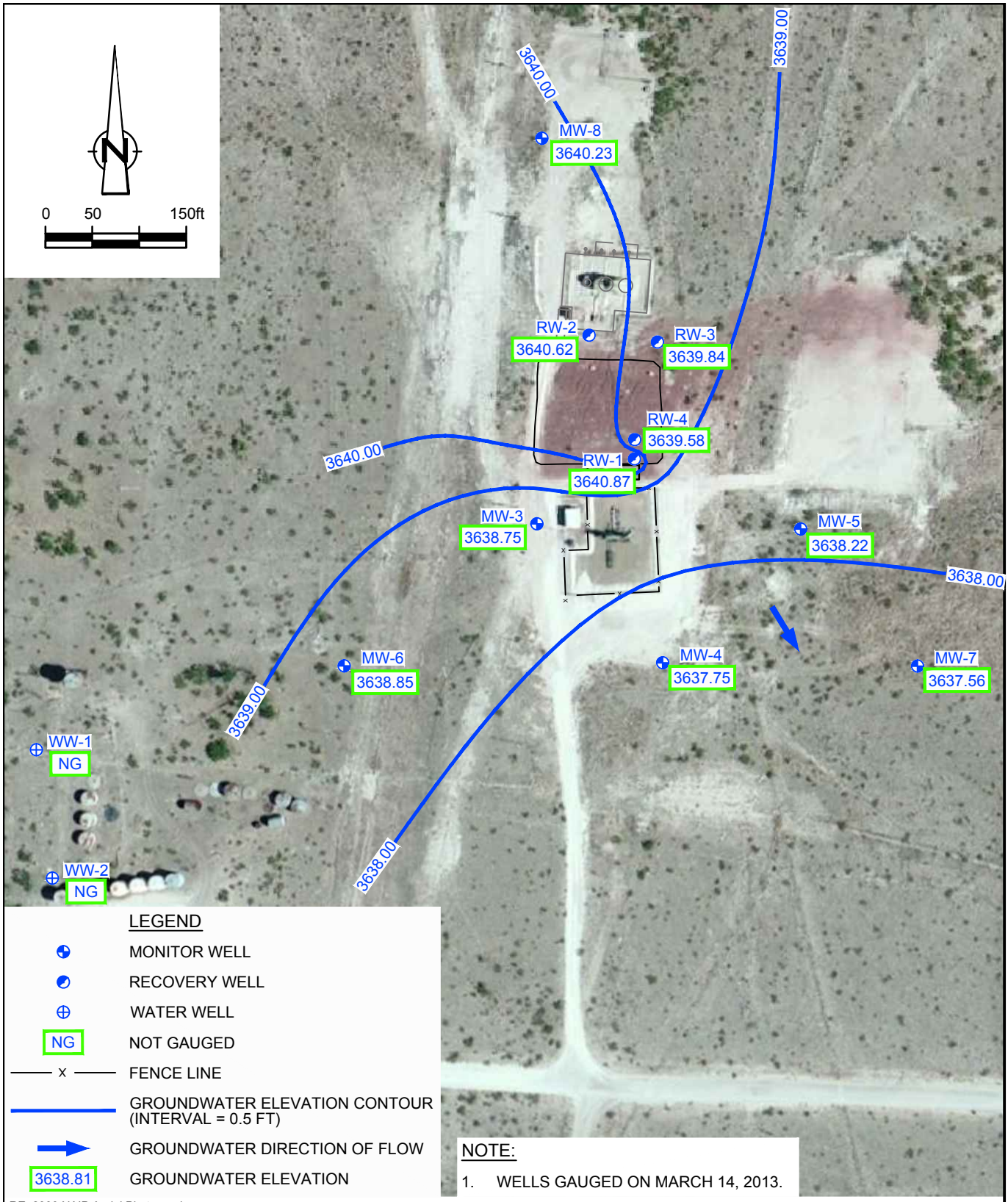
figure 2

SITE MAP
NEW MEXICO "F" STATE
GROUNDWATER REMEDIATION PROJECT
Chevron Environmental Management Company

039122-00(010)GN-DL002 APR 23/2013



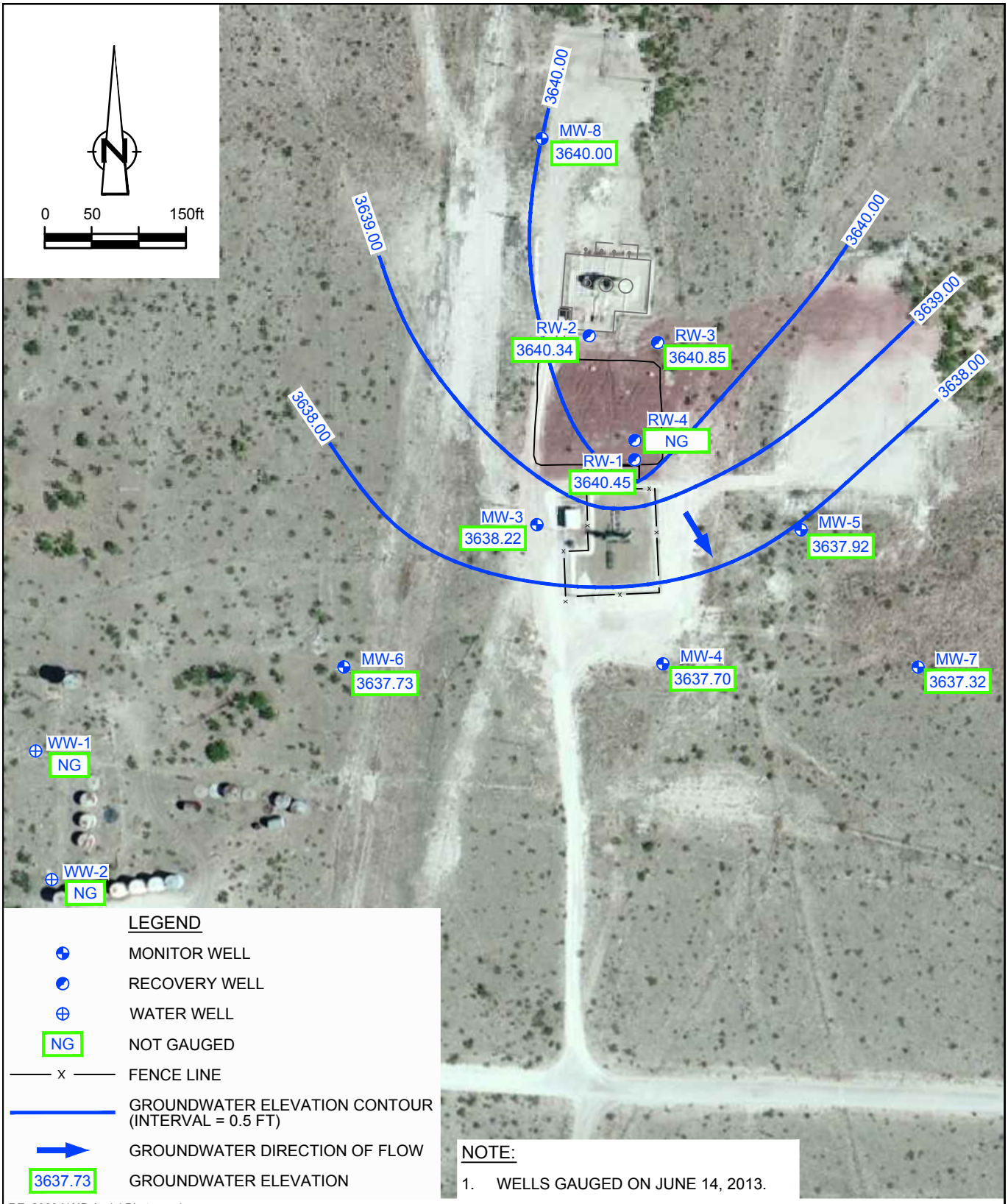
RE: 2009 NAIP Aerial Photograph

figure 3

MARCH 2013 GROUNDWATER GRADIENT MAP
NEW MEXICO "F" STATE
GROUNDWATER REMEDIATION PROJECT

Chevron Environmental Management Company

CPA



RE: 2009 NAIP Aerial Photograph

figure 4

JUNE 2013 GROUNDWATER GRADIENT MAP
NEW MEXICO "F" STATE
GROUNDWATER REMEDIATION PROJECT

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CPA

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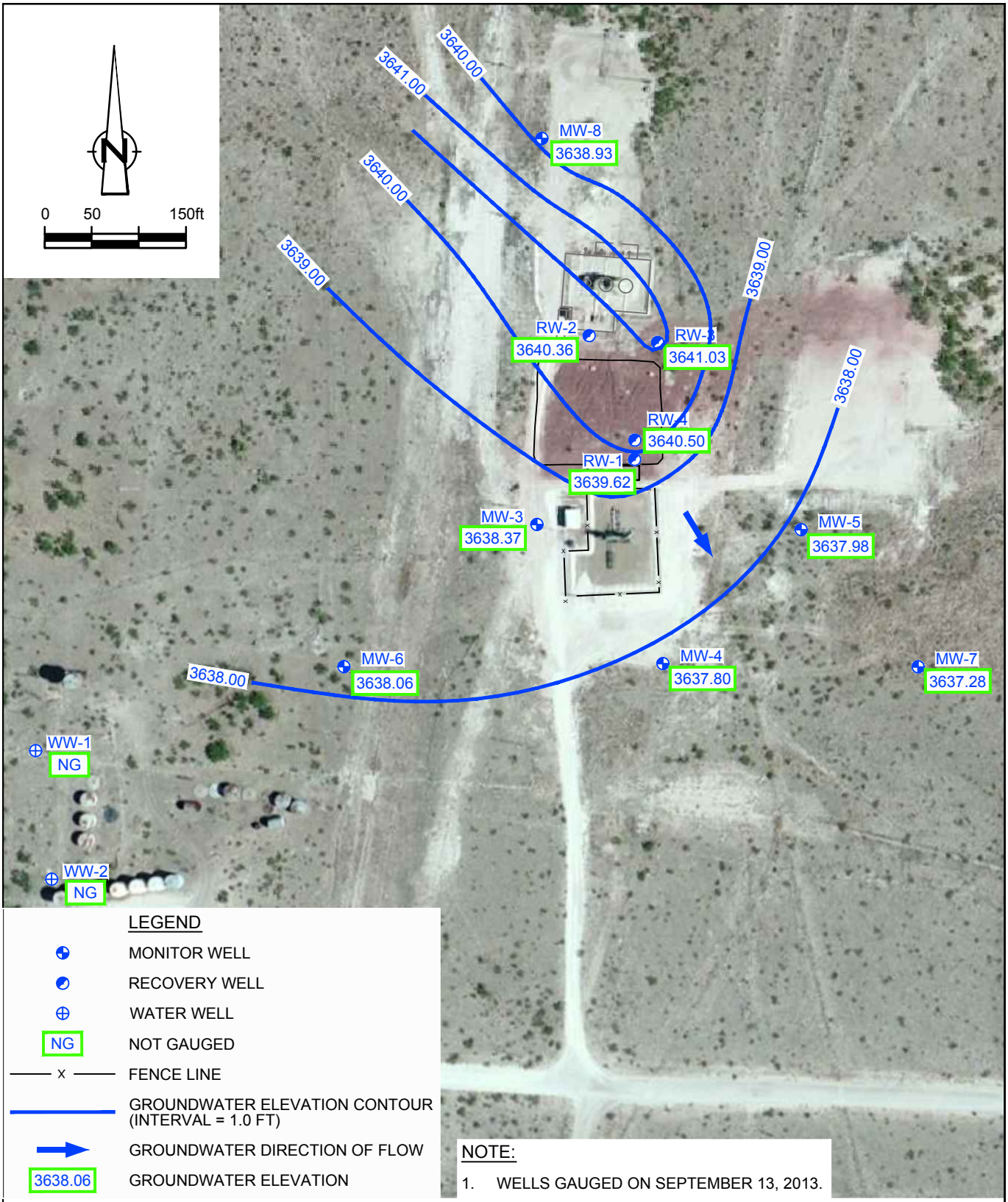

RE: 2009 NAIP Aerial Photograph

figure 5

SEPTEMBER 2013 GROUNDWATER GRADIENT MAP
NEW MEXICO "F" STATE
GROUNDWATER REMEDIATION PROJECT
Chevron Environmental Management Company

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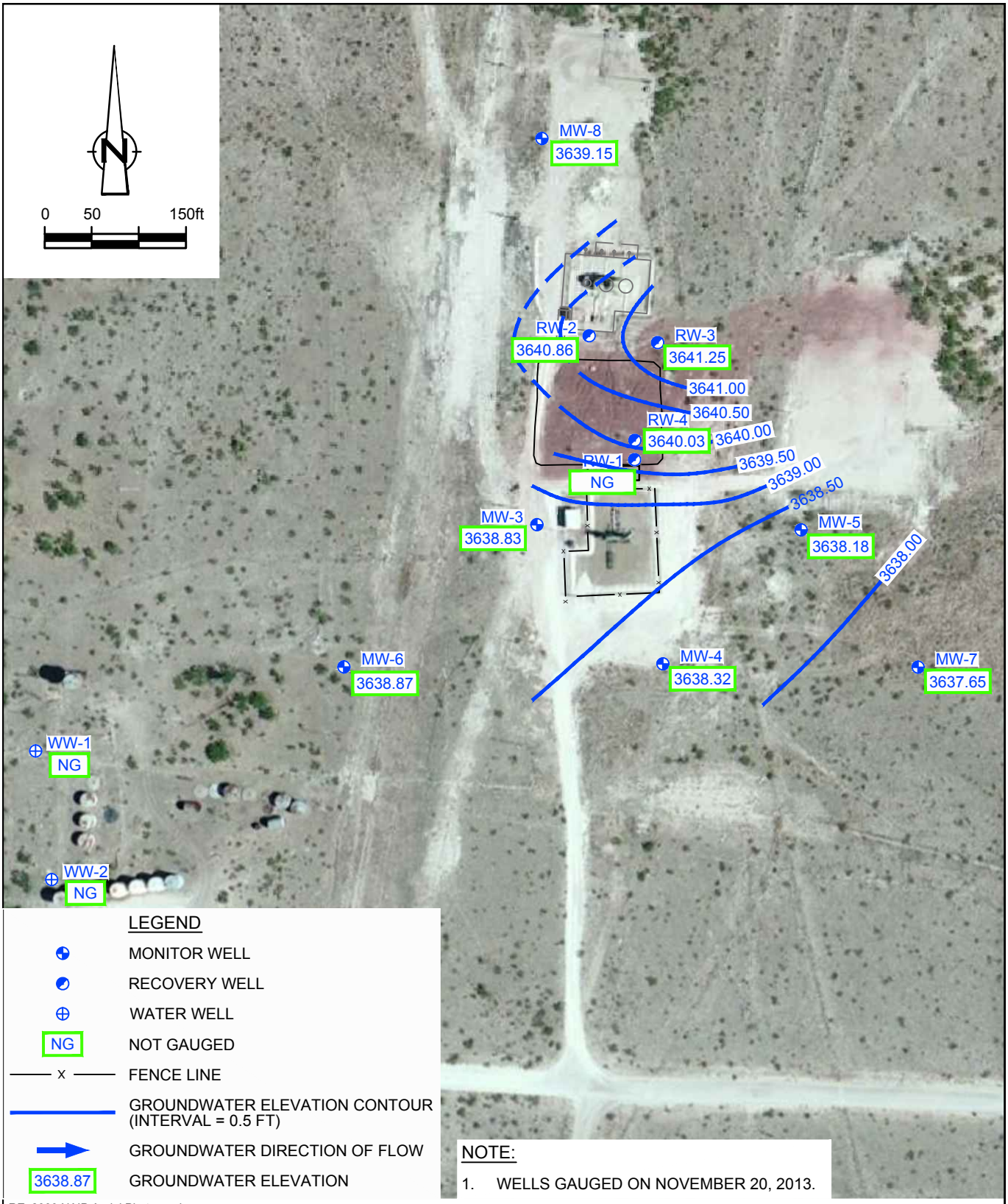

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figure 6

NOVEMBER 2013 GROUNDWATER GRADIENT MAP
NEW MEXICO "F" STATE
GROUNDWATER REMEDIATION PROJECT

Chevron Environmental Management Company

CPA

039122-00(010)GN-DL003 DEC 20/2013

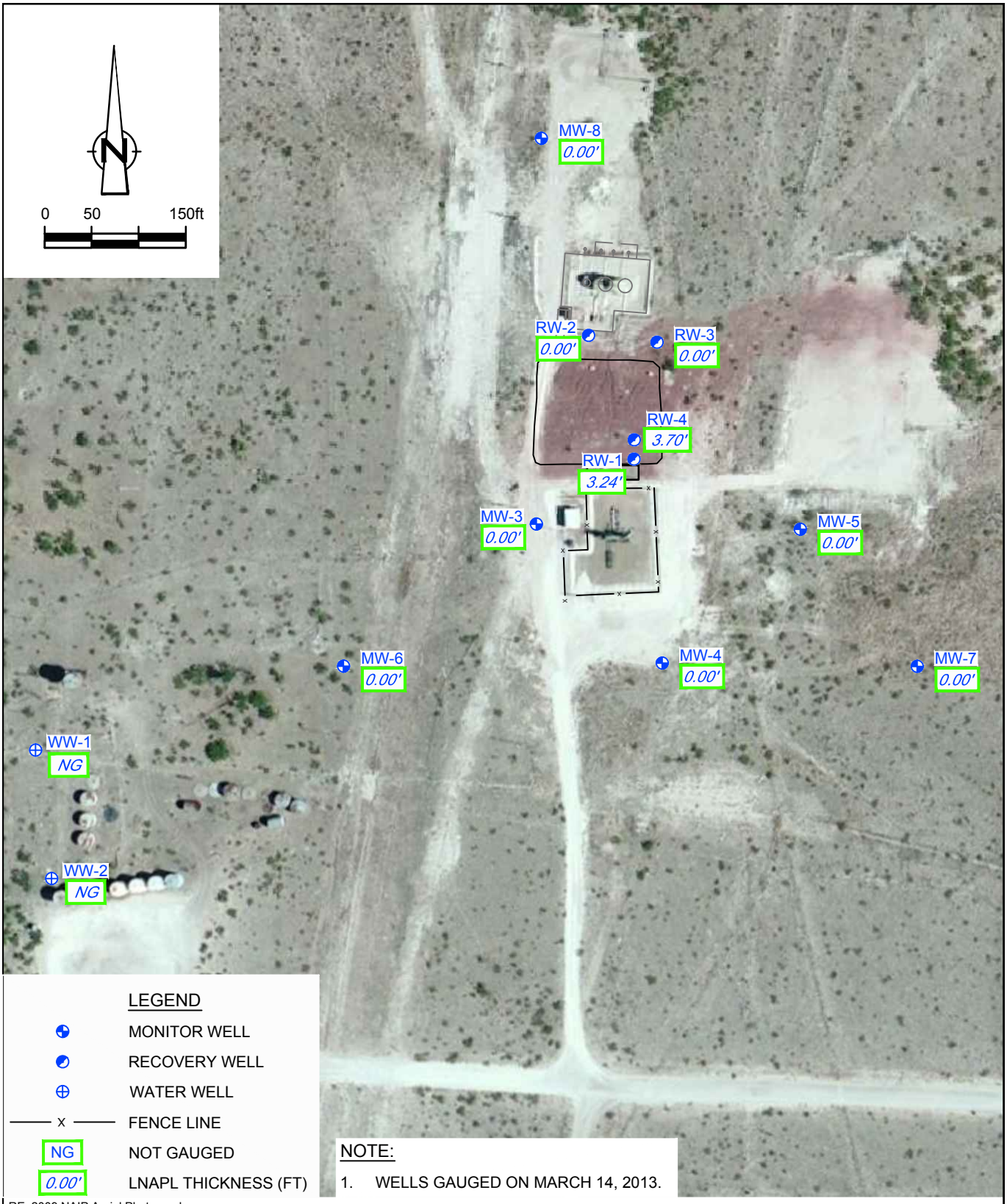

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figure 7

MARCH 2013 LNAPL THICKNESS
NEW MEXICO "F" STATE
GROUNDWATER REMEDIATION PROJECT

Chevron Environmental Management Company

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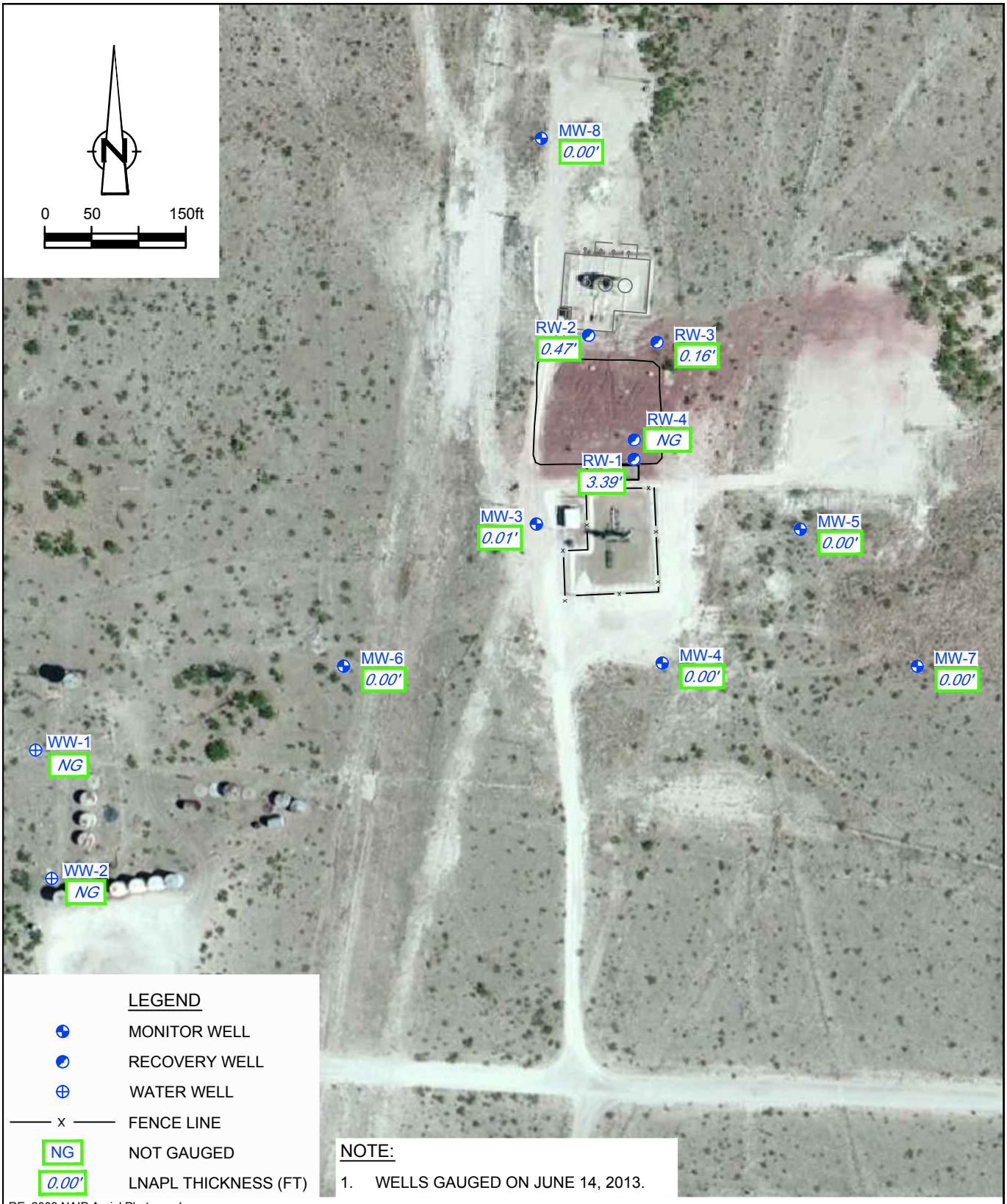

RE: 2009 NAIP Aerial Photograph

figure 8

JUNE 2013 LNAPL THICKNESS
NEW MEXICO "F" STATE
GROUNDWATER REMEDIATION PROJECT

Chevron Environmental Management Company

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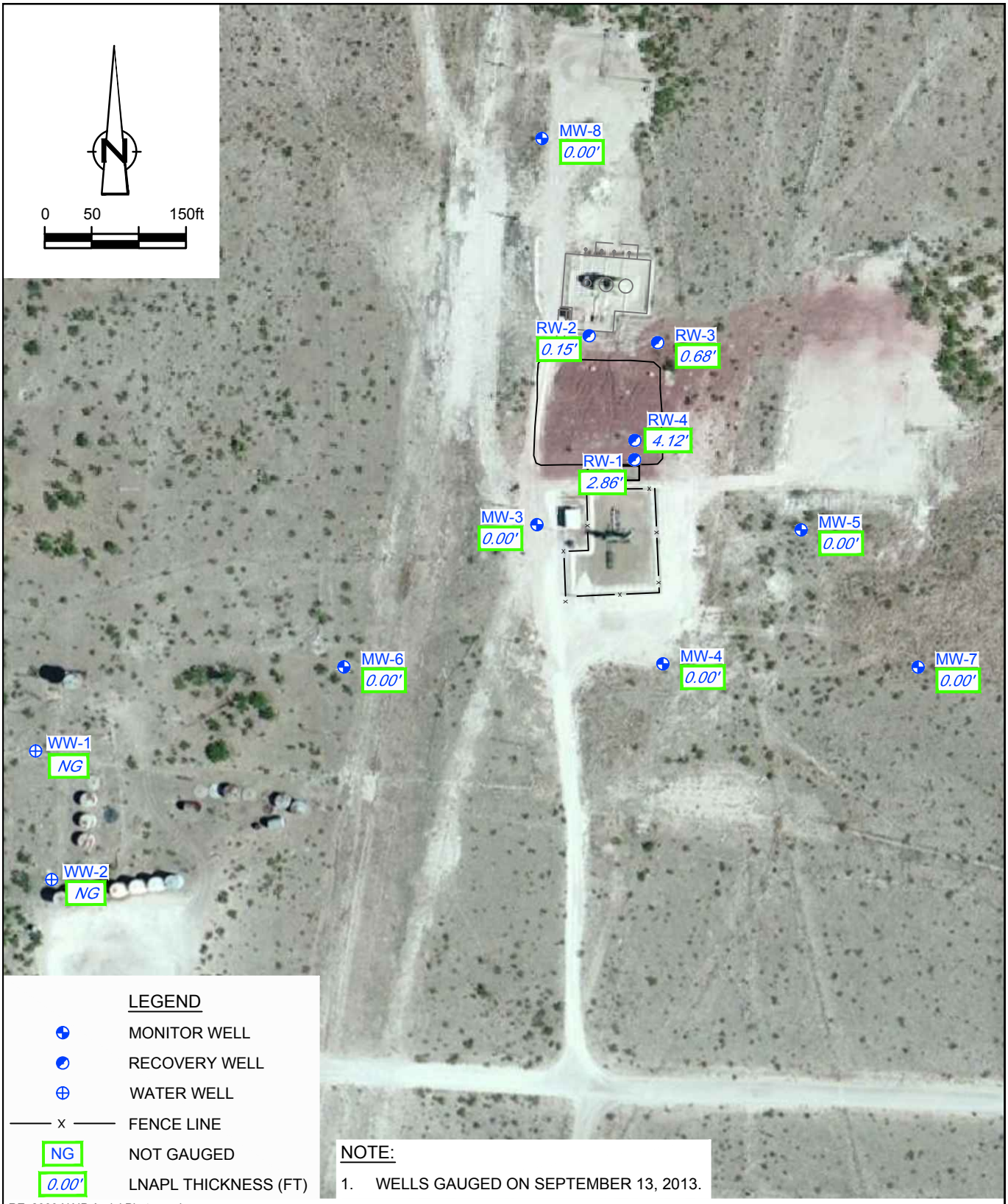

RE: 2009 NAIP Aerial Photograph

figure 9

SEPTEMBER 2013 LNAPL THICKNESS
NEW MEXICO "F" STATE
GROUNDWATER REMEDIATION PROJECT

Chevron Environmental Management Company

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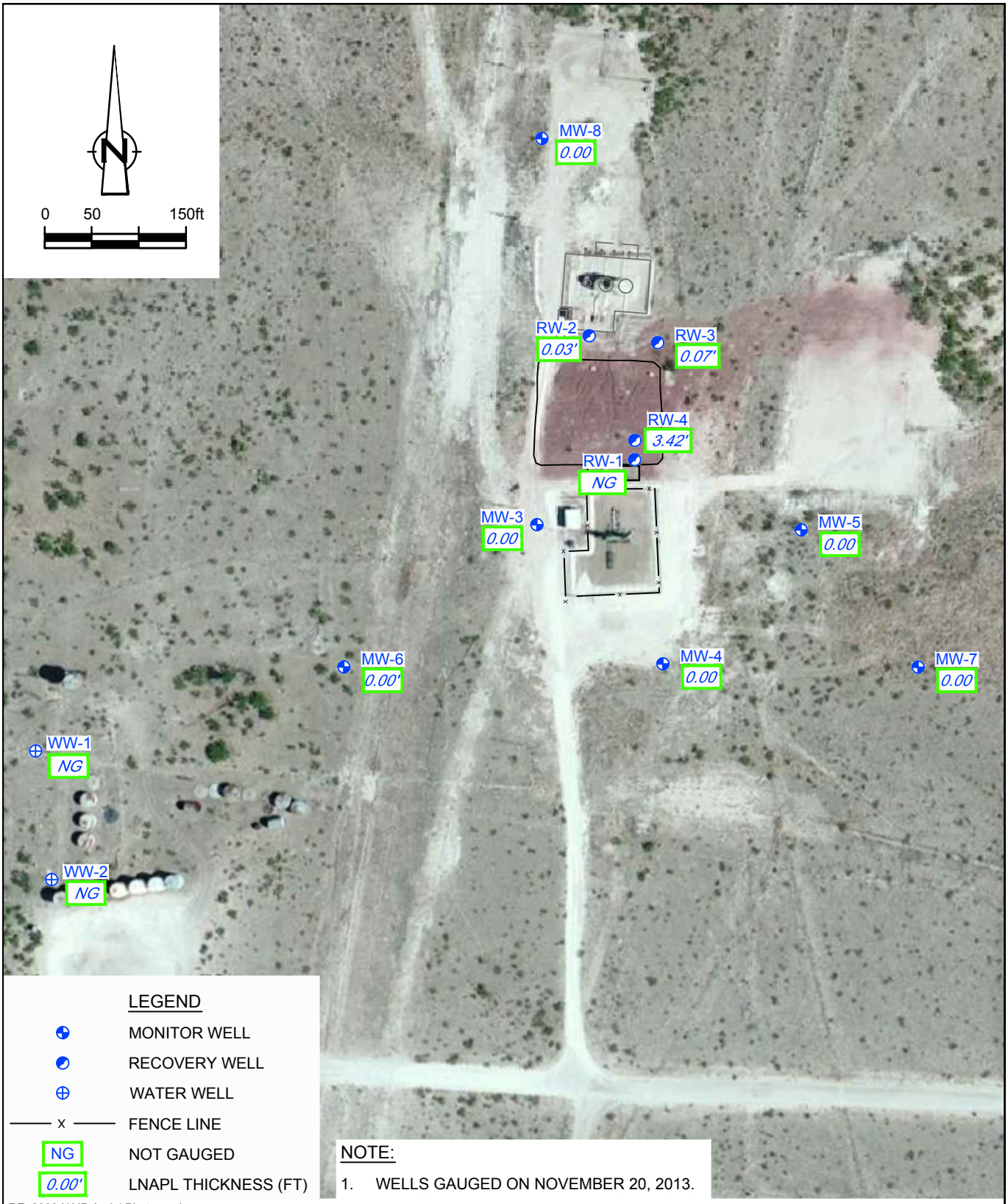

RE: 2009 NAIP Aerial Photograph

figure 10

NOVEMBER 2013 LNAPL THICKNESS
NEW MEXICO "F" STATE
GROUNDWATER REMEDIATION PROJECT

Chevron Environmental Management Company

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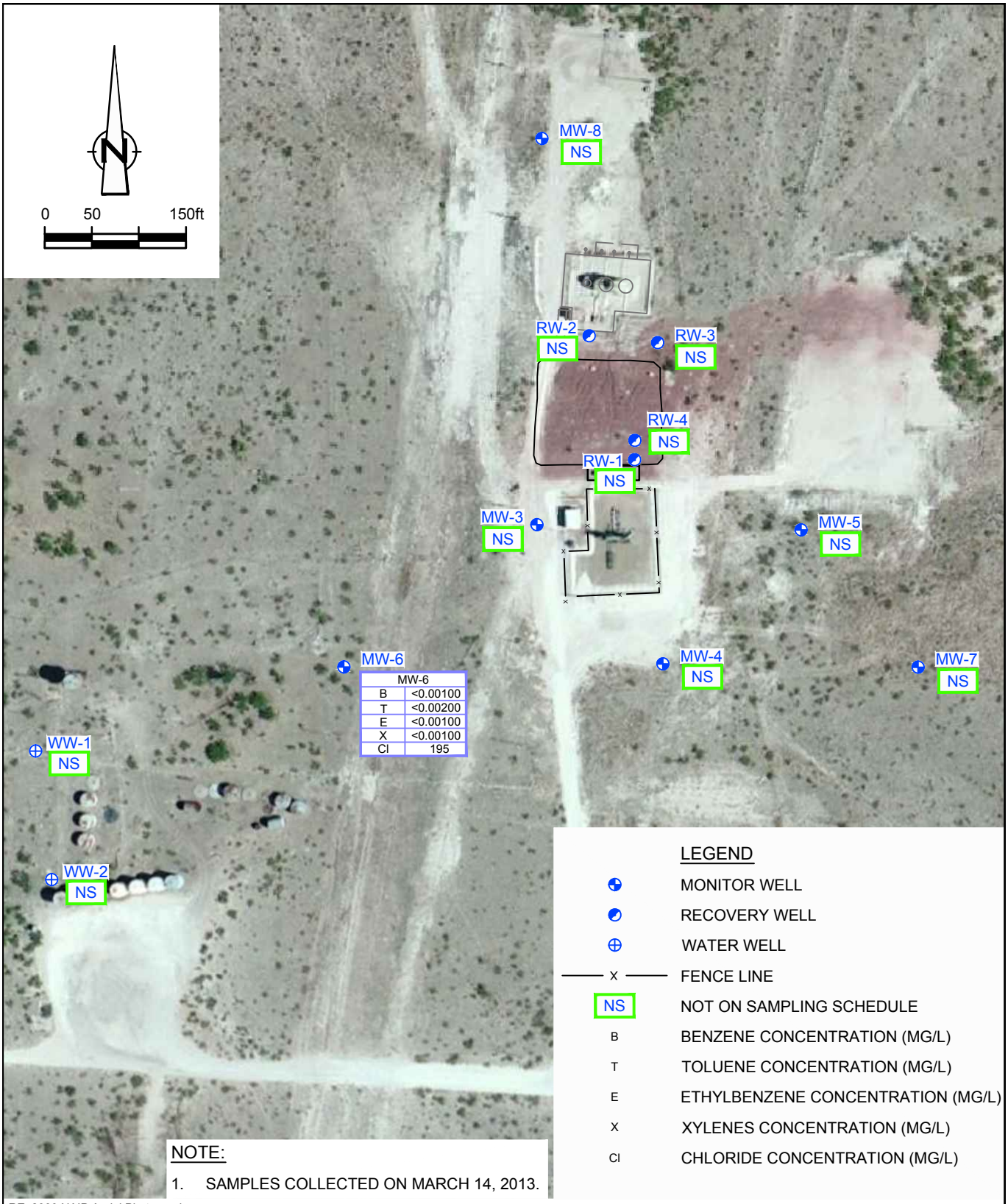

RE: 2009 NAIP Aerial Photograph

figure 11

MARCH 2013 BTEX AND CHLORIDE CONCENTRATION MAP
NEW MEXICO "F" STATE
GROUNDWATER REMEDIATION PROJECT

Chevron Environmental Management Company

CRA

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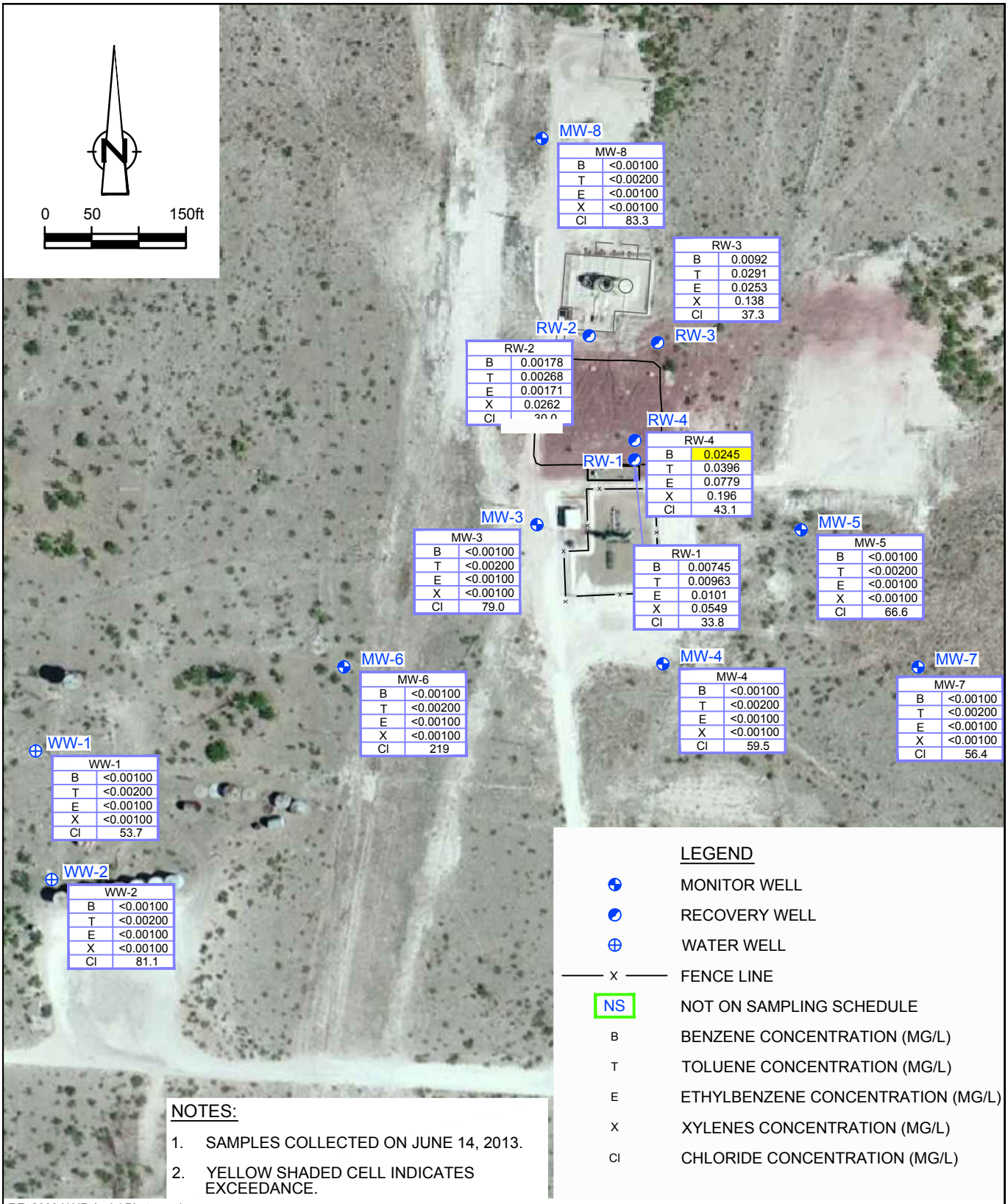

RE: 2009 NAIP Aerial Photograph

figure 12

JUNE 2013 BTEX AND CHLORIDE CONCENTRATION MAP
NEW MEXICO "F" STATE
GROUNDWATER REMEDIATION PROJECT

Chevron Environmental Management Company

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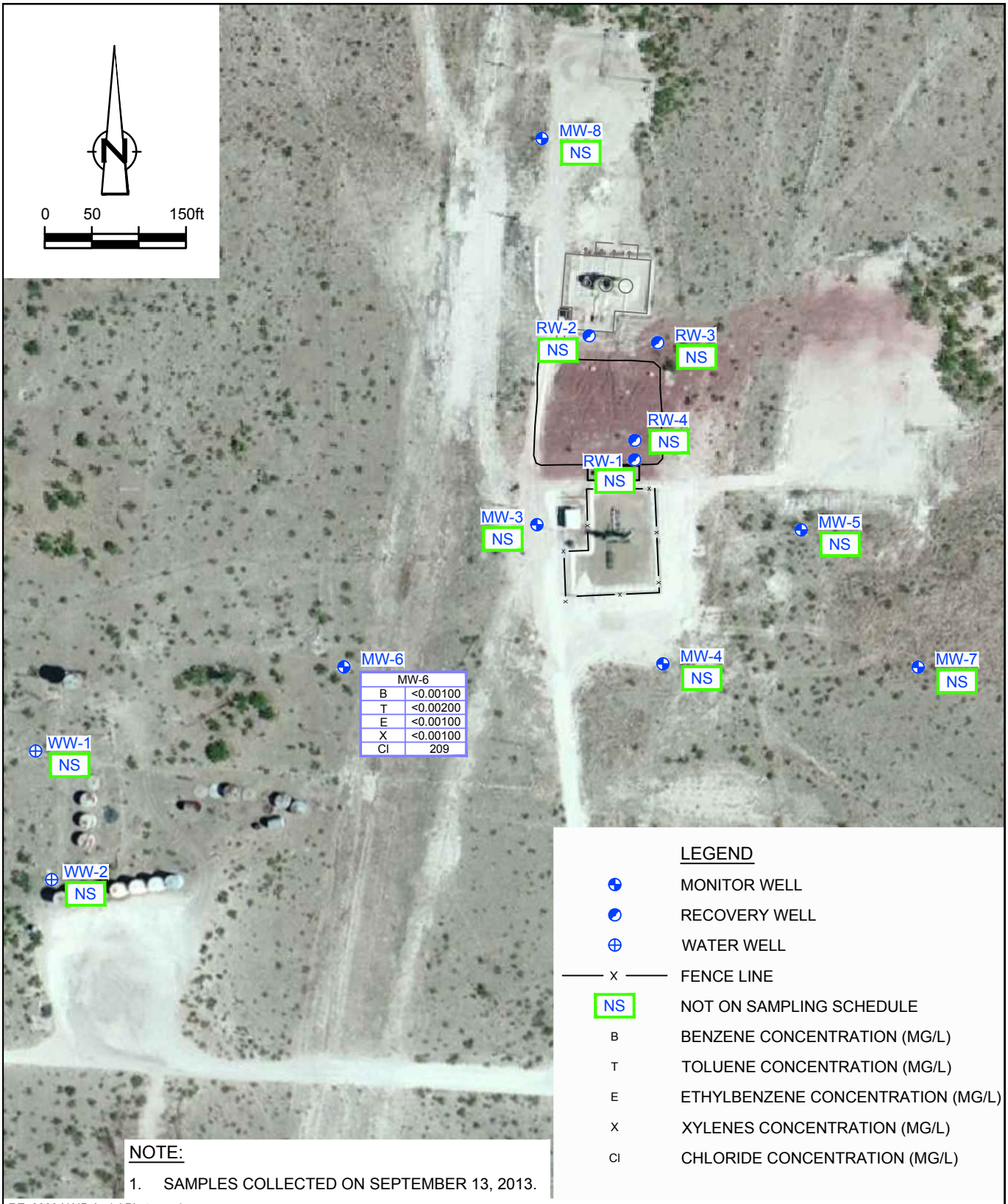

RE: 2009 NAIP Aerial Photograph

figure 13

SEPTEMBER 2013 BTEX AND CHLORIDE CONCENTRATION MAP
NEW MEXICO "F" STATE
GROUNDWATER REMEDIATION PROJECT

Chevron Environmental Management Company

CRA

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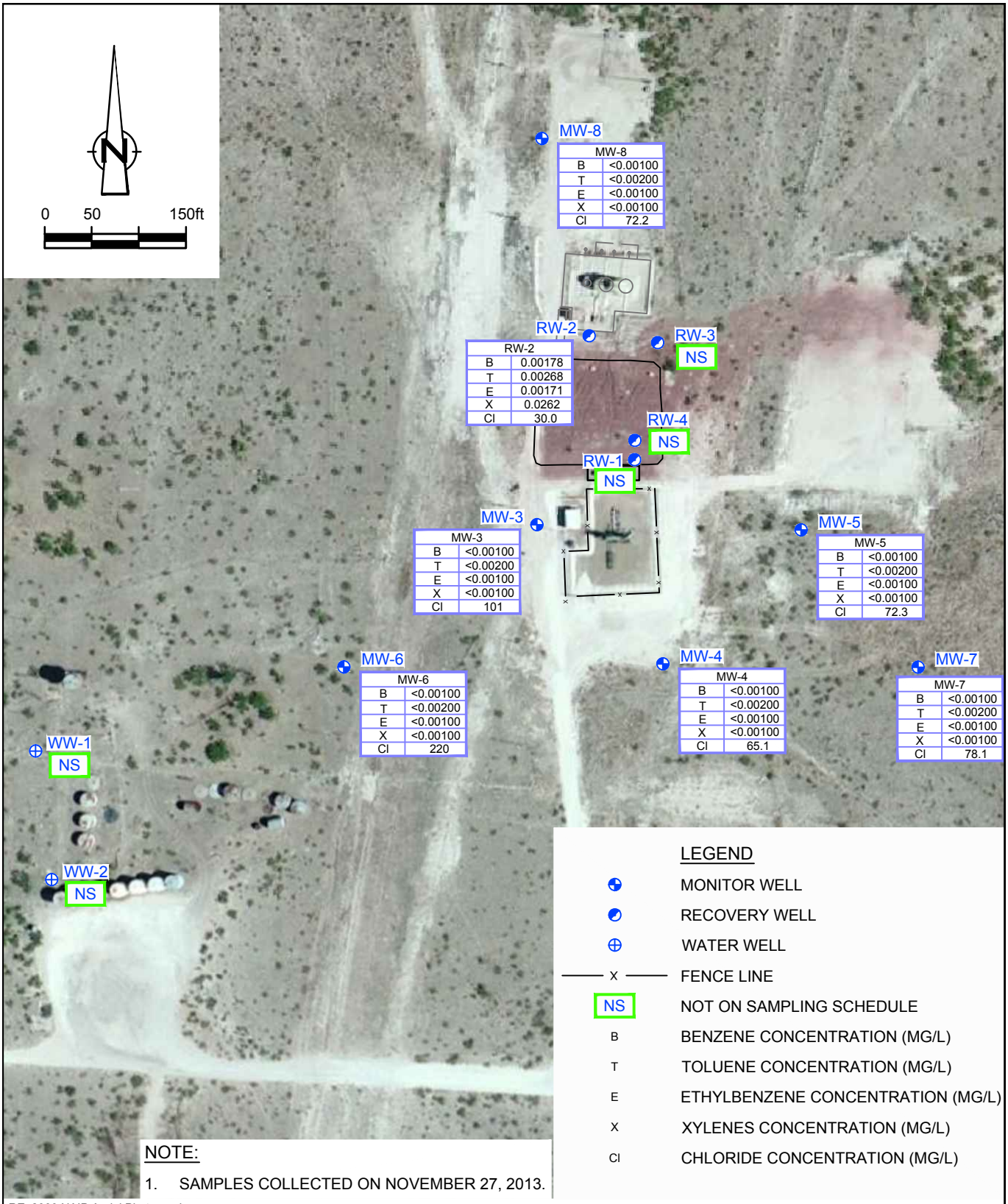

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figure 14

NOVEMBER 2013 BTEX AND CHLORIDE CONCENTRATION MAP
NEW MEXICO "F" STATE
GROUNDWATER REMEDIATION PROJECT

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039122-00(010)GN-DL005 APR 17/2014

TABLES

TABLE I

GROUNDWATER GAUGING SUMMARY
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
FORMER NEW MEXICO "F" STATE TANK BATTERY
LEA COUNTY, NEW MEXICO

Well ID *TOC Elevation*	Collection Date	Depth to Groundwater (ft TOC[2])	Depth to LNAPL (ft TOC)	LNAPL Thickness (ft)	Groundwater Elevation (ft above MSL[3])	Total Well Depth (ft TOC)	Well Screen Interval (ft bgs[4])
MW-3	7/28/98	59.53	---	---	3637.32	70.15	55 - 75
3696.85	6/25/99	59.06	---	---	3637.79	---	---
	2/16/01	59.53	---	---	3637.32	---	---
	6/11/02	59.18	---	---	3637.67	---	---
	11/26/02	59.54	---	---	3637.31	---	---
	6/5/03	59.45	---	---	3637.40	---	---
	12/3/03	59.47	---	---	3637.38	---	---
	7/1/04	59.24	---	---	3637.61	---	---
	12/20/04	58.83	---	---	3638.02	---	---
	6/6/05	58.53	---	---	3638.32	---	---
	12/12/05	57.83	---	---	3639.02	---	---
	1/25/06	57.85	---	---	3639.00	---	---
	5/1/06	57.59	---	---	3639.26	---	---
	6/26/06	57.66	---	---	3639.19	---	---
	12/18/06	57.54	---	---	3639.31	---	---
	3/16/07	57.43	---	---	3639.42	---	---
	6/26/07	57.31	---	---	3639.54	---	---
	9/27/07	57.89	---	---	3638.96	---	---
	12/13/07	57.61	---	---	3639.24	---	---
	3/6/08	57.70	---	---	3639.15	---	---
	6/4/08	57.33	---	---	3639.52	---	---
	9/4/08	57.45	---	---	3639.40	---	---
	11/13/08	57.26	---	---	3639.59	---	---
	3/5/09	57.65	---	---	3639.20	---	---
	6/15/09	57.40	---	---	3639.45	---	---
	9/9/09	57.64	---	---	3639.21	---	---
	11/19/09	57.59	---	---	3639.26	---	---
	3/23/10	57.60	---	---	3639.25	---	---
	6/29/10	58.34	---	---	3638.51	---	---
	9/22/10	58.35	---	---	3638.50	---	---
	11/8/10	57.61	---	---	3639.24	---	---
	6/2/11	57.49	---	---	3639.36	---	---
	12/1/11	58.42	---	---	3638.43	---	---
	3/7/12	57.92	---	---	3638.93	---	---
	6/26/12	57.89	---	---	3638.96	---	---
	9/20/12	58.14	---	---	3638.71	---	---
	11/26/12	58.15	---	---	3638.70	---	---
	3/14/13	58.10	---	---	3638.75	---	---
	6/14/13	58.64	58.63	0.01	3638.22	---	---
	9/13/13	58.48	---	---	3638.37	---	---
	11/20/13	58.02	---	---	3638.83	---	---

TABLE I

GROUNDWATER GAUGING SUMMARY
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
FORMER NEW MEXICO "F" STATE TANK BATTERY
LEA COUNTY, NEW MEXICO

Well ID *TOC Elevation*	Collection Date	Depth to Groundwater (ft TOC[2])	Depth to LNAPL (ft TOC)	LNAPL Thickness (ft)	Groundwater Elevation (ft above MSL[3])	Total Well Depth (ft TOC)	Well Screen Interval (ft bgs[4])
MW-4	7/28/98	69.72	---	---	3629.78	68.74	55 - 75
3699.50	6/25/99	62.31	---	---	3637.19	---	---
	2/16/01	62.52	---	---	3636.98	---	---
	6/11/02	62.39	---	---	3637.11	---	---
	11/26/02	62.76	---	---	3636.74	---	---
	6/5/03	62.71	---	---	3636.79	---	---
	12/3/03	62.67	---	---	3636.83	---	---
	7/1/04	62.43	---	---	3637.07	---	---
	12/20/04	62.02	---	---	3637.48	---	---
	6/6/05	61.67	---	---	3637.83	---	---
	12/12/05	61.11	---	---	3638.39	---	---
	1/25/06	61.11	---	---	3638.39	---	---
	5/1/06	60.89	---	---	3638.61	---	---
	6/26/06	60.93	---	---	3638.57	---	---
	12/18/06	60.79	---	---	3638.71	---	---
	3/16/07	60.72	---	---	3638.78	---	---
	6/26/07	60.60	---	---	3638.90	---	---
	9/27/07	61.02	---	---	3638.48	---	---
	12/13/07	60.88	---	---	3638.62	---	---
	3/6/08	60.96	---	---	3638.54	---	---
	6/4/08	60.65	---	---	3638.85	---	---
	9/4/08	60.75	---	---	3638.75	---	---
	11/13/08	60.61	---	---	3638.89	---	---
	3/5/09	60.75	---	---	3638.75	---	---
	6/15/09	60.70	---	---	3638.80	---	---
	9/9/09	60.89	---	---	3638.61	---	---
	11/19/09	60.83	---	---	3638.67	---	---
	3/23/10	60.91	---	---	3638.59	---	---
	6/29/10	61.54	---	---	3637.96	---	---
	9/22/10	61.53	---	---	3637.97	---	---
	11/8/10	60.96	---	---	3638.54	---	---
	6/2/11	60.85	---	---	3638.65	---	---
	12/1/11	61.63	---	---	3637.87	---	---
	3/7/12	61.16	---	---	3638.34	---	---
	6/26/12	61.16	---	---	3638.34	---	---
	9/20/12	61.33	---	---	3638.17	---	---
	11/26/12	61.40	---	---	3638.10	---	---
	3/14/13	61.75	---	---	3637.75	---	---
	6/14/13	61.80	---	---	3637.70	---	---
	9/13/13	61.70	---	---	3637.80	---	---
	11/20/13	61.18	---	---	3638.32	---	---

TABLE I

GROUNDWATER GAUGING SUMMARY
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
FORMER NEW MEXICO "F" STATE TANK BATTERY
LEA COUNTY, NEW MEXICO

Well ID *TOC Elevation*	Collection Date	Depth to Groundwater (ft TOC[2])	Depth to LNAPL (ft TOC)	LNAPL Thickness (ft)	Groundwater Elevation (ft above MSL[3])	Total Well Depth (ft TOC)	Well Screen Interval (ft bgs[4])
MW-5	7/28/98	56.53	---	---	3636.99	66.80	48 - 68
3693.52	3/23/99	56.30	---	---	3637.22	---	---
	6/25/99	56.21	---	---	3637.31	---	---
	2/16/01	56.31	---	---	3637.21	---	---
	6/11/02	56.29	---	---	3637.23	---	---
	11/26/02	56.13	---	---	3637.39	---	---
	6/5/03	56.53	---	---	3636.99	---	---
	12/3/03	56.57	---	---	3636.95	---	---
	7/1/04	54.34	---	---	3639.18	---	---
	12/20/04	55.86	---	---	3637.66	---	---
	6/6/05	55.60	---	---	3637.92	---	---
	12/12/05	55.04	---	---	3638.48	---	---
	1/25/06	55.07	---	---	3638.45	---	---
	5/1/06	54.87	---	---	3638.65	---	---
	6/26/06	54.86	---	---	3638.66	---	---
	12/18/06	54.61	---	---	3638.91	---	---
	3/16/07	54.51	---	---	3639.01	---	---
	6/26/07	54.49	---	---	3639.03	---	---
	9/27/07	54.84	---	---	3638.68	---	---
	12/13/07	54.74	---	---	3638.78	---	---
	3/6/08	54.77	---	---	3638.75	---	---
	6/4/08	54.58	---	---	3638.94	---	---
	9/4/08	54.68	---	---	3638.84	---	---
	11/13/08	54.57	---	---	3638.95	---	---
	3/5/09	54.70	---	---	3638.82	---	---
	6/15/09	54.69	---	---	3638.83	---	---
	9/9/09	54.86	---	---	3638.66	---	---
	11/19/09	54.81	---	---	3638.71	---	---
	3/23/10	54.80	---	---	3638.72	---	---
	6/29/10	55.38	---	---	3638.14	---	---
	9/22/10	55.40	---	---	3638.12	---	---
	11/8/10	54.84	---	---	3638.68	---	---
	6/2/11	55.79	---	---	3637.73	---	---
	12/1/11	55.49	---	---	3638.03	---	---
	3/7/12	54.14	---	---	3639.38	---	---
	6/26/12	55.14	---	---	3638.38	---	---
	9/20/12	55.28	---	---	3638.24	---	---
	11/26/12	55.37	---	---	3638.15	---	---
	3/14/13	55.30	---	---	3638.22	---	---
	6/14/13	55.60	---	---	3637.92	---	---
	9/13/13	55.54	---	---	3637.98	---	---
	11/20/13	55.34	---	---	3638.18	---	---

TABLE I

GROUNDWATER GAUGING SUMMARY
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
FORMER NEW MEXICO "F" STATE TANK BATTERY
LEA COUNTY, NEW MEXICO

Well ID *TOC Elevation*	Collection Date	Depth to Groundwater (ft TOC[2])	Depth to LNAPL (ft TOC)	LNAPL Thickness (ft)	Groundwater Elevation (ft above MSL[3])	Total Well Depth (ft TOC)	Well Screen Interval (ft bgs[4])
MW-6	7/28/98	67.86	---	---	3636.95	78.25	56 - 76
3704.81	6/25/99	67.25	---	---	3637.56	---	---
	2/16/01	67.45	---	---	3637.36	---	---
	6/11/02	67.19	---	---	3637.62	---	---
	11/26/02	67.09	---	---	3637.72	---	---
	6/5/03	67.57	---	---	3637.24	---	---
	12/3/03	67.61	---	---	3637.20	---	---
	7/1/04	67.43	---	---	3637.38	---	---
	12/20/04	67.55	---	---	3637.26	---	---
	6/6/05	66.41	---	---	3638.40	---	---
	12/12/05	65.80	---	---	3639.01	---	---
	1/25/06	65.88	---	---	3638.93	---	---
	5/1/06	65.57	---	---	3639.24	---	---
	6/26/06	65.82	---	---	3638.99	---	---
	12/18/06	65.67	---	---	3639.14	---	---
	3/16/07	65.69	---	---	3639.12	---	---
	6/26/07	65.41	---	---	3639.40	---	---
	9/27/07	66.46	---	---	3638.35	---	---
	12/13/07	65.85	---	---	3638.96	---	---
	3/6/08	65.68	---	---	3639.13	---	---
	6/4/08	65.39	---	---	3639.42	---	---
	9/4/08	65.56	---	---	3639.25	---	---
	11/13/08	65.32	---	---	3639.49	---	---
	3/5/09	65.88	---	---	3638.93	---	---
	6/15/09	65.38	---	---	3639.43	---	---
	9/9/09	65.67	---	---	3639.14	---	---
	11/19/09	65.70	---	---	3639.11	---	---
	3/23/10	65.69	---	---	3639.12	---	---
	6/29/10	66.69	---	---	3638.12	---	---
	9/22/10	66.72	---	---	3638.09	---	---
	11/8/10	65.75	---	---	3639.06	---	---
	3/3/11	65.52	---	---	3639.29	---	---
	6/2/11	65.28	---	---	3639.53	---	---
	9/27/11	67.49	---	---	3637.32	---	---
	12/1/11	66.55	---	---	3638.26	---	---
	3/7/12	66.00	---	---	3638.81	---	---
	6/26/12	65.92	---	---	3638.89	---	---
	9/20/12	66.53	---	---	3638.28	---	---
	11/26/12	66.19	---	---	3638.62	---	---
	3/14/13	65.96	---	---	3638.85	---	---
	6/14/13	67.08	---	---	3637.73	---	---
	9/13/13	66.75	---	---	3638.06	---	---
	11/20/13	65.94	---	---	3638.87	---	---

TABLE I

GROUNDWATER GAUGING SUMMARY
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
FORMER NEW MEXICO "F" STATE TANK BATTERY
LEA COUNTY, NEW MEXICO

Well ID *TOC Elevation*	Collection Date	Depth to Groundwater (ft TOC[2])	Depth to LNAPL (ft TOC)	LNAPL Thickness (ft)	Groundwater Elevation (ft above MSL[3])	Total Well Depth (ft TOC)	Well Screen Interval (ft bgs[4])
MW-7	7/28/98	58.08	---	---	3636.50	68.88	49 - 69
3694.58	6/25/99	57.96	---	---	3636.62	---	---
	2/16/01	58.09	---	---	3636.49	---	---
	6/11/02	58.07	---	---	3636.51	---	---
	11/26/02	57.92	---	---	3636.66	---	---
	6/5/03	58.29	---	---	3636.29	---	---
	12/3/03	58.33	---	---	3636.25	---	---
	7/1/04	58.11	---	---	3636.47	---	---
	12/20/04	57.62	---	---	3636.96	---	---
	6/6/05	57.28	---	---	3637.30	---	---
	12/12/05	56.84	---	---	3637.74	---	---
	1/25/06	56.86	---	---	3637.72	---	---
	5/1/06	56.69	---	---	3637.89	---	---
	6/26/06	56.66	---	---	3637.92	---	---
	12/18/06	56.40	---	---	3638.18	---	---
	3/16/07	56.28	---	---	3638.30	---	---
	6/26/07	56.29	---	---	3638.29	---	---
	9/27/07	56.59	---	---	3637.99	---	---
	12/13/07	56.51	---	---	3638.07	---	---
	3/6/08	56.56	---	---	3638.02	---	---
	6/4/08	56.38	---	---	3638.20	---	---
	9/4/08	56.49	---	---	3638.09	---	---
	11/13/08	56.40	---	---	3638.18	---	---
	3/5/09	56.48	---	---	3638.10	---	---
	6/15/09	56.51	---	---	3638.07	---	---
	9/9/09	56.64	---	---	3637.94	---	---
	11/19/09	56.59	---	---	3637.99	---	---
	3/23/10	56.63	---	---	3637.95	---	---
	6/29/10	57.13	---	---	3637.45	---	---
	9/22/10	57.15	---	---	3637.43	---	---
	11/8/10	56.61	---	---	3637.97	---	---
	6/2/11	56.58	---	---	3638.00	---	---
	12/1/11	57.22	---	---	3637.36	---	---
	3/7/12	56.92	---	---	3637.66	---	---
	6/26/12	56.93	---	---	3637.65	---	---
	9/20/12	57.01	---	---	3637.57	---	---
	11/26/12	57.13	---	---	3637.45	---	---
	3/14/13	57.02	---	---	3637.56	---	---
	6/14/13	57.26	---	---	3637.32	---	---
	9/13/13	57.30	---	---	3637.28	---	---
	11/20/13	56.93	---	---	3637.65	---	---

TABLE I

GROUNDWATER GAUGING SUMMARY
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
FORMER NEW MEXICO "F" STATE TANK BATTERY
LEA COUNTY, NEW MEXICO

Well ID *TOC Elevation*	Collection Date	Depth to Groundwater (ft TOC[2])	Depth to LNAPL (ft TOC)	LNAPL Thickness (ft)	Groundwater Elevation (ft above MSL[3])	Total Well Depth (ft TOC)	Well Screen Interval (ft bgs[4])
MW-8	7/28/98	56.84	---	---	3637.74	66.91	46 - 66
3694.58	6/25/99	56.56	---	---	3638.02	---	---
	2/16/01	56.49	---	---	3638.09	---	---
	6/11/02	56.56	---	---	3638.02	---	---
	11/26/02	56.88	---	---	3637.70	---	---
	6/5/03	56.89	---	---	3637.69	---	---
	12/3/03	56.91	---	---	3637.67	---	---
	7/1/04	56.70	---	---	3637.88	---	---
	12/20/04	56.23	---	---	3638.35	---	---
	6/6/05	55.86	---	---	3638.72	---	---
	12/12/05	55.29	---	---	3639.29	---	---
	1/25/06	55.30	---	---	3639.28	---	---
	5/1/06	55.03	---	---	3639.55	---	---
	6/26/06	54.96	---	---	3639.62	---	---
	12/18/06	54.80	---	---	3639.78	---	---
	3/16/07	54.68	---	---	3639.90	---	---
	6/26/07	54.67	---	---	3639.91	---	---
	9/27/07	54.95	---	---	3639.63	---	---
	12/13/07	54.82	---	---	3639.76	---	---
	3/6/08	54.82	---	---	3639.76	---	---
	6/4/08	54.70	---	---	3639.88	---	---
	9/4/08	54.77	---	---	3639.81	---	---
	11/13/08	54.73	---	---	3639.85	---	---
	3/5/09	55.05	---	---	3639.53	---	---
	6/15/09	54.96	---	---	3639.62	---	---
	9/9/09	55.14	---	---	3639.44	---	---
	11/19/09	55.12	---	---	3639.46	---	---
	3/23/10	55.16	---	---	3639.42	---	---
	6/29/10	55.66	---	---	3638.92	---	---
	9/22/10	55.65	---	---	3638.93	---	---
	11/8/10	55.12	---	---	3639.46	---	---
	6/2/11	55.02	---	---	3639.56	---	---
	12/1/11	55.73	---	---	3638.85	---	---
	3/7/12	55.46	---	---	3639.12	---	---
	6/26/12	55.46	---	---	3639.12	---	---
	9/20/12	55.50	---	---	3639.08	---	---
	11/26/12	55.57	---	---	3639.01	---	---
	3/14/13	55.38	---	---	3639.20	---	---
	6/14/13	55.61	---	---	3638.97	---	---
	9/13/13	55.65	---	---	3638.93	---	---
	11/20/13	55.43	---	---	3639.15	---	---

TABLE I

GROUNDWATER GAUGING SUMMARY
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
FORMER NEW MEXICO "F" STATE TANK BATTERY
LEA COUNTY, NEW MEXICO

Well ID *TOC Elevation*	Collection Date	Depth to Groundwater (ft TOC[2])	Depth to LNAPL (ft TOC)	LNAPL Thickness (ft)	Groundwater Elevation (ft above MSL[3])	Total Well Depth (ft TOC)	Well Screen Interval (ft bgs[4])
RW-1	11/3/99	62.17	---	---	3637.75	71.60	55 - 75
3699.92	2/16/01	62.37	62.33	0.04	3637.59	---	---
	6/11/02	62.26	61.86	0.40	3638.01	---	---
	11/26/02	62.60	62.07	0.53	3637.79	---	---
	6/5/03	63.00	62.84	0.16	3637.06	---	---
	12/3/03	63.26	62.61	0.65	3637.23	---	---
	7/1/04	63.10	62.33	0.77	3637.50	---	---
	12/20/04	61.80	60.96	0.84	3638.86	---	---
	3/1/05	Start-up groundwater extraction system				---	---
	1/25/06	61.44	58.67	2.77	3640.92	---	---
	5/1/06	61.56	58.38	3.18	3641.16	---	---
	6/26/06	61.59	58.43	3.16	3641.11	---	---
	12/18/06	58.78	58.55	0.23	3641.34	---	---
	3/16/07	58.74	58.30	0.44	3641.57	---	---
	6/26/07	58.52	58.37	0.15	3641.53	---	---
	9/27/07	59.40	58.72	0.68	3641.13	---	---
	12/13/07	60.90	58.44	2.46	3641.23	---	---
	3/6/08	59.24	58.76	0.48	3641.11	---	---
	6/4/08	59.37	58.59	0.78	3641.25	---	---
	9/4/08	58.82	58.51	0.31	3641.38	---	---
	11/13/08	60.59	58.10	2.49	3641.56	---	---
	3/5/09	60.82	58.50	2.32	3641.18	---	---
	6/15/09	60.65	58.28	2.37	3641.40	---	---
	9/9/09	60.77	58.50	2.27	3641.19	---	---
	11/19/09	58.96	58.63	0.33	3641.26	---	---
	3/23/10	61.51	58.80	2.71	3640.84	---	---
	6/29/10	62.18	59.00	3.18	3640.59	---	---
	9/22/10	60.80	58.40	2.40	3641.27	---	---
	11/8/10	61.16	58.39	2.77	3641.24	---	---
	6/2/11	61.23	58.36	2.87	3641.26	---	---
	9/27/11	62.44	59.43	3.01	3640.18	---	---
	12/2/11	62.24	58.95	3.29	3640.63	---	---
	3/7/12	61.10	58.80	2.30	3640.88	---	---
	6/26/12	60.80	58.80	2.00	3640.91	---	---
	9/20/12	62.09	58.84	3.25	3640.75	---	---
	11/26/12	62.24	58.85	3.39	3640.72	---	---
	3/14/13	61.96	58.72	3.24	3640.87	---	---
	6/14/13	62.51	59.12	3.39	3640.45	---	---
	9/13/13	62.91	60.05	2.86	3639.58	---	---
	11/20/13	not gauged					

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GROUNDWATER GAUGING SUMMARY
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
FORMER NEW MEXICO "F" STATE TANK BATTERY
LEA COUNTY, NEW MEXICO

Well ID *TOC Elevation*	Collection Date	Depth to Groundwater (ft TOC[2])	Depth to LNAPL (ft TOC)	LNAPL Thickness (ft)	Groundwater Elevation (ft above MSL[3])	Total Well Depth (ft TOC)	Well Screen Interval (ft bgs[4])
RW-2	10/14/99	53.28	---	---	3638.84	67.55	47 - 67
3692.12	11/3/99	53.95	---	---	3638.17	---	---
	2/16/01	54.01	---	---	3638.11	---	---
	6/11/02	54.01	53.98	0.03	3638.14	---	---
	11/26/02	54.28	54.07	0.21	3638.02	---	---
	6/5/03	53.24	53.23	0.01	3638.89	---	---
	12/3/03	54.51	54.38	0.13	3637.72	---	---
	7/1/04	54.51	54.12	0.39	3637.95	---	---
	12/20/04	53.69	53.52	0.17	3638.58	---	---
	3/1/05	Start-up groundwater extraction system				---	---
	1/25/06	51.55	51.14	0.41	3640.93	---	---
	5/1/06	51.34	50.91	0.43	3641.16	---	---
	6/26/06	51.02	50.94	0.08	3641.17	---	---
	11/28/06	Absorbant sock installed in well					
	12/18/06	51.15	50.75	0.40	3641.32	---	---
	3/16/07	50.69	---	---	3641.43	---	---
	6/26/07	50.63	---	---	3641.49	---	---
	9/27/07	51.00	---	---	3641.12	---	---
	12/13/07	50.92	---	---	3641.20	---	---
	3/6/08	50.90	---	---	3641.22	---	---
	6/4/08	50.65	---	---	3641.47	---	---
	9/4/08	50.73	---	---	3641.39	---	---
	11/13/08	50.67	---	---	3641.45	---	---
	3/5/09	51.03	---	---	3641.09	---	---
	6/15/09	50.80	---	---	3641.32	---	---
	9/9/09	51.02	50.97	0.05	3641.14	---	---
	11/19/09	50.99	50.95	0.04	3641.17	---	---
	3/23/10	51.16	---	---	3640.96	---	---
	6/29/10	51.70	51.56	0.14	3640.55	---	---
	9/22/10	51.65	---	---	3640.47	---	---
	11/8/10	50.95	50.94	0.01	3641.18	---	---
	11/29/10	50.89	---	---	3641.23	---	---
	2/4/11	50.82	---	---	3641.30	---	---
	6/2/11	50.91	---	---	3641.21	---	---
	9/27/11	51.97	---	---	3640.15	---	---
	12/2/11	51.85	---	---	3640.27	---	---
	3/7/12	51.33	---	---	3640.79	---	---
	6/26/12	51.35	51.27	0.08	3640.84	---	---
	9/20/12	51.54	51.40	0.14	3640.71	---	---
	11/26/12	55.26	---	---	3636.86	---	---
	3/14/13	51.50	---	---	3640.62	---	---
	6/14/13	52.20	51.73	0.47	3640.34	---	---
	9/13/13	51.89	51.74	0.15	3640.36	---	---
	11/20/13	51.29	51.26	0.03	3640.86	---	---

TABLE I

GROUNDWATER GAUGING SUMMARY
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
FORMER NEW MEXICO "F" STATE TANK BATTERY
LEA COUNTY, NEW MEXICO

Well ID *TOC Elevation*	Collection Date	Depth to Groundwater (ft TOC[2])	Depth to LNAPL (ft TOC)	LNAPL Thickness (ft)	Groundwater Elevation (ft above MSL[3])	Total Well Depth (ft TOC)	Well Screen Interval (ft bgs[4])
RW-3	10/14/99	45.82	---	---	3645.04	68.65	47 - 67
3690.86	11/3/99	52.82	---	---	3638.04	---	---
	2/16/01	52.88	---	---	3637.98	---	---
	6/11/02	52.91	---	---	3637.95	---	---
	11/26/02	53.22	53.15	0.07	3637.70	---	
	6/5/03	54.56	54.40	0.16	3636.44	---	---
	12/3/03	53.23	---	---	3637.63	---	---
	7/1/04	53.19	52.98	0.21	3637.85	---	---
	12/20/04	52.50	52.09	0.41	3638.72	---	---
	3/1/05	Start-up groundwater extraction system				---	---
	1/25/06	50.71	---	---	3640.15	---	---
	5/1/06	50.49	---	---	3640.37	---	---
	6/26/06	50.50	---	---	3640.36	---	---
	11/28/06	Absorbant sock installed in well					
	12/18/06	50.31	---	---	3640.55	---	---
	3/16/07	50.22	---	---	3640.64	---	---
	6/26/07	50.15	---	---	3640.71	---	---
	9/27/07	50.49	---	---	3640.37	---	---
	12/13/07	52.38	---	---	3638.48	---	---
	3/6/08	50.42	---	---	3640.44	---	---
	6/4/08	50.32	---	---	3640.54	---	---
	9/4/08	50.90	---	---	3639.96	---	---
	11/13/08	50.15	---	---	3640.71	---	---
	3/5/09	50.49	---	---	3640.37	---	---
	6/15/09	50.35	---	---	3640.51	---	---
	9/9/09	50.52	---	---	3640.34	---	---
	11/19/09	50.50	---	---	3640.36	---	---
	3/23/10	51.73	---	---	3639.13	---	---
	6/29/10	51.10	---	---	3639.76	---	---
	9/22/10	51.22	---	---	3639.64	---	---
	11/8/10	50.65	50.64	0.01	3640.22	---	---
	2/4/11	50.39	---	---	3640.47	---	---
	6/2/11	54.01	---	---	3636.85	---	---
	9/27/11	51.55	---	---	3639.31	---	---
	12/2/11	51.39	---	---	3639.47	---	---
	3/7/12	51.00	50.85	0.15	3639.99	---	---
	6/26/12	50.90	50.84	0.06	3640.01	---	---
	9/20/12	Not Gauged - Obstruction in Well					
	11/26/12	Not Gauged - Obstruction in Well					
	3/14/13	51.02	---	---	3639.84	51.10	---
	6/14/13	51.41	51.25	0.16	3640.85	---	---
	9/13/13	51.70	51.02	0.68	3641.03	---	---
	11/20/13	50.93	50.86	0.07	3641.25	---	---

TABLE I

GROUNDWATER GAUGING SUMMARY
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
FORMER NEW MEXICO "F" STATE TANK BATTERY
LEA COUNTY, NEW MEXICO

Well ID *TOC Elevation*	Collection Date	Depth to Groundwater (ft TOC[2])	Depth to LNAPL (ft TOC)	LNAPL Thickness (ft)	Groundwater Elevation (ft above MSL[3])	Total Well Depth (ft TOC)	Well Screen Interval (ft bgs[4])
RW-4	6/2/11	60.44	59.40	1.04	3640.43	75.00	35-75
3699.94	6/21/11	63.15	59.35	3.80	3640.20	---	---
	9/27/11	65.66	59.95	5.71	3639.40	---	---
	12/2/11	63.54	59.82	3.72	3639.74	---	---
	3/7/12	60.21	59.90	0.31	3640.01	---	---
	6/26/12	63.06	59.55	3.51	3640.03	---	---
	9/20/12	63.10	56.08	7.02	3643.14	---	---
	11/26/12	63.67	59.70	3.97	3639.83	---	---
	3/14/13	63.68	59.98	3.70	3639.58	---	---
	6/14/13	not gauged				---	---
	9/13/13	63.14	59.02	4.12	3640.50	---	---
	11/20/13	62.98	59.56	3.42	3640.03	---	---
WW-1	6/11/02	66.35	---	---	3637.82	Unknown	Unknown
3704.17	6/5/03	68.25	---	---	3635.92	---	---
WW-2	6/11/02	66.18	---	---	3637.66	Unknown	Unknown
3703.84	11/26/02	66.18	---	---	3637.66	---	---
	6/5/03	68.54	---	---	3635.30	---	---

Notes:

1. Data through June 6, 2005 provided by Larson & Associates, Inc.
2. TOC - Top of Casing.
3. MSL - Mean Sea Level.
4. bgs - Below ground surface.
5. Corrected groundwater elevations from July 1998 to December 2006 were calculated using LNAPL specific gravity of 0.88.
6. Corrected groundwater elevations from January 2007 to current were calculated using LNAPL specific gravity of 0.897.
7. MW-1, MW-2 and MW-9 were plugged and abandoned and replaced with RW-1, RW-2 and RW-3 in November 1999.
8. Monitor wells (MWs) are 2-inch in diameter; Recovery wells (RWs) are 4-inch in diameter.

TABLE II

GROUNDWATER ANALYTICAL SUMMARY
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
FORMER NEW MEXICO "F" STATE TANK BATTERY
LEA COUNTY, NEW MEXICO

Sample ID	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Chloride
New Mexico Water Quality Control Commission Groundwater Standard		0.01[1]	0.75[1]	0.75[1]	0.62[1]	250.0[2]
MW-3	7/28/98	**0.003**	<0.001	<0.001	**0.002**	**36.0**
	2/16/01	<0.005	<0.005	<0.005	<0.005	**31**
	6/12/02	<0.005	<0.005	<0.005	<0.005	**27.1**
	11/26/03	<0.001	<0.001	<0.001	<0.001	**31.9**
	6/6/03	<0.001	<0.001	<0.001	<0.001	**27.5**
	12/4/03	<0.001	<0.001	<0.001	**0.0017**	**26.1**
	7/2/04	<0.005	<0.005	<0.005	<0.005	**28.0**
	12/21/04	<0.005	<0.005	<0.005	<0.005	**32.3**
	6/6/05	<0.00100	<0.00100	<0.00100	<0.00100	**34.3**
	12/13/05	<0.005	<0.005	<0.005	<0.010	**29.3**
	6/27/06	<0.000500	<0.000500	<0.000500	<0.001	**31.1**
	12/19/06	<0.005	<0.005	<0.005	<0.001	**28.0**
	6/27/07	<0.000500	<0.000500	<0.000500	<0.00100	**31.0**
	12/14/07	<0.000500	<0.000500	<0.000500	<0.00100	**31**
	6/5/08	<0.00037	<0.00039	<0.00042	<0.00035	**30**
DUP	11/14/08	<0.00037	<0.00039	<0.00042	<0.00035	**32**
	11/14/08	<0.00037	<0.00039	<0.00042	<0.00035	**32**
	6/16/09	<0.00037	<0.00039	<0.00042	<0.00035	**35**
	11/20/09	<0.00037	<0.00039	<0.00042	<0.00035	**40**
	7/1/10	<0.00020	<0.00020	<0.00020	<0.00070	**50.4**
	11/9/10	<0.00010	<0.00010	<0.00010	<0.00030	**64.0**
	6/2/11	**0.00053J**	**0.00061J**	<0.0010	<0.0030	**90.7**
	12/2/11	<0.00010	<0.00010	<0.00010	<0.00030	**85.0**
DUP	12/2/11	<0.00010	<0.00010	<0.00010	<0.00030	**85.7**
	6/26/12	<0.000100	<0.000100	<0.000100	<0.000100	**114**
	11/26/12	<0.000100	<0.000200	**0.00116**	**0.00345**	**94.6**
	6/14/13	<0.001	<0.002	<0.001	<0.001	**79.0**
	11/27/13	<0.001	<0.002	<0.001	<0.001	**101**

TABLE II

GROUNDWATER ANALYTICAL SUMMARY
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
FORMER NEW MEXICO "F" STATE TANK BATTERY
LEA COUNTY, NEW MEXICO

Sample ID	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Chloride
New Mexico Water Quality Control Commission Groundwater Standard		**0.01[1]**	**0.75[1]**	**0.75[1]**	**0.62[1]**	**250.0[2]**
MW-4	7/28/98	<0.001	<0.001	<0.001	<0.001	**94.0**
	2/16/01	<0.005	<0.005	<0.005	**0.008**	**170**
	6/12/02	<0.005	<0.005	<0.005	<0.005	**85.6**
	11/26/03	**0.002**	<0.001	<0.001	<0.005	**160.0**
	6/6/03	<0.001	<0.001	<0.001	**0.0026**	**111.0**
	12/4/03	**0.0015**	<0.001	<0.001	<0.001	**104.0**
	7/2/04	<0.001	<0.001	<0.001	<0.001	**72.4**
	12/21/04	<0.005	<0.005	<0.005	<0.005	**59.7**
	6/6/05	<0.00100	<0.00100	<0.00100	<0.00100	**58.4**
	12/13/05	<0.005	<0.005	<0.005	<0.010	**55.3**
	6/27/06	**0.000597**	<0.000500	<0.000500	<0.001	**48.8**
	12/19/06	<0.005	<0.005	<0.005	<0.001	**34.0**
	6/27/07	<0.000500	<0.000500	<0.000500	<0.00100	**39.0**
	12/13/07	0.000968	<0.000500	<0.000500	**0.00254**	**63.1**
	6/5/08	<0.00037	<0.00039	<0.00042	<0.00035	**61.0**
	11/14/08	<0.00037	<0.00039	<0.00042	<0.00035	**52.0**
	6/16/09	<0.00037	<0.00039	<0.00042	<0.00035	**59.0**
	11/20/09	<0.00037	<0.00039	<0.00042	<0.00035	**58.0**
	7/1/10	**0.00032J**	<0.00020	<0.00020	<0.00070	**54.5**
	11/9/10	<0.00010	<0.00010	<0.00010	<0.00030	**57.5**
DUP	11/9/10	<0.00010	<0.00010	<0.00010	<0.00030	**58.4**
	6/2/11	<0.00010	<0.00010	<0.00010	<0.00030	**49.8**
	12/2/11	<0.00010	<0.00010	<0.00010	<0.00030	**142.0**
	6/26/12	<0.000100	<0.000100	<0.000100	<0.000100	**73.7**
	11/26/12	<0.000100	<0.000200	<0.000100	<0.000100	**69.3**
	6/14/13	<0.001	<0.002	<0.001	<0.001	**59.5**
	11/27/13	<0.001	<0.002	<0.001	<0.001	**65.1**

TABLE II

GROUNDWATER ANALYTICAL SUMMARY
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
FORMER NEW MEXICO "F" STATE TANK BATTERY
LEA COUNTY, NEW MEXICO

Sample ID	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Chloride
New Mexico Water Quality Control Commission Groundwater Standard		0.01[1]	0.75[1]	0.75[1]	0.62[1]	250.0[2]
MW-5	7/28/98	<0.001	<0.001	<0.001	<0.001	**360.0**
	2/16/01	<0.005	<0.005	<0.005	<0.005	**120**
	6/12/02	<0.005	<0.005	<0.005	<0.005	**90.2**
	11/26/03	**0.002**	<0.001	**0.003**	<0.002	**59.1**
	6/6/03	<0.001	<0.001	<0.001	<0.001	**48.6**
	12/4/03	<0.001	<0.001	<0.001	<0.001	**36.5**
	7/2/04	<0.005	<0.005	<0.005	<0.005	**32.9**
	12/21/04	<0.005	<0.005	<0.005	<0.005	**39.8**
	6/6/05	<0.00100	<0.00100	<0.00100	<0.00100	**41.1**
	12/13/05	<0.005	<0.005	<0.005	<0.010	**39.7**
	6/27/06	<0.000500	<0.000500	<0.000500	<0.001	**43.2**
	12/19/06	<0.005	<0.005	<0.005	<0.001	**51.0**
	6/27/07	<0.000500	<0.000500	<0.000500	<0.00100	**67**
	12/14/07	<0.000500	<0.000500	<0.000500	<0.00100	**101**
	6/4/08	<0.00037	<0.00039	<0.00042	<0.00035	**78.7**
	11/14/08	<0.00037	<0.00039	<0.00042	<0.00035	**100**
	6/16/09	<0.00037	<0.00039	<0.00042	<0.00035	**140**
	11/20/09	<0.00037	<0.00039	<0.00042	<0.00035	**110**
	7/1/10	<0.00020	<0.00020	<0.00020	<0.00070	**115**
	11/9/10	<0.00010	<0.00010	<0.00010	<0.00030	**168**
	6/2/11	<0.00010	<0.00010	<0.00010	<0.00030	**134**
	12/2/11	<0.00010	<0.00010	<0.00010	<0.00030	**172**
	6/26/12	<0.000100	<0.000100	<0.000100	<0.000100	**137**
	11/26/12	<0.000100	<0.000200	<0.000100	<0.000100	**110**
	6/14/13	<0.001	<0.002	<0.001	<0.001	**66.6**
	11/27/13	<0.001	<0.002	<0.001	<0.001	**72.3**

TABLE II

GROUNDWATER ANALYTICAL SUMMARY
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
FORMER NEW MEXICO "F" STATE TANK BATTERY
LEA COUNTY, NEW MEXICO

Sample ID	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Chloride
New Mexico Water Quality Control Commission Groundwater Standard		0.01[1]	0.75[1]	0.75[1]	0.62[1]	250.0[2]
MW-6	7/28/98	<0.001	<0.001	<0.001	<0.001	**43.0**
	2/16/01	<0.005	<0.005	**0.006**	**0.006**	**52**
	6/12/02	<0.001	<0.001	<0.001	<0.001	**54.1**
	11/26/03	<0.001	<0.001	<0.001	<0.002	**65.0**
	6/6/03	<0.001	<0.001	<0.001	<0.001	**43.7**
	12/4/03	<0.001	<0.001	<0.001	<0.001	**45.3**
	7/2/04	<0.001	<0.001	<0.001	<0.001	**57.5**
	12/21/04	<0.005	<0.005	<0.005	<0.005	**61.3**
	6/6/05	<0.00100	<0.00100	<0.00100	<0.00100	**66.7**
	12/13/05	<0.005	<0.005	<0.005	<0.010	**80.9**
	6/27/06	<0.000500	<0.000500	<0.000500	<0.001	**86.4**
	12/19/06	<0.005	<0.005	<0.005	<0.001	**88.0**
	3/16/07	<0.000500	<0.000500	<0.000500	<0.001	**92.2**
	6/27/07	<0.000500	<0.000500	<0.000500	<0.00100	**110**
	9/27/07	<0.000500	<0.000500	<0.000500	<0.00100	**99.5**
	12/14/07	<0.000500	<0.000500	<0.000500	<0.00100	**99.2**
	3/6/08	<0.000370	<0.000390	<0.000420	<0.000350	**88.8**
	6/4/08	<0.00037	<0.00039	<0.00042	<0.00035	**117**
	9/4/08	<0.00037	<0.00039	<0.00042	<0.00035	**130**
	11/14/08	<0.00037	<0.00039	<0.00042	<0.00035	**130**
	3/5/09	<0.00037	<0.00039	<0.00042	<0.00035	**140**
	6/16/09	<0.00037	<0.00039	<0.00042	<0.00035	**160**
	9/9/09	<0.00037	<0.00039	<0.00042	<0.00035	**160**
	11/20/09	<0.00037	<0.00039	<0.00042	<0.00035	**140**
	3/23/10	<0.00020	<0.00020	<0.00020	<0.00070	**169**
	7/1/10	<0.00020	<0.00020	<0.00020	<0.00070	**161**
DUP	7/1/10	<0.00020	<0.00020	<0.00020	<0.00070	**169**
	9/22/10	**0.00033J**	<0.00010	<0.00010	<0.00030	**157**
	11/9/10	<0.00010	<0.00010	**0.0010**	<0.00030	**182**
	3/3/11	<0.00010	<0.00010	<0.00010	<0.00030	**225**
	6/2/11	<0.00010	<0.00010	<0.00010	<0.00030	**215**
DUP	6/2/11	<0.00010	<0.00010	<0.00010	<0.00030	**221**
	9/27/11	<0.00010	<0.00010	<0.00010	<0.00030	**222**
	12/2/11	<0.00010	<0.00010	<0.00010	<0.00030	**198**
	3/7/12	<0.000100	<0.000200	<0.000100	<0.000100	**189**
	6/26/12	<0.000100	<0.000100	<0.000100	<0.000100	**259**
DUP	6/26/12	<0.000100	<0.000100	<0.000100	<0.000100	**260**
	9/20/12	<0.000100	<0.000200	<0.000100	<0.000100	**221**
	11/26/12	<0.000100	<0.000200	<0.000100	<0.000100	**176**
	3/14/13	<0.001	<0.002	<0.001	<0.001	**195**
	6/14/13	<0.001	<0.002	<0.001	<0.001	**219**
	9/13/13	<0.001	<0.002	<0.001	<0.001	**209**
	11/27/13	<0.001	<0.002	<0.001	<0.001	**220**

TABLE II

GROUNDWATER ANALYTICAL SUMMARY
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
FORMER NEW MEXICO "F" STATE TANK BATTERY
LEA COUNTY, NEW MEXICO

Sample ID	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Chloride
New Mexico Water Quality Control Commission Groundwater Standard		0.01[1]	0.75[1]	0.75[1]	0.62[1]	250.0[2]
MW-7	7/28/98	<0.001	<0.001	<0.001	<0.001	**82.0**
	2/16/01	<0.005	<0.005	<0.005	<0.005	**150**
	6/12/02	<0.005	<0.005	<0.005	<0.005	**96.7**
	11/26/03	<0.001	<0.001	<0.001	<0.002	**133.0**
	6/6/03	<0.001	<0.001	<0.001	<0.001	**199.0**
	12/4/03	<0.001	<0.001	<0.001	<0.001	**230.0**
	7/2/04	<0.001	<0.001	<0.001	<0.001	**215.0**
	12/21/04	<0.005	<0.005	<0.005	<0.005	**274.0**
	6/6/05	<0.00100	<0.00100	<0.00100	<0.00100	**221.0**
	12/13/05	<0.005	<0.005	<0.005	<0.010	**204.0**
	6/27/06	<0.000500	<0.000500	<0.000500	<0.001	**158.0**
	12/19/06	<0.005	<0.005	<0.005	<0.001	**130.0**
	6/27/07	<0.000500	<0.000500	<0.000500	<0.00100	**110**
	12/13/07	<0.000500	<0.000500	<0.000500	<0.00100	**135**
	6/5/08	<0.00037	<0.00039	<0.00042	<0.00035	**72.4**
	11/14/08	<0.00037	<0.00039	<0.00042	<0.00035	**66**
	6/16/09	<0.00037	<0.00039	<0.00042	<0.00035	**58**
	11/20/09	<0.00037	<0.00039	<0.00042	<0.00035	**47**
	7/1/10	<0.00020	<0.00020	<0.00020	<0.00070	**51.2**
	11/9/10	<0.00010	<0.00010	<0.00010	<0.00030	**67.1**
	6/2/11	<0.00010	<0.00010	<0.00010	<0.00030	**69.4**
	12/2/11	<0.00010	<0.00010	<0.00010	<0.00030	**76.6**
	6/26/12	<0.000100	<0.000100	<0.000100	<0.000100	**91.5**
	11/26/12	<0.000100	<0.000200	<0.000100	<0.000100	**67.7**
	6/14/13	<0.001	<0.002	<0.001	<0.001	**56.4**
	11/27/13	<0.001	<0.002	<0.001	<0.001	**78.1**

TABLE II

GROUNDWATER ANALYTICAL SUMMARY
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
FORMER NEW MEXICO "F" STATE TANK BATTERY
LEA COUNTY, NEW MEXICO

Sample ID	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Chloride
New Mexico Water Quality Control Commission Groundwater Standard		0.01[1]	0.75[1]	0.75[1]	0.62[1]	250.0[2]
MW-8	7/28/98	<0.001	<0.001	<0.001	<0.001	**29.0**
	2/16/01	<0.005	<0.005	<0.005	<0.005	**94**
	6/12/02	<0.005	<0.005	<0.005	<0.005	**180.0**
	11/26/03	<0.001	<0.001	<0.001	<0.002	**239.0**
	6/6/03	<0.001	<0.001	<0.001	<0.001	**244.0**
	12/4/03	<0.001	<0.001	<0.001	<0.001	**251.0**
	7/2/04	<0.005	<0.005	<0.005	<0.005	**206.0**
	12/21/04	<0.005	<0.005	<0.005	<0.005	**244.0**
	6/6/05	<0.00100	<0.00100	<0.00100	<0.00100	**227.0**
	12/13/05	<0.005	<0.005	<0.005	<0.010	**144.0**
	6/27/06	<0.000500	<0.000500	<0.000500	<0.001	**92.6**
	12/19/06	<0.005	<0.005	<0.005	<0.001	**83.0**
	6/27/07	<0.000500	<0.000500	<0.000500	<0.00100	**79**
	12/13/07	<0.000500	<0.000500	<0.000500	<0.00100	**82.9**
	6/4/08	<0.00037	<0.00039	<0.00042	<0.00035	**54.9**
	11/14/08	<0.00037	<0.00039	<0.00042	<0.00035	**47**
	6/16/09	<0.00037	<0.00039	<0.00042	<0.00035	**45**
	11/20/09	<0.00037	<0.00039	<0.00042	<0.00035	**36**
	7/1/10	<0.00020	<0.00020	<0.00020	<0.00070	**38.4**
	11/9/10	<0.00010	<0.00010	<0.00010	<0.00030	**47.6**
	6/2/11	<0.00010	<0.00010	<0.00010	<0.00030	**51.8**
	12/2/11	<0.00010	<0.00010	<0.00010	<0.00030	**72.7**
	6/26/12	<0.000100	<0.000100	<0.000100	<0.000100	**95.7**
	11/26/12	<0.000100	<0.000200	<0.000100	<0.000100	**77.6**
	6/14/13	<0.001	<0.002	<0.001	<0.001	**83.3**
DUP	6/14/13	<0.001	<0.002	<0.001	<0.001	**84.3**
	11/27/13	<0.001	<0.002	<0.001	<0.001	**72.2**
DUP	11/27/13	<0.001	<0.002	<0.001	<0.001	**71.3**

TABLE II

GROUNDWATER ANALYTICAL SUMMARY
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
FORMER NEW MEXICO "F" STATE TANK BATTERY
LEA COUNTY, NEW MEXICO

Sample ID	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Chloride
New Mexico Water Quality Control Commission Groundwater Standard		0.01[1]	0.75[1]	0.75[1]	0.62[1]	250.0[2]
WW-1	7/28/98	<0.001	<0.001	<0.001	<0.001	**100.0**
	6/12/02	<0.001	<0.001	<0.001	<0.001	**43.6**
	11/26/02	<0.001	<0.001	<0.001	<0.002	**80.0**
	6/6/03	<0.001	<0.001	<0.001	<0.001	**73.4**
	12/4/03	<0.001	<0.001	<0.001	<0.001	**65.3**
	7/2/04	<0.001	<0.001	<0.001	<0.001	**66.5**
	12/21/04	<0.005	<0.005	<0.005	<0.005	**74.3**
	6/6/05	<0.00100	<0.00100	<0.00100	<0.00100	**63.4**
	12/13/05	<0.005	<0.005	<0.005	<0.010	**41.1**
	6/27/06	<0.000500	<0.000500	<0.000500	<0.001	**50.0**
	12/19/06	<0.005	<0.005	<0.005	<0.001	**80.0**
	6/27/07	<0.000500	<0.000500	<0.000500	<0.00100	**52**
	12/14/07	<0.000500	<0.000500	<0.000500	<0.00100	**59.8**
	6/4/08	<0.00037	<0.00039	<0.00042	<0.00035	**64.1**
DUP	6/4/08	<0.00037	<0.00039	<0.00042	<0.00035	**64.4**
	11/14/08	<0.00037	<0.00039	<0.00042	<0.00035	**73**
	6/17/09	<0.00037	<0.00039	<0.00042	<0.00035	**60**
	11/20/09	<0.00037	<0.00039	<0.00042	<0.00035	**64**
	7/1/10	<0.00020	<0.00020	<0.00020	<0.00070	**41.0**
	11/9/10	<0.00010	<0.00010	<0.00010	<0.00030	**77.0**
	6/2/11	<0.00010	<0.00010	<0.00010	<0.00030	**73.6**
	12/2/11	<0.00010	<0.00010	<0.00010	<0.00030	**50.2**
	6/26/12	<0.000100	<0.000100	<0.000100	<0.000100	**90.0**
	11/26/12	<0.000100	<0.000200	<0.000100	<0.000100	**69.9**
	6/14/13	<0.001	<0.002	<0.001	<0.001	**53.7**
	11/27/13	Not Sampled				

TABLE II

GROUNDWATER ANALYTICAL SUMMARY
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
FORMER NEW MEXICO "F" STATE TANK BATTERY
LEA COUNTY, NEW MEXICO

Sample ID	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Chloride
New Mexico Water Quality Control Commission Groundwater Standard		**0.01[1]**	**0.75[1]**	**0.75[1]**	**0.62[1]**	**250.0[2]**
WW-2	6/12/02	<0.001	<0.001	<0.001	<0.001	**53.7**
	11/26/02	<0.001	<0.001	<0.001	<0.002	**70.9**
	6/6/03	<0.001	<0.001	<0.001	<0.001	**71.1**
	12/4/03	<0.001	<0.001	<0.001	<0.001	**52.4**
	7/2/04	<0.001	<0.001	<0.001	<0.001	**51.0**
	12/21/04	<0.005	<0.005	<0.005	<0.005	**55.6**
	6/6/05	<0.00100	<0.00100	<0.00100	<0.00100	**55.3**
	12/13/05	<0.005	<0.005	<0.005	<0.010	**75.3**
	6/27/06	<0.000500	<0.000500	<0.000500	<0.001	**69.7**
	12/19/06	<0.005	<0.005	<0.005	<0.001	**57.0**
	6/27/07	<0.000500	<0.000500	<0.000500	<0.00100	**46**
	12/14/07	<0.000500	<0.000500	<0.000500	<0.00100	**83.1**
	6/4/08	<0.00037	<0.00039	<0.00042	<0.00035	**65.9**
	11/14/08	<0.00037	<0.00039	<0.00042	<0.00035	**73**
	6/17/09	<0.00037	<0.00039	<0.00042	<0.00035	**60**
	11/20/09	Not Sampled - Pump Not Working				
	7/1/10	<0.00020	<0.00020	<0.00020	<0.00070	**66.3**
	11/9/10	<0.00010	<0.00010	<0.00010	<0.00030	**77.2**
	6/2/11	<0.00010	<0.00010	<0.00010	<0.00030	**74.9**
	12/2/11	<0.00010	<0.00010	<0.00010	<0.00030	**76.5**
	6/26/12	<0.000100	<0.000100	<0.000100	<0.000100	**63.1**
	11/26/12	<0.000100	<0.000200	<0.000100	<0.000100	**50.3**
	6/14/13	<0.001	<0.002	<0.001	<0.001	**81.1**
	11/27/13	Not Sampled				
RW-1[3]	6/5/08	**0.0119**	<0.0039	<0.0042	<0.0035	**36.2**
	6/17/09	**0.012**	**0.0055**	**0.0018**	**0.012**	**49.0**
	7/1/10	**0.022**	**0.00070J**	**0.0027**	**0.017**	**41.1**
	6/26/12	**0.0113**	<0.00100	**0.00514**	**0.0350**	**44.1**
	6/27/13	**0.00745**	**0.00963**	**0.0101**	**0.0549**	**33.8**
RW-2	6/27/07	**0.00287**	<0.0025	<0.00250	**0.0303**	**60**
	6/5/08	<0.0037	<0.0039	<0.0042	<0.0035	**51.1**
	6/17/09	<0.00037	**0.0046**	<0.00042	**0.016**	**44**
	7/1/10	**0.0016**	<0.00020	<0.00020	**0.0067**	**30.1**
	6/26/12	<0.00100	<0.00100	<0.00100	**0.00362**	**43.9**
	6/14/13	**0.00178**	**0.00268**	**0.00171**	**0.0262**	**30**

TABLE II

GROUNDWATER ANALYTICAL SUMMARY
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
FORMER NEW MEXICO "F" STATE TANK BATTERY
LEA COUNTY, NEW MEXICO

Sample ID	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Chloride
New Mexico Water Quality Control Commission Groundwater Standard		0.01[1]	0.75[1]	0.75[1]	0.62[1]	250.0[2]
RW-3	6/11/02	<0.005	<0.005	<0.005	<0.005	**25.9**
	12/3/04	<0.001	<0.001	<0.001	<0.001	**36.6**
	6/27/07	**0.00855**	<0.00250	**0.0122**	**0.0270**	**130**
	6/5/08	<0.0037	<0.0039	<0.0042	**0.0129**	**90.6**
	6/17/09	**0.0052**	**0.0042**	**0.011**	**0.0250**	**74**
	11/20/09	<0.00037	**0.001**	**0.0027**	**0.0076**	**60**
DUP	11/20/09	<0.00037	**0.0013**	**0.003**	**0.0080**	**60**
	7/1/10	**0.0065**	<0.00020	**0.0066**	**0.0030**	**68.3**
	6/26/12	**0.00682**	<0.00100	<0.00100	<0.00100	**55.4**
	6/14/13	**0.0092**	**0.0291**	**0.0253**	**0.138**	**37.3**
RW-4	6/26/12	**0.00221**	<0.00100	**0.00410**	**0.0188**	**65.1**
	6/27/13	**0.0245**	**0.0396**	**0.0779**	**0.196**	**43.1**

Notes:

1. Result shown in mg/L.
2. Data through June 6, 2005 provided by Larson & Associates, Inc.
3. Bold indicates detection above method detection limit.
4. Shaded cells indicate New Mexico Water Quality Control Commission (NMWQCC) exceedance.
5. [1]Human Health Standards for Groundwater.
6. [2]Other Standards for Domestic Water Supply.
7. [3]RW-1 was sampled by dropping a disposable PVC bailer below 3.18 feet of LNAPL.

TABLE III

SUMMARY OF FIELD DUPLICATE SAMPLE RESULTS
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
F STATE
LEA COUNTY, NEW MEXICO

Date	Original Sample ID	Chloride Sample Result (mg/L)	Duplicate Sample ID	Chloride Sample Result (mg/L)	RPD[1]
6/4/08	WW-1	64.1	DUP	64.4	0.4669
11/14/08	MW-3	32	DUP	32	0.0000
11/20/10	RW-3	60	DUP	60	0.0000
7/1/10	MW-6	161	DUP	169	4.8485
11/9/10	MW-4	57.5	DUP	58.4	1.5531
6/2/11	MW-6	215	DUP	221	2.7523
12/2/11	MW-3	85	DUP	85.7	0.8202
6/26/12	MW-6	259	DUP	260	0.3854
6/14/13	MW-8	83.3	DUP	84.0	0.8368
11/27/13	MW-8	72.2	DUP	71.3	1.2544

Notes:
1) RPD - relative percent differences

APPENDICES

Appendix A

Certified Laboratory Reports

Analytical Report 459349

for

Conestoga Rovers & Associates

Project Manager: Brittany Ford

New Mexico F State

039122

25-MAR-13

Collected By: Client

12600 West I-20 East Odessa, Texas 79765

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-10-6-TX), Arizona (AZ0765), Arkansas (08-039-0), Connecticut (PH-0102), Florida (E871002)
Illinois (002082), Indiana (C-TX-02), Iowa (392), Kansas (E-10380), Kentucky (45), Louisiana (03054)
New Hampshire (297408), New Jersey (TX007), New York (11763), Oklahoma (9218), Pennsylvania (68-03610)
Rhode Island (LAO00312), USDA (S-44102), DoD (L11-54)

Xenco-Atlanta (EPA Lab Code: GA00046):
Florida (E87429), North Carolina (483), South Carolina (98015), Kentucky (85), DoD (L10-135)
Louisiana (04176), USDA (P330-07-00105)

Xenco-Tampa Mobile (EPA Lab code: FL01212): Florida (E84900)
Xenco-Lakeland: Florida (E84098)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-TX)
Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295-TX)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)
Xenco Tucson (EPA Lab code:AZ000989): Arizona (AZ0758)

25-MAR-13

Project Manager: **Brittany Ford**
Conestoga Rovers & Associates
2135 S Loop 250 W
Midland, TX 79703

Reference: XENCO Report No(s): **459349**
New Mexico F State
Project Address:

Brittany Ford:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 459349. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 459349 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Nicholas Straccione
Project Manager

Sample Cross Reference 459349

Conestoga Rovers & Associates, Midland, TX

New Mexico F State

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW6 031413	W	03-14-13 10:10		459349-001

Project ID:	*039122*	Report Date:	*25-MAR-13*
Work Order Number(s):	*459349*	Date Received:	*03/15/2013*

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Certificate of Analysis Summary 459349

Conestoga Rovers & Associates, Midland, TX

Project Name: New Mexico F State

Project Id: 039122
Contact: Brittany Ford
Project Location:

Date Received in Lab: Fri Mar-15-13 09:43 am
Report Date: 25-MAR-13
Project Manager: Nicholas Straccione

Analysis Requested							
	Lab Id:	459349-001					
	Field Id:	MW6 031413					
	Depth:						
	Matrix:	WATER					
	Sampled:	Mar-14-13 10:10					
BTEX by EPA 8021B	***Extracted:***	Mar-22-13 13:00					
	Analyzed:	Mar-22-13 15:27					
	Units/RL:	mg/L RL					
Benzene		ND 0.00100					
Toluene		ND 0.00200					
Ethylbenzene		ND 0.00100					
m,p-Xylenes		ND 0.00200					
o-Xylene		ND 0.00100					
Total Xylenes		ND 0.00100					
Total BTEX		ND 0.00100					
Inorganic Anions by EPA 300/300.1	***Extracted:***	Mar-18-13 10:00					
	Analyzed:	Mar-19-13 05:22					
	Units/RL:	mg/L RL					
Chloride		195 10.0					

Nicholas Straccione
Project Manager

Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the quantiation limit and above the detection limit.

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

* Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

***** (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

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	Phone	Fax
4143 Greenbriar Dr, Stafford, TX 77477	(281) 240-4200	(281) 240-4280
9701 Harry Hines Blvd , Dallas, TX 75220	(214) 902 0300	(214) 351-9139
5332 Blackberry Drive, San Antonio TX 78238	(210) 509-3334	(210) 509-3335
2505 North Falkenburg Rd, Tampa, FL 33619	(813) 620-2000	(813) 620-2033
12600 West I-20 East, Odessa, TX 79765	(432) 563-1800	(432) 563-1713
6017 Financial Drive, Norcross, GA 30071	(770) 449-8800	(770) 449-5477
3725 E. Atlanta Ave, Phoenix, AZ 85040	(602) 437-0330	

Form 2 - Surrogate Recoveries

Project Name: New Mexico F State

Work Orders : 459349,

Project ID: 039122

Lab Batch #: 909649 **Sample:** 459349-001 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 03/22/13 15:27

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
	SURROGATE RECOVERY STUDY				
1,4-Difluorobenzene	0.0281	0.0300	94	80-120	
4-Bromofluorobenzene	0.0289	0.0300	96	80-120	

Lab Batch #: 909649 **Sample:** 635521-1-BLK / BLK **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 03/22/13 13:49

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
	SURROGATE RECOVERY STUDY				
1,4-Difluorobenzene	0.0259	0.0300	86	80-120	
4-Bromofluorobenzene	0.0250	0.0300	83	80-120	

Lab Batch #: 909649 **Sample:** 635521-1-BKS / BKS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 03/22/13 13:16

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
	SURROGATE RECOVERY STUDY				
1,4-Difluorobenzene	0.0325	0.0300	108	80-120	
4-Bromofluorobenzene	0.0295	0.0300	98	80-120	

Lab Batch #: 909649 **Sample:** 635521-1-BSD / BSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 03/22/13 13:33

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
	SURROGATE RECOVERY STUDY				
1,4-Difluorobenzene	0.0315	0.0300	105	80-120	
4-Bromofluorobenzene	0.0288	0.0300	96	80-120	

Lab Batch #: 909649 **Sample:** 459386-002 S / MS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 03/22/13 14:55

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
	SURROGATE RECOVERY STUDY				
1,4-Difluorobenzene	0.0318	0.0300	106	80-120	
4-Bromofluorobenzene	0.0349	0.0300	116	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: New Mexico F State

Work Orders : 459349,

Project ID: 039122

Lab Batch #: 909649 **Sample:** 459386-002 SD / MSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 03/22/13 16:00

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0326	0.0300	109	80-120	
4-Bromofluorobenzene	0.0296	0.0300	99	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

BS / BSD Recoveries

Project Name: New Mexico F State

Work Order #: 459349 **Project ID:** 039122

Analyst: KEB **Date Prepared:** 03/22/2013 **Date Analyzed:** 03/22/2013

Lab Batch ID: 909649 **Sample:** 635521-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00100	0.100	0.0895	90	0.100	0.0864	86	4	70-125	25	
Toluene	<0.00200	0.100	0.0875	88	0.100	0.0858	86	2	70-125	25	
Ethylbenzene	<0.00100	0.100	0.0969	97	0.100	0.0913	91	6	71-129	25	
m,p-Xylenes	<0.00200	0.200	0.183	92	0.200	0.177	89	3	70-131	25	
o-Xylene	<0.00100	0.100	0.0878	88	0.100	0.0831	83	6	71-133	25	

Analyst: AMB **Date Prepared:** 03/18/2013 **Date Analyzed:** 03/19/2013

Lab Batch ID: 909499 **Sample:** 635438-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<1.00	25.0	25.8	103	25.0	26.2	105	2	80-120	20	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

Form 3 - MS Recoveries

Project Name: New Mexico F State

Work Order #: 459349
Lab Batch #: 909499
Project ID: 039122
Date Analyzed: 03/19/2013
Date Prepared: 03/18/2013
Analyst: AMB
QC- Sample ID: 459402-021 S
Batch #: 1
Matrix: Water
Reporting Units: mg/L

MATRIX / MATRIX SPIKE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride	1990	1250	3280	103	80-120	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference [E] = 200*(C-A)/(C+B)
All Results are based on MDL and Validated for QC Purposes

BRL - Below Reporting Limit

Form 3 - MS / MSD Recoveries

Project Name: New Mexico F State

Work Order # : 459349 **Project ID:** 039122

Lab Batch ID: 909649 **QC- Sample ID:** 459386-002 S **Batch #:** 1 **Matrix:** Water

Date Analyzed: 03/22/2013 **Date Prepared:** 03/22/2013 **Analyst:** KEB

Reporting Units: mg/L

BTEX by EPA 8021B Analytes	MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY										
	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00100	0.100	0.0903	90	0.100	0.0820	82	10	70-125	25	
Toluene	<0.00200	0.100	0.0918	92	0.100	0.0879	88	4	70-125	25	
Ethylbenzene	<0.00100	0.100	0.0943	94	0.100	0.0858	86	9	71-129	25	
m,p-Xylenes	<0.00200	0.200	0.174	87	0.200	0.161	81	8	70-131	25	
o-Xylene	<0.00100	0.100	0.0886	89	0.100	0.0841	84	5	71-133	25	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not ApplicableN = See Narrative, EQL = Estimated Quantitation Limit

ANALYSIS REQUEST & CHAIN OF CUSTODY RECORD

XENCO Laboratories

☐ 4143 Greenbriar Drive, Stafford, TX 77477 **281-240-4200**
☐ 5332, Blackberry Drive, San Antonio, TX 78238 **210-509-3334**
☐ 9701 Harry Hines Blvd., Dallas, TX 75220 **214-902-0300**
☐ 12600 West I-20 East, Odessa, TX 79765 **432-563-1800**

Serial #: 326834 Page 1 of 1

Company-City CRA - Midland **Phone** 432-686-0086

Lab Only: 459349

Project Name-Location ☐ Previously done at XENCO **Project ID** 0 39122

TAT: ASAP 5h 12h 24h 48h 3d 5d 7d 10d 21d Standard TAT is project specific.
It is typically 5-7 Working Days for level II and 10+ Working days for level III and IV data.

Proj. State: TX, AL, FL, GA, LA, MS, NC, NJ, PA, SC, TN, UT Other

Proj. Manager (PM) Brittany Ford

E-mail Results to ☒PM and BFord@crawworld.com **Fax No:** (432) 686-0186

Invoice to ☐ Accounting ☐ Inc. Invoice with Final Report ☐ Invoice must have a P.O.
Bill to:

Quote/Pricing: **P.O. No:** ☐ Call for P.O.

Reg Program: UST DRY-CLEAN Land-Fill Waste-Disp NPDES DW **TRRP**

QAPP Per-Contract CLP AGCEE NAVY DOE DOD USACE OTHER:

Special DLs (GW DW QAPP MDLs RLs See Lab PM Included Call PM)

Sampler Name Justin Nixon **Signature**

	Sample ID	Sampling Date	Time	Depth ft' in" m	Matrix	Composite	Grab	# Containers	Container Size	Container Type	Preservatives	VOA: Full-List BTEX-MTBE EtOH Oxyg VOHs VOAs	VOA: PP TCL DW Appdx-1 Appdx-2 CALL Other:	PAHs SIM 8310 8270	TX-1005 DRO GRO MA EPH MA VPH	SVOCs: Full-List DW BN&AE TCLP PP Appdx-2 CALL	OC Pesticides PCBs Herbicides OP Pesticides	Metals: RCRA-8 RCRA-4 Pb 13PP 23TAL Appdx 1 Appdx2	SPLP - TCLP (Metals VOCs SVOCs Pest. Herb. PCBs)	EDB / DBCP	BTEX 8021B	Chloride E300.0	TATASAP 5h 12h 24h 48h 3d 5d 7d (10d) 21d	Addn: PAH above mg/L W, mg/Kg S Highest Hit	Hold Samples (Surcharges will apply and are pre-approved)	Sample Clean-ups are pre-approved as needed	Addn: Date Rcv. by: From:
1	MW6 031413	3-14-13	1010		W		X	3			HCL										X	X						1
2																												2
3																												3
4																												4
5																												5
6																												6
7																												7
8																												8
9																												9
10																												10

	Relinquished by (Initials and Sign)	Date & Time	Relinquished to (Initials and Sign)	Date & Time
1	1) JM	3/15/13 0943	2)	
2	3)		4)	
3	5)		6)	3/15/13 9:43

Total Containers per COC: 3 Cooler Temp: 1.0 °C

Otherwise agreed on writing. Reports are the Intellectual Property of XENCO until paid. Samples will be held 30 days after final report is e-mailed unless hereby requested. Rush Charges and Collection Fees are pre-approved if needed.

Preservatives: Various (**V**), HCl pH<2 (**H**), H2SO4 pH<2 (**S**), HNO3 pH<2 (**N**), Asbc Acid&NaOH (**A**), ZnAc&NaOH (**Z**), (Cool, <4C) (**C**), None (**NA**),See Label (**L**), Other (**O**) _____
Cont. Size: 4oz (**4**), 8oz (**8**), 32oz (**32**), 40ml VOA (**40**), 1L (**1**), 500ml (**5**), Tedlar Bag (**B**), Various (**V**), Other _____ **Cont. Type:** Glass Amb (**A**), Glass Clear (**C**), Plastic (**P**), Various (**V**)

Matrix: Air (**A**), Product (**P**), Solid (**S**), Water (**W**), Liquid (**L**)

Committed to Excellence in Service and Quality *www.xenco.com*

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: Conestoga Rovers & Associates

Date/ Time Received: 03/15/2013 09:43:00 AM

Work Order #: 459349

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used :

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	1
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**Yes**
#5 Custody Seals intact on sample bottles?	**Yes**
#6 *Custody Seals Signed and dated?	**Yes**
#7 *Chain of Custody present?	**Yes**
#8 Sample instructions complete on Chain of Custody?	**Yes**
#9 Any missing/extra samples?	**No**
#10 Chain of Custody signed when relinquished/ received?	**Yes**
#11 Chain of Custody agrees with sample label(s)?	**Yes**
#12 Container label(s) legible and intact?	**Yes**
#13 Sample matrix/ properties agree with Chain of Custody?	**Yes**
#14 Samples in proper container/ bottle?	**Yes**
#15 Samples properly preserved?	**Yes**
#16 Sample container(s) intact?	**Yes**
#17 Sufficient sample amount for indicated test(s)?	**Yes**
#18 All samples received within hold time?	**Yes**
#19 Subcontract of sample(s)?	**Yes**
#20 VOC samples have zero headspace (less than 1/4 inch bubble)?	**Yes**
#21 <2 for all samples preserved with HNO3,HCL, H2SO4?	**Yes**
#22 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	**Yes**

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst:	PH Device/Lot#:

Checklist completed by: _____ Date: _____

Checklist reviewed by: _____ Date: _____

Analytical Report 465163

for

Conestoga Rovers & Associates

Project Manager: Brittany Ford

Midland Odessa Discounted Fee Schedule

039122

24-JUN-13

Collected By: Client

12600 West I-20 East Odessa, Texas 79765

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-10-6-TX), Arizona (AZ0765), Arkansas (08-039-0), Connecticut (PH-0102), Florida (E871002)
Illinois (002082), Indiana (C-TX-02), Iowa (392), Kansas (E-10380), Kentucky (45), Louisiana (03054)
New Hampshire (297408), New Jersey (TX007), New York (11763), Oklahoma (9218), Pennsylvania (68-03610)
Rhode Island (LAO00312), USDA (S-44102), DoD (L11-54)

Xenco-Atlanta (EPA Lab Code: GA00046):
Florida (E87429), North Carolina (483), South Carolina (98015), Kentucky (85), DoD (L10-135)
Louisiana (04176), USDA (P330-07-00105)

Xenco-Tampa Mobile (EPA Lab code: FL01212): Florida (E84900)
Xenco-Lakeland: Florida (E84098)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-TX)
Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295-TX)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)
Xenco Tucson (EPA Lab code:AZ000989): Arizona (AZ0758)

24-JUN-13

Project Manager: **Brittany Ford**
Conestoga Rovers & Associates
2135 S Loop 250 W
Midland, TX 79703

Reference: XENCO Report No(s): **465163**
Midland Odessa Discounted Fee Schedule
Project Address:

Brittany Ford:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 465163. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 465163 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Kelsey Brooks
Project Manager

Sample Cross Reference 465163

Conestoga Rovers & Associates, Midland, TX

Midland Odessa Discounted Fee Schedule

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
RW02-061413	W	06-14-13 15:00		465163-001
RW03-061413	W	06-14-13 15:30		465163-002
MW05-061413	W	06-14-13 10:40		465163-003
MW06-061413	W	06-14-13 11:00		465163-004
MW07-061413	W	06-14-13 11:20		465163-005
MW08-061413	W	06-14-13 09:20		465163-006
WW01-061413	W	06-14-13 10:00		465163-007
WW02-061413	W	06-14-13 10:20		465163-008
DUP1-061413	W	06-14-13 09:20		465163-009
MW03-061413	W	06-14-13 09:40		465163-010
MW04-061413	W	06-14-13 11:40		465163-011

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Certificate of Analysis Summary 465163

Conestoga Rovers & Associates, Midland, TX

Project Name: Midland Odessa Discounted Fee Schedule

Project Id: 039122
Contact: Brittany Ford
Project Location:

Date Received in Lab: Mon Jun-17-13 10:13 am
Report Date: 24-JUN-13
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	465163-001		465163-002		465163-003		465163-004		465163-005		465163-006	
	Field Id:	RW02-061413		RW03-061413		MW05-061413		MW06-061413		MW07-061413		MW08-061413	
	Depth:												
	Matrix:	WATER		WATER		WATER		WATER		WATER		WATER	
	Sampled:	Jun-14-13 15:00		Jun-14-13 15:30		Jun-14-13 10:40		Jun-14-13 11:00		Jun-14-13 11:20		Jun-14-13 09:20	
BTEX by EPA 8021B	***Extracted:***	Jun-20-13 14:30		Jun-20-13 14:30		Jun-20-13 14:30		Jun-20-13 14:30		Jun-20-13 14:30		Jun-20-13 14:30	
	Analyzed:	Jun-21-13 09:45		Jun-21-13 10:17		Jun-21-13 09:29		Jun-20-13 19:18		Jun-20-13 19:34		Jun-20-13 19:50	
	Units/RL:	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL
Benzene		0.00178	0.00100	0.00920	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100
Toluene		0.00268	0.00200	0.0291	0.00200	ND	0.00200	ND	0.00200	ND	0.00200	ND	0.00200
Ethylbenzene		0.00171	0.00100	0.0253	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100
m,p-Xylenes		0.0150	0.00200	0.134	0.00200	ND	0.00200	ND	0.00200	ND	0.00200	ND	0.00200
o-Xylene		0.0112	0.00100	0.00400	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100
Total Xylenes		0.0262	0.00100	0.138	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100
Total BTEX		0.0324	0.00100	0.202	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100
Inorganic Anions by EPA 300/300.1	***Extracted:***	Jun-18-13 10:00		Jun-18-13 10:00		Jun-18-13 10:00		Jun-18-13 10:00		Jun-18-13 10:00		Jun-18-13 10:00	
	Analyzed:	Jun-18-13 12:55		Jun-18-13 13:38		Jun-18-13 14:00		Jun-18-13 14:22		Jun-18-13 14:43		Jun-18-13 15:05	
	Units/RL:	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL
Chloride		30.0	5.00	37.3	5.00	66.6	5.00	219	10.0	56.4	5.00	83.3	5.00

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 465163

Conestoga Rovers & Associates, Midland, TX

Project Name: Midland Odessa Discounted Fee Schedule

Project Id: 039122
Contact: Brittany Ford
Project Location:

Date Received in Lab: Mon Jun-17-13 10:13 am
Report Date: 24-JUN-13
Project Manager: Kelsey Brooks

Analysis Requested											
	Lab Id:	465163-007		465163-008		465163-009		465163-010		465163-011	
	Field Id:	WW01-061413		WW02-061413		DUP1-061413		MW03-061413		MW04-061413	
	Depth:										
	Matrix:	WATER		WATER		WATER		WATER		WATER	
	Sampled:	Jun-14-13 10:00		Jun-14-13 10:20		Jun-14-13 09:20		Jun-14-13 09:40		Jun-14-13 11:40	
BTEX by EPA 8021B	***Extracted:***	Jun-24-13 08:00		Jun-24-13 08:00		Jun-24-13 08:00		Jun-24-13 08:00		Jun-24-13 08:00	
	Analyzed:	Jun-24-13 16:08		Jun-24-13 10:45		Jun-24-13 15:46		Jun-24-13 11:02		Jun-24-13 11:18	
	Units/RL:	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL
Benzene		ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100
Toluene		ND	0.00200	ND	0.00200	ND	0.00200	ND	0.00200	ND	0.00200
Ethylbenzene		ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100
m,p-Xylenes		ND	0.00200	ND	0.00200	ND	0.00200	ND	0.00200	ND	0.00200
o-Xylene		ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100
Total Xylenes		ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100
Total BTEX		ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100
Inorganic Anions by EPA 300/300.1	***Extracted:***	Jun-18-13 10:00		Jun-18-13 10:00		Jun-18-13 10:00		Jun-18-13 10:00		Jun-18-13 10:00	
	Analyzed:	Jun-18-13 16:10		Jun-18-13 16:32		Jun-18-13 16:54		Jun-18-13 17:15		Jun-18-13 17:37	
	Units/RL:	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL
Chloride		53.7	2.00	81.1	5.00	84.0	5.00	79.0	5.00	59.5	5.00

Kelsey Brooks
Project Manager

Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the quantiation limit and above the detection limit.

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

* Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

\+ NELAC certification not offered for this compound.

***** (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

Form 2 - Surrogate Recoveries

Project Name: Midland Odessa Discounted Fee Schedule

Work Orders : 465163,

Project ID: 039122

Lab Batch #: 916808 **Sample:** 465163-004 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/20/13 19:18

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0338	0.0300	113	80-120	
4-Bromofluorobenzene	0.0242	0.0300	81	80-120	

Lab Batch #: 916808 **Sample:** 465163-005 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/20/13 19:34

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0351	0.0300	117	80-120	
4-Bromofluorobenzene	0.0245	0.0300	82	80-120	

Lab Batch #: 916808 **Sample:** 465163-006 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/20/13 19:50

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0338	0.0300	113	80-120	
4-Bromofluorobenzene	0.0240	0.0300	80	80-120	

Lab Batch #: 916808 **Sample:** 465163-003 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/21/13 09:29

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0324	0.0300	108	80-120	
4-Bromofluorobenzene	0.0244	0.0300	81	80-120	

Lab Batch #: 916808 **Sample:** 465163-001 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/21/13 09:45

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0349	0.0300	116	80-120	
4-Bromofluorobenzene	0.0291	0.0300	97	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Midland Odessa Discounted Fee Schedule

Work Orders : 465163,

Project ID: 039122

Lab Batch #: 916808 **Sample:** 465163-002 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/21/13 10:17

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0248	0.0300	83	80-120	
4-Bromofluorobenzene	0.0246	0.0300	82	80-120	

Lab Batch #: 916886 **Sample:** 465163-008 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/24/13 10:45

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0350	0.0300	117	80-120	
4-Bromofluorobenzene	0.0256	0.0300	85	80-120	

Lab Batch #: 916886 **Sample:** 465163-010 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/24/13 11:02

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0349	0.0300	116	80-120	
4-Bromofluorobenzene	0.0252	0.0300	84	80-120	

Lab Batch #: 916886 **Sample:** 465163-011 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/24/13 11:18

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0333	0.0300	111	80-120	
4-Bromofluorobenzene	0.0252	0.0300	84	80-120	

Lab Batch #: 916886 **Sample:** 465163-009 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/24/13 15:46

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0332	0.0300	111	80-120	
4-Bromofluorobenzene	0.0242	0.0300	81	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Midland Odessa Discounted Fee Schedule

Work Orders : 465163,

Project ID: 039122

Lab Batch #: 916886 **Sample:** 465163-007 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/24/13 16:08

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0359	0.0300	120	80-120	
4-Bromofluorobenzene	0.0248	0.0300	83	80-120	

Lab Batch #: 916808 **Sample:** 640019-1-BLK / BLK **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/20/13 18:46

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0343	0.0300	114	80-120	
4-Bromofluorobenzene	0.0240	0.0300	80	80-120	

Lab Batch #: 916886 **Sample:** 640115-1-BLK / BLK **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/24/13 09:14

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0347	0.0300	116	80-120	
4-Bromofluorobenzene	0.0249	0.0300	83	80-120	

Lab Batch #: 916808 **Sample:** 640019-1-BKS / BKS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/20/13 17:58

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0311	0.0300	104	80-120	
4-Bromofluorobenzene	0.0242	0.0300	81	80-120	

Lab Batch #: 916886 **Sample:** 640115-1-BKS / BKS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/24/13 08:25

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0350	0.0300	117	80-120	
4-Bromofluorobenzene	0.0297	0.0300	99	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Midland Odessa Discounted Fee Schedule

Work Orders : 465163,

Project ID: 039122

Lab Batch #: 916808 **Sample:** 640019-1-BSD / BSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/20/13 18:14

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
	SURROGATE RECOVERY STUDY				
1,4-Difluorobenzene	0.0322	0.0300	107	80-120	
4-Bromofluorobenzene	0.0242	0.0300	81	80-120	

Lab Batch #: 916886 **Sample:** 640115-1-BSD / BSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/24/13 08:42

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
	SURROGATE RECOVERY STUDY				
1,4-Difluorobenzene	0.0339	0.0300	113	80-120	
4-Bromofluorobenzene	0.0290	0.0300	97	80-120	

Lab Batch #: 916808 **Sample:** 465199-001 S / MS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/20/13 22:47

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
	SURROGATE RECOVERY STUDY				
1,4-Difluorobenzene	0.0352	0.0300	117	80-120	
4-Bromofluorobenzene	0.0243	0.0300	81	80-120	

Lab Batch #: 916886 **Sample:** 465367-002 S / MS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/24/13 12:32

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
	SURROGATE RECOVERY STUDY				
1,4-Difluorobenzene	0.0296	0.0300	99	80-120	
4-Bromofluorobenzene	0.0244	0.0300	81	80-120	

Lab Batch #: 916886 **Sample:** 465367-002 SD / MSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/24/13 12:49

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
	SURROGATE RECOVERY STUDY				
1,4-Difluorobenzene	0.0336	0.0300	112	80-120	
4-Bromofluorobenzene	0.0251	0.0300	84	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

BS / BSD Recoveries

Project Name: Midland Odessa Discounted Fee Schedule

Work Order #: 465163 **Project ID:** 039122

Analyst: DYV **Date Prepared:** 06/20/2013 **Date Analyzed:** 06/20/2013

Lab Batch ID: 916808 **Sample:** 640019-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00100	0.100	0.119	119	0.100	0.120	120	1	70-125	25	
Toluene	<0.00200	0.100	0.0975	98	0.100	0.0964	96	1	70-125	25	
Ethylbenzene	<0.00100	0.100	0.0867	87	0.100	0.0862	86	1	71-129	25	
m,p-Xylenes	<0.00200	0.200	0.171	86	0.200	0.170	85	1	70-131	25	
o-Xylene	<0.00100	0.100	0.0865	87	0.100	0.0861	86	0	71-133	25	

Analyst: DYV **Date Prepared:** 06/24/2013 **Date Analyzed:** 06/24/2013

Lab Batch ID: 916886 **Sample:** 640115-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00100	0.100	0.102	102	0.100	0.120	120	16	70-125	25	
Toluene	<0.00200	0.100	0.0889	89	0.100	0.101	101	13	70-125	25	
Ethylbenzene	<0.00100	0.100	0.0837	84	0.100	0.0927	93	10	71-129	25	
m,p-Xylenes	<0.00200	0.200	0.167	84	0.200	0.184	92	10	70-131	25	
o-Xylene	<0.00100	0.100	0.0866	87	0.100	0.0945	95	9	71-133	25	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

BS / BSD Recoveries

Project Name: Midland Odessa Discounted Fee Schedule

Work Order #: 465163 **Project ID:** 039122

Analyst: AMB **Date Prepared:** 06/18/2013 **Date Analyzed:** 06/18/2013

Lab Batch ID: 916702 **Sample:** 639978-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<1.00	25.0	23.2	93	25.0	23.2	93	0	80-120	20	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

Form 3 - MS Recoveries

Project Name: Midland Odessa Discounted Fee Schedule

Work Order #: 465163

Lab Batch #: 916808 **Project ID:** 039122

Date Analyzed: 06/20/2013 **Date Prepared:** 06/20/2013 **Analyst:** DYV

QC- Sample ID: 465199-001 S **Batch #:** 1 **Matrix:** Water

Reporting Units: mg/L

MATRIX / MATRIX SPIKE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Benzene	<0.00100	0.100	0.119	119	70-125	
Toluene	<0.00200	0.100	0.0959	96	70-125	
Ethylbenzene	<0.00100	0.100	0.0834	83	71-129	
m,p-Xylenes	<0.00200	0.200	0.164	82	70-131	
o-Xylene	<0.00100	0.100	0.0841	84	71-133	

Lab Batch #: 916702

Date Analyzed: 06/18/2013 **Date Prepared:** 06/18/2013 **Analyst:** AMB

QC- Sample ID: 465163-001 S **Batch #:** 1 **Matrix:** Water

Reporting Units: mg/L

MATRIX / MATRIX SPIKE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride	30.0	125	157	102	80-120	

Lab Batch #: 916702

Date Analyzed: 06/18/2013 **Date Prepared:** 06/18/2013 **Analyst:** AMB

QC- Sample ID: 465163-011 S **Batch #:** 1 **Matrix:** Water

Reporting Units: mg/L

MATRIX / MATRIX SPIKE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride	59.5	125	192	106	80-120	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference [E] = 200*(C-A)/(C+B)
All Results are based on MDL and Validated for QC Purposes

BRL - Below Reporting Limit

Form 3 - MS / MSD Recoveries

Project Name: Midland Odessa Discounted Fee Schedule

Work Order # : 465163 **Project ID:** 039122

Lab Batch ID: 916886 **QC- Sample ID:** 465367-002 S **Batch #:** 1 **Matrix:** Water

Date Analyzed: 06/24/2013 **Date Prepared:** 06/24/2013 **Analyst:** DYV

Reporting Units: mg/L

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00100	0.100	0.120	120	0.100	0.120	120	0	70-125	25	
Toluene	<0.00200	0.100	0.101	101	0.100	0.101	101	0	70-125	25	
Ethylbenzene	<0.00100	0.100	0.0950	95	0.100	0.0939	94	1	71-129	25	
m,p-Xylenes	<0.00200	0.200	0.188	94	0.200	0.186	93	1	70-131	25	
o-Xylene	<0.00100	0.100	0.0960	96	0.100	0.0951	95	1	71-133	25	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

ANALYSIS REQUEST & CHAIN OF CUSTODY RECORD

XENCO Laboratories

☐ 4143 Greenbriar Drive, Stafford, TX 77477 **281-240-4200**
☐ 5332, Blackberry Drive, San Antonio, TX 78238 **210-509-3334**
☐ 9701 Harry Hines Blvd., Dallas, TX 75220 **214-902-0300**
☒ 12600 West I-20 East, Odessa, TX 79765 **432-563-1800**

Serial #: 322845 Page 1 of 2

Company-City: CRA Midland **Phone:** 432-686-0086

Lab Only: 465163

Project Name-Location ☐ Previously done at XENCO **Project ID:** 039122

TAT: ASAP 5h 12h 24h 48h 3d 5d 7d 10d 21d Standard TAT is project specific.
It is typically 5-7 Working Days for level II and 10+ Working days for level III and IV data.

Proj. State: TX, AL, FL, GA, LA, MS, NC, NJ, PA, SC, TN, UT Other

Proj. Manager (PM): Brittany Ford

E-mail Results to ☒ PM and BFord@crawford.com **Fax No:** 432-686-0186

Invoice to ☐ Accounting ☐ Inc. Invoice with Final Report ☐ Invoice must have a P.O.
Bill to:

Quote/Pricing: **P.O. No:** ☐ Call for P.O.

Reg Program: UST DRY-CLEAN Land-Fill Waste-Disp NPDES DW **TRRP**

QAPP Per-Contract CLP AGCEE NAVY DOE DOD USACE OTHER:

Special DLs (GW DW QAPP MDLs RLs See Lab PM Included Call PM)

Sampler Name: Justin Nixon **Signature:**

	Sample ID	Sampling Date	Time	Depth ft' In" m	Matrix	Composite	Grab	# Containers	Container Size	Container Type	Preservatives	VOA: Full-List BTEX-MTBE EtOH Oxyg VOHs VOAs	VOA: PP TCL DW Appdx-1 Appdx-2 CALL Other:	PAHs SIM 8310 8270	TX-1005 DRO GRO MA EPH MA VPH	SVOCs: Full-List DW BN&AE TCLP PP Appdx-2 CALL	OC Pesticides PCBs Herbicides OP Pesticides	Metals: RCRA-8 RCRA-4 Pb 13PP 23TAL Appdx 1 Appdx2	SPLP - TCLP (Metals VOCs SVOCs Pest. Herb. PCBs)	EDB / DBCP	BTEX 8021B	Chloride E300.0	TAT ASAP 5h 12h 24h 48h 3d 5d 7d 10d 21d	Addn: PAH above mg/L W, mg/Kg S Highest Hit	Hold Samples (Surcharges will apply and are pre-approved)	Remarks: Sample Clean-ups are pre-approved as needed	Addn: Date Rcv. by: From:	
1	RW02-061413	6-14-13	1500		W		X	3													X	X						1
2	RW03-061413		1530																									2
3	MW05-061413		1040																									3
4	MW06-061413		1100																									4
5	MW07-061413		1120																									5
6	MW08-061413		920																									6
7	MW01-061413		1000																									7
8	MW02-061413		1020																									8
9	Dup1-061413		920																									9
10	MW03-061413		940																									10

Relinquished by (Initials and Sign)	Date & Time	Relinquished to (Initials and Sign)	Date & Time
1) JN	6-14-13 1030	2)	
3)		4)	
5)		6) BR Bill Rubenacker	6-17-13 10:15

Total Containers per COC: 30 Cooler Temp: 5.5 °C

Otherwise agreed on writing. Reports are the Intellectual Property of XENCO until paid. Samples will be held 30 days after final report is e-mailed unless thereby requested. Rush Charges and Collection Fees are pre-approved if needed.

Preservatives: Various (**V**), HCl pH<2 (**H**), H2SO4 pH<2 (**S**), HNO3 pH<2 (**N**), Asbc Acid&NaOH (**A**), ZnAc&NaOH (**Z**), (Cool, <4C) (**C**), None (**NA**),See Label (**L**), Other (**O**) _____
Cont. Size: 4oz (**4**), 8oz (**8**), 32oz (**32**), 40ml VOA (**40**), 1L (**1**), 500ml (**5**), Tedlar Bag (**B**), Various (**V**), Other _____ **Cont. Type:** Glass Amb (**A**), Glass Clear (**C**), Plastic (**P**), Various (**V**)

Matrix: Air (**A**), Product (**P**), Solid (**S**), Water (**W**), Liquid (**L**)

Committed to Excellence in Service and Quality *www.xenco.com*

ANALYSIS REQUEST & CHAIN OF CUSTODY RECORD

XENCO Laboratories

☐ 4143 Greenbriar Drive, Stafford, TX 77477 **281-240-4200**
☐ 5332, Blackberry Drive, San Antonio, TX 78238 **210-509-3334**
☐ 9701 Harry Hines Blvd., Dallas, TX 75220 **214-902-0300**
☒ 12600 West I-20 East, Odessa, TX 79765 **432-563-1800**

Serial #: 322844 Page 2 of 2

Company-City: CRA - Midland **Phone:** 432-686-0086

Lab Only: 465163

Project Name-Location: Monument, NM ☐ Previously done at XENCO **Project ID:** 039123

TAT: ASAP 5h 12h 24h 48h 3d 5d 7d 10d 21d Standard TAT is project specific.
It is typically 5-7 Working Days for level II and 10+ Working days for level III and IV data.

Proj. State: TX, AL, FL, GA, LA, MS, NC, NJ, PA, SC, TN, UT Other

Proj. Manager (PM): Brittany Ford

E-mail Results to: ☒ PM and BFord@crawtd.com **Fax No:** 432-686-0186

Invoice to ☐ Accounting ☐ Inc. Invoice with Final Report ☐ Invoice must have a P.O.
Bill to:

Quote/Pricing: **P.O. No:** ☐ Call for P.O.

Reg Program: UST DRY-CLEAN Land-Fill Waste-Disp NPDES DW **TRRP**
QAPP Per-Contract CLP AGCEE NAVY DOE DOD USACE OTHER:

Special DLs (GW DW QAPP MDLs RLs See Lab PM Included Call PM)

Sampler Name: Justin Nixon **Signature:**

	Sample ID	Sampling Date	Time	Depth ft' In" m	Matrix	Composite	Grab	# Containers	Container Size	Container Type	Preservatives
1	MW04-061413	6-14-13	1140		W		X	3			
2			"		"						
3											
4											
5											
6											
7											
8											
9											
10											

	VOA: Full-List BTEX-MTBE EtOH Oxyg VOHs VOAs	VOA: PP TCL DW Appdx-1 Appdx-2 CALL Other:	PAHs SIM 8310 8270	TX-1005 DRO GRO MA EPH MA VPH	SVOCs: Full-List DW BN&AE TCLP PP Appdx-2 CALL	OC Pesticides PCBs Herbicides OP Pesticides	Metals: RCRA-8 RCRA-4 Pb 13PP 23TAL Appdx 1 Appdx2	SPLP - TCLP (Metals VOCs SVOCs Pest. Herb. PCBs)	EDB / DBCP	BTEX 8021B	Chloride E 300.0
1										X	X
2											
3											
4											
5											
6											
7											
8											
9											
10											

TAT ASAP 5h 12h 24h 48h 3d 5d 7d 10d 21d

Addn: PAH above mg/L W, mg/Kg S Highest Hit

Hold Samples (Surcharges will apply and are pre-approved)

Remarks

Sample Clean-ups are pre-approved as needed

Addn: Date Rcv. by: From:

Relinquished by (Initials and Sign)	Date & Time	Relinquished to (Initials and Sign)	Date & Time
1)	6-17-13 1030	2)	
3)		4)	
5)		6) BR Bill Blue	6-17-13 10:15

Total Containers per COC: 3 Cooler Temp: 5.5°C 6.5

Otherwise agreed on writing. Reports are the Intellectual Property of XENCO until paid. Samples will be held 30 days after final report is e-mailed unless hereby requested. Rush Charges and Collection Fees are pre-approved if needed.

Preservatives: Various (**V**), HCl pH<2 (**H**), H2SO4 pH<2 (**S**), HNO3 pH<2 (**N**), Asbc Acid&NaOH (**A**), ZnAc&NaOH (**Z**), (Cool, <4C) (**C**), None (**NA**),See Label (**L**), Other (**O**) _____
Cont. Size: 4oz (**4**), 8oz (**8**), 32oz (**32**), 40ml VOA (**40**), 1L (**1**), 500ml (**5**), Tedlar Bag (**B**), Various (**V**), Other _____ **Cont. Type:** Glass Amb (**A**), Glass Clear (**C**), Plastic (**P**), Various (**V**)

Matrix: Air (**A**), Product (**P**), Solid (**S**), Water (**W**), Liquid (**L**)

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XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: Conestoga Rovers & Associates

Date/ Time Received: 06/17/2013 10:13:00 AM

Work Order #: 465163

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used :

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	5.5
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**Yes**
#5 Custody Seals intact on sample bottles?	**Yes**
#6 *Custody Seals Signed and dated?	**Yes**
#7 *Chain of Custody present?	**Yes**
#8 Sample instructions complete on Chain of Custody?	**Yes**
#9 Any missing/extra samples?	**No**
#10 Chain of Custody signed when relinquished/ received?	**Yes**
#11 Chain of Custody agrees with sample label(s)?	**Yes**
#12 Container label(s) legible and intact?	**Yes**
#13 Sample matrix/ properties agree with Chain of Custody?	**Yes**
#14 Samples in proper container/ bottle?	**Yes**
#15 Samples properly preserved?	**Yes**
#16 Sample container(s) intact?	**Yes**
#17 Sufficient sample amount for indicated test(s)?	**Yes**
#18 All samples received within hold time?	**Yes**
#19 Subcontract of sample(s)?	**No**
#20 VOC samples have zero headspace (less than 1/4 inch bubble)?	**Yes**
#21 <2 for all samples preserved with HNO3,HCL, H2SO4?	**Yes**
#22 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	**N/A**

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst:	PH Device/Lot#:

Checklist completed by: Kelsey Brooks Date: 06/17/2013

Checklist reviewed by: Kelsey Brooks Date: 06/17/2013

Analytical Report 465916

for

Conestoga Rovers & Associates

Project Manager: Scott Christ

F Slate

039122

08-JUL-13

Collected By: Client

12600 West I-20 East Odessa, Texas 79765

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-10-6-TX), Arizona (AZ0765), Arkansas (08-039-0), Connecticut (PH-0102), Florida (E871002)
Illinois (002082), Indiana (C-TX-02), Iowa (392), Kansas (E-10380), Kentucky (45), Louisiana (03054)
New Hampshire (297408), New Jersey (TX007), New York (11763), Oklahoma (9218), Pennsylvania (68-03610)
Rhode Island (LAO00312), USDA (S-44102), DoD (L11-54)

Xenco-Atlanta (EPA Lab Code: GA00046):
Florida (E87429), North Carolina (483), South Carolina (98015), Kentucky (85), DoD (L10-135)
Louisiana (04176), USDA (P330-07-00105)

Xenco-Tampa Mobile (EPA Lab code: FL01212): Florida (E84900)
Xenco-Lakeland: Florida (E84098)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-TX)
Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295-TX)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)
Xenco Tucson (EPA Lab code:AZ000989): Arizona (AZ0758)

08-JUL-13

Project Manager: **Scott Christ**
Conestoga Rovers & Associates
2135 S Loop 250 W
Midland, TX 79703

Reference: XENCO Report No(s): **465916**
F Slate
Project Address: TX

Scott Christ:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 465916. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 465916 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Kelsey Brooks
Project Manager

Sample Cross Reference 465916

Conestoga Rovers & Associates, Midland, TX

F Slate

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
RW 1	W	06-27-13 10:00		465916-001
RW 4	W	06-27-13 10:20		465916-002

This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory.

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Certificate of Analytical Results 465916

Conestoga Rovers & Associates, Midland, TX

F Slate

Sample Id: **RW 1** Matrix: Water Sample Depth:

Lab Sample Id: 465916-001 Date Collected: 06.27.13 10.00 Date Received: 06.28.13 10.10

Analytical Method: Inorganic Anions by EPA 300/300.1 Prep Method: E300P

Analyst: AMB % Moist: Tech: AMB

Seq Number: 917907 Date Prep: 07.02.13 10.00

Prep seq: 640752

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Chloride	16887-00-6	**33.8**	5.00	0.140	mg/L	07.03.13 09:21		5

Analytical Method: BTEX by EPA 8021B Prep Method: 5030B

Analyst: DYV % Moist: Tech: DYV

Seq Number: 917708 Date Prep: 07.02.13 15.30

Prep seq: 640597

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	**0.00745**	0.00100	0.000500	mg/L	07.03.13 14:21		1
Toluene	108-88-3	**0.00963**	0.00200	0.00100	mg/L	07.03.13 14:21		1
Ethylbenzene	100-41-4	**0.0101**	0.00100	0.000700	mg/L	07.03.13 14:21		1
m,p-Xylenes	179601-23-1	**0.0534**	0.00200	0.00140	mg/L	07.03.13 14:21		1
o-Xylene	95-47-6	**0.00145**	0.00100	0.000700	mg/L	07.03.13 14:21		1
Total Xylenes	1330-20-7	**0.0549**		0.000700	mg/L	07.03.13 14:21		
Total BTEX		**0.0820**		0.000500	mg/L	07.03.13 14:21		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	90	80 - 120	%		
4-Bromofluorobenzene	98	80 - 120	%		

Certificate of Analytical Results 465916

Conestoga Rovers & Associates, Midland, TX

F Slate

Sample Id: **RW 4** Matrix: Water Sample Depth:

Lab Sample Id: 465916-002 Date Collected: 06.27.13 10.20 Date Received: 06.28.13 10.10

Analytical Method: Inorganic Anions by EPA 300/300.1 Prep Method: E300P

Analyst: AMB % Moist: Tech: AMB

Seq Number: 917907 Date Prep: 07.02.13 10.00

Prep seq: 640752

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Chloride	16887-00-6	**43.1**	5.00	0.140	mg/L	07.03.13 10:04		5

Analytical Method: BTEX by EPA 8021B Prep Method: 5030B

Analyst: DYV % Moist: Tech: DYV

Seq Number: 917708 Date Prep: 07.02.13 15.30

Prep seq: 640597

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	**0.0245**	0.0100	0.00500	mg/L	07.03.13 11:41		10
Toluene	108-88-3	**0.0396**	0.0200	0.0100	mg/L	07.03.13 11:41		10
Ethylbenzene	100-41-4	**0.0779**	0.0100	0.00700	mg/L	07.03.13 11:41		10
m,p-Xylenes	179601-23-1	**0.196**	0.0200	0.0140	mg/L	07.03.13 11:41		10
o-Xylene	95-47-6	ND	0.0100	0.00700	mg/L	07.03.13 11:41	U	10
Total Xylenes	1330-20-7	**0.196**		0.00700	mg/L	07.03.13 11:41		
Total BTEX		**0.338**		0.00500	mg/L	07.03.13 11:41		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	110	80 - 120	%		
4-Bromofluorobenzene	98	80 - 120	%		

Certificate of Analytical Results 465916

Conestoga Rovers & Associates, Midland, TX

F Slate

Sample Id: **640597-1-BLK** Matrix: Water Sample Depth:

Lab Sample Id: 640597-1-BLK Date Collected: Date Received:

Analytical Method: BTEX by EPA 8021B Prep Method: 5030B

Analyst: DYV % Moist: Tech: DYV

Seq Number: 917708 Date Prep: 07.02.13 15.30

Prep seq: 640597

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	07.02.13 20:32	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	07.02.13 20:32	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	07.02.13 20:32	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	07.02.13 20:32	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	07.02.13 20:32	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	120	80 - 120	%		
4-Bromofluorobenzene	83	80 - 120	%		

Sample Id: **640752-1-BLK** Matrix: Water Sample Depth:

Lab Sample Id: 640752-1-BLK Date Collected: Date Received:

Analytical Method: Inorganic Anions by EPA 300/300.1 Prep Method: E300P

Analyst: AMB % Moist: Tech: AMB

Seq Number: 917907 Date Prep: 07.02.13 10.00

Prep seq: 640752

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Chloride	16887-00-6	ND	1.00	0.0280	mg/L	07.03.13 03:12	U	1

Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the quantiation limit and above the detection limit.

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

***** (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

Form 2 - Surrogate Recoveries

Project Name: F Slate

Work Orders : 465916, **Project ID:** 039122

Lab Batch #: 917708 **Sample:** 640597-1-BKS / BKS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 07/02/13 19:44

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0298	0.0300	99	80-120	
4-Bromofluorobenzene	0.0245	0.0300	82	80-120	

Lab Batch #: 917708 **Sample:** 640597-1-BSD / BSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 07/02/13 20:00

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0296	0.0300	99	80-120	
4-Bromofluorobenzene	0.0245	0.0300	82	80-120	

Lab Batch #: 917708 **Sample:** 640597-1-BLK / BLK **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 07/02/13 20:32

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0359	0.0300	120	80-120	
4-Bromofluorobenzene	0.0249	0.0300	83	80-120	

Lab Batch #: 917708 **Sample:** 465713-014 S / MS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 07/02/13 23:26

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0283	0.0300	94	80-120	
4-Bromofluorobenzene	0.0253	0.0300	84	80-120	

Lab Batch #: 917708 **Sample:** 465713-014 SD / MSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 07/02/13 23:42

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0308	0.0300	103	80-120	
4-Bromofluorobenzene	0.0252	0.0300	84	80-120	

* Surrogate outside of Laboratory QC limits
** Surrogates outside limits; data and surrogates confirmed by reanalysis
*** Poor recoveries due to dilution
Surrogate Recovery [D] = 100 * A / B
All results are based on MDL and validated for QC purposes.

BS / BSD Recoveries

Project Name: F Slate

Work Order #: 465916 **Project ID:** 039122

Analyst: DYV **Date Prepared:** 07/02/2013 **Date Analyzed:** 07/02/2013

Lab Batch ID: 917708 **Sample:** 640597-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.000500	0.100	0.117	117	0.100	0.115	115	2	70-125	25	
Toluene	<0.00100	0.100	0.0920	92	0.100	0.0918	92	0	70-125	25	
Ethylbenzene	<0.000700	0.100	0.0819	82	0.100	0.0813	81	1	71-129	25	
m,p-Xylenes	<0.00140	0.200	0.162	81	0.200	0.160	80	1	70-131	25	
o-Xylene	<0.000700	0.100	0.0838	84	0.100	0.0814	81	3	71-133	25	

Analyst: AMB **Date Prepared:** 07/02/2013 **Date Analyzed:** 07/03/2013

Lab Batch ID: 917907 **Sample:** 640752-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<0.0280	25.0	22.8	91	25.0	22.7	91	0	80-120	20	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

Form 3 - MS Recoveries

Project Name: F Slate

Work Order #: 465916
Lab Batch #: 917907
Project ID: 039122
Date Analyzed: 07/03/2013
Date Prepared: 07/02/2013
Analyst: AMB
QC- Sample ID: 465916-001 S
Batch #: 1
Matrix: Water
Reporting Units: mg/L

MATRIX / MATRIX SPIKE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride	33.8	125	153	95	80-120	

Lab Batch #: 917907
Date Analyzed: 07/03/2013
Date Prepared: 07/02/2013
Analyst: AMB
QC- Sample ID: 465966-013 S
Batch #: 1
Matrix: Water
Reporting Units: mg/L

MATRIX / MATRIX SPIKE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride	275	125	415	112	80-120	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference [E] = 200*(C-A)/(C+B)
All Results are based on MDL and Validated for QC Purposes

BRL - Below Reporting Limit

Form 3 - MS / MSD Recoveries

Project Name: F Slate

Work Order # : 465916 **Project ID:** 039122

Lab Batch ID: 917708 **QC- Sample ID:** 465713-014 S **Batch #:** 1 **Matrix:** Water

Date Analyzed: 07/02/2013 **Date Prepared:** 07/02/2013 **Analyst:** DYV

Reporting Units: mg/L

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	0.00449	0.100	0.119	115	0.100	0.119	115	0	70-125	25	
Toluene	<0.00100	0.100	0.0938	94	0.100	0.0929	93	1	70-125	25	
Ethylbenzene	<0.000700	0.100	0.0812	81	0.100	0.0807	81	1	71-129	25	
m,p-Xylenes	<0.00140	0.200	0.161	81	0.200	0.160	80	1	70-131	25	
o-Xylene	<0.000700	0.100	0.0818	82	0.100	0.0820	82	0	71-133	25	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

ANALYSIS REQUEST & CHAIN OF CUSTODY RECORD

XENCO Laboratories

☐ 4143 Greenbriar Drive, Stafford, TX 77477 **281-240-4200**
☐ 5332, Blackberry Drive, San Antonio, TX 78238 **210-509-3334**
☐ 9701 Harry Hines Blvd., Dallas, TX 75220 **214-902-0300**
☐ 12600 West I-20 East, Odessa, TX 79765 **432-563-1800**

Serial #: 327880 Page of

Company-City CRA	**Phone** 432 498 0086
Project Name-Location F State ☐ Previously done at XENCO	**Project ID** 039122
Proj. State: TX, AL, FL, GA, LA, MS, NC, NJ, PA, SC, TN, UT Other NM	**Proj. Manager (PM)** Scott Christ
E-mail Results to ☑ PM and schrist@craworld / bford@craworld.com	**Fax No:**
Invoice to ☐ Accounting ☐ Inc. Invoice with Final Report ☐ Invoice must have a P.O. Bill to:	
Quote/Pricing:	**P.O. No:** ☐ Call for P.O.
Reg Program: UST DRY-CLEAN Land-Fill Waste-Disp NPDES DW **TRRP** QAPP Per-Contract CLP AGCEE NAVY DOE DOD USACE OTHER:	
Special DLs (GW DW QAPP MDLs RLs See Lab PM Included Call PM)	
Sampler Name Daniel Archer	**Signature**

Lab Only: 465916

TAT: ASAP 5h 12h 24h 48h 3d (5d) 7d (10d) 21d Standard TAT is project specific.
It is typically 5-7 Working Days for level II and ~~10+~~ Working days for level III and IV data.

	Sample ID	Sampling Date	Time	Depth ft' In" m	Matrix	Composite	Grab	# Containers	Container Size	Container Type	Preservatives
1	RW 1	27 Jun 13	1000		W		X	4	VOA 250ml		HCl ICE
2	RW 4	27 Jun 13	1020		W		X	4	VOA 250ml		HCl ICE
3											
4											
5											
6											
7											
8											
9											
10											

	VOA: Full-List BTEX-MTBE EtOH Oxyg VOHs VOAs	VOA: PP TCL DW Appdx-1 Appdx-2 CALL Other:	PAHs SIM 8310 8270	TX-1005 DRO GRO MA EPH MA VPH	SVOCs: Full-List DW BN&AE TCLP PP Appdx-2 CALL	OC Pesticides PCBs Herbicides OP Pesticides	Metals: RCRA-8 RCRA-4 Pb 13PP 23TAL Appdx 1 Appdx2	SPLP - TCLP (Metals VOCs SVOCs Pest. Herb. PCBs)	EDB / DBCP	BTEX 8021B	Chloride E300.0	TAT ASAP 5h 12h 24h 48h 3d 5d 7d (10d) 21d	Addn: PAH above mg/L W, mg/Kg S Highest Hit	Hold Samples (Surcharges will apply and are pre-approved)
1										X	X	X		
2										X	X	X		
3														
4														
5														
6														
7														
8														
9														
10														

Remarks

Sample Clean-ups are pre-approved as needed

Addn: Date Rcv. by: From:

Relinquished by (Initials and Sign)	Date & Time	Relinquished to (Initials and Sign)	Date & Time
1)	28 Jun 13 1010	2)	6-28-13 10:10
3)		4)	
5)		6)	

Total Containers per COC: 8 Cooler Temp: 3.0 °C

Otherwise agreed on writing. Reports are the Intellectual Property of XENCO until paid. Samples will be held 30 days after final report is e-mailed unless hereby requested. Rush Charges and Collection Fees are pre-approved if needed.

Preservatives: Various (**V**), HCl pH<2 (**H**), H2SO4 pH<2 (**S**), HNO3 pH<2 (**N**), Asbc Acid&NaOH (**A**), ZnAc&NaOH (**Z**), (Cool, <4C) (**C**), None (**NA**),See Label (**L**), Other (**O**) _____
Cont. Size: 4oz (**4**), 8oz (**8**), 32oz (**32**), 40ml VOA (**40**), 1L (**1**), 500ml (**5**), Tedlar Bag (**B**), Various (**V**), Other _____ **Cont. Type:** Glass Amb (**A**), Glass Clear (**C**), Plastic (**P**), Various (**V**)

Matrix: Air (**A**), Product (**P**), Solid (**S**), Water (**W**), Liquid (**L**)

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Final 1.000

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: Conestoga Rovers & Associates

Date/ Time Received: 06/28/2013 10:10:00 AM

Work Order #: 465916

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used :

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	3
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**Yes**
#5 Custody Seals intact on sample bottles?	**Yes**
#6 *Custody Seals Signed and dated?	**Yes**
#7 *Chain of Custody present?	**Yes**
#8 Sample instructions complete on Chain of Custody?	**Yes**
#9 Any missing/extra samples?	**No**
#10 Chain of Custody signed when relinquished/ received?	**Yes**
#11 Chain of Custody agrees with sample label(s)?	**Yes**
#12 Container label(s) legible and intact?	**Yes**
#13 Sample matrix/ properties agree with Chain of Custody?	**Yes**
#14 Samples in proper container/ bottle?	**Yes**
#15 Samples properly preserved?	**Yes**
#16 Sample container(s) intact?	**Yes**
#17 Sufficient sample amount for indicated test(s)?	**Yes**
#18 All samples received within hold time?	**Yes**
#19 Subcontract of sample(s)?	**Yes**
#20 VOC samples have zero headspace (less than 1/4 inch bubble)?	**Yes**
#21 <2 for all samples preserved with HNO3,HCL, H2SO4?	**Yes**
#22 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	**Yes**

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst:	PH Device/Lot#:

Checklist completed by: Kelsey Brooks Date: 06/28/2013

Checklist reviewed by: Kelsey Brooks Date: 06/28/2013

Analytical Report 470310

for

Conestoga Rovers & Associates

Project Manager: Brittany Ford

F State

039122.2013.01

20-SEP-13

Collected By: Client

12600 West I-20 East Odessa, Texas 79765

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-13-14-TX), Arizona (AZ0765), Arkansas (08-039-0), Connecticut (PH-0102), Florida (E871002)
Illinois (002082), Indiana (C-TX-02), Iowa (392), Kansas (E-10380), Kentucky (45), Louisiana (03054)
New Hampshire (297408), New Jersey (TX007), New York (11763), Oklahoma (9218), Pennsylvania (68-03610)
Rhode Island (LAO00312), USDA (S-44102), DoD (L11-54)

Xenco-Atlanta (EPA Lab Code: GA00046):
Florida (E87429), North Carolina (483), South Carolina (98015), Kentucky (85), DoD (L10-135)
Louisiana (04176), USDA (P330-07-00105)

Xenco-Tampa Mobile (EPA Lab code: FL01212): Florida (E84900)
Xenco-Lakeland: Florida (E84098)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-TX)
Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295-TX)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)
Xenco Tucson (EPA Lab code:AZ000989): Arizona (AZ0758)

20-SEP-13

Project Manager: **Brittany Ford**
Conestoga Rovers & Associates
2135 S Loop 250 W
Midland, TX 79703

Reference: XENCO Report No(s): **470310**
F State
Project Address: New Mexico

Brittany Ford:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 470310. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 470310 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Julian Martinez
Project Manager

Sample Cross Reference 470310

Conestoga Rovers & Associates, Midland, TX

F State

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW-6	W	09-13-13 13:15		470310-001

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-922962 Inorganic Anions by EPA 300/300.1
E300

Batch 922962, Chloride recovered below QC limits in the Matrix Spike and Matrix Spike Duplicate.
Samples affected are: 470310-001.
The Laboratory Control Sample for Chloride is within laboratory Control Limits

Certificate of Analysis Summary 470310

Conestoga Rovers & Associates, Midland, TX

Project Name: F State

Project Id: 039122.2013.01
Contact: Brittany Ford
Project Location: New Mexico

Date Received in Lab: Fri Sep-13-13 04:34 pm
Report Date: 20-SEP-13
Project Manager: Kelsey Brooks

Analysis Requested							
	Lab Id:	470310-001					
	Field Id:	MW-6					
	Depth:						
	Matrix:	WATER					
	Sampled:	Sep-13-13 13:15					
BTEX by EPA 8021B	***Extracted:***	Sep-19-13 17:00					
	Analyzed:	Sep-19-13 20:42					
	Units/RL:	mg/L	RL				
Benzene		ND	0.00100				
Toluene		ND	0.00200				
Ethylbenzene		ND	0.00100				
m_p-Xylenes		ND	0.00200				
o-Xylene		ND	0.00100				
Total Xylenes		ND	0.00100				
Total BTEX		ND	0.00100				
Inorganic Anions by EPA 300/300.1 SUB: TX104704215	***Extracted:***	Sep-17-13 12:30					
	Analyzed:	Sep-17-13 21:36					
	Units/RL:	mg/L	RL				
Chloride		209	1.00				

Julian Martinez
Project Manager

Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the quantiation limit and above the detection limit.

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

***** (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

Form 2 - Surrogate Recoveries

Project Name: F State

Work Orders : 470310,

Project ID: 039122.2013.01

Lab Batch #: 923164 **Sample:** 470310-001 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 09/19/13 20:42

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0288	0.0300	96	80-120	
4-Bromofluorobenzene	0.0287	0.0300	96	80-120	

Lab Batch #: 923164 **Sample:** 644114-1-BLK / BLK **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 09/19/13 19:38

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0296	0.0300	99	80-120	
4-Bromofluorobenzene	0.0294	0.0300	98	80-120	

Lab Batch #: 923164 **Sample:** 644114-1-BKS / BKS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 09/19/13 18:50

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0282	0.0300	94	80-120	
4-Bromofluorobenzene	0.0301	0.0300	100	80-120	

Lab Batch #: 923164 **Sample:** 644114-1-BSD / BSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 09/19/13 19:06

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0298	0.0300	99	80-120	
4-Bromofluorobenzene	0.0296	0.0300	99	80-120	

Lab Batch #: 923164 **Sample:** 470446-004 S / MS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 09/19/13 22:33

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0313	0.0300	104	80-120	
4-Bromofluorobenzene	0.0300	0.0300	100	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: F State

Work Orders : 470310,

Project ID: 039122.2013.01

Lab Batch #: 923164 **Sample:** 470446-004 SD / MSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 09/19/13 22:49

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0310	0.0300	103	80-120	
4-Bromofluorobenzene	0.0292	0.0300	97	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Blank Spike Recovery

Project Name: F State

Work Order #: 470310 **Project ID:** 039122.2013.01

Lab Batch #: 922962 **Sample:** 643929-1-BKS **Matrix:** Water

Date Analyzed: 09/17/2013 **Date Prepared:** 09/17/2013 **Analyst:** RKO

Reporting Units: mg/L **Batch #:** 1

BLANK /BLANK SPIKE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Control Limits %R	Flags
Chloride	<1.00	100	101	101	90-110	

Blank Spike Recovery [D] = 100*[C]/[B]
All results are based on MDL and validated for QC purposes.

BRL - Below Reporting Limit

BS / BSD Recoveries

Project Name: F State

Work Order #: 470310 **Project ID:** 039122.2013.01

Analyst: ARM **Date Prepared:** 09/19/2013 **Date Analyzed:** 09/19/2013

Lab Batch ID: 923164 **Sample:** 644114-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00100	0.100	0.112	112	0.100	0.110	110	2	70-125	25	
Toluene	<0.00200	0.100	0.114	114	0.100	0.110	110	4	70-125	25	
Ethylbenzene	<0.00100	0.100	0.109	109	0.100	0.105	105	4	71-129	25	
m_p-Xylenes	<0.00200	0.200	0.217	109	0.200	0.209	105	4	70-131	25	
o-Xylene	<0.00100	0.100	0.108	108	0.100	0.104	104	4	71-133	25	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

Form 3 - MS / MSD Recoveries

Project Name: F State

Work Order # : 470310 **Project ID:** 039122.2013.01

Lab Batch ID: 923164 **QC- Sample ID:** 470446-004 S **Batch #:** 1 **Matrix:** Water

Date Analyzed: 09/19/2013 **Date Prepared:** 09/19/2013 **Analyst:** ARM

Reporting Units: mg/L

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00100	0.100	0.108	108	0.100	0.0993	99	8	70-125	25	
Toluene	<0.00200	0.100	0.108	108	0.100	0.0997	100	8	70-125	25	
Ethylbenzene	<0.00100	0.100	0.102	102	0.100	0.0954	95	7	71-129	25	
m_p-Xylenes	<0.00200	0.200	0.205	103	0.200	0.191	96	7	70-131	25	
o-Xylene	<0.00100	0.100	0.102	102	0.100	0.0954	95	7	71-133	25	

Lab Batch ID: 922962 **QC- Sample ID:** 470110-009 S **Batch #:** 1 **Matrix:** Water

Date Analyzed: 09/18/2013 **Date Prepared:** 09/17/2013 **Analyst:** RKO

Reporting Units: mg/L

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<1.00	100	98.4	98	100	97.6	98	1	80-120	20	

Lab Batch ID: 922962 **QC- Sample ID:** 470365-001 S **Batch #:** 1 **Matrix:** Waste Water

Date Analyzed: 09/17/2013 **Date Prepared:** 09/17/2013 **Analyst:** RKO

Reporting Units: mg/L

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	52.4	100	130	78	100	128	76	2	80-120	20	X

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

ANALYSIS REQUEST & CHAIN OF CUSTODY RECORD

XENCO Laboratories

☐ 4143 Greenbriar Drive, Stafford, TX 77477 **281-240-4200**
☐ 5332, Blackberry Drive, San Antonio, TX 78238 **210-509-3334**
☐ 9701 Harry Hines Blvd., Dallas, TX 75220 **214-902-0300**
☐ 12600 West I-20 East, Odessa, TX 79765 **432-563-1800**

Serial #: 324691 Page of

Company-City: CRA **Phone:** 4326866060

Lab Only: 470310

Project Name-Location: F State ☑ Previously done at XENCO **Project ID:** 039122 2013 01

TAT: ASAP 5h 12h 24h 48h 3d (5d circled) 7d 10d 21d Standard TAT is project specific.
It is typically 5-7 Working Days for level II and 10+ Working days for level III and IV data.

Proj. State: TX, AL, FL, GA, LA, MS, NC, NJ, PA, SC, TN, UT Other NM

Proj. Manager (PM): Brit Ford

E-mail Results to ☑ PM and bford@craworld.com **Fax No:**

Invoice to ☐ Accounting ☐ Inc. Invoice with Final Report ☐ Invoice must have a P.O.
Bill to:

Quote/Pricing: **P.O. No:** ☐ Call for P.O.

Reg Program: UST DRY-CLEAN Land-Fill Waste-Disp NPDES DW **TRRP**
QAPP Per-Contract CLP AGCEE NAVY DOE DOD USACE OTHER:

Special DLs (GW DW QAPP MDLs RLs See Lab PM Included Call PM)

Sampler Name **Signature**

Analysis columns: VOA: Full-List (BTEX circled) MTBE EtOH Oxyg VOHs VOAs; VOA: PP TCL DW Appdx-1 Appdx-2 CALL Other:; PAHs SIM 8310 8270; TX-1005 DRO GRO MA EPH MA VPH; SVOCs: Full-List DW BN&AE TCLP PP Appdx-2 CALL; OC Pesticides PCBs Herbicides OP Pesticides; Metals: RCRA-8 RCRA-4 Pb 13PP 23TAL Appdx 1 Appdx2; SPLP - TCLP (Metals VOCs SVOCs Pest. Herb. PCBs); EDB / DBCP; Cl EPA 300

Right columns: TATASAP 5h 12h 24h 48h 3d 5d 7d 10d 21d; Addn: PAH above mg/L W, mg/Kg S Highest Hit; Hold Samples (Surcharges will apply and are pre-approved); Sample Clean-ups are pre-approved as needed

#	Sample ID	Sampling Date	Time	Depth ft' In" m	Matrix	Composite	Grab	# Containers	Container Size	Container Type	Preservatives	VOA: Full-List BTEX	Cl EPA 300
1	MW-6	13Sep13	1315		W		/	3	V	V	HCl	X	X
2													
3													
4													
5													
6													
7													
8													
9													
10													

Remarks

Addn: Date Rcv. by: From:

#	Relinquished by (Initials and Sign)	Date & Time	Relinquished to (Initials and Sign)	Date & Time
1	1) [signature]	13Sep13 1634	2) [signature]	9-13-13 1634
2	3)		4)	
3	5)		6)	

Total Containers per COC: 3 Cooler Temp: 0.5 °C

Otherwise agreed on writing. Reports are the Intellectual Property of XENCO until paid. Samples will be held 30 days after final report is e-mailed unless hereby requested. Rush Charges and Collection Fees are pre-approved if needed.

Preservatives: Various (**V**), HCl pH<2 (**H**), H2SO4 pH<2 (**S**), HNO3 pH<2 (**N**), Asbc Acid&NaOH (**A**), ZnAc&NaOH (**Z**), (Cool, <4C) (**C**), None (**NA**),See Label (**L**), Other (**O**)
Cont. Size: 4oz (**4**), 8oz (**8**), 32oz (**32**), 40ml VOA (**40**), 1L (**1**), 500ml (**5**), Tedlar Bag (**B**), Various (**V**), Other ______ **Cont. Type:** Glass Amb (**A**), Glass Clear (**C**), Plastic (**P**), Various (**V**)
Matrix: Air (**A**), Product (**P**), Solid (**S**), Water (**W**), Liquid (**L**)

Committed to Excellence in Service and Quality www.xenco.com

Notice: Signature of this document and relinquishment of these samples constitutes a valid purchase order from client company to Xenco Laboratories and its affiliates, subcontractors and assigns under Xenco's standard terms and conditions of service unless previously negotiated under a fully executed client contract.

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: Conestoga Rovers & Associates

Date/ Time Received: 09/13/2013 04:34:00 PM

Work Order #: 470310

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used :

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	.5
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**N/A**
#5 Custody Seals intact on sample bottles?	**N/A**
#6 *Custody Seals Signed and dated?	**N/A**
#7 *Chain of Custody present?	**Yes**
#8 Sample instructions complete on Chain of Custody?	**Yes**
#9 Any missing/extra samples?	**No**
#10 Chain of Custody signed when relinquished/ received?	**Yes**
#11 Chain of Custody agrees with sample label(s)?	**Yes**
#12 Container label(s) legible and intact?	**Yes**
#13 Sample matrix/ properties agree with Chain of Custody?	**Yes**
#14 Samples in proper container/ bottle?	**Yes**
#15 Samples properly preserved?	**Yes**
#16 Sample container(s) intact?	**Yes**
#17 Sufficient sample amount for indicated test(s)?	**Yes**
#18 All samples received within hold time?	**Yes**
#19 Subcontract of sample(s)?	**Yes**
#20 VOC samples have zero headspace (less than 1/4 inch bubble)?	**Yes**
#21 <2 for all samples preserved with HNO3,HCL, H2SO4?	**Yes**
#22 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	**N/A**

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst:	PH Device/Lot#:

Checklist completed by: Candace James
Candace James
Date: 09/13/2013

Checklist reviewed by:
Date: 09/13/2013

Analytical Report 475032

for

Conestoga Rovers & Associates

Project Manager: Brittany Ford

F-State

09-DEC-13

Collected By: Client

12600 West I-20 East Odessa, Texas 79765

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-13-15-TX), Arizona (AZ0765), Arkansas (08-039-0), Connecticut (PH-0102), Florida (E871002)
Illinois (002082), Indiana (C-TX-02), Iowa (392), Kansas (E-10380), Kentucky (45), Louisiana (03054)
New Hampshire (297408), New Jersey (TX007), New York (11763), Oklahoma (9218), Pennsylvania (68-03610)
Rhode Island (LAO00312), USDA (S-44102), DoD (L11-54)

Xenco-Atlanta (EPA Lab Code: GA00046):
Florida (E87429), North Carolina (483), South Carolina (98015), Kentucky (85), DoD (L10-135)
Louisiana (04176), USDA (P330-07-00105)

Xenco-Tampa Mobile (EPA Lab code: FL01212): Florida (E84900)
Xenco-Lakeland: Florida (E84098)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-TX)
Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295-TX)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)
Xenco Tucson (EPA Lab code:AZ000989): Arizona (AZ0758)

09-DEC-13

Project Manager: **Brittany Ford**
Conestoga Rovers & Associates
2135 S Loop 250 W
Midland, TX 79703

Reference: XENCO Report No(s): **475032**
F-State
Project Address: New Mexico

Brittany Ford:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 475032. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 475032 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Kelsey Brooks
Project Manager

Sample Cross Reference 475032

Conestoga Rovers & Associates, Midland, TX

F-State

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW-8-112713	W	11-27-13 13:15		475032-001
MW-3-112713	W	11-27-13 13:25		475032-002
MW-6-112713	W	11-27-13 13:40		475032-003
MW-4-112713	W	11-27-13 14:00		475032-004
MW-7-112713	W	11-27-13 14:15		475032-005
MW-5-112713	W	11-27-13 14:35		475032-006
DUP-1-112713	W	11-27-13 00:00		475032-007

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Certificate of Analysis Summary 475032

Conestoga Rovers & Associates, Midland, TX

Project Name: F-State

Project Id:
Contact: Brittany Ford
Project Location: New Mexico

Date Received in Lab: Mon Dec-02-13 09:34 am
Report Date: 09-DEC-13
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	475032-001		475032-002		475032-003		475032-004		475032-005		475032-006	
	Field Id:	MW-8-112713		MW-3-112713		MW-6-112713		MW-4-112713		MW-7-112713		MW-5-112713	
	Depth:												
	Matrix:	WATER		WATER		WATER		WATER		WATER		WATER	
	Sampled:	Nov-27-13 13:15		Nov-27-13 13:25		Nov-27-13 13:40		Nov-27-13 14:00		Nov-27-13 14:15		Nov-27-13 14:35	
BTEX by EPA 8021B	***Extracted:***	Dec-02-13 11:00		Dec-02-13 11:00		Dec-02-13 11:00		Dec-02-13 11:00		Dec-02-13 11:00		Dec-02-13 11:00	
	Analyzed:	Dec-02-13 22:52		Dec-02-13 23:08		Dec-02-13 23:24		Dec-02-13 23:40		Dec-02-13 23:56		Dec-03-13 00:43	
	Units/RL:	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL
Benzene		ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100
Toluene		ND	0.00200	ND	0.00200	ND	0.00200	ND	0.00200	ND	0.00200	ND	0.00200
Ethylbenzene		ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100
m,p-Xylenes		ND	0.00200	ND	0.00200	ND	0.00200	ND	0.00200	ND	0.00200	ND	0.00200
o-Xylene		ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100
Total Xylenes		ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100
Total BTEX		ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100
Inorganic Anions by EPA 300/300.1	***Extracted:***	Dec-03-13 10:00		Dec-03-13 10:00		Dec-03-13 10:00		Dec-03-13 10:00		Dec-03-13 10:00		Dec-03-13 10:00	
	Analyzed:	Dec-03-13 23:17		Dec-04-13 01:33		Dec-04-13 02:18		Dec-04-13 02:41		Dec-04-13 03:03		Dec-04-13 03:26	
	Units/RL:	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL
Chloride		72.2	5.00	101	5.00	220	5.00	65.1	5.00	78.1	5.00	72.3	5.00

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 475032

Conestoga Rovers & Associates, Midland, TX

Project Name: F-State

Project Id:
Contact: Brittany Ford
Project Location: New Mexico

Date Received in Lab: Mon Dec-02-13 09:34 am
Report Date: 09-DEC-13
Project Manager: Kelsey Brooks

Analysis Requested							
	Lab Id:	475032-007					
	Field Id:	DUP-1-112713					
	Depth:						
	Matrix:	WATER					
	Sampled:	Nov-27-13 00:00					
BTEX by EPA 8021B	***Extracted:***	Dec-02-13 11:00					
	Analyzed:	Dec-03-13 00:59					
	Units/RL:	mg/L RL					
Benzene		ND 0.00100					
Toluene		ND 0.00200					
Ethylbenzene		ND 0.00100					
m,p-Xylenes		ND 0.00200					
o-Xylene		ND 0.00100					
Total Xylenes		ND 0.00100					
Total BTEX		ND 0.00100					
Inorganic Anions by EPA 300/300.1	***Extracted:***	Dec-03-13 10:00					
	Analyzed:	Dec-04-13 03:49					
	Units/RL:	mg/L RL					
Chloride		71.3 5.00					

Kelsey Brooks
Project Manager

Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the quantitation limit and above the detection limit.

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

***** (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

Form 2 - Surrogate Recoveries

Project Name: F-State

Work Orders : 475032,

Project ID:

Lab Batch #: 928985 **Sample:** 475032-001 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 12/02/13 22:52

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0274	0.0300	91	80-120	
4-Bromofluorobenzene	0.0282	0.0300	94	80-120	

Lab Batch #: 928985 **Sample:** 475032-002 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 12/02/13 23:08

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0261	0.0300	87	80-120	
4-Bromofluorobenzene	0.0273	0.0300	91	80-120	

Lab Batch #: 928985 **Sample:** 475032-003 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 12/02/13 23:24

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0263	0.0300	88	80-120	
4-Bromofluorobenzene	0.0279	0.0300	93	80-120	

Lab Batch #: 928985 **Sample:** 475032-004 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 12/02/13 23:40

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0277	0.0300	92	80-120	
4-Bromofluorobenzene	0.0286	0.0300	95	80-120	

Lab Batch #: 928985 **Sample:** 475032-005 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 12/02/13 23:56

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0270	0.0300	90	80-120	
4-Bromofluorobenzene	0.0294	0.0300	98	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: F-State

Work Orders : 475032,

Project ID:

Lab Batch #: 928985 **Sample:** 475032-006 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 12/03/13 00:43

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0272	0.0300	91	80-120	
4-Bromofluorobenzene	0.0294	0.0300	98	80-120	

Lab Batch #: 928985 **Sample:** 475032-007 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 12/03/13 00:59

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0272	0.0300	91	80-120	
4-Bromofluorobenzene	0.0275	0.0300	92	80-120	

Lab Batch #: 928985 **Sample:** 647762-1-BLK / BLK **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 12/02/13 21:16

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0283	0.0300	94	80-120	
4-Bromofluorobenzene	0.0269	0.0300	90	80-120	

Lab Batch #: 928985 **Sample:** 647762-1-BKS / BKS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 12/02/13 19:57

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0306	0.0300	102	80-120	
4-Bromofluorobenzene	0.0299	0.0300	100	80-120	

Lab Batch #: 928985 **Sample:** 647762-1-BSD / BSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 12/02/13 20:13

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0311	0.0300	104	80-120	
4-Bromofluorobenzene	0.0309	0.0300	103	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: F-State

Work Orders : 475032,

Project ID:

Lab Batch #: 928985 **Sample:** 474800-001 S / MS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 12/02/13 20:29

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0301	0.0300	100	80-120	
4-Bromofluorobenzene	0.0325	0.0300	108	80-120	

Lab Batch #: 928985 **Sample:** 474800-001 SD / MSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 12/02/13 20:45

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0308	0.0300	103	80-120	
4-Bromofluorobenzene	0.0327	0.0300	109	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

BS / BSD Recoveries

Project Name: F-State

Work Order #: 475032 **Project ID:**

Analyst: ARM **Date Prepared:** 12/02/2013 **Date Analyzed:** 12/02/2013

Lab Batch ID: 928985 **Sample:** 647762-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00100	0.100	0.110	110	0.100	0.116	116	5	70-125	25	
Toluene	<0.00200	0.100	0.107	107	0.100	0.113	113	5	70-125	25	
Ethylbenzene	<0.00100	0.100	0.101	101	0.100	0.107	107	6	71-129	25	
m,p-Xylenes	<0.00200	0.200	0.202	101	0.200	0.214	107	6	70-131	25	
o-Xylene	<0.00100	0.100	0.103	103	0.100	0.109	109	6	71-133	25	

Analyst: AMB **Date Prepared:** 12/03/2013 **Date Analyzed:** 12/03/2013

Lab Batch ID: 929056 **Sample:** 647851-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<1.00	25.0	22.9	92	25.0	23.1	92	1	80-120	20	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

BS / BSD Recoveries

Project Name: F-State

Work Order #: 475032 **Project ID:**

Analyst: AMB **Date Prepared:** 12/03/2013 **Date Analyzed:** 12/04/2013

Lab Batch ID: 929328 **Sample:** 647852-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<1.00	25.0	23.2	93	25.0	23.2	93	0	80-120	20	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

Form 3 - MS Recoveries

Project Name: F-State

Work Order #: 475032

Lab Batch #: 929056 **Project ID:**

Date Analyzed: 12/03/2013 **Date Prepared:** 12/03/2013 **Analyst:** AMB

QC- Sample ID: 475007-010 S **Batch #:** 1 **Matrix:** Water

Reporting Units: mg/L

Inorganic Anions by EPA 300	MATRIX / MATRIX SPIKE RECOVERY STUDY					
Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride	261	250	502	96	80-120	

Lab Batch #: 929056

Date Analyzed: 12/03/2013 **Date Prepared:** 12/03/2013 **Analyst:** AMB

QC- Sample ID: 475080-001 S **Batch #:** 1 **Matrix:** Water

Reporting Units: mg/L

Inorganic Anions by EPA 300	MATRIX / MATRIX SPIKE RECOVERY STUDY					
Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride	2050	2500	4550	100	80-120	

Lab Batch #: 929328

Date Analyzed: 12/04/2013 **Date Prepared:** 12/03/2013 **Analyst:** AMB

QC- Sample ID: 475032-002 S **Batch #:** 1 **Matrix:** Water

Reporting Units: mg/L

Inorganic Anions by EPA 300	MATRIX / MATRIX SPIKE RECOVERY STUDY					
Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride	101	125	215	91	80-120	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference [E] = 200*(C-A)/(C+B)
All Results are based on MDL and Validated for QC Purposes

BRL - Below Reporting Limit

Form 3 - MS / MSD Recoveries

Project Name: F-State

Work Order # : 475032 **Project ID:**

Lab Batch ID: 928985 **QC- Sample ID:** 474800-001 S **Batch #:** 1 **Matrix:** Water

Date Analyzed: 12/02/2013 **Date Prepared:** 12/02/2013 **Analyst:** ARM

Reporting Units: mg/L

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00100	0.100	0.117	117	0.100	0.116	116	1	70-125	25	
Toluene	<0.00200	0.100	0.115	115	0.100	0.114	114	1	70-125	25	
Ethylbenzene	<0.00100	0.100	0.110	110	0.100	0.109	109	1	71-129	25	
m,p-Xylenes	<0.00200	0.200	0.222	111	0.200	0.218	109	2	70-131	25	
o-Xylene	<0.00100	0.100	0.112	112	0.100	0.111	111	1	71-133	25	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

ANALYSIS REQUEST & CHAIN OF CUSTODY RECORD

XENCO Laboratories

☐ 4143 Greenbriar Drive, Stafford, TX 77477 **281-240-4200**
☐ 5332, Blackberry Drive, San Antonio, TX 78238 **210-509-3334**
☐ 9701 Harry Hines Blvd., Dallas, TX 75220 **214-902-0300**
☒ 12600 West I-20 East, Odessa, TX 79765 **432-563-1800**

Serial #: 316678 Page 1 of 1

Company-City: Conestoga-Rovers + Associates **Phone:**

Lab Only: 475032

Project Name-Location: F-State ☐ Previously done at XENCO **Project ID:**

TAT: ASAP 5h 12h 24h 48h 3d (5d 7d) 10d 21d Standard TAT is project specific. It is typically 5-7 Working Days for level II and 10+ Working days for level III and IV data.

Proj. State: TX, AL, FL, GA, LA, MS, NC, NJ, PA, SC, TN, UT Other NM

Proj. Manager (PM): Brittany Ford

E-mail Results to ☒ PM and **Fax No:**

Invoice to ☐ Accounting ☐ Inc. Invoice with Final Report ☐ Invoice must have a P.O.
Bill to:

Quote/Pricing: **P.O. No:** ☐ Call for P.O.

Reg Program: UST DRY-CLEAN Land-Fill Waste-Disp NPDES DW **TRRP** QAPP Per-Contract CLP AGCEE NAVY DOE DOD USACE OTHER:

Special DLs (GW DW QAPP MDLs RLs See Lab PM Included Call PM)

Sampler Name: Warren Maurer **Signature:** [signature]

Analysis columns: VOA: Full-List BTEX-MTBE EtOH Oxyg VOHs VOAs; VOA: PP TCL DW Appdx-1 Appdx-2 CALL Other:; PAHs SIM 8310 8270; TX-1005 DRO GRO MA EPH MA VPH; SVOCs: Full-List DW BN&AE TCLP PP Appdx-2 CALL; OC Pesticides PCBs Herbicides OP Pesticides; Metals: RCRA-8 RCRA-4 Pb 13PP 23TAL Appdx 1 Appdx2; SPLP - TCLP (Metals VOCs SVOCs Pest. Herb. PCBs); EDB / DBCP; BTEX 8021B; Chlorides E300.0; TATASAP 5h 12h 24h 48h 3d 5d 7d 10d 21d; Addn: PAH above mg/L W, mg/Kg S Highest Hit; Hold Samples (Surcharges will apply and are pre-approved); Sample Clean-ups are pre-approved as needed

Remarks: Addn: / Date / Rcv. by: / From:

#	Sample ID	Sampling Date	Time	Depth ft' In" m	Matrix	Composite	Grab	# Containers	Container Size	Container Type	Preservatives	BTEX 8021B	Chlorides E300.0	#
1	MW-8-112713	11/27/13	1315		W			3				X	X	1
2	MW-3-112713	↓	1325		↓			↓				↓	↓	2
3	MW-6-112713	↓	1340		↓			↓				↓	↓	3
4	MW-4-112713	↓	1400		↓			↓				↓	↓	4
5	MW-7-112713	↓	1415		↓			↓				↓	↓	5
6	MW-5-112713	↓	1435		↓			↓				↓	↓	6
7	Dup-1-112713	↓	—		↓			↓				↓	↓	7
8														8
9														9
10														10

	Relinquished by (Initials and Sign)	Date & Time	Relinquished to (Initials and Sign)	Date & Time
1	1) RWM [signature]	9:34 12/2/13	2) [signature]	9:34 12/2/13
2	3)		4)	
3	5)		6)	

Total Containers per COC: 21 Cooler Temp: -1.1 / 0 °C

Otherwise agreed on writing. Reports are the Intellectual Property of XENCO until paid. Samples will be held 30 days after final report is e-mailed unless hereby requested. Rush Charges and Collection Fees are pre-approved if needed.

Preservatives: Various (**V**), HCl pH<2 (**H**), H2SO4 pH<2 (**S**), HNO3 pH<2 (**N**), Asbc Acid&NaOH (**A**), ZnAc&NaOH (**Z**), (Cool, <4C) (**C**), None (**NA**), See Label (**L**), Other (**O**)
Cont. Size: 4oz (**4**), 8oz (**8**), 32oz (**32**), 40ml VOA (**40**), 1L (**1**), 500ml (**5**), Tedlar Bag (**B**), Various (**V**), Other **Cont. Type:** Glass Amb (**A**), Glass Clear (**C**), Plastic (**P**), Various (**V**)
Matrix: Air (**A**), Product (**P**), Solid (**S**), Water (**W**), Liquid (**L**)

Committed to Excellence in Service and Quality *www.xenco.com*

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: Conestoga Rovers & Associates

Date/ Time Received: 12/02/2013 09:34:00 AM

Work Order #: 475032

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used :

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	0
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**N/A**
#5 Custody Seals intact on sample bottles?	**N/A**
#6 *Custody Seals Signed and dated?	**N/A**
#7 *Chain of Custody present?	**Yes**
#8 Sample instructions complete on Chain of Custody?	**Yes**
#9 Any missing/extra samples?	**No**
#10 Chain of Custody signed when relinquished/ received?	**Yes**
#11 Chain of Custody agrees with sample label(s)?	**Yes**
#12 Container label(s) legible and intact?	**Yes**
#13 Sample matrix/ properties agree with Chain of Custody?	**Yes**
#14 Samples in proper container/ bottle?	**Yes**
#15 Samples properly preserved?	**Yes**
#16 Sample container(s) intact?	**Yes**
#17 Sufficient sample amount for indicated test(s)?	**Yes**
#18 All samples received within hold time?	**Yes**
#19 Subcontract of sample(s)?	**No**
#20 VOC samples have zero headspace (less than 1/4 inch bubble)?	**Yes**
#21 <2 for all samples preserved with HNO3,HCL, H2SO4?	**Yes**
#22 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	**N/A**

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst:	PH Device/Lot#:

Checklist completed by: Candace James Date: 12/02/2013
Candace James

Checklist reviewed by: Kelsey Brooks Date: 12/02/2013
Kelsey Brooks

Appendix B

MDPE Reports

AcuVac Remediation, LLC.

1656-H Townhurst, Houston, Texas 77043
713.468.6688 • fax:713.468.6689 • www.acuvac.com

February 14, 2013

Ms. Brittany Ford
Project Manager
Conestoga-Rovers & Associates
2135 S. Loop 250 W.
Midland, TX 79703

Dear Brittany:

Re: Event #7: "F" State Site, Lea County, NM

The following is the Report and a copy of the Operating Data collected during the Mobile Dual Phase (MDP) Event #7 at the above location on February 11, 2013. Table #1 is the Well Data Information on well RW-1. PSH is referred to as NAPL in this report. GW samples are frequently taken in 2,000 ml beakers to determine the average NAPL percentage and volume.

Summary of MDP Event #7 - Well RW-1

The total Event time was 8.0 hours. The data is compared to Event #6 conducted on November 13, 2012 which had a total Event time of 7.5 hours.

- The total GW/NAPL recovered was 1,995 gals of which 4.72% or 94.1gals were NAPL.
- Total NAPL vapors burned as IC engine fuel was 5.30 gals, **resulting in a total liquid and vapor NAPL recovery of 99.4 gals, or 4.98%. This equates to 12.42 gal/hr, which is an decrease of 1.15 gals/hr.**
- Average HORIBA Analytical Data from the influent vapor samples was: HC = 14,557 ppmv, CO_2 = 9.89%, CO = 0%, O_2 = 5.6% and H_2S = 3.11%.
- Compared with MDP Event #6 data, the TPH levels increased 1,003 ppmv, CO_2 increased 0.34%, CO was equal, O_2 decreased 0.9% and H_2S decreased 0.51%.
- The Average Induced Vacuum was 67.94"H_2O and the average EW vapor flow was 6.71 scfm. The average induced vacuum increased 9.25"H_20 and the average well flow increased 0.25 scfm.
- The GW pump was set at 62.0 ft BTOC. The average GW/NAPL pump rate was 4.15gpm. The average GW pump rate decreased 0.13 gpm.
- The average GW depression was estimated at 2.0 ft below static level, which was steady with Event #6. This estimate is based on the GW pump position and GW rate.

- At the start of Event #7, the static NAPL level was 3.68 ft and 0.21 ft of NAPL was estimated at the conclusion of the Event. The static GW level decreased 12.73 ft based on hydro-equivalent.

Summary and Observations:

During each Event, the test data is compared to the previous Event to evaluate the progress for this remediation project.

The HORIBA Analytical instrument is calibrated with HEXANE and CO_2.

The formula used to calculate the Emission Rate is:

$$ER = HC\ (ppmv) \times MW\ (Hexane) \times Flow\ Rate\ (scfm) \times 1.58E^{-7} \frac{(min)(lb\ mole)}{(hr)(ppmv)(ft^3)} = lbs/hr$$

The total NAPL removed, including liquid and vapor, during the 8.0 hour Event #7 (well RW-1), was 99.4 gals, or 4.98 % of the total liquid volume of 1,995 gals. This equates to 12.42 gals/hr.

During the seven Events totaling 52.3 hours, the total NAPL removed, including liquid and vapor, equals 599.6 gals, or 4.68 % of a total liquid volume of 12,798 gals. This equates to a NAPL recovery rate of 11.46 gals/hr.

Additional Information:

- The average liquid and vapor NAPL recovery from well RW-1 decreased slightly from 13.56 to 12.42 gal/hr.
- The induced vacuum was higher than Event #6, but the GW/NAPL pump rate decreased by 0.63 gpm. These changes were necessary to maintain a constant liquid depression at approximately 2.0 ft.
- At the conclusion of the Event, the well was gauged and 0.21" of NAPL remained in the well.

We appreciate you selecting AcuVac to provide this service. We have schedule Event #8 for Thursday March 14, 2013. Should you have any questions, please contact me.

Sincerely,

James E. Sadler, VP
Engineering/Environmental

130006.REP

Well and Recovery Data Information - Event #7

February 11, 2013

EVENT NO		7
WELL NO.		**RW-1**
Total Event Hours		8.0
TD	ft	90.0
Well Size	in	4.0
DTGW - Static - Start Event #7	ft	62.59
DTNAPL - Static - Start Event #7	ft	58.91
NAPL	ft	3.68
DTGW - End Event #7	ft	59.52
DTNAPL - End Event #7	ft	59.31
NAPL	ft	0.21
Average Extraction Well Vacuum	"H_2O	67.94
Average Extraction Well Vapor Flow	scfm	6.71
Average GW/NAPL Pump Rate	gpm	4.15
Average TPH	ppmv	14,557
Average CO_2	%	9.89
Average CO	%	0
Average O_2	%	5.6
Average H_2S	%	3.11
Total Liquid Volume Recovered	gals	1,995
Total Liquid NAPL Recovered	gals	94.10
Total Liquid NAPL Recovered	%	4.98
Total Vapor and Liquid NAPL Recovered	gals	99.4
Total NAPL Recovered	%	4.72
Total NAPL Recovered	lbs	695.8
Total Volume of Well Vapors	cu.ft	3,222

130006.REP

OPERATING DATA - EVENT # 7 **PAGE # 1** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: "F" STATE, Lea County, NM **Project Managers:** Sadler/Faucher

	Date:	2-11-13	-	-	-	-	-
	Parameters	Time 0745	Time 0815	Time 0845	Time 0915	Time 0945	Time 1015
	WELL # RW-1	Hr Meter 6219.5	Hr Meter 6220.0	Hr Meter 6220.5	Hr Meter 6221.0	Hr Meter 6221.5	Hr Meter 6222.0
ENGINE/BLOWER	R.P.M.	1800	1800	1800	1800	1800	1800
	Oil Pressure psi	50	50	50	50	50	50
	Water Temp °F	140	150	150	160	160	160
	Volts	13	13	13	13	13	13
	Intake Vacuum "Hg	20	20	20	20	20	20
	Gas Flow Fuel/Propane cfh	110	110	110	110	110	110
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump **ON/OFF**	ON	ON	ON	ON	ON	ON
	Extraction Well Flow scfm	5.29	5.29	5.29	5.29	5.73	5.73
	Extraction Well Vacuum "H_2O	60	60	60	60	60	60
	Pump Rate gals/min	4.0	4.0	4.0	4.0	4.0	4.0
	Total Volume gals	-	120	240	360	480	600
	Influent Vapor Temp. °F	68	68	68	68	68	68
	Air Temperature °F	34.6	35.8	36.3	38.5	40.1	42.1
	Barometric Pressure "Hg	29.96	29.96	29.95	29.95	29.96	29.96
VAPOR /INFLUENT	HC ppmv	15,820	-	12,620	-	14,200	
	CO_2 / CO %	9.44/0	-	9.72/0	-	10.32/0	
	O_2 %	6.4	-	6.6	-	6.1	
	H_2S ppm	3.0	-	3.0	-	3.0	
NOTES	SET GW/NAPL Pump inlet @ 62.0 Ft BTOC - Initial EW induced vacuum set @ 60" H_2O, Vapor well flow (VWF) = 5.29 scfm						
	0945 - NOTE - VWF @ 5.73 scfm						
MANIFOLD	NAPL % Vol Gals	-	11/13.2	10/12.0	7/8.4	7/8.4	6/7.2
	Data Logger ft	N/A	-	-	-	-	-
	Depth of GW Depression ft	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
	Extraction Well DTNAPL ft	58.91					
	Extraction Well DTGW ft	62.59					

( ) Indicates Well Pressure NAPL = 3.68'

OPERATING DATA - EVENT # 7 **PAGE # 2** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: "F" STATE, Lea County, NM **Project Managers:** Sadler/Faucher

	Date:	2-11-13	-	-	-	-	-
	Parameters	Time 1045	Time 1115	Time 1145	Time 1213	Time 1245	Time 1315
	WELL # RW-1	Hr Meter 6222.5	Hr Meter 6223.0	Hr Meter 6223.5	Hr Meter 6224.0	Hr Meter 6224.5	Hr Meter 6225.0
ENGINE/BLOWER	R.P.M.	1800	1800	1800	1800	1800	1800
	Oil Pressure psi	50	50	50	50	50	50
	Water Temp °F	160	160	160	160	160	160
	Volts	13	13	13	13	13	13
	Intake Vacuum "Hg	20	20	19	19	19	19
	Gas Flow Fuel/Propane cfh	110	110	100	100	100	100
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump **ON/OFF**	ON	ON	ON	ON	ON	ON
	Extraction Well Flow scfm	6.18	6.18	7.68	7.68	7.68	7.68
	Extraction Well Vacuum "H_2O	60	60	75	75	75	75
	Pump Rate gals/min	4.0	4.0	4.0	4.0	4.0	4.0
	Total Volume gals	720	840	960	1080	1200	1320
	Influent Vapor Temp. °F	69	69	69	69	69	69
	Air Temperature °F	44.6	46.8	48.2	49.1	50.6	51.9
	Barometric Pressure "Hg	29.94	29.92	29.89	29.87	29.87	29.86
VAPOR /INFLUENT	HC ppmv	14,840	-	12,130	-	13,340	-
	CO_2 / CO %	10.56/0	-	9.54/0	-	9.56/0	-
	O_2 %	6.5	-	3.4	-	4.8	-
	H_2S ppm	3.0	-	3.0	-	3.0	-

NOTES

EW induced vacuum steady @ 60" H_2O, VWF @ 6.18scfm - PR: 4.0gpm

1115HRS - INCREASED EW vacuum = 75" H_2O, VWF = 8.54scfm

PR = 4.0gpm

MANIFOLD	NAPL % Vol Gals	5/6.0	4/4.8	4/4.8	4/4.8	4/4.8	4/4.8
	Data Logger ft	N/A	-	-	-	-	-
	Depth of GW Depression ft	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
	Extraction Well DTNAPL ft						
	Extraction Well DTGW ft						

( ) Indicates Well Pressure

OPERATING DATA - EVENT # 7 **PAGE # 3** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: "F" STATE, Lea County, NM **Project Managers:** Sadler/Faucher

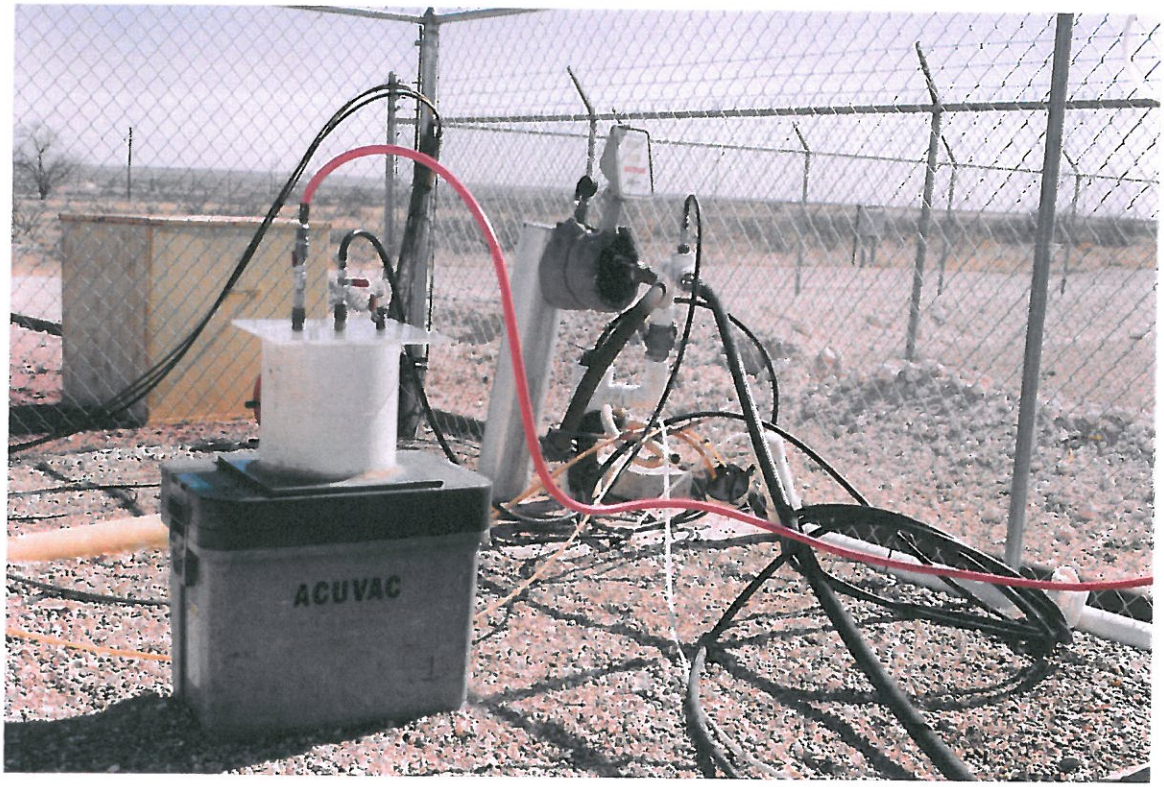
	Date:	2-11-13	-	-	-	-	
	Parameters	Time 1345	Time 1415	Time 1445	Time 1515	Time 1545	Time
	WELL # RW-1	Hr Meter 6225.5	Hr Meter 6226.0	Hr Meter 6226.5	Hr Meter 6227.0	Hr Meter 6227.5	Hr Meter
ENGINE/BLOWER	R.P.M.	1800	1800	1800	1800	1800	
	Oil Pressure psi	50	50	50	50	50	
	Water Temp °F	160	160	160	160	160	
	Volts	13	13	13	13	13	
	Intake Vacuum "Hg	19	19	19	19	19	
	Gas Flow Fuel/Propane cfh	100	100	100	100	100	
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump ON/OFF	ON	ON	ON	ON	ON	
	Extraction Well Flow scfm	7.68	7.68	7.68	7.68	7.68	
	Extraction Well Vacuum "H_2O	75	75	75	75	75	
	Pump Rate gals/min	4.5	4.5	4.5	4.5	4.5	
	Total Volume gals	1455	1590	1725	1860	1995	
	Influent Vapor Temp. °F	69	69	69	69	69	
	Air Temperature °F	52.3	53.1	55.6	56.7	57.2	
	Barometric Pressure "Hg	29.83	29.83	29.80	29.79	29.78	
VAPOR /INFLUENT	HC ppmv	14,700	-	16,550	-	16,710	
	CO_2 / CO %	9.2/0	-	10.0/0	-	10.6/0	
	O_2 %	4.8	-	5.0	-	5.1	
	H_2S ppm	4.0	-	3.0	-	3.0	
NOTES	EW vacuum and VWP steady @ 75" H_2O, 7.68 scfm - PR= 4.5 gpm						
	1345 HRS - PR : 4.5 gpm - NOTED NAPL recovery on decreasing trend						
	NOTE: HORIBA HC levels continue on an increasing trend -						
	Induced vacuum ROI appears to be increasing to be the						
	increase in light HC fractions						
						84.3	
MANIFOLD	NAPL % Vol / Gals	3/4.0	3/4.1	2/2.7	2/2.7	1/1.9	
	Data Logger ft	N/A	-	-	-	-	
	Depth of GW Depression ft	-2.0	-2.0	-2.0	-2.0	-2.0	
	Extraction Well DTNAPL ft					59.31	
	Extraction Well DTGW ft					59.52	

( ) Indicates Well Pressure

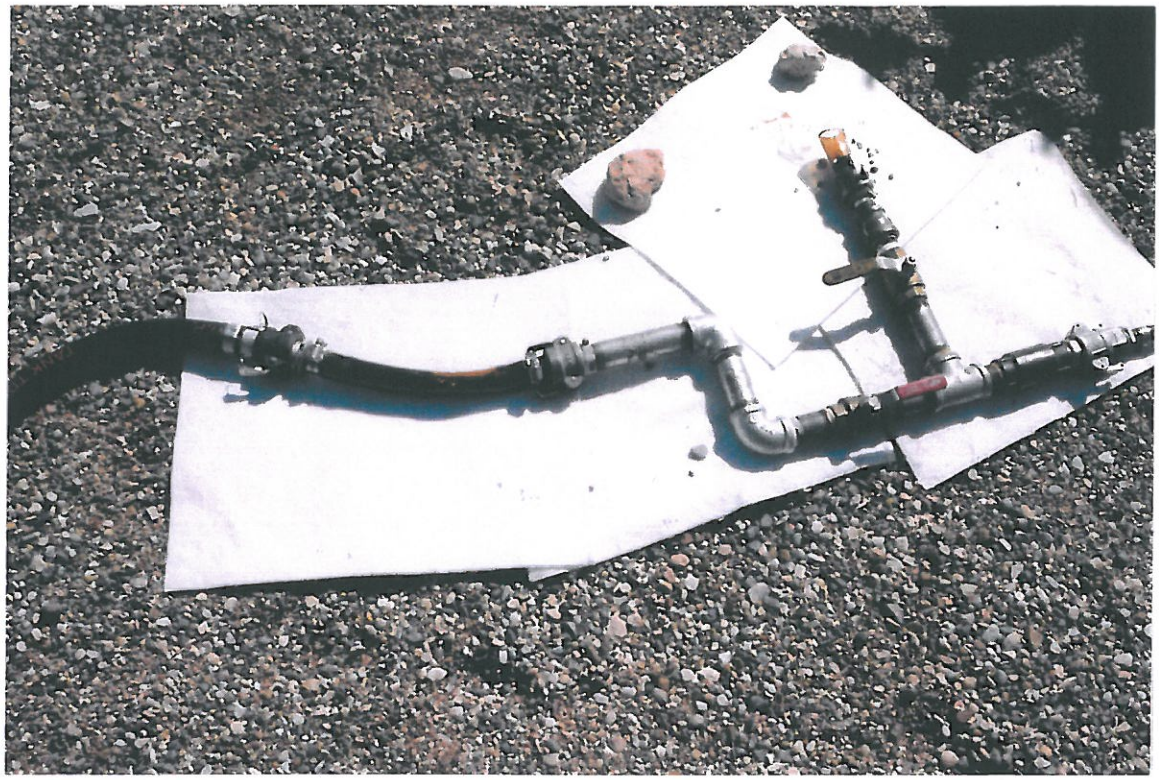
NAPL 021

"F" STATE SITE
LEA COUNTY, NM

"F" STATE SITE
LEA COUNTY, NM



"F" STATE SITE
LEA COUNTY, NM



AcuVac Remediation, LLC.

1656-H Townhurst, Houston, Texas 77043
713.468.6688 • fax:713.468.6689 • www.acuvac.com

March 22, 2013

Ms. Brittany Ford
Project Manager
Conestoga-Rovers & Associates
2135 S. Loop 250 W.
Midland, TX 79703

Dear Brittany:

Re: Event #8: "F" State Site, Lea County, NM

The following is the Report and a copy of the Operating Data collected during the Mobile Dual Phase (MDP) Event #8 at the above location on March 14, 2013. Table #1 is the Well Data Information on well RW-1. PSH is referred to as NAPL in this report. GW samples are frequently taken in 2,000 ml beakers to determine the average NAPL percentage and volume.

Summary of MDP Event #8 - Well RW-1

The total Event time was 7.5 hours. The data is compared to Event #7 conducted on February 11, 2013, which had a total Event time of 8.0 hours.

- The total GW/NAPL recovered was 2,046 gals of which 5.80% or 118.6 gals were NAPL.
- Total NAPL vapors burned as IC engine fuel was 6.71 gals, **resulting in a total liquid and vapor NAPL recovery of 125.3 gals, or 6.12%. This equates to 15.66 gal/hr, which is an increase of 3.24 gals/hr.**
- Average HORIBA Analytical Data from the influent vapor samples was: HC = 15,168 ppmv, CO_2 = 9.79%, CO = 0%, O_2 = 5.5% and H_2S = 2.88%.
- Compared with MDP Event #7 data, the TPH levels increased 611 ppmv, CO_2 decreased 0.10%, CO was equal, O_2 decreased 0.2% and H_2S decreased 0.24%.
- The Average Induced Vacuum was 82.50"H_2O and the average EW vapor flow was 8.15 scfm. The average induced vacuum increased 14.56"H_20 and the average well flow increased 1.44 scfm.
- The GW pump was set at 62.0 ft BTOC. The average GW/NAPL pump rate was 4.58 gpm. The average GW pump rate increased 0.44 gpm.
- The average GW depression was estimated at 2.0 ft below static level, which was consistent with Event #7. This estimate is based on the GW pump position and GW rate.

- At the start of Event #8, the static NAPL level was 3.24 ft and 0.02 ft of NAPL was estimated at the conclusion of the Event. The static GW level decreased 0.38 ft based on hydro-equivalent.

Summary and Observations:

During each Event, the test data is compared to the previous Event to evaluate the progress for this remediation project.

The HORIBA Analytical instrument is calibrated with HEXANE and CO_2.

The formula used to calculate the Emission Rate is:

$$ER = HC\ (ppmv) \times MW\ (Hexane) \times Flow\ Rate\ (scfm) \times 1.58E^{-7} \frac{(min)(lb\ mole)}{(hr)(ppmv)(ft^3)} = lbs/hr$$

The total NAPL removed, including liquid and vapor, during the 8.0 hour Event #8 (well RW-1), was 125.3 gals, or 6.12% of the total liquid volume of 2,046 gals. This equates to 15.66 gals/hr.

During the eight Events totaling 60.3 hours, the total NAPL removed, including liquid and vapor, equals 724.9 gals, or 4.88% of a total liquid volume of 14,844 gals. This equates to a NAPL recovery rate of 12.02 gals/hr.

Additional Information:

- The average liquid and vapor NAPL recovery from well RW-1 increased significantly from 12.42 to 15.66 gal/hr.
- The induced vacuum was higher than Event #7, and the GW/NAPL pump rate increased by 0.44 gpm. These changes were necessary to maintain a constant liquid depression at approximately 2.0 ft.
- At the conclusion of the Event, the well was gauged and 0.02" of NAPL remained in the well.

We appreciate you selecting AcuVac to provide this service. We have scheduled Event #9 for Tuesday, April 16, 2013. Should you have any questions, please contact me.

Sincerely,

James E. Sadler, VP
Engineering/Environmental

Well and Recovery Data Information - Event #8

March 12, 2013

EVENT NO		8
WELL NO.		**RW-1**
Total Event Hours		7.5
TD	ft	90.0
Well Size	in	4.0
DTGW - Static - Start Event #8	ft	61.96
DTNAPL - Static - Start Event #8	ft	58.72
NAPL	ft	3.24
DTGW - End Event #8	ft	59.14
DTNAPL - End Event #8	ft	59.12
NAPL	ft	0.02
Average Extraction Well Vacuum	"H_2O	82.50
Average Extraction Well Vapor Flow	scfm	8.15
Average GW/NAPL Pump Rate	gpm	4.58
Average TPH	ppmv	15,168
Average CO_2	%	9.79
Average CO	%	0
Average O_2	%	5.5
Average H_2S	%	2.88
Total Liquid Volume Recovered	gals	2,046
Total Liquid NAPL Recovered	gals	118.6
Total Liquid NAPL Recovered	%	5.80
Total Vapor and Liquid NAPL Recovered	gals	125.3
Total NAPL Recovered	%	6.12
Total NAPL Recovered	lbs	724.9
Total Volume of Well Vapors	cu.ft	3,912

OPERATING DATA - EVENT #8 **PAGE # 1** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: "F" State Site, Lea County, NM **Project Managers: Sadler/Lundgren**

	Date:	03/14/2013	03/14/2013	03/14/2013	03/14/2013	03/14/2013	03/14/2013
	Parameters	Time 0745	Time 0815	Time 0845	Time 0915	Time 0945	Time 1015
	WELL # RW-1	Hr Meter 6239.5	Hr Meter 6240.0	Hr Meter 6240.5	Hr Meter 6241.0	Hr Meter 6241.5	Hr Meter 6242.0
ENGINE/BLOWER	R.P.M.	1800	1800	1900	1800	1900	1800
	Oil Pressure psi	50	50	50	50	50	50
	Water Temp °F	140	160	160	160	160	160
	Volts	13	13	13	13	13	13
	Intake Vacuum "Hg	19	19	19	19	19	19
	Gas Flow Fuel/Propane cfh	110	110	110	110	110	110
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump ON/OFF	ON	ON	ON	ON	ON	ON
	Extraction Well Flow scfm	6.47	6.91	7.34	7.34	7.78	7.78
	Extraction Well Vacuum "H_2O	75	75	75	75	75	75
	Pump Rate gals/min	4.2	4.2	4.2	4.2	4.2	4.2
	Total Volume gals	-	126	252	378	504	630
	Influent Vapor Temp. °F	68	68	68	68	68	68
	Air Temperature °F	46.4	48.6	50.3	52.0	53.8	55.9
	Barometric Pressure "Hg	30.20	30.20	30.21	30.21	30.21	30.20
VAPOR /INFLUENT	HC ppmv	13,810	-	14,950	-	15,070	-
	CO_2 / CO %	9.32/.01	-	9.58/0	-	9.62/0	-
	O_2 %	6.3	-	4.9	-	4.7	-
	H_2S %	2.0	-	3.0	-	3.0	-
NOTES	SET GW/NAPL Pump @ 620 ft BTOC - Initial FW induced vacuum @ 75 "H_2O, VWF = 6.47 scfm - increasing to 6.91 scfm Pump Rate = 4.2 gpm - 0845 - VWF = 7.34 scfm - 0945 - VWF = 7.78 scfm						
MANIFOLD	NAPL % Vol / Gals	-	10 / 12.6	10 / 12.6	8.0 / 10.1	7.5 / 9.5	7.0 / 8.8
	Data Logger ft	N/A	-	-	-	-	-
	Depth of GW Depression ft	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
	Extraction Well DTNAPL ft	58.72					
	Extraction Well DTGW ft	61.96					

( ) Indicates Well Pressure

NAPL = 3.24'

OPERATING DATA - EVENT #8 **PAGE # 2** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: "F" State Site, Lea County, NM **Project Managers: Sadler/Lundgren**

	Date:	03/14/2013	03/14/2013	03/14/2013	03/14/2013	03/14/2013	03/14/2013
	Parameters	Time 1045	Time 1115	Time 1145	Time 1215	Time 1245	Time 1315
	WELL # Rec-1	Hr Meter 6242.5	Hr Meter 6243.0	Hr Meter 6243.5	Hr Meter 6244.0	Hr Meter 6244.5	Hr Meter 6245.0
ENGINE/BLOWER	R.P.M.	1800	1800	1800	1800	1800	1800
	Oil Pressure psi	50	50	50	50	50	50
	Water Temp °F	160	160	160	160	160	160
	Volts	13	13	13	13	13	13
	Intake Vacuum "Hg	19	19	19	19	19	19
	Gas Flow Fuel/Propane cfh	110	110	110	110	110	110
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump ON/OFF	ON	ON	ON	ON	ON	ON
	Extraction Well Flow scfm	7.78	7.78	7.78	7.78	7.78	7.78
	Extraction Well Vacuum "H_2O	75	75	75	75	75	75
	Pump Rate gals/min	4.2	4.2	4.2	4.2	4.2	4.2
	Total Volume gals	756	882	1008	1134	1260	1386
	Influent Vapor Temp. °F	69	69	69	69	69	69
	Air Temperature °F	58.1	61.6	64.8	67.0	72.3	74.8
	Barometric Pressure "Hg	30.20	30.20	30.19	30.19	30.17	30.16
VAPOR /INFLUENT	HC ppmv	14,870	-	15,140	-	15,260	-
	CO_2 / CO %	9.94/0	-	9.96/0	-	10.02/0	-
	O_2 %	5.4	-	5.6	-	5.6	-
	H_2S %	3.0	-	3.0	-	3.0	-
NOTES	EW induced vacuum and UWF steady @ 75" H_2O, 7.78 scfm PR = 4.2 gpm - NAPL steady @ 7% of volume 1315 Hrs. INCREASED EW vacuum = 90" H_2O, UWF = 7.78 scfm						
MANIFOLD	NAPL % Vol / Gals	7/8.8	7/8.8	6/7.6	5/6.3	5/6.3	4.5/5.7
	Data Logger ft	N/A	-	-	-	-	-
	Depth of GW Depression ft	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
	Extraction Well DTNAPL ft						
	Extraction Well DTGW ft						

( ) Indicates Well Pressure

OPERATING DATA - EVENT #8 **PAGE # 3** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: "F" State Site, Lea County, NM **Project Managers: Sadler/Lundgren**

	Date:	03/14/2013	03/14/2013	03/14/2013	03/14/2013	03/14/2013	03/14/2013
	Parameters	Time 1345	Time 1415	Time 1445	Time 1515	Time 1545	Time
	WELL # RW-1	Hr Meter 6245.5	Hr Meter 6246.0	Hr Meter 6246.5	Hr Meter 6247.0	Hr Meter -	Hr Meter
ENGINE/BLOWER	R.P.M.	1800	1800	1800	1800	-	
	Oil Pressure psi	50	50	50	50	-	
	Water Temp °F	160	160	160	160	-	
	Volts	13	13	13	13	-	
	Intake Vacuum "Hg	18	18	18	18	-	
	Gas Flow Fuel/Propane cfh	110	110	110	110	-	
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump ON/OFF	ON	ON	ON	ON	-	
	Extraction Well Flow scfm	8.39	8.81	8.81	8.81	-	
	Extraction Well Vacuum "H_2O	90	90	90	90	-	
	Pump Rate gals/min	5.5	5.5	5.3	5.5	-	
	Total Volume gals	1551	1716	1881	2046	-	
	Influent Vapor Temp. °F	69	69	69	69	-	
	Air Temperature °F	75.5	77.2	77.4	79.0	-	
	Barometric Pressure "Hg	30.13	30.13	30.12	30.10	-	
VAPOR /INFLUENT	HC ppmv	15,080	-	15,120	-	-	
	CO_2 / CO %	10.0 / 0	-	10.0 / 0	-	-	
	O_2 %	5.7	-	5.9	-	-	
	H_2S %	30	-	30	-	-	
NOTES	BW induced vacuum @ 90" H_2O, UWF = 8.39 scfm - PR = 5.5 gpm						
	1415 HRS - UWF = 8.81 scfm - NAPL steady @ 3-4% of liquid volume						
	1515 HRS - MDP discontinued, maximum volume of holding tank						
MANIFOLD	NAPL % Vol Gals	4 / 6.6	4 / 6.6	3 / 5.0	2 / 3.3		
	Data Logger ft	N/A	-	-	-		
	Depth of GW Depression ft	-2.0	-2.0	-2.0	-2.0		
	Extraction Well DTNAPL ft				59.12		
	Extraction Well DTGW ft				59.14		

( ) Indicates Well Pressure

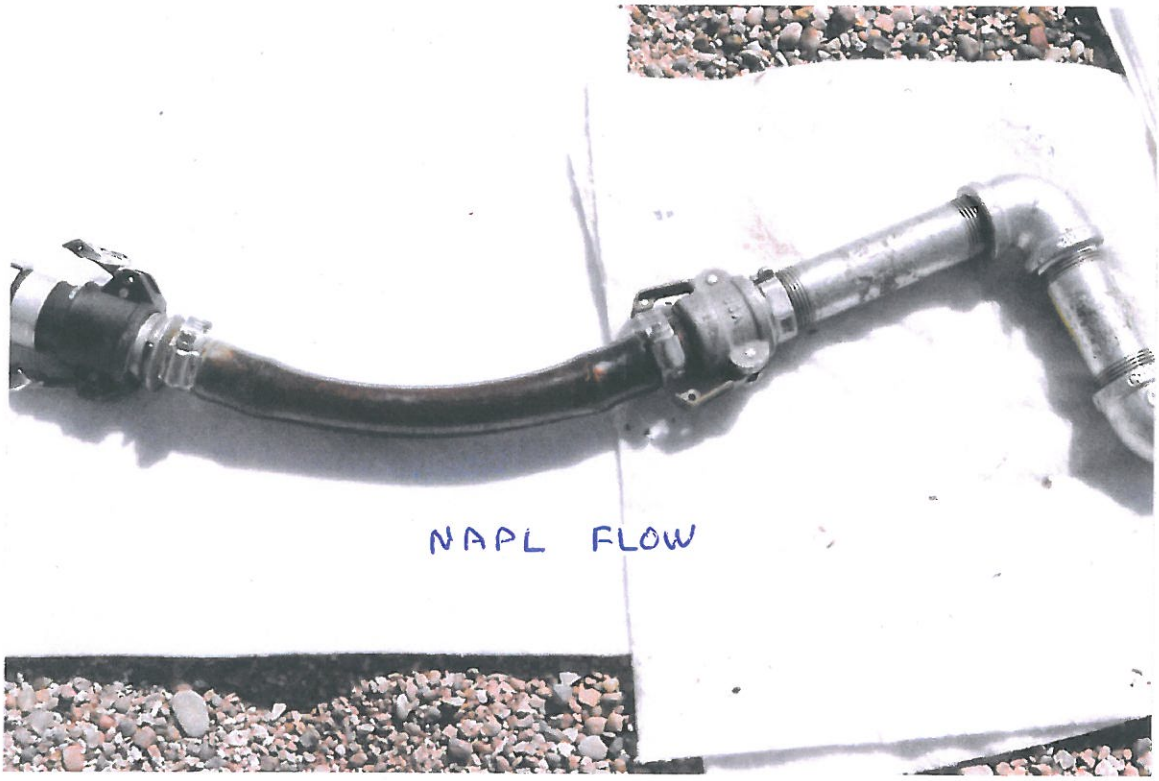
7FORMS/TestForms/1210018

NAPL 0025ft

"F" STATE SITE
LEA COUNTY, NM

"F" STATE SITE
LEA COUNTY, NM

"F" STATE SITE
LEA COUNTY, NM



"F" STATE SITE
LEA COUNTY, NM

AcuVac Remediation, LLC.

1656-H Townhurst, Houston, Texas 77043
713.468.6688 • Fax: 713.468.6689 • www.acuvac.com

April 9, 2013

Ms. Brittany Ford
Project Manager
Conestoga-Rovers & Associates
2135 S. Loop 250 W.
Midland, TX 79703

Dear Brittany:

Re: Event #9: "F" State Site, Lea County, NM

The following is the Report and a copy of the Operating Data collected during the Mobile Dual Phase (MDP) Event #9 at the above location on April 9, 2013. Table #1 is the Well Data Information on well RW-1. PSH is referred to as NAPL in this report. GW samples are frequently taken in 2,000 ml beakers to determine the average NAPL percentage and volume.

Summary of MDP Event #9 - Well RW-1

The total Event time was 7.0 hours. The data is compared to Event #8 conducted on March 14, 2013, which had a total Event time of 7.5 hours.

- The total GW/NAPL recovered was 1,950 gals of which 5.92% or 115.5 gals were NAPL.
- Total NAPL vapors burned as IC engine fuel were 5.51 gals, **resulting in a total liquid and vapor NAPL recovery of 121.0 gals, or 6.21%. This equates to 17.29 gal/hr, which is an increase of 1.62 gals/hr.**
- Average HORIBA Analytical Data from the influent vapor samples was: HC = 14,816 ppmv, CO_2 = 7.43%, CO = 0%, O_2 = 7.7% and H_2S = 3.00%.
- Compared with MDP Event #8 data, the TPH levels decreased 351 ppmv, CO_2 decreased 2.36%, CO was equal, O_2 increased 2.2% and H_2S increased 0.13%.
- The Average Induced Vacuum was 82.14"H_2O and the average EW vapor flow was 7.83 scfm. The average induced vacuum decreased 0.36"H_20 and the average well flow decreased 0.32 scfm.
- The GW pump was set at 62.0 ft BTOC. The average GW/NAPL pump rate was 5.00 gpm. The average GW pump rate increased 0.42 gpm.
- The average GW depression was estimated at 2.0 ft below static level, which was consistent with Event #8. This estimate is based on the GW pump position and GW rate.

- At the start of Event #9, the static NAPL level was 3.21 ft and 0.20 ft of NAPL was estimated at the conclusion of the Event. The static GW level decreased 0.38 ft based on hydro-equivalent.

Summary and Observations:

During each Event, the test data is compared to the previous Event to evaluate the progress for this remediation project.

The HORIBA Analytical instrument is calibrated with HEXANE and CO_2.

The formula used to calculate the Emission Rate is:

$$ER = HC\ (ppmv) \times MW\ (Hexane) \times Flow\ Rate\ (scfm) \times 1.58E^{-7} \frac{(min)(lb\ mole)}{(hr)(ppmv)(ft^3)} = lbs/hr$$

The total NAPL removed, including liquid and vapor, during the 7.5 hour Event #9 (well RW-1), was 115.5 gals, or 5.92% of the total liquid volume of 1,950 gals. This equates to 17.29 gals/hr.

During the eight Events totaling 67.8 hours, the total NAPL removed, including liquid and vapor, equals 845.9 gals, or 5.04% of a total liquid volume of 16,794 gals. This equates to a NAPL recovery rate of 12.57 gals/hr.

Additional Information:

- The average liquid and vapor NAPL recovery from well RW-1 increased significantly from 15.66 to 17.29 gal/hr. The increase is most likely the result of the increased groundwater pump rate.
- The induced vacuum was slightly lower than Event #8, and the GW/NAPL pump rate increased by 0.42 gpm. These changes were necessary to maintain a constant liquid depression at approximately 2.0 ft.
- At the conclusion of the Event, the well was gauged and 0.20" of NAPL remained in the well.

We appreciate you selecting AcuVac to provide this service. **We have scheduled Event #10 for Tuesday, May 21, 2013. Should you have any questions, please contact me.**

Sincerely,

James E. Sadler, VP
Engineering/Environmental

cc: Scott Christ
CRA- Houston

Well and Recovery Data Information - Event #9

April 9, 2013

EVENT NO		9
WELL NO.		**RW-1**
Total Event Hours		7.0
TD	ft	90.0
Well Size	in	4.0
DTGW - Static - Start Event #9	ft	61.63
DTNAPL - Static - Start Event #9	ft	58.42
NAPL	ft	3.21
DTGW - End Event #9	ft	59.32
DTNAPL - End Event #9	ft	59.12
NAPL	ft	0.20
Average Extraction Well Vacuum	"H_2O	82.14
Average Extraction Well Vapor Flow	scfm	7.83
Average GW/NAPL Pump Rate	gpm	5.00
Average TPH	ppmv	14,816
Average CO_2	%	7.43
Average CO	%	0
Average O_2	%	7.7
Average H_2S	%	3.00
Total Liquid Volume Recovered	gals	1,950
Total Liquid NAPL Recovered	gals	115.5
Total Liquid NAPL Recovered	%	5.92
Total Vapor and Liquid NAPL Recovered	gals	121.0
Total NAPL Recovered	%	6.21
Total NAPL Recovered	lbs	845.9
Total Volume of Well Vapors	cu.ft	3,289

OPERATING DATA - EVENT #9 **PAGE # 1** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: "F" State Site, Lea County, NM **Project Managers: Sadler/Faucher/Wells**

	Date:	04/09/2013	04/09/2013	04/09/2013	04/09/2013	04/09/2013	04/09/2013
	Parameters	Time 0730	Time 0800	Time 0930	Time 0900	Time 0930	Time 1000
	WELL # RW-1	Hr Meter 6309.0	Hr Meter 6309.5	Hr Meter 6310.0	Hr Meter 6310.5	Hr Meter 6311.0	Hr Meter 6311.5
ENGINE/BLOWER	R.P.M.	1900	1900	1900	1900	1900	1900
	Oil Pressure psi	50	50	50	50	50	50
	Water Temp °F	130	130	130	130	130	130
	Volts	14	14	14	14	14	14
	Intake Vacuum "Hg	19	19	19	19	19	19
	Gas Flow Fuel/Propane cfh	120	120	120	120	120	120
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump ON/OFF	ON	ON	ON	ON	ON	ON
	Extraction Well Flow scfm	7.83	7.83	7.83	7.83	7.83	7.83
	Extraction Well Vacuum "H_2O	90	90	90	80	80	80
	Pump Rate gals/min	5.0	5.0	5.0	5.0	5.0	5.0
	Total Volume gals	-	150	300	450	600	750
	Influent Vapor Temp. °F	68	68	68	68	68	68
	Air Temperature °F	66.0	67.0	67.8	71.0	74.8	77.1
	Barometric Pressure "Hg	29.40	29.40	29.40	29.40	29.40	29.40
VAPOR /INFLUENT	HC ppmv	13,750	11,480	-	9890	-	10,720
	CO_2 / CO %	9.36/.03	8.42/.01	-	7.0/0.0	-	8.06/0.0
	O_2 %	5.6	5.7	-	5.5	-	5.6
	H_2S %	3	2	-	3	-	3

NOTES

STARTED @ 0730 HRS. SET GW/NAPL PUMP @ 63.50 FT BTOC
INDUCED WELL VACUUM SET @ 90" H_2O, WELL VAPOR SET @ 7.83 SCFM
GW PUMP RATE SET @ 5.0 GPM
AT 0900 HRS REDUCED INDUCED WELL VACUUM TO 80 "H_2O, VAPOR WELL FLOW REMAINED @ 7.83 SCFM

MANIFOLD	NAPL % Vol / Gals	-	9/13.5	9/13.5	8/12.0	8/12.0	8/12.0
	Data Logger ft	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
	Depth of GW Depression ft	2.5	2.5	2.5	2.5	2.5	2.5
	Extraction Well DTNAPL ft	58.42					
	Extraction Well DTGW ft	61.63					

( ) Indicates Well Pressure NAPL 3.21

OPERATING DATA - EVENT #9 **PAGE # 2** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: "F" State Site, Lea County, NM **Project Managers: Sadler/Faucher/Wells**

	Parameters		Date:	04/09/2013	04/09/2013	04/09/2013	04/09/2013	04/09/2013	04/09/2013
			Time	1030	1100	1130	1200	1230	1300
	WELL # RW-1		Hr Meter	6312.0	6312.5	6313.0	6313.5	6314.0	6314.5
ENGINE/BLOWER	R.P.M.			1900	1900	1900	1900	1900	1900
	Oil Pressure	psi		50	50	50	50	50	50
	Water Temp	°F		140	140	140	140	140	140
	Volts			14	14	14	14	14	14
	Intake Vacuum	"Hg		20	20	20	20	20	20
	Gas Flow Fuel/Propane	cfh		120	120	120	120	120	120
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump	ON/OFF		ON	ON	ON	ON	ON	ON
	Extraction Well Flow	scfm		7.83	7.83	7.83	7.83	7.83	7.83
	Extraction Well Vacuum	"H_2O		80	80	80	80	80	80
	Pump Rate	gals/min		5.0	5.0	5.0	4.5	4.0	4.0
	Total Volume	gals		900	1050	1200	1335	1455	1575
	Influent Vapor Temp.	°F		68	68	68	68	68	68
	Air Temperature	°F		79.4	78.8	81.1	84.2	81.3	88.1
	Barometric Pressure	"Hg		29.42	29.42	29.42	29.42	29.42	29.42
VAPOR /INFLUENT	HC	ppmv		–	8090	–	6340	–	9210
	CO_2 / CO	%		–	6.06/0.0	–	6.12/0.0	–	6.80/0.0
	O_2	%		–	9.6	–	10.0	–	9.7
	H_2S	%		–	4	–	3	–	3
MANIFOLD	NAPL	% Vol / Gals		6/9.0	5/7.5	4/6.0	4/5.4	4/4.8	4/4.8
	Data Logger	ft		-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
	Depth of GW Depression	ft		2.5	2.5	2.5	2.5	2.5	2.5
	Extraction Well DTNAPL	ft							
	Extraction Well DTGW	ft							

NOTES

AT 1030 HRS BAROMETRIC PRESSURE ↑ SLIGHTLY TO 29.42 "Hg

AT 1200 HRS REDUCED GW PUMP RATE TO 4.5 GPM AND AT 1230 REDUCED GW PUMP RATE TO 4.0 GPM TO ENSURE AN 8 HR EVENT

1200 HR INFLUENT VAPOR READINGS WERE LOWER DUE TO TEMPORARY REDUCTION IN WELL VAC.

( ) Indicates Well Pressure

OPERATING DATA - EVENT #9 **PAGE # 3** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: "F" State Site, Lea County, NM **Project Managers: Sadler/Faucher/Wells**

	Parameters							
	Date:		**04/09/2013**	**04/09/2013**	**04/09/2013**	**04/09/2013**	**04/09/2013**	**04/09/2013**
			Time 1330	Time 1400	Time 1430	Time	Time	Time
	WELL # RW-1		Hr Meter 6315.0	Hr Meter 6315.5	Hr Meter 6316.0	Hr Meter	Hr Meter	Hr Meter
ENGINE/BLOWER	R.P.M.		1900	1900	1900			
	Oil Pressure	psi	50	50	50			
	Water Temp	°F	140	140	140			
	Volts		14	14	14			
	Intake Vacuum	"Hg	20	20	20			
	Gas Flow Fuel/Propane	cfh	120	120	120			
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump	**ON/OFF**	ON	ON	ON			
	Extraction Well Flow	scfm	7.83	7.83	7.83			
	Extraction Well Vacuum	"H_2O	80	80	80			
	Pump Rate	gals/min	4.0	4.0	4.0			
	Total Volume	gals	1695	1815	1950			
	Influent Vapor Temp.	°F	68	68	68			
	Air Temperature	°F	83.6	81.6	82.7			
	Barometric Pressure	"Hg	29.41	29.41	29.41			
VAPOR /INFLUENT	HC	ppmv	—	9050	—			
	CO_2 / CO	%	—	7.60/0.0	—			
	O_2	%	—	9.5	—			
	H_2S	%	—	3	—			
NOTES								
MANIFOLD	NAPL % Vol Gals		3/6	3/6	3/6			
	Data Logger	ft	-2.0	-2.0	-2.0			
	Depth of GW Depression	ft	2.50	2.50	2.50			
	Extraction Well DTNAPL	ft			59.12			
	Extraction Well DTGW	ft			59.32			

( ) Indicates Well Pressure

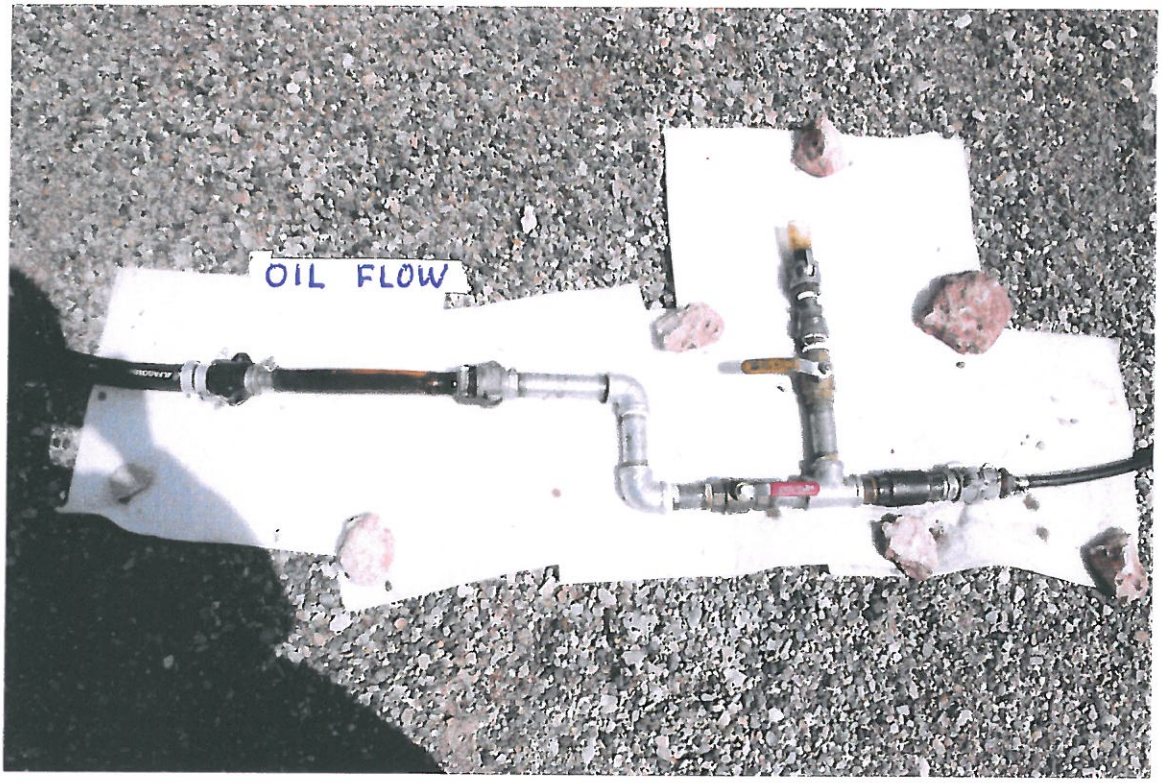
NAPL 0.20

7FORMS/TestForms/1210018

"F" STATE SITE
LEA COUNTY, NM

"F" STATE SITE
LEA COUNTY, NM

"F" STATE SITE
LEA COUNTY, NM



AcuVac Remediation, LLC.

1656-H Townhurst, Houston, Texas 77043
713.468.6688 • Fax: 713.468.6689 • www.acuvac.com

May 15, 2013

Mr. Scott Christ
Project Manager
Conestoga-Rovers & Associates
6320 Rothway, Suite 100
Houston, Texas 77040

Dear Scott:

Re: Event #10: "F" State Site, Lea County, NM

The following is the Report and a copy of the Operating Data collected during the Mobile Dual Phase (MDP) Event #10 at the above location on May 15, 2013. Table #1 is the Well Data Information on well RW-1. PSH is referred to as NAPL in this report. GW samples are frequently taken in 2,000 ml beakers to determine the average NAPL percentage and volume.

Summary of MDP Event #10 - Well RW-1

The total Event time was 7.0 hours. The data is compared to Event #9 conducted on April 9, 2013, which had a total Event time of 7.0 hours.

- The total GW/NAPL recovered was 1,935 gals of which 5.92% or 109.8 gals were NAPL.
- Total NAPL vapors burned as IC engine fuel were 4.89 gals, **resulting in a total liquid and vapor NAPL recovery of 114.7 gals, or 5.93%. This equates to 16.38 gal/hr, which is a decrease of 0.90 gals/hr.**
- Average HORIBA Analytical Data from the influent vapor samples was: HC = 11,856 ppmv, CO_2 = 8.58%, CO = 0%, O_2 = 10.1% and H_2S = 1.75%.
- Compared with MDP Event #9 data, the TPH levels decreased 2,960 ppmv, CO_2 increased 1.15%, CO was equal, O_2 increased 2.5% and H_2S decreased 1.25%.
- The Average Induced Vacuum was 100.00"H_2O and the average EW vapor flow was 8.68 scfm. The average induced vacuum increased 17.86"H_2O and the average well flow increased 0.85 scfm.
- The GW pump was set at 62.0 ft BTOC. The average GW/NAPL pump rate was 4.61 gpm. The average GW pump rate decreased 0.39 gpm.
- The average GW depression was estimated at 1.0 ft below static level, which was consistent with Event #9. This estimate is based on the GW pump position and GW rate.

- At the start of Event #10, the static NAPL level was 3.89 ft and 0.11 ft of NAPL remained at the conclusion of the Event. The static GW level decreased 0.34 ft based on hydro-equivalent.

Summary and Observations:

During each Event, the test data is compared to the previous Event to evaluate the progress for this remediation project.

The HORIBA Analytical instrument is calibrated with HEXANE and CO_2.

The formula used to calculate the Emission Rate is:

$$ER = HC\ (ppmv) \times MW\ (Hexane) \times Flow\ Rate\ (scfm) \times 1.58E^{-7} \frac{(min)(lb\ mole)}{(hr)(ppmv)(ft^3)} = lbs/hr$$

The total NAPL removed, including liquid and vapor, during the 7.0 hour Event #10 (well RW-1), was 114.7 gals, or 5.93% of the total liquid volume of 1,935 gals. This equates to 16.38 gals/hr.

During the ten Events totaling 74.3 hours, the total NAPL removed, including liquid and vapor, equals 960.6 gals, or 5.13% of a total liquid volume of 18,729 gals. This equates to a NAPL recovery rate of 12.93 gals/hr.

Additional Information:

- The average liquid and vapor NAPL recovery from well RW-1 decreased from 17.29 to 16.38 gal/hr.
- The induced vacuum was set higher, and the average GW/NAPL pump rate was slightly decreased by 0.39 gpm. These changes were necessary to maintain a liquid recovery volume in the 1,950 gallon range over a 7.0 hour Event period. **The 2,000 gallon collection tank is a limiting factor for this site. With a larger capacity collection tank, the induced vacuum, liquid pump rate and NAPL recovery could be increased.**

We appreciate you selecting AcuVac to provide this service. **We have scheduled Event #11 for Thursday, June 13, 2013. Should you have any questions, please contact me.**

Sincerely,

James E. Sadler, VP
Engineering/Environmental

cc: Brittany Ford
CRA- Dallas

Well and Recovery Data Information - Event #10

May 15, 2013

EVENT NO		10
		RW-1
Total Event Hours		7.0
TD	ft	90.0
Well Size	in	4.0
DTGW - Static - Start Event #10	ft	62.71
DTNAPL - Static - Start Event #10	ft	58.82
NAPL	ft	3.89
DTGW - End Event #10	ft	59.27
DTNAPL - End Event #10	ft	59.16
NAPL	ft	0.11
Average Extraction Well Vacuum	"H_2O	100.00
Average Extraction Well Vapor Flow	scfm	8.68
Average GW/NAPL Pump Rate	gpm	4.61
Average TPH	ppmv	11,856
Average CO_2	%	8.58
Average CO	%	0
Average O_2	%	10.1
Average H_2S	%	1.75
Total Liquid Volume Recovered	gals	1,935
Total Liquid NAPL Recovered	gals	109.8
Total Liquid NAPL Recovered	%	5.92
Total Vapor and Liquid NAPL Recovered	gals	114.7
Total NAPL Recovered	%	5.93
Total NAPL Recovered	lbs	802.8
Total Volume of Well Vapors	cu.ft	3,647

AVR

OPERATING DATA - EVENT #10 **PAGE # 1** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: "F" State Site, Lea County, NM **Project Managers: Sadler/Faucher/Hendley**

		Date:	5/15/13	5/15/13	5/15/13	5/15/13	5/15/13	5/15/13
	Parameters		Time 0715	Time 0745	Time 0815	Time 0845	Time 0915	Time 0945
	WELL # MW-1		Hr Meter 6350.0	Hr Meter 6350.5	Hr Meter 6351.0	Hr Meter 6351.5	Hr Meter 6352.0	Hr Meter 6352.5
ENGINE/BLOWER	R.P.M.		2300	2100	2100	2100	2100	2100
	Oil Pressure	psi	50	50	60	50	50	50
	Water Temp	°F	130	140	140	140	140	150
	Volts		13	13	13	13	13	13
	Intake Vacuum	"Hg	19	19	19	19	19	19
	Gas Flow Fuel/Propane	cfh	150	120	120	120	120	120
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump	ON/OFF	ON	ON	ON	ON	ON	ON
	Extraction Well Flow	scfm	8.68	8.68	8.68	8.68	8.68	8.68
	Extraction Well Vacuum	"H_2O	100	100	100	100	100	100
	Pump Rate	gals/min	4.5	4.5	4.5	4.5	4.5	4.5
	Total Volume	gals	-	135	270	405	540	675
	Influent Vapor Temp.	°F	68	68	68	68	68	68
	Air Temperature	°F	58.1	60.2	66.0	73.2	73.9	76.8
	Barometric Pressure	"Hg	29.84	29.84	29.84	29.84	29.84	29.84
VAPOR /INFLUENT	HC	ppmv	11,030	-	10,160	-	12,340	-
	CO_2 / CO	%	8.68/0.0	-	8.46/0.0	-	9.27/0.0	-
	O_2	%	8.4	-	8.2	-	9.8	-
	H_2S	%	2	-	2	-	-	-
MANIFOLD	NAPL	% Vol / Gals	-	8/10.8	8/10.8	8/10.8	7/9.45	7/9.45
	Data Logger	ft	-	-	-	-	-	-
	Depth of GW Depression	ft	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
	Extraction Well DTNAPL	ft	58.92					
	Extraction Well DTGW	ft	62.71					

NOTES

STARTED EVENT AT 0715 HRS. SET GW PUMP INLET @ 63.50 FT BTOC
WELL VAC SET @ 100" H_2O REMAINED CONSTANT FOR FIRST FEW HOURS
GW PUMP RATE SET @ 4.5 GPM. WELL VAPOR FLOW OF 8.68 SCFM
RESULTED FROM INDUCED VACUUM.

( ) Indicates Well Pressure

NAPL 3.09

AVR

OPERATING DATA - EVENT #10 **PAGE # 2** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: "F" State Site, Lea County, NM **Project Managers: Sadler/Faucher/Hendley**

		Date:	5/13/15	5/13/15	5/13/15	5/13/15	5/13/15	5/13/15
	Parameters		Time 1015	Time 1045	Time 1115	Time 1145	Time 1215	Time 1245
	WELL #		Hr Meter 6353.0	Hr Meter 6353.5	Hr Meter 6354.0	Hr Meter 6354.5	Hr Meter 6355.0	Hr Meter 6355.5
ENGINE/BLOWER	R.P.M.		2100	2100	2100	2100	2100	2100
	Oil Pressure	psi	50	50	60	50	50	50
	Water Temp	°F	160	160	160	160	160	160
	Volts		13	13	13	13	13	13
	Intake Vacuum	"Hg	19	19	19	19	19	19
	Gas Flow Fuel/Propane	cfh	120	120	120	120	120	120
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump	ON/OFF	ON	ON	ON	ON	ON	ON
	Extraction Well Flow	scfm	8.68	8.68	8.68	8.68	8.68	8.68
	Extraction Well Vacuum	"H_2O	100	100	100	100	100	100
	Pump Rate	gals/min	4.5	4.5	4.5	4.5	4.5	5.0
	Total Volume	gals	810	945	1080	1215	1350	1485
	Influent Vapor Temp.	°F	68	68	68	68	70	70
	Air Temperature	°F	83.4	86.7	89.3	92.0	94.0	94.0
	Barometric Pressure	"Hg	29.84	29.82	29.82	29.82	29.82	29.82
VAPOR /INFLUENT	HC	ppmv	14,680	–	12,320	–	16,170	–
	CO_2 / CO	%	10.2/0.04	–	8.7/0.01	–	6.9/0.0	–
	O_2	%	12.5	–	11.6	–	10.2	–
	H_2S	%	2	–	2	–	2	–

NOTES

AT 1045 HOURS BAROMETRIC PRESSURE DECREASED SLIGHTLY
HC CONTENT STARTED A SLIGHTLY DECLINING TREND
AT 1245 HOURS GW PUMP RATE INCREASED TO 5.0 GPM
INDUCED VACUUM AND WELL VAPOR FLOW REMAINED STEADY.

MANIFOLD	NAPL % Vol Gals		5/6.75	5/6.75	5/6.75	5/6.75	5/6.75	5/6.75
	Data Logger	ft	–	–	–	–	–	–
	Depth of GW Depression	ft	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
	Extraction Well DTNAPL	ft	–	–	–	–	–	–
	Extraction Well DTGW	ft	–	–	–	–	–	–

( ) Indicates Well Pressure

OPERATING DATA - EVENT #10 **PAGE # 3** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: "F" State Site, Lea County, NM **Project Managers: Sadler/Faucher/Hendley**

	Date:	5/15/13	5/15/13	5/15/13	5/16/13	5/15/13	
	Parameters	Time 1315	Time 1345	Time 1415	Time 1445	Time 1515	Time
	WELL # MW-1	Hr Meter 6356.0	Hr Meter 6356.5	Hr Meter 6357.0	Hr Meter 6357.5	Hr Meter	Hr Meter
ENGINE/BLOWER	R.P.M.	2100	2100	2100			
	Oil Pressure psi	50	50	50			
	Water Temp °F	160	160	160			
	Volts	13	13	13			
	Intake Vacuum "Hg	19	19	19			
	Gas Flow Fuel/Propane cfh	120	120	120			
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump **ON/OFF**	ON	ON	OFF			
	Extraction Well Flow scfm	8.68	8.68	8.68			
	Extraction Well Vacuum "H_2O	100	100	100			
	Pump Rate gals/min	5.0	5.0	5.0			
	Total Volume gals	1635	1785	1935			
	Influent Vapor Temp. °F	70	70	70			
	Air Temperature °F	94	95	95			
	Barometric Pressure "Hg	29.74	29.74	29.74			
VAPOR /INFLUENT	HC ppmv	11,730	—	11,420			
	CO_2 / CO %	7.80/0.0	—	8.60/0.0			
	O_2 %	10.2	—	9.4			
	H_2S %	2	—	2			

NOTES

AT 1315 HRS BAROMETRIC PRESSURE DECREASED SLIGHTLY.
INDUCED VACUUM AND WELL VAPOR FLOW REMAINED STEADY
AT 1415 HRS COLLECTION TANK REACHED CAPACITY AND EVENT ENDED.

MANIFOLD	NAPL % Vol / Gals	5/7.5	4/6.0	4/6.0			
	Data Logger ft	—	—	—			
	Depth of GW Depression ft	-1.0	-1.0	-1.0			
	Extraction Well DTNAPL ft			59.16			
	Extraction Well DTGW ft			59.27			

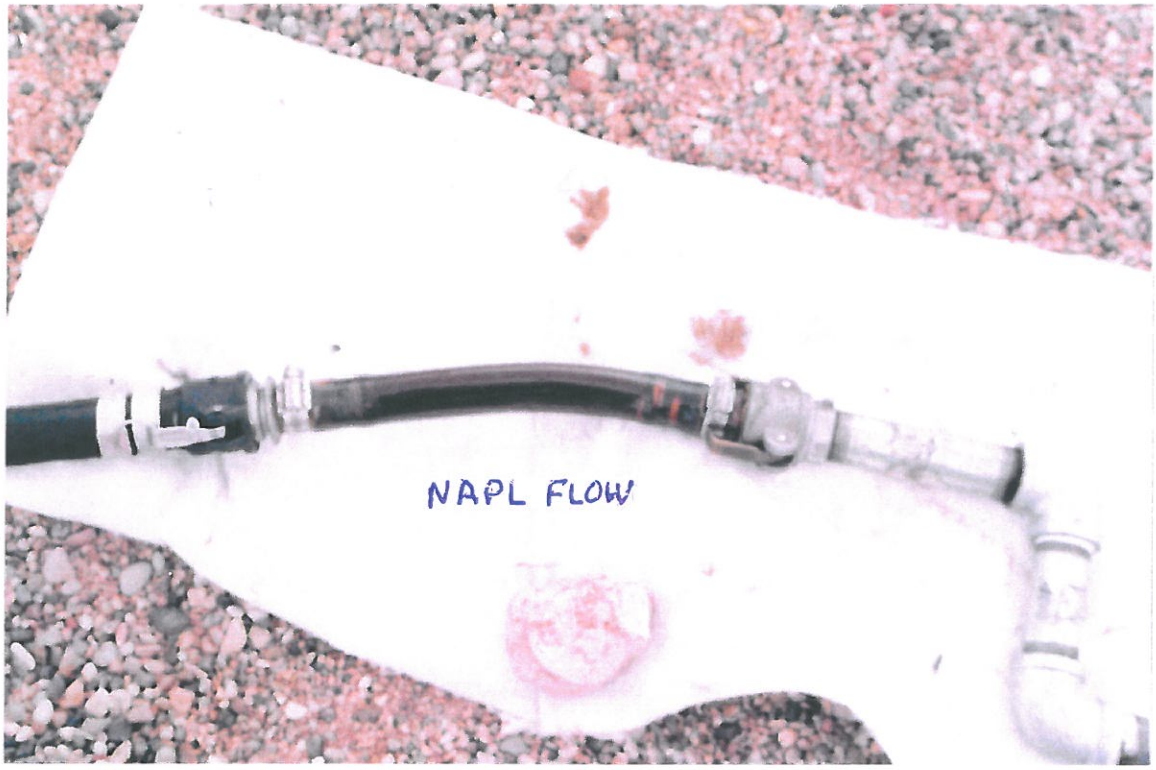
( ) Indicates Well Pressure

NAPL 0.11

"F" STATE SITE
LEA COUNTY, NM

"F" STATE SITE
LEA COUNTY, NM

"F" STATE SITE
LEA COUNTY, NM



AcuVac Remediation, LLC.

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713.468.6688 • Fax: 713.468.6689 • www.acuvac.com

June 14, 2013

Mr. Scott Christ
Project Manager
Conestoga-Rovers & Associates
6320 Rothway, Suite 100
Houston, Texas 77040

Dear Scott:

Re: Event #11: "F" State Site, Lea County, NM

The following is the Report and a copy of the Operating Data collected during the Mobile Dual Phase (MDP) Event #11 at the above location on June 14, 2013. Table #1 is the Well Data Information on well RW-1. PSH is referred to as NAPL in this report. GW samples are frequently taken in 2,000 ml beakers to determine the average NAPL percentage and volume.

Summary of MDP Event #11 - Well RW-1

The total Event time was 7.5 hours. The data is compared to Event #10 conducted on May 15, 2013, which had a total Event time of 7.0 hours.

- The total GW/NAPL recovered was 1,965 gals of which 5.63% or 116.7 gals were NAPL.
- Total NAPL vapors burned as IC engine fuel were 5.20 gals, **resulting in a total liquid and vapor NAPL recovery of 121.9 gals, or 6.20%. This equates to 16.25 gal/hr, which is a decrease of 0.13 gals/hr.**
- Average HORIBA Analytical Data from the influent vapor samples was: HC = 9,999 ppmv, CO_2 = 7.35%, CO = 0%, O_2 = 10.1% and H_2S = 1.75%.
- Compared with MDP Event #10 data, the TPH levels decreased 1,857 ppmv, CO_2 decreased 1.23%, CO, O_2, and H_2S were equal.
- The Average Induced Vacuum was 113.75"H_2O and the average EW vapor flow was 10.22 scfm. The average induced vacuum increased 13.75"H_2O and the average well flow increased 1.54 scfm.
- The GW pump was set at 62.0 ft BTOC. The average GW/NAPL pump rate was 4.41 gpm. The average GW pump rate decreased 0.20 gpm.
- The average GW depression was estimated at 1.0 ft below static level, which was consistent with Event #10. This estimate is based on the GW pump position and GW rate.

- At the start of Event #11, the static NAPL level was 3.39 ft and 0.02 ft of NAPL remained at the conclusion of the Event. The static GW level decreased 0.25 ft based on hydro-equivalent.

Summary and Observations:

During each Event, the test data is compared to the previous Event to evaluate the progress for this remediation project.

The HORIBA Analytical instrument is calibrated with HEXANE and CO_2.

The formula used to calculate the Emission Rate is:

$$ER = HC\ (ppmv) \times MW\ (Hexane) \times Flow\ Rate\ (scfm) \times 1.58E^{-7} \frac{(min)(lb\ mole)}{(hr)(ppmv)(ft^3)} = lbs/hr$$

The total NAPL removed, including liquid and vapor, during the 7.5 hour Event #11 (well RW-1), was 121.9 gals, or 6.20% of the total liquid volume of 1,965 gals. This equates to 16.25 gals/hr.

During the eleven Events totaling 81.8 hours, the total NAPL removed, including liquid and vapor, equals 1,082.5 gals, or 5.23% of a total liquid volume of 20,694 gals. This equates to a NAPL recovery rate of 13.23 gals/hr.

Additional Information:

- The average liquid and vapor NAPL recovery from well RW-1 decreased slightly from 16.38 to 16.25 gal/hr.
- The induced vacuum was set higher, and the average GW/NAPL pump rate was slightly decreased by 0.24 gpm. These changes were necessary to maintain a liquid recovery volume in the 1,815 gallon range over a 7.5 hour Event period. **The 2,000 gallon collection tank is a limiting factor for this site. With a larger capacity collection tank, the induced vacuum, liquid pump rate and NAPL recovery could be increased.**

We appreciate you selecting AcuVac to provide this service. **We have scheduled Event #12 for Wednesday, July 10, 2013. Should you have any questions, please contact me.**

Sincerely,

James E. Sadler, VP
Engineering/Environmental

cc: Brittany Ford
CRA- Dallas

Well and Recovery Data Information - Event #11

June 14, 2013

EVENT NO		11
		RW-1
Total Event Hours		7.5
TD	ft	90.0
Well Size	in	4.0
DTGW - Static - Start Event #11	ft	62.51
DTNAPL - Static - Start Event #11	ft	59.12
NAPL	ft	3.39
DTGW - End Event #11	ft	59.95
DTNAPL - End Event #11	ft	59.93
NAPL	ft	0.02
Average Extraction Well Vacuum	"H_2O	113.75
Average Extraction Well Vapor Flow	scfm	10.22
Average GW/NAPL Pump Rate	gpm	4.41
Average TPH	ppmv	9,999
Average CO_2	%	7.35
Average CO	%	0
Average O_2	%	10.1
Average H_2S	%	1.75
Total Liquid Volume Recovered	gals	1,965
Total Liquid NAPL Recovered	gals	116.7
Total Liquid NAPL Recovered	%	5.63
Total Vapor and Liquid NAPL Recovered	gals	121.9
Total NAPL Recovered	%	6.20
Total NAPL Recovered	lbs	853.3
Total Volume of Well Vapors	cu.ft	4,600

OPERATING DATA - EVENT #11 **PAGE # 1** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: "F" State Site, Lea County, NM **Project Managers: Faucher/Hendley**

		Date:	6/14/13	6/14/13	6/14/13	6/14/13	6/14/13	6/14/13
	Parameters		Time 0630	Time 0700	Time 0730	Time 0800	Time 0830	Time 0900
	WELL # RW-1		Hr Meter 6407.0	Hr Meter 6407.5	Hr Meter 6408.0	Hr Meter 6408.5	Hr Meter 6409.0	Hr Meter 6409.5
ENGINE/BLOWER	R.P.M.		2100	2100	2100	2100	2100	2100
	Oil Pressure	psi	50	50	50	50	50	
	Water Temp	°F	130	130	130	130	130	140
	Volts		13	13	13	13	13	13
	Intake Vacuum	"Hg	19	19	19	19	19	19
	Gas Flow Fuel/Propane	cfh	120	120	120	120	120	120
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump	ON/OFF	ON	ON	ON	ON	ON	ON
	Extraction Well Flow	scfm	7.11	9.47	9.47	10.26	10.26	10.63
	Extraction Well Vacuum	"H_2O	100	100	100	100	100	120
	Pump Rate	gals/min	-	4.5	4.5	4.5	4.5	4.5
	Total Volume	gals		135	270	405	540	675
	Influent Vapor Temp.	°F	68	68	68	68	68	68
	Air Temperature	°F	72.2	72.4	72.4	76.0	77.4	77.4
	Barometric Pressure	"Hg	30.12	30.12	30.12	30.12	30.12	30.12
VAPOR /INFLUENT	HC	ppmv	11,120	-	9230	-	9060	-
	CO_2 / CO	%	7.46/0.01	-	6.98/0.0	-	6.98/0.0	-
	O_2	%	10.9	-	8.2	-	12.5	-
	H_2S	%	2	-	2	-	2	-
MANIFOLD	NAPL % Vol Gals		-	9/	8/	8/	7/	7/
	Data Logger	ft	-	-	-	-	-	-
	Depth of GW Depression	ft	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
	Extraction Well DTNAPL	ft	59.12					
	Extraction Well DTGW	ft	62.51					

NOTES

STARTED EVENT AT 0630 HRS. SET GW PUMP @ 62.0 FT BTOC.
WELL VAC SET AT 100 "H_2O. REMAINED CONSTANT UNTIL 0900 HRS @ 120 "H_2O
GW PUMP RATE SET @ 4.5 GPM. WELL VAPOR FLOW STARTED @ 7.11 SCFM
AND INCREASED TO 10.26 SCFM @ 100 "H_2O. INCREASED TO 10.63 SCFM @ 120 "H_2O

( ) Indicates Well Pressure

NAPL 3.39

7FORMS/TestForms/1210018

OPERATING DATA - EVENT #11 **PAGE # 2** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: "F" State Site, Lea County, NM **Project Managers: Faucher/Hendley**

	Date:	6/14/13	6/14/13	6/14/13	6/14/13	6/14/13	6/14/13
	Parameters	Time 0930	Time 1000	Time 1030	Time 1100	Time 1130	Time 1200
	WELL # RW-1	Hr Meter 6410.0	Hr Meter 6410.5	Hr Meter 6411.0	Hr Meter 6411.5	Hr Meter 6412.0	Hr Meter 6412.5
ENGINE/BLOWER	R.P.M.	2100	2100	2100	2100	2100	2100
	Oil Pressure psi	50	50	50	50	50	50
	Water Temp °F	160	160	160	160	160	160
	Volts	13	13	13	13	13	13
	Intake Vacuum "Hg	19	19	19	19	19	19
	Gas Flow Fuel/Propane cfh	120	120	120	120	120	120
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump **ON/OFF**	ON	ON	ON	ON	ON	OFF
	Extraction Well Flow scfm	10.63	10.63	10.63	10.63	10.63	—
	Extraction Well Vacuum "H_2O	120	120	120	120	120	—
	Pump Rate gals/min	4.5	4.5	4.5	5.0	5.0	—
	Total Volume gals	810	945	1080	1215	1350	
	Influent Vapor Temp. °F	68	68	68	68	68	68
	Air Temperature °F	81.2	79.2	76.4	76.6	74.2	74.6
	Barometric Pressure "Hg	30.10	30.10	30.10	30.10	30.10	30.10
VAPOR /INFLUENT	HC ppmv	8860	—	12,610	—	11830	—
	CO_2 / CO %	6.56/0.0	—	8.48/0.01	—	8.21/0.0	—
	O_2 %	7.7	—	10.2	—	9.4	—
	H_2S %	2	—	2	—	1	—
NOTES	WELL VACUUM AND FLOW REMAINED STEADY AT 120" H_2O AND 10.63 AT 1200 HRS MECHANICAL ISSUE STOPPED TEST. TEST RESTARTED @ 1230 HRS						
MANIFOLD	NAPL % Vol Gals	6/8.1	6/8.1	6/8.1	5/6.75	5/6.75	5/6.75
	Data Logger ft	—	—	—	—	—	—
	Depth of GW Depression ft						
	Extraction Well DTNAPL ft						
	Extraction Well DTGW ft						

( ) Indicates Well Pressure

OPERATING DATA - EVENT #11 PAGE # 3 **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: "F" State Site, Lea County, NM **Project Managers: Faucher/Hendley**

	Date:	6/14/13	6/14/13	6/14/13	6/14/13		
	Parameters	Time 1230	Time 1300	Time 1330	Time 1400	Time	Time
	WELL # RW-1	Hr Meter 6413.0	Hr Meter 6413.5	Hr Meter 6414.0	Hr Meter 6414.5	Hr Meter	Hr Meter
ENGINE/BLOWER	R.P.M.	2100	2100	2100	2100		
	Oil Pressure psi	50	50	50	50		
	Water Temp °F	160	160	160	160		
	Volts	13	13	13	13		
	Intake Vacuum "Hg	19	19	19	19		
	Gas Flow Fuel/Propane cfh	120	120	120	120		
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump **ON/OFF**	ON	ON	ON	OFF		
	Extraction Well Flow scfm	10.63	10.63	10.63	10.63		
	Extraction Well Vacuum "H_2O	120	120	120	120		
	Pump Rate gals/min	5.0	5.0	5.0	OFF		
	Total Volume gals	1500	1650	1800	1950		
	Influent Vapor Temp. °F	68	68	68	68		
	Air Temperature °F	72.2	70.8	70.2	72.4		
	Barometric Pressure "Hg	30.08	30.06	30.04	30.04		
VAPOR /INFLUENT	HC ppmv	10,020	—	7260	—		
	CO_2 / CO %	7.14/0.0	—	6.96/0.0	—		
	O_2 %	7.8	—	14.2	—		
	H_2S %	1	—	2	—		
NOTES	INDUCED WELL VAC AND VAPOR FLOW REMAINED STEADY. AT 1400 HRS COLLECTION TANK REACHED CAPACITY AND EVENT ENDED						
MANIFOLD	NAPL % Vol Gals	4/6.0	4/6.0	4/6.0	4/6.0		
	Data Logger ft						
	Depth of GW Depression ft	-1.0	-1.0	-1.0	.		
	Extraction Well DTNAPL ft				59.93		
	Extraction Well DTGW ft				59.95		

( ) Indicates Well Pressure

7FORMS/TestForms/1210018

NAPL .02

"F" STATE SITE
LEA COUNTY, NM

"F" STATE SITE
LEA COUNTY, NM

"F" STATE SITE
LEA COUNTY, NM

AcuVac Remediation, LLC.

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July 10, 2013

Mr. Scott Christ
Project Manager
Conestoga-Rovers & Associates
6320 Rothway, Suite 100
Houston, Texas 77040

Dear Scott:

Re: Event #12: "F" State Site, Lea County, NM

The following is the Report and a copy of the Operating Data collected during the Mobile Dual Phase (MDP) Event #12 at the above location on July 10, 2013. Table #1 is the Well Data Information on well RW-1. PSH is referred to as NAPL in this report. GW samples are frequently taken in 2,000 ml beakers to determine the average NAPL percentage and volume.

Summary of MDP Event #12 - Well RW-1

The total Event time was 6.5 hours. The data is compared to Event #11 conducted on June 14, 2013, which had a total Event time of 7.5 hours.

- The total GW/NAPL recovered was 1,905 gals of which 6.39% or 121.65 gals were NAPL.
- Total NAPL vapors burned as IC engine fuel were 4.67 gals, **resulting in a total liquid and vapor NAPL recovery of 126.32 gals, or 6.63%. This equates to 19.43 gal/hr, which is a increase of 3.18 gals/hr.**
- Average HORIBA Analytical Data from the influent vapor samples was: HC = 11,181 ppmv, CO_2 = 7.59%, CO = 0%, O_2 = 10.1% and H_2S = 2.43%.
- Compared with MDP Event #11 data, the TPH levels increased 1,182 ppmv, CO_2 increased 0.24%, CO was equal at 0%, O_2 was steady at 10.1%, and H_2S increased 0.68%.
- The Average Induced Vacuum was 100.00"H_2O and the average EW vapor flow was 9.47 scfm. The average induced vacuum decreased 13.75"H_2O and the average well flow decreased 0.75 scfm.
- The GW pump was set at 62.0 ft BTOC. The average GW/NAPL pump rate was 4.59 gpm. The average GW pump rate increased 0.18 gpm.
- The average GW depression was estimated at 1.0 ft below static level, which was consistent with Event #11. This estimate is based on the GW pump position and GW rate.
- At the start of Event #12, the static NAPL level was 3.76 ft and 0.02 ft of NAPL remained at the conclusion of the Event. The static GW level decreased 0.25 ft based on hydro-equivalent.

Summary and Observations:

During each Event, the test data is compared to the previous Event to evaluate the progress for this remediation project.

The HORIBA Analytical instrument is calibrated with HEXANE and CO_2.

The formula used to calculate the Emission Rate is:

$$ER = HC\ (ppmv) \times MW\ (Hexane) \times Flow\ Rate\ (scfm) \times 1.58E^{-7} \frac{(min)(lb\ mole)}{(hr)(ppmv)(ft^3)} = lbs/hr$$

The total NAPL removed, including liquid and vapor, during the 6.5 hour Event #12 (well RW-1), was 126.32 gals, or 6.63% of the total liquid volume of 1,905 gals. This equates to 19.43 gals/hr.

During the eleven Events totaling 88.3 hours, the total NAPL removed, including liquid and vapor, equals 1,208.83 gals, or 5.35% of a total liquid volume of 22,599 gals. This equates to a NAPL recovery rate of 13.69 gals/hr.

Additional Information:

- The average liquid and vapor NAPL recovery from well RW-1 increased from 16.25 to 19.43 gal/hr.
- The induced vacuum was set lower, and the average GW/NAPL pump rate was slightly increased by 0.18 gpm. These changes were necessary to maintain a liquid recovery volume in the 1,900 gallon range over a 7.0 hour Event period. **The 2,000 gallon collection tank is a limiting factor for this site. With a larger capacity collection tank, the induced vacuum, liquid pump rate and NAPL recovery could be increased.**

This was the last Event we have scheduled for this site. We are preparing a final report with more data and recommendations on how to increase the LNAPL recovery rate through the Event process at this site. Once we compile all the data, we would like to schedule a conference with both of you, perhaps in your Houston office.

We appreciate you selecting AcuVac to provide this service.

Sincerely,

James E. Sadler, VP
Engineering/Environmental

cc: Brittany Ford
CRA- Dallas

Well and Recovery Data Information - Event #12

July 10, 2013

EVENT NO		12
Well Number		**RW-1**
Total Event Hours		6.5
TD	ft	90.0
Well Size	in	4.0
DTGW - Static - Start Event #12	ft	62.80
DTNAPL - Static - Start Event #12	ft	59.04
NAPL	ft	3.76
DTGW - End Event #12	ft	59.95
DTNAPL - End Event #12	ft	59.93
NAPL	ft	0.02
Average Extraction Well Vacuum	"H_2O	100.00
Average Extraction Well Vapor Flow	scfm	9.47
Average GW/NAPL Pump Rate	gpm	4.59
Average TPH	ppmv	11,181
Average CO_2	%	7.59
Average CO	%	0
Average O_2	%	10.1
Average H_2S	%	2.43
Total Liquid Volume Recovered	gals	1,905
Total Liquid NAPL Recovered	gals	121.65
Total Liquid NAPL Recovered	%	6.39
Total Vapor and Liquid NAPL Recovered	gals	126.32
Total NAPL Recovered	%	6.63
Total NAPL Recovered	lbs	884.2
Total Volume of Well Vapors	cu.ft	3,693

OPERATING DATA - EVENT #12 **PAGE # 1** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: "F" State Site, Lea County, NM **Project Managers: Faucher/Hendley**

	Date:	07/10/2013	07/10/2013	07/10/2013	07/10/2013	07/10/2013	07/10/2013
	Parameters	Time 0630	Time 0700	Time 0730	Time 0800	Time 0830	Time 0900
	WELL # **MW-1**	Hr Meter 6447.5	Hr Meter 6448.0	Hr Meter 6448.5	Hr Meter 6449.0	Hr Meter 6449.5	Hr Meter 6450.0
ENGINE/BLOWER	R.P.M.	2400	2200	2200	2200	2200	2200
	Oil Pressure psi	50	50	50	50	50	50
	Water Temp °F	130	130	140	140	140	140
	Volts	13	13	13	13	13	13
	Intake Vacuum "Hg	19	19	19	19	19	19
	Gas Flow Fuel/Propane cfh	130	130	130	130	130	130
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump **ON/OFF**	ON	ON	ON	ON	ON	ON
	Extraction Well Flow scfm	9.47	9.47	9.47	9.47	9.47	9.47
	Extraction Well Vacuum "H_2O	100	100	100	100	100	100
	Pump Rate gals/min	4.0	4.0	4.0	4.0	5.0	5.0
	Total Volume gals	—	120	240	360	480	630
	Influent Vapor Temp. °F	—	—	—	—	—	—
	Air Temperature °F	74.2	75.4	76.0	80.4	82.4	83.8
	Barometric Pressure "Hg	30.10	30.10	30.10	30.10	30.10	30.10
VAPOR /INFLUENT	HC ppmv	10,040	—	10,840	—	9,340	—
	CO_2 / CO %	5.84/0.0	—	7.20/0.0	—	7.62/0.0	—
	O_2 %	10.3	—	10.9	—	14.7	—
	H_2S %	3	—	2	—	2	—
NOTES	PERFORMED ALL SAFETY CHECKS STARTED EVENT @ 0630 HRS						
	SET GW PUMP @ 62.0 FT BTOC INITIAL WELL VAC SET @ 100" H_2O						
	RESULTING IN A WELL VAPOR FLOW OF 9.47 SCFM						
	WELL VAC AND VAPOR FLOW REMAINED CONSTANT						
	AT 0830 HRS INCREASED GW PUMP RATE TO 5.0 GPM.						
MANIFOLD	NAPL % Vol / Gals	—	9/10.8	8/9.6	8/9.6	7/8.4	7/8.4
	Data Logger ft	—	—	—	—	—	—
	Depth of GW Depression ft	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
	Extraction Well DTNAPL ft	59.04					
	Extraction Well DTGW ft	62.80					

( ) Indicates Well Pressure NAPL 3.76

OPERATING DATA - EVENT #12 **PAGE # 2** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: "F" State Site, Lea County, NM **Project Managers: Faucher/Hendley**

	Date:	07/10/2013	07/10/2013	07/10/2013	07/10/2013	07/10/2013	07/10/2013
	Parameters	Time 0930	Time 1000	Time 1030	Time 1100	Time 1130	Time 1200
	WELL # **MW-1**	Hr Meter 6450.5	Hr Meter 6451.0	Hr Meter 6451.5	Hr Meter 6452.0	Hr Meter 6452.5	Hr Meter 6453.0
ENGINE/BLOWER	R.P.M.	2000	2000	2000	2000	2000	2000
	Oil Pressure psi	50	50	50	50	50	50
	Water Temp °F	140	140	140	140	140	140
	Volts	13	13	13	13	13	13
	Intake Vacuum "Hg	19	19	19	19	19	19
	Gas Flow Fuel/Propane cfh	12	12	12	12	12	12
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump **ON/OFF**	ON	ON	ON	ON	ON	ON
	Extraction Well Flow scfm	5.47	5.47	5.47	5.47	5.47	5.47
	Extraction Well Vacuum "H_2O	100	100	100	100	100	100
	Pump Rate gals/min	5.0	5.0	5.5	5.5	5.5	5.5
	Total Volume gals	780	930	1080	1245	1410	1575
	Influent Vapor Temp. °F	—	—	—	—	—	—
	Air Temperature °F	86.2	88.8	91.4	92.6	95.4	96.6
	Barometric Pressure "Hg	30.10	30.10	30.10	30.10	30.10	30.10
VAPOR /INFLUENT	HC ppmv	9980	—	11730	—	12,120	—
	CO_2 / CO %	7.52/0.0	—	7.64/0.0	—	8.28/0.0	—
	O_2 %	7.5	—	7.8	—	8.7	—
	H_2S %	2	—	2	—	3	—
NOTES	INDUCED WELL VAC AND WELL VAPOR FLOW REMAINED CONSTANT DURING THIS PERIOD. INCREASED THE GW PUMP RATE TO 5.5 GPM @ 1030 HRS.						
MANIFOLD	NAPL % Vol Gals	9/10.50	7/10.50	7/10.50	6/9.9	6/9.9	5/8.25
	Data Logger ft	—	—	—	—	—	—
	Depth of GW Depression ft	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
	Extraction Well DTNAPL ft						
	Extraction Well DTGW ft						

( ) Indicates Well Pressure

OPERATING DATA - EVENT #12 **PAGE # 3** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: "F" State Site, Lea County, NM **Project Managers: Faucher/Hendley**

	Date:	07/10/2013	07/10/2013	07/10/2013	07/10/2013	07/10/2013	07/10/2013
	Parameters	Time 1230	Time 1300	Time	Time	Time	Time
	WELL # **MW-1**	Hr Meter 6453.5	Hr Meter 6454.0	Hr Meter	Hr Meter	Hr Meter	Hr Meter
ENGINE/BLOWER	R.P.M.	2000	2000				
	Oil Pressure psi	50	50				
	Water Temp °F	140	140				
	Volts	13	13				
	Intake Vacuum "Hg	19	19				
	Gas Flow Fuel/Propane cfh	12	12				
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump **ON/OFF**	ON	ON				
	Extraction Well Flow scfm	9.47	9.47				
	Extraction Well Vacuum "H_2O	100	100				
	Pump Rate gals/min	5.5	5.5				
	Total Volume gals	1740	1905				
	Influent Vapor Temp. °F	—	—				
	Air Temperature °F	97.4	97.8				
	Barometric Pressure "Hg	30.10	30.10				
VAPOR /INFLUENT	HC ppmv	14,220	—				
	CO_2 / CO %	9.0/0.0	—				
	O_2 %	10.9	—				
	H_2S %	3	—				
NOTES	WELL FLOW AND VAC REMAINED STEADY THROUGHOUT THE PERIOD. AT 1300 HRS COLLECTION TANK REACHED CAPACITY AND EVENT CONCLUDED.						
MANIFOLD	NAPL % Vol Gals	4/6.6	4/6.6				
	Data Logger ft						
	Depth of GW Depression ft	-1.0	-1.0				
	Extraction Well DTNAPL ft		55.93				
	Extraction Well DTGW ft		55.95				

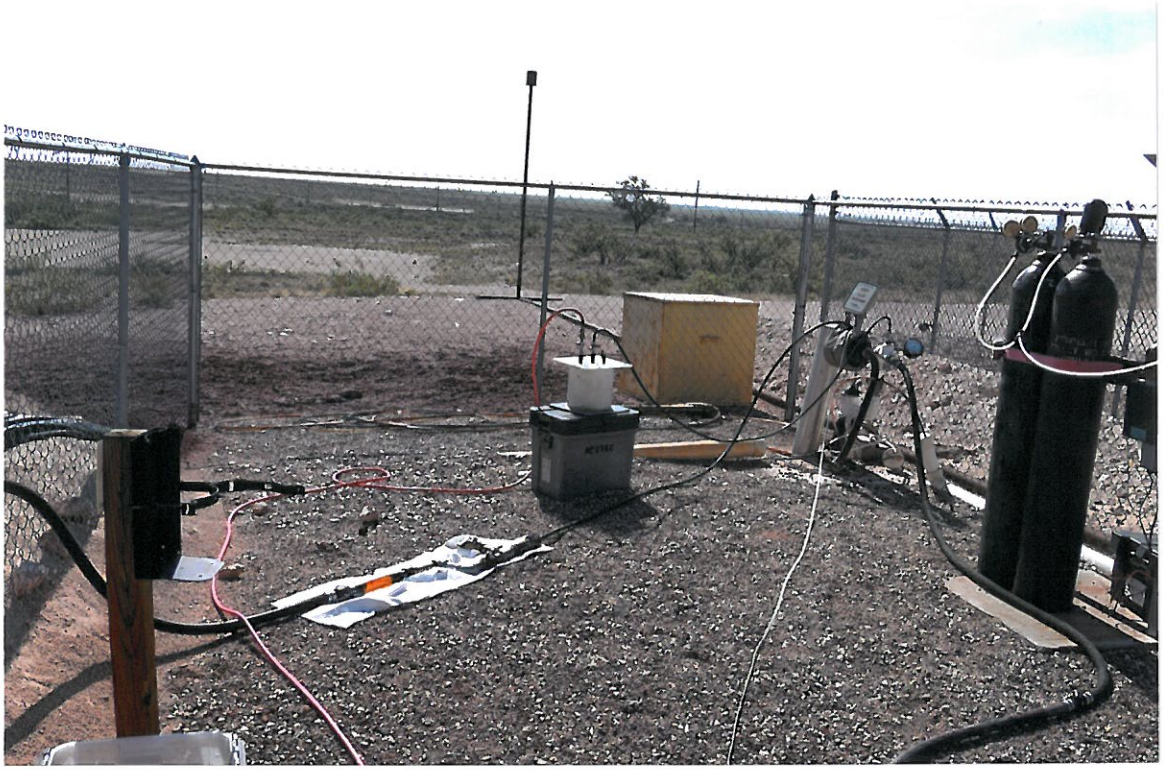
( ) Indicates Well Pressure

7FORMS/TestForms/1210018

NAPL .02

"F" STATE SITE
LEA COUNTY, NM

"F" STATE SITE
LEA COUNTY, NM



"F" STATE SITE
LEA COUNTY, NM

AcuVac Remediation, LLC.

1656-H Townhurst, Houston, Texas 77043
713.468.6688 • Fax: 713.468.6689 • www.acuvac.com

October 21, 2013

Mr. Scott Christ
Project Manager
Conestoga-Rovers & Associates
6320 Rothway, Suite 100
Houston, Texas 77040

Dear Scott:

Re: Event #13: "F" State Site, Lea County, NM

The following is the Report and a copy of the Operating Data collected during the Mobile Dual Phase (MDP) Event #13 at the above location on October 17, 2013. Table #1 is the Well Data Information on well RW-1. PSH is referred to as NAPL in this report. GW samples are frequently taken in 2,000 ml beakers to determine the average NAPL percentage and volume.

Summary of MDP Event #13 - Well RW-1

The total Event time was 7.0 hours. The data is compared to Event #12 conducted on July 10, 2013, which had a total Event time of 6.5 hours.

- The total GW/NAPL recovered was 1,890 gals of which 8.68% or 164.03 gals were NAPL.
- Total NAPL vapors burned as IC engine fuel were 5.45 gals, **resulting in a total liquid and vapor NAPL recovery of 169.48 gals, or 8.97%. This equates to 24.21 gal/hr, which is an increase of 4.78 gals/hr.**
- Average HORIBA Analytical Data from the influent vapor samples was: HC = 12,316 ppmv, CO_2 = 7.35%, CO = 0%, O_2 = 9.4% and H_2S = 2.63ppm.
- Compared with MDP Event #12 data, the TPH levels increased 1,135 ppmv, CO_2 decreased 0.24%, CO was equal at 0%, O_2 decreased 0.7%, and H_2S increased 0.20 ppm.
- The Average Induced Vacuum was 93.33"H_2O and the average EW vapor flow was 9.32 scfm. The average induced vacuum decreased 6.67"H_2O and the average well flow decreased 0.15 scfm.
- The GW pump was set at 62.0 ft BTOC. The average GW/NAPL pump rate was 4.50 gpm. The average GW pump rate decreased 0.09 gpm.
- The average GW depression was estimated at 1.0 ft below static level, which was consistent with Event #12. This estimate is based on the GW pump position and GW rate.
- At the start of Event #13, the static NAPL level was 3.73 ft and 0.01 ft of NAPL remained at the conclusion of the Event. The static GW level decreased 0.25 ft based on hydro-equivalent.

Additional Information- Event #13

- During the Event period the Induced Well Vacuum was varied to increase the recovery of NAPL as a percentage of the total liquid volume. This cycle of increasing and decreasing the Induced Well Vacuum every 30 minutes continued for the remainder of the Event period. Based on our observations of the amount of NAPL visible in the site gauge, the NAPL recovery increased to approximately 12.5%. We recommend the installation of a new, more shallow, well that will increase the percentage of NAPL recovery further as less groundwater will be included in the liquid recovery.
- The GW pump rate remained steady throughout the Event period at 4.5 gpm as the 2,000 gallon collection tank is a limiting factor. In order to compensate for the tank size, the Induced Well Vacuum was varied, as described above, in order to reduce the GW upwelling and enable the GW pump to capture more NAPL.
- Based on the use of the above methods, the average liquid and vapor NAPL recovery from well RW-1 increased from 19.43 to 24.21 gal/hr.

NAPL Recovery Data:

The total NAPL removed, including liquid and vapor, during the 7.0 hour Event #13 (well RW-1), was 169.48 gals, or 8.97% of the total liquid volume of 1,890 gals. This equates to 24.21 gals/hr.

During the thirteen Events totaling 95.3 hours, the total NAPL removed, including liquid and vapor, equals 1,378.31 gals, or 5.63% of a total liquid volume of 24,489 gals. This equates to a NAPL recovery rate of 14.46 gals/hr.

Method of Calibration and Calculations

During each Event, the test data is compared to the previous Event to evaluate the progress for this remediation project.

The HORIBA Analytical instrument is calibrated with HEXANE and CO_2.

The formula used to calculate the Emission Rate is:

$$ER = HC\ (ppmv) \times MW\ (Hexane) \times Flow\ Rate\ (scfm) \times 1.58E^{-7}\ \frac{(min)(lb\ mole)}{(hr)(ppmv)(ft^3)} = lbs/hr$$

Information included with Report

- Recorded Data
- Photographs of the MDP System and well RW-1

We have tentatively scheduled the next Event for November 14, 2013. Once we review our schedule we can confirm this date with you.

We appreciate you selecting AcuVac to provide this service.

Sincerely,

ACUVAC REMEDIATION, LLC

Paul D. Faucher
Vice President, Operations

cc: Brittany Ford
CRA- Dallas

Well and Recovery Data Information - Event #13

October 17, 2013

Table #1

EVENT		1A
Well Number		**MW-8**
Total Event Hours		7.0
TD	ft	90.0
Well Size	in	4.0
DTGW - Static - Start Event	ft	62.49
DTNAPL - Static - Start Event	ft	58.76
NAPL	ft	3.73
DTGW - End Event	ft	59.32
DTNAPL - End Event	ft	59.31
NAPL	ft	0.01
Average Extraction Well Vacuum	"H_2O	93.33
Average Extraction Well Vapor Flow	scfm	9.32
Average GW/NAPL Pump Rate	gpm	4.50
Average TPH	ppmv	12,316
Average CO_2	%	7.35
Average CO	%	0
Average O_2	%	9.4
Average H_2S	ppm	2.63
Total Liquid Volume Recovered	gals	1,890
Total Liquid NAPL Recovered	gals	164.03
Total Liquid NAPL Recovered	%	8.68
Total Vapor and Liquid NAPL Recovered	gals	169.48
Total NAPL Recovered	%	8.97
Total NAPL Recovered	lbs	1,186
Total Volume of Well Vapors	cu.ft	3,914

OPERATING DATA - EVENT #13 **PAGE # 1** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: "F" State Site, Lea County, NM **Project Managers:** Faucher/Hendley

Date: 10/17/2013

	Parameters		Time	Time	Time	Time	Time	Time
			0700	0730	0800	0830	0900	0930
	WELL #		Hr Meter	Hr Meter	Hr Meter	Hr Meter	Hr Meter	Hr Meter
			6577.5	6578.0	6578.5	6579.0	6579.5	6580.0
ENGINE/BLOWER	R.P.M.		2000	2000	2000	2000	2000	2000
	Oil Pressure	psi	50	50	50	50	50	50
	Water Temp	°F	130	130	130	130	130	130
	Volts		13	13	13	13	13	13
	Intake Vacuum	"Hg	18	18	18	18	18	18
	Gas Flow Fuel/Propane	cfh	120	120	120	120	120	120
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump	ON/OFF	ON	ON	ON	ON	ON	ON
	Extraction Well Flow	scfm	9.47	9.47	9.47	9.47	9.47	9.47
	Extraction Well Vacuum	"H_2O	100	100	100	100	100	100
	Pump Rate	gals/min	4.5	4.5	4.5	4.5	4.5	4.5
	Total Volume	gals	–	135	270	405	540	675
	Influent Vapor Temp.	°F	–	–	–	–	–	–
	Air Temperature	°F	41 CLOUDY	44	46	49	51	52
	Barometric Pressure	"Hg	30.08	30.08	30.08	30.08	30.08	30.08
	Absolute Pressure	"Hg	–	–	–	–	–	–
VAPOR /INFLUENT	HC	ppmv	12,580	–	12,760	–	12,460	–
	CO_2	%	6.84	–	7.32	–	7.48	–
	CO	%	0.0	–	0.0	–	0.0	–
	O_2	%	10.5	–	9.7	–	9.6	–
	H_2S	ppm	2.0	–	3.0	–	2.0	–

NOTES

ARRIVED AT THE SITE AT 0600 HRS. MOBILIZED THE ACUVAC MDP SYSTEM. PERFORMED ALL SAFETY CHECKS. TAILGATE SAFETY MEETING. STARTED EVENT AT 0700 HRS. SET INITIAL INDUCED WELL VAC @ 100" H_2O RESULTING IN A WELL FLOW OF 9.47 SCFM. SET TOTAL FLUIDS PUMP @ 62.0 FT BTOC. SET INITIAL GW PUMP RATE @ 4.5 GPM. INDUCED WELL VAC, WELL FLOW AND GW PUMP RATE REMAINED CONSTANT THROUGHOUT THE PERIOD

MANIFOLD								
	LNAPL % Vol / Gals	– / –	10 / 13.5	9 / 12.15	8 / 10.8	8 / 10.8	7 / 9.45
	Depth of GW Depression ft	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
	Extraction Well DTLNAPL ft	58.76					
	Extraction Well DTGW ft	62.49					

( ) Indicates Well Pressure

NAPL 3.73

OPERATING DATA - EVENT #13 **PAGE # 2** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: "F" State Site, Lea County, NM **Project Managers:** Faucher/Hendley

	Date:	10/17/2013					
	Parameters	Time 1000	Time 1030	Time 1100	Time 1130	Time 1200	Time 1230
	WELL #	Hr Meter 6580.5	Hr Meter 6581.0	Hr Meter 6581.5	Hr Meter 6582.0	Hr Meter 6582.50	Hr Meter 6583.0
ENGINE/BLOWER	R.P.M.	2000	2000	2000	2000	2000	2000
	Oil Pressure psi	50	50	50	50	50	50
	Water Temp °F	130	130	130	130	130	130
	Volts	13	13	13	13	13	13
	Intake Vacuum "Hg	18	18	18	18	18	18
	Gas Flow Fuel/Propane cfh	120	120	120	120	120	120
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump **ON/OFF**	ON	ON	ON	ON	ON	ON
	Extraction Well Flow scfm	5.0	5.47	5.0	5.47	5.0	5.47
	Extraction Well Vacuum "H_2O	80	100	80	100	80	100
	Pump Rate gals/min	4.5	4.5	4.5	4.5	4.5	4.5
	Total Volume gals	810	945	1080	1215	1350	1485
	Influent Vapor Temp. °F	-	-	-	-	-	-
	Air Temperature °F	50	50	51	52	55	SUNDAY 60
	Barometric Pressure "Hg	30.08	30.08	30.10	30.10	30.10	30.10
	Absolute Pressure "Hg	-	-	-	-	-	-
VAPOR /INFLUENT	HC ppmv	11,820	-	12,970	-	12,530	-
	CO_2 %	6.32	-	7.62	-	7.34	-
	CO %	0.0	-	0.0	-	0.0	-
	O_2 %	10.7	-	9.4	-	8.9	-
	H_2S ppm	3.0	-	3.0	-	3.0	-
NOTES	AT 1000 HRS REDUCED INDUCED WELL VAC TO 80"H_2O WHICH LOWERED THE WATER COLUMN IN THE WELL RESULTING IN INCREASED PRODUCT RECOVERY. BASED UPON TIMED VISUAL INSPECTION OF THE CLEAR SITE GAUGE, PRODUCT RECOVERY INCREASED TO APPROXIMATELY 12.5% BASED UPON PRODUCT APPEARING IN THE SITE GLASS FOR APPROXIMATELY 20 MINUTES EACH HALF HOUR. AT THE BOTTOM OF THE HOUR THE INDUCED WELL VAC WAS INCREASED TO 100"H_2O. THIS CYCLE CONTINUED FOR THE REMAINDER OF THE EVENT PERIOD.						
MANIFOLD	LNAPL % Vol / Gals	12.5 / 16.9	5.0 / 6.75	12.5 / 16.9	5.0 / 6.75	12.5 / 16.9	5.0 / 6.75
	Depth of GW Depression ft	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
	Extraction Well DTLNAPL ft						
	Extraction Well DTGW ft						

( ) Indicates Well Pressure

OPERATING DATA - EVENT #13 **PAGE # 3** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: **"F" State Site, Lea County, NM** **Project Managers: Faucher/Hendley**

	Date:	10/17/2013					
	Parameters	Time 1300	Time 1330	Time 1400	Time	Time	Time
	WELL #	Hr Meter 6583.5	Hr Meter 6584.0	Hr Meter 6584.5	Hr Meter	Hr Meter	Hr Meter
ENGINE/BLOWER	R.P.M.	2000	2000	2000			
	Oil Pressure psi	50	50	50			
	Water Temp °F	130	130	130			
	Volts	13	13	13			
	Intake Vacuum "Hg	18	18	18			
	Gas Flow Fuel/Propane cfh	120	120	120			
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump **ON/OFF**	ON	ON	ON			
	Extraction Well Flow scfm	9.0	9.47	9.0			
	Extraction Well Vacuum "H_2O	80	100	80			
	Pump Rate gals/min	4.5	4.5	4.5			
	Total Volume gals						
	Influent Vapor Temp. °F	–	–	–			
	Air Temperature °F	SUNNY 62	68	72			
	Barometric Pressure "Hg	30.10	30.10	30.10			
	Absolute Pressure "Hg	–	–	–			
VAPOR /INFLUENT	HC ppmv	11,930		11,480			
	CO_2 %	8.34		7.56			
	CO %	0.0		0.0			
	O_2 %	8.4		7.8			
	H_2S ppm	2.0		3.0			

NOTES

AT 1400 HRS THE COLLECTION TANK WAS NEAR CAPACITY. THE VACUUM WAS STOPPED. CONTINUED TO PUMP THE WELL DOWN UNTIL 1410 HRS. AT WHICH POINT THE PUMP WAS SHUT OFF. DEMOBILIZED THE SITE. PERFORMED HOUSEKEEPING, LOCKED THE GATE. AT 1500 HRS LEFT THE SITE.

MANIFOLD	LNAPL % Vol Gals	12.50/16.9	5.0/6.75	12.50/16.9			
	Depth of GW Depression ft						
	Extraction Well DTLNAPL ft	59.31					
	Extraction Well DTGW ft	59.32					

( ) Indicates Well Pressure

7FORMS/TestForms/1210017B

NAPL .01

"F" STATE SITE
LEA COUNTY, NM

"F" STATE SITE
LEA COUNTY, NM

AcuVac Remediation, LLC.

1656-H Townhurst, Houston, Texas 77043
713.468.6688 • Fax: 713.468.6689 • www.acuvac.com

November 25, 2013

Mr. Scott Christ
Project Manager
Conestoga-Rovers & Associates
6320 Rothway, Suite 100
Houston, Texas 77040

Dear Scott:

Re: Event #14: "F" State Site, Lea County, NM

The following is the Report and a copy of the Operating Data collected during the Mobile Dual Phase (MDP) Event #14 at the above location on November 21, 2013. Table #1 is the Well Data Information on well RW-1. PSH is referred to as NAPL in this report. GW samples are frequently taken in 2,000 ml beakers to determine the average NAPL percentage and volume.

Summary of MDP Event #14- Well RW-1

The total Event time was 7.0 hours. The data is compared to Event #13 conducted on October 17, 2013, which had a total Event time of 7.0 hours.

- The total GW/NAPL recovered was 1,890 gals of which 8.75% or 165.38 gals were NAPL.
- Total NAPL vapors burned as IC engine fuel were 5.33 gals, **resulting in a total liquid and vapor NAPL recovery of 170.71 gals, or 9.03%. This equates to 24.39 gal/hr, which is an increase of 0.18 gals/hr.**
- Average HORIBA Analytical Data from the influent vapor samples was: HC = 12,763 ppmv, CO_2 = 8.92%, CO = 0%, O_2 = 9.4% and H_2S = 2.13ppm.
- Compared with MDP Event #13 data, the TPH levels increased 447 ppmv, CO_2 increased 1.57%, CO was equal at 0%, O_2 was equal at 9.4%, and H_2S decreased 0.50 ppm.
- The Average Induced Vacuum was 88.67"H_2O and the average EW vapor flow was 8.80 scfm. The average induced vacuum decreased 4.66"H_2O and the average well flow decreased 0.52 scfm.
- The GW pump was set at 62.0 ft BTOC. The average GW/NAPL pump rate was 4.50 gpm. The average GW pump rate was equal at 4.50 gpm.
- The average GW depression was estimated at 1.0 ft below static level, which was consistent with Event #13. This estimate is based on the GW pump position and GW rate.
- At the start of Event #14, the static NAPL level was 3.35 ft and 0.04 ft of NAPL remained at the conclusion of the Event. The static GW level decreased 0.25 ft based on hydro-equivalent.

Additional Information- Event #14

- During the Event period the Induced Well Vacuum was varied to increase the recovery of NAPL as a percentage of the total liquid volume. This cycle of increasing and decreasing the Induced Well Vacuum every 30 minutes continued for the Event period. Based on our observations of the amount of NAPL visible in the site gauge, the NAPL recovery increased to approximately 12.5%.
- A recommendation is to install a new, more shallow, well that will increase the percentage of NAPL recovery further as less groundwater will be included in the liquid recovery.
- A liquid sample was taken at 1030 hours to illustrate the amount of NAPL in the groundwater/NAPL mixture. A photo is included for reference purposes.
- At the conclusion of the Event, the collection tank was gauged. There was not a clean separation of the groundwater and NAPL at this point. However, it is concluded that 0.60 ft of NAPL was detected. Based on the dimensions of the collection tank, this is approximately 150 gals. A total of 1,890 gals were recovered, leaving 1,740 gals of a groundwater/NAPL emulsion still in suspension. Based on the liquid sample collected, it is estimated that the groundwater/NAPL emulsion contained approximately 1.0 - 1.50% NAPL, increasing the NAPL recovery by approximately 20 gals for a total NAPL recovery of 170 gals. This exceeds the measured amounts of NAPL recovered during the Event.
- The GW pump rate remained steady throughout the Event period at 4.5 gpm as the 2,000 gallon collection tank is a limiting factor. In order to compensate for the tank size, the Induced Well Vacuum was varied, as described above, in order to reduce the GW upwelling and enable the GW pump to capture more NAPL.
- Based on the use of the above methods, the average liquid and vapor NAPL recovery from well RW-1 increased from 24.21 to 24.39 gal/hr.
- A Summary of Events #4 through #14 is included to illustrate the NAPL at the start and conclusion of each Event, the total NAPL recovered during each Event and the resulting cost per gallon to recover.

NAPL Recovery Data:

The total NAPL removed, including liquid and vapor, during the 7.0 hour Event #14 (well RW-1), was 170.71 gals, or 9.03% of the total liquid volume of 1,890 gals. This equates to 24.39 gals/hr.

During the fourteen Events totaling 102.3 hours, the total NAPL removed, including liquid and vapor, equals 1,549.02 gals, or 5.87% of a total liquid volume of 26,379 gals. This equates to a NAPL recovery rate of 15.14 gals/hr.

Method of Calibration and Calculations

During each Event, the test data is compared to the previous Event to evaluate the progress for this remediation project.

The HORIBA Analytical instrument is calibrated with HEXANE and CO_2.

The formula used to calculate the Emission Rate is:

$$ER = HC\ (ppmv) \times MW\ (Hexane) \times Flow\ Rate\ (scfm) \times 1.58E^{-7} \frac{(min)(lb\ mole)}{(hr)(ppmv)(ft^3)} = lbs/hr$$

Information included with Report

- Summary of Events #4 to #14
- Recorded Data
- Photographs of the MDP System and well RW-1

We have tentatively scheduled the next Event for December 13, 2013. Once we review our schedule we can confirm this date with you.

We appreciate you selecting AcuVac to provide this service.

Sincerely,

ACUVAC REMEDIATION, LLC

Paul D. Faucher
Vice President, Operations

cc: Brittany Ford
CRA- Dallas

Well and Recovery Data Information - Event #14

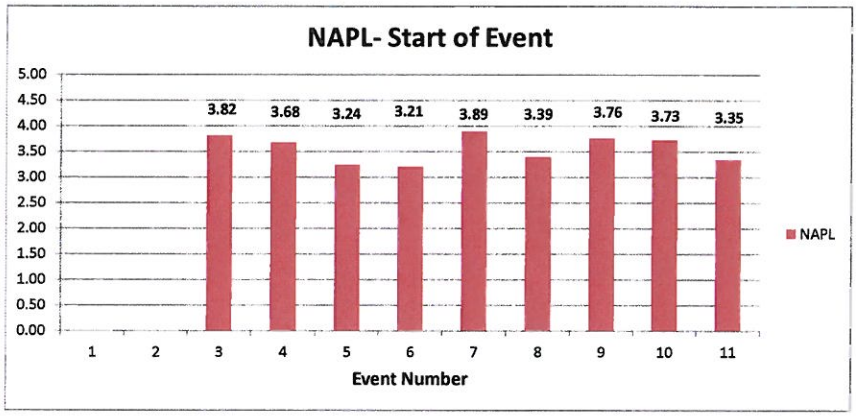
November 21, 2013

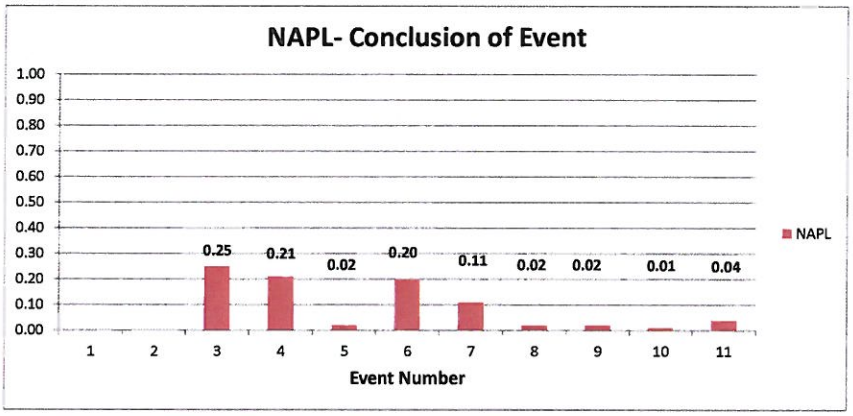
Table #1

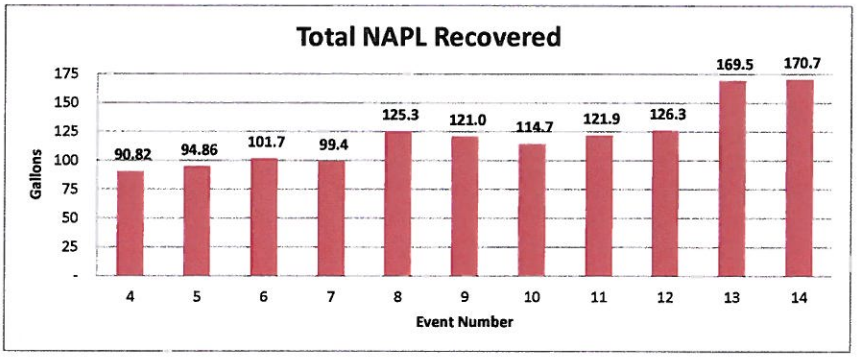
EVENT		14
Well Number		**RW-1**
Total Event Hours		7.0
TD	ft	90.0
Well Size	in	4.0
DTGW - Static - Start Event	ft	61.98
DTNAPL - Static - Start Event	ft	58.63
NAPL	ft	3.35
DTGW - End Event	ft	59.24
DTNAPL - End Event	ft	59.20
NAPL	ft	0.04
Average Extraction Well Vacuum	"H_2O	88.67
Average Extraction Well Vapor Flow	scfm	8.80
Average GW/NAPL Pump Rate	gpm	4.50
Average TPH	ppmv	12,763
Average CO_2	%	8.92
Average CO	%	0
Average O_2	%	9.4
Average H_2S	ppm	2.13
Total Liquid Volume Recovered	gals	1,890
Total Liquid NAPL Recovered	gals	165.38
Total Liquid NAPL Recovered	%	8.75
Total Vapor and Liquid NAPL Recovered	gals	170.71
Total NAPL Recovered	%	9.03
Total NAPL Recovered	lbs	1,195
Total Volume of Well Vapors	cu.ft	3,696

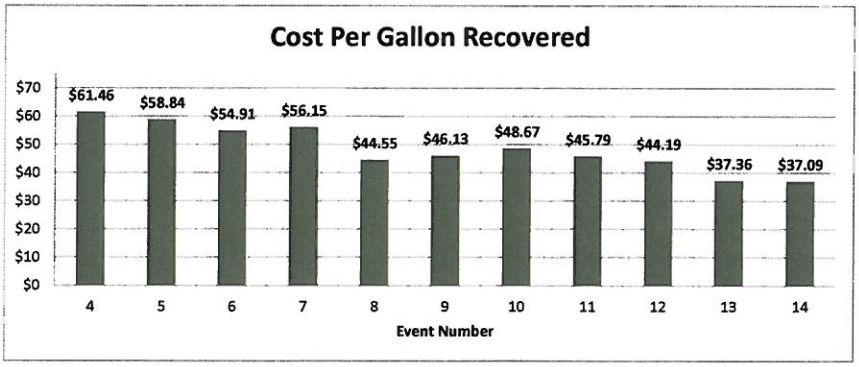
AcuVac Remediation, LLC

"F" STATE SITE
LEA COUNTY, NM
SUMMARY OF EVENTS #4 THROUGH #14









OPERATING DATA - EVENT #14 **PAGE # 1** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: "F" State Site, Lea County, NM **Project Managers:** Faucher/Hendley

	Date:	11/21/2013	-	-	-	-	-
	Parameters	Time 0630	Time 0700	Time 0730	Time 0800	Time 0830	Time 0900
	WELL #	Hr Meter 6605.0	Hr Meter 6605.5	Hr Meter 6606.0	Hr Meter 6606.5	Hr Meter 6607.0	Hr Meter 6607.50
ENGINE/BLOWER	R.P.M.	2000	2000	2000	2000	2000	2000
	Oil Pressure psi	50	50	50	50	50	50
	Water Temp °F	130	130	130	130	130	130
	Volts	13	13	13	13	13	13
	Intake Vacuum "Hg	16	16	16	16	16	16
	Gas Flow Fuel/Propane cfh	120	120	120	120	120	120
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump **ON/OFF**	ON	ON	ON	ON	ON	ON
	Extraction Well Flow scfm	8.18	8.68	8.18	9.47	8.18	9.47
	Extraction Well Vacuum "H_2O	80	100	80	100	80	100
	Pump Rate gals/min	4.5	4.5	4.5	4.5	4.5	4.5
	Total Volume gals	-	135	270	405	540	675
	Influent Vapor Temp. °F	-	-	-	-	-	-
	Air Temperature CLOUDY °F	54	54	55	SUNNY 56	56	60
	Barometric Pressure "Hg	30.02	30.02	30.02	30.04	30.04	30.04
	Absolute Pressure "Hg	-	-	-	-	-	-
VAPOR /INFLUENT	HC ppmv	10,230	-	12,550	-	12,810	-
	CO_2 %	7.68	-	9.28	-	8.78	-
	CO %	0	-	.02	-	.02	-
	O_2 %	8.2	-	7.1	-	10.8	-
	H_2S ppm	2	-	2	-	1	-
NOTES	SEE PAGE 1A.						
MANIFOLD	LNAPL % Vol Gals	-/-	12.50/16.88	5/6.75	12.50/16.88	5/6.75	12.50/16.88
	Depth of GW Depression ft	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
	Extraction Well DTLNAPL ft	58.63					
	Extraction Well DTGW ft	61.98					

( ) Indicates Well Pressure

NAPL 3.35

DETAILED OPERATING DATA - EVENT #14 **PAGE # 1A** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: "F" State Site, Lea County, NM **Project Managers:** Faucher/Hendley

	Date:	11/21/13	-	-	-	-	-
	Parameters	Time	Time	Time	Time	Time	Time
	WELL # MW-1	Hr Meter	Hr Meter	Hr Meter	Hr Meter	Hr Meter	Hr Meter

NOTES

PARTIALLY MOBED THE SITE ON 11/20/13 LAYING OUT HOSES AND THE TOTAL FLUIDS PUMP. ADVISED BY CRA TECH THAT THE COLLECTION TANK MAY HAVE NOT BEEN FULLY VACATED. THIS LATER TURNED OUT NOT TO BE THE CASE.

ARRIVED AT THE SITE AT 0600 ON 11/21/13. COMPLETED MOBE. PERFORMED SAFETY CHECKS. HELD TAILGATE SAFETY MTG.

STARTED EVENT @ 0630 HRS. INITIAL INDUCED WELL VAC WAS SET AT 80" H_2O WITCH RESULTED IN A WELL VAPOR FLOW OF 8.18 SCFM. SET TOTAL FLUIDS PUMP @ 62.0 FT BTOC. SET INITIAL PUMP RATE @ 4.5 GPM. AT 0700 HRS INCREASED THE INDUCED WELL VAC TO 100" H_2O RESULTING IN A WELL VAPOR FLOW OF 8.68 SCFM.

AT 0730 HRS REDUCED WELL VAC TO 80" H_2O / WVF 8.18 SCFM.

NAPL RECOVERY INCREASED SIGNIFICANTLY WITH THE SITE GLASS APPEARING PARTIALLY OPAQUE FOR 30 MINUTES.

AT 0800 HRS INCREASED INDUCED WELL VAC TO 100" H_2O AND WELL VAPOR FLOW TO 9.47 SCFM. NAPL RECOVERY FELL.

THIS CYCLE WAS REPEATED THROUGH 0900 HRS.

( ) Indicates Well Pressure

OPERATING DATA - EVENT #14 **PAGE # 2** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: "F" State Site, Lea County, NM **Project Managers:** Faucher/Hendley

	Date:	11/21/2013	–	–	–	–	–
	Parameters	Time 0930	Time 1000	Time 1030	Time 1100	Time 1130	Time 1200
	WELL #	Hr Meter 6608.0	Hr Meter 6608.5	Hr Meter 6609.0	Hr Meter 6609.5	Hr Meter 6610.0	Hr Meter 6610.5
ENGINE/BLOWER	R.P.M.	2000	2000	2000	2000	2000	2000
	Oil Pressure psi	50	50	50	50	50	50
	Water Temp °F	140	140	140	140	140	140
	Volts	13	13	13	13	13	13
	Intake Vacuum "Hg	16	18	18	18	18	18
	Gas Flow Fuel/Propane cfh	120	120	120	120	120	120
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump **ON/OFF**	ON	ON	ON	ON	ON	ON
	Extraction Well Flow scfm	8.18	9.47	8.18	9.47	7.49	9.47
	Extraction Well Vacuum "H_2O	80	100	80	100	70	100
	Pump Rate gals/min	4.5	4.5	4.5	4.5	4.5	4.5
	Total Volume gals	810	945	1,080	1215	1350	1485
	Influent Vapor Temp. °F	–	–	–	–	–	–
	Air Temperature °F	68	72	BREEZY 72	72	74	78
	Barometric Pressure "Hg	30.06	30.06	30.06	30.06	30.04	30.04
	Absolute Pressure "Hg	–	–	–	–	–	–
VAPOR /INFLUENT	HC ppmv	14,910	–	15,160	–	13,710	–
	CO_2 %	9.32	–	9.68	–	9.54	–
	CO %	.04	–	.04	–	.05	–
	O_2 %	12.1	–	9.0	–	9.4	–
	H_2S ppm	2	–	2	–	2	–
NOTES	CYCLE OF INCREASING AND DECREASING THE INDUCED WELL VAC WAS REPEATED THROUGHOUT THIS PERIOD OF THE EVENT. AT 1030 HRS OBTAINED A LIQUID SAMPLE. SEE ATTACHED PHOTO.						
MANIFOLD	LNAPL % Vol Gals	5.0/6.75	12.50/16.88	5.0/6.75	12.50/16.88	6/6.75	12.50/16.88
	Depth of GW Depression ft	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
	Extraction Well DTLNAPL ft						
	Extraction Well DTGW ft						

( ) Indicates Well Pressure

OPERATING DATA - EVENT #14 **PAGE # 3** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: "F" State Site, Lea County, NM **Project Managers:** Faucher/Hendley

	Date:	11/21/2013	–	–	–	–	–
	Parameters	Time 1230	Time 1300	Time 1330	Time	Time	Time
	WELL #	Hr Meter 6611.0	Hr Meter 6611.5	Hr Meter 6612.0	Hr Meter	Hr Meter	Hr Meter
ENGINE/BLOWER	R.P.M.	2000	2000	2200			
	Oil Pressure psi	50	50	50			
	Water Temp °F	140	140	140			
	Volts	13	13	13			
	Intake Vacuum "Hg	18	18	18			
	Gas Flow Fuel/Propane cfh	120	120	120			
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump **ON/OFF**	ON	ON	OFF			
	Extraction Well Flow scfm	7.49	9.47	7.49			
	Extraction Well Vacuum "H_2O	70	100	70			
	Pump Rate gals/min	4.5	4.5	4.5			
	Total Volume gals	1620	1755	1890			
	Influent Vapor Temp. °F	–	–	–			
	Air Temperature °F	78	79	80			
	Barometric Pressure "Hg	30.04	30.02	30.00			
	Absolute Pressure "Hg	–	–	–			
VAPOR /INFLUENT	HC ppmv	11,370	–	11,360			
	CO_2 %	8.40	–	8.68			
	CO %	.01	–	.01			
	O_2 %	9.6	–	8.6			
	H_2S ppm	3	–	3			

NOTES

THE CYCLE OF INCREASING AND DECREASING THE WELL VAC CONTINUED DURING THIS PERIOD. AT 1330 HRS VAC WAS DISCONTINUED. TOTAL FLUIDS PUMP WAS DISCONTINUED @ 1340 HRS. RW-1 WAS GAUGED.

DE-MOBED THE SITE. DEPARTED SITE AT 1430 HRS.

ADDITIONAL COMMENTS ON PAGE 3B.

MANIFOLD	LNAPL % Vol Gals	5/6.75	12.50/16.88	5/6.75			
	Depth of GW Depression ft	-1.0	-1.0	-1.0			
	Extraction Well DTLNAPL ft			59.20			
	Extraction Well DTGW ft			59.24			

( ) Indicates Well Pressure

NAPL .04

DETAILED OPERATING DATA - EVENT #14 PAGE # 3A ACUVAC MOBILE DUAL PHASE SYSTEM

Location: "F" State Site, Lea County, NM **Project Managers:** Faucher/Hendley

	Date:	11/21/13	-	-	-	-	-
	Parameters	Time	Time	Time	Time	Time	Time
	WELL # MW-1	Hr Meter	Hr Meter	Hr Meter	Hr Meter	Hr Meter	Hr Meter

NOTES

AT 1415 THE COLLECTION TANK WAS GAUGED TO OBTAIN AN ESTIMATE OF THE NAPL THICKNESS. THE NAPL WAS APPROX 1 FT BELOW THE TOP OF THE TANK OPENING. THE BOTTOM OF THE NAPL THICKNESS WAS ESTIMATED AT 1.6 FT BELOW THE TANK OPENING. THAT INDICATES A NAPL THICKNESS OF .6 FT OR 7.2". THE FOLLOWING IS A BASIC CALCULATION TO RECONCILE / PROVE THE ESTIMATES MADE DURING THE COURSE OF THE EVENT.

TANK HEIGHT 96", TANK VOLUME 2,000 GAL. 2000/96 = 20.83 GAL/IN

NAPL THICKNESS:

7.2" * 20.83 GAL = 149.98 GAL

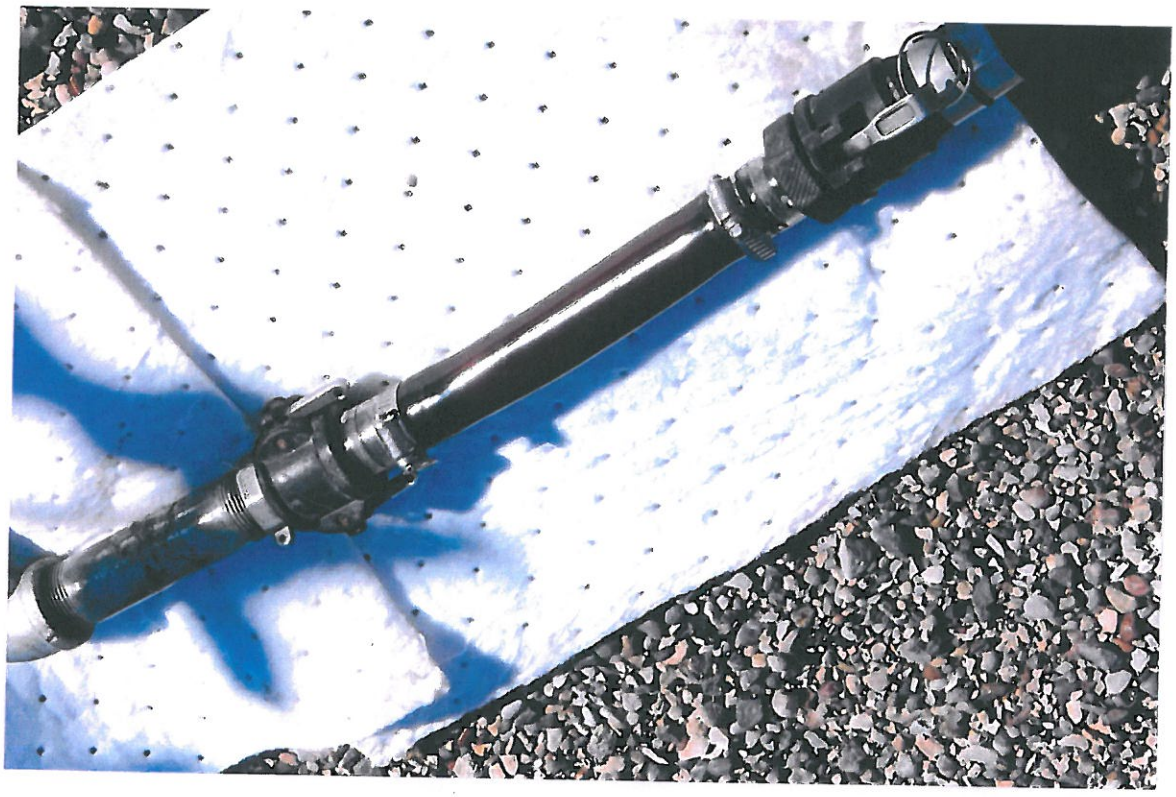
TOTAL VOLUME RECOVERED	1,890.00 GAL
NAPL FROM ABOVE	(149.98)
	1740.02
ESTIMATED NAPL CONTENT OF REMAINING LIQUID.	1%
	17.40

TOTAL NAPL 149.98 + 17.40 = 167.38 GAL SAY 170 GAL

THE ABOVE CALCULATION SUPPORTS THE ESTIMATES USED DURING THE EVENT PERIOD TO DETERMINE THE NAPL RECOVERY.

( ) Indicates Well Pressure

"F" STATE SITE
LEA COUNTY, NM



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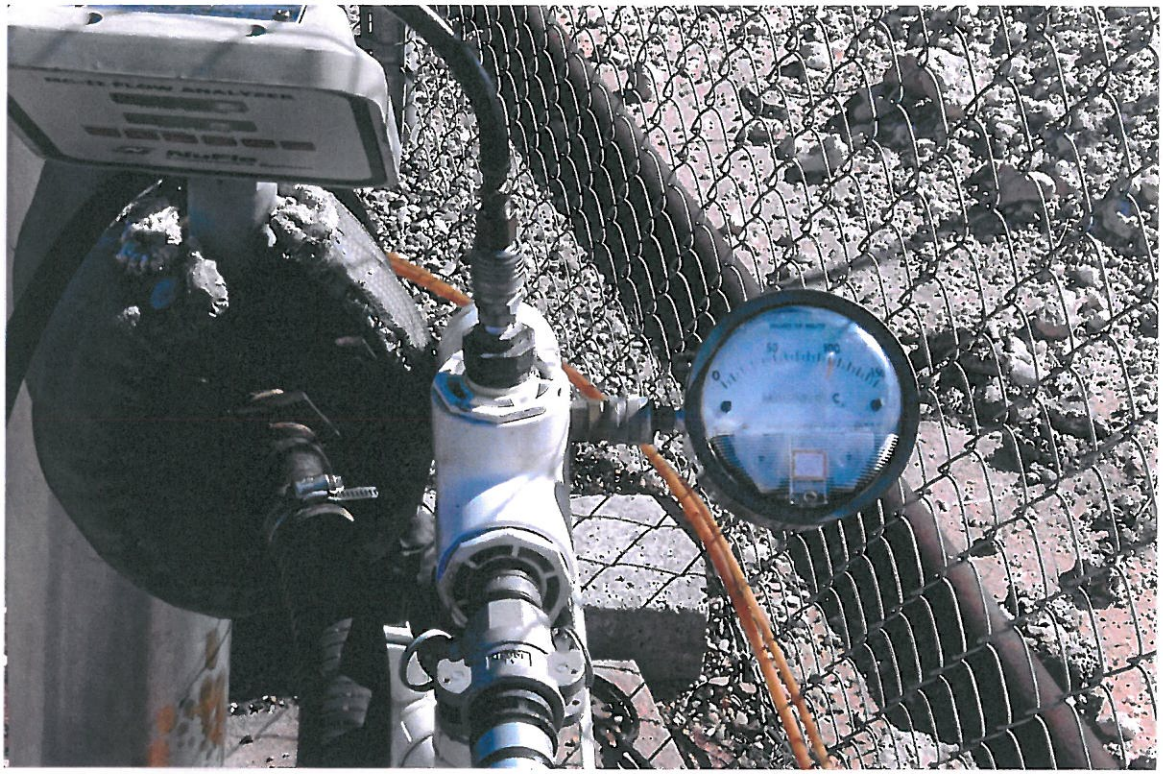

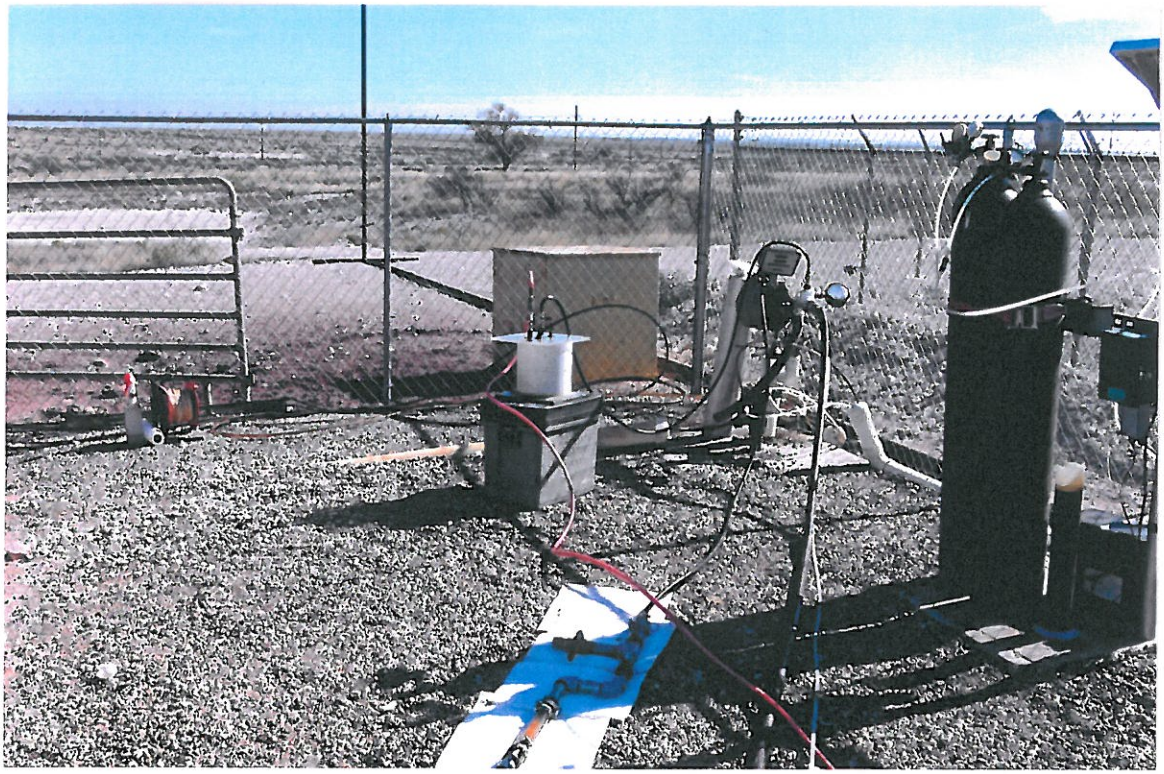

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LEA COUNTY, NM