AP - 087

AGWMR

08/10/2009

AP-087

TETRA TECH

E.C. HILL "B" ATB @ WELL # 24
ANNUAL GROUNDWATER SAMPLING REPORT

LOCATED IN
LEA COUNTY, NEW MEXICO

Prepared for:

GLENN SPRINGS HOLDINGS
(A wholly owned subsidiary of Occidental Petroleum)

Prepared by:

Tetra Tech
1910 N. Big Spring St.
Midland, Texas 79705
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Tetra Tech Project No. 115-6402944
AUGUST 10, 2009

complex world CLEAR SOLUTIONS™

TETRA TECH

August 10, 2009

Mr. Glenn von Gonten
New Mexico Energy, Minerals, & Natural Resources
Oil Conservation Division, Environmental Bureau
1220 S. St. Francis Drive
Santa Fe, New Mexico 87504

Re: October 2008 to June 2009 Annual Groundwater Sampling Report for the OXY USA, Inc., E.C. Hill Abandoned Tank Battery (ATB) at Well #24, Located in Section 34, Township 23 South, Range 37 East, Lea County, New Mexico. NMOCD AP-87

Mr. Von Gonten:

This report details the results of the quarterly sampling events, which began in the third quarter of 2008, performed at the OXY USA, Inc. (OXY) E. C. Hill Abandoned Tank Battery (ATB) at Well #24 (Site). The site is located approximately 12 miles south of Eunice, Lea County, New Mexico. The facility was acquired by OXY USA, Inc. in March 2008. Prior to OXY acquiring the property, the facility was operated by Plains Exploration and Production, Pogo Producing Company, and Latigo Petroleum.

FACILITY BACKGROUND

As part of a due diligence assessment for Pogo Producing Company (Pogo), this site was inspected by Highlander Environmental Corp. Due to visual historic spills, Highlander supervised the installation of auger holes and soil borings at the site. The site location is shown on Figure 1.

As part of the investigation, two impacted areas were investigated east of the abandoned facility. A total of eight (8) auger holes were installed in an area measuring 75' x 25'. One auger hole was placed in the second impacted area measuring 12' x 12'. Chloride impact was not observed in any of the analyzed auger samples. TPH concentrations were defined below the RRAL in six of the nine auger holes. One borehole was installed near auger hole AH-2. Borehole BH-1 exhibited TPH concentrations above the RRAL to a depth of 60'-62' below ground surface (bgs). The sample from 70'-72' was below the RRAL.

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Based on the analytical results, borehole (BH-1) was converted to a temporary 2-inch monitor well. Groundwater was encountered at approximately 82 feet below top of casing (TOC). On September 22 and 29, 2006 and October 4, 2006, Highlander purged and sampled the well per New Mexico Oil Conservation Division (NMOCD) guidelines for analysis of chlorides, TPH, and BTEX. Chloride concentrations did not exceed New Mexico Water Quality Control Commission (NMWQCC) standards, while hydrocarbon constituents (BTEX) were below the NMWQCC action levels and total TPH was 73.3 mg/L. The well was scheduled to be sampled on May 16, 2007, however, 2.68' of Phase Separated Hydrocarbons (PSH) was measured in the well. At that time, the well was completed as a permanent well. On July 25, 2007, the Director of the NMOCD, Environmental Bureau was notified in writing of groundwater impact at the above-referenced site in accordance with NM Rule 116. To complete delineation at the site, three additional monitor wells were installed at the site in September 2007. The monitor well locations are shown on Figure 2.

On July 8, 2008 a Stage 1 Abatement Plan was submitted by OXY to the NMOCD addressing the groundwater and soil impacts at the site. In the abatement plan an additional recovery well was proposed within the vicinity of monitor well MW-1. In addition, OXY proposed to excavate the hydrocarbon impacted soils in the southern end of the facility to a depth of 4.0' bgs and place an impermeable infiltration barrier to prevent further vertical migration of hydrocarbons within the soil. As of this report, no response has been received from the NMOCD on the Stage 1 Abatement Plan.

Gauging and Monitor Well Sampling

On October 23, 2008, December 12, 2008, March 12, 2009, and June 22, 2009, Tetra Tech, Inc was onsite to gauge all monitor wells. During these sampling events, Phase Separated Hydrocarbon (PSH) was measured in monitor well MW-1, which was subsequently not sampled. The PSH thickness in MW-1 ranged from 2.99' to 3.06' throughout the sampling period. PSH thickness maps for the four gauging events are included as Figures 7 through 10. Utilizing the water level elevation calculations, groundwater gradient maps were generated for the four sampling events. The hydraulic gradient indicates an east to southeasterly direction. Potentiometric surface maps for the four sampling events are included as Figures 3 through 6. Gauging data is summarized in Table 1.

During the four sampling events, each of the wells without PSH was purged utilizing a submersible pump and sampled for BTEX and chlorides. In addition, the monitor wells without PSH were also sampled for major anions/cations during the October sampling event. The samples were properly preserved and under proper chain-of-custody control were submitted to Trace

Analysis Inc. of Lubbock, Texas, ALS Laboratory Group, and Accutest of Houston, Texas for analysis of BTEX by EPA Method SW8021B, major anions/cations by EPA Methods SM2320B, S6010B, SM4500H, SM2540C, and chlorides by EPA Method 300.0. Analytical results indicate that BTEX was not detected at or above detection limits for all sampled monitor wells for the four sampling events. Chlorides ranged from 108 mg/L in monitor well MW-4 to 315 mg/L in monitor well MW-2. Chlorides slightly exceeded the NMWQCC standards of 250 mg/L in monitor well MW-2 throughout the sampling period. The analyses are shown in Table 2 and 3. The hydrocarbon concentration maps for the four sampling events are shown as Figures 11 through 14, while chloride isopleth maps are shown as Figures 15 through 18. Copies of the laboratory analyses are enclosed in Appendix A.

CONCLUSTIONS

1. During the four sampling events, Phase separated hydrocarbons (PSH) were measured in monitor well MW-1. The PSH thickness in MW-1 ranged from 2.99' to 3.06' throughout the three sampling events.

2. The groundwater gradient for the four sampling events is to the east/southeast.

3. The monitor wells were gauged and sampled on October 23, 2008, December 12, 2008, March 12, 2009, and June 22, 2009. The samples were preserved and delivered to Trace Analysis, Inc. of Lubbock, Texas, ALS Laboratory Group and/or Accutest of Houston, Texas under proper chain-of-custody control. The samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) by method SW8021B, major anions/cations by EPA Methods SM2320B, S6010B, SM4500H, SM2540C, and chlorides by method 300.0, within their specified holding times.

4. Analytical results indicate that BTEX was not detected at or above detection limits for all sampled monitor wells for the four sampling events.

5. Chlorides ranged from 108 mg/L in monitor well MW-4 to 315 mg/L in monitor well MW-2. Chlorides slightly exceeded the NMWQCC standards of 250 mg/L in monitor well MW-2 throughout the sampling period.

6. A Stage 1 Abatement Plan was submitted to the NMOCD on July 8, 2008. As of this report, no response has been received from the NMOCD.

TETRA TECH

RECOMMENDATIONS

1. Quarterly groundwater monitoring and gauging will be continued throughout the year.

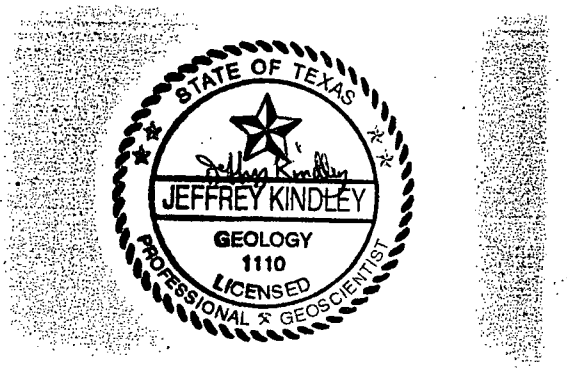
2. A PSH Recovery system will be installed in monitor well MW-1

If you have any question or comments concerning the assessment or the activities performed at the Site, please call me at (432) 682-4559.

Respectfully submitted,
Tetra Tech, Inc.

Jeffrey Kindley, P.G.
Senior Environmental Geologist

cc: Rick Passmore –Glenn Spring Holdings



FIGURES

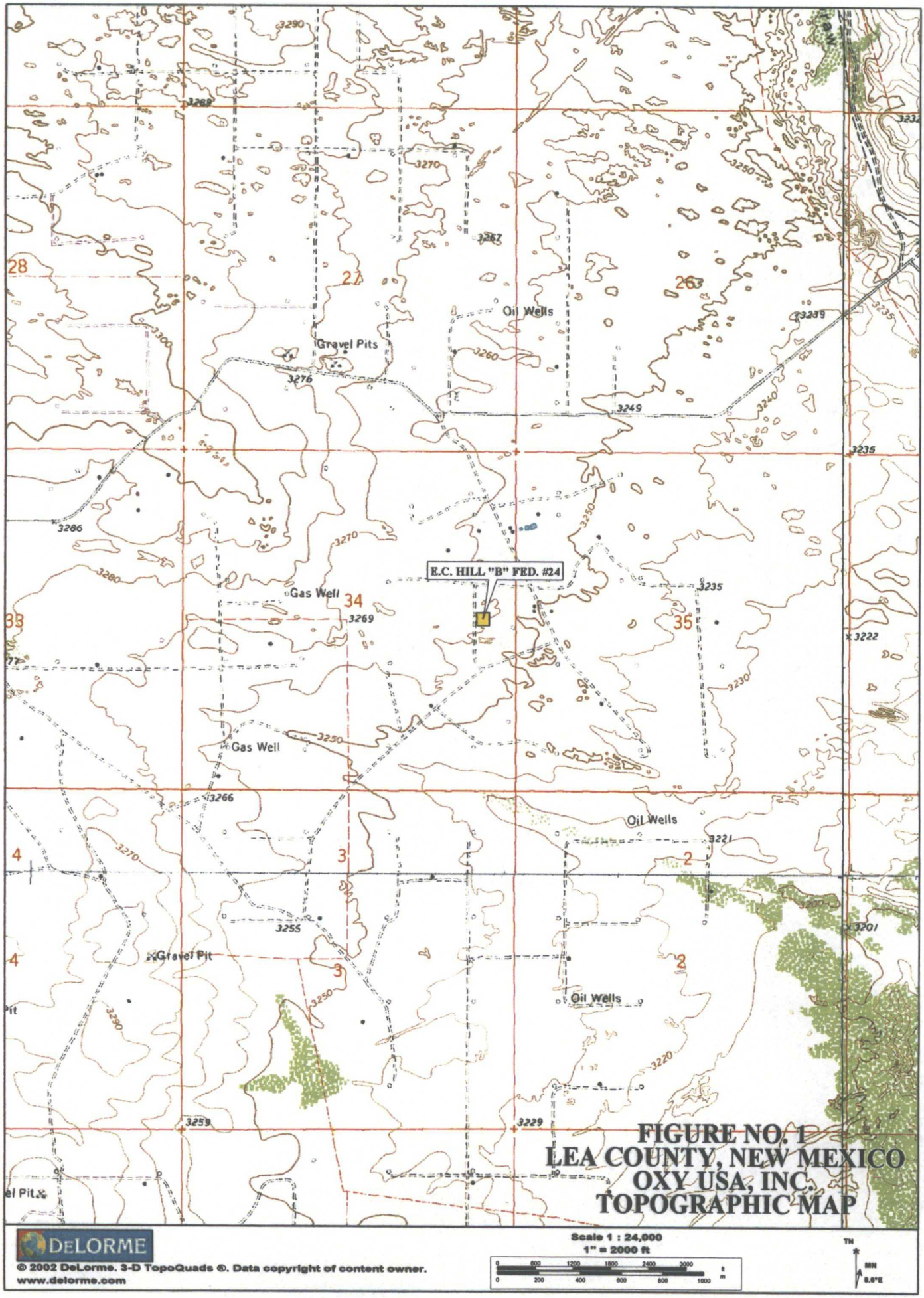
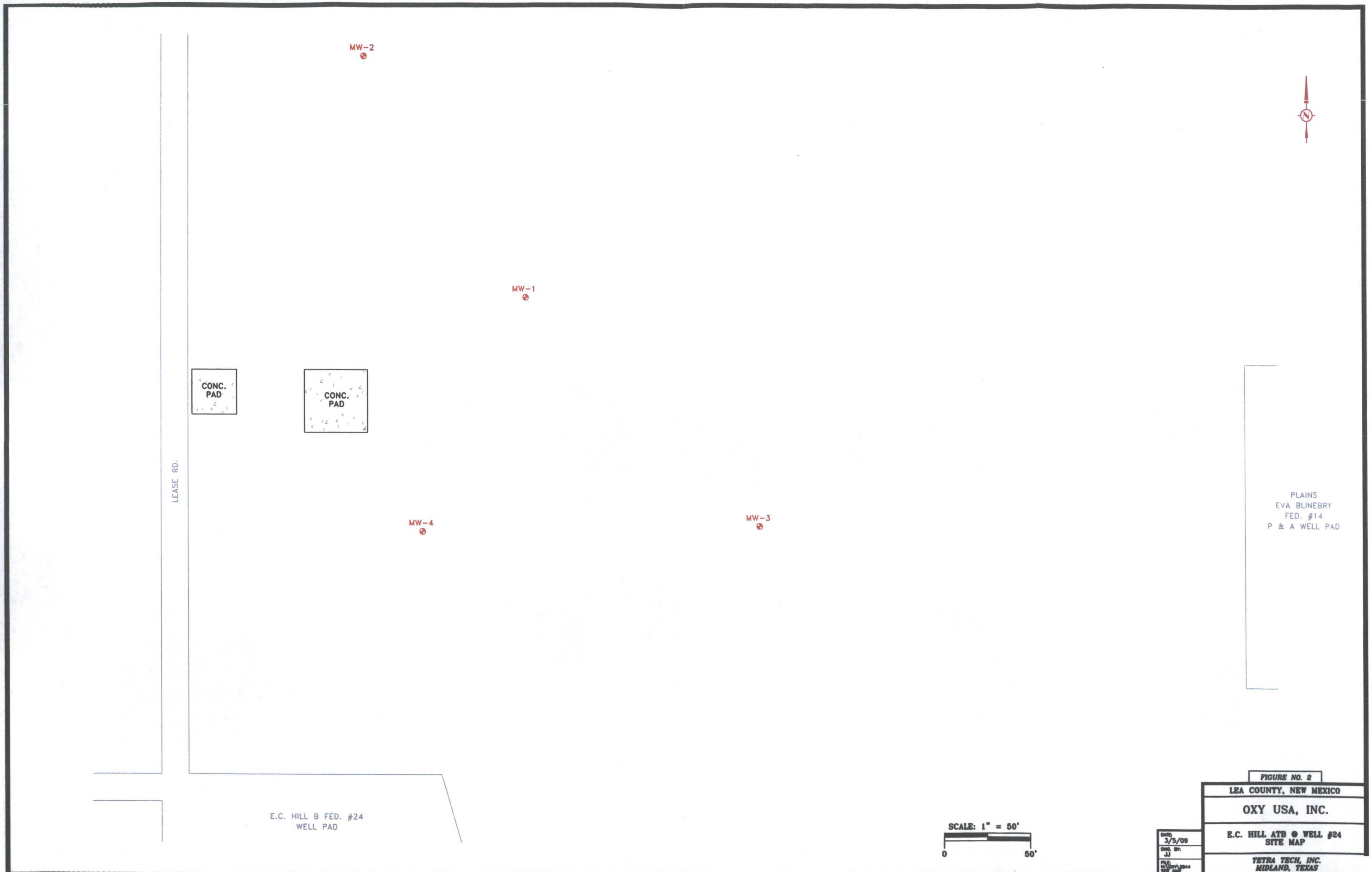


FIGURE NO. 1
LEA COUNTY, NEW MEXICO
OXY USA, INC.
TOPOGRAPHIC MAP


MW-2
MW-1
CONC. PAD
CONC. PAD
LEASE RD.
MW-4
MW-3
PLAINS EVA BLINEBRY FED. #14 P & A WELL PAD
E.C. HILL B FED. #24 WELL PAD
SCALE: 1" = 50'
0
50'
FIGURE NO. 2
LEA COUNTY, NEW MEXICO
OXY USA, INC.
E.C. HILL ATB @ WELL #24 SITE MAP
TETRA TECH, INC. MIDLAND, TEXAS
DATE: 3/5/09
DWG. BY: JJ

MW-2
3178.16

MW-1
3177.27

MW-4
3177.51

MW-3
3177.04

3178.00

3177.50

3177.00

CONC. PAD

CONC. PAD

LEASE RD.

E.C. HILL B FED. #24
WELL PAD

PLAINS
EVA BLINEBRY
FED. #14
P & A WELL PAD

CONTOUR INTERVAL = 0.50'

SCALE: 1" = 50'

0 50'

FIGURE NO. 3

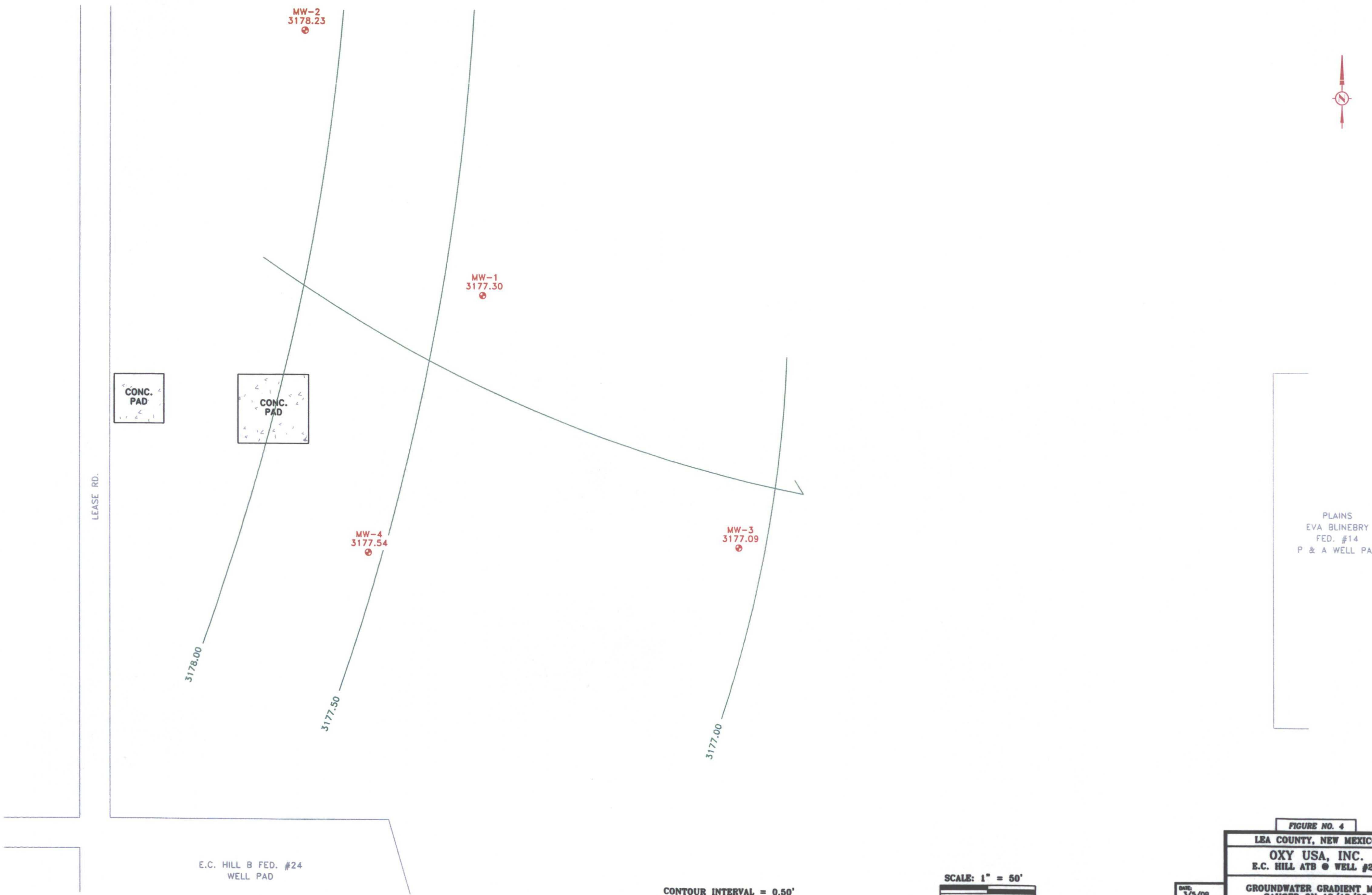
LEA COUNTY, NEW MEXICO

OXY USA, INC.
E.C. HILL ATB ● WELL #24

GROUNDWATER GRADIENT MAP
GAUGED ON 10/23/08

TETRA TECH, INC.
MIDLAND, TEXAS

DATE: 3/5/09
DWG. BY: JJ
FILE: H:\Oxy\2044 SITE MAP



CONTOUR INTERVAL = 0.50'

SCALE: 1" = 50'

0 50'

DATE: 3/5/09
DWG. BY: JJ

FIGURE NO. 4

LEA COUNTY, NEW MEXICO

OXY USA, INC.
E.C. HILL ATB @ WELL #24

GROUNDWATER GRADIENT MAP
GAUGED ON 12/12/08

TETRA TECH, INC.
MIDLAND, TEXAS

FIGURE NO. 5

LEA COUNTY, NEW MEXICO

OXY USA, INC.
E.C. HILL ATB ● WELL #24

GROUNDWATER GRADIENT MAP
GAUGED ON 3/12/09

TETRA TECH, INC.
MIDLAND, TEXAS

DATE: 7/15/09
DWG. BY: JJ
FILE: SCI\OXY\2044 SITE MAP

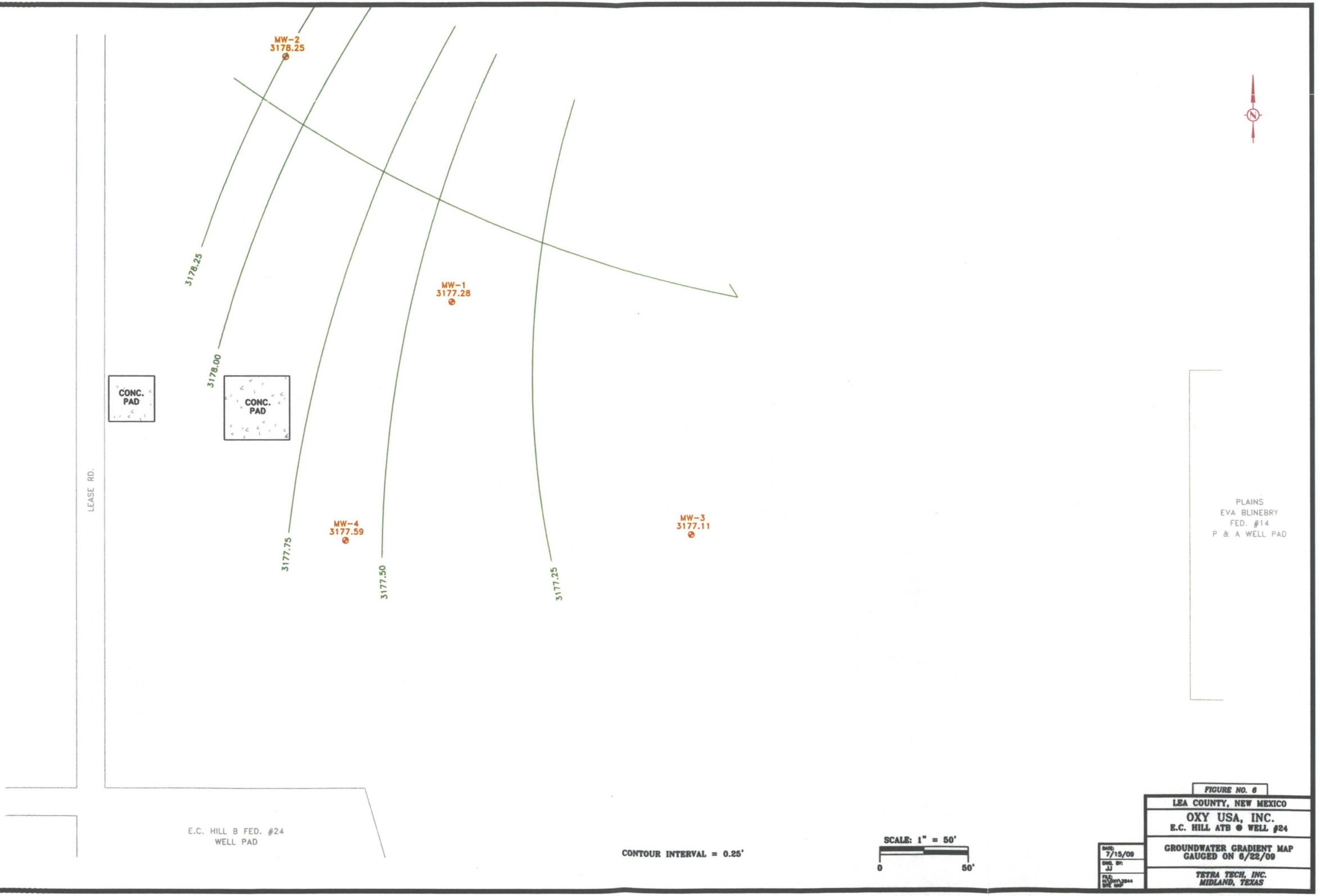


FIGURE NO. 6

LEA COUNTY, NEW MEXICO

OXY USA, INC.

E.C. HILL ATB ● WELL #24

GROUNDWATER GRADIENT MAP
GAUGED ON 6/22/09

TETRA TECH, INC.
MIDLAND, TEXAS

MW-2
0.00

1.00
2.00
3.00
MW-1
3.03

CONC. PAD

CONC. PAD

LEASE RD.

MW-4
0.00

MW-3
0.00

PLAINS
EVA BLINEBRY
FED. #14
P & A WELL PAD

E.C. HILL B FED. #24
WELL PAD

PSH THICKNESS MEASURED IN FEET

SCALE: 1" = 50'

0 50'

FIGURE NO. 7

LEA COUNTY, NEW MEXICO

OXY USA, INC.
E.C. HILL ATB ● WELL #24

PSH THICKNESS MAP
GAUGED ON 10/23/08

TETRA TECH, INC.
MIDLAND, TEXAS

DATE: 3/5/09
DWG. BY: JJ
FILE: [illegible]

MW-2
0.00

1.00
2.00
MW-1
2.99

CONC. PAD

CONC. PAD

LEASE RD.

MW-4
0.00

MW-3
0.00

PLAINS
EVA BLINEBRY
FED. #14
P & A WELL PAD

E.C. HILL B FED. #24
WELL PAD

PSH THICKNESS MEASURED IN FEET

SCALE: 1" = 50'

0 50'

FIGURE NO. 8

LEA COUNTY, NEW MEXICO

OXY USA, INC.
E.C. HILL ATB ● WELL #24

PSH THICKNESS MAP
GAUGED ON 12/12/08

DATE: 3/5/09
DWG. BY: JJ
FILE: [illegible]

TETRA TECH, INC.
MIDLAND, TEXAS

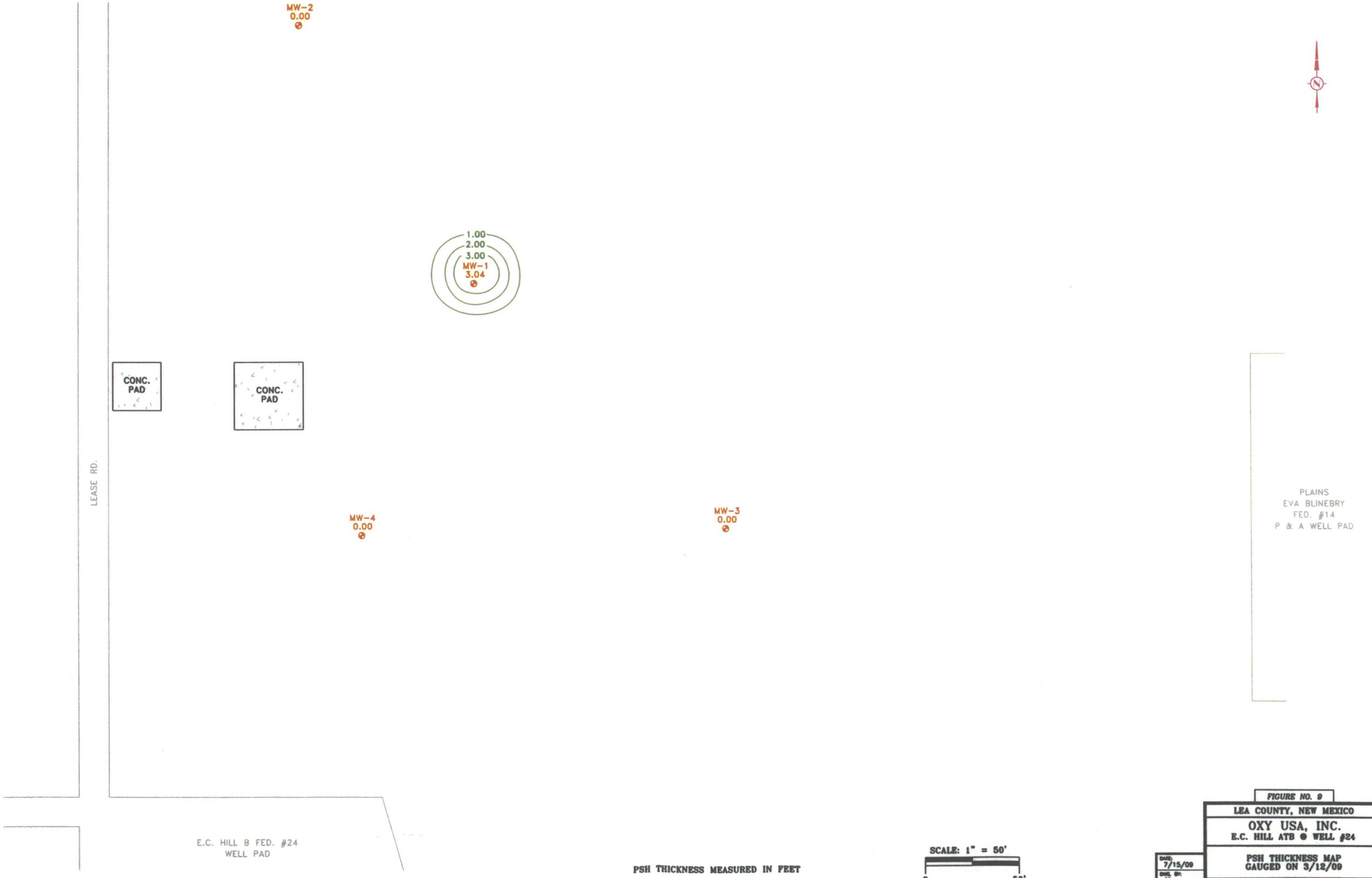


FIGURE NO. 9

LEA COUNTY, NEW MEXICO

OXY USA, INC.
E.C. HILL ATB @ WELL #24

PSH THICKNESS MAP
GAUGED ON 3/12/09

DATE: 7/15/09
DWG. BY: JJ

TETRA TECH, INC.
MIDLAND, TEXAS

MW-2
0.00

1.00
2.00
3.00
MW-1
3.06

CONC. PAD

CONC. PAD

LEASE RD.

MW-4
0.00

MW-3
0.00

PLAINS
EVA BLINEBRY
FED. #14
P & A WELL PAD

E.C. HILL B FED. #24
WELL PAD

PSH THICKNESS MEASURED IN FEET

SCALE: 1" = 50'

0 50'

FIGURE NO. 10

LEA COUNTY, NEW MEXICO

OXY USA, INC.
E.C. HILL ATB ● WELL #24

PSH THICKNESS MAP
GAUGED ON 6/22/09

TETRA TECH, INC.
MIDLAND, TEXAS

DATE: 7/15/09
DWG. BY: JJ
FILE: 20644

MW-2
B <0.001
BTEX <0.001

MW-1
PSH

CONC. PAD

CONC. PAD

LEASE RD.

MW-4
B <0.001
BTEX <0.001

MW-3
B <0.001
BTEX <0.001

PLAINS
EVA BLINEBRY
FED. #14
P & A WELL PAD

E.C. HILL B FED. #24
WELL PAD

PSH = PHASE SEPARATED HYDROCARBON
RESULTS IN mg/L

SCALE: 1" = 50'
0 50'

FIGURE NO. 11

LEA COUNTY, NEW MEXICO

OXY USA, INC.
E.C. HILL ATB ● WELL #24

HYDROCARBON CONCENTRATION MAP
SAMPLED ON 10/23/08

DATE: 3/5/09
DWG. BY: JJ
FILE: 20844 SITE MAP

TETRA TECH, INC.
MIDLAND, TEXAS

MW-2
B <0.005
BTEX <0.005

MW-1
PSH

CONC. PAD

CONC. PAD

LEASE RD.

MW-4
B <0.005
BTEX <0.005

MW-3
B <0.005
BTEX <0.005

PLAINS
EVA BLINEBRY
FED. #14
P & A WELL PAD

E.C. HILL B FED. #24
WELL PAD

PSH = PHASE SEPARATED HYDROCARBON
RESULTS IN mg/L

SCALE: 1" = 50'

0 50'

FIGURE NO. 12

LEA COUNTY, NEW MEXICO

OXY USA, INC.
E.C. HILL ATB ● WELL #24

HYDROCARBON CONCENTRATION MAP
SAMPLED ON 12/12/08

DATE: 3/5/09
DWG. BY: JJ
FILE: HOBBS\2044 SITE MAP

TETRA TECH, INC.
MIDLAND, TEXAS

MW-2
B <0.001
BTEX <0.003

MW-1
PSH

CONC. PAD

CONC. PAD

LEASE RD.

MW-4
B <0.001
BTEX <0.003

MW-3
B <0.001
BTEX <0.003

PLAINS
EVA BLINEBRY
FED. #14
P & A WELL PAD

E.C. HILL B FED. #24
WELL PAD

PSH = PHASE SEPARATED HYDROCARBON
RESULTS IN mg/L

SCALE: 1" = 50'

0 50'

DATE: 7/5/09
DWG. BY: JJ
FILE:

FIGURE NO. 13

LEA COUNTY, NEW MEXICO

OXY USA, INC.
E.C. HILL ATB ● WELL #24

HYDROCARBON CONCENTRATION MAP
SAMPLED ON 6/22/09

TETRA TECH, INC.
MIDLAND, TEXAS

<250
MW-2
267

MW-1
PSH

CONC. PAD

CONC. PAD

LEASE RD.

MW-4
109

MW-3
119

PLAINS
EVA BLINEBRY
FED. #14
P & A WELL PAD

E.C. HILL B FED. #24
WELL PAD

PSH = PHASE SEPARATED HYDROCARBON
RESULTS IN mg/L

SCALE: 1" = 50'
0 50'

FIGURE NO. 14

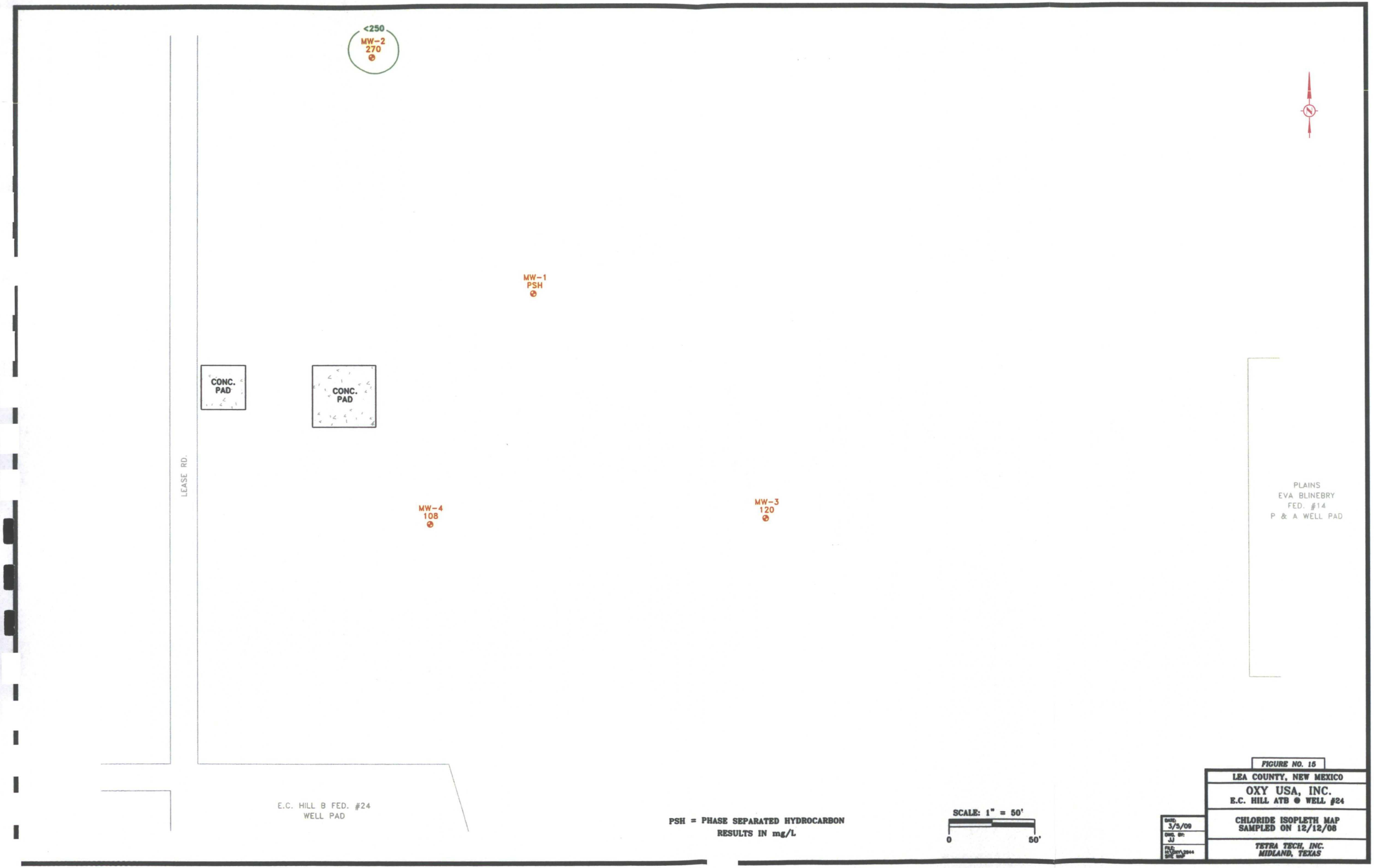
LEA COUNTY, NEW MEXICO

OXY USA, INC.
E.C. HILL ATB ● WELL #24

CHLORIDE ISOPLETH MAP
SAMPLED ON 10/23/08

TETRA TECH, INC.
MIDLAND, TEXAS

DATE: 3/5/09
DWG. BY: JJ
FILE: HOUSTON\2044 SITE MAP



<250
MW-2
270
MW-1
PSH
CONC. PAD
CONC. PAD
LEASE RD.
MW-4
108
MW-3
120
PLAINS
EVA BLINEBRY
FED. #14
P & A WELL PAD
E.C. HILL B FED. #24
WELL PAD
N
PSH = PHASE SEPARATED HYDROCARBON
RESULTS IN mg/L
SCALE: 1" = 50'
0
50'
FIGURE NO. 15
LEA COUNTY, NEW MEXICO
OXY USA, INC.
E.C. HILL ATB @ WELL #24
CHLORIDE ISOPLETH MAP
SAMPLED ON 12/12/08
TETRA TECH, INC.
MIDLAND, TEXAS
DATE: 3/5/09
DWG. BY: JJ
FILE: H:\OXY\2944 SITE MAP

<250
<300
MW-2
315

MW-1
PSH

CONC.
PAD

CONC.
PAD

LEASE RD.

MW-4
111

MW-3
120

PLAINS
EVA BLINEBRY
FED. #14
P & A WELL PAD

E.C. HILL B FED. #24
WELL PAD

PSH = PHASE SEPARATED HYDROCARBON
RESULTS IN mg/L

SCALE: 1" = 50'
0 50'

FIGURE NO. 16

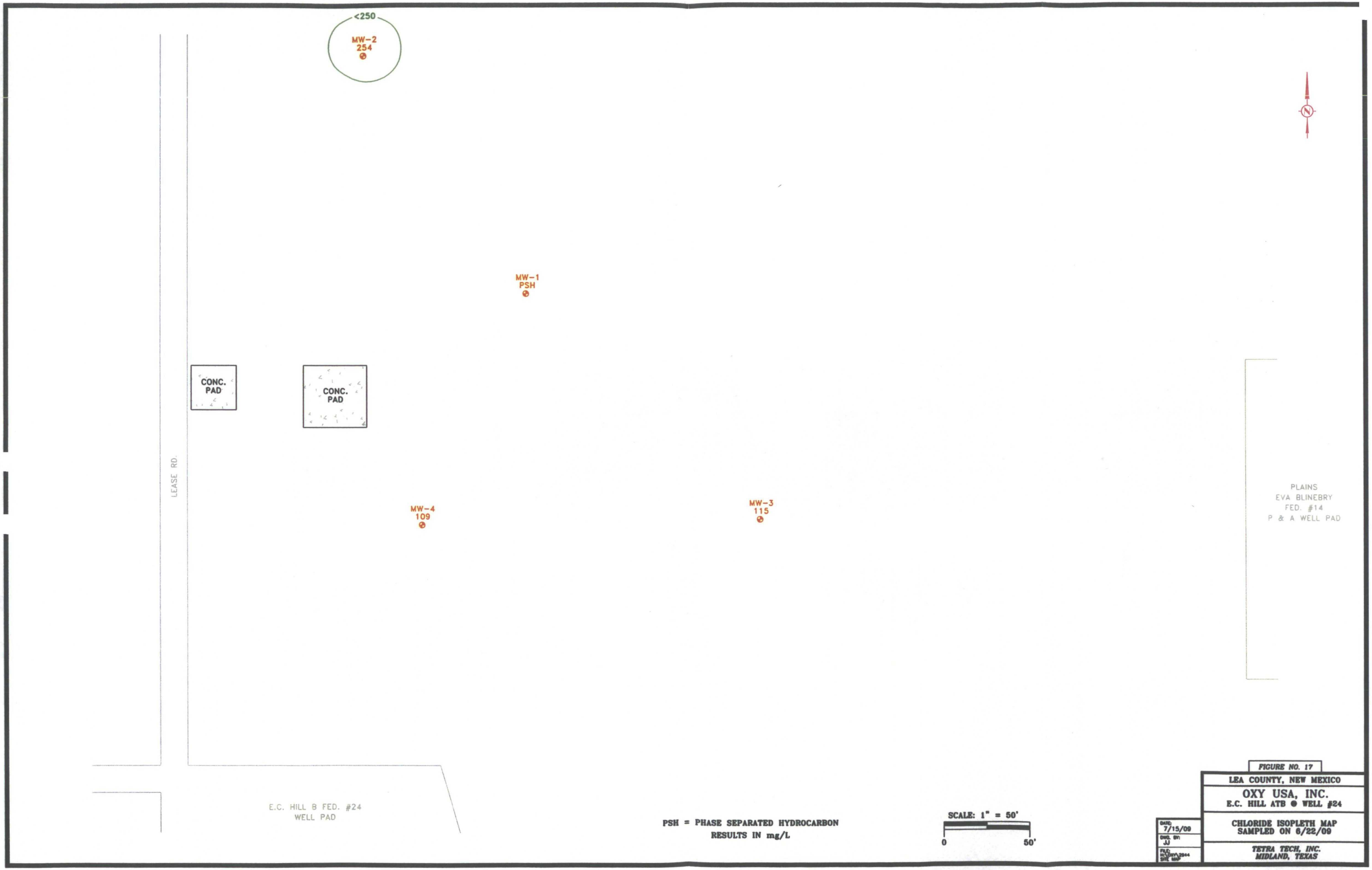
LEA COUNTY, NEW MEXICO

OXY USA, INC.
E.C. HILL ATB ● WELL #24

CHLORIDE ISOPLETH MAP
SAMPLED ON 3/12/09

TETRA TECH, INC.
MIDLAND, TEXAS

DATE: 7/15/09
DWG. BY: JJ
FN:C: HOBBS\2844 SITE MAP



<250
MW-2
254
MW-1
PSH
CONC. PAD
CONC. PAD
LEASE RD.
MW-4
109
MW-3
115
PLAINS
EVA BLINEBRY
FED. #14
P & A WELL PAD
E.C. HILL B FED. #24
WELL PAD
PSH = PHASE SEPARATED HYDROCARBON
RESULTS IN mg/L
SCALE: 1" = 50'
0
50'
FIGURE NO. 17
LEA COUNTY, NEW MEXICO
OXY USA, INC.
E.C. HILL ATB @ WELL #24
CHLORIDE ISOPLETH MAP
SAMPLED ON 6/22/09
TETRA TECH, INC.
MIDLAND, TEXAS
DATE: 7/15/09
DWG. BY: JJ

TABLES

Table 1
OXY USA, Inc.
E.C. Hill 'B' ATB at Well #24
Summary of Groundwater Elevations and PSH Thickness
Lea County, New Mexico

Well/ Borehole ID	Date Measurement	Top of Casing Elevation, feet AMSL	Total Well Depth (in ft)	Product (ft) (TOC)	Water level (ft) (TOC)	PSH Thickness (ft)	Groundwater Elevation (ft)
MW-1	10/23/08	3260.03	98	82.00	85.03	3.03	3177.27
	12/12/08			81.98	84.97	2.99	3177.30
	03/12/09			81.98	85.02	3.04	3177.29
	06/22/09			81.99	85.05	3.06	3177.28
MW-2	10/23/08	3265.85	95	-	87.69	0	3178.16
	12/12/08			-	87.62	0	3178.23
	03/12/09			-	87.63	0	3178.22
	06/22/09			-	87.60	0	3178.25
MW-3	10/23/08	3257.76	93	-	80.72	0	3177.04
	12/12/08			-	80.67	0	3177.09
	03/12/09			-	80.68	0	3177.08
	06/22/09			-	79.65	0	3178.11
MW-4	10/23/08	3260.41	93	-	82.90	0	3177.51
	12/12/08			-	82.87	0	3177.54
	03/12/09			-	82.88	0	3177.53
	06/22/09			-	82.82	0	3177.59

(-) No data (TOC) Top of casing
(MW-1) Groundwater elevation corrected using 0.75 specific gravity

Table 2
OXY USA, Inc.
E.C. Hill 'B' ATB at Well #24
Summary of Analysis of Groundwater Samples
Lea County, New Mexico

Sample ID	Sample Date	PSH Thickness (ft)	Benzene (mg/l)	Toluene (mg/l)	Ethyl-benzene (mg/l)	Xylene (mg/l)	Total BTEX (mg/l)	TPH 8015M			Chloride (mg/l)
								GRO (mg/l)	DRO (mg/l)	Total (mg/l)	
MW-1	09/22/06	-	<0.001	<0.001	**0.031**	**0.0669**	**0.0979**	-	-	-	138
	09/29/06	-	**0.0012**	<0.001	**0.0143**	**0.0386**	**0.0541**	-	-	-	111
	10/04/06	-	<0.001	<0.001	**0.0175**	**0.097**	**0.1145**	**12.0**	**61.7**	**73.7**	119
	11/14/07	2.68	-	-	-	-	-	-	-	-	-
	10/23/08	3.03	-	-	-	-	-	-	-	-	-
	12/12/08	2.99	-	-	-	-	-	-	-	-	-
	03/12/09	3.04	-	-	-	-	-	-	-	-	-
	06/22/09	3.06	-	-	-	-	-	-	-	-	-
MW-2	10/23/08	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	267
	12/12/08	-	<0.005	<0.005	<0.005	<0.015	<0.015	-	-	-	270
	03/12/09	-	<0.001	<0.001	<0.001	<0.003	<0.003	-	-	-	315
	06/22/09	-	<0.001	<0.001	<0.001	<0.003	<0.003	-	-	-	254
MW-3	10/23/08	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	119
	12/12/08	-	<0.005	<0.005	<0.005	<0.015	<0.015	-	-	-	120
	03/12/09	-	<0.001	<0.001	<0.001	<0.003	<0.003	-	-	-	120
	06/22/09	-	<0.001	<0.001	<0.001	<0.003	<0.003	-	-	-	115
MW-4	10/23/08	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	109
	12/12/08	-	<0.005	<0.005	<0.005	<0.015	<0.015	-	-	-	108
	03/12/09	-	<0.001	<0.001	<0.001	<0.003	<0.003	-	-	-	111

Table 2
OXY USA, Inc.
E.C. Hill 'B' ATB at Well #24
Summary of Analysis of Groundwater Samples
Lea County, New Mexico

Sample ID	Sample Date	PSH Thickness (ft)	Benzene (mg/l)	Toluene (mg/l)	Ethyl-benzene (mg/l)	Xylene (mg/l)	Total BTEX (mg/l)	TPH 8015M			Chloride (mg/l)
								GRO (mg/l)	DRO (mg/l)	Total (mg/l)	
MW-4	06/22/09	-	<0.001	<0.001	<0.001	<0.003	<0.003	-	-	-	110
Dup	03/12/09	-	<0.001	<0.001	<0.001	<0.003	<0.003	-	-	-	111
Dup	06/22/09	-	<0.001	<0.001	<0.001	<0.003	<0.003	-	-	-	109

(-) Not Analyzed
NM - Not measured

APPENDIX A
LABORATORY ANALYTICAL

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
200 East Sunset Road, Suite E El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
5002 Basin Street, Suite A1 Midland, Texas 79703 432•689•6301 FAX 432•689•6313
6015 Harris Parkway, Suite 110 Ft. Worth, Texas 76132 817•201•5260
E-Mail: lab@traceanalysis.com

Certifications

WBENC: 237019 **HUB:** 1752439743100-86536 **DBE:** VN 20657
NCTRCA WFWB38444Y0909

NELAP Certifications

Lubbock: T104704219-08-TX LELAP-02003 Kansas E-10317 **El Paso:** T104704221-08-TX LELAP-02002 **Midland:** T104704392-08-TX

Analytical and Quality Control Report

Tim Reed
Tetra Tech
1910 N. Big Spring Street
Midland, TX, 79705

Report Date: November 5, 2008

Work Order: 8102415

Project Location: Lea Co.
Project Name: OXY/E.C. Hill B ATB @ Well #24
Project Number: 115-6402944

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
177256	MW-2	water	2008-10-23	12:10	2008-10-24
177257	MW-3	water	2008-10-23	12:00	2008-10-24
177258	MW-4	water	2008-10-23	12:20	2008-10-24

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

Dr. Blair Leftwich, Director

Standard Flags

B - The sample contains less than ten times the concentration found in the method blank.

Case Narrative

Samples for project OXY/E.C. Hill B ATB @ Well #24 were received by TraceAnalysis, Inc. on 2008-10-24 and assigned to work order 8102415. Samples for work order 8102415 were received intact without headspace and at a temperature of 3.0 deg. C.

Samples were analyzed for the following tests using their respective methods.

Test	Method
Alkalinity	SM 2320B
BTEX	S 8021B
Ca, Dissolved	S 6010B
Chloride (IC)	E 300.0
Hardness	S 6010B
K, Dissolved	S 6010B
Mg, Dissolved	S 6010B
Na, Dissolved	S 6010B
pH	SM 4500-H+
SO4 (IC)	E 300.0
TDS	SM 2540C

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 8102415 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Analytical Report

Sample: 177256 - MW-2

Laboratory:	Midland				
Analysis:	Alkalinity	Analytical Method:	SM 2320B	Prep Method:	N/A
QC Batch:	53708	Date Analyzed:	2008-10-28	Analyzed By:	AR
Prep Batch:	45973	Sample Preparation:	2008-10-28	Prepared By:	AR

Parameter	Flag	Result	RL Units	Dilution	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCo3	1	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCo3	1	1.00
Bicarbonate Alkalinity		**158**	mg/L as CaCo3	1	4.00
Total Alkalinity		**158**	mg/L as CaCo3	1	4.00

Sample: 177256 - MW-2

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	53630	Date Analyzed:	2008-10-25	Analyzed By:	AG
Prep Batch:	45915	Sample Preparation:	2008-10-24	Prepared By:	AG

Parameter	Flag	Result	RL Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0931	mg/L	1	0.100	93	77.8 - 121.1
4-Bromofluorobenzene (4-BFB)		0.0764	mg/L	1	0.100	76	40.1 - 136

Sample: 177256 - MW-2

Laboratory:	Lubbock				
Analysis:	Ca, Dissolved	Analytical Method:	S 6010B	Prep Method:	S 3005A
QC Batch:	53920	Date Analyzed:	2008-10-31	Analyzed By:	TP
Prep Batch:	46006	Sample Preparation:	2008-10-30	Prepared By:	KV

Parameter	Flag	Result	RL Units	Dilution	RL
Dissolved Calcium		**179**	mg/L	1	1.00

Sample: 177256 - MW-2

Laboratory:	Midland				
Analysis:	Chloride (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	53710	Date Analyzed:	2008-10-28	Analyzed By:	AR
Prep Batch:	45929	Sample Preparation:	2008-10-27	Prepared By:	AR

Parameter	Flag	Result	RL Units	Dilution	RL
Chloride		**267**	mg/L	10	0.500

Sample: 177256 - MW-2

Laboratory:	Lubbock				
Analysis:	Hardness	Analytical Method:	S 6010B	Prep Method:	N/A
QC Batch:	53920	Date Analyzed:	2008-10-31	Analyzed By:	TP
Prep Batch:	46006	Sample Preparation:	2008-10-30	Prepared By:	KV

Parameter	Flag	Result	RL Units	Dilution	RL
Hardness (by ICP)		**579**	mg eq CaCO3/L	1	0.00

Sample: 177256 - MW-2

Laboratory:	Lubbock				
Analysis:	K, Dissolved	Analytical Method:	S 6010B	Prep Method:	S 3005A
QC Batch:	53920	Date Analyzed:	2008-10-31	Analyzed By:	TP
Prep Batch:	46006	Sample Preparation:	2008-10-30	Prepared By:	KV

Parameter	Flag	Result	RL Units	Dilution	RL
Dissolved Potassium		**5.61**	mg/L	1	1.00

Sample: 177256 - MW-2

Laboratory:	Lubbock				
Analysis:	Mg, Dissolved	Analytical Method:	S 6010B	Prep Method:	S 3005A
QC Batch:	53920	Date Analyzed:	2008-10-31	Analyzed By:	TP
Prep Batch:	46006	Sample Preparation:	2008-10-30	Prepared By:	KV

Parameter	Flag	Result	RL Units	Dilution	RL
Dissolved Magnesium		**32.1**	mg/L	1	1.00

Sample: 177256 - MW-2

Laboratory:	Lubbock				
Analysis:	Na, Dissolved	Analytical Method:	S 6010B	Prep Method:	S 3005A
QC Batch:	53920	Date Analyzed:	2008-10-31	Analyzed By:	TP
Prep Batch:	46006	Sample Preparation:	2008-10-30	Prepared By:	KV

Parameter	Flag	Result	RL Units	Dilution	RL
Dissolved Sodium		**88.7**	mg/L	1	1.00

Sample: 177256 - MW-2

Laboratory:	Midland				
Analysis:	pH	Analytical Method:	SM 4500-H+	Prep Method:	N/A
QC Batch:	53609	Date Analyzed:	2008-10-24	Analyzed By:	AR
Prep Batch:	45899	Sample Preparation:	2008-10-24	Prepared By:	AR

Parameter	Flag	Result	RL Units	Dilution	RL
pH		**7.74**	s.u.	1	0.00

Sample: 177256 - MW-2

Laboratory:	Midland				
Analysis:	SO4 (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	53710	Date Analyzed:	2008-10-28	Analyzed By:	AR
Prep Batch:	45929	Sample Preparation:	2008-10-27	Prepared By:	AR

Parameter	Flag	Result	RL Units	Dilution	RL
Sulfate		**263**	mg/L	10	0.500

Sample: 177256 - MW-2

Laboratory:	Midland				
Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	53827	Date Analyzed:	2008-10-31	Analyzed By:	AR
Prep Batch:	45981	Sample Preparation:	2008-10-29	Prepared By:	AR

Parameter	Flag	Result	RL Units	Dilution	RL
Total Dissolved Solids		**1010**	mg/L	2	10.0

Sample: 177257 - MW-3

Laboratory:	Midland				
Analysis:	Alkalinity	Analytical Method:	SM 2320B	Prep Method:	N/A
QC Batch:	53708	Date Analyzed:	2008-10-28	Analyzed By:	AR
Prep Batch:	45973	Sample Preparation:	2008-10-28	Prepared By:	AR

Parameter	Flag	RL Result	Units	Dilution	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCo3	1	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCo3	1	1.00
Bicarbonate Alkalinity		**217**	mg/L as CaCo3	1	4.00
Total Alkalinity		**217**	mg/L as CaCo3	1	4.00

Sample: 177257 - MW-3

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	53630	Date Analyzed:	2008-10-25	Analyzed By:	AG
Prep Batch:	45915	Sample Preparation:	2008-10-24	Prepared By:	AG

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0917	mg/L	1	0.100	92	77.8 - 121.1
4-Bromofluorobenzene (4-BFB)		0.0727	mg/L	1	0.100	73	40.1 - 136

Sample: 177257 - MW-3

Laboratory:	Lubbock				
Analysis:	Ca, Dissolved	Analytical Method:	S 6010B	Prep Method:	S 3005A
QC Batch:	53920	Date Analyzed:	2008-10-31	Analyzed By:	TP
Prep Batch:	46006	Sample Preparation:	2008-10-30	Prepared By:	KV

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Calcium		**136**	mg/L	1	1.00

Sample: 177257 - MW-3

Laboratory:	Midland				
Analysis:	Chloride (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	53710	Date Analyzed:	2008-10-28	Analyzed By:	AR
Prep Batch:	45929	Sample Preparation:	2008-10-27	Prepared By:	AR

Parameter	Flag	Result	RL Units	Dilution	RL
Chloride		**119**	mg/L	10	0.500

Sample: 177257 - MW-3

Laboratory:	Lubbock				
Analysis:	Hardness	Analytical Method:	S 6010B	Prep Method:	N/A
QC Batch:	53920	Date Analyzed:	2008-10-31	Analyzed By:	TP
Prep Batch:	46006	Sample Preparation:	2008-10-30	Prepared By:	KV

Parameter	Flag	Result	RL Units	Dilution	RL
Hardness (by ICP)		**419**	mg eq CaCO3/L	1	0.00

Sample: 177257 - MW-3

Laboratory:	Lubbock				
Analysis:	K, Dissolved	Analytical Method:	S 6010B	Prep Method:	S 3005A
QC Batch:	53920	Date Analyzed:	2008-10-31	Analyzed By:	TP
Prep Batch:	46006	Sample Preparation:	2008-10-30	Prepared By:	KV

Parameter	Flag	Result	RL Units	Dilution	RL
Dissolved Potassium		**5.02**	mg/L	1	1.00

Sample: 177257 - MW-3

Laboratory:	Lubbock				
Analysis:	Mg, Dissolved	Analytical Method:	S 6010B	Prep Method:	S 3005A
QC Batch:	53920	Date Analyzed:	2008-10-31	Analyzed By:	TP
Prep Batch:	46006	Sample Preparation:	2008-10-30	Prepared By:	KV

Parameter	Flag	Result	RL Units	Dilution	RL
Dissolved Magnesium		**19.4**	mg/L	1	1.00

Sample: 177257 - MW-3

Laboratory:	Lubbock				
Analysis:	Na, Dissolved	Analytical Method:	S 6010B	Prep Method:	S 3005A
QC Batch:	53920	Date Analyzed:	2008-10-31	Analyzed By:	TP
Prep Batch:	46006	Sample Preparation:	2008-10-30	Prepared By:	KV

Parameter	Flag	Result	RL Units	Dilution	RL
Dissolved Sodium		**88.3**	mg/L	1	1.00

Sample: 177257 - MW-3

Laboratory:	Midland				
Analysis:	pH	Analytical Method:	SM 4500-H+	Prep Method:	N/A
QC Batch:	53609	Date Analyzed:	2008-10-24	Analyzed By:	AR
Prep Batch:	45899	Sample Preparation:	2008-10-24	Prepared By:	AR

Parameter	Flag	Result	RL Units	Dilution	RL
pH		**7.76**	s.u.	1	0.00

Sample: 177257 - MW-3

Laboratory:	Midland				
Analysis:	SO4 (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	53710	Date Analyzed:	2008-10-28	Analyzed By:	AR
Prep Batch:	45929	Sample Preparation:	2008-10-27	Prepared By:	AR

Parameter	Flag	Result	RL Units	Dilution	RL
Sulfate		**226**	mg/L	10	0.500

Sample: 177257 - MW-3

Laboratory:	Midland				
Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	53827	Date Analyzed:	2008-10-31	Analyzed By:	AR
Prep Batch:	45981	Sample Preparation:	2008-10-29	Prepared By:	AR

Parameter	Flag	Result	RL Units	Dilution	RL
Total Dissolved Solids		**768**	mg/L	1	10.0

Sample: 177258 - MW-4

Laboratory:	Midland				
Analysis:	Alkalinity	Analytical Method:	SM 2320B	Prep Method:	N/A
QC Batch:	53708	Date Analyzed:	2008-10-28	Analyzed By:	AR
Prep Batch:	45973	Sample Preparation:	2008-10-28	Prepared By:	AR

Parameter	Flag	Result	RL	Units	Dilution	RL
Hydroxide Alkalinity		<1.00		mg/L as CaCo3	1	1.00
Carbonate Alkalinity		<1.00		mg/L as CaCo3	1	1.00
Bicarbonate Alkalinity		**168**		mg/L as CaCo3	1	4.00
Total Alkalinity		**168**		mg/L as CaCo3	1	4.00

Sample: 177258 - MW-4

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	53630	Date Analyzed:	2008-10-25	Analyzed By:	AG
Prep Batch:	45915	Sample Preparation:	2008-10-24	Prepared By:	AG

Parameter	Flag	Result	RL	Units	Dilution	RL
Benzene		<0.00100		mg/L	1	0.00100
Toluene		<0.00100		mg/L	1	0.00100
Ethylbenzene		<0.00100		mg/L	1	0.00100
Xylene		<0.00100		mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0913	mg/L	1	0.100	91	77.8 - 121.1
4-Bromofluorobenzene (4-BFB)		0.0758	mg/L	1	0.100	76	40.1 - 136

Sample: 177258 - MW-4

Laboratory:	Lubbock				
Analysis:	Ca, Dissolved	Analytical Method:	S 6010B	Prep Method:	S 3005A
QC Batch:	53921	Date Analyzed:	2008-10-31	Analyzed By:	TP
Prep Batch:	46006	Sample Preparation:	2008-10-30	Prepared By:	KV

Parameter	Flag	Result	RL	Units	Dilution	RL
Dissolved Calcium		**119**		mg/L	1	1.00

Sample: 177258 - MW-4

Laboratory:	Midland				
Analysis:	Chloride (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	53710	Date Analyzed:	2008-10-28	Analyzed By:	AR
Prep Batch:	45929	Sample Preparation:	2008-10-27	Prepared By:	AR

Parameter	Flag	Result	RL Units	Dilution	RL
Chloride		**109**	mg/L	10	0.500

Sample: 177258 - MW-4

Laboratory:	Lubbock				
Analysis:	Hardness	Analytical Method:	S 6010B	Prep Method:	N/A
QC Batch:	53921	Date Analyzed:	2008-10-31	Analyzed By:	TP
Prep Batch:	46006	Sample Preparation:	2008-10-30	Prepared By:	KV

Parameter	Flag	Result	RL Units	Dilution	RL
Hardness (by ICP)		**381**	mg eq CaCO3/L	1	0.00

Sample: 177258 - MW-4

Laboratory:	Lubbock				
Analysis:	K, Dissolved	Analytical Method:	S 6010B	Prep Method:	S 3005A
QC Batch:	53921	Date Analyzed:	2008-10-31	Analyzed By:	TP
Prep Batch:	46006	Sample Preparation:	2008-10-30	Prepared By:	KV

Parameter	Flag	Result	RL Units	Dilution	RL
Dissolved Potassium		**4.95**	mg/L	1	1.00

Sample: 177258 - MW-4

Laboratory:	Lubbock				
Analysis:	Mg, Dissolved	Analytical Method:	S 6010B	Prep Method:	S 3005A
QC Batch:	53921	Date Analyzed:	2008-10-31	Analyzed By:	TP
Prep Batch:	46006	Sample Preparation:	2008-10-30	Prepared By:	KV

Parameter	Flag	Result	RL Units	Dilution	RL
Dissolved Magnesium		**20.4**	mg/L	1	1.00

Sample: 177258 - MW-4

Laboratory:	Lubbock				
Analysis:	Na, Dissolved	Analytical Method:	S 6010B	Prep Method:	S 3005A
QC Batch:	53921	Date Analyzed:	2008-10-31	Analyzed By:	TP
Prep Batch:	46006	Sample Preparation:	2008-10-30	Prepared By:	KV

Parameter	Flag	Result	RL	Units	Dilution	RL
Dissolved Sodium		**92.1**		mg/L	1	1.00

Sample: 177258 - MW-4

Laboratory:	Midland				
Analysis:	pH	Analytical Method:	SM 4500-H+	Prep Method:	N/A
QC Batch:	53609	Date Analyzed:	2008-10-24	Analyzed By:	AR
Prep Batch:	45899	Sample Preparation:	2008-10-24	Prepared By:	AR

Parameter	Flag	Result	RL	Units	Dilution	RL
pH		**7.84**		s.u.	1	0.00

Sample: 177258 - MW-4

Laboratory:	Midland				
Analysis:	SO4 (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	53710	Date Analyzed:	2008-10-28	Analyzed By:	AR
Prep Batch:	45929	Sample Preparation:	2008-10-27	Prepared By:	AR

Parameter	Flag	Result	RL	Units	Dilution	RL
Sulfate		**264**		mg/L	10	0.500

Sample: 177258 - MW-4

Laboratory:	Midland				
Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	53827	Date Analyzed:	2008-10-31	Analyzed By:	AR
Prep Batch:	45981	Sample Preparation:	2008-10-29	Prepared By:	AR

Parameter	Flag	Result	RL	Units	Dilution	RL
Total Dissolved Solids		**780**		mg/L	1	10.0

Method Blank (1) QC Batch: 53630

QC Batch: 53630 | Date Analyzed: 2008-10-25 | Analyzed By: AG
Prep Batch: 45915 | QC Preparation: 2008-10-24 | Prepared By: AG

Parameter	Flag	MDL Result	Units	RL
Benzene		<0.000300	mg/L	0.001
Toluene		<0.000200	mg/L	0.001
Ethylbenzene		<0.000500	mg/L	0.001
Xylene		<0.000400	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0902	mg/L	1	0.100	90	77.2 - 129.1
4-Bromofluorobenzene (4-BFB)		0.0851	mg/L	1	0.100	85	69.1 - 122.3

Method Blank (1) QC Batch: 53708

QC Batch: 53708 | Date Analyzed: 2008-10-28 | Analyzed By: AR
Prep Batch: 45973 | QC Preparation: 2008-10-28 | Prepared By: AR

Parameter	Flag	MDL Result	Units	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCo3	1
Carbonate Alkalinity		<1.00	mg/L as CaCo3	1
Bicarbonate Alkalinity		<4.00	mg/L as CaCo3	4
Total Alkalinity		<4.00	mg/L as CaCo3	4

Method Blank (1) QC Batch: 53710

QC Batch: 53710 | Date Analyzed: 2008-10-28 | Analyzed By: AR
Prep Batch: 45929 | QC Preparation: 2008-10-27 | Prepared By: AR

Parameter	Flag	MDL Result	Units	RL
Chloride		1.16	mg/L	0.5

Method Blank (1) QC Batch: 53710

QC Batch: 53710 | Date Analyzed: 2008-10-28 | Analyzed By: AR
Prep Batch: 45929 | QC Preparation: 2008-10-27 | Prepared By: AR

Parameter	Flag	MDL Result	Units	RL
Sulfate		<0.0320	mg/L	0.5

Method Blank (1) QC Batch: 53827

QC Batch:	53827	Date Analyzed:	2008-10-31	Analyzed By:	AR
Prep Batch:	45981	QC Preparation:	2008-10-29	Prepared By:	AR

Parameter	Flag	MDL Result	Units	RL
Total Dissolved Solids		<5.00	mg/L	10

Method Blank (1) QC Batch: 53920

QC Batch:	53920	Date Analyzed:	2008-10-31	Analyzed By:	TP
Prep Batch:	46006	QC Preparation:	2008-10-30	Prepared By:	KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Calcium		<0.175	mg/L	1

Method Blank (1) QC Batch: 53920

QC Batch:	53920	Date Analyzed:	2008-10-31	Analyzed By:	TP
Prep Batch:	46006	QC Preparation:	2008-10-30	Prepared By:	KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Potassium		<0.327	mg/L	1

Method Blank (1) QC Batch: 53920

QC Batch:	53920	Date Analyzed:	2008-10-31	Analyzed By:	TP
Prep Batch:	46006	QC Preparation:	2008-10-30	Prepared By:	KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Magnesium		<0.148	mg/L	1

Method Blank (1) QC Batch: 53920

QC Batch:	53920	Date Analyzed:	2008-10-31	Analyzed By:	TP
Prep Batch:	46006	QC Preparation:	2008-10-30	Prepared By:	KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Sodium		<0.244	mg/L	1

Method Blank (1) QC Batch: 53921

QC Batch:	53921	Date Analyzed:	2008-10-31	Analyzed By:	TP
Prep Batch:	46006	QC Preparation:	2008-10-30	Prepared By:	KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Calcium		<0.175	mg/L	1

Method Blank (1) QC Batch: 53921

QC Batch:	53921	Date Analyzed:	2008-10-31	Analyzed By:	TP
Prep Batch:	46006	QC Preparation:	2008-10-30	Prepared By:	KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Potassium		<0.327	mg/L	1

Method Blank (1) QC Batch: 53921

QC Batch:	53921	Date Analyzed:	2008-10-31	Analyzed By:	TP
Prep Batch:	46006	QC Preparation:	2008-10-30	Prepared By:	KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Magnesium		<0.148	mg/L	1

Method Blank (1) QC Batch: 53921

QC Batch:	53921	Date Analyzed:	2008-10-31	Analyzed By:	TP
Prep Batch:	46006	QC Preparation:	2008-10-30	Prepared By:	KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Sodium		<0.244	mg/L	1

Duplicates (1) Duplicated Sample: 177258

QC Batch: 53609 | Date Analyzed: 2008-10-24 | Analyzed By: AR
Prep Batch: 45899 | QC Preparation: 2008-10-24 | Prepared By: AR

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
pH	7.86	7.84	s.u.	1	0	1.5

Duplicates (1) Duplicated Sample: 177258

QC Batch: 53708 | Date Analyzed: 2008-10-28 | Analyzed By: AR
Prep Batch: 45973 | QC Preparation: 2008-10-28 | Prepared By: AR

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Hydroxide Alkalinity	<1.00	<1.00	mg/L as CaCo3	1	0	20
Carbonate Alkalinity	<1.00	<1.00	mg/L as CaCo3	1	0	20
Bicarbonate Alkalinity	175	168	mg/L as CaCo3	1	4	20
Total Alkalinity	175	168	mg/L as CaCo3	1	4	20

Duplicates (1) Duplicated Sample: 177258

QC Batch: 53827 | Date Analyzed: 2008-10-31 | Analyzed By: AR
Prep Batch: 45981 | QC Preparation: 2008-10-29 | Prepared By: AR

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids	743	780	mg/L	1	5	20

Laboratory Control Spike (LCS-1)

QC Batch: 53630 | Date Analyzed: 2008-10-25 | Analyzed By: AG
Prep Batch: 45915 | QC Preparation: 2008-10-24 | Prepared By: AG

continued ...

control spikes continued ...

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene	0.103	mg/L	1	0.100	<0.00110	103	84 - 119.7
Toluene	0.103	mg/L	1	0.100	<0.00100	103	84.9 - 118.2
Ethylbenzene	0.104	mg/L	1	0.100	<0.00100	104	84.4 - 118.6
Xylene	0.296	mg/L	1	0.300	<0.00290	99	84.8 - 117.8

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene	0.0971	mg/L	1	0.100	<0.00110	97	84 - 119.7	6	20
Toluene	0.0978	mg/L	1	0.100	<0.00100	98	84.9 - 118.2	5	20
Ethylbenzene	0.0987	mg/L	1	0.100	<0.00100	99	84.4 - 118.6	5	20
Xylene	0.283	mg/L	1	0.300	<0.00290	94	84.8 - 117.8	4	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.0939	0.0913	mg/L	1	0.100	94	91	80 - 128.3
4-Bromofluorobenzene (4-BFB)	0.0876	0.0869	mg/L	1	0.100	88	87	67.7 - 126.3

Laboratory Control Spike (LCS-1)

QC Batch: 53710 | Date Analyzed: 2008-10-28 | Analyzed By: AR
Prep Batch: 45929 | QC Preparation: 2008-10-27 | Prepared By: AR

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	11.9	mg/L	1	12.5	1.16	95	90 - 110

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride	11.8	mg/L	1	12.5	1.16	94	90 - 110	1	

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: 53710 | Date Analyzed: 2008-10-28 | Analyzed By: AR
Prep Batch: 45929 | QC Preparation: 2008-10-27 | Prepared By: AR

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Sulfate	12.8	mg/L	1	12.5	<0.0320	102	90 - 110

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Sulfate	12.7	mg/L	1	12.5	<0.0320	102	90 - 110	1	

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: 53920 | Date Analyzed: 2008-10-31 | Analyzed By: TP
Prep Batch: 46006 | QC Preparation: 2008-10-30 | Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Calcium	52.8	mg/L	1	50.0	<0.175	106	85 - 115

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Calcium	45.5	mg/L	1	50.0	<0.175	91	85 - 115	15	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: 53920 | Date Analyzed: 2008-10-31 | Analyzed By: TP
Prep Batch: 46006 | QC Preparation: 2008-10-30 | Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Potassium	50.9	mg/L	1	50.0	<0.327	102	85 - 115

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Potassium	45.5	mg/L	1	50.0	<0.327	91	85 - 115	11	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: 53920 | Date Analyzed: 2008-10-31 | Analyzed By: TP
Prep Batch: 46006 | QC Preparation: 2008-10-30 | Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Magnesium	52.0	mg/L	1	50.0	<0.148	104	85 - 115

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Magnesium	44.8	mg/L	1	50.0	<0.148	90	85 - 115	15	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: 53920 | Date Analyzed: 2008-10-31 | Analyzed By: TP
Prep Batch: 46006 | QC Preparation: 2008-10-30 | Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Sodium	51.3	mg/L	1	50.0	<0.244	103	85 - 115

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Sodium	46.0	mg/L	1	50.0	<0.244	92	85 - 115	11	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: 53921 | Date Analyzed: 2008-10-31 | Analyzed By: TP
Prep Batch: 46006 | QC Preparation: 2008-10-30 | Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Calcium	52.8	mg/L	1	50.0	<0.175	106	85 - 115

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Calcium	45.5	mg/L	1	50.0	<0.175	91	85 - 115	15	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: 53921 | Date Analyzed: 2008-10-31 | Analyzed By: TP
Prep Batch: 46006 | QC Preparation: 2008-10-30 | Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Potassium	50.9	mg/L	1	50.0	<0.327	102	85 - 115

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Potassium	45.5	mg/L	1	50.0	<0.327	91	85 - 115	11	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: 53921 | Date Analyzed: 2008-10-31 | Analyzed By: TP
Prep Batch: 46006 | QC Preparation: 2008-10-30 | Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Magnesium	52.0	mg/L	1	50.0	<0.148	104	85 - 115

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Magnesium	44.8	mg/L	1	50.0	<0.148	90	85 - 115	15	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: 53921 | Date Analyzed: 2008-10-31 | Analyzed By: TP
Prep Batch: 46006 | QC Preparation: 2008-10-30 | Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Sodium	51.3	mg/L	1	50.0	<0.244	103	85 - 115

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Sodium	46.0	mg/L	1	50.0	<0.244	92	85 - 115	11	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) Spiked Sample: 177263

QC Batch: 53630 | Date Analyzed: 2008-10-25 | Analyzed By: AG
Prep Batch: 45915 | QC Preparation: 2008-10-24 | Prepared By: AG

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene	0.520	mg/L	5	0.500	<0.00550	104	77.5 - 121.1
Toluene	0.519	mg/L	5	0.500	<0.00500	104	78.8 - 119.6
Ethylbenzene	0.520	mg/L	5	0.500	<0.00500	104	77.9 - 120.5
Xylene	1.48	mg/L	5	1.50	<0.0145	99	78.3 - 119.4

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene	0.511	mg/L	5	0.500	<0.00550	102	77.5 - 121.1	2	20
Toluene	0.510	mg/L	5	0.500	<0.00500	102	78.8 - 119.6	2	20
Ethylbenzene	0.514	mg/L	5	0.500	<0.00500	103	77.9 - 120.5	1	20
Xylene	1.46	mg/L	5	1.50	<0.0145	97	78.3 - 119.4	1	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.464	0.459	mg/L	5	0.5	93	92	86.6 - 118.9
4-Bromofluorobenzene (4-BFB)	0.401	0.404	mg/L	5	0.5	80	81	59.4 - 127.3

Matrix Spike (MS-1) Spiked Sample: 177263

QC Batch: 53710 | Date Analyzed: 2008-10-28 | Analyzed By: AR
Prep Batch: 45929 | QC Preparation: 2008-10-27 | Prepared By: AR

Param		MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	[1]	9700	mg/L	50	625	9248	72	90 - 110

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param		MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride	[2]	9770	mg/L	50	625	9248	84	90 - 110	1	

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) Spiked Sample: 177263

QC Batch: 53710 | Date Analyzed: 2008-10-28 | Analyzed By: AR
Prep Batch: 45929 | QC Preparation: 2008-10-27 | Prepared By: AR

[1]Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.
[2]Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Sulfate	844	mg/L	50	625	207	102	90 - 110

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Sulfate	843	mg/L	50	625	207	102	90 - 110	0	

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) Spiked Sample: 177241

QC Batch: 53920 | Date Analyzed: 2008-10-31 | Analyzed By: TP
Prep Batch: 46006 | QC Preparation: 2008-10-30 | Prepared By: KV

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Calcium	451	mg/L	10	50.0	404	94	75 - 125

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Calcium	453	mg/L	10	50.0	404	98	75 - 125	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) Spiked Sample: 177241

QC Batch: 53920 | Date Analyzed: 2008-10-31 | Analyzed By: TP
Prep Batch: 46006 | QC Preparation: 2008-10-30 | Prepared By: KV

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Potassium	58.7	mg/L	1	50.0	15	87	75 - 125

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Potassium	58.4	mg/L	1	50.0	15	87	75 - 125	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) Spiked Sample: 177241

QC Batch: 53920 | Date Analyzed: 2008-10-31 | Analyzed By: TP
Prep Batch: 46006 | QC Preparation: 2008-10-30 | Prepared By: KV

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Magnesium	108	mg/L	1	50.0	62.4	91	75 - 125

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Magnesium	110	mg/L	1	50.0	62.4	95	75 - 125	2	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) Spiked Sample: 177241

QC Batch: 53920 | Date Analyzed: 2008-10-31 | Analyzed By: TP
Prep Batch: 46006 | QC Preparation: 2008-10-30 | Prepared By: KV

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Sodium	431	mg/L	10	50.0	384	94	75 - 125

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Sodium	432	mg/L	10	50.0	384	96	75 - 125	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) Spiked Sample: 177258

QC Batch: 53921 | Date Analyzed: 2008-10-31 | Analyzed By: TP
Prep Batch: 46006 | QC Preparation: 2008-10-30 | Prepared By: KV

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Calcium	166	mg/L	1	50.0	119	94	75 - 125

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Calcium	163	mg/L	1	50.0	119	88	75 - 125	2	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) Spiked Sample: 177258

QC Batch: 53921 | Date Analyzed: 2008-10-31 | Analyzed By: TP
Prep Batch: 46006 | QC Preparation: 2008-10-30 | Prepared By: KV

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Potassium	49.0	mg/L	1	50.0	4.95	88	75 - 125

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Potassium	46.6	mg/L	1	50.0	4.95	83	75 - 125	5	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) Spiked Sample: 177258

QC Batch: 53921 | Date Analyzed: 2008-10-31 | Analyzed By: TP
Prep Batch: 46006 | QC Preparation: 2008-10-30 | Prepared By: KV

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Magnesium	66.8	mg/L	1	50.0	20.4	93	75 - 125

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Magnesium	63.9	mg/L	1	50.0	20.4	87	75 - 125	4	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) Spiked Sample: 177258

QC Batch: 53921 | Date Analyzed: 2008-10-31 | Analyzed By: TP
Prep Batch: 46006 | QC Preparation: 2008-10-30 | Prepared By: KV

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Sodium	140	mg/L	1	50.0	92.1	96	75 - 125

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Sodium	136	mg/L	1	50.0	92.1	88	75 - 125	3	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Standard (ICV-1)

QC Batch: 53609 | Date Analyzed: 2008-10-24 | Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
pH		s.u.	7.00	7.04	100	98 - 102	2008-10-24

Standard (CCV-1)

QC Batch: 53609 Date Analyzed: 2008-10-24 Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
pH		s.u.	7.00	7.01	100	98 - 102	2008-10-24

Standard (ICV-1)

QC Batch: 53630 Date Analyzed: 2008-10-25 Analyzed By: AG

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0996	100	85 - 115	2008-10-25
Toluene		mg/L	0.100	0.0998	100	85 - 115	2008-10-25
Ethylbenzene		mg/L	0.100	0.100	100	85 - 115	2008-10-25
Xylene		mg/L	0.300	0.286	95	85 - 115	2008-10-25

Standard (CCV-1)

QC Batch: 53630 Date Analyzed: 2008-10-25 Analyzed By: AG

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0957	96	85 - 115	2008-10-25
Toluene		mg/L	0.100	0.0968	97	85 - 115	2008-10-25
Ethylbenzene		mg/L	0.100	0.0975	98	85 - 115	2008-10-25
Xylene		mg/L	0.300	0.278	93	85 - 115	2008-10-25

Standard (ICV-1)

QC Batch: 53708 Date Analyzed: 2008-10-28 Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0.00	<1.00		0 - 200	2008-10-28
Carbonate Alkalinity		mg/L as CaCo3	0.00	250		0 - 200	2008-10-28
Bicarbonate Alkalinity		mg/L as CaCo3	0.00	<4.00		0 - 200	2008-10-28
Total Alkalinity		mg/L as CaCo3	250	253	101	90 - 110	2008-10-28

Standard (CCV-1)

QC Batch: 53708 Date Analyzed: 2008-10-28 Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0.00	<1.00		0 - 200	2008-10-28
Carbonate Alkalinity		mg/L as CaCo3	0.00	244		0 - 200	2008-10-28
Bicarbonate Alkalinity		mg/L as CaCo3	0.00	<4.00		0 - 200	2008-10-28
Total Alkalinity		mg/L as CaCo3	250	247	99	90 - 110	2008-10-28

Standard (ICV-1)

QC Batch: 53710 Date Analyzed: 2008-10-28 Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.5	11.8	94	90 - 110	2008-10-28

Standard (ICV-1)

QC Batch: 53710 Date Analyzed: 2008-10-28 Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Sulfate		mg/L	12.5	12.7	102	90 - 110	2008-10-28

Standard (CCV-1)

QC Batch: 53710 Date Analyzed: 2008-10-28 Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.5	11.8	94	90 - 110	2008-10-28

Standard (CCV-1)

QC Batch: 53710 Date Analyzed: 2008-10-28 Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Sulfate		mg/L	12.5	12.8	102	90 - 110	2008-10-28

Standard (ICV-1)

QC Batch: 53827 Date Analyzed: 2008-10-31 Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	936	94	90 - 110	2008-10-31

Standard (CCV-1)

QC Batch: 53827 Date Analyzed: 2008-10-31 Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	993	99	90 - 110	2008-10-31

Standard (ICV-1)

QC Batch: 53920 Date Analyzed: 2008-10-31 Analyzed By: TP

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	50.0	51.2	102	90 - 110	2008-10-31

Standard (ICV-1)

QC Batch: 53920 Date Analyzed: 2008-10-31 Analyzed By: TP

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Potassium		mg/L	50.0	51.8	104	90 - 110	2008-10-31

Standard (ICV-1)

QC Batch: 53920 Date Analyzed: 2008-10-31 Analyzed By: TP

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Magnesium		mg/L	50.0	51.3	103	90 - 110	2008-10-31

Standard (ICV-1)

QC Batch: 53920 Date Analyzed: 2008-10-31 Analyzed By: TP

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Sodium		mg/L	50.0	50.7	101	90 - 110	2008-10-31

Standard (CCV-1)

QC Batch: 53920 Date Analyzed: 2008-10-31 Analyzed By: TP

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	50.0	50.5	101	90 - 110	2008-10-31

Standard (CCV-1)

QC Batch: 53920 Date Analyzed: 2008-10-31 Analyzed By: TP

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Potassium		mg/L	50.0	47.8	96	90 - 110	2008-10-31

Standard (CCV-1)

QC Batch: 53920 Date Analyzed: 2008-10-31 Analyzed By: TP

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Magnesium		mg/L	50.0	50.5	101	90 - 110	2008-10-31

Standard (CCV-1)

QC Batch: 53920 Date Analyzed: 2008-10-31 Analyzed By: TP

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Sodium		mg/L	50.0	49.7	99	90 - 110	2008-10-31

Standard (ICV-1)

QC Batch: 53921 Date Analyzed: 2008-10-31 Analyzed By: TP

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	50.0	51.2	102	90 - 110	2008-10-31

Standard (ICV-1)

QC Batch: 53921 Date Analyzed: 2008-10-31 Analyzed By: TP

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Potassium		mg/L	50.0	51.8	104	90 - 110	2008-10-31

Standard (ICV-1)

QC Batch: 53921 Date Analyzed: 2008-10-31 Analyzed By: TP

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Magnesium		mg/L	50.0	51.3	103	90 - 110	2008-10-31

Standard (ICV-1)

QC Batch: 53921 Date Analyzed: 2008-10-31 Analyzed By: TP

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Sodium		mg/L	50.0	50.7	101	90 - 110	2008-10-31

Standard (CCV-1)

QC Batch: 53921 Date Analyzed: 2008-10-31 Analyzed By: TP

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	50.0	49.5	99	90 - 110	2008-10-31

Standard (CCV-1)

QC Batch: 53921 Date Analyzed: 2008-10-31 Analyzed By: TP

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Potassium		mg/L	50.0	47.1	94	90 - 110	2008-10-31

Standard (CCV-1)

QC Batch: 53921 Date Analyzed: 2008-10-31 Analyzed By: TP

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Magnesium		mg/L	50.0	49.4	99	90 - 110	2008-10-31

Standard (CCV-1)

QC Batch: 53921 Date Analyzed: 2008-10-31 Analyzed By: TP

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Sodium		mg/L	50.0	49.7	99	90 - 110	2008-10-31

8102415

Analysis Request of Chain of Custody Record

PAGE: 1 OF: 1

TETRA TECH
1910 N. Big Spring St.
Midland, Texas 79705
(432) 682-4559 • Fax (432) 682-3946

CLIENT NAME: OXY

SITE MANAGER: Tim Rudd

PROJECT NO.: 115-6402944

PROJECT NAME: OXY / E.C. Hill B ATB @ Well #24 Lea Co.

LAB I.D. NUMBER	DATE 2008	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	BTEX 8021B	TPH 8015 MOD. TX1005 (Ext. to C35)	PAH 8270	RCRA Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Metals Ag As Ba Cd Vr Pd Hg Se	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC.MS Vol. 8240/8260/624	GC.MS Semi. Vol. 8270/625	PCB's 8080/608	Pest. 808/608	Chloride	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos)	Major Anions/Cations pH, TDS				
177256	10/23	1210	W		X	MW-2	7		X		X		X															X				
257	10/23	1200	W		X	MW-3	7		X		X		X															X				
258	10/23	1220	W		X	MW-4	7		X		X		X															X				

ANALYSIS REQUEST (Circle or Specify Method No.)

RELINQUISHED BY: (Signature) — Date: 10/24/08 Time: 552 — RECEIVED BY: (Signature) — Date: — Time:

SAMPLED BY: (Print & Initial) JT / ICG — Date: 10/23/08 Time:

RELINQUISHED BY: (Signature) — Date: — Time: — RECEIVED BY: (Signature) — Date: — Time:

SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS — AIRBILL #: — OTHER:

RELINQUISHED BY: (Signature) — Date: — Time: — RECEIVED BY: (Signature) — Date: — Time:

TETRA TECH CONTACT PERSON: Tim Rudd — Results by:

RECEIVING LABORATORY: Trace — RECEIVED BY: (Signature)

ADDRESS: — CITY: Midland — STATE: TX — ZIP: — PHONE: — CONTACT: — DATE: 10-24-08 — TIME: 10:15

RUSH Charges Authorized: Yes (No)

SAMPLE CONDITION WHEN RECEIVED: 3.0°C ice

REMARKS: Alk, TDS, pH, SO4, Chloride - Midland Ca, Hardness, K, Mg, Na - Lubbock

Please fill out all copies - Laboratory retains Yellow copy - Return Orginal copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy.

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

22-Dec-08

Tim Reed
Tetra Tech
1910 N. Big Spring St
Midland, TX 79705

Tel: (432) 682-4559
Fax:

Re: ATB at Well #24

Work Order : **0812310**

Dear Tim,

ALS Laboratory Group received 4 samples on 12/13/2008 09:15 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Laboratory Group and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 14.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Lora Terrill

Electronically approved by: Glenda H. Ramos

Lora Terrill
VP Lab Operations

ACCREDITED IN ACCORDANCE WITH nelac
Certificate No: T104704231-08-TX

ALS Laboratory Group

Date: 22-Dec-08

Client: Tetra Tech
Project: ATB at Well #24
Work Order: **0812310**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
0812310-01	MW-2	Water		12/12/2008 10:25	12/13/2008 09:15	☐
0812310-02	MW-3	Water		12/12/2008 11:00	12/13/2008 09:15	☐
0812310-03	MW-4	Water		12/12/2008 11:35	12/13/2008 09:15	☐

ALS Laboratory Group

Date: 22-Dec-08

Client: Tetra Tech
Project: ATB at Well #24
Work Order: 0812310

Case Narrative

No Findings.

ALS Laboratory Group

Date: *22-Dec-08*

Client: Tetra Tech
Project: ATB at Well #24
Work Order: 0812310
Sample ID: MW-2
Lab ID: 0812310-01
Collection Date: 12/12/2008 10:25 AM
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TCL VOLATILES			**SW8260**			Analyst: **PC**
Benzene	U		5.0	µg/L	1	12/15/2008 03:55 PM
Ethylbenzene	U		5.0	µg/L	1	12/15/2008 03:55 PM
Toluene	U		5.0	µg/L	1	12/15/2008 03:55 PM
Xylenes, Total	U		15	µg/L	1	12/15/2008 03:55 PM
Surr: 1,2-Dichloroethane-d4	*93.2*		*70-125*	*%REC*	1	12/15/2008 03:55 PM
Surr: 4-Bromofluorobenzene	*97.3*		*72-125*	*%REC*	1	12/15/2008 03:55 PM
Surr: Dibromofluoromethane	*95.8*		*71-125*	*%REC*	1	12/15/2008 03:55 PM
Surr: Toluene-d8	*102*		*75-125*	*%REC*	1	12/15/2008 03:55 PM
ANIONS			**E300**			Analyst: **IGF**
Chloride	**270**		**5.00**	**mg/L**	10	12/19/2008 12:02 PM
Surr: Selenate (surr)	*93.1*		*85-115*	*%REC*	10	12/19/2008 12:02 PM

Qualifiers:

U - Analyzed for but Not Detected
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
a - Not accredited
S - Spike Recovery outside accepted recovery limits
P - Dual Column results percent difference > 40%
E - Value above quantitation range
H - Analyzed outside of Hold Time
n - Not offered for accreditation

ALS Laboratory Group

Date: *22-Dec-08*

Client: Tetra Tech
Project: ATB at Well #24
Work Order: 0812310
Sample ID: MW-3
Lab ID: 0812310-02
Collection Date: 12/12/2008 11:00 AM
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TCL VOLATILES			**SW8260**			Analyst: **PC**
Benzene	U		5.0	µg/L	1	12/15/2008 04:20 PM
Ethylbenzene	U		5.0	µg/L	1	12/15/2008 04:20 PM
Toluene	U		5.0	µg/L	1	12/15/2008 04:20 PM
Xylenes, Total	U		15	µg/L	1	12/15/2008 04:20 PM
Surr: 1,2-Dichloroethane-d4	*94.6*		*70-125*	*%REC*	1	12/15/2008 04:20 PM
Surr: 4-Bromofluorobenzene	*98.8*		*72-125*	*%REC*	1	12/15/2008 04:20 PM
Surr: Dibromofluoromethane	*96.4*		*71-125*	*%REC*	1	12/15/2008 04:20 PM
Surr: Toluene-d8	*108*		*75-125*	*%REC*	1	12/15/2008 04:20 PM
ANIONS			**E300**			Analyst: **IGF**
Chloride	**120**		**5.00**	**mg/L**	10	12/19/2008 12:48 PM
Surr: Selenate (surr)	*91.6*		*85-115*	*%REC*	10	12/19/2008 12:48 PM

Qualifiers:

U - Analyzed for but Not Detected
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
a - Not accredited
S - Spike Recovery outside accepted recovery limits
P - Dual Column results percent difference > 40%
E - Value above quantitation range
H - Analyzed outside of Hold Time
n - Not offered for accreditation

ALS Laboratory Group

Date: *22-Dec-08*

Client: Tetra Tech
Project: ATB at Well #24
Work Order: 0812310
Sample ID: MW-4
Lab ID: 0812310-03
Collection Date: 12/12/2008 11:35 AM
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TCL VOLATILES			**SW8260**			Analyst: **PC**
Benzene	U		5.0	µg/L	1	12/15/2008 04:46 PM
Ethylbenzene	U		5.0	µg/L	1	12/15/2008 04:46 PM
Toluene	U		5.0	µg/L	1	12/15/2008 04:46 PM
Xylenes, Total	U		15	µg/L	1	12/15/2008 04:46 PM
Surr: 1,2-Dichloroethane-d4	*93.5*		*70-125*	*%REC*	1	12/15/2008 04:46 PM
Surr: 4-Bromofluorobenzene	*98.8*		*72-125*	*%REC*	1	12/15/2008 04:46 PM
Surr: Dibromofluoromethane	*95.9*		*71-125*	*%REC*	1	12/15/2008 04:46 PM
Surr: Toluene-d8	*105*		*75-125*	*%REC*	1	12/15/2008 04:46 PM
ANIONS			**E300**			Analyst: **IGF**
Chloride	**108**		**10.0**	**mg/L**	20	12/19/2008 03:30 PM
Surr: Selenate (surr)	*95.5*		*85-115*	*%REC*	20	12/19/2008 03:30 PM

Qualifiers:

U - Analyzed for but Not Detected
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
a - Not accredited
S - Spike Recovery outside accepted recovery limits
P - Dual Column results percent difference > 40%
E - Value above quantitation range
H - Analyzed outside of Hold Time
n - Not offered for accreditation

ALS Laboratory Group

Client: Tetra Tech

Work Order: 0812310

Project: ATB at Well #24

Date: *22-Dec-08*

QC BATCH REPORT

Batch ID: **R71249** Instrument ID **VOA1** Method: **SW8260**

MBLK Sample ID: **VBLKW-121508-R71249** Units: **µg/L** Analysis Date: **12/15/2008 12:33 PM**

Client ID: Run ID: **VOA1_081215A** SeqNo: **1560063** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	5.0								
Ethylbenzene	U	5.0								
Toluene	U	5.0								
Xylenes, Total	U	15								
Surr: 1,2-Dichloroethane-d4	*49.53*	5.0	*50*	0	*99.1*	*70-125*	0			
Surr: 4-Bromofluorobenzene	*50.5*	5.0	*50*	0	*101*	*72-125*	0			
Surr: Dibromofluoromethane	*49.71*	5.0	*50*	0	*99.4*	*71-125*	0			
Surr: Toluene-d8	*52.89*	5.0	*50*	0	*106*	*75-125*	0			

LCS Sample ID: **VLCSW-121508-R71249** Units: **µg/L** Analysis Date: **12/15/2008 12:58 PM**

Client ID: Run ID: **VOA1_081215A** SeqNo: **1560064** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	49.96	5.0	50	0	99.9	73-121	0			
Ethylbenzene	50.59	5.0	50	0	101	80-120	0			
Toluene	50.13	5.0	50	0	100	80-120	0			
Xylenes, Total	147.4	15	150	0	98.3	80-120	0			
Surr: 1,2-Dichloroethane-d4	*50.14*	5.0	*50*	0	*100*	*70-125*	0			
Surr: 4-Bromofluorobenzene	*50.71*	5.0	*50*	0	*101*	*72-125*	0			
Surr: Dibromofluoromethane	*50.44*	5.0	*50*	0	*101*	*71-125*	0			
Surr: Toluene-d8	*50.74*	5.0	*50*	0	*101*	*75-125*	0			

MS Sample ID: **0812245-04AMS** Units: **µg/L** Analysis Date: **12/15/2008 03:05 PM**

Client ID: Run ID: **VOA1_081215A** SeqNo: **1560066** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	50.14	5.0	50	0	100	73-121	0			
Ethylbenzene	47.63	5.0	50	0	95.3	80-120	0			
Toluene	47.31	5.0	50	0	94.6	80-120	0			
Xylenes, Total	141.3	15	150	0	94.2	80-120	0			
Surr: 1,2-Dichloroethane-d4	*48.15*	5.0	*50*	0	*96.3*	*70-125*	0			
Surr: 4-Bromofluorobenzene	*49.8*	5.0	*50*	0	*99.6*	*72-125*	0			
Surr: Dibromofluoromethane	*49.14*	5.0	*50*	0	*98.3*	*71-125*	0			
Surr: Toluene-d8	*50.24*	5.0	*50*	0	*100*	*75-125*	0			

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

O - Referenced analyte value is > 4 times amount spiked

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

P - Dual Column results percent difference > 40%

B - Analyte detected in assoc. Method Blank

U - Analyzed for but not detected

E - Value above quantitation range

Client: Tetra Tech
Work Order: 0812310
Project: ATB at Well #24

QC BATCH REPORT

Batch ID: **R71249** Instrument ID **VOA1** Method: **SW8260**

MSD Sample ID: **0812245-04AMSD** Units: **µg/L** Analysis Date: **12/15/2008 03:30 PM**

Client ID: Run ID: **VOA1_081215A** SeqNo: **1560067** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	50.09	5.0	50	0	100	73-121	50.14	0.115	20	
Ethylbenzene	51.39	5.0	50	0	103	80-120	47.63	7.59	20	
Toluene	50.54	5.0	50	0	101	80-120	47.31	6.59	20	
Xylenes, Total	145.6	15	150	0	97.1	80-120	141.3	3.02	20	
Surr: 1,2-Dichloroethane-d4	*46.98*	5.0	*50*	0	*94*	*70-125*	48.15	*2.46*	*20*	
Surr: 4-Bromofluorobenzene	*52.12*	5.0	*50*	0	*104*	*72-125*	49.8	*4.57*	*20*	
Surr: Dibromofluoromethane	*49.18*	5.0	*50*	0	*98.4*	*71-125*	49.14	*0.0693*	*20*	
Surr: Toluene-d8	*54.88*	5.0	*50*	0	*110*	*75-125*	50.24	*8.83*	*20*	

The following samples were analyzed in this batch: 0812310-01A 0812310-02A 0812310-03A

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
O - Referenced analyte value is > 4 times amount spiked
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
P - Dual Column results percent difference > 40%
B - Analyte detected in assoc. Method Blank
U - Analyzed for but not detected
E - Value above quantitation range

Client: Tetra Tech
Work Order: 0812310
Project: ATB at Well #24

QC BATCH REPORT

Batch ID: **R71470** Instrument ID **ICS3000** Method: **E300**

MBLK Sample ID: **WBLKW1-121908-R71470** Units: **mg/L** Analysis Date: **12/19/2008 10:26 AM**
Client ID: Run ID: **ICS3000_081219A** SeqNo: **1564298** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.50								
Surr: Selenate (surr)	*4.782*	0.10	*5*	0	*95.6*	*85-115*	0			

LCS Sample ID: **WLCSW2-121908-R71470** Units: **mg/L** Analysis Date: **12/19/2008 10:49 AM**
Client ID: Run ID: **ICS3000_081219A** SeqNo: **1564299** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.66	0.50	20	0	98.3	90-110	0			
Surr: Selenate (surr)	*4.851*	0.10	*5*	0	*97*	*85-115*	0			

MSD Sample ID: **0812310-03BMS** Units: **mg/L** Analysis Date: **12/19/2008 04:16 PM**
Client ID: **MW-4** Run ID: **ICS3000_081219A** SeqNo: **1564313** Prep Date: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	298.5	10	200	107.7	95.4	80-120	0			
Surr: Selenate (surr)	*93.83*	2.0	*100*	0	*93.8*	*85-115*	0			

DUP Sample ID: **0812310-03BDUP** Units: **mg/L** Analysis Date: **12/19/2008 03:53 PM**
Client ID: **MW-4** Run ID: **ICS3000_081219A** SeqNo: **1564312** Prep Date: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	107.8	10	0	0	0	0-0	107.7	0.143	20	
Surr: Selenate (surr)	*95.82*	2.0	*100*	0	*95.8*	*85-115*	95.48	*0.358*	*20*	

The following samples were analyzed in this batch: 0812310-03B

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
O - Referenced analyte value is > 4 times amount spiked
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
P - Dual Column results percent difference > 40%
B - Analyte detected in assoc. Method Blank
U - Analyzed for but not detected
E - Value above quantitation range

Client: Tetra Tech
Work Order: 0812310
Project: ATB at Well #24

QC BATCH REPORT

Batch ID: **R71472** Instrument ID **ICS3000** Method: **E300**

MBLK Sample ID: **WBLKW2-121908-R71472** Units: **mg/L** Analysis Date: **12/19/2008 10:11 AM**
Client ID: Run ID: **ICS3000_081219C** SeqNo: **1564357** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.50								
Surr: Selenate (surr)	*4.753*	0.10	*5*	0	*95.1*	*85-115*	0			

LCS Sample ID: **WLCSW2-121908-R71472** Units: **mg/L** Analysis Date: **12/19/2008 10:34 AM**
Client ID: Run ID: **ICS3000_081219C** SeqNo: **1564358** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.7	0.50	20	0	98.5	90-110	0			
Surr: Selenate (surr)	*4.753*	0.10	*5*	0	*95.1*	*85-115*	0			

MS Sample ID: **0812349-28BMS** Units: **mg/L** Analysis Date: **12/19/2008 07:16 PM**
Client ID: Run ID: **ICS3000_081219C** SeqNo: **1564371** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	10.13	0.50	10	0.615	95.2	80-120	0			
Surr: Selenate (surr)	*4.656*	0.10	*5*	0	*93.1*	*85-115*	0			

DUP Sample ID: **0812349-28BDUP** Units: **mg/L** Analysis Date: **12/19/2008 06:53 PM**
Client ID: Run ID: **ICS3000_081219C** SeqNo: **1564370** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.488	0.50	0	0	0	0-0	0.615	0	20	J
Surr: Selenate (surr)	*4.597*	0.10	*5*	0	*91.9*	*85-115*	4.613	*0.347*	*20*	

The following samples were analyzed in this batch: 0812310-01B 0812310-02B

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
O - Referenced analyte value is > 4 times amount spiked
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
P - Dual Column results percent difference > 40%
B - Analyte detected in assoc. Method Blank
U - Analyzed for but not detected
E - Value above quantitation range

[X] **ALS Laboratory Group**
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

Chain of Custody Form

Page 1 of 1

[ ] **ALS Laboratory Group**
3352 128th Ave.
Holland, MI 49424-9263
Tel: +1 616 399 6070
Fax: +1 616 399 6185

ALS Project Manager: | ALS Work Order #: 0812310

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	ATB at Well #24 Lea County, NM	A	VOC (8260) BTEX
Work Order		Project Number	115-6402944	B	Anions (300) Chloride
Company Name	Tetra Tech	Bill To Company	CRA	C	
Send Report To	Tim Reed	Invoice Attn	Darla Stewart	D	
Address	1910 N. Big Spring St	Address	2055 Niagara Falls Blvd	E	
			Suite #3	F	
City/State/Zip	Midland, TX 79705	City/State/Zip	Niagara Falls, NY 14304	G	
Phone	(432) 682-4559	Phone	(716) 297-6150	H	
Fax		Fax		I	
e-Mail Address	Tim.reed@tetratech.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-2	12-12-08	1025	H2O	HCl	4	✓	✓									
2	MW-3	↓	1100	↓	↓	↓	✓	✓									
3	MW-4	↓	1135	↓	↓	↓	✓	✓									
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Robert Gable [signature]

Shipment Method: Fed-Ex

Required Turnaround Time: (Check Box) [X] Std 10 WK Days [ ] 5 WK Days [ ] Other [ ] 2 WK Days [ ] 24 Hour

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
[signature]	12-12-08	1350	
Relinquished by:	Date: 12/13/08	Time: 0940	Received by (Laboratory): [signature]
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: 10 Work Day TAT.

Cooler ID | Cooler Temp.

QC Package: (Check One Box Below)
- [X] Level II Std QC
- [ ] Level III Std QC/Raw Data
- [ ] Level IV SW846/CLP
- [ ] Other ____________
- [ ] TRRP CheckList
- [ ] TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Laboratory Group.
2. Unless otherwise agreed in a formal contract, services provided by ALS Laboratory Group are expressly limited to the terms and conditions stated on the reverse.

ALS Laboratory Group

Sample Receipt Checklist

Client Name: TETRA TECH MIDLAND

Date/Time Received: 12/13/2008 09:15

Work Order Number 0812310

Received by: ECD

Checklist completed by W Signature Date 12/13/08

Reviewed by Initials Date 12/15/08

Matrix:

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ✓	No	Not Present
Custody seals intact on shipping container/cooler?	Yes ✓	No	Not Present
Custody seals intact on sample bottles?	Yes	No	Not Present ✓
Chain of custody present?	Yes ✓	No	
Chain of custody signed when relinquished and received?	Yes ✓	No	
Chain of custody agrees with sample labels?	Yes ✓	No	
Samples in proper container/bottle?	Yes ✓	No	
Sample containers intact?	Yes ✓	No	
Sufficient sample volume for indicated test?	Yes ✓	No	
All samples received within holding time?	Yes ✓	No	
Container/Temp Blank temperature in compliance?	Yes ✓	No	
Temperature(s)/Thermometer(s):	1.9	004	
Cooler(s)/Kit(s):	1821		
Water - VOA vials have zero headspace?	Yes ✓	No	No VOA vials submitted
Water - pH acceptable upon receipt?	Yes ✓	No	N/A

Adjusted? Checked by

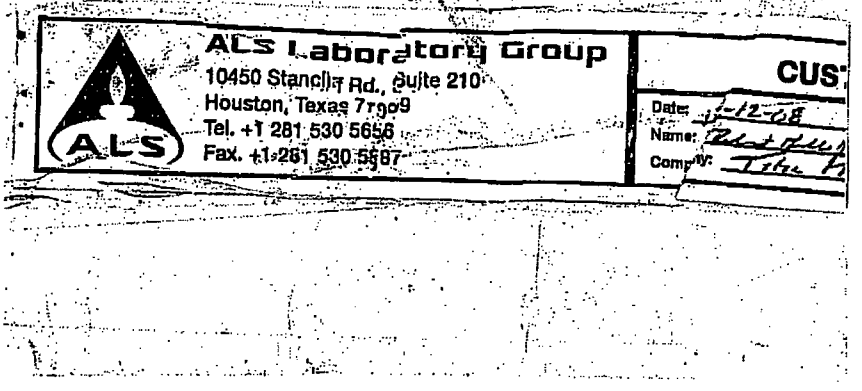
Login Notes: Trip Blanks logged in without analysis

Client contacted: Date contacted: Person contacted

Contacted by: Regarding:

Comments:

Corrective Action



ALS Laboratory Group
10450 Stancliff Rd., Suite 210
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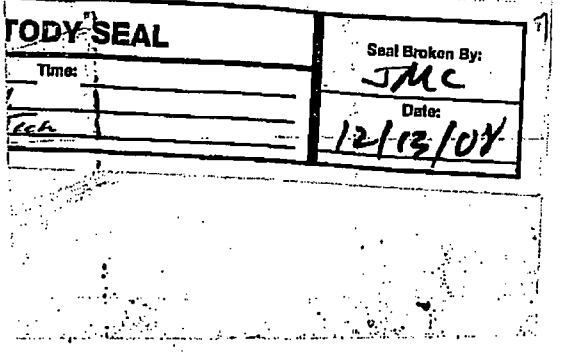
CUS

Date: 12-12-08
Name:
Comp'y:



TODY SEAL

Time:

Seal Broken By:
JMC

Date:
12/13/08

CONESTOGA-ROVERS & ASSOCIATES

9033 Meridian Way, West Chester, Ohio 45069
Telephone: (513) 942-4750 Fax: (513) 942-8585
www.CRAworld.com

MEMORANDUM

TO: Tim Reed (Timothy.Reed@TetraTech.com)

REF. NO.: 55625 [55625DM-95]

FROM: Deborah Brennan/bjw/1-NF DB/bjw

DATE: July 15, 2009

CC: Angela Bown

E-Mail and Hard Copy if Requested

RE: **Analytical Results and QA/QC Review**
Quarterly Groundwater Monitoring Program
PXP-Hill, E.C. "B" ATB at Well #24 Site
Lea County, New Mexico
June 2009

INTRODUCTION

Groundwater samples were collected in June 2009 in support of the Quarterly Groundwater Monitoring Program at the PXP-Hill, E.C. "B" ATB at Well #24 Site. Accutest Laboratories (Accutest) in Houston, Texas and Dayton, New Jersey analyzed the samples for the following:

Parameter	*Methodology*
Select Volatile Organic Compounds (VOCs)	SW-846 8260B[1]
Chloride	EPA 300[2]

A field key is presented in Table 1. The analytical results are summarized in Table 2. The quality assurance/quality control (QA/QC) criteria by which these data have been assessed are outlined in the analytical methods, the "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review," October 1999, and the "National Functional Guidelines for Inorganic Data Review," February 1994.

Data assessment was based on information obtained from the Chain of Custody form, finished data sheets, blank data, surrogate recoveries, and blank spike recoveries. A copy of the Chain of Custody is attached.

QA/QC REVIEW

All samples were prepared and analyzed within the method required holding times.

1 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and subsequent revisions.

2 "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

Surrogate compounds were added to all samples, blanks, and QC samples prior to VOC analysis. All surrogate recoveries were acceptable, demonstrating good analytical accuracy.

Method blanks were analyzed for all parameters. Target compounds were not detected in the method blanks indicating that contamination was not an issue for this event.

Blank spike (BS) samples were prepared and analyzed for all parameters. The BS analyses demonstrated acceptable analytical accuracy.

While a Duplicate analysis was performed for the Chloride and MS/MSD analyses were performed for all VOCs, the samples chosen were not from this project. The data was not evaluated on this basis.

One trip blank was submitted to the laboratory and analyzed for the selected VOCs (see Table 1). Trip blanks are collected to assess contamination from sample bottles, preservation, and storage. All results were non-detect for the VOCs of interest.

One field duplicate sample set was submitted for analysis. The data indicate that an adequate level of precision was achieved for the sampling event.

CONCLUSION

Based on the preceding assessment, the data were acceptable for use without qualifications.

TABLE 1

SAMPLE COLLECTION AND ANALYSIS SUMMARY
QUARTERLY GROUNDWATER MONITORING
PXP-HILL, E.C. "B" ATB AT WELL #24
LEA COUNTY, NEW MEXICO
JUNE 2009

			Analysis/Parameters		
Sample I.D.	*Collection Date (mm/dd/yy)*	*Collection Time (hr:min)*	*VOCs (BTEX)*	*Chloride*	*Comments*
MW-2	06/22/09	11:15	X	X	
MW-3	06/22/09	11:25	X	X	
MW-4	06/22/09	11:35	X	X	
Dup#1	06/22/09	-	X	X	Field Duplicate of MW-4
Trip Blank	06/22/09	-	X		

Notes:

BTEX Benzene, Toluene, Ethylbenzene and Xylene.
VOCs Volatile Organic Compounds.

TABLE 2

ANALYTICAL RESULTS SUMMARY
QUARTERLY GROUNDWATER MONITORING
PXP-HILL, E.C. "B" ATB AT #24
LEA COUNTY, NEW MEXICO
JUNE 2009

	Sample Location:	*MW-2*	*MW-3*	*MW-4*	*MW-4*
	Sample ID:	*MW-2*	*MW-3*	*MW-4*	*DUP#1*
	Sample Date:	*6/22/2009*	*6/22/2009*	*6/22/2009*	*6/22/2009*
					(Duplicate)
Parameters	*Units*				
Volatile Organic Compounds - BTEX					
Benzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U
Xylene (total)	µg/L	3.0 U	3.0 U	3.0 U	3.0 U
General Chemistry					
Chloride	mg/L	254	115	110	109

Notes:

U - Not present at or above the associated value.

ACCUTEST Laboratories

CHAIN OF CUSTODY

PAGE ___ OF ___

10165 Harwin Dr. Ste 150 Houston, TX 77036
TEL. 713-271-4700 FAX: 713-271-4770
www.accutest.com

FED-EX Tracking # | Bottle Order Control #
Accutest Quote # | Accutest Job # T31878

Client / Reporting Information

Company Name: Conestoga Rover & Associates
Street Address: 9033 Meridian Way
City: West Chester State: OH Zip: 45069
Project Contact: Angela Bown E-mail: abown@craworld.com
Phone #: 513-942-4750 Fax #:
Sampler(s) Name(s): Phone #:

Project Information

Project Name: GSHI PXP Hill, E.C. "B" ATB at Well #24
Street:
City: State: NM
Project #: 55625DM (ENV749A007)
Client Purchase Order #: 4501319169
Project Manager:

Billing Information (If different from Report to)
Company Name: GSHI c/o CRA
Street Address: 2055 Niagara Falls Blvd, Suite 3
City: Niagara Falls State: NY Zip: 14304
Attention: Jan Devonshire

Requested Analyses

Accutest Sample #	Field ID / Point of Collection	Date	Time	Sampled By	Matrix	# of bottles	HCl	NaOH	ZnAc/NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	TSP	NaHSO4	ENCORE	OTHER	V8260BTX	Chloride	LAB USE ONLY
		6/22/05																	X	X	
1	MW-2	↓	1115	JT/JJ	GW	4	3					1							X	X	
2	MW-3	↓	1125	JT/JJ	↓	↓	3					1							X	X	
3	MW-4	↓	1135	JT/JJ	↓	↓	3					1							X	X	
4	Dup #1	↓	—	JT/JJ	↓	↓	3					1							X	X	
5	Trip Blank	6/[illegible]/05	1300	JT/JJ	NTB	3	3												X		

Matrix Codes:
DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL - Sludge
SED - Sediment
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid
WP - Wipe
FB - Field Blank

Turnaround Time (Business days)

- [X] Standard
- [ ] 5 Day RUSH
- [ ] 4 Day RUSH
- [ ] 3 Day RUSH
- [ ] 2 Day RUSH
- [ ] 1 Day EMERGENCY

Emergency & Rush T/A data available VIA Lablink

Approved By (Accutest PM): / Date:

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [X] Commercial "B" (Level 2)
- [ ] FULT1 (Level 3+4)
- [ ] REDT1 (Level 3+4)
- [ ] Commercial "C"
- [ ] TRRP
- [ ] EDD Format
- [ ] Other_______

Commercial "A" = Results Only
Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC & Surrogate Summary

Comments / Special Instructions

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1 [signature]	6/23/05 1300	1	2 [signature]	6.24.05 930	2 [signature]
3 Relinquished by Sampler:	Date Time:	3 Received By:	4 Relinquished By:	Date Time:	4 Received By:
5 Relinquished by:	Date Time:	5 Received By:	Custody Seal # ☐ Intact ☐ Not intact	Preserved where applicable ☐	On Ice / Cooler Temp. 3.2

4.1

4

T31878: Chain of Custody