

**3R - 407**

**2011 AGWMR**

**08/20/2012**



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**EL PASO CGP COMPANY**

1001 LOUISIANA STREET  
HOUSTON, TX 77002

**2011 ANNUAL REPORT  
PIT GROUNDWATER REMEDIATION  
VOLUME 3: GALLEGOS CANYON UNIT #124E**

**AUGUST 2012**



**MWH**

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**2011 ANNUAL GROUNDWATER REPORT  
NAVAJO SITES VOLUME III  
EL PASO CGP COMPANY**

**TABLE OF CONTENTS**

<b>METER or LINE ID</b>	<b>NMOCD CASE NO.</b>	<b>SITE NAME</b>	<b>TOWNSHIP</b>	<b>RANGE</b>	<b>SECTION</b>	<b>UNIT</b>
95608	3RP-407-0	Gallegos Canyon Unit #124E	28N	12W	35	N



**MWH**





**LEGEND**

- Sites on Federal Land
- Sites on Navajo Nation Land
- ▲ Sites on State/Fee "Non-Federal" Lands

\*Closure Request Pending with the NMOCD.



PROJECT: SAN JUAN RIVER BASIN

TITLE: Site Locations

FIGURE:

1

## **LIST OF ACRONYMS**

AMSL	above mean sea level
BTEX	benzene, toluene, ethylbenzene, xylenes
btoc	below top of casing
EPCGP	El Paso CGP Company
ft	foot/feet
GWEL	groundwater elevation
ID	identification
MW	monitoring well
NMWQCC	New Mexico Water Quality Control Commission
TOC	top of casing
NA	not applicable
NMOCD	New Mexico Oil Conservation Division
NS	not sampled
ORC	oxygen-releasing compound
µg/L	micrograms per liter

**EPCGP GROUNDWATER SITES  
2011 ANNUAL GROUNDWATER REPORT**

**GCU #124E  
Meter Code: 95608**

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**SITE DETAILS**

<b>Legal Description:</b>	<b>Town:</b>	28N	<b>Range:</b>	12W	<b>Sec:</b>	35	<b>Unit:</b>	N
<b>NMOCD Haz Ranking:</b>	20	<b>Land Type:</b>	Navajo	<b>Operator:</b>	BP / Amoco Production			

**PREVIOUS ACTIVITIES**

<b>Site Assessment:</b>	Jan/95	<b>Excavation:</b>	Oct/95 (196 cy)	<b>Soil Boring:</b>	Mar/98
<b>Monitor Well:</b>	Jun/98	<b>Geoprobe:</b>	NA	<b>Additional MWs:</b>	*
<b>Downgradient MWs:</b>	*	<b>Replace MW:</b>	NA	<b>Quarterly Initiated:</b>	Jun/98
<b>ORC Nutrient Injection:</b>	NA	<b>Re-Excavation:</b>	NA	<b>PSH Removal Initiated:</b>	Apr/99
<b>Annual Initiated:</b>	NA	<b>Quarterly Resumed:</b>	NA	<b>PSH Removal in 2011?</b>	No

\* Attempts were made in November 2000 to install additional wells that resulted in dry holes.

**SUMMARY OF 2011 ACTIVITIES**

**MW-1:** Semiannual groundwater sampling (February and September) was performed in 2011. Quarterly water level monitoring was also conducted in 2011.

**Site-Wide Activities:** No other activities were performed at this Site during 2011.

**SITE MAP**

Site maps (February and September) are attached as Figures 1 and 2.

**SUMMARY TABLES AND GRAPHS**

- Historic analytical and water level data are summarized in Table 1 and presented graphically in Figure 3.
- Historic free-product recovery data are summarized in Table 2 and presented graphically in Figure 3.
- The 2011 laboratory reports are presented in Attachment 1 (included on CD).
- The 2011 field documentation is presented in Attachment 2 (included on CD).

**EPCGP GROUNDWATER SITES  
2011 ANNUAL GROUNDWATER REPORT**

**GCU #124E  
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**GEOLOGIC LOGS AND WELL COMPLETION DIAGRAMS**

No subsurface activities were performed at this Site during 2011.

**DISPOSITION OF GENERATED WASTES**

All purge water was taken to the El Paso Natural Gas Rio Vista Compressor Station.

**ISOCONCENTRATION MAPS**

No isoconcentration maps were generated for this Site; however, the attached Site maps present the analytical data collected during 2011.

**RESULTS**

- The semiannual benzene results were 109 µg/L and 288 µg/L for February and September 2011, respectively. These results are in a similar range as those observed since mid to late 2008, when seasonal irrigation (from NAPI) apparently resulted in significant increases in BTEX concentrations. In general, though, the benzene concentrations have attenuated significantly from a high of 2,960 µg/L observed in 1999.
- The concentrations of total xylenes increased in 2011 to 1,020 µg/L, in apparent connection with the elevated water levels at the site.
- The other BTEX constituent concentrations were below all applicable standards during 2011. Overall, toluene appears to be the BTEX constituent that has attenuated most significantly over time.
- Gauging at MW-1 did not detect any free-product in 2011. Measurable free-product has not been detected in the well since 2003. Virtually all of the free-product recovery was completed by the end of 2002 (approximately 19 gallons). At times, a sheen is observed on the water during bailing activities.

**REMAINING CLOSURE REQUIREMENTS**

- This site is being managed per the procedures set forth in the document entitled, "Remediation Plan for Groundwater Encountered During Pit Closure Activities" (El Paso Natural Gas Company / El Paso Field Services Company, 1995). This remediation plan was conditionally approved by the New Mexico Oil Conservation Division (OCD) in correspondence dated November 30, 1995; and the OCD approval conditions were adopted into El Paso's program methods.
- In order to meet the remaining closure requirements at this site, the following condition must be achieved: groundwater contaminant concentrations in the monitor wells must meet the NMWOCC standards for at least 4 consecutive

**EPCGP GROUNDWATER SITES  
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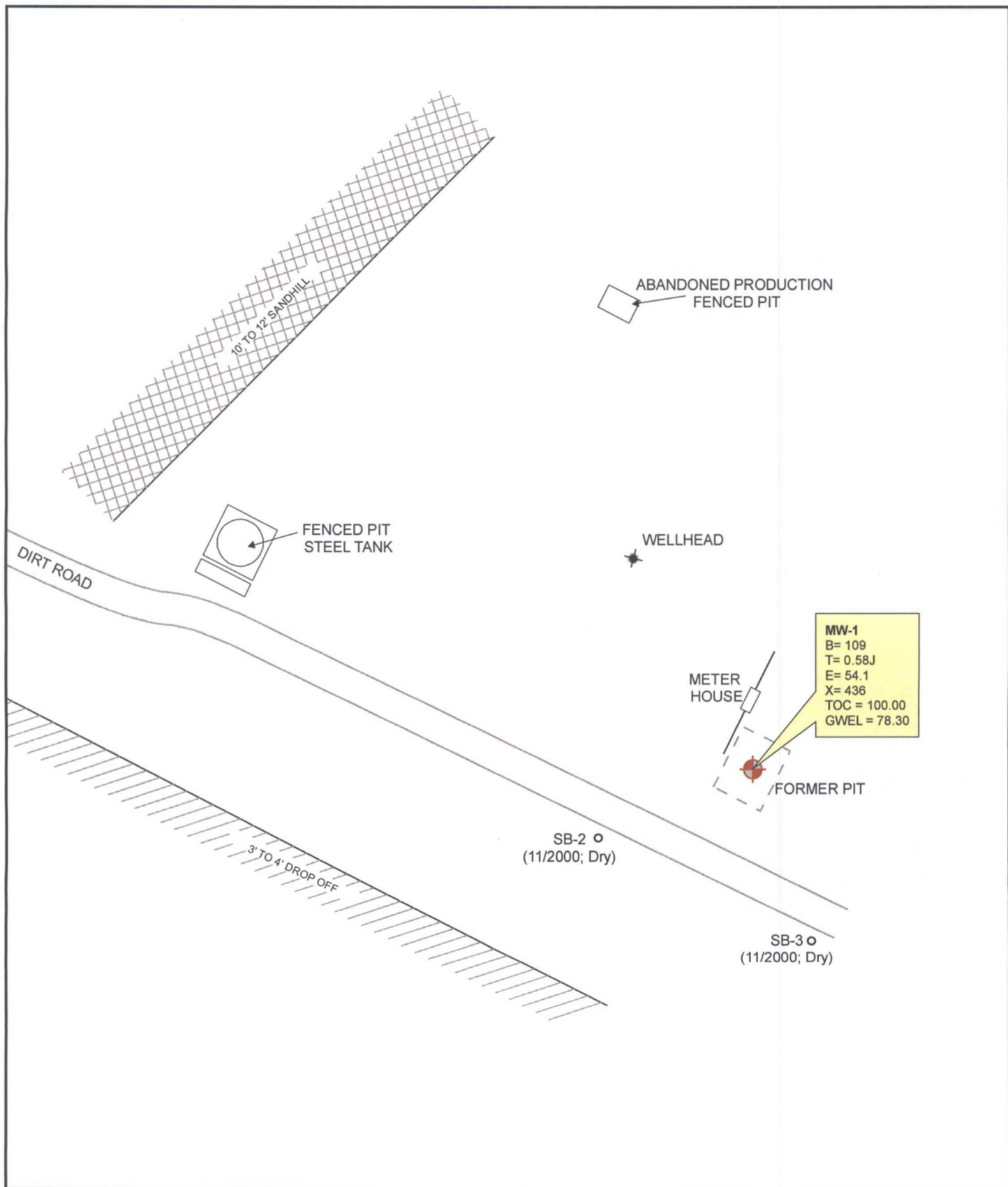
quarters. Alternatively, concentrations must be reduced to below background levels; however, there are no established background concentrations for the remaining constituents of concern. Currently, MW-1 requires additional monitoring. The remaining applicable standards are:

<b>Constituent</b>	<b>NMWQCC GW Standard (µg/L)</b>
Benzene	10
Toluene	750
Ethylbenzene	750
Total Xylenes	620

**RECOMMENDATIONS**

- EPCGP recommends continued semiannual sampling at MW-1, along with quarterly water level gauging.
- At this site, it appears that the benzene, ethylbenzene, and total xylenes concentrations have risen significantly in response to the significant increased water level elevations observed starting in 2008. The borehole log of MW-1 indicates that the subsurface is generally sandy, with differing degrees of consolidation present, particularly below approximately 10 feet bgs. In 2003, the operator closed a blowdown pit in place (with no excavation performed) that showed significant impacts (e.g., TPH of 966 ppm at the 9 feet bgs floor, which was described as sandstone bedrock). This was done with the belief that static groundwater was greater than 50 feet deep. EPCGP will be working in 2012 to more carefully evaluate potential operator sources as well as remedial alternatives for the site. EPCGP will present its findings in the 2012 annual report.
- Once the benzene concentrations again approach the standard, sampling will return to a quarterly frequency until BTEX concentrations are below the applicable NNEPA/USEPA standards for three consecutive quarters and NMWQCC standards for four consecutive quarters.





### LEGEND

**MW-1**  Existing Monitoring / Observation Well

**B** Benzene (ug/L)

**T** Toluene (ug/L)

**E** Ethylbenzene (ug/L)

**X** Total Xylenes (ug/L)

**GWEL** Groundwater Elevation (ft. \*)

\* = Elevations in feet relative to a 100 ft benchmark.

**J** Result Flagged as Estimated

0 10 20 40 60 80 Feet

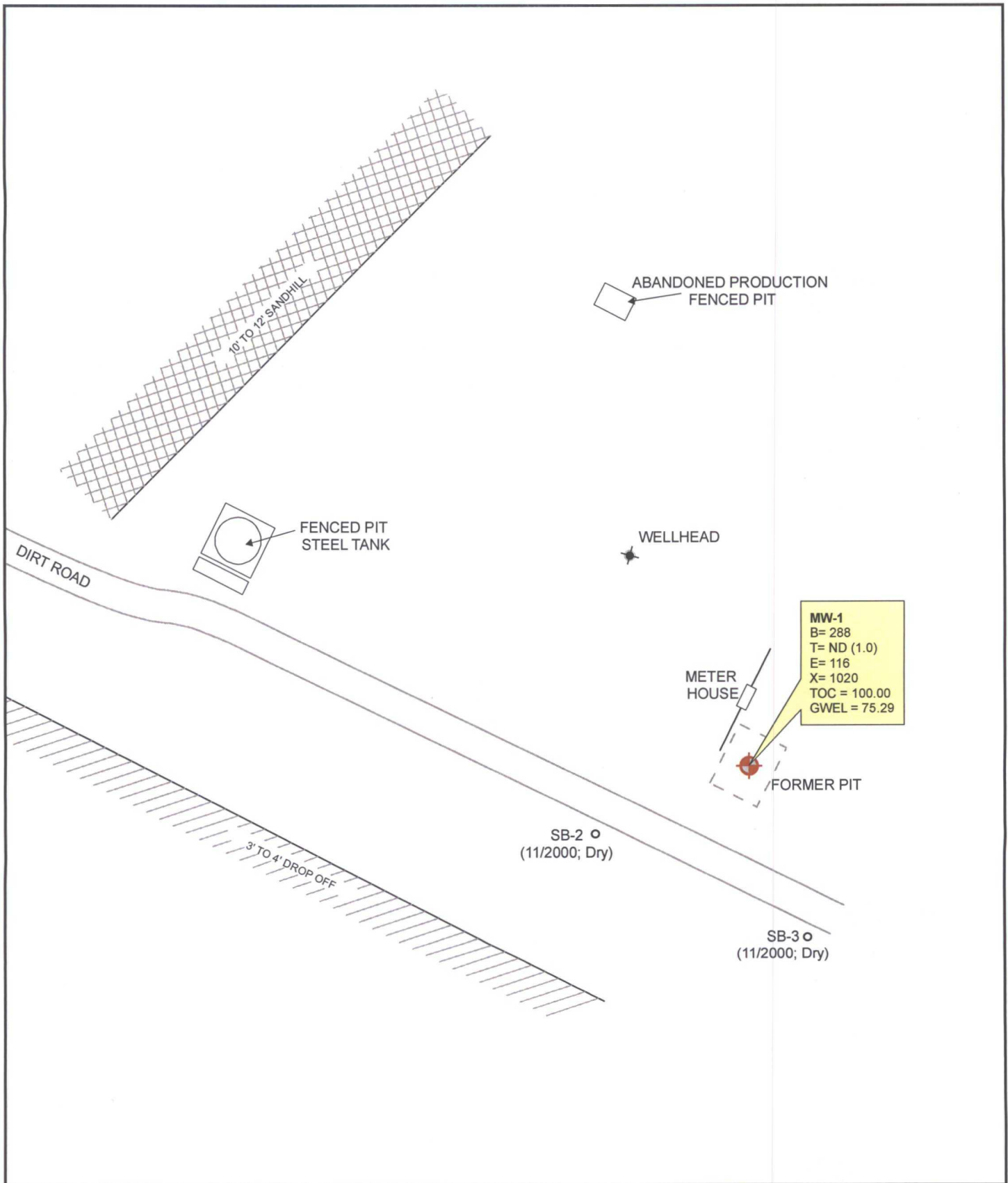


PROJECT: GALLEGOS CANYON UNIT #124E

TITLE: Groundwater Potentiometric Surface Map,  
and BTEX Concentrations - February 1, 2011

FIGURE:

1



### LEGEND

**MW-1** Existing Monitoring / Observation Well

**B** Benzene (ug/L)

**T** Toluene (ug/L)

**E** Ethylbenzene (ug/L)

**X** Total Xylenes (ug/L)

**GWEL** Groundwater Elevation (ft. \*)

\* = Elevations in feet relative to a 100 ft benchmark.

**ND** Not Detected; Reporting Limit Shown in Parentheses

0 10 20 40 60 80 Feet



**MWH**

PROJECT:

GALLEGOS CANYON UNIT #124E

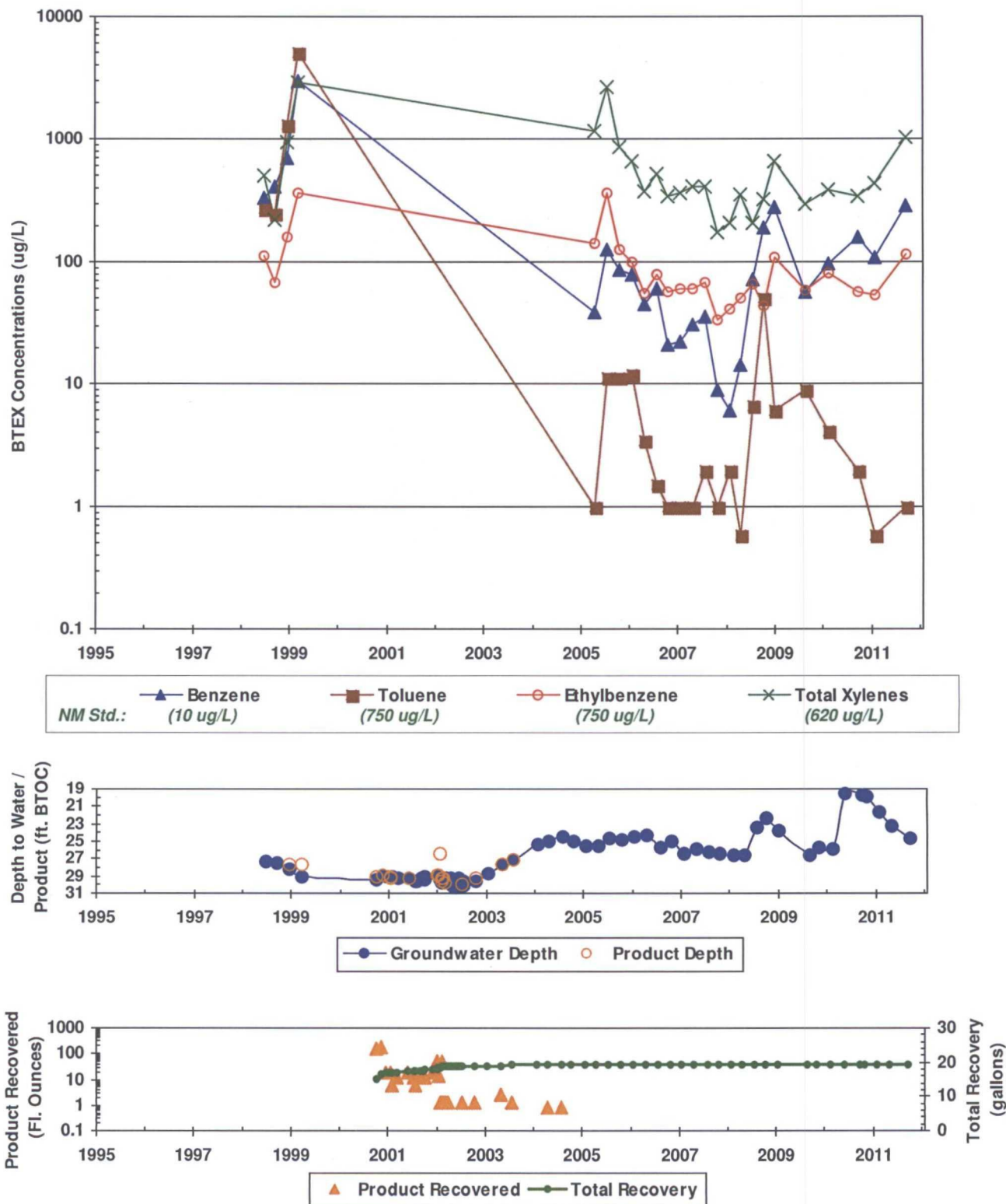
TITLE:

Groundwater Potentiometric Surface Map,  
and BTEX Concentrations - September 23, 2011

FIGURE:

**2**

**FIGURE 3**  
**SUMMARY OF GROUNDWATER BTEX CONCENTRATIONS, FLUID LEVELS, AND PRODUCT RECOVERY**  
**GCU #124E (METER #95608)**  
**MW-1**



\*In some cases, older recovery event data are not available. However, the cumulative totals still include all historic recovery.



**TABLE 1**  
**SUMMARY OF BTEX COMPOUNDS IN GROUNDWATER**  
**GCU #124E (METER #95608)**

Monitor Well	Sample Date	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes	Depth to Water (ft BTOC)	Corr. GW Elevation (Feet*)
NMWQCC GW Std.:		10	750	750	620		
MW-1	6/25/1998	340	271	111	510	27.21	72.79
MW-1	9/14/1998	410	251	68.3	220	27.50	72.50
MW-1	12/15/1998	710	1300	160	940	28.16	72.28
MW-1	3/16/1999	2960	5130	367	2890	29.02	72.12
MW-1	4/19/2005	38.8	<1.0	142	1160	25.45	74.55
MW-1	7/20/2005	125	11.4	371	2640	24.73	75.27
MW-1	10/20/2005	86.8	11.3	125	864	24.85	75.15
MW-1	1/19/2006	77.9	12.0	101	656	24.53	75.47
MW-1	4/24/2006	45.1	3.5J	56.1	377	24.25	75.75
MW-1	7/31/2006	60.8	1.5J	79.3	524	25.68	74.32
MW-1	10/24/2006	21.1	<1.0	56.6	349	24.94	75.06
MW-1	1/19/2007	22.4	<1.0	60.0	367	26.33	73.67
MW-1	4/24/2007	30.3	<1.0	60.6	407	25.97	74.03
MW-1	7/31/2007	35.3	<2.0	68.4	416	26.26	73.74
MW-1	10/25/2007	9.0	<1.0	33.2	173	26.44	73.56
MW-1	1/28/2008	6.0	<2.0	41.6	210	26.67	73.33
MW-1	4/23/2008	14.1	0.59J	50.1	360	26.67	73.33
MW-1	7/23/2008	72.7	6.7	65.8	210	23.49	76.51
MW-1	10/8/2008	194	<50	43.6J	328	22.30	77.70
MW-1	1/7/2009	281	6J	110	653	23.74	76.26
MW-1	8/25/2009	57.9	8.8J	58.4	298	26.65	73.35
MW-1	2/15/2010	98.3	4.1	80.6	385	25.93	74.07
MW-1	9/27/2010	159	<2.0	56.4	348	19.78	80.22
MW-1	2/1/2011	109	0.58J	54.1	436	21.70	78.30
MW-1	9/23/2011	288	<1.0	116	1020	24.71	75.29

**Notes:**

Results shown in bold typeface exceed their respective New Mexico Water Quality Control Commission standards.

"J" = result is qualified as estimated. See laboratory report and/or supplemental data validation report for further detail.

"<" = analyte was not detected at the indicated reporting limit (some historic data were reported at the detection limit).

Static groundwater elevations have been corrected for product thickness where applicable. Specific gravity of 0.8 used.

\*This site has a benchmark elevation of 100 feet rather than mean sea level.

**TABLE 2**  
**SUMMARY OF FREE-PRODUCT REMOVAL**  
**GCU #124E (METER #95608)**

Monitor Well	Removal Date	Depth to Product (ft BTOC)	Depth to Water (ft BTOC)	Product Thickness (feet)	Volume Removed (gallons)	Cumulative Removal (gallons)	Corrected GW Elevation (Feet*)
MW-1	12/15/1998	27.61	28.16	0.55	NA	NA	72.28
MW-1	3/16/1999	27.60	29.02	1.42	NA	NA	72.12
MW-1	10/5/2000	29.04	29.46	0.42	1.25	15.30	70.88
MW-1	11/15/2000	28.93	28.93	0.00	1.50	16.80	71.07
MW-1	12/20/2000	--	28.98	0.00	0.15	16.95	71.02
MW-1	1/9/2001	29.18	29.21	0.03	--	16.95	70.81
MW-1	1/15/2001	29.04	29.07	0.03	--	16.95	70.95
MW-1	1/22/2001	--	28.99	0.00	0.15	17.10	71.01
MW-1	1/30/2001	--	29.09	0.00	0.05	17.15	70.91
MW-1	3/12/2001	--	29.26	0.00	0.10	17.25	70.74
MW-1	6/5/2001	29.28	29.32	0.04	0.15	17.40	70.71
MW-1	7/13/2001	--	29.65	0.00	0.10	17.50	70.35
MW-1	8/2/2001	--	29.53	0.00	0.05	17.55	70.47
MW-1	8/31/2001	--	29.27	0.00	0.10	17.65	70.73
MW-1	9/21/2001	--	29.33	0.00	0.10	17.75	70.67
MW-1	10/2/2001	--	28.98	0.00	0.10	17.85	71.02
MW-1	12/5/2001	NA	NA	NA	0.16	18.01	NA
MW-1	1/2/2002	28.85	28.96	0.11	0.16	18.16	71.13
MW-1	1/7/2002	28.94	28.99	0.05	0.38	18.54	71.05
MW-1	1/23/2002	26.35	29.35	3.00	0.11	18.65	73.05
MW-1	1/30/2002	29.22	29.24	0.02	0.01	18.66	70.78
MW-1	2/7/2002	29.66	29.70	0.04	0.38	19.04	70.33
MW-1	2/14/2002	29.28	29.29	0.01	0.01	19.05	70.72
MW-1	2/20/2002	29.75	29.76	0.01	0.01	19.06	70.25
MW-1	3/4/2002	--	29.30	0.00	0.01	19.07	70.70
MW-1	3/11/2002	--	29.17	0.00	0.01	19.08	70.83
MW-1	3/21/2002	--	29.47	0.00	0.01	19.09	70.53
MW-1	3/28/2002	--	29.33	0.00	0.01	19.10	70.67
MW-1	4/3/2002	--	29.33	0.00	0.01	19.11	70.67
MW-1	7/2/2002	29.98	29.99	0.01	--	19.11	70.02
MW-1	7/15/2002	--	29.63	0.00	0.01	19.12	70.37
MW-1	10/16/2002	29.24	29.65	0.41	0.01	19.13	70.68
MW-1	5/5/2003	27.69	27.72	0.03	0.02	19.15	72.30
MW-1	7/18/2003	27.06	27.08	0.02	0.01	19.16	72.94



**TABLE 2**

**SUMMARY OF FREE-PRODUCT REMOVAL  
GCU #124E (METER #95608)**

<b>Monitor Well</b>	<b>Removal Date</b>	<b>Depth to Product (ft BTOC)</b>	<b>Depth to Water (ft BTOC)</b>	<b>Product Thickness (feet)</b>	<b>Volume Removed (gallons)</b>	<b>Cumulative Removal (gallons)</b>	<b>Corrected GW Elevation (Feet*)</b>
<b>MW-1</b>	4/15/2004	--	24.98	0.00	0.01	19.17	75.02
<b>MW-1</b>	7/26/2004	--	24.50	0.00	0.01	19.18	75.50

**Notes:**

"--" indicates either that product was not measurably detected or that product was not recovered.

"NA" indicates that the respective data point is not available.

Groundwater elevations may not be static due to removal of equipment. Corrections for product thickness utilize SG of 0.8.

\*This site has a benchmark elevation of 100 feet rather than mean sea level.