3R - 381

AGWMR

AUGUST 2010

3R381

BP AMERICA PRODUCTION CO.

GROUNDWATER REMEDIATION REPORT

GCU #170
(K) SECTION 35, T29N, R12W, NMPM
SAN JUAN COUNTY, NEW MEXICO

PREPARED FOR:
NEW MEXICO OIL CONSERVATION DIVISION
1220 ST. FRANCIS DRIVE
SANTA FE, NEW MEXICO 87504

DECEMBER 2010

PREPARED BY:
BLAGG ENGINEERING, INC.

Consulting Petroleum / Reclamation Services
P.O. Box 87
Bloomfield, New Mexico 87413

BP AMERICA PRODUCTION COMPANY
GCU # 170
NE¼ SW¼, Sec. 35, T29N, R12W

Monitor Well Sampling Dates: **5/26/09, 12/28/09, 5/10/10, 10/21/10**

Pit Closure and Background:

A site earthen separator pit closure was initiated in March 1995 by removing impacted soil via excavation. Documentation for this work and subsequent groundwater monitoring data for the site was previously submitted to the New Mexico Oil Conservation Division (**NMOCD**) for review. The reporting herein is for site monitoring conducted in 2009 and 2010.

Groundwater Monitor Well Sampling Procedures:

Groundwater monitor well MW #3R was purged of its well bore using a new disposable bailer, then given a sufficient amount of time to allow recovery prior to sample collections. The groundwater samples were collected following US EPA: SW-846 protocol, were placed into laboratory supplied containers with appropriate preservative, and stored in an ice chest for express delivery to an analytical laboratory for testing under strict chain-of-custody procedures. Analytical testing for benzene, toluene, ethylbenzene, and total xylenes (BTEX) by US EPA Method 8021B was conducted.

Fluids generated during monitor well development and purging were managed by discarding into the separator below-grade tank (BGT) located on the well site. The BGT contents are eventually disposed through approved NMOCD operational procedures for removal of produced fluids.

Water Quality and Gradient Information:

Bi-annual sampling of the groundwater monitor well MW #3R was conducted in 2009 and 2010. A historical summary of laboratory analytical BTEX results are included within the table on the following page. Field data sheets, laboratory reports, and laboratory quality assurance/quality control information are also included within this report.

Groundwater contour maps (Figure 2 through Figure 5) reveal the relative elevations from the site wells have consistently shown an apparent northwest flow direction.

Summary and/or Recommendations:

Continued site monitoring per BP's NMOCD approved Ground Water Management Plan is recommended. Hydrocarbon impacts appear to be in a steady state condition. It is necessary to install at least one (1) groundwater monitor well down gradient of MW #3R for delineation of any residual/dissolve phase BTEX. If warranted, alternative remedial actions will be evaluated.

BP AMERICA GROUNDWATER MONITOR WELL LABORATORY RESULTS

SUBMITTED BY BLAGG ENGINEERING, INC.

GCU # 170 - SEPARATOR PIT
UNIT K, SEC. 35, T29N, R12W

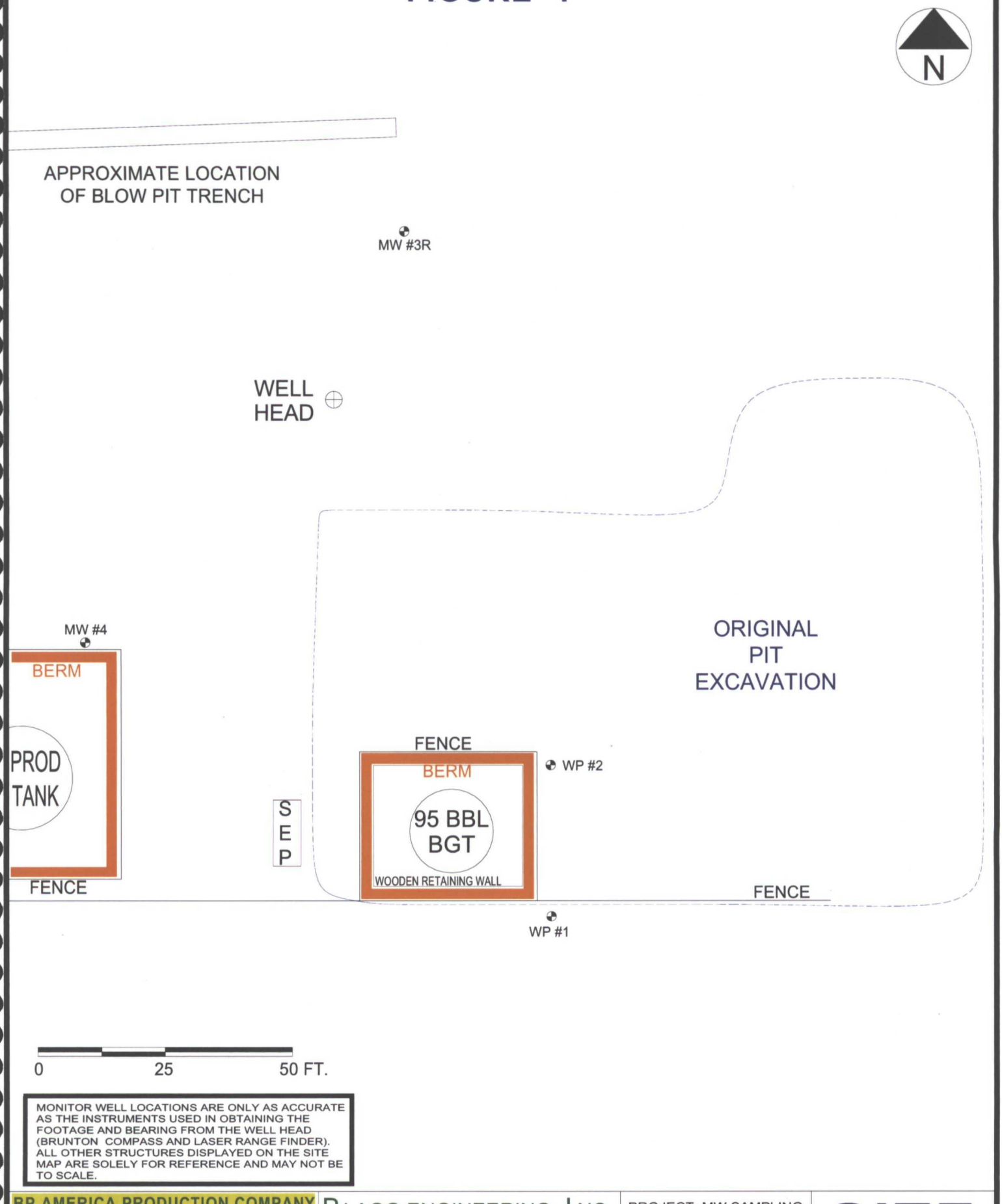
REVISED DATE: November 2, 2010

FILENAME: (17-4Q-10.WK4) NJV

SAMPLE DATE	MONITOR WELL #	D.T.W. (ft)	T.D. (ft)	TDS mg/L	COND. (umhos/cm)	pH	PRODUCT (ft)	BTEX EPA METHOD 8021B (ppb) Benzene	Toluene	Ethyl Benzene	Total Xylene
28-Jun-95	MW #1	10.50	15.00		1,400	7.4		0.2	0.2	0.3	0.9
08-Sep-95		9.56			1,400	7.8		**206**	82.3	4.9	67.0
07-Dec-95		9.91			1,700	6.8		**ND**	0.37	ND	ND
08-Mar-96		10.93			1,200	6.6		**ND**	0.97	ND	ND
04-Jun-96		10.74			1,300	6.7		**ND**	ND	ND	ND
28-Jun-95	WP #2	10.45	15.00		1,600	7.4		1.9	38.3	0.2	0.8
08-Sep-95		9.35			1,300	7.4		**47.1**	19.8	1.2	17.6
07-Dec-95		9.45			1,600	7.2		**ND**	ND	ND	ND
08-Mar-96		10.24			1,700	7.0		**ND**	ND	ND	ND
04-Jun-96		10.00			2,100	6.9		**ND**	ND	ND	ND
28-Jun-95	MW #3	10.45	15.00		1,500	7.4		**2115.7**	**4485.8**	318	**2704.4**
08-Sep-95		9.60			1,700	7.8		**1,200**	**815**	131	**661**
07-Dec-95		9.80			1,800	7.0		**4,830**	**7,680**	294	**2,760**
08-Mar-96		10.74			1,500	6.6		**5,020**	**6,410**	105	**2,603**
04-Jun-96		10.57			1,600	6.6		**5,140**	**5,560**	116	**2,631**
24-Jun-97		10.72			1,700	6.9		**1,115**	**542**	88.2	**850**
08-Jun-98		10.69			1,600	7.3		**921**	**1,020**	16.1	**279.4**
28-May-99		10.29			1,700	7.0		**69.3**	**78.1**	3	**88.7**
24-May-00		10.70			1,700	7.1		**1,100**	**770**	19	**410**
26-Jun-01	MW #3R	10.45	19.50		2,200	7.21		**160**	**540**	76	**590**
31-May-02		10.45			2,600	7.18		**32**	**17**	2.3	**29.6**
29-May-03		10.34			1,800	6.95		**75**	**30**	4.8	**38**
24-Jun-04		10.30			2,300	6.92		**71**	**26**	6.4	**36**
27-Jun-05		10.15			2,000	7.00		**80**	**47**	6.6	**53**
29-Jun-06		9.91			1,900	6.92		**130**	**39**	8.3	**150**
25-Jun-07		9.71			2,000	6.76		**270**	**170**	27	**310**
09-Jun-08		9.82			1,100	7.01		**142**	**104**	12.2	**114**
27-Aug-08		9.39			1,800	7.06		**200**	**150**	24	**190**
26-May-09		10.15			1,400	7.38		**150**	**73**	13	**93**
28-Dec-09		9.45			1,700	7.26		**77**	**44**	8.6	**50**
10-May-10		9.91			1,400	7.35		**130**	**72**	12	**110**
21-Oct-10		8.74			1,500	7.25		**87**	**46**	12	**86**
26-Jun-01	MW #4	11.14	18.50		800	7.41		ND	ND	ND	ND
					NMWQCC GROUNDWATER STANDARDS			**10**	**750**	**750**	**620**

NOTES :
1) **RESULTS IN BOLD RED TYPE INDICATE EXCEEDING NMWQCC STANDARDS .**
2) **RESULTS IN BOLD BLUE TYPE INDICATE BELOW NMWQCC STANDARDS AFTER PREVIOUS RESULTS IN BOLD RED TYPE EXCEEDED .**
3) **ND INDICATES NOT DETECTED AT THE REPORTING LIMITS (less than regulatory standards of at least a magnitude of 10) .**

FIGURE 1



MONITOR WELL LOCATIONS ARE ONLY AS ACCURATE AS THE INSTRUMENTS USED IN OBTAINING THE FOOTAGE AND BEARING FROM THE WELL HEAD (BRUNTON COMPASS AND LASER RANGE FINDER). ALL OTHER STRUCTURES DISPLAYED ON THE SITE MAP ARE SOLELY FOR REFERENCE AND MAY NOT BE TO SCALE.

BP AMERICA PRODUCTION COMPANY

GCU 170

NE/4 SW/4 SEC. 35, T29N, R12W

SAN JUAN COUNTY, NEW MEXICO

BLAGG ENGINEERING, INC.

CONSULTING PETROLEUM / RECLAMATION SERVICES

P.O. BOX 87

BLOOMFIELD, NEW MEXICO 87413

PHONE: (505) 632-1199

PROJECT: MW SAMPLING

DRAWN BY: NJV

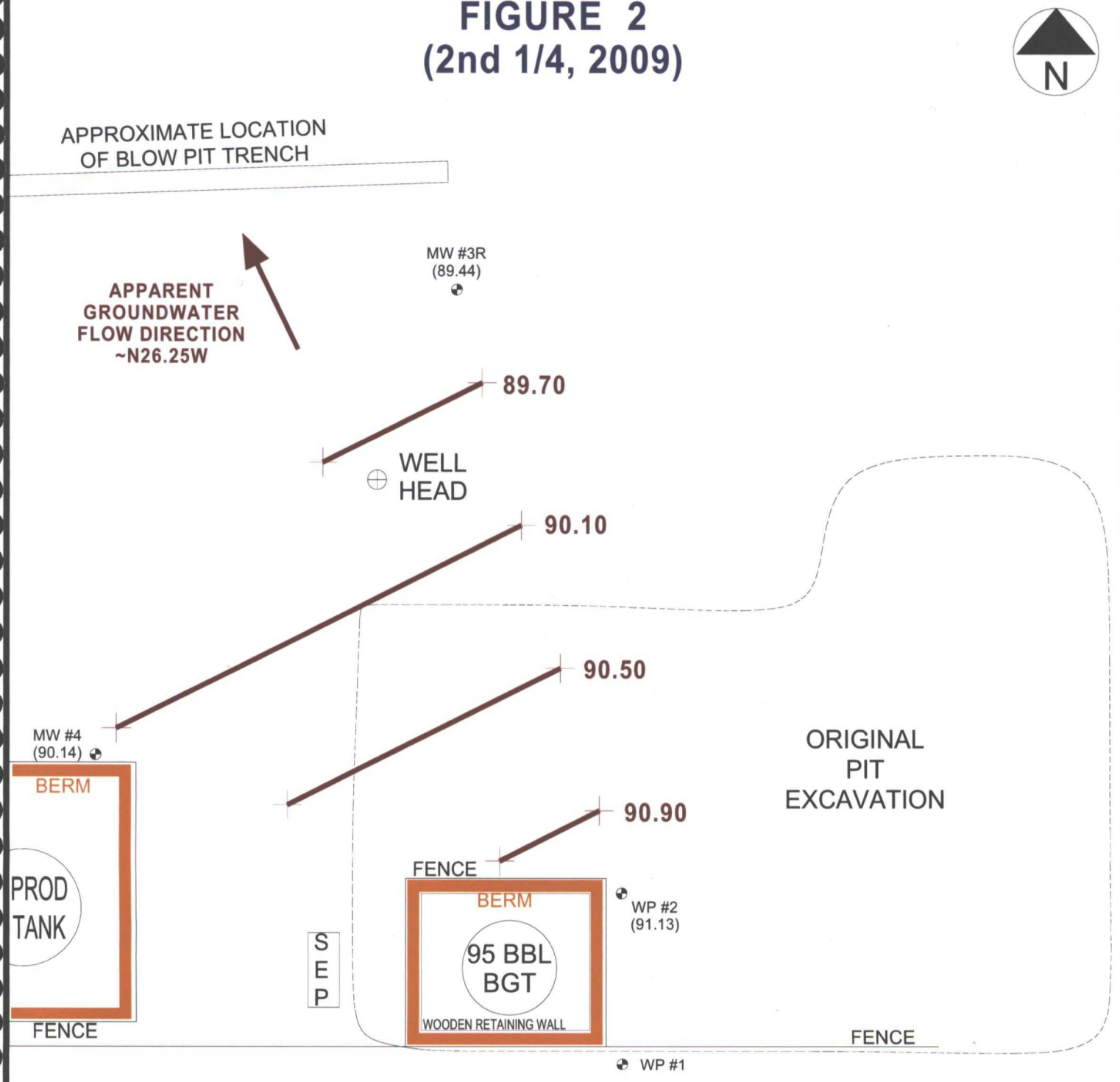
FILENAME: GCU170-SM-05-10.SKF

REVISED: 05/10/10 NJV

SITE MAP

05/10

FIGURE 2
(2nd 1/4, 2009)



MONITOR WELL LOCATIONS ARE ONLY AS ACCURATE AS THE INSTRUMENTS USED IN OBTAINING THE FOOTAGE AND BEARING FROM THE WELL HEAD (BRUNTON COMPASS AND LASER RANGE FINDER). ALL OTHER STRUCTURES DISPLAYED ON THE SITE MAP ARE SOLELY FOR REFERENCE AND MAY NOT BE TO SCALE.

	Top of Well Elevation
WP #2	(100.80)
MW #3R	(99.59)
MW #4	(101.14)
MW #4 (90.14)	Groundwater Elevation as of 5/26/09.

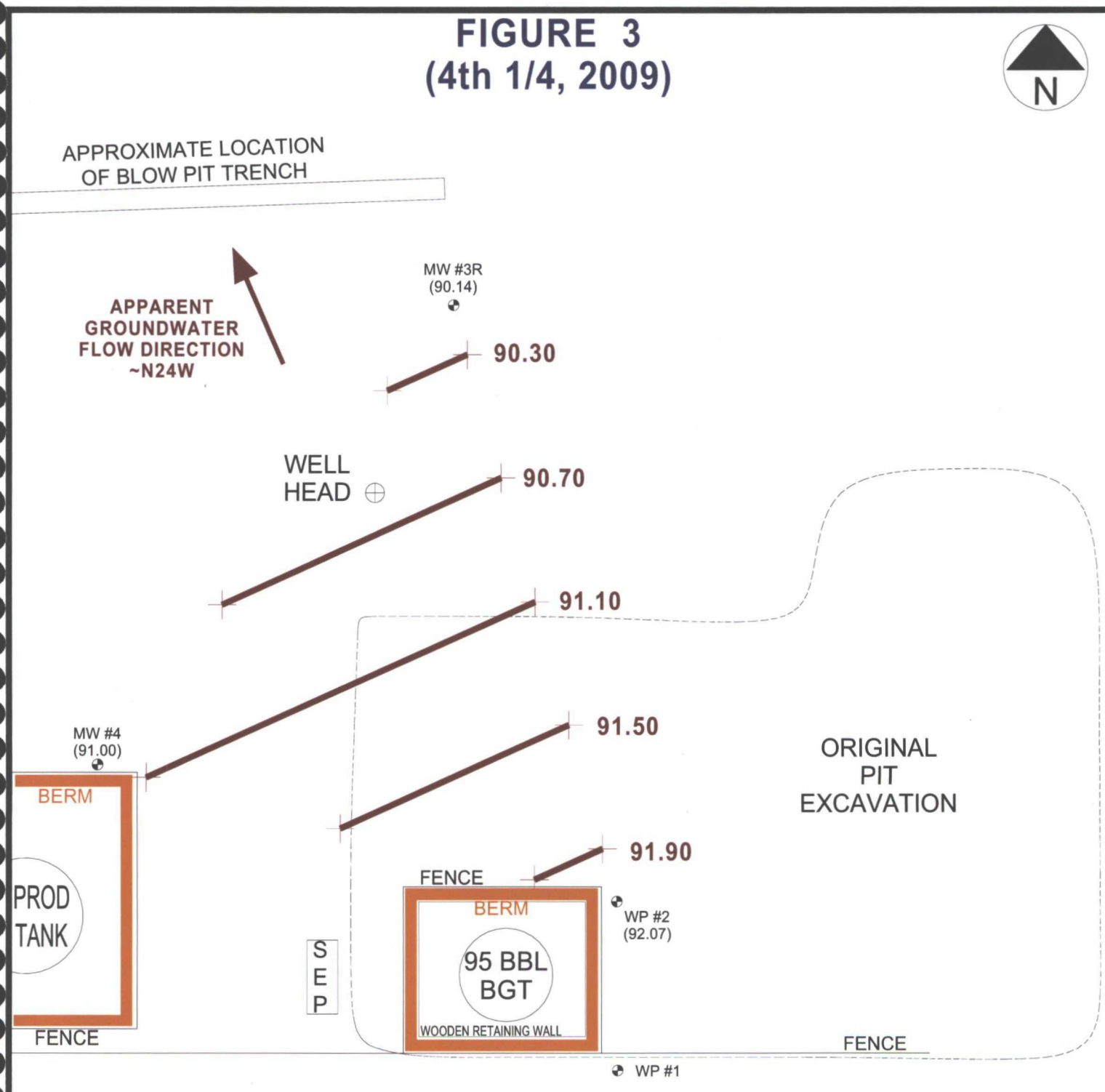
BP AMERICA PRODUCTION COMPANY
GCU # 170
NE/4 SW/4 SEC. 35, T29N, R12W
SAN JUAN COUNTY, NEW MEXICO

BLAGG ENGINEERING, INC.
CONSULTING PETROLEUM / RECLAMATION SERVICES
P.O. BOX 87
BLOOMFIELD, NEW MEXICO 87413
PHONE: (505) 632-1199

PROJECT: MW SAMPLING
DRAWN BY: NJV
FILENAME: 05-26-09-GW.SKF
REVISED: 05/27/09 NJV

GROUNDWATER CONTOUR MAP
05/09

FIGURE 3
(4th 1/4, 2009)



0 25 50 FT.

MONITOR WELL LOCATIONS ARE ONLY AS ACCURATE AS THE INSTRUMENTS USED IN OBTAINING THE FOOTAGE AND BEARING FROM THE WELL HEAD (BRUNTON COMPASS AND LASER RANGE FINDER). ALL OTHER STRUCTURES DISPLAYED ON THE SITE MAP ARE SOLELY FOR REFERENCE AND MAY NOT BE TO SCALE.

	Top of Well Elevation
WP #2	(100.80)
MW #3R	(99.59)
MW #4	(101.14)
MW #4 (91.00)	Groundwater Elevation as of 12/28/09.

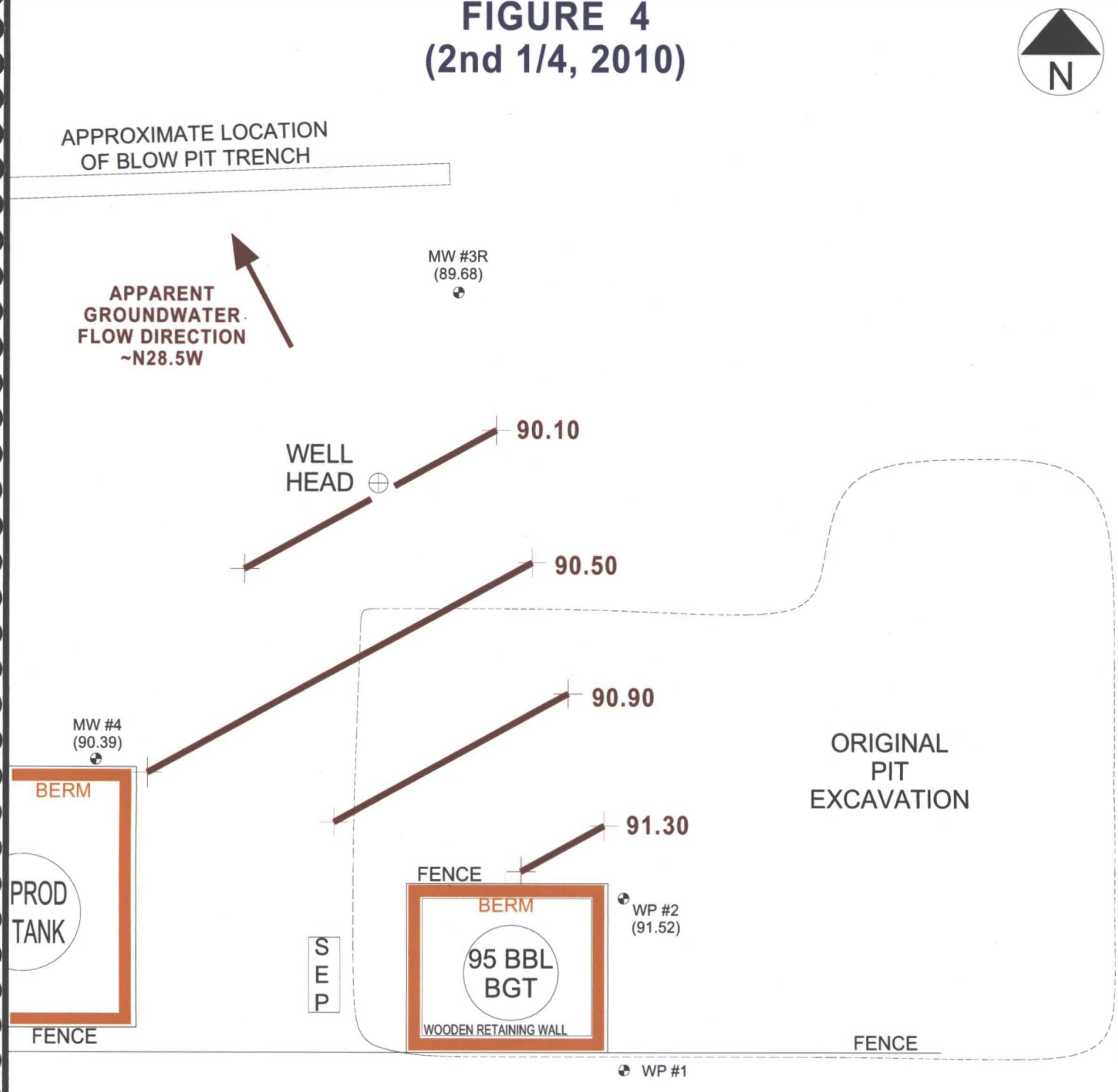
BP AMERICA PRODUCTION COMPANY
GCU # 170
NE/4 SW/4 SEC. 35, T29N, R12W
SAN JUAN COUNTY, NEW MEXICO

BLAGG ENGINEERING, INC.
CONSULTING PETROLEUM / RECLAMATION SERVICES
P.O. BOX 87
BLOOMFIELD, NEW MEXICO 87413
PHONE: (505) 632-1199

PROJECT: MW SAMPLING
DRAWN BY: NJV
FILENAME: 12-28-09-GW.SKF
REVISED: 12/28/09 NJV

GROUNDWATER CONTOUR MAP
12/09

FIGURE 4
(2nd 1/4, 2010)



MONITOR WELL LOCATIONS ARE ONLY AS ACCURATE AS THE INSTRUMENTS USED IN OBTAINING THE FOOTAGE AND BEARING FROM THE WELL HEAD (BRUNTON COMPASS AND LASER RANGE FINDER). ALL OTHER STRUCTURES DISPLAYED ON THE SITE MAP ARE SOLELY FOR REFERENCE AND MAY NOT BE TO SCALE.

	Top of Well Elevation
WP #2	(100.80)
MW #3R	(99.59)
MW #4	(101.14)
MW #4 (90.39)	Groundwater Elevation as of 5/10/10.

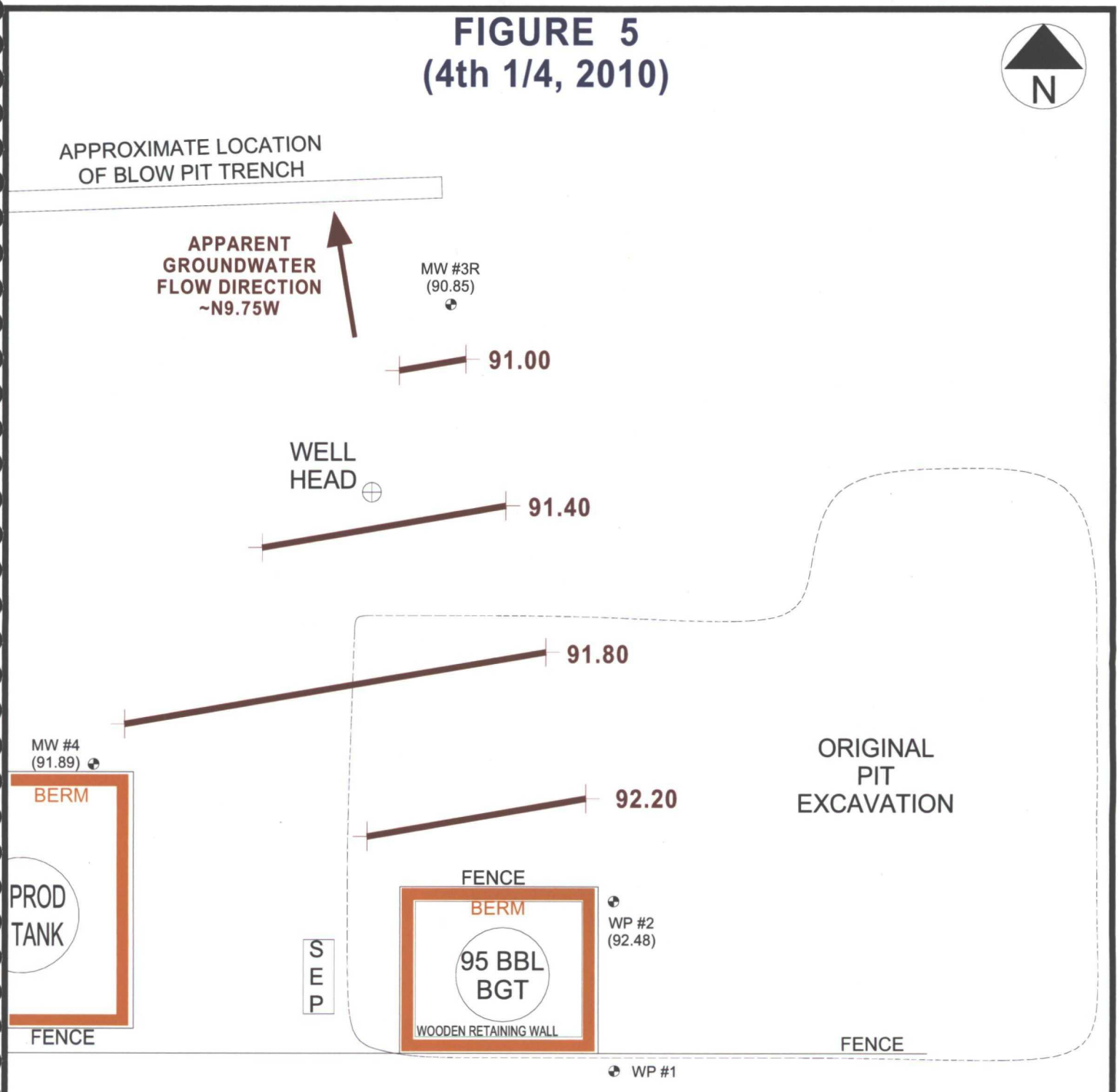
BP AMERICA PRODUCTION COMPANY
GCU # 170
NE/4 SW/4 SEC. 35, T29N, R12W
SAN JUAN COUNTY, NEW MEXICO

BLAGG ENGINEERING, INC.
CONSULTING PETROLEUM / RECLAMATION SERVICES
P.O. BOX 87
BLOOMFIELD, NEW MEXICO 87413
PHONE: (505) 632-1199

PROJECT: MW SAMPLING
DRAWN BY: NJV
FILENAME: 05-10-10-GW.SKF
REVISED: 05/10/10 NJV

GROUNDWATER CONTOUR MAP
05/10

FIGURE 5
(4th 1/4, 2010)



0 25 50 FT.

MONITOR WELL LOCATIONS ARE ONLY AS ACCURATE AS THE INSTRUMENTS USED IN OBTAINING THE FOOTAGE AND BEARING FROM THE WELL HEAD (BRUNTON COMPASS AND LASER RANGE FINDER). ALL OTHER STRUCTURES DISPLAYED ON THE SITE MAP ARE SOLELY FOR REFERENCE AND MAY NOT BE TO SCALE.

	Top of Well Elevation
WP #2	(100.80)
MW #3R	(99.59)
MW #4	(101.14)
MW #4 (91.89)	Groundwater Elevation as of 10/21/10.

BP AMERICA PRODUCTION COMPANY
GCU # 170
NE/4 SW/4 SEC. 35, T29N, R12W
SAN JUAN COUNTY, NEW MEXICO

BLAGG ENGINEERING, INC.
CONSULTING PETROLEUM / RECLAMATION SERVICES
P.O. BOX 87
BLOOMFIELD, NEW MEXICO 87413
PHONE: (505) 632-1199

PROJECT: MW SAMPLING
DRAWN BY: NJV
FILENAME: 10-21-10-GW.SKF
REVISED: 10/23/10 NJV

GROUNDWATER CONTOUR MAP
10/10

BLAGG ENGINEERING, INC.

MONITOR WELL DEVELOPMENT & / OR SAMPLING DATA

CLIENT : BP AMERICA PROD. CO.

CHAIN-OF-CUSTODY # : N / A

GCU # 170 - SEPARATOR PIT
UNIT K, SEC. 35, T29N, R12W

LABORATORY (S) USED : HALL ENVIRONMENTAL

Date : **May 19, 2009**

SAMPLER : N J V

Filename : **05-19-09.WK4**

PROJECT MANAGER : N J V

WELL #	WELL ELEV. (ft)	WATER ELEV. (ft)	DEPTH TO WATER (ft)	TOTAL DEPTH (ft)	SAMPLING TIME	pH	CONDUCT (umhos)	TEMP. (celcius)	VOLUME PURGED (gal.)
WP-2	100.80	91.13	9.67	15.00	-	-	-	-	-
MW-3R	99.59	89.44	10.15	19.50	0810	7.38	1,400	12.7	4.50
MW-4	101.14	90.14	11.00	18.50	-	-	-	-	-
					INSTRUMENT CALIBRATIONS =	4.01/7.00/10.00	2,800		
					DATE & TIME =	05/16/09	0810		

NOTES : Volume of water purged from well prior to sampling: V = pi X r2 X h X 7.48 gal./ft3) X 3 (wellbores).
(i.e. 2" MW r = (1/12) ft. h = 1 ft.) (i.e. 4" MW r = (2/12) ft. h = 1 ft.)
Ideally a minimum of three (3) wellbore volumes:
2.00 " well diameter = 0.49 gallons per foot of water.

Comments or note well diameter if not standard 2 ".

Excellent recovery in MW # 3R . Collected sample for BTEX per US EPA Method 8021B from MW # 3R only .

on-site	7:42	temp	55 F
off-site	8:16	temp	59 F
sky cond.	Mostly sunny		
wind speed	0 - 5	direct.	North

Hall Environmental Analysis Laboratory, Inc.

Date: *08-Jun-09*

CLIENT:	Blagg Engineering	**Client Sample ID:**	MW-3R
Lab Order:	0905495	**Collection Date:**	5/26/2009 8:10:00 AM
Project:	GCU #170	**Date Received:**	5/27/2009
Lab ID:	0905495-01	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **DAM**
Benzene	150	10		µg/L	10	6/6/2009 8:14:13 PM
Toluene	73	1.0		µg/L	1	6/5/2009 6:22:16 PM
Ethylbenzene	13	1.0		µg/L	1	6/5/2009 6:22:16 PM
Xylenes, Total	93	2.0		µg/L	1	6/5/2009 6:22:16 PM
Surr: 4-Bromofluorobenzene	116	65.9-130		%REC	1	6/5/2009 6:22:16 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Chain-of-Custody Record

Client: BLAGG ENER. / BP AMERICA

Mailing Address: P.O. BOX 87
BLFD., NM 87413

Phone #: 632-1199

email or Fax#:

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
☐ Other
☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush

Project Name: GCU #170

Project #:

Project Manager: NELSON VELEZ

Sampler: NELSON VELEZ

On Ice: ☒ Yes ☐ No

Sample Temperature: 1.9

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0905099	BTEX + MTBE + TMB's (8021B)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)					Air Bubbles (Y or N)
5/26/09	0810	WATER	MW #3R	40ml-2	HCl	-1	✓															

Date:	Time:	Relinquished by:	Received by:	Date	Time
5/26/09	1615			5/21/09	1320
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

QA/QC SUMMARY REPORT

Client: Blagg Engineering
Project: GCU #170 **Work Order:** 0905495

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: EPA Method 8021B: Volatiles									
Sample ID: 5ML RB		*MBLK*			Batch ID: **R33978**		Analysis Date:		6/5/2009 8:52:07 AM
Benzene	ND	µg/L	1.0						
Toluene	ND	µg/L	1.0						
Ethylbenzene	ND	µg/L	1.0						
Xylenes, Total	ND	µg/L	2.0						
Sample ID: 100NG BTEX LCS		*LCS*			Batch ID: **R33978**		Analysis Date:		6/5/2009 7:23:20 PM
Benzene	19.32	µg/L	1.0	96.6	85.9	113			
Toluene	19.52	µg/L	1.0	97.6	86.4	113			
Ethylbenzene	19.52	µg/L	1.0	97.6	83.5	118			
Xylenes, Total	59.44	µg/L	2.0	99.1	83.4	122			
Sample ID: 100NG BTEX LCSD		*LCSD*			Batch ID: **R33978**		Analysis Date:		6/5/2009 7:53:53 PM
Benzene	19.61	µg/L	1.0	98.0	85.9	113	1.49	27	
Toluene	19.70	µg/L	1.0	98.5	86.4	113	0.918	19	
Ethylbenzene	19.64	µg/L	1.0	98.2	83.5	118	0.613	10	
Xylenes, Total	59.29	µg/L	2.0	98.8	83.4	122	0.253	13	

Qualifiers:

E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	S	Spike recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name BLAGG | Date Received: 5/27/2009

Work Order Number 0905495 | Received by: TLS

Checklist completed by: _____ (Signature) 5/27/09 (Date) | Sample ID labels checked by: TS (Initials)

Matrix: | Carrier name: UPS

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐		
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐	Not Shipped ☐	
Custody seals intact on sample bottles?	Yes ☐	No ☐	N/A ☑		
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 ☐			
Water - VOA vials have zero headspace?	No VOA vials submitted ☐	Yes ☑	No ☐		
Water - Preservation labels on bottle and cap match?	Yes ☐	No ☐	N/A ☑		
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑		
Container/Temp Blank temperature?	4.9°	<6° C *Acceptable* If given sufficient time to cool.			

Number of preserved bottles checked for pH: _____

<2 >12 unless noted below.

COMMENTS:

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

BLAGG ENGINEERING, INC.

MONITOR WELL DEVELOPMENT & / OR SAMPLING DATA

CLIENT : BP AMERICA PROD. CO. **CHAIN-OF-CUSTODY # :** N / A

GCU # 170 - SEPARATOR PIT
UNIT K, SEC. 35, T29N, R12W

LABORATORY (S) USED : HALL ENVIRONMENTAL

Date : December 28, 2009 **SAMPLER :** N J V

Filename : 12-28-09.WK4 **PROJECT MANAGER :** N J V

WELL #	WELL ELEV. (ft)	WATER ELEV. (ft)	DEPTH TO WATER (ft)	TOTAL DEPTH (ft)	SAMPLING TIME	pH	CONDUCT (umhos)	TEMP. (celcius)	VOLUME PURGED (gal.)
WP-2	100.80	92.07	8.73	15.00	-	-	-	-	-
MW-3R	99.59	90.14	9.45	19.50	1325	7.26	1,700	13.4	5.00
MW-4	101.14	91.00	10.14	18.50	-	-	-	-	-
					INSTRUMENT CALIBRATIONS =	4.01/7.00/10.00	2,800		
					DATE & TIME =	12/28/09	1320		

NOTES : Volume of water purged from well prior to sampling: V = pi X r2 X h X 7.48 gal./ft3) X 3 (wellbores).
(i.e. 2" MW r = (1/12) ft. h = 1 ft.) (i.e. 4" MW r = (2/12) ft. h = 1 ft.)
Ideally a minimum of three (3) wellbore volumes:
2.00 " well diameter = 0.49 gallons per foot of water.

Comments or note well diameter if not standard 2 ".

Excellent recovery in MW # 3R . Collected sample for BTEX per US EPA Method 8021B from MW # 3R only .

on-site	12:55	temp	29 F
off-site	1:35	temp	31 F
sky cond.	Mostly cloudy		
wind speed	0 - 10	direct.	E

Hall Environmental Analysis Laboratory, Inc.

Date: *04-Jan-10*

CLIENT:	Blagg Engineering	**Client Sample ID:**	MW #3R
Lab Order:	0912560	**Collection Date:**	12/28/2009 1:25:00 PM
Project:	GCU #170	**Date Received:**	12/29/2009
Lab ID:	0912560-01	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	77	1.0		µg/L	1	12/31/2009 1:36:33 AM
Toluene	44	1.0		µg/L	1	12/31/2009 1:36:33 AM
Ethylbenzene	8.6	1.0		µg/L	1	12/31/2009 1:36:33 AM
Xylenes, Total	50	2.0		µg/L	1	12/31/2009 1:36:33 AM
Surr: 4-Bromofluorobenzene	104	65.9-130		%REC	1	12/31/2009 1:36:33 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Chain-of-Custody Record

Client: BLAGG ENGR. / BP AMERICA

Mailing Address: P.O. BOX 87
BLFD., NM 87413

Phone #: (505) 632-1199

email or Fax#:

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
☐ Other
☐ EDD (Type)

☒ Standard ☐ Rush

Project Name: GCU #170

Project #:

Project Manager: NELSON VELEZ

Sampler: NELSON VELEZ

On Ice: ☒ Yes ☐ No

Sample Temperature: 2.8

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0912560	BTEX + MTBE + TMB's (8021B)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)					Air Bubbles (Y or N)
12/28/09	1325	WATER	MW #3R	2-40ml	HCl & cool	1	✓															

Date:	Time:	Relinquished by:	Received by:	Date	Time
12/28/09	1500			12/29/09	10:20
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

QA/QC SUMMARY REPORT

Client: Blagg Engineering
Project: GCU #170 **Work Order:** 0912560

Analyte	Result	Units	PQL	SPK Va	SPK ref	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: EPA Method 8021B: Volatiles											
Sample ID: 5ML RB		*MBLK*				Batch ID:	**R36771**	Analysis Date:		12/30/2009 8:55:29 AM	
Benzene	ND	µg/L	1.0								
Toluene	ND	µg/L	1.0								
Ethylbenzene	ND	µg/L	1.0								
Xylenes, Total	ND	µg/L	2.0								
Sample ID: 100NG BTEX LCS		*LCS*				Batch ID:	**R36771**	Analysis Date:		12/30/2009 7:32:46 PM	
Benzene	20.55	µg/L	1.0	20	0	103	85.9	113			
Toluene	21.01	µg/L	1.0	20	0	105	86.4	113			
Ethylbenzene	20.64	µg/L	1.0	20	0.1	103	83.5	118			
Xylenes, Total	62.32	µg/L	2.0	60	0	104	83.4	122			
Sample ID: 100NG BTEX LCSD		*LCSD*				Batch ID:	**R36771**	Analysis Date:		12/30/2009 8:03:02 PM	
Benzene	19.64	µg/L	1.0	20	0	98.2	85.9	113	4.51	27	
Toluene	19.63	µg/L	1.0	20	0	98.2	86.4	113	6.75	19	
Ethylbenzene	19.16	µg/L	1.0	20	0.1	95.3	83.5	118	7.45	10	
Xylenes, Total	58.67	µg/L	2.0	60	0	97.8	83.4	122	6.04	13	

Qualifiers:

E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	S	Spike recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name **BLAGG** Date Received: **12/29/2009**

Work Order Number **0912560** Received by: ARS

Checklist completed by: _____ 12/29/09 Sample ID labels checked by: _____ TS

Signature Date Initials

Matrix: Carrier name: Greyhound

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐	Not Shipped ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	N/A ☑	
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 ☐		Number of preserved bottles checked for pH:
Water - VOA vials have zero headspace?	No VOA vials submitted ☐	Yes ☑	No ☐	
Water - Preservation labels on bottle and cap match?	Yes ☐	No ☐	N/A ☑	
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑	*<2 >12 unless noted below.*
Container/Temp Blank temperature?	**2.8°**	*<6° C Acceptable* If given sufficient time to cool.		

COMMENTS:

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

BLAGG ENGINEERING, INC.

MONITOR WELL DEVELOPMENT & / OR SAMPLING DATA

CLIENT : BP AMERICA PROD. CO.

CHAIN-OF-CUSTODY # : N / A

GCU # 170 - SEPARATOR PIT
UNIT K, SEC. 35, T29N, R12W

LABORATORY (S) USED : HALL ENVIRONMENTAL

Date : **May 10, 2010**

SAMPLER : N J V

Filename : **05-10-10.WK4**

PROJECT MANAGER : N J V

WELL #	WELL ELEV. (ft)	WATER ELEV. (ft)	DEPTH TO WATER (ft)	TOTAL DEPTH (ft)	SAMPLING TIME	pH	CONDUCT (umhos)	TEMP. (celcius)	VOLUME PURGED (gal.)
WP-2	100.80	91.52	9.28	15.00	-	-	-	-	-
MW-3R	99.59	89.68	9.91	19.50	0925	7.35	1,400	13.3	4.75
MW-4	101.14	90.39	10.75	18.50	-	-	-	-	-

INSTRUMENT CALIBRATIONS =	4.01/7.00/10.00	2,800
DATE & TIME =	05/10/10	0915

NOTES : Volume of water purged from well prior to sampling: V = pi X r2 X h X 7.48 gal./ft3) X 3 (wellbores).
(i.e. 2" MW r = (1/12) ft. h = 1 ft.) (i.e. 4" MW r = (2/12) ft. h = 1 ft.)
Ideally a minimum of three (3) wellbore volumes:
2.00 " well diameter = 0.49 gallons per foot of water.

Comments or note well diameter if not standard 2 ".

Excellent recovery in MW # 3R . Collected sample for BTEX per US EPA Method 8021B from MW # 3R only .

on-site	8:40	temp	49 F
off-site	9:35	temp	52 F
sky cond.	Sunny / partly cloudy		
wind speed	10 - 20	direct.	W - WSW

Hall Environmental Analysis Laboratory, Inc.

Date: *26-May-10*

CLIENT:	Blagg Engineering	**Client Sample ID:**	MW #3R
Lab Order:	1005290	**Collection Date:**	5/10/2010 9:25:00 AM
Project:	GCU #170	**Date Received:**	5/12/2010
Lab ID:	1005290-01	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	130	10		µg/L	10	5/21/2010 1:05:05 PM
Toluene	72	1.0		µg/L	1	5/20/2010 5:15:41 PM
Ethylbenzene	12	1.0		µg/L	1	5/20/2010 5:15:41 PM
Xylenes, Total	110	2.0		µg/L	1	5/20/2010 5:15:41 PM
Surr: 4-Bromofluorobenzene	103	65.9-130		%REC	1	5/20/2010 5:15:41 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
NC	Non-Chlorinated	ND	Not Detected at the Reporting Limit
PQL	Practical Quantitation Limit	S	Spike recovery outside accepted recovery limits

Chain-of-Custody Record

Client: BLAGG ENGR. / BP AMERICA

Mailing Address: P.O. BOX 87
BLFD., NM 87413

Phone #: 505 632-1199

email or Fax#:

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush

Project Name: GCU #170

Project #:

Project Manager: NELSON VELEZ

Sampler: NELSON VELEZ

On Ice: ☒ Yes ☐ No

Sample Temperature: 3.4

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1005210	(BTEX + MTBE + TMB's (8021B)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)					Air Bubbles (Y or N)
5/10/10	0925	WATER	MW #3R	2-40ml	HCl & COOL	1	✓															

Date: 5/11/10 Time: 1615 Relinquished by: [signature]

Received by: [signature] Date: 5/12/10 Time: 10:15

Date: Time: Relinquished by:

Received by: Date: Time:

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

QA/QC SUMMARY REPORT

Client: Blagg Engineering
Project: GCU #170 **Work Order:** 1005290

Analyte	Result	Units	PQL	SPK Va	SPK ref	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: EPA Method 8021B: Volatiles											
Sample ID: 5ML RB		*MBLK*				**Batch ID: R38838**		**Analysis Date:**		5/20/2010 9:10:09 AM	
Benzene	ND	µg/L	1.0								
Toluene	ND	µg/L	1.0								
Ethylbenzene	ND	µg/L	1.0								
Xylenes, Total	ND	µg/L	2.0								
Sample ID: 5ML RB		*MBLK*				**Batch ID: R38870**		**Analysis Date:**		5/21/2010 9:16:27 AM	
Benzene	ND	µg/L	1.0								
Toluene	ND	µg/L	1.0								
Ethylbenzene	ND	µg/L	1.0								
Xylenes, Total	ND	µg/L	2.0								
Sample ID: 100NG BTEX LCS		*LCS*				**Batch ID: R38838**		**Analysis Date:**		5/20/2010 8:48:11 PM	
Benzene	20.66	µg/L	1.0	20	0	103	87.9	121			
Toluene	19.36	µg/L	1.0	20	0	96.8	83	124			
Ethylbenzene	19.10	µg/L	1.0	20	0.134	94.8	81.7	122			
Xylenes, Total	59.26	µg/L	2.0	60	0	98.8	85.6	121			
Sample ID: 100NG BTEX LCSD		*LCSD*				**Batch ID: R38838**		**Analysis Date:**		5/20/2010 9:18:30 PM	
Benzene	20.59	µg/L	1.0	20	0	103	87.9	121	0.330	14.6	
Toluene	19.61	µg/L	1.0	20	0	98.1	83	124	1.29	18	
Ethylbenzene	19.55	µg/L	1.0	20	0.134	97.1	81.7	122	2.33	15.8	
Xylenes, Total	60.09	µg/L	2.0	60	0	100	85.6	121	1.39	15.9	

Qualifiers:

E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	NC	Non-Chlorinated
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name **BLAGG** Date Received: **5/12/2010**

Work Order Number **1005290** Received by: **ARS**

Checklist completed by: _____ 5/12/10 Sample ID labels checked by: _____

Signature Date Initials

Matrix: Carrier name: Greyhound

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐	Not Shipped ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	N/A ☑	
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 ☐		
Water - VOA vials have zero headspace?	No VOA vials submitted ☐	Yes ☑	No ☐	
Water - Preservation labels on bottle and cap match?	Yes ☐	No ☐	N/A ☑	
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑	
Container/Temp Blank temperature?	**3.4°**	*<6° C Acceptable* If given sufficient time to cool.		

Number of preserved bottles checked for pH: _____

<2 >12 unless noted below.

COMMENTS:

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

BLAGG ENGINEERING, INC.

MONITOR WELL DEVELOPMENT & / OR SAMPLING DATA

CLIENT : BP AMERICA PROD. CO. **CHAIN-OF-CUSTODY # :** N / A

GCU # 170 - SEPARATOR PIT
UNIT K, SEC. 35, T29N, R12W

LABORATORY (S) USED : HALL ENVIRONMENTAL

Date : October 21, 2010 **SAMPLER :** N J V

Filename : 10-21-10.WK4 **PROJECT MANAGER :** N J V

WELL #	WELL ELEV. (ft)	WATER ELEV. (ft)	DEPTH TO WATER (ft)	TOTAL DEPTH (ft)	SAMPLING TIME	pH	CONDUCT (umhos)	TEMP. (celcius)	VOLUME PURGED (gal.)
WP-2	100.80	92.48	8.32	15.00	-	-	-	-	-
MW-3R	99.59	90.85	8.74	19.50	0950	7.25	1,500	16.0	5.25
MW-4	101.14	91.89	9.25	18.50	-	-	-	-	-
					INSTRUMENT CALIBRATIONS =	4.01/7.00/10.00	2,800		
					DATE & TIME =	10/21/10	0940		

NOTES : Volume of water purged from well prior to sampling: V = pi X r2 X h X 7.48 gal./ft3) X 3 (wellbores).
(i.e. 2" MW r = (1/12) ft. h = 1 ft.) (i.e. 4" MW r = (2/12) ft. h = 1 ft.)
Ideally a minimum of three (3) wellbore volumes:
2.00 " well diameter = 0.49 gallons per foot of water.

Comments or note well diameter if not standard 2".

Excellent recovery in MW # 3R . Collected sample for BTEX per US EPA Method 8021B from MW # 3R only .

on-site	8:50	temp	47 F
off-site	10:00	temp	50 F
sky cond.	Sunny / partly cloudy		
wind speed	0 - 5	direct.	E - NE

Hall Environmental Analysis Laboratory, Inc.

Date: *29-Oct-10*

CLIENT:	Blagg Engineering	**Client Sample ID:**	MW #3R
Lab Order:	1010A01	**Collection Date:**	10/21/2010 9:50:00 AM
Project:	GCU #170	**Date Received:**	10/22/2010
Lab ID:	1010A01-01	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	87	5.0		µg/L	5	10/28/2010 2:59:43 AM
Toluene	46	5.0		µg/L	5	10/28/2010 2:59:43 AM
Ethylbenzene	12	5.0		µg/L	5	10/28/2010 2:59:43 AM
Xylenes, Total	86	10		µg/L	5	10/28/2010 2:59:43 AM
Surr: 4-Bromofluorobenzene	107	81.3-151		%REC	5	10/28/2010 2:59:43 AM

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level

Chain-of-Custody Record

Client: BLAGG ENGR. / BP AMERICA

Mailing Address: P. O. BOX 87
BLFD., NM 87413

Phone #: (505) 632-1199

email or Fax#:

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
~~X~~ Standard

Project Name:
GCU #170

Project #:

Project Manager:
NELSON VELEZ

Sampler: NELSON VELEZ

On Ice: ☒ Yes ☐ No

Sample Temperature: 2.1

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1010A01	BTEX + MTBE + TMB's (8021B)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)					Air Bubbles (Y or N)
9/21/10	0950	WATER	MW #3R	40ml-2	HCl + COOL	-1	✓															

Date: 9/21/10 Time: 1550 Relinquished by: [signature]
Received by: [signature] Date: 10/22/10 Time: 1020

Date: Time: Relinquished by:
Received by: Date: Time:

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

QA/QC SUMMARY REPORT

Client: Blagg Engineering
Project: GCU #170 **Work Order:** 1010A01

Analyte	Result	Units	PQL	SPK Val	SPK ref	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: EPA Method 8021B: Volatiles											
Sample ID: 5ML RB		*MBLK*				Batch ID: **R41813**		Analysis Date: 10/27/2010 9:16:43 AM			
Benzene	ND	µg/L	1.0								
Toluene	ND	µg/L	1.0								
Ethylbenzene	ND	µg/L	1.0								
Xylenes, Total	ND	µg/L	2.0								
Sample ID: 100NG BTEX LCS		*LCS*				Batch ID: **R41813**		Analysis Date: 10/27/2010 12:52:24 PM			
Benzene	20.85	µg/L	1.0	20	0	104	84.7	118			
Toluene	21.96	µg/L	1.0	20	0	110	82	123			
Ethylbenzene	22.04	µg/L	1.0	20	0.096	110	83	118			
Xylenes, Total	69.60	µg/L	2.0	60	0	116	85.4	119			

Qualifiers:

E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	NC	Non-Chlorinated

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name BLAGG | Date Received: 10/22/2010

Work Order Number 1010A01 | Received by: MLW

Checklist completed by: Signature 10/22/10 Date | Sample ID labels checked by: Initials

Matrix: | Carrier name: Priority US Mail

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐	Not Shipped ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	N/A ☑	
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 ☐		Number of preserved bottles checked for pH:
Water - VOA vials have zero headspace?	No VOA vials submitted ☐	Yes ☑	No ☐	
Water - Preservation labels on bottle and cap match?	Yes ☑	No ☐	N/A ☐	
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐	*<2 >12 unless noted below.*
Container/Temp Blank temperature?	**2.7°**	*<6° C Acceptable* If given sufficient time to cool.		

COMMENTS:

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____