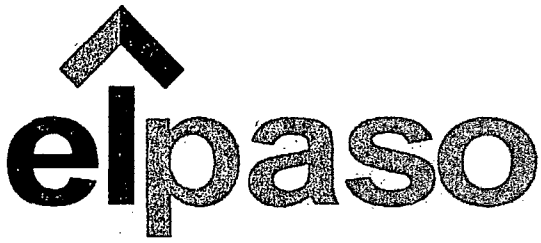
3R - 201

AGWMR

2009



El Paso Tennessee
Pipeline Company

San Juan Basin Pit Program
Groundwater Sites Project

Final 2009 Annual Report
Non-Federal Sites (Volume 2)

April 2010

MWH

1801 California Street, Suite 2900
Denver, Colorado 80202

2009 ANNUAL GROUNDWATER REPORT
NON-FEDERAL SITES VOLUME II

EL PASO TENNESSEE PIPELINE COMPANY

TABLE OF CONTENTS

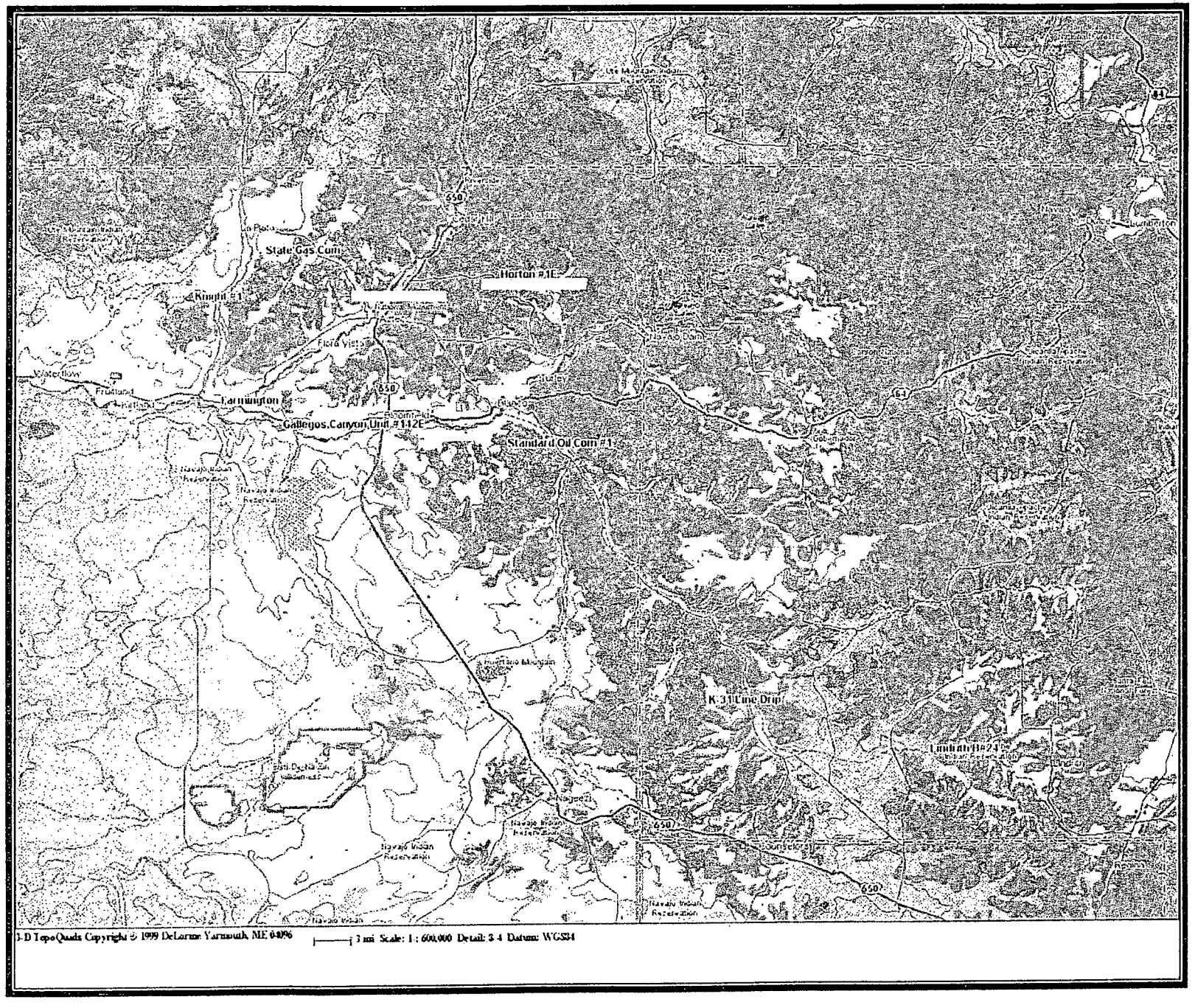
*The Lindrith B#24 site was submitted for closure in 2006 and is pending approval from NMOCD. There were no monitoring activities for this site in 2009.

elpaso MWH

LIST OF ACRONYMS

AMSL	above mean sea level
B	benzene
btoc	below top of casing
E	ethylbenzene
EPTPC	El Paso Tennessee Pipeline Company
ft	foot/feet
GWEL	groundwater elevation
ID	identification
MW	monitor well
NMWQCC	New Mexico Water Quality Control Commission
T	toluene
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
X	total xylenes

Non-Federal Groundwater Site Map



EPTPC GROUNDWATER SITES
2009 ANNUAL GROUNDWATER REPORT

Johnston Fed #4
Meter Code: 70194

SITE DETAILS

Legal Description: **Town:** 31N **Range:** 09W **Sec:** 33 **Unit:** H

NMOCD Haz Ranking: 40 **Land Type:** Fee **Operator:** ConocoPhillips

PREVIOUS ACTIVITIES

Site Assessment:	8/94	**Excavation:**	9/94 (60 cy)	**Soil Boring:**	8/95
Monitor Well:	8/95	**Geoprobe:**	9/97	**Additional MWs:**	12/95
Downgradient MWs:	12/95	**Replace MW:**	NA	**Quarterly Initiated:**	NA
ORC Nutrient Injection:	NA	**Re-Excavation:**	NA	**PSH Removal Initiated:**	9/97
Annual Initiated:	6/01	**Quarterly Resumed:**	NA	**PSH Removal in 2009?**	Yes

SUMMARY OF 2009 ACTIVITIES

MW-1: Annual groundwater sampling (June) and quarterly water level monitoring were performed during 2009.

MW-2: Annual groundwater sampling (June) and quarterly water level monitoring were performed during 2009.

MW-3: Annual groundwater sampling (June) and quarterly free-product recovery were performed during 2009.

MW-4: Annual groundwater sampling (June) and quarterly water level monitoring were performed during 2009.

TMW-5: Annual groundwater sampling (June) and quarterly water level monitoring were performed during 2009.

Site-Wide Activities: No other activities were performed at this Site in 2009.

SITE MAP

A Site map (June) is attached as Figure 1.

SUMMARY TABLES AND GRAPHS

- Historic analytical and water level data are summarized in Table 1 and presented graphically in Figures 2 through 6. Where applicable, static water level elevations were corrected for measurable thicknesses of free-product (specific gravity of 0.8).

- Historic free-product recovery data are summarized in Table 2 and presented graphically in Figures 2 and 4.
- The 2009 laboratory report is presented in Attachment 1 (included on CD).
- The 2009 field documentation is presented in Attachment 2 (included on CD).

GEOLOGIC LOGS AND WELL COMPLETION DIAGRAMS

No subsurface activities were performed at this Site during 2009.

DISPOSITION OF GENERATED WASTES

All purge water was taken to the El Paso Natural Gas Rio Vista Compressor Station. Spent product recovery socks were disposed of as non-hazardous solid waste.

ISOCONCENTRATION MAPS

No isoconcentration maps were prepared for this Site; however, the attached Site map presents the water level and analytical data collected during June 2009.

RESULTS

- The groundwater flow direction at this Site trends toward the east.
- Monitoring wells MW-2 and MW-3 are located downgradient of the former pit. The presence of hydrocarbon contamination in TMW-5, which is located upgradient to crossgradient from the former El Paso pit, may suggest an alternative source of contamination at the Site.
- The annual groundwater sample from MW-1 (a former product well) contained elevated concentrations of benzene, toluene, and total xylenes well above their respective NMWQCC standards. MW-1 was previously sampled in 1997 and exhibited recoverable product until 2006. Current concentrations appear to be similar to the historic data.
- The benzene concentration in the annual groundwater sample collected at MW-2 decreased from 201 µg/L in June 2008 to 22.9 µg/L in June 2009. As a long-term trend, the benzene concentration appears to be steadily attenuating from its high of 5,900 µg/L in 1996.
- Free-product recovery efforts at MW-3 resulted in the removal of approximately 0.30 gallons of free-phase hydrocarbons during 2009, bringing the cumulative total volume recovered to 11.29 gallons. A groundwater sample collected from MW-3 in June 2009 contained elevated concentrations benzene, toluene, and total xylenes above their respective NMWQCC standards. These results were similar to the previous sample results from 1997.

- Monitoring well MW-4 was sampled for the third time in June 2009 and appears to be clean. This well, installed in late 2006, was anticipated to be downgradient of the former pit; however, based on the subsequent survey and monitoring data, this well appears to be more cross-gradient of the pit.

- Temporary monitoring well TMW-5 continues to be significantly impacted, though it is upgradient to crossgradient from the former El Paso pit. The June 2009 benzene concentration of 1,540 µg/L and total xylenes concentration of 784 µg/L both exceeded their respective NMWQCC standards. It is noted that the samples from this well contain a much higher concentration of ethylbenzene than toluene. By comparison, the groundwater in MW-1 and MW-3 (located at and downgradient of the former El Paso pit, respectively) contains far more toluene content than ethylbenzene.

RECOMMENDATIONS

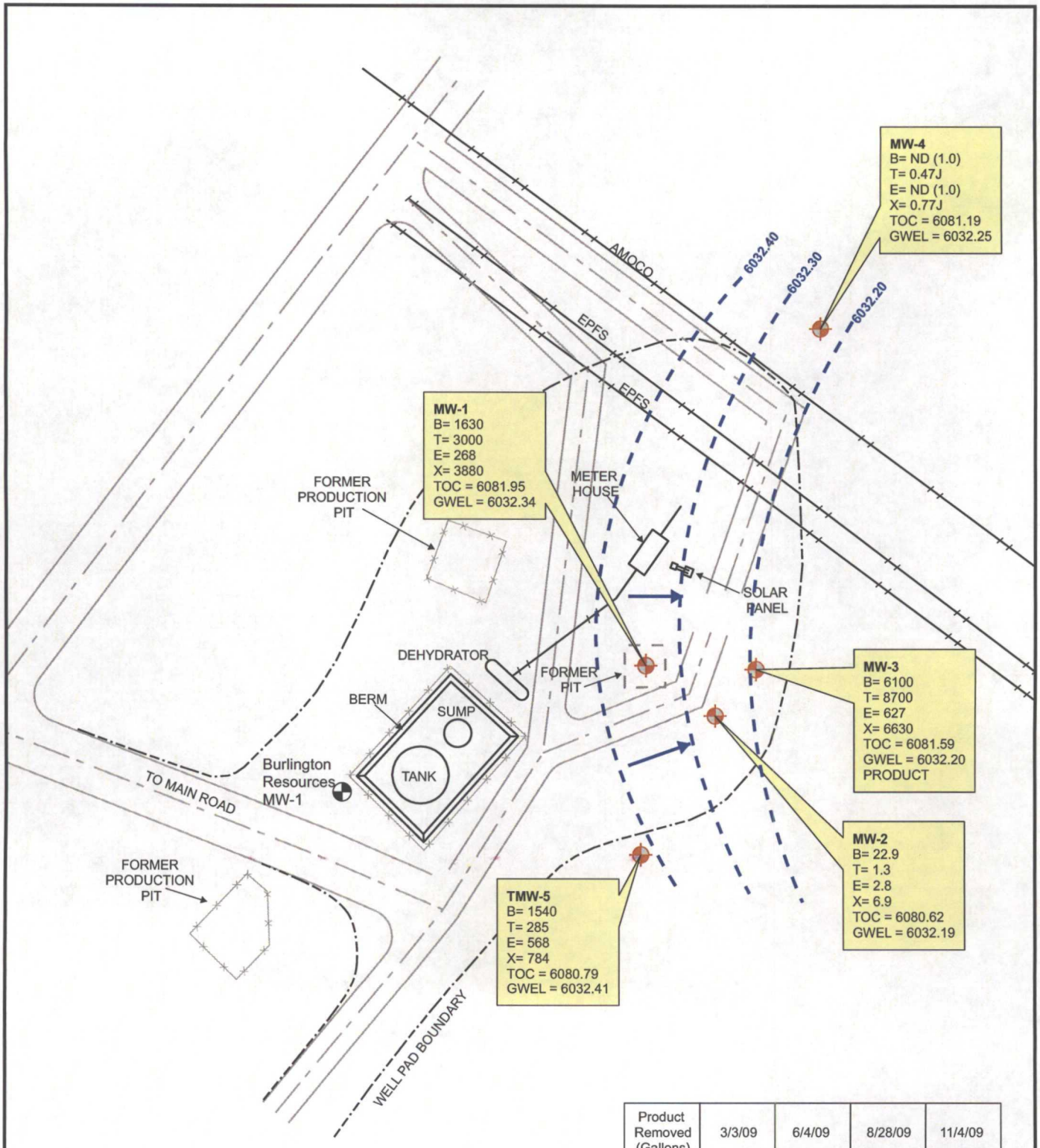
- EPTPC will continue annual sampling and quarterly water level monitoring at MW-1.

- EPTPC will continue annual sampling and quarterly water level monitoring at MW-2 until analytical results indicate that Site BTEX concentrations are approaching closure criteria. This well will then be scheduled for quarterly sampling until closure criteria have been met.

- EPTPC will continue quarterly free-product recovery efforts at MW-3; however, the frequency of monitoring may be adjusted based on the amount of product recovered during the monitoring visits. This well will be sampled annually.

- Monitoring wells MW-4 and TMW-5 will be sampled annually in conjunction with MW-1, MW-2, and MW-3. EPTPC may continue to evaluate the source of the potential upgradient impacts in the vicinity of TMW-5.

- EPTPC recommends installing a new monitoring well east of MW-3. With the hydraulic gradient now understood as clearly eastward, additional downgradient delineation of the dissolved phase plume is warranted.



Product Removed (Gallons)	3/3/09	6/4/09	8/28/09	11/4/09
MW-3	0.05	0.06	0.12	0.06

LEGEND

MW-4	Existing Monitoring / Observation Well
PZ-01	Abandoned Monitoring Well
→	Groundwater Flow Direction
—1275—	Potentiometric Surface Contour (Inferred Where Dashed)

B	Benzene (ug/L)
T	Toluene (ug/L)
E	Ethylbenzene (ug/L)
X	Total Xylenes (ug/L)
TOC	Top of Casing (ft. AMSL)
GWEL	Groundwater Elevation (ft. AMSL)

N

0 25 50 Feet

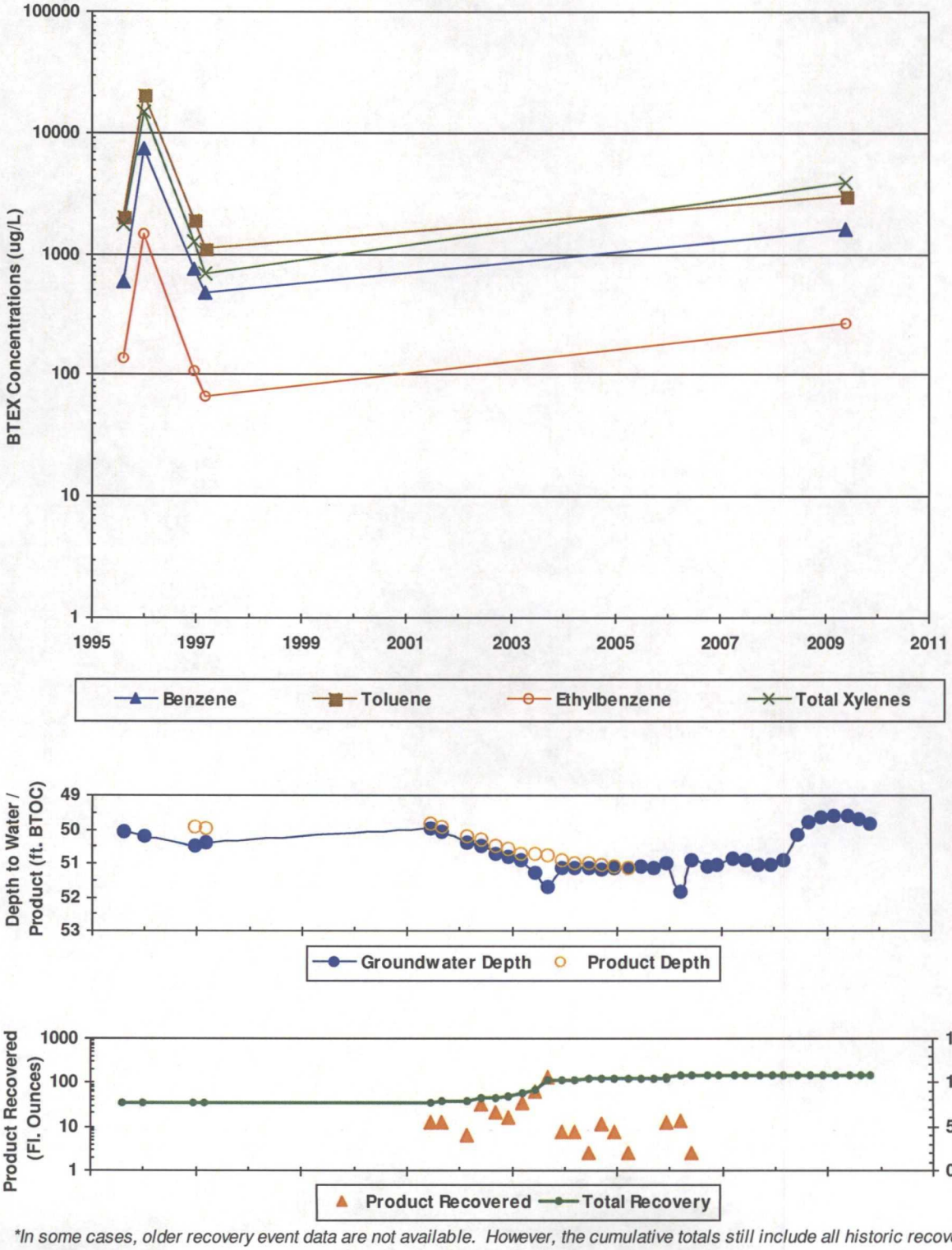
MWH elpaso

PROJECT: JOHNSTON FED #4

TITLE: Groundwater Potentiometric Surface Map, and BTEX Concentrations - June 9, 2009

FIGURE: 1

FIGURE 2
SUMMARY OF GROUNDWATER BTEX CONCENTRATIONS, FLUID LEVELS, AND PRODUCT RECOVERY
JOHNSTON FED #4 (METER #70194)
MW01



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

FIGURE 3
SUMMARY OF GROUNDWATER BTEX CONCENTRATIONS AND FLUID LEVELS
JOHNSTON FED #4 (METER #70194)
MW02

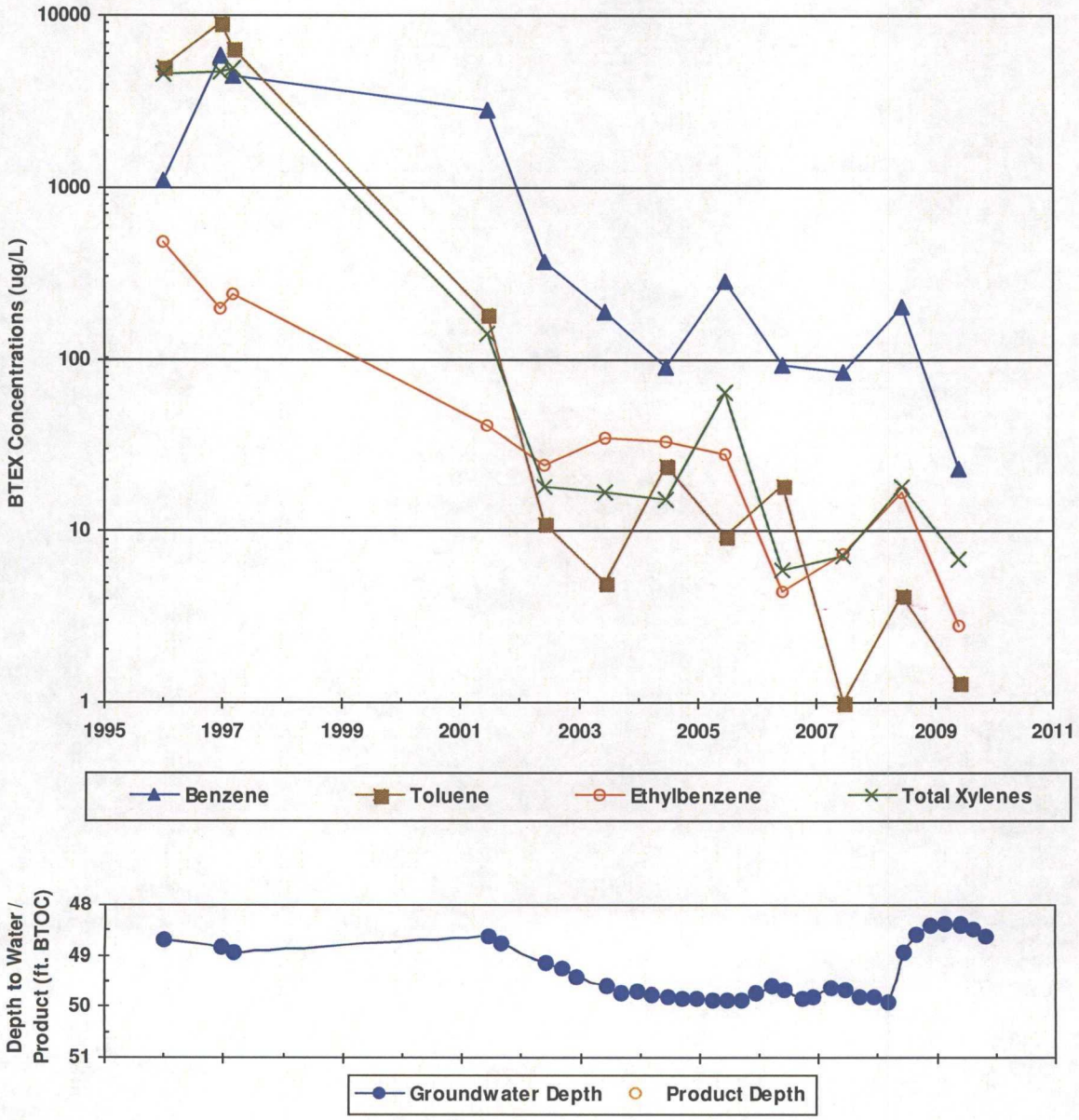
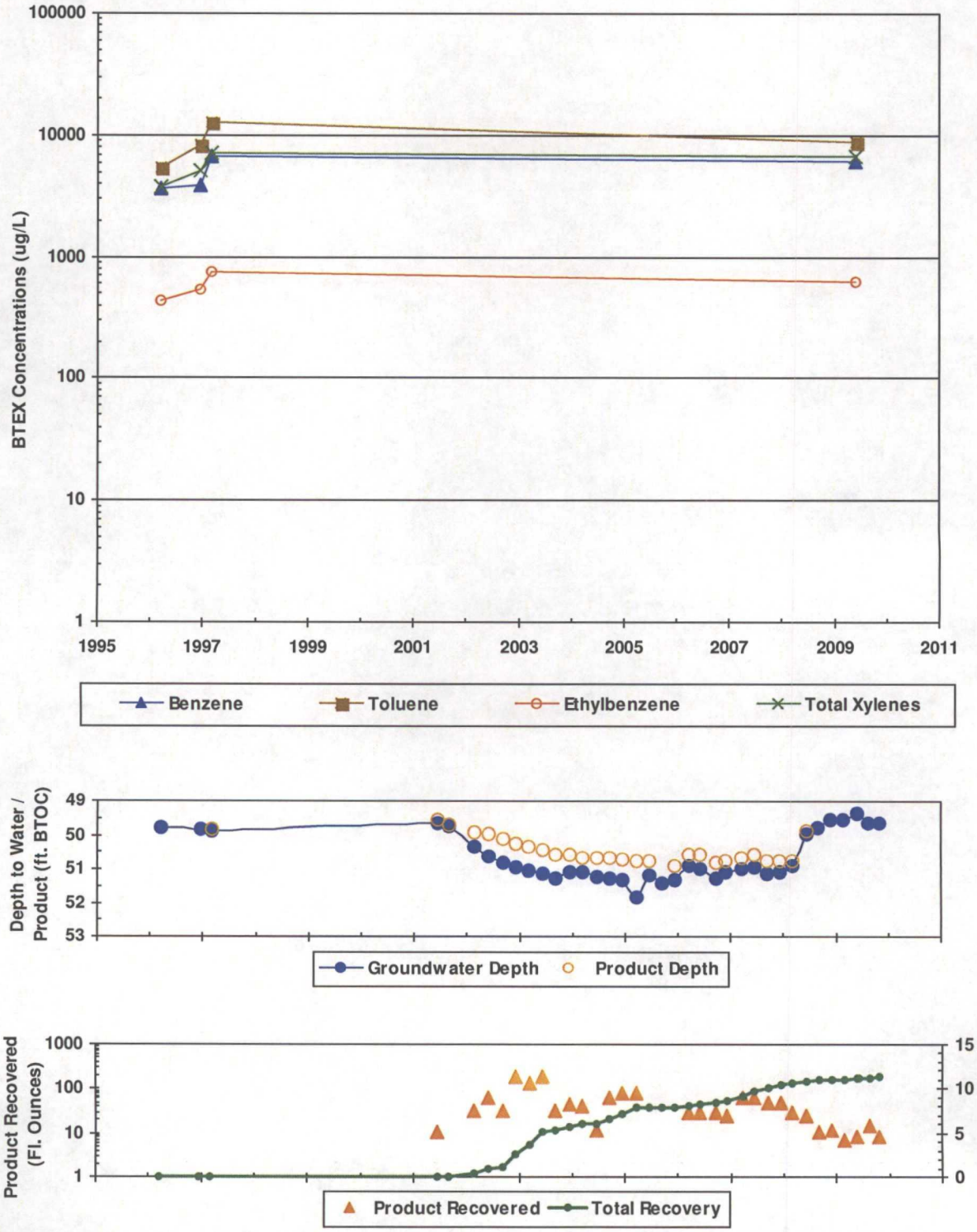
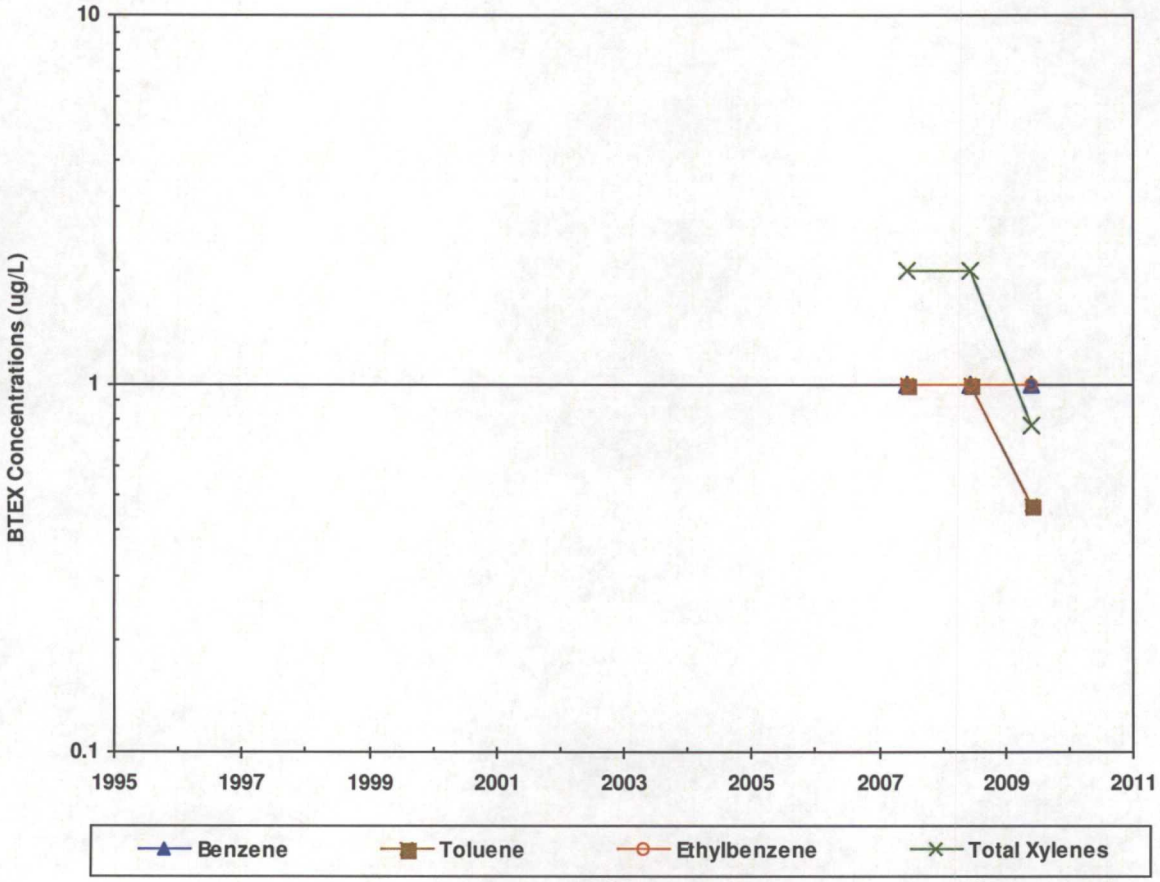


FIGURE 4
SUMMARY OF GROUNDWATER BTEX CONCENTRATIONS, FLUID LEVELS, AND PRODUCT RECOVERY
JOHNSTON FED #4 (METER #70194)
MW03



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

FIGURE 5
SUMMARY OF GROUNDWATER BTEX CONCENTRATIONS AND FLUID LEVELS
JOHNSTON FED #4 (METER #70194)
MW04



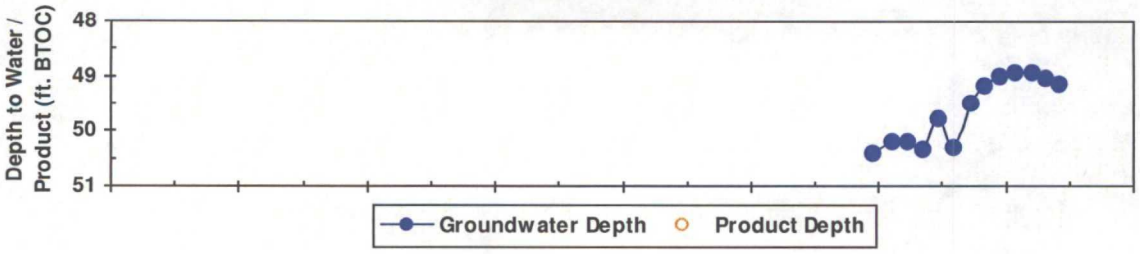


FIGURE 6
SUMMARY OF GROUNDWATER BTEX CONCENTRATIONS AND FLUID LEVELS
JOHNSTON FED #4 (METER #70194)
TMW05

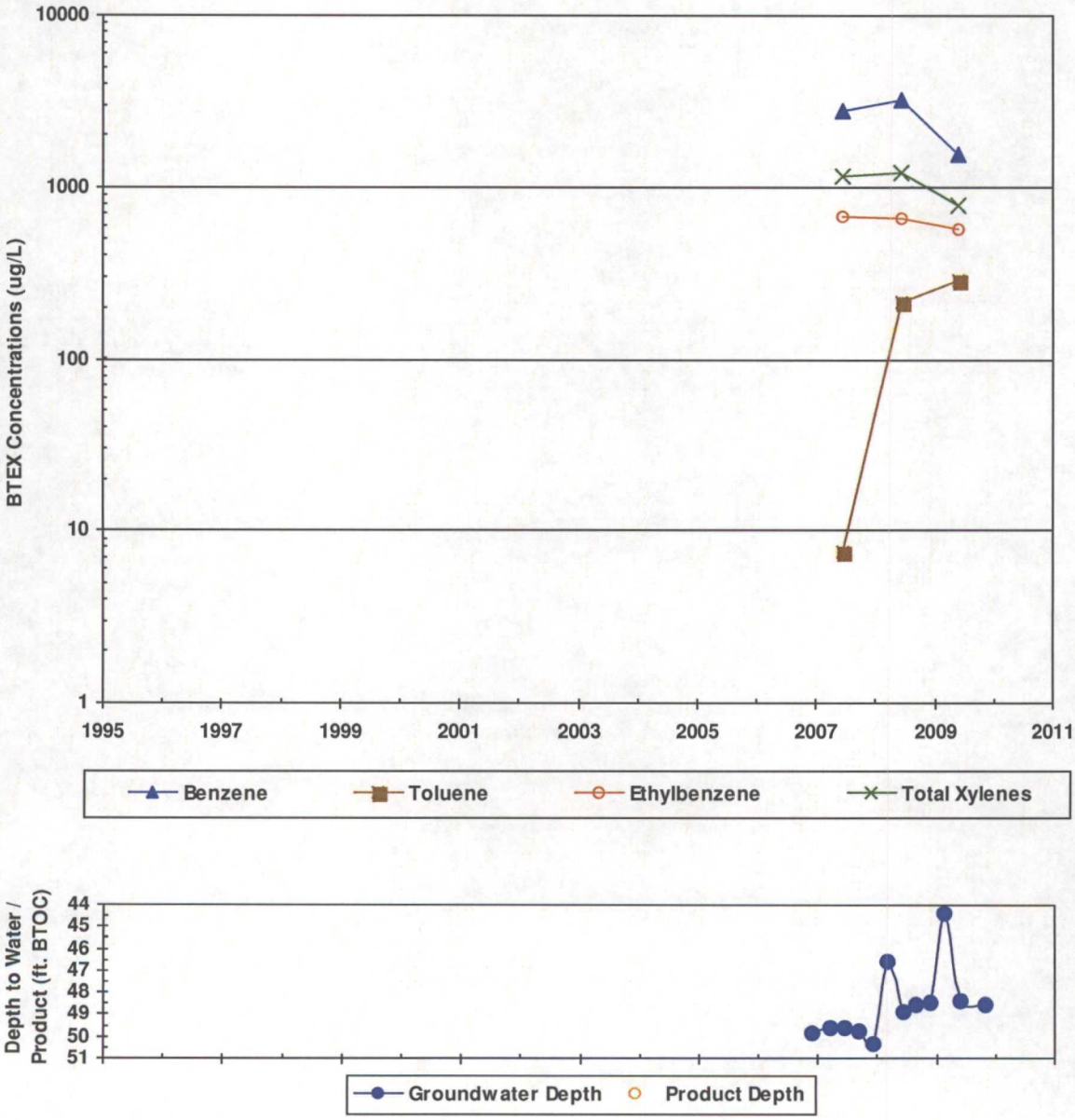


TABLE 1

SUMMARY OF BTEX COMPOUNDS IN GROUNDWATER SAMPLES
JOHNSTON FED #4 (METER #70194)

Monitor Well	Sample Date	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)	Depth to Water (ft BTOC)	Corrected GW Elevation (ft AMSL)
NMWQCC GW Std.:		10	750	750	620		
MW01	8/8/1995	**590**	**2040**	137	**1764**	50.08	6031.87
MW01	1/4/1996	**7380**	**20900**	**1480**	**14600**	50.23	6031.72
MW01	12/17/1996	**762**	**1930**	107	**1270**	50.50	6031.90
MW01	3/6/1997	**483**	**1110**	66.1	**678**	50.38	6031.88
MW01	6/9/2009	**1630**	**3000**	268	**3880**	49.61	6032.34
MW02	1/4/1996	**1104**	**5107**	479	**4640**	48.71	6031.91
MW02	12/17/1996	**5900**	**8970**	197	**4670**	48.84	6031.78
MW02	3/6/1997	**4500**	**6480**	236	**4920**	48.94	6031.68
MW02	6/22/2001	**2800**	180	41	140	48.62	6032.00
MW02	6/3/2002	**370**	11	24	18	49.15	6031.47
MW02	6/18/2003	**186**	<5.0	34.9	16.8	49.62	6031.00
MW02	6/22/2004	**88.9**	24	32.9	15.2	49.82	6030.80
MW02	6/23/2005	**283**	9.4	27.7	64.5	49.87	6030.75
MW02	6/7/2006	**92.1**	18.4	4.4	5.9	49.67	6030.95
MW02	6/19/2007	**83.0**	<1.0	7.3	7.2	49.67	6030.95
MW02	6/17/2008	**201**	4.2	16.6	17.9	48.93	6031.69
MW02	6/9/2009	**22.9**	1.3	2.8	6.9	48.43	6032.19
MW03	3/19/1996	**3660**	**5410**	436	**3730**	49.81	6031.78
MW03	12/17/1996	**3910**	**8210**	530	**5020**	49.84	6031.75
MW03	3/6/1997	**6670**	**12700**	**759**	**7020**	49.87	6031.75
MW03	6/9/2009	**6100**	**8700**	627	**6630**	49.39	6032.20
MW04	6/19/2007	<1.0	<1.0	<1.0	<2.0	50.21	6030.98
MW04	6/17/2008	<1.0	<1.0	<1.0	<2.0	49.50	6031.69
MW04	6/9/2009	<1.0	0.47J	<1.0	0.77J	48.94	6032.25
TMW05	6/19/2007	**2730**	7.6	680	**1160**	49.64	6031.15
TMW05	6/17/2008	**3190**	217	651	**1220**	48.87	6031.92
TMW05	6/9/2009	**1540**	285	568	**784**	48.38	6032.41

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.

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

TABLE 2

SUMMARY OF FREE-PRODUCT REMOVAL
JOHNSTON FED #4 (METER #70194)

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 (ft AMSL)
MW01	12/17/1996	49.94	50.50	0.56	--	7.65	6031.90
MW01	3/6/1997	49.99	50.38	0.39	--	7.65	6031.88
MW01	6/22/2001	49.82	49.96	0.14	0.10	7.75	6032.10
MW01	9/4/2001	49.94	50.05	0.11	0.10	7.85	6031.99
MW01	3/4/2002	50.23	50.40	0.17	0.05	7.90	6031.69
MW01	6/3/2002	50.31	50.50	0.19	0.25	8.15	6031.60
MW01	9/10/2002	50.51	50.70	0.19	0.16	8.31	6031.40
MW01	12/12/2002	50.60	50.83	0.23	0.13	8.44	6031.30
MW01	3/14/2003	50.73	50.90	0.17	0.26	8.70	6031.19
MW01	6/18/2003	50.74	51.28	0.54	0.50	9.20	6031.10
MW01	9/16/2003	50.78	51.70	0.92	1.00	10.20	6030.99
MW01	12/17/2003	50.92	51.15	0.23	0.06	10.26	6030.98
MW01	3/16/2004	50.98	51.14	0.16	0.06	10.32	6030.94
MW01	6/22/2004	51.02	51.15	0.13	0.02	10.34	6030.90
MW01	9/22/2004	51.06	51.18	0.12	0.09	10.43	6030.87
MW01	12/21/2004	51.08	51.15	0.07	0.06	10.49	6030.86
MW01	3/23/2005	51.13	51.13	0.00	0.02	10.51	6030.82
MW01	12/15/2005	--	51.02	0.00	0.10	10.61	6030.93
MW01	3/27/2006	--	51.86	0.00	0.11	10.72	6030.09
MW01	6/7/2006	--	50.92	0.00	0.02	10.74	6031.03
MW03	3/6/1997	49.83	49.87	0.04	--	0.00	6031.75
MW03	6/22/2001	49.58	49.66	0.08	0.08	0.08	6031.99
MW03	9/4/2001	49.70	49.76	0.06	--	0.08	6031.88
MW03	3/4/2002	49.91	50.35	0.44	0.25	0.33	6031.59
MW03	6/3/2002	49.96	50.62	0.66	0.50	0.83	6031.50
MW03	9/10/2002	50.12	50.79	0.67	0.25	1.08	6031.34
MW03	12/12/2002	50.25	50.95	0.70	1.50	2.58	6031.20
MW03	3/14/2003	50.34	51.03	0.69	1.00	3.58	6031.11
MW03	6/18/2003	50.45	51.16	0.71	1.50	5.08	6031.00
MW03	9/16/2003	50.58	51.30	0.72	0.25	5.33	6030.86
MW03	12/17/2003	50.60	51.08	0.48	0.35	5.68	6030.89
MW03	3/16/2004	50.68	51.10	0.42	0.31	5.99	6030.83
MW03	6/22/2004	50.68	51.22	0.54	0.09	6.08	6030.80
MW03	9/22/2004	50.69	51.30	0.61	0.50	6.58	6030.78

TABLE 2

SUMMARY OF FREE-PRODUCT REMOVAL
JOHNSTON FED #4 (METER #70194)

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 (ft AMSL)
MW03	12/21/2004	50.71	51.32	0.61	0.63	7.21	6030.76
MW03	3/23/2005	50.76	51.85	1.09	0.61	7.82	6030.61
MW03	6/23/2005	50.76	51.20	0.44	--	7.82	6030.74
MW03	12/15/2005	50.92	51.32	0.40	--	7.82	6030.59
MW03	3/27/2006	50.58	50.92	0.34	0.22	8.04	6030.94
MW03	6/7/2006	50.56	51.01	0.45	0.22	8.26	6030.94
MW03	9/25/2006	50.80	51.27	0.47	0.22	8.48	6030.70
MW03	12/7/2006	50.77	51.07	0.30	0.20	8.68	6030.76
MW03	3/28/2007	50.66	50.99	0.33	0.47	9.15	6030.86
MW03	6/18/2007	50.58	50.97	0.39	0.47	9.62	6030.93
MW03	9/17/2007	50.78	51.15	0.37	0.39	10.01	6030.74
MW03	12/17/2007	50.78	51.08	0.30	0.39	10.40	6030.75
MW03	3/10/2008	50.75	50.90	0.15	0.23	10.63	6030.81
MW03	6/17/2008	49.89	49.98	0.09	0.20	10.83	6031.68
MW03	9/10/2008	--	49.77	0.00	0.08	10.91	6031.82
MW03	12/2/2008	--	49.58	0.00	0.09	11.00	6032.01
MW03	3/3/2009	--	49.55	0.00	0.05	11.05	6032.04
MW03	6/4/2009	NA	NA	NA	0.06	11.11	NA
MW03	8/28/2009	--	49.65	0.00	0.12	11.23	6031.94
MW03	11/4/2009	--	49.63	0.00	0.06	11.29	6031.96

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.

Lodestar Services, Incorporated
PO Box 4465, Durango, CO 81302 Office (970) 946-1093

WATER LEVEL DATA

Project Name: San Juan Basin Groundwater **Date:** 03/03/2009
Project Manager: Ashley Ager
Client: MWH
Site Name: Johnston Federal #4

Well	Time	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Volume Removed	Comments
MW-1	########	-	49.60	-	-	
MW-2		-	48.37	-	-	
MW-3		-	49.55	-	-	Recovered 7 oz product, set new sock
MW-4		-	48.93	-	-	
TMW-5		-	44.40	-	-	

Comments
Operator: ConocoPhillips
Reviewed site map (no changes necessary), made site photos

Signature: *Ashley L. Ager* Date: 03/04/2009

Lodestar Services, Incorporated
PO Box 4465, Durango, CO 81302 Office (970) 946-1093

WATER LEVEL DATA

Project Name: San Juan Basin Groundwater **Date:**
Project Manager: Ashley Ager
Client: MWH
Site Name: Johnston Federal #4

Well	Time	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Volume Removed
MW-1	7:32 AM	-	49.61	-	-
MW-2		-	48.43	-	-
MW-3		-	49.39	-	-
MW-4		-	48.94	-	-
TMW-5		-	48.38	-	-

Comments
Sampled MW-2 with hydrasleeve and collected comparative sample by purging well witl
Note that on site map, TMW-5 is labelled as MW-5.

Signature: *Ashley L. Ager* Date: 06/10/2009

Lodestar Services, Incorporated
PO Box 4465, Durango, CO 81302 Office (970) 946-1093

WATER LEVEL DATA

6/9/09

Comments
Sampled BTEX
Sampled BTEX; collected two samples: one with hydrasleeve and another by purging with bailer
Sampled BTEX, replaced PR sock
Sampled BTEX
Sampled BTEX

1 bailer.

Lodestar Services, Incorporated
PO Box 4465, Durango, CO 81302 Office (970) 946-1093

WATER LEVEL DATA

Project Name: San Juan Basin Groundwater **Date:**
Project Manager: Ashley Ager
Client: MWH
Site Name: Johnston Federal #4

Well	Time	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Volume Removed
MW-1	2:30 PM	-	49.71	-	-
MW-2		-	48.50	-	-
MW-3		-	49.65	-	-
MW-4		-	49.04	-	-
TMW-5		-	dry	-	-

Comments
TMW-5 seems to have an obstruction. Unable to get well past 27.78'

Signature: *Ashley L. Ager* Date: 08/31/2009

Lodestar Services, Incorporated
PO Box 4465, Durango, CO 81302 Office (970) 946-1093

WATER LEVEL DATA

8/28/09

Comments
Replaced PR sock, recovered 15.25 oz
Sampled BTEX
Dry at 27.78 (obstructed?)

Lodestar Services, Incorporated
PO Box 4465, Durango, CO 81302 Office (970) 946-1093

WATER LEVEL DATA

Project Name: San Juan Basin Groundwater **Date:**
Project Manager: Ashley Ager
Client: MWH
Site Name: Johnston Federal #4

Well	Time	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Volume Removed
MW-1	9:39 AM	-	49.83	-	-
MW-2		-	48.62	-	-
MW-3		-	49.63	-	-
MW-4		-	49.16	-	-
TMW-5		-	48.58	-	-

Comments

Signature: *Ashley L. Ager* Date: 11/05/2009

Lodestar Services, Incorporated
PO Box 4465, Durango, CO 81302 Office (970) 946-1093

WATER LEVEL DATA

11/4/09

Comments
Replaced PR sock, recovered 7.5 oz

Lodestar Services, Incorporated
PO Box 4465, Durango, CO 81302 Office 970-946-1093

Site Visit Memo

To: Jed Smith

From: Ashley Ager

CC: File

Date: June 4, 2009

Re: Johnston Federal #4 Site Visit

On June 2, 2009, Lodestar Services visited the Johnston Federal #4 to pull the absorbent sock from MW-3 in preparation for measuring static water levels. There was approximately 8 oz of product removed from the well.

Additionally, Lodestar set a Hydrasleeve groundwater sampler in well MW-2. Depth to water in the well was measured to be 48.38'. Total depth was 53.5'. Lodestar tied the sampler in half and set it 15" from the bottom of the well. A sample will be retrieved next week, as will a traditional sample for comparison.

Gulf Coast ACCUTEST. Laboratories

IT'S ALL IN THE CHEMISTRY

06/18/09

Technical Report for

Montgomery Watson

San Juan Basin Pit Groundwater Remediation 2008-2009

Johnston Fed4

Accutest Job Number: T30977

Sampling Date: 06/09/09

Report to:

MWH Americas
1801 California St. Suite 2900
Denver, CO 80202
jed.smith@mwhglobal.com; daniel.a.wade@mwhglobal.com;
craig.moore@mwhglobal.com; ala@lodestarservices.com
ATTN: Jed Smith

Total number of pages in report: **20**

ACCREDITED IN ACCORDANCE WITH nelac

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Paul K Canevaro

Paul Canevaro
Laboratory Director

ACCUTEST LABORATORIES 50 YEARS 1956-2006

Client Service contact: Georgia Jones 713-271-4700

Certifications: TX (T104704220-06-TX) AR (88-0756) FL (E87628) KS (E-10366) LA (85695/04004) OK (9103) UT(7132714700)

Sections: 1 2 3 4 5

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Sample Summary

Montgomery Watson

Job No: T30977

San Juan Basin Pit Groundwater Remediation 2008-2009
Project No: Johnston Fed4

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
T30977-1	06/09/09	07:00	TU	06/11/09	AQ	Trip Blank Water	090609TB01
T30977-2	06/09/09	08:18	TU	06/11/09	AQ	Ground Water	JOHNSTON FED 4 MW-1
T30977-3	06/09/09	09:17	TU	06/11/09	AQ	Ground Water	JOHNSTON FED 4 TMW-5
T30977-4	06/09/09	09:32	TU	06/11/09	AQ	Ground Water	JOHNSTON FED 4 MW-2H
T30977-5	06/09/09	09:45	TU	06/11/09	AQ	Ground Water	JOHNSTON FED 4 MW-2
T30977-6	06/09/09	10:35	TU	06/11/09	AQ	Ground Water	JOHNSTON FED 4 MW-3
T30977-7	06/09/09	11:30	TU	06/11/09	AQ	Ground Water	JOHNSTON FED 4 MW-4

ACCUTEST Laboratories

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client:	Montgomery Watson	**Job No**	T30977
Site:	San Juan Basin Pit Groundwater Remediation 2008-2009	**Report Date**	6/18/2009 9:16:08 AM

6 Sample(s), 1 Trip Blank(s) and 0 Field Blank(s) were collected on 06/09/2009 and were received at Accutest on 06/11/2009 properly preserved, at 3.6 Deg. C and intact. These Samples received an Accutest job number of T30977. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Volatiles by GC By Method SW846 8021B

Matrix AQ **Batch ID:** GKK1505

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) T31120-1MS, T31120-1MSD were used as the QC samples indicated.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data QualityObjectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used

Sample Results

Report of Analysis

Accutest Laboratories

Report of Analysis

3.1

Client Sample ID:	090609TB01		
Lab Sample ID:	T30977-1	Date Sampled:	06/09/09
Matrix:	AQ - Trip Blank Water	Date Received:	06/11/09
Method:	SW846 8021B	Percent Solids:	n/a
Project:	San Juan Basin Pit Groundwater Remediation 2008-2009		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK031314.D	1	06/16/09	FI	n/a	n/a	GKK1505
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.21	ug/l	
108-88-3	Toluene	0.25	1.0	0.23	ug/l	J
100-41-4	Ethylbenzene	ND	1.0	0.35	ug/l	
1330-20-7	Xylenes (total)	ND	2.0	0.55	ug/l	
95-47-6	o-Xylene	ND	1.0	0.55	ug/l	
	m,p-Xylene	ND	1.0	0.66	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	77%		58-125%
98-08-8	aaa-Trifluorotoluene	91%		73-139%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	JOHNSTON FED 4 MW-1		
Lab Sample ID:	T30977-2	Date Sampled:	06/09/09
Matrix:	AQ - Ground Water	Date Received:	06/11/09
Method:	SW846 8021B	Percent Solids:	n/a
Project:	San Juan Basin Pit Groundwater Remediation 2008-2009		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK031331.D	50	06/16/09	FI	n/a	n/a	GKK1505
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	1630	50	10	ug/l	
108-88-3	Toluene	3000	50	11	ug/l	
100-41-4	Ethylbenzene	268	50	17	ug/l	
1330-20-7	Xylenes (total)	3880	100	28	ug/l	
95-47-6	o-Xylene	795	50	28	ug/l	
	m,p-Xylene	3080	50	33	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	83%		58-125%
98-08-8	aaa-Trifluorotoluene	94%		73-139%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	JOHNSTON FED 4 TMW-5		
Lab Sample ID:	T30977-3	Date Sampled:	06/09/09
Matrix:	AQ - Ground Water	Date Received:	06/11/09
Method:	SW846 8021B	Percent Solids:	n/a
Project:	San Juan Basin Pit Groundwater Remediation 2008-2009		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK031326.D	20	06/16/09	FI	n/a	n/a	GKK1505
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	1540	20	4.1	ug/l	
108-88-3	Toluene	285	20	4.5	ug/l	
100-41-4	Ethylbenzene	568	20	7.0	ug/l	
1330-20-7	Xylenes (total)	784	40	11	ug/l	
95-47-6	o-Xylene	131	20	11	ug/l	
	m,p-Xylene	653	20	13	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	84%		58-125%
98-08-8	aaa-Trifluorotoluene	94%		73-139%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	JOHNSTON FED 4 MW-2H		
Lab Sample ID:	T30977-4	Date Sampled:	06/09/09
Matrix:	AQ - Ground Water	Date Received:	06/11/09
Method:	SW846 8021B	Percent Solids:	n/a
Project:	San Juan Basin Pit Groundwater Remediation 2008-2009		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK031318.D	1	06/16/09	FI	n/a	n/a	GKK1505
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	18.5	1.0	0.21	ug/l	
108-88-3	Toluene	0.82	1.0	0.23	ug/l	J
100-41-4	Ethylbenzene	1.2	1.0	0.35	ug/l	
1330-20-7	Xylenes (total)	2.5	2.0	0.55	ug/l	
95-47-6	o-Xylene	0.71	1.0	0.55	ug/l	J
	m,p-Xylene	1.8	1.0	0.66	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	80%		58-125%
98-08-8	aaa-Trifluorotoluene	91%		73-139%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	JOHNSTON FED 4 MW-2		
Lab Sample ID:	T30977-5	Date Sampled:	06/09/09
Matrix:	AQ - Ground Water	Date Received:	06/11/09
Method:	SW846 8021B	Percent Solids:	n/a
Project:	San Juan Basin Pit Groundwater Remediation 2008-2009		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK031319.D	1	06/16/09	FI	n/a	n/a	GKK1505
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	22.9	1.0	0.21	ug/l	
108-88-3	Toluene	1.3	1.0	0.23	ug/l	
100-41-4	Ethylbenzene	2.8	1.0	0.35	ug/l	
1330-20-7	Xylenes (total)	6.9	2.0	0.55	ug/l	
95-47-6	o-Xylene	1.7	1.0	0.55	ug/l	
	m,p-Xylene	5.2	1.0	0.66	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	86%		58-125%
98-08-8	aaa-Trifluorotoluene	104%		73-139%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	JOHNSTON FED 4 MW-3		
Lab Sample ID:	T30977-6	Date Sampled:	06/09/09
Matrix:	AQ - Ground Water	Date Received:	06/11/09
Method:	SW846 8021B	Percent Solids:	n/a
Project:	San Juan Basin Pit Groundwater Remediation 2008-2009		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK031327.D	200	06/16/09	FI	n/a	n/a	GKK1505
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	6100	200	41	ug/l	
108-88-3	Toluene	8700	200	45	ug/l	
100-41-4	Ethylbenzene	627	200	70	ug/l	
1330-20-7	Xylenes (total)	6630	400	110	ug/l	
95-47-6	o-Xylene	1350	200	110	ug/l	
	m,p-Xylene	5270	200	130	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	79%		58-125%
98-08-8	aaa-Trifluorotoluene	91%		73-139%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	JOHNSTON FED 4 MW-4		
Lab Sample ID:	T30977-7	Date Sampled:	06/09/09
Matrix:	AQ - Ground Water	Date Received:	06/11/09
Method:	SW846 8021B	Percent Solids:	n/a
Project:	San Juan Basin Pit Groundwater Remediation 2008-2009		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK031324.D	1	06/16/09	FI	n/a	n/a	GKK1505
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.21	ug/l	
108-88-3	Toluene	0.47	1.0	0.23	ug/l	J
100-41-4	Ethylbenzene	ND	1.0	0.35	ug/l	
1330-20-7	Xylenes (total)	0.77	2.0	0.55	ug/l	J
95-47-6	o-Xylene	ND	1.0	0.55	ug/l	
	m,p-Xylene	0.77	1.0	0.66	ug/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	76%		58-125%
98-08-8	aaa-Trifluorotoluene	89%		73-139%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

CHAIN OF CUSTODY

ACCUTEST Laboratories
10165 Harwin, Suite 150 - Houston, TX 77036 - 713-271-4700 fax: 713-271-4770

FED-EX Tracking # 8693 8850 8175 | Bottle Order Control # | Accutest Quote # | Accutest Job # T30977

Client / Reporting Information

Company Name: MWH
Project Contact: Jed Smith | E-Mail: jed.smith@mwhglobal.com
Address: 1801 California Street, Suite 2900
City: Denver | State: CO | Zip: 80202
Phone No.: 303-291-2276 | Fax No.:
Sampler's Name: Troy Urban

Project Information

Project Name / No.: Johnston Fed 4 EPTPC San Juan Basin Pit GW Remediation 2008-2009
Bill to: El Paso Corp | Invoice Attn.: Norma Ramos
Address: 1001 Louisiana Street, Rm S1904B
City: Hou | State: TX | Zip: 77002
Phone No.: | Fax No.:
Client Purchase Order #: West-ALAB-Ground Rem-007

Requested Analyses

BTEX (8021B) include m,p, & o-xylene

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Wastewater
SO - Soil
SL - Sludge
OI - Oil
LIQ - Liquid
SOL - Other Solid

Accutest Sample #	Field ID / Point of Collection	Collection Date	Collection Time	Matrix	# of bottles	Number of preserved bottles: HCl	H2SO4	NaOH	HNO3	ZnOAc	NaHSO4	MeOH	None	BTEX (8021B) include m,p, & o-xylene	LAB USE ONLY
	090609TB01	060909	0700	GW	2	X								X	
	Johnston Fed 4 MW-1	060909	0818	GW	3	X								X	
	Johnston Fed 4TMW-5	060909	0917	GW	3	X								X	
	Johnston Fed4 MW-2H	060909	0932	GW	1½	X								X	
	Johnston Fed 4 MW-2	060909	0945	GW	3	X								X	
	Johnston Fed4 MW-3	060909	1035	GW	3	X								X	
	Johnston Fed4 MW-4	060909	1130	GW	3	X								X	

Turnaround Time (Business days)

- [X] 10 Day *STANDARD* — Approved By:/ Date:
- [ ] 7 Day
- [ ] 4 Day *RUSH*
- [ ] 3 Day *EMERGENCY*
- [ ] 2 Day *EMERGENCY*
- [ ] 1 Day *EMERGENCY*
- [ ] Other

Real time analytical data available via Lablink

Data Deliverable Information

- [ ] Commercial "A"
- [X] Commercial "B"
- [ ] Reduced Tier 1
- [ ] Full Data Package
- [ ] TRRP-13
- [ ] EDD Format
- [ ] Other

Commercial "A" = Results Only
Commercial "B" = Results & Standard QC

Comments / Remarks

If samples are received unpreserved, please notify MWH regarding holding time!!!

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	Troy Urban	6/10/09	1	2 Fed Ex	06/11/09 1000	2
3	Relinquished by:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
5	Relinquished by:	Date Time:	Received By:	Custody Seal #	Preserved where applicable ☐	On Ice ☒ Cooler Temp. 3.6

4.1 4

T30977: Chain of Custody
Page 1 of 3

SAMPLE INSPECTION FORM

Accutest Job Number: T30977 Client: MWH Date/Time Received: 06/11/09 1000

# of Coolers Received: 1 Thermometer #: IR-1 Temperature Adjustment Factor: -0.4

Cooler Temps: #1: 3.6 #2: _____ #3: _____ #4: _____ #5: _____ #6: _____ #7: _____ #8: _____

Method of Delivery: FEDEX UPS Accutest Courier Greyhound Delivery Other

Airbill Numbers: _____

COOLER INFORMATION
- [ ] Custody seal missing or not intact
- [ ] Temperature criteria not met
- [ ] Wet ice received in cooler

CHAIN OF CUSTODY
- [ ] Chain of Custody not received
- [ ] Sample D/T unclear or missing
- [ ] Analyses unclear or missing
- [ ] COC not properly executed

SAMPLE INFORMATION
- [ ] Sample containers received broken
- [ ] VOC vials have headspace
- [ ] Sample labels missing or illegible
- [ ] ID on COC does not match label(s)
- [ ] D/T on COC does not match label(s)
- [ ] Sample/Bottles rcvd but no analysis on COC
- [ ] Sample listed on COC, but not received
- [ ] Bottles missing for requested analysis
- [ ] Insufficient volume for analysis
- [ ] Sample received improperly preserved

TRIP BLANK INFORMATION
- [ ] Trip Blank on COC but not received
- [ ] Trip Blank received but not on COC
- [ ] Trip Blank not intact
- [ ] Received Water Trip Blank
- [ ] Received Soil TB

Number of Encores? _____
Number of 5035 kits? _____
Number of lab-filtered metals? _____

Summary of Discrepancies:

TECHNICIAN SIGNATURE/DATE: [signature] 06/11/09

INFORMATION AND SAMPLE LABELING VERIFIED BY: EE 6-11-9

CORRECTIVE ACTIONS

Client Representative Notified: _____ **Date:** _____

By Accutest Representative: _____ **Via:** Phone Email

Client Instructions:

JOB #: T30977 DATE/TIME RECEIVED: 06/11/09 1000

CLIENT: MWH INITIALS: FF

COOLER#	SAMPLE ID	FIELD ID	DATE	MATRIX	VOL	BOTTLE #	LOCATION	PRESERV	PH	
1	1	090609 Trip Blank		W	40 ml	1-2	VR	1 (2) 3 4 5 6 7 8	<2	>12
	2	MW-1	06/09/09 0700			1-3		1 (2) 3 4 5 6 7 8	<2	>12
	3	MW-5	0819					1 (2) 3 4 5 6 7 8	<2	>12
	4	MW-2H	0917			1 1/2		1 (2) 3 4 5 6 7 8	<2	>12
	5	MW-2	0952			1-3		1 (2) 3 4 5 6 7 8	<2	>12
	6	MW-3	0945			"		1 (2) 3 4 5 6 7 8	<2	>12
	7	MW-4	1130			"		1 (2) 3 4 5 6 7 8	<2	>12
								1 2 3 4 5 6 7 8	<2	>12
								1 2 3 4 5 6 7 8	<2	>12
								1 2 3 4 5 6 7 8	<2	>12
								1 2 3 4 5 6 7 8	<2	>12
								1 2 3 4 5 6 7 8	<2	>12
			FF 06/11/09					1 2 3 4 5 6 7 8	<2	>12
								1 2 3 4 5 6 7 8	<2	>12
								1 2 3 4 5 6 7 8	<2	>12
								1 2 3 4 5 6 7 8	<2	>12
								1 2 3 4 5 6 7 8	<2	>12
								1 2 3 4 5 6 7 8	<2	>12
								1 2 3 4 5 6 7 8	<2	>12
								1 2 3 4 5 6 7 8	<2	>12
								1 2 3 4 5 6 7 8	<2	>12

PRESERVATIVES: 1: None 2: HCL 3: HNO3 4: H2SO4 5: NAOH 6: DI 7: MeOH 8: Other

LOCATION: 1: Walk-In #1 (Waters) 2: Walk-In #2 (Soils) VR: Volatile Fridge M: Metals SUB: Subcontract EF: Encore Freezer

Rev 8/13/01 ewp

4.1

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T30977: Chain of Custody
Page 3 of 3

GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: T30977
Account: MWHCODE Montgomery Watson
Project: San Juan Basin Pit Groundwater Remediation 2008-2009

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GKK1505-MB	KK031313.D	1	06/16/09	FI	n/a	n/a	GKK1505

The QC reported here applies to the following samples: Method: SW846 8021B

T30977-1, T30977-2, T30977-3, T30977-4, T30977-5, T30977-6, T30977-7

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.35	ug/l	
108-88-3	Toluene	ND	1.0	0.23	ug/l	
1330-20-7	Xylenes (total)	ND	2.0	0.55	ug/l	
95-47-6	o-Xylene	ND	1.0	0.55	ug/l	
	m,p-Xylene	ND	1.0	0.66	ug/l	

CAS No.	Surrogate Recoveries		Limits
460-00-4	4-Bromofluorobenzene	76%	58-125%
98-08-8	aaa-Trifluorotoluene	90%	73-139%

Blank Spike Summary

Job Number: T30977
Account: MWHCODE Montgomery Watson
Project: San Juan Basin Pit Groundwater Remediation 2008-2009

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GKK1505-BS	KK031309.D	1	06/16/09	FI	n/a	n/a	GKK1505

The QC reported here applies to the following samples: Method: SW846 8021B

T30977-1, T30977-2, T30977-3, T30977-4, T30977-5, T30977-6, T30977-7

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	20	19.8	99	86-121
100-41-4	Ethylbenzene	20	18.0	90	81-116
108-88-3	Toluene	20	19.8	99	87-117
1330-20-7	Xylenes (total)	60	53.3	89	85-115
95-47-6	o-Xylene	20	17.7	89	87-116
	m,p-Xylene	40	35.6	89	84-116

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	4-Bromofluorobenzene	83%	58-125%
98-08-8	aaa-Trifluorotoluene	94%	73-139%

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: T30977
Account: MWHCODE Montgomery Watson
Project: San Juan Basin Pit Groundwater Remediation 2008-2009

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
T31120-1MS	KK031320.D	1	06/16/09	FI	n/a	n/a	GKK1505
T31120-1MSD	KK031321.D	1	06/16/09	FI	n/a	n/a	GKK1505
T31120-1	KK031315.D	1	06/16/09	FI	n/a	n/a	GKK1505

The QC reported here applies to the following samples: Method: SW846 8021B

T30977-1, T30977-2, T30977-3, T30977-4, T30977-5, T30977-6, T30977-7

CAS No.	Compound	T31120-1 ug/l	Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	1.0 U		20	22.7	114	22.3	112	2	86-121/19
100-41-4	Ethylbenzene	1.0 U		20	21.1	106	21.0	105	0	81-116/14
108-88-3	Toluene	1.0 U		20	22.3	112	22.3	112	0	87-117/16
1330-20-7	Xylenes (total)	2.0 U		60	61.7	103	60.8	101	1	85-115/12
95-47-6	o-Xylene	1.0 U		20	20.6	103	20.1	101	2	87-116/16
	m,p-Xylene	1.0 U		40	41.1	103	40.8	102	1	84-116/13

CAS No.	Surrogate Recoveries	MS	MSD	T31120-1	Limits
460-00-4	4-Bromofluorobenzene	82%	79%	77%	58-125%
98-08-8	aaa-Trifluorotoluene	92%	88%	92%	73-139%

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WELL DEVELOPMENT AND SAMPLING LOG

Project Name: San Juan Basin | Location: Johnston Federal #4 | Well No: MW-1
Client: MWH | Date: 6/9/2009 | Time: 7:38
Project Manager: Ashley Ager | Sampler's Name: Troy Urban

Measuring Point: TOC | Depth to Water: 49.61 ft | Depth to Product: ft
Well Diameter: 4" | Total Depth: 57.02 ft | Product Thickness: ft
Water Column Height: 7.41 ft

Sampling Method: ☐ Submersible Pump ☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Other
☑ Bottom Valve Bailer ☐ Double Check Valve Bailer

Criteria: ☑ 3 to 5 Casing Volumes of Water Removal ☑ Stabilization of Indicator Parameters ☑ Other bail dry

Water Volume in Well			
Gal/ft x ft of water	Gallons	Ounces	Volume to be removed
7.41 x .65	4.81 x 3		14.44 gal

Time (military)	pH (su)	SC (us)	Temp (°F)	ORP (millivolts)	D.O. (mg/L)	Turbidity (NTU)	Vol Evac. gal	Comments/Flow Rate
8:47	6.88	1388	60.1				0.75	clear
	7.11	1463	60.4				2.5	dark gray, sheen, HC odor
	7.12	1505	60.1				3.75	dark gray, sheen, HC odor
	7.18	1517	59.9				5	dark gray, sheen, HC odor
	7.01	1519	59.9				10	dark gray, sheen, HC odor
	7.00	1527	59.9				12.5	dark gray, sheen, HC odor
	6.96	1511	59.5				13.75	black, sheen, HC odor
Final:	6.96	1543	59.4				14.75	black, sheen, HC odor

COMMENTS:

Instrumentation: ☑ pH Meter ☐ DO Monitor ☑ Conductivity Meter ☑ Temperature Meter ☐ Other

Water Disposal: Rio Vista

Sample ID: MW-1 | Sample Time: 8:18

Analysis Requested: ☑ BTEX ☐ VOCs ☐ Alkalinity ☐ TDS ☐ Cations ☐ Anions ☐ Nitrate ☐ Nitrite ☐ Metals
☐ Other

Trip Blank: 9062009TB01 | Duplicate Sample:

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WELL DEVELOPMENT AND SAMPLING LOG

Project Name: San Juan Basin | Location: Johnston Federal #4 | Well No: MW-2
Client: MWH | Date: 6/9/2009 | Time: 9:35
Project Manager: Ashley Ager | Sampler's Name: Troy Urban

Measuring Point: TOC | Depth to Water: 48.43 ft | Depth to Product: ft
Well Diameter: 4" | Total Depth: 53.6 ft | Product Thickness: ft
Water Column Height: 5.17 ft

Sampling Method: ☐ Submersible Pump ☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Other
☑ Bottom Valve Bailer ☐ Double Check Valve Bailer

Criteria: ☑ 3 to 5 Casing Volumes of Water Removal ☑ Stabilization of Indicator Parameters ☑ Other bail dry

Water Volume in Well			
Gal/ft x ft of water	Gallons	Ounces	Volume to be removed
5.17 x .65	3.36 x 3		10.1 gal

Time (military)	pH (su)	SC (us)	Temp (°F)	ORP (millivolts)	D.O. (mg/L)	Turbidity (NTU)	Vol Evac. gal	Comments/Flow Rate
9:40	6.81	1203	60.4				1.25	gray, black ppt
	6.81	1191	60.4				2	black
	6.87	1209	60.6				2.35	black
	6.85	1208	60.3				2.5	black, bailing down
	6.82	1207	60.2				3	black, bailing down
	6.80	1215	60.0				3.25	black, bailing down
	6.82	1210	60.2				3.35	black, bailing down
Final:	6.82	1208	60.3				3.45	black, dry

COMMENTS: Well bailed dry during purging. Collected comparative sample with hydrasleeve prior to purging.

Instrumentation: ☑ pH Meter ☐ DO Monitor ☑ Conductivity Meter ☑ Temperature Meter ☐ Other

Water Disposal: Rio Vista

Sample ID: MW-2 | Sample Time: 9:45

Analysis Requested: ☑ BTEX ☐ VOCs ☐ Alkalinity ☐ TDS ☐ Cations ☐ Anions ☐ Nitrate ☐ Nitrite ☐ Metals
☐ Other

Trip Blank: 9062009TB01 | Duplicate Sample:

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WELL DEVELOPMENT AND SAMPLING LOG

Project Name: San Juan Basin | Location: Johnston Federal #4 | Well No: MW-3
Client: MWH | Date: 6/9/2009 | Time: 9:50
Project Manager: Ashley Ager | Sampler's Name: Troy Urban

Measuring Point: TOC | Depth to Water: 49.39 ft | Depth to Product: ft
Well Diameter: 4" | Total Depth: 59.44 ft | Product Thickness: ft
Water Column Height: 10.05 ft

Sampling Method: ☐ Submersible Pump ☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Other
☑ Bottom Valve Bailer ☐ Double Check Valve Bailer

Criteria: ☑ 3 to 5 Casing Volumes of Water Removal ☑ Stabilization of Indicator Parameters ☑ Other bail dry

Water Volume in Well			
Gal/ft x ft of water	Gallons	Ounces	Volume to be removed
10.05 x .65	6.53 x 3		19.5 gal

Time (military)	pH (su)	SC (us)	Temp (°F)	ORP (millivolts)	D.O. (mg/L)	Turbidity (NTU)	Vol Evac. gal	Comments/Flow Rate
10:04	6.85	1156	61.8				1	black, sheen
	6.97	1161	60.6				2	black, sheen
	6.80	1168	61.3				3	black, sheen
	7.03	1169	60.8				5	black, sheen
	7.09	1211	61.0				10	black, sheen
	7.11	1212	61.0				15	black, sheen
	7.14	1228	60.4				18	black, sheen
	7.13	1239	60.1				19	black, sheen
Final:	7.13	1246	59.9				20	black, sheen

COMMENTS:

Instrumentation: ☑ pH Meter ☐ DO Monitor ☑ Conductivity Meter ☑ Temperature Meter ☐ Other

Water Disposal: Rio Vista

Sample ID: MW-3 | Sample Time: 10:35

Analysis Requested: ☑ BTEX ☐ VOCs ☐ Alkalinity ☐ TDS ☐ Cations ☐ Anions ☐ Nitrate ☐ Nitrite ☐ Metals
☐ Other

Trip Blank: 9062009TB01 | Duplicate Sample:

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WELL DEVELOPMENT AND SAMPLING LOG

Project Name: San Juan Basin | Location: Johnston Federal #4 | Well No: MW-4
Client: MWH | Date: 6/9/2009 | Time: 10:48
Project Manager: Ashley Ager | Sampler's Name: Troy Urban

Measuring Point: TOC | Depth to Water: 48.94 ft | Depth to Product: ft
Well Diameter: 2" | Total Depth: 62.02 ft | Product Thickness: ft
Water Column Height: 13.08 ft

Sampling Method: ☐ Submersible Pump ☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Other
☑ Bottom Valve Bailer ☐ Double Check Valve Bailer

Criteria: ☑ 3 to 5 Casing Volumes of Water Removal ☑ Stabilization of Indicator Parameters ☑ Other bail dry

Water Volume in Well			
Gal/ft x ft of water	Gallons	Ounces	Volume to be removed
13.08 x .16	2.09 x 3		6.28 gal

Time (military)	pH (su)	SC (us)	Temp (°F)	ORP (millivolts)	D.O. (mg/L)	Turbidity (NTU)	Vol Evac. gal	Comments/Flow Rate
10:54	7.34	1996	59.7				0.25	brown, silty
	7.44	1610	59.2				0.5	brown, silty
	7.43	1630	59.0				0.75	brown, silty
	4.48	1610	58.8				1	brown, silty
	7.44	1650	58.3				2	brown, silty
	7.43	1540	58.6				3	brown, silty
	4.70	1510	58.6				4	brown, silty
	7.41	1530	58.1				5	brown, silty
	7.38	1510	58.3				6	brown, silty
	7.41	1460	58.1				6.25	brown, silty
Final:	7.4	1480	58.1				6.5	brown, silty

COMMENTS:

Instrumentation: ☑ pH Meter ☐ DO Monitor ☑ Conductivity Meter ☑ Temperature Meter ☐ Other

Water Disposal: Rio Vista

Sample ID: MW-4 | Sample Time: 11:30

Analysis Requested: ☑ BTEX ☐ VOCs ☐ Alkalinity ☐ TDS ☐ Cations ☐ Anions ☐ Nitrate ☐ Nitrite ☐ Metals
☐ Other

Trip Blank: 9062009TB01 | Duplicate Sample:

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WELL DEVELOPMENT AND SAMPLING LOG

Project Name: San Juan Basin | Location: Johnston Federal #4 | Well No: TMW-5
Client: MWH | Date: 6/9/2009 | Time: 8:29
Project Manager: Ashley Ager | Sampler's Name: Troy Urban

Measuring Point: TOC | Depth to Water: 48.38 ft | Depth to Product: ft
Well Diameter: 2" | Total Depth: 63.87 ft | Product Thickness: ft
Water Column Height: 15.49 ft

Sampling Method: ☐ Submersible Pump ☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Other
☑ Bottom Valve Bailer ☐ Double Check Valve Bailer

Criteria: ☑ 3 to 5 Casing Volumes of Water Removal ☑ Stabilization of Indicator Parameters ☑ Other bail dry

Water Volume in Well			
Gal/ft x ft of water	Gallons	Ounces	Volume to be removed
15.49 x .16	2.48 x 3		7.43 gal

Time (military)	pH (su)	SC (us)	Temp (°F)	ORP (millivolts)	D.O. (mg/L)	Turbidity (NTU)	Vol Evac. gal	Comments/Flow Rate
8:35	7.05	1187	59.9				0.25	light gray, sheen
	7.10	1216	60.1				0.5	dark gray, sheen
	7.11	1263	59.4				0.75	dark gray, sheen
	7.14	1246	59.7				1	dark gray, sheen
	7.15	1256	59.9				2	dark gray sheen
	7.14	1258	59.7				3	gray, sheen
	7.15	1266	60.1				4	gray, sheen
	7.12	1235	59.7				5	gray, sheen
	7.13	1263	59.9				6	gray, sheen
	7.12	1245	60.1				7	gray, sheen
Final:	7.13	1255	59.9				7.5	gray, sheen

COMMENTS:

Instrumentation: ☑ pH Meter ☐ DO Monitor ☑ Conductivity Meter ☑ Temperature Meter ☐ Other

Water Disposal: Rio Vista

Sample ID: TMW-5 | Sample Time: 9:17

Analysis Requested: ☑ BTEX ☐ VOCs ☐ Alkalinity ☐ TDS ☐ Cations ☐ Anions ☐ Nitrate ☐ Nitrite ☐ Metals
☐ Other

Trip Blank: 9062009TB01 | Duplicate Sample: