3R-024

GW Remediation Report

DATE:
Feb. 2008

3R024

BP AMERICA PRODUCTION CO.

GROUNDWATER REMEDIATION REPORT

GOOCH #1E
(F) SECTION 20, T28N, R8W, NMPM
SAN JUAN COUNTY, NEW MEXICO

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

FEBRUARY 2008

PREPARED BY:
BLAGG ENGINEERING, INC.

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

BP AMERICA PRODUCTION COMPANY
Gooch #1E
Se/4 Nw/4, Sec. 20, T28N, R8W

Pit Closure Dates: **May, 1994 – separator pit; April, 1997 – abandoned & dehydrator pits**

Reclamation Procedures: **Excavation – May, 1994; April-May, 1997**

Monitor Well Installation Dates: **May, 1996; June, 2006**

Monitor Well Sampling Dates: **June & December, 1996; June & August, 2006**

Historical Information:

Environmental site activity was initiated in May, 1994. An earthen separator pit was remediated via excavation of the impacted soil media. The excavation perimeter was measured at approximately 35 X 20 X 10 feet depth. An estimated 250 cubic yards of soil was removed and landfarmed on-site during this remedial effort. Afterwards, the exposed groundwater within the excavations was sampled and tested for benzene, toluene, ethylbenzene, and total xylenes (BTEX) per US EPA method 8020.

The BTEX results of the groundwater sampling from the separator pit excavation are as follows;

Sample ID	Date	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Total Xylenes (ppb)
WATER @ 9'	05/26/94	**14.2**	61	ND	435
NMWQCC regulatory Standards		**10**	**750**	**750**	**620**

Note: ppb = parts per billion, ND = Not Detectable at Stated Limit, NMWQCC = New Mexico Water Quality Control Commission.

The pit closure data was submitted to the New Mexico Oil Conservation Division (NMOCD) with letter dated June 20, 1994. NMOCD responded with letter dated December 19, 1996 denying closure based on results exceeding the New Mexico Water Quality Control Commission (NMWQCC) standards.

Three (3) groundwater monitor wells were installed in May, 1996. Monitor wells MW #1, MW #2, and MW #3 were installed by Blagg Engineering, Inc. (BEI) utilizing a truck mounted drill rig with solid 3 ¾ inch augers. Two (2) inch PVC piping was hand driven into the annular after drilling to total depth and auger removal was finalized (see Bore/Test Hole Reports). The monitor wells were then completed by infilling the annular with Colorado silica sand. The monitor wells were developed and sampled in June, 1996. The BTEX results of the groundwater from the wells are as follows;

Sample ID	Date	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Total Xylenes (ppb)
MW #1	06/17/96	**0.02 ft. (¼ inch) of free phase product in well bore**			
MW #2	06/17/96	ND	0.78	ND	ND
MW #3	06/17/96	1.39	ND	ND	ND
NMWQCC regulatory Standards		**10**	**750**	**750**	**620**

Note: ppb = parts per billion, ND = Non detectable at stated limits, NMWQCC = New Mexico Water Quality Control Commission.

In December, 1996, monitor well MW #1 was again measured with 0.02 ft. (¼ inch) of free phase product within the well bore. BEI suspected that a dehydrator (dehy) pit located on BP's Riddle F LS #3A bearing SSW of MW #1 may have been contributing to the free phase product observed.

In April, 1997, BP elected to investigate/remediate the Riddle F LS #3A dehy. pit along with the Gooch abandoned (aban) and dehy pits (Figure 1). The excavation perimeters were measured at approximately 95 X 35 X 14 feet depth for the Riddle dehy, 50 X 40 X 12 feet depth for the Gooch aban, and 65 X 123 X 12 for the Gooch dehy pit. A combined estimation of 5,250 cubic yards of soil was removed from all four (4) excavated areas. Approximately 1,100 cubic yards was partially landfarmed on-site while the remaining 4,150 cubic yards was transported and composted at the Riddle F LS #1 (Unit L, Sec. 17, T28N, R8W). The exposed groundwater within the excavations were sampled and tested for BTEX.

The BTEX results of the groundwater sampling from the April-May, 1997 excavated areas are as follows;

Sample ID	Date	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Total Xylenes (ppb)
PW1 @ GW (9') – aban	04/14/97	3.9	229	9.9	**667**
PW1 @ GW (9') – dehy	04/15/97	**21.0**	646	150	**2,555**
PW1 @ GW (9') – Riddle F LS #3A dehy.	05/09/97	ND	17.2	ND	45.2
NMWQCC regulatory Standards		**10**	**750**	**750**	**620**

Note: ppb = parts per billion, ND = Not Detectable at Stated Limit, NMWQCC = New Mexico Water Quality Control Commission.

Upon receipt of the Gooch laboratory results, NMOCD was notified with letter dated May 21, 1997 of the groundwater impact (attached).

Groundwater Investigation and Soil Lithology:

Seven (7) additional monitor wells were installed in June, 2006 to test groundwater quality. Boring logs for all monitor wells along with well completion information are contained within this report. The well site is located in a remote area and no domestic or municipal receptors are at risk.

Soil lithology at the site consists of primarily coarse grained sand, non cohesive, and firm. Silty sand to clay was observed at depths greater than eight (8) feet below grade during the 1996 monitor well installations and the 1997 remediation effort.

Groundwater Monitor Well Sampling Procedures:

Groundwater samples were collected from site monitor wells following US EPA: SW-846 protocol. After well development, samples were collected with new disposable bailers, placed into laboratory supplied containers with appropriate preservative and stored in an ice chest for express delivery to a qualified laboratory for testing. Analytical testing included BTEX by US EPA Method 8021B and general water chemistry.

Waste generated during monitor well sampling and development was disposed of utilizing the separator tank pit located on the well site.

Groundwater Quality & Flow Direction Information:

Groundwater monitor well sampling was reinitiated in June, 2006. Summary of laboratory BTEX and general water chemistry analytical results are included in the tables on the following pages. The data indicates all BTEX constituents tested at non-detectable levels. There were no abnormalities revealed from the general water chemistry testing. All pertinent laboratory reports and field data sheets can be found in Appendix A.

Groundwater contour maps of relative water table elevations are attached. The groundwater flow direction in June, 1996 (Figure 2) displayed a northeasterly trend based on the limited data points. With more data points available in 2006, a north-northwest to northwest flow direction was revealed from the two (2) sampling events conducted (Figures 3 & 4).

Summary and Recommendations:

Hydrocarbon impacts from four (4) apparent source areas appear to have been remediated via excavation of impacted soil. All site wells tested at non-detectable or well below NMWQCC standards for BTEX. Permanent site closure is recommended. Following approval by the NMOCD, site monitor wells will be abandoned pursuant to the approved BP Ground Water Management Plan.

BP AMERICA PRODUCTION CO. GROUNDWATER LAB RESULTS

SUBMITTED BY BLAGG ENGINEERING, INC.

GOOCH # 1E

UNIT F, SEC. 20, T28N, R8W

REVISED DATE: December 5, 2006

FILENAME: (G1E-3Q06.WK4) NJV

								BTEX EPA METHOD 8021B (ppb)			
SAMPLE DATE	WELL NAME or No.	D.T.W. (ft)	T.D. (ft)	TDS (mg/L)	COND. umhos	pH	PRODUCT (ft)	Benzene	Toluene	Ethyl Benzene	Total Xylene
17-Jun-96	MW #1	10.73	14.61				0.02				
16-Dec-96							0.02				
27-Jun-06	MW #1R	11.87	19.85	6,000	5,300	7.13		ND	ND	ND	ND
29-Aug-06		11.65			4,500	7.16		ND	ND	ND	ND
17-Jun-96	MW #2	10.75	15.34	6,430	4,800	7.20		ND	0.78	ND	4.93
27-Jun-06		10.49		5,870	5,200	7.29		ND	ND	ND	ND
29-Aug-06		10.30			4,600	7.25		ND	ND	ND	ND
17-Jun-96	MW #3	11.44	15.35	6,580	5,000	6.90		1.39	ND	ND	ND
27-Jun-06	MW #4	13.28	20.00	6,130	5,300	7.26		ND	ND	ND	ND
29-Aug-06		13.15			4,600	7.21		ND	ND	ND	ND
27-Jun-06	MW #5	11.96	20.00	6,250	5,300	7.29		ND	ND	ND	ND
29-Aug-06		11.84			4,800	7.22		ND	ND	ND	ND
27-Jun-06	MW #6	11.76	20.00	5,170	4,900	7.20		ND	ND	ND	ND
29-Aug-06		11.58			4,300	7.31		ND	ND	ND	ND
27-Jun-06	MW #7	10.73	20.00	6,020	5,300	7.08		ND	ND	ND	ND
29-Aug-06		10.37			4,700	7.28		ND	ND	ND	ND
27-Jun-06	MW #8	12.08	20.00	6,400	5,500	7.11		ND	ND	ND	ND
29-Aug-06		11.79			4,800	7.06		ND	ND	ND	ND
27-Jun-06	MW #9	11.91	20.00	6,390	5,300	7.30		ND	ND	ND	ND
29-Aug-06		11.60			4,600	7.26		ND	ND	ND	ND
					NMWQCC GROUNDWATER STANDARDS			10	750	750	620

GENERAL WATER QUALITY
AMOCO PRODUCTION COMPANY
GOOCH # 1E
SAMPLE DATE : JUNE 17, 1996

PARAMETERS		MW # 1	MW # 2	MW # 3	Units
GENERAL	LAB pH	-	7.8	7.7	s. u.
	LAB CONDUCTIVITY (25 DEG. CELCIUS)	-	8,680	9,220	umhos cm
	TOTAL DISSOLVED SOLIDS (180 DEG. CELCIUS)	-	6,430	6,580	mg / L
	TOTAL DISSOLVED SOLIDS (CALCULATED)	-	6,470	6,100	mg / L
ANIONS	TOTAL ALKALINITY AS CaCO3	-	955	1,000	mg / L
	BICARBONATE ALKALINITY (AS CaCO3)	-	955	1,000	mg / L
	CARBONATE ALKALINITY (AS CaCO3)	-	NA	NA	mg / L
	HYDROXIDE ALKALINITY (AS CaCO3)	-	NA	NA	mg / L
	CHLORIDE	-	192	42.5	mg / L
	SULFATE	-	3,550	3,270	mg / L
	NITRATE + NITRITE - N	-	NA	NA	
	NITRATE - N	-	NA	NA	
	NITRITE - N	-	NA	NA	
CATIONS	TOTAL HARDNESS AS CaCO3	-	905	607	mg / L
	CALCIUM	-	327	331	mg / L
	MAGNESIUM	-	21.8	<0.1	mg / L
	POTASSIUM	-	<5.0	5.00	mg / L
	SODIUM	-	1,800	1,900	mg / L
DATA VALIDATION					ACCEPTANCE LEVEL
	CATION/ANION DIFFERENCE	-	1.03	3.01	+/- 5 %
	TDS (180):TDS (CALCULATED)	-	1.0	1.1	1.0 - 1.2

GENERAL WATER QUALITY

BP AMERICA PRODUCTION COMPANY

GOOCH # 1E

Sample Date : June 27 , 2006

PARAMETERS	MW # 1R	MW # 2	MW # 4	MW # 5	Units
LAB pH	7.32	7.52	7.45	7.57	s. u.
LAB CONDUCTIVITY @ 25 C	9,500	9,150	9,530	9,950	umhos / cm
TOTAL DISSOLVED SOLIDS @ 180 C	6,000	5,870	6,130	6,250	mg / L
TOTAL DISSOLVED SOLIDS (Calc)	6,050	5,830	6,070	6,340	mg / L
SODIUM ABSORPTION RATIO	30.1	29.2	29.4	30.8	ratio
TOTAL ALKALINITY AS CaCO3	652	808	398	376	mg / L
TOTAL HARDNESS AS CaCO3	628	592	612	626	mg / L
BICARBONATE as HCO3	652	808	398	376	mg / L
CARBONATE AS CO3	< 0.1	< 0.1	< 0.1	< 0.1	mg / L
HYDROXIDE AS OH	< 0.1	< 0.1	< 0.1	< 0.1	mg / L
NITRATE NITROGEN	< 0.01	< 0.01	< 0.01	< 0.01	mg / L
NITRITE NITROGEN	< 0.01	< 0.01	< 0.01	< 0.01	mg / L
CHLORIDE	126	101	31.4	30.5	mg / L
FLUORIDE	1.50	1.52	1.89	1.17	mg / L
PHOSPHATE	< 0.01	0.58	< 0.01	< 0.01	mg / L
SULFATE	3,540	3,300	3,810	4,020	mg / L
IRON	0.738	0.020	0.655	0.823	mg / L
CALCIUM	242	218	223	216	mg / L
MAGNESIUM	5.60	11.2	13.2	20.7	mg / L
POTASSIUM	10.6	80.8	75.8	50.0	mg / L
SODIUM	1,730	1,630	1,670	1,770	mg / L
CATION / ANION DIFFERENCE	0.05	0.15	0.04	0.03	

GENERAL WATER QUALITY

BP AMERICA PRODUCTION COMPANY

GOOCH # 1E

Sample Date : June 27 , 2006

PARAMETERS	MW # 6	MW # 7	MW # 8	MW # 9	Units
LAB pH	7.41	7.62	7.40	7.63	s. u.
LAB CONDUCTIVITY @ 25 C	8,230	9,550	9,920	10,010	umhos / cm
TOTAL DISSOLVED SOLIDS @ 180 C	5,170	6,020	6,400	6,390	mg / L
TOTAL DISSOLVED SOLIDS (Calc)	5,240	6,080	6,320	6,380	mg / L
SODIUM ABSORPTION RATIO	21.6	25.5	24.3	53.5	ratio
TOTAL ALKALINITY AS CaCO3	556	390	404	374	mg / L
TOTAL HARDNESS AS CaCO3	787	768	866	248	mg / L
BICARBONATE as HCO3	556	390	404	374	mg / L
CARBONATE AS CO3	< 0.1	< 0.1	< 0.1	< 0.1	mg / L
HYDROXIDE AS OH	< 0.1	< 0.1	< 0.1	< 0.1	mg / L
NITRATE NITROGEN	< 0.01	0.07	< 0.01	< 0.01	mg / L
NITRITE NITROGEN	< 0.01	< 0.01	< 0.01	< 0.01	mg / L
CHLORIDE	83.3	38.9	38.4	27.7	mg / L
FLUORIDE	1.10	1.40	1.68	1.81	mg / L
PHOSPHATE	< 0.01	< 0.01	< 0.01	< 0.01	mg / L
SULFATE	3,120	3,830	3,990	4,030	mg / L
IRON	0.578	0.007	0.402	0.825	mg / L
CALCIUM	267	259	279	73.1	mg / L
MAGNESIUM	28.6	28.9	40.6	15.6	mg / L
POTASSIUM	16.7	65.1	89.8	73.8	mg / L
SODIUM	1,390	1,620	1,640	1,930	mg / L
CATION / ANION DIFFERENCE	0.12	0.15	0.04	0.15	

RESULTS TO BOB MCCOY 6/10/94 REG

CLIENT: AMOCO

ENVIROTECH Inc.

5796 US HWY. 64, FARMINGTON, NM 87401
(505) 632-0615

PIT NO: A0030

C.O.C. NO: 3694

FIELD REPORT: CLOSURE VERIFICATION

JOB No: 92140
PAGE No: 1 of 1

LOCATION: NAME: GOOCH WELL #: 1E PIT: SEP

QUAD/UNIT: F SEC: 20 TWP: 28N RNG: 8W BM: NM CNTY: SJ ST: NM

QTR/FOOTAGE: SE/4 NW/4 CONTRACTOR: PAUL VELASQUEZ

DATE STARTED:
DATE FINISHED: 5-26-94

ENVIRONMENTAL SPECIALIST: REG

SOIL REMEDIATION: EXCAVATION APPROX. 20 FT. x 35 FT. x 10 FT. DEEP.

DISPOSAL FACILITY: ON SITE CUBIC YARDAGE: ~250

LAND USE: RANGE LEASE: FEDERAL LEASE # NMSF080112

FIELD NOTES & REMARKS: PIT LOCATED APPROXIMATELY 75 FEET S30°W FROM WELLHEAD.

DEPTH TO GROUNDWATER: 9' NEAREST WATER SOURCE: >1000' NEAREST SURFACE WATER: <1000'

NMOCD RANKING SCORE: 30 NMOCD TPH CLOSURE STD: 100 PPM

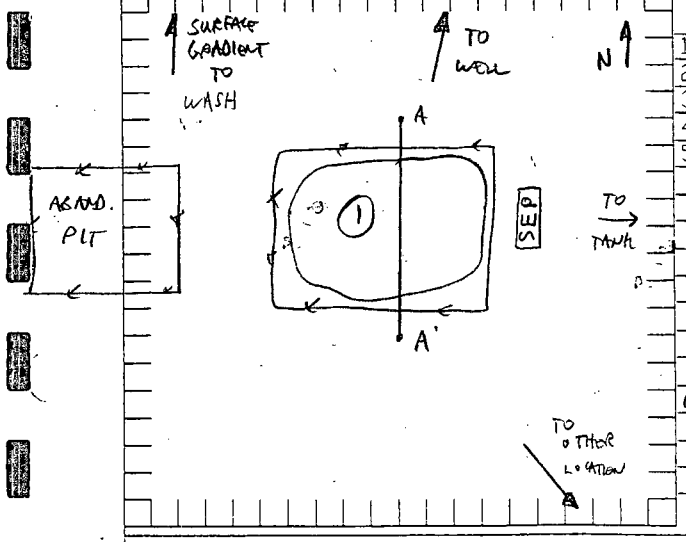
SOIL AND EXCAVATION DESCRIPTION: SOIL EXCAVATED TO GROUNDWATER - SILTY SANDY, BROWN SOIL - NO STAIN OR ODOR. GROUNDWATER SAMPLE COLLECTED. CLOUDY - NO ODOR.

FIELD 418.1 CALCULATIONS

SAMPLE I.D.	LAB No:	WEIGHT (g)	mL. FREON	DILUTION	READING	CALC. ppm

SCALE
0 10 20 FEET

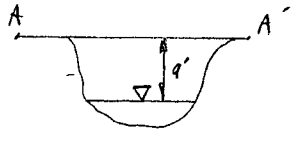
PIT PERIMETER



OVM RESULTS

SAMPLE ID	FIELD HEADSPACE PID (ppm)
1 @ 9'	WATER
2	
3	
4	
5	
	LAB SAMPLES
WATER @ 9'	BTEX

PIT PROFILE



TRAVEL NOTES: CALLOUT: 5-26-94 ONSITE: 5-26-94 1000

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	Water @ 9'	Date Reported:	06-01-94
Laboratory Number:	7529	Date Sampled:	05-26-94
Sample Matrix:	Water	Date Received:	05-26-94
Preservative:	HgCl and Cool	Date Analyzed:	05-31-94
Condition:	Cool and Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	14.2	0.4
Toluene	61	0.3
Ethylbenzene	ND	0.2
p,m-Xylene	338	0.2
o-Xylene	97	0.3

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	100 %
Bromofluorobenzene	97 %

Method: Method 5030A, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: Gooch #1E Separator Pit A0030

Analyst

Review

3694

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location	ANALYSIS/PARAMETERS
ALLCCE # 9214C	GOOCH #1E	A0030
Sampler: (Signature) R. E. O'Neill	Chain of Custody Tape No.	

Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	No. of Containers	BTEX						Remarks
WATER @ 9'	5/26/94	1015	7529	WATER	2	✓						SEP. PIT

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
R. E. O'Neill	5/26/94	1302	Debi L. Glenn	5-31-94	1600
Relinquished by: (Signature)			Received by: (Signature)		
Relinquished by: (Signature)			Received by: (Signature)		

ENVIROTECH INC.
5796 U.S. Highway 64-3014
Farmington, New Mexico 87401
(505) 632-0615

san juan repro Form 578-81

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 S. PACHECO
SANTA FE, NEW MEXICO 87505
(505) 827-7131

December 19, 1996

CERTIFIED MAIL
RETURN RECEIPT NO. P-269-269-232

Mr. B.D. Shaw
Amoco Production Company
200 Amoco Court
Farmington, New Mexico 87401

RE: FINAL SAN JUAN BASIN PIT CLOSURE REPORTS

Dear Mr. Shaw:

The New Mexico Oil Conservation Division (OCD) has completed a review o Amoco Production Company's (Amoco) June 20, 1994 "AMOCO PRODUCTION COMPAN PIT CLOSURE VERIFICATIONS" which were submitted on behalf of Amoco by thei consultant Blagg Engineering, Inc. This document contains "PIT REMEDIATIO AND CLOSURE REPORTS" for 54 unlined pits in the San Juan Basin o Northwestern New Mexico.

The OCD's review of the above referenced document is addressed below:

A. The pit closure/soil remediation activities conducted at the site listed below are approved.

1.	Cole A#1E (Blow pit)	Unit I, Sec. 35, T28N, R10W.
2.	Cole A#1E (Tank pit)	Unit I, Sec. 35, T28N, R10W.
3.	Elliott GC C#1 (Blow pit)	Unit G, Sec. 09, T30N, R09W.
4.	Elliott GC C#1A (Blow pit)	Unit E, Sec. 09, T30N, R09W.
5.	Elliott GC L#1 (Blow pit)	Unit A, Sec. 33, T30N, R09W.
6.	Elliott GC N#1E (~~Blow pit~~ Separator)	Unit A, Sec. 33, T30N, R09W.
7.	Elliott GC N#1E (Blow pit)	Unit A, Sec. 33, T30N, R09W.
8.	Elliott GC B#1 (Blow pit)	Unit K, Sec. 27, T30N, R09W.
9.	Elliott GC B#1 (Compressor pit)	Unit K, Sec. 27, T30N, R09W.
10.	E.E. Elliott B#8 (Blow pit)	Unit K, Sec. 27, T30N, R09W.
11.	E.E. Elliott C#2 (Blow pit)	Unit F, Sec. 09, T30N, R09W.
12.	Florance #55 (Tank pit)	Unit M, Sec. 22, T30N, R09W.
13.	Johnston LS #8 (Tank pit)	Unit G, Sec. 17, T28N, R09W.
14.	Johnston LS #8 (Blow pit)	Unit G, Sec. 17, T28N, R09W.
15.	Johnston LS #8 (Separator pit)	Unit G, Sec. 17, T28N, R09W.
16.	Omler A#2 (Blow pit)	Unit G, Sec. 35, T28N, R10W.
17.	Omler A#2 (Separator pit)	Unit G, Sec. 35, T28N, R10W.
18.	Omler A#2E (Blow pit)	Unit D, Sec. 35, T28N, R10W.
19.	Omler A#2E (Tank pit)	Unit D, Sec. 35, T28N, R10W.
20.	Omler A#2E (Separator pit)	Unit D, Sec. 35, T28N, R10W.
21.	Omler A#3 (Separator pit)	Unit M, Sec. 26, T28N, R10W.
22.	Omler A#3E (Separator pit)	Unit O, Sec. 26, T28N, R10W.
23.	Omler A#3E (Tank pit)	Unit O, Sec. 26, T28N, R10W.
24.	Riddle A#3 (Tank pit)	Unit A, Sec. 18, T30N, R09W.

Please be advised that OCD approval does not relieve Amoco o liability if remaining contaminants are found to pose a future threa to surface water, ground water, human health or the environment. I addition, OCD approval does not relieve Amoco of responsibility fo compliance with any other federal, state or local laws and/o regulations.

B. The pit remedial activities conducted at the sites listed below ar satisfactory. However, according to the reports, onsite landfarmin and/or composting actions are still continuing at the sites Subsequently, the OCD cannot issue final closure approval at this tim and approval of closure actions at these sites is **denied**. Pleas resubmit final closure reports for these sites upon completion of th landfarming and/or composting activities. The final reports wil include the results of the soil remediation levels achieved, th laboratory analyses and associated quality assurance/quality contro data and the disposition of the remediated soils.

2.	Abrams GC D#1 (Blow pit)	Unit I, Sec. 29, T29N, R10W
3.	Florance B#1 (Blow pit)	Unit E, Sec. 22, T30N, R09W
4.	Florance C LS #13 (Dehy pit)	Unit C, Sec. 29, T28N, R08W
5.	Florance #124 (Blow pit)	Unit M, Sec. 27, T29N, R09W
6.	W.D. Heath A#3X (Separator pit)	Unit K, Sec. 17, T29N, R09W
7.	W.D. Heath A#5 (Blow pit)	Unit P, Sec. 17, T29N, R09W
8.	W.D. Heath A#10 (Blow pit)	Unit K, Sec. 17, T29N, R09W
9.	W.D. Heath A#10 (Separator pit)	Unit K, Sec. 17, T29N, R09W
10.	W.D. Heath A#10E (Blow pit)	Unit A, Sec. 17, T29N, R09W
11.	W.D. Heath A#13 (Blow pit)	Unit N, Sec. 17, T29N, R09W
12.	Skelly GC #1E (Separator pit)	Unit O, Sec. 32, T29N, R10W
13.	Warren #4E (Separator pit)	Unit H, Sec. 13, T28N, R09W
14.	Warren Com #3 (Separator pit)	Unit P, Sec. 12, T28N, R09W
15.	Warren Com #3 (Blow pit)	Unit P, Sec. 12, T28N, R09W
16.	Warren Com #3 (Dehy pit)	Unit P, Sec. 12, T28N, R09W
17.	Warren LS #1A (Dehy pit)	Unit J, Sec. 13, T28N, R09W
18.	Warren LS #1A (Separator pit)	Unit J, Sec. 13, T28N, R09W
19.	Warren LS #8 (Separator pit)	Unit M, Sec. 07, T28N, R08W
20.	Warren LS #4E (Blow pit)	Unit H, Sec. 13, T28N, R09W
21.	Warren LS #4E (Separator pit)	Unit H, Sec. 13, T28N, R09W
22.	Warren LS #11 (Dehy pit)	Unit A, Sec. 13, T28N, R09W

C. The final pit remedial contaminant levels at the sites listed belo are in excess of the OCD's recommended remediation levels Consequently, the OCD cannot issue final closure approval and approva of closure actions at these sites is **denied**. The OCD requests tha Amoco address the extent of the remaining contamination at thes sites. The OCD will reconsider issuing closure approval upo resubmission of pit closure forms which address the remaining exten of contamination at the sites. The resubmitted forms should includ the completed form and all pertinent information elated to the exten

of contamination, the results of the soil remediation levels achieved, the results of the soil remediation levels achieved, the laboratory analyses and associated quality assurance/quality control data and the disposition of the remediated soils.

6.	Florance GC B#1 (Separator pit)	Unit H, Sec. 09, T29N, R12W.
7.	Omler A#1E (Separator pit)	Unit F, Sec. 26, T28N, R10W.
8.	W.D. Heath A#3X (Blow pit)	Unit K, Sec. 17, T29N, R09W.
9.	W.D. Heath A#5 (Separator pit)	Unit P, Sec. 17, T29N, R09W.

D. Ground waters at the sites listed below are contaminated with petroleum related constituents in excess of New Mexico Water Quality Control Commission ground water standards. In addition, the extent of ground water contamination at the sites has not been determined. Therefore, approval of these pit closure forms is **denied**. The OCD requests that Amoco investigate the extent of contamination and, if necessary, remediate contaminated ground water pursuant to Amoco's November 21, 1995 ground water investigation/remediation work plan which was approved by the OCD on November 29, 1995.

1.	Gooch #1E (Separator pit)	Unit F, Sec. 20, T28N, R08W.
2.	Hutton GC #1E (Separator pit)	Unit F, Sec. 06, T29N, R12W.
3.	McCoy GC C#1 (Separator pit)	Unit A, Sec. 28, T30N, R12W.
4.	Sullivan Frame GU A#1E (Dehy pit)	Unit A, Sec. 30, T29N, R10W.
8.	Sullivan GC D#1 (Separator pit)	Unit B, Sec. 26, T29N, R11W.

To simplify the approval process for both Amoco and OCD, the OCD requests that Amoco submit all future pit closure reports only upon completion of all closure activities including onsite landfarming or composting of contaminated soils. The reports should include the completed form and all pertinent information related to the extent of contamination, the results of the soil remediation levels in the pits and landfarms, all laboratory analyses and associated quality assurance/quality control data and the disposition of all remediated soils.

If you have any questions, please call me at (505) 827-7154.

Sincerely,

William C. Olson
Hydrogeologist
Environmental Bureau

xc: OCD Aztec District Office
Bill Liess, BLM Farmington District Office

CLIENT: AMOCO

BLAGG ENGINEERING, INC.
P.O. BOX 87, BLOOMFIELD, NM 87413
(505) 632-1199

LOCATION NO: 80493
C.O.C. NO: 5179

FIELD REPORT: CLOSURE VERIFICATION

PAGE No: 1 of 1

LOCATION: NAME: GOOCH WELL #: 1E PIT: ABAN.
QUAD/UNIT: F SEC: 20 TWP: 28N RNG: 8W PM: NM CNTY: SJ ST: NM
QTR/FOOTAGE: SE/4 NW/4 CONTRACTOR: P+S

DATE STARTED: 4/14/97
DATE FINISHED:
ENVIRONMENTAL SPECIALIST: NV

EXCAVATION APPROX. 50 FT. x 40 FT. x 14 FT. DEEP. CUBIC YARDAGE: 1000

DISPOSAL FACILITY: ON-SITE & RIDDLE F LS REMEDIATION METHOD: ~~LANDFARMED~~ LANDFARM/COMPOSTED

LAND USE: RANGE LEASE: SF-080112 FORMATION: OK

FIELD NOTES & REMARKS: PIT LOCATED APPROXIMATELY 138 FT. S63W FROM WELLHEAD.

DEPTH TO GROUNDWATER: <50' NEAREST WATER SOURCE: >1000' NEAREST SURFACE WATER: <1000'

NMOCD RANKING SCORE: 30 NMOCD TPH CLOSURE STD: 100 PPM

CHECK ONE:
- ✓ PIT ABANDONED
- ___ STEEL TANK INSTALLED
- ___ FIBERGLASS TANK INSTALLED

SOIL AND EXCAVATION DESCRIPTION:

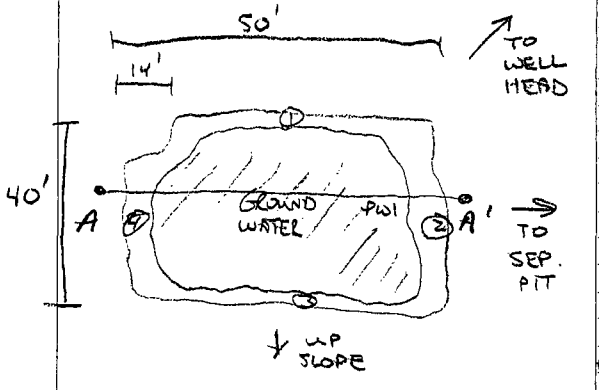
SIDEWALLS MOSTLY DK. YELL. BROWN SAND W/ SOME SMALL GRAVEL NEAR GROUNDWATER (@ 9'), NON COHESIVE SLIGHTLY MOIST, FIRM, NO APPARENT HC ODOR IN ANY OF THE OVM SAMPLES, NO APPARENT HC STAINING OR ODOR OBSERVED W/IN ENTIRE EXCAVATION, DK. YELL. BROWN CLAY BETWEEN 9-10' INTERVAL BELOW GROUND SURFACE, HIGHLY PLASTIC, MOIST, VERY STIFF (OBSERVED MOSTLY ON SOUTH SIDEWALL), NO FREE PRODUCT OR SHEEN OBSERVED ON GROUNDWATER SURFACE, NO HC ODOR ~~OBSERVED~~ DETECTED DURING COLLECTION OF GROUNDWATER SAMPLES.

FIELD 418.1 CALCULATIONS

TIME	SAMPLE I.D.	LAB No:	WEIGHT (g)	mL. FREON	DILUTION	READING	CALC. ppm

SCALE
0 FT

PIT PERIMETER



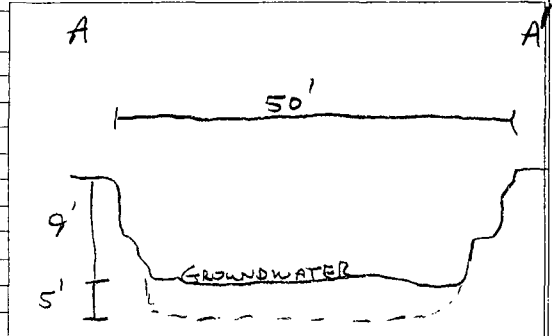
OVM RESULTS

SAMPLE ID	FIELD HEADSPACE PID (ppm)
1 @ 7'	0.0
2 @ 7'	0.0
3 @ 7'	0.0
4 @ 6'	0.0
5	

LAB SAMPLES

SAMPLE ID	ANALYSIS	TIME
PW1 CGW (9')	BTEX	1430
	ANION/CATION	

PIT PROFILE



TRAVEL NOTES: CALLOUT: — ONSITE: 4/14/97 AFTER.

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Blagg / Amoco	Project #:	04034
Sample ID:	PW 1 @ GW (9')	Date Reported:	04-15-97
Chain of Custody:	5179	Date Sampled:	04-14-97
Laboratory Number:	B133	Date Received:	04-15-97
Sample Matrix:	Water	Date Analyzed:	04-15-97
Preservative:	HgCl2 & Cool	Analysis Requested:	BTEX
Condition:	Cool & Intact		

Parameter	Concentration (ug/L)	Dilution Factor	Det. Limit (ug/L)
Benzene	**3.9**	**1**	**0.2**
Toluene	**229**	**1**	**0.2**
Ethylbenzene	**9.9**	**1**	**0.2**
p,m-Xylene	**512**	**1**	**0.2**
o-Xylene	**155**	**1**	**0.1**
Total BTEX	**910**		

ND - Parameter not detected at the stated detection limit.

Surrogate Recoveries:	Parameter	Percent Recovery
	Trifluorotoluene	**99 %**
	Bromofluorobenzene	**100 %**

References: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992.

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1994.

Comments: **Gooch #1E Aban. Pit.**

Analyst

Review

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ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

CATION / ANION ANALYSIS

Client:	Blagg / Amoco	Project #:	04034
Sample ID:	PW 1 @ GW (9')	Date Reported:	04-17-97
Laboratory Number:	B133	Date Sampled:	04-14-97
Sample Matrix:	Water	Date Received:	04-15-97
Preservative:	Cool	Date Analyzed:	04/16/97 - 04/17/97
Condition:	Cool & Intact	Chain of Custody:	5179

Parameter	Analytical Result	Units		Units
pH	**7.48**	s.u.		
Conductivity @ 25° C	**2,164**	umhos/cm		
Total Dissolved Solids @ 180C	**1,080**	mg/L		
Total Dissolved Solids (Calc)	**1,122**	mg/L		
SAR	**18.07**	ratio		
Total Alkalinity as CaCO3	**434**	mg/L		
Total Hardness as CaCO3	**75.4**	mg/L		
Bicarbonate as HCO3	**434**	mg/L	7.11	meq/L
Carbonate as CO3	**<1**	mg/L	0.00	meq/L
Hydroxide as OH	**<1**	mg/L	0.00	meq/L
Nitrate Nitrogen	**0.2**	mg/L	0.00	meq/L
Nitrite Nitrogen	**<.001**	mg/L	0.00	meq/L
Chloride	**16.2**	mg/L	0.46	meq/L
Fluoride	**8.20**	mg/L	0.43	meq/L
Phosphate	**0.7**	mg/L	0.02	meq/L
Sulfate	**447**	mg/L	9.31	meq/L
Calcium	**0.41**	mg/L	0.02	meq/L
Magnesium	**18.0**	mg/L	1.48	meq/L
Potassium	**7.60**	mg/L	0.19	meq/L
Sodium	**360**	mg/L	15.66	meq/L
Cations			17.36	meq/L
Anions			17.33	meq/L
Cation/Anion Difference			**0.13%**	

Reference: U.S.E.P.A., 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983
Standard Methods For The Examination of Water And Waste Water", 18th ed., 1992.

Comments: **Gooch #1E Aban. Pit.**

Analyst

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5179

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location	ANALYSIS/PARAMETERS
BLAGG / Amoco	ABAN. PIT GOOCH #1E	

Sampler: (Signature)	Chain of Custody Tape No.
Nelson Velez	04034

Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	No. of Containers	ANION / CATION	BTEX (8020)					Remarks
												ALL SAMPLES PRESERV. COOL & BTEX
PW1@GW(9')	4/14/97	1430	8133	WATER	3	✓	✓					PRESERV w/ $HgCl_2$
												ALSO.
					Samples received cool & intact							

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Nelson Velez	4/15/97	0712	Glenn L. Spencer	4-15-97	0712
Relinquished by: (Signature)			Received by: (Signature)		
Relinquished by: (Signature)			Received by: (Signature)		

ENVIROTECH INC.
5796 U.S. Highway 64-3014
Farmington, New Mexico 87401
(505) 632-0615

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS
QUALITY ASSURANCE REPORT

Client:	QA/QC	Project #:	N/A
Sample ID:	Laboratory Blank	Date Reported:	04-15-97
Laboratory Number:	04-15-BTEX.BLANK	Date Sampled:	N/A
Sample Matrix:	Water	Date Received:	N/A
Preservative:	N/A	Date Analyzed:	04-15-97
Condition:	N/A	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	**ND**	**0.2**
Toluene	**ND**	**0.2**
Ethylbenzene	**ND**	**0.2**
p,m-Xylene	**ND**	**0.2**
o-Xylene	**ND**	**0.1**

ND - Parameter not detected at the stated detection limit.

Surrogate Recoveries:	Parameter	Percent Recovery
	Trifluorotoluene	**100 %**
	Bromofluorobenzene	**100 %**

References: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992.

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1994.

Comments: **QA/QC for samples B128 - B131 and B133.**

Analyst

Review

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ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS
QUALITY ASSURANCE REPORT

Client:	QA/QC	Project #:	N/A
Sample ID:	Matrix Duplicate	Date Reported:	04-15-97
Laboratory Number:	B133	Date Sampled:	N/A
Sample Matrix:	Water	Date Received:	N/A
Preservative:	HgCl and Cool	Date Analyzed:	04-15-97
Condition:	Cool and Intact	Analysis Requested:	BTEX-MTBE

Parameter	Sample Result (ug/L)	Duplicate Result (ug/L)	Percent Diff.	Det. Limit (ug/L)	Dilution Factor
Benzene	**3.9**	**3.8**	**3.6%**	**0.2**	**1**
Toluene	**229**	**220**	**4.1%**	**0.2**	**1**
Ethylbenzene	**9.9**	**9.4**	**4.7%**	**0.2**	**1**
p,m-Xylene	**512**	**501**	**2.1%**	**0.2**	**1**
o-Xylene	**155**	**152**	**2.0%**	**0.1**	**1**

ND - Parameter not detected at the stated detection limit.

QA/QC Acceptance Criteria:	Parameter	Maximum Difference
	8020 Compounds	**30 %**

References: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992.

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1994.

Comments: **QA/QC for samples B128 - B131 and B133.**

Analyst

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ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS
QUALITY ASSURANCE REPORT

Client:	QA/QC	Project #:	N/A
Sample ID:	Matrix Spike	Date Reported:	04-15-97
Laboratory Number:	B133	Date Sampled:	N/A
Sample Matrix:	Water	Date Received:	N/A
Preservative:	Cool	Date Analyzed:	04-15-97
Condition:	Cool and Intact		

Parameter	Sample Result (ug/L)	Spike Added (ug/L)	Spiked Sample Result (ug/L)	Det. Limit (ug/L)	Percent Recovery	SW-846 % Rec. Accept. Range
Benzene	**3.9**	**50.0**	**53.6**	**0.2**	**99%**	**39-150**
Toluene	**229**	**50.0**	**280**	**0.2**	**100%**	**46-148**
Ethylbenzene	**9.9**	**50.0**	**59.6**	**0.2**	**100%**	**32-160**
p,m-Xylene	**512**	**100**	**613**	**0.2**	**100%**	**46-148**
o-Xylene	**155**	**50.0**	**204**	**0.1**	**99%**	**46-148**

ND - Parameter not detected at the stated detection limit.

References: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992.

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1994.

Comments: **QA/QC for samples B128 - B131 and B133.**

Analyst

Review

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CLIENT: AMOCO

BLAGG ENGINEERING, INC.
P.O. BOX 87, BLOOMFIELD, NM 87413
(505) 632-1199

LOCATION NO: 80493
C.O.C. NO: 5032

FIELD REPORT: CLOSURE VERIFICATION

PAGE No: 1 of 1

LOCATION: NAME: GOOCH 1E WELL #: 1E PIT: DEHY
QUAD/UNIT: F SEC: 20 TWP: 28N RNG: 8W PM: NM CNTY: SJ ST: NM
QTR/FOOTAGE: SE/4 NW/4 CONTRACTOR: P & S

DATE STARTED: 4/15/97
DATE FINISHED:
ENVIRONMENTAL SPECIALIST: NV

EXCAVATION APPROX. 65 FT. x 123 FT. x 12 FT. DEEP. CUBIC YARDAGE: 2,200
DISPOSAL FACILITY: ON-SITE / RIDDLE F LS #1 REMEDIATION METHOD: ~~LANDFARMED~~ LANDFARMED/COMPOSTED NV
LAND USE: RANGE LEASE: SF-080112 FORMATION: DK

FIELD NOTES & REMARKS: PIT LOCATED APPROXIMATELY 110 FT. N51W FROM WELLHEAD.
DEPTH TO GROUNDWATER: <50' NEAREST WATER SOURCE: >1000' NEAREST SURFACE WATER: <200'
NMOCD RANKING SCORE: 40 NMOCD TPH CLOSURE STD: 100 PPM

CHECK ONE:
✓ PIT ABANDONED
___ STEEL TANK INSTALLED
___ FIBERGLASS TANK INSTALLED

SOIL AND EXCAVATION DESCRIPTION:

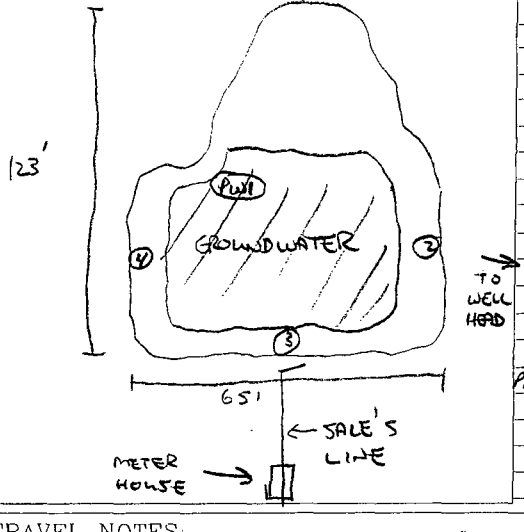
MOSTLY DK. YELL. BROWN SAND, NON COHESIVE, SLIGHTLY MOIST FIRM, NO APPARENT HC ODOR OR STAINING FROM GROUND SURFACE TO APPROX. 6'-7' BELOW GRADE IN ENTIRE EXCAVATION, SOUTH SIDEWALL CONTAINS MED. TO DARK GRAY SAND w/ STRONG HC ODOR BELOW SALE'S LINE (7'-9' INTERVAL), CLAY, HIGHLY PLASTIC, MOIST TO SATURATED, APPARENT HC STAINING ON SOUTH, NORTH, AND NORTHWEST CORNER SIDEWALLS (9'-13'), DK. YELL. BROWN EAST & WEST SIDE WALLS w/ NO APPARENT HC STAINING OR ODOR, GROUNDWATER NOT TREATED PRIOR TO (PUMPED) 4/15/97 SAMPLING.

FIELD 418.1 CALCULATIONS

TIME	SAMPLE I.D.	LAB No:	WEIGHT (g)	mL. FREON	DILUTION	READING	CALC. ppm

SCALE
0 FT

PIT PERIMETER



OVM RESULTS

SAMPLE ID	FIELD HEADSPACE PID (ppm)
1	
2 @ 8'	0.0
3 @ 9'	879
4 @ 8'	0.0
5	

LAB SAMPLES

SAMPLE ID	ANALYSIS	TIME
PWHBGWX(4)	BTEX	1615
	ANION / CATION	

PIT PROFILE

TRAVEL NOTES: CALLOUT: NA ONSITE: 4/15/97 AFTER.

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Blagg / Amoco	Project #:	04034
Sample ID:	PW 1 @ GW (9')	Date Reported:	04-16-97
Chain of Custody:	5032	Date Sampled:	04-15-97
Laboratory Number:	B136	Date Received:	04-16-97
Sample Matrix:	Water	Date Analyzed:	04-16-97
Preservative:	HgCl2 & Cool	Analysis Requested:	BTEX
Condition:	Cool & Intact		

Parameter	Concentration (ug/L)	Dilution Factor	Det. Limit (ug/L)
Benzene	**21.0**	**5**	**0.9**
Toluene	**646**	**5**	**0.8**
Ethylbenzene	**150**	**5**	**0.8**
p,m-Xylene	**2,090**	**5**	**1.1**
o-Xylene	**465**	**5**	**0.5**
Total BTEX	**3,370**		

ND - Parameter not detected at the stated detection limit.

Surrogate Recoveries:	Parameter	Percent Recovery
	Trifluorotoluene	**99 %**
	Bromofluorobenzene	**100 %**

References: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992.

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1994.

Comments: **Gooch #1E Dehydrator Pit.**

Analyst

Review

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ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

CATION / ANION ANALYSIS

Client:	Blagg / Amoco	Project #:	04034
Sample ID:	PW 1 @ GW (9')	Date Reported:	04-17-97
Laboratory Number:	B136	Date Sampled:	04-15-97
Sample Matrix:	Water	Date Received:	04-16-97
Preservative:	Cool	Date Analyzed:	04-17-97
Condition:	Cool & Intact	Chain of Custody:	5032

Parameter	Analytical Result	Units		Units
pH	**7.47**	s.u.		
Conductivity @ 25° C	**2,645**	umhos/cm		
Total Dissolved Solids @ 180C	**1,320**	mg/L		
Total Dissolved Solids (Calc)	**1,338**	mg/L		
SAR	**22.80**	ratio		
Total Alkalinity as CaCO3	**610**	mg/L		
Total Hardness as CaCO3	**73.2**	mg/L		
Bicarbonate as HCO3	**610**	mg/L	10.00	meq/L
Carbonate as CO3	**<1**	mg/L	0.00	meq/L
Hydroxide as OH	**<1**	mg/L	0.00	meq/L
Nitrate Nitrogen	**0.6**	mg/L	0.01	meq/L
Nitrite Nitrogen	**<.001**	mg/L	0.00	meq/L
Chloride	**105**	mg/L	2.96	meq/L
Fluoride	**7.71**	mg/L	0.41	meq/L
Phosphate	**2.7**	mg/L	0.09	meq/L
Sulfate	**376**	mg/L	7.83	meq/L
Calcium	**0.19**	mg/L	0.01	meq/L
Magnesium	**17.8**	mg/L	1.46	meq/L
Potassium	**7.50**	mg/L	0.19	meq/L
Sodium	**450**	mg/L	19.58	meq/L
Cations			21.24	meq/L
Anions			21.29	meq/L
Cation/Anion Difference			**0.23%**	

Reference: U.S.E.P.A., 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983
Standard Methods For The Examination of Water And Waste Water", 18th ed., 1992.

Comments: **Gooch #1E Dehydrator Pit.**

Analyst

Review

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5032

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location	ANALYSIS/PARAMETERS
BLAGG / AMOCO	DEHYDRATOR PIT GOOCH A/E	

Sampler: (Signature) Nelson Velez

Chain of Custody Tape No. 04034

Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	No. of Containers	BTEX (8020)	ANION / CATION					Remarks
												ALL SAMPLES PRESERV. COOL; BTEX ALSO
PW1@GW(9')	4/15/97	1615	B136	WATER	3	✓	✓					PRESERV. w/ $HgCl_2$
					Samples received cool & intact							

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Nelson Velez	4/16/97	0828	Glenn L. Copeland	4/16/97	0828
Relinquished by: (Signature)			Received by: (Signature)		
Relinquished by: (Signature)			Received by: (Signature)		

ENVIROTECH INC.
5796 U.S. Highway 64-3014
Farmington, New Mexico 87401
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ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS
QUALITY ASSURANCE REPORT

Client:	QA/QC	Project #:	N/A
Sample ID:	Laboratory Blank	Date Reported:	04-16-97
Laboratory Number:	04-16-BTEX.BLANK	Date Sampled:	N/A
Sample Matrix:	Water	Date Received:	N/A
Preservative:	N/A	Date Analyzed:	04-16-97
Condition:	N/A	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	**ND**	**0.2**
Toluene	**ND**	**0.2**
Ethylbenzene	**ND**	**0.2**
p,m-Xylene	**ND**	**0.2**
o-Xylene	**ND**	**0.1**

ND - Parameter not detected at the stated detection limit.

Surrogate Recoveries:	Parameter	Percent Recovery
	Trifluorotoluene	**100 %**
	Bromofluorobenzene	**100 %**

References: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992.

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1994.

Comments: **QA/QC for samples B134 - B136.**

Analyst

Review

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ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	QA/QC	Project #:	N/A
Sample ID:	Matrix Duplicate	Date Reported:	04-16-97
Laboratory Number:	B134	Date Sampled:	N/A
Sample Matrix:	Soil	Date Received:	N/A
Preservative:	Cool	Date Analyzed:	04-16-97
Condition:	Cool and Intact	Analysis Requested:	BTEX

Parameter	Sample Result (ug/Kg)	Duplicate Result (ug/Kg)	Det. Limit (ug/Kg)	Percent Difference
Benzene	**50.0**	**47.0**	**11.7**	**0.0%**
Toluene	**36,900**	**36,600**	**11.1**	**0.8%**
Ethylbenzene	**11,100**	**10,900**	**10.1**	**1.2%**
p,m-Xylene	**34,400**	**33,800**	**14.4**	**1.8%**
o-Xylene	**19,500**	**19,400**	**6.9**	**0.4%**

ND - Parameter not detected at the stated detection limit.

QA/QC Acceptance Criteria:	Parameter	Maximum Difference
	8020 Compounds	**30 %**

References: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992.

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1994.

Comments: **QA/QC for samples B134 - B136.**

Analyst

Review

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ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	QA/QC	Project #:	N/A
Sample ID:	Matrix Spike	Date Reported:	04-16-97
Laboratory Number:	B134	Date Sampled:	N/A
Sample Matrix:	Soil	Date Received:	N/A
Preservative:	Cool	Date Extracted:	04-16-97
Condition:	Cool and Intact	Date Analyzed:	04-16-97

Parameter	Sample Result (ug/Kg)	Spike Added (ug/Kg)	Spiked Sample Result (ug/Kg)	Det. Limit (ug/Kg)	Percent Recovery	SW-846 % Rec. Accept. Range
Benzene	**50.0**	**50.0**	**98.4**	**11.7**	**100%**	**39-150**
Toluene	**36,900**	**50.0**	**36,900**	**11.1**	**100%**	**46-148**
Ethylbenzene	**11,100**	**50.0**	**11,120**	**10.1**	**100%**	**32-160**
p,m-Xylene	**34,400**	**100**	**34,500**	**14.4**	**100%**	**46-148**
o-Xylene	**19,500**	**50.0**	**19,600**	**6.9**	**100%**	**46-148**

ND - Parameter not detected at the stated detection limit.

References: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992.

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1994.

Comments: **QA/QC for samples B134 - B136.**

Analyst

Review

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BLAGG ENGINEERING, INC.
P.O. Box 87, Bloomfield, New Mexico 87413
Phone: (505)632-1199 Fax: (505)632-3903

May 21, 1997

Mr. Roger Anderson
Chief of Environmental Bureau
State of New Mexico Oil Conservation Division
2040 So. Pacheco
Santa Fe, New Mexico 87505

RE: Groundwater Impact
Amoco Production Company: Gooch #1E - Dehydrator pit
Legal Description: Unit F, Sec. 20, T28N, R08W
San Juan County, New Mexico

Dear Mr. Anderson:

Initial groundwater sample analytical results at the above referenced well site during pit closure activity indicated contamination to be above the State of New Mexico Water Quality Control Commission's regulatory standards for Benzene and total Xylenes. Sampling on the Dehydrator pit was conducted April 15, 1997. Depth to groundwater was measured at approximately nine (9) feet below grade. Listed below are summary analytical results for Benzene, Toluene, Ethylbenzene, and total Xylenes (BTEX):

Parameter	Dehydrator Pit (parts per billion)
Benzene	**21.0**
Toluene	646
Ethylbenzene	150
Total Xylenes	**2,555**

If you have any questions concerning this information, please do not hesitate to contact us at (505) 632-1199. Thank you for your cooperation.

Respectfully submitted,
Blagg Engineering, Inc.

Jeffrey C. Blagg, P.E.
President

cc: Denny Foust, Deputy Oil & Gas Inspector, NMOCD, Aztec, NM
Buddy Shaw, Environmental Coordinator, Amoco Production Company, Farmington, NM

NV/nv GOOCH-1E.DEH

BLAGG ENGINEERING, INC.
P.O. Box 87, Bloomfield, New Mexico 87413
Phone: (505)632-1199 Fax: (505)632-3903

May 21, 1997

Mr. Roger Anderson
Chief of Environmental Bureau
State of New Mexico Oil Conservation Division
2040 So. Pacheco
Santa Fe, New Mexico 87505

RE: Groundwater Impact
Amoco Production Company: Gooch #1E - Abandoned pit
Legal Description: Unit F, Sec. 20, T28N, R08W
San Juan County, New Mexico

Dear Mr. Anderson:

Initial groundwater sample analytical results at the above referenced well site during pit closure activity indicated contamination to be above the State of New Mexico Water Quality Control Commission's regulatory standards for total Xylenes. Sampling on the Abandoned pit was conducted April 14, 1997. Depth to groundwater was measured at approximately nine (9) feet below grade. Listed below are summary analytical results for Benzene, Toluene, Ethylbenzene, and total Xylenes (BTEX):

Parameter	Abandoned Pit (parts per billion)
Benzene	3.9
Toluene	229
Ethylbenzene	9.9
Total Xylenes	**667**

If you have any questions concerning this information, please do not hesitate to contact us at (505) 632-1199. Thank you for your cooperation.

Respectfully submitted,
Blagg Engineering, Inc.

Jeffrey C. Blagg, P.E.
President

cc: Denny Foust, Deputy Oil & Gas Inspector, NMOCD, Aztec, NM
Buddy Shaw, Environmental Coordinator, Amoco Production Company, Farmington, NM

NV/nv GOOCH-1E.ABA

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Blagg / Amoco	Project #:	04034
Sample ID:	PW 1. ~~PW-2~~ @ GW (9')	Date Reported:	05-12-97
Chain of Custody:	5090	Date Sampled:	05-09-97
Laboratory Number:	B206	Date Received:	05-09-97
Sample Matrix:	Water	Date Analyzed:	05-12-97
Preservative:	HgCl2 & Cool	Analysis Requested:	BTEX
Condition:	Cool & Intact		

Parameter	Concentration (ug/L)	Dilution Factor	Det. Limit (ug/L)
Benzene	**ND**	**1**	**0.2**
Toluene	**17.2**	**1**	**0.2**
Ethylbenzene	**ND**	**1**	**0.2**
p,m-Xylene	**32.2**	**1**	**0.2**
o-Xylene	**13.0**	**1**	**0.1**
Total BTEX	**62.4**		

ND - Parameter not detected at the stated detection limit.

Surrogate Recoveries:	Parameter	Percent Recovery
	Trifluorotoluene	**99 %**
	Bromofluorobenzene	**100 %**

References: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992.

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1994.

RIDDLE F LS #3A

Comments: ~~**Gooch #1E**~~ **Dehy. Pit.**

Analyst

Review

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ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

CATION / ANION ANALYSIS

Client:	Blagg / Amoco	Project #:	04034
Sample ID:	~~PW1~~ PW-2 @ GW (9')	Date Reported:	05-12-97
Laboratory Number:	B206	Date Sampled:	05-09-97
Sample Matrix:	Water	Date Received:	05-09-97
Preservative:	Cool	Date Analyzed:	05/9/97 & 05/12/97
Condition:	Cool & Intact	Chain of Custody:	5090

Parameter	Analytical Result	Units		Units
pH	**8.09**	s.u.		
Conductivity @ 25° C	**18,720**	umhos/cm		
Total Dissolved Solids @ 180C	**9,320**	mg/L		
Total Dissolved Solids (Calc)	**9,295**	mg/L		
SAR	**62.9**	ratio		
Total Alkalinity as CaCO3	**344**	mg/L		
Total Hardness as CaCO3	**216**	mg/L		
Bicarbonate as HCO3	**344**	mg/L	5.64	meq/L
Carbonate as CO3	**<1**	mg/L	0.00	meq/L
Hydroxide as OH	**<1**	mg/L	0.00	meq/L
Nitrate Nitrogen	**0.1**	mg/L	0.00	meq/L
Nitrite Nitrogen	**<0.001**	mg/L	0.00	meq/L
Chloride	**350**	mg/L	9.87	meq/L
Fluoride	**32.2**	mg/L	1.70	meq/L
Phosphate	**0.7**	mg/L	0.02	meq/L
Sulfate	**5,650**	mg/L	117.63	meq/L
Calcium	**76.1**	mg/L	3.80	meq/L
Magnesium	**52.4**	mg/L	4.31	meq/L
Potassium	**14.8**	mg/L	0.38	meq/L
Sodium	**2,910**	mg/L	126.59	meq/L
Cations			135.07	meq/L
Anions			134.86	meq/L
Cation/Anion Difference			**0.16%**	

Reference: U.S.E.P.A., 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.
Standard Methods For The Examination of Water And Waste Water", 18th ed., 1992.

Comments: RIDGE FLS #3A ~~Gooch # 1E~~ **Dehy. Pit.**

Analyst

Review

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5090

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location	ANALYSIS/PARAMETERS
BLAGG / AMOCO	RIDDLE F LS #3A (OEHY PIT) ~~GOOCH #1E~~	
Sampler: (Signature) Nelson Velez	Chain of Custody Tape No. 04034	

Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	No. of Containers	BTEX (8020)	ANION/ CATION					Remarks
												SAMPLES PRESERV. COOL
~~PW #2~~ eGW (9')	5/9/97	0845	B206	WATER	3	✓	✓					BTEX SAMPLES
PW 1												PRESERV. w/ $HgCl_2$
												ALSO.
					Samples received cool and intact DH							

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Nelson Velez	5/9/97	1041	Glenn L. Spencer	5-9-97	1041
Relinquished by: (Signature)			Received by: (Signature)		
Relinquished by: (Signature)			Received by: (Signature)		

ENVIROTECH INC.
5796 U.S. Highway 64-3014
Farmington, New Mexico 87401
(505) 632-0615

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS
QUALITY ASSURANCE REPORT

Client:	QA/QC	Project #:	N/A
Sample ID:	Laboratory Blank	Date Reported:	05-12-97
Laboratory Number:	05-12-BTEX.BLANK	Date Sampled:	N/A
Sample Matrix:	Water	Date Received:	N/A
Preservative:	N/A	Date Analyzed:	05-12-97
Condition:	N/A	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	**ND**	**0.2**
Toluene	**ND**	**0.2**
Ethylbenzene	**ND**	**0.2**
p,m-Xylene	**ND**	**0.2**
o-Xylene	**ND**	**0.1**

ND - Parameter not detected at the stated detection limit.

Surrogate Recoveries:	Parameter	Percent Recovery
	Trifluorotoluene	**99 %**
	Bromofluorobenzene	**100 %**

References: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992.

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1994.

Comments: **QA/QC for samples B206 - B207.**

Analyst

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ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS
QUALITY ASSURANCE REPORT

Client:	QA/QC	Project #:	N/A
Sample ID:	Matrix Duplicate	Date Reported:	05-12-97
Laboratory Number:	B206	Date Sampled:	N/A
Sample Matrix:	Water	Date Received:	N/A
Preservative:	HgCl and Cool	Date Analyzed:	05-12-97
Condition:	Cool and Intact	Analysis Requested:	BTEX-MTBE

Parameter	Sample Result (ug/L)	Duplicate Result (ug/L)	Percent Diff.	Det. Limit (ug/L)	Dilution Factor
Benzene	**ND**	**ND**	**0.0%**	**0.2**	**1**
Toluene	**17.2**	**17.2**	**0.0%**	**0.2**	**1**
Ethylbenzene	**ND**	**ND**	**0.0%**	**0.2**	**1**
p,m-Xylene	**32.2**	**32.0**	**0.7%**	**0.2**	**1**
o-Xylene	**13.0**	**12.8**	**1.6%**	**0.1**	**1**

ND - Parameter not detected at the stated detection limit.

QA/QC Acceptance Criteria:	Parameter	Maximum Difference
	8020 Compounds	**30 %**

References: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992.

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1994.

Comments: **QA/QC for samples B206 - B207.**

Analyst

Review

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ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS
QUALITY ASSURANCE REPORT

Client:	QA/QC	Project #:	N/A
Sample ID:	Matrix Spike	Date Reported:	05-12-97
Laboratory Number:	B206	Date Sampled:	N/A
Sample Matrix:	Water	Date Received:	N/A
Preservative:	Cool	Date Analyzed:	05-12-97
Condition:	Cool and Intact		

Parameter	Sample Result (ug/L)	Spike Added (ug/L)	Spiked Sample Result (ug/L)	Det. Limit (ug/L)	Percent Recovery	SW-846 % Rec. Accept. Range
Benzene	**ND**	**50.0**	**50.2**	**0.2**	**100%**	**39-150**
Toluene	**17.2**	**50.0**	**67.1**	**0.2**	**100%**	**46-148**
Ethylbenzene	**ND**	**50.0**	**49.6**	**0.2**	**99%**	**32-160**
p,m-Xylene	**32.2**	**100**	**132**	**0.2**	**100%**	**46-148**
o-Xylene	**13.0**	**50.0**	**62.4**	**0.1**	**99%**	**46-148**

ND - Parameter not detected at the stated detection limit.

References: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992.

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1994.

Comments: **QA/QC for samples B206 - B207.**

Analyst

Review

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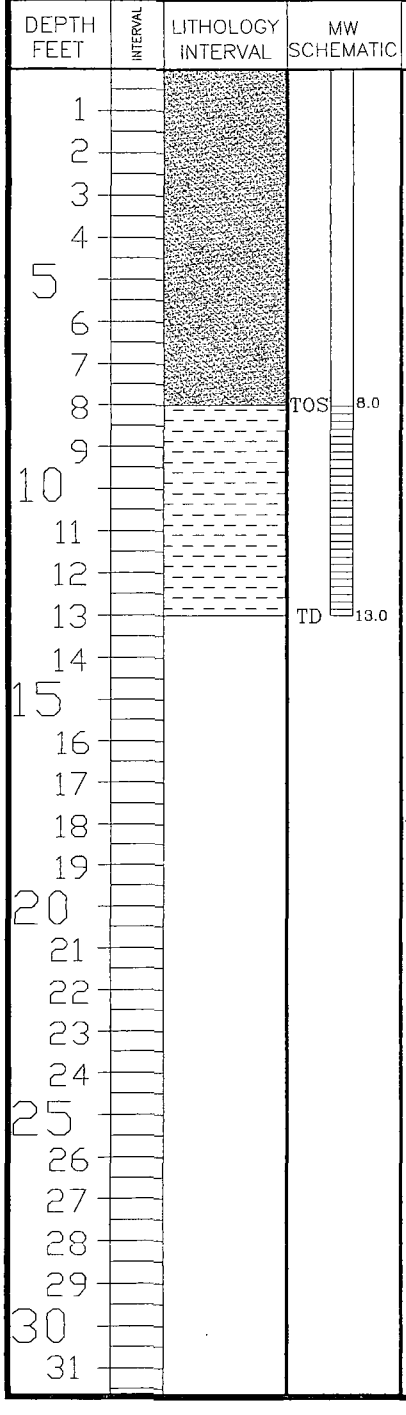
BLAGG ENGINEERING, Inc.

P.O. BOX 87
BLOOMFIELD, NM 87413
(505) 632-1199

BORE / TEST HOLE REPORT

LOCATION NAME:	GOOCH # 1E
CLIENT:	AMOCO PRODUCTION COMPANY
CONTRACTOR:	BLAGG ENGINEERING, INC.
EQUIPMENT USED:	MOBILE DRILL RIG (EARTHPROBE)
BORING LOCATION:	S3W, 102 FEET FROM WELL HEAD.

BORING #.....	BH - 1
MW #.....	1
PAGE #.....	1
DATE STARTED	5/30/96
DATE FINISHED	5/30/96
OPERATOR.....	JCB
PREPARED BY	NJV



FIELD CLASSIFICATION AND REMARKS

GROUND SURFACE

TOP OF CASING APPROX. 1.25 FT. ABOVE GROUND SURFACE.

DARK YELLOWISH BROWN SAND TO SILTY SAND, NON COHESIVE, SLIGHTLY MOIST, FIRM, NO APPARENT HYDROCARBON ODOR OBSERVED (0.0 - 8.0 FT. INTERVAL).

▼ GW DEPTH ON 6/17/96 = 9.48 FT. (APPROX.)

LT. TO MED. GRAY SAND TO SILTY SAND, NON COHESIVE, SLIGHTLY MOIST, FIRM, HYDROCARBON ODOR OBSERVED (8.0 - 13.0 FT. INTERVAL).

NOTES:
- SAND TO SILTY SAND.
- SAND TO SILTY SAND (DISCOLORED).
- TOS - TOP OF SCREEN FROM GROUND SURFACE.
- TD - TOTAL DEPTH OF MONITOR WELL FROM GROUND SURFACE.
- GW - GROUND WATER.

DRAWING: GOOCH-1 | DATE: 1/24/97 | DWN BY: NJV

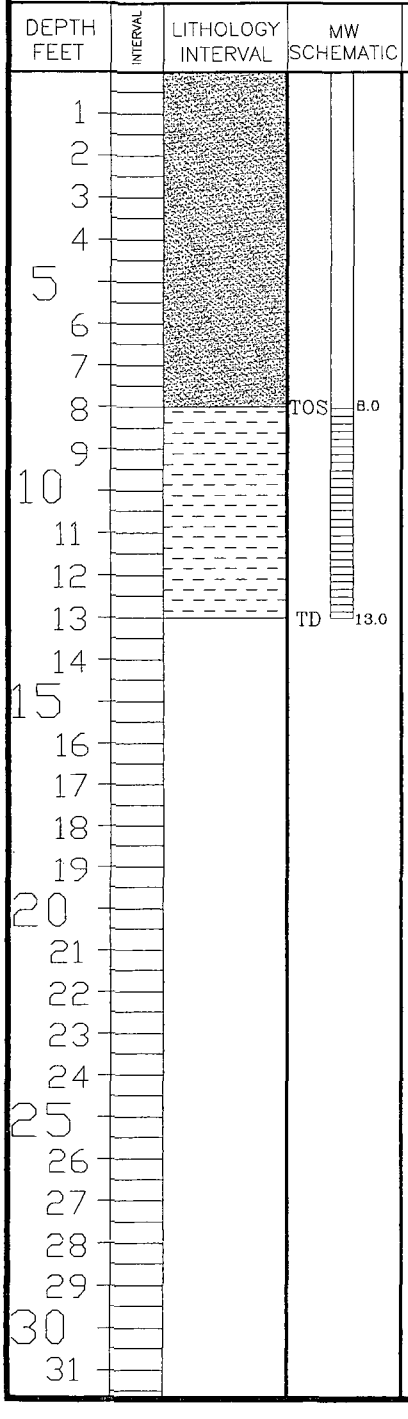
BLAGG ENGINEERING, Inc.

P.O. BOX 87
BLOOMFIELD, NM 87413
(505) 632-1199

BORE / TEST HOLE REPORT

LOCATION NAME:	GOOCH # 1E
CLIENT:	AMOCO PRODUCTION COMPANY
CONTRACTOR:	BLAGG ENGINEERING, INC.
EQUIPMENT USED:	MOBILE DRILL RIG (EARTHPROBE)
BORING LOCATION:	S54W, 75 FEET FROM WELL HEAD.

BORING #.....	BH - 2
MW #.....	2
PAGE #.....	2
DATE STARTED	5/30/96
DATE FINISHED	5/30/96
OPERATOR.....	JCB
PREPARED BY	NJV



FIELD CLASSIFICATION AND REMARKS

GROUND SURFACE

TOP OF CASING APPROX. 2.00 FT. ABOVE GROUND SURFACE.

DARK YELLOWISH BROWN SAND TO SILTY SAND, NON COHESIVE, SLIGHTLY MOIST, FIRM, NO APPARENT HYDROCARBON ODOR OBSERVED (0.0 - 8.0 FT. INTERVAL).

▼ GW DEPTH ON 6/17/96 = 8.75 FT. (APPROX.)

LT. TO MED. GRAY SAND TO SILTY SAND, NON COHESIVE, SLIGHTLY MOIST, FIRM, HYDROCARBON ODOR OBSERVED (8.0 - 13.0 FT. INTERVAL).

NOTES:
- SAND TO SILTY SAND.
- SAND TO SILTY SAND (DISCOLORED).
- TOS - TOP OF SCREEN FROM GROUND SURFACE.
- TD - TOTAL DEPTH OF MONITOR WELL FROM GROUND SURFACE.
- GW - GROUND WATER.

DRAWING: GOOCH-2	DATE: 1/24/97	DWN BY: NJV

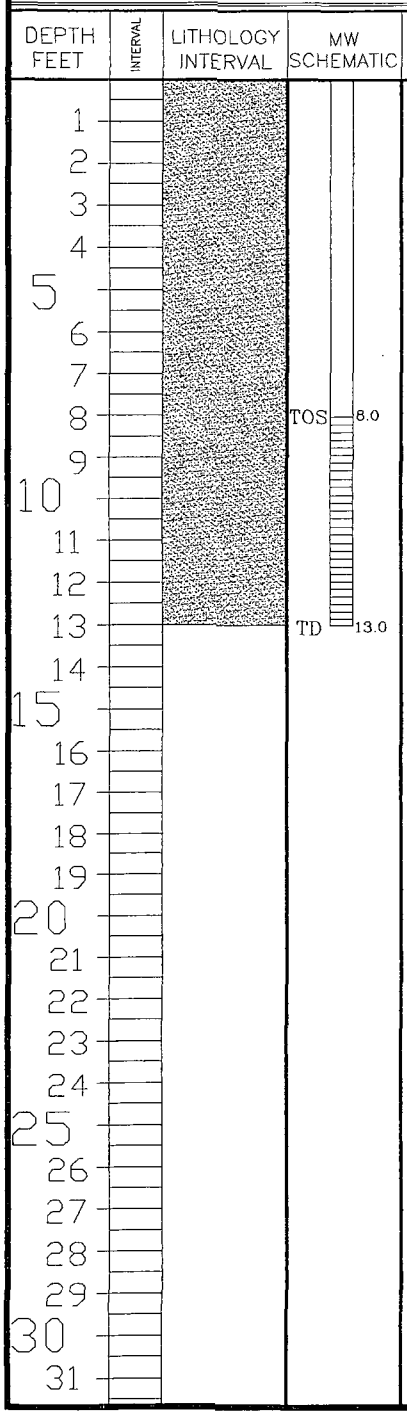
BLAGG ENGINEERING, Inc.

P.O. BOX 87
BLOOMFIELD, NM 87413
(505) 632-1199

BORE / TEST HOLE REPORT

LOCATION NAME:	GOOCH # 1E
CLIENT:	AMOCO PRODUCTION COMPANY
CONTRACTOR:	BLAGG ENGINEERING, INC.
EQUIPMENT USED:	MOBILE DRILL RIG (EARTHPROBE)
BORING LOCATION:	N87W, 60 FEET FROM WELL HEAD.

BORING #.....	BH - 3
MW #.....	3
PAGE #.....	3
DATE STARTED	5/30/96
DATE FINISHED	5/30/96
OPERATOR.....	JCB
PREPARED BY	NJV



FIELD CLASSIFICATION AND REMARKS

GROUND SURFACE

TOP OF CASING APPROX. 2.00 FT. ABOVE GROUND SURFACE.

DARK YELLOWISH BROWN SAND TO SILTY SAND CONTINUOUS THROUGHOUT ENTIRE BORING, NON COHESIVE, SLIGHTLY MOIST, FIRM, NO APPARENT HYDROCARBON ODOR OBSERVED.

▼ GW DEPTH ON 6/17/96 = 9.44 FT. (APPROX.)

NOTES: ▒ – SAND TO SILTY SAND.
TOS – TOP OF SCREEN FROM GROUND SURFACE.
TD – TOTAL DEPTH OF MONITOR WELL FROM GROUND SURFACE.
GW – GROUND WATER.

DRAWING: GOOCH-3	DATE: 1/24/97	DWN BY: NJV

MONITOR WELL #1

AMOCO PRODUCTION COMPANY

GOOCH # 1E

MONITOR WELL CONSTRUCTION & COMPLETION

INSTALLED WITH MOBILE RIG

BLAGG ENGINEERING, INC.

CONSULTING PETROLEUM / RECLAMATION SERVICES

P.O. BOX 87

BLOOMFIELD, NEW MEXICO 87413

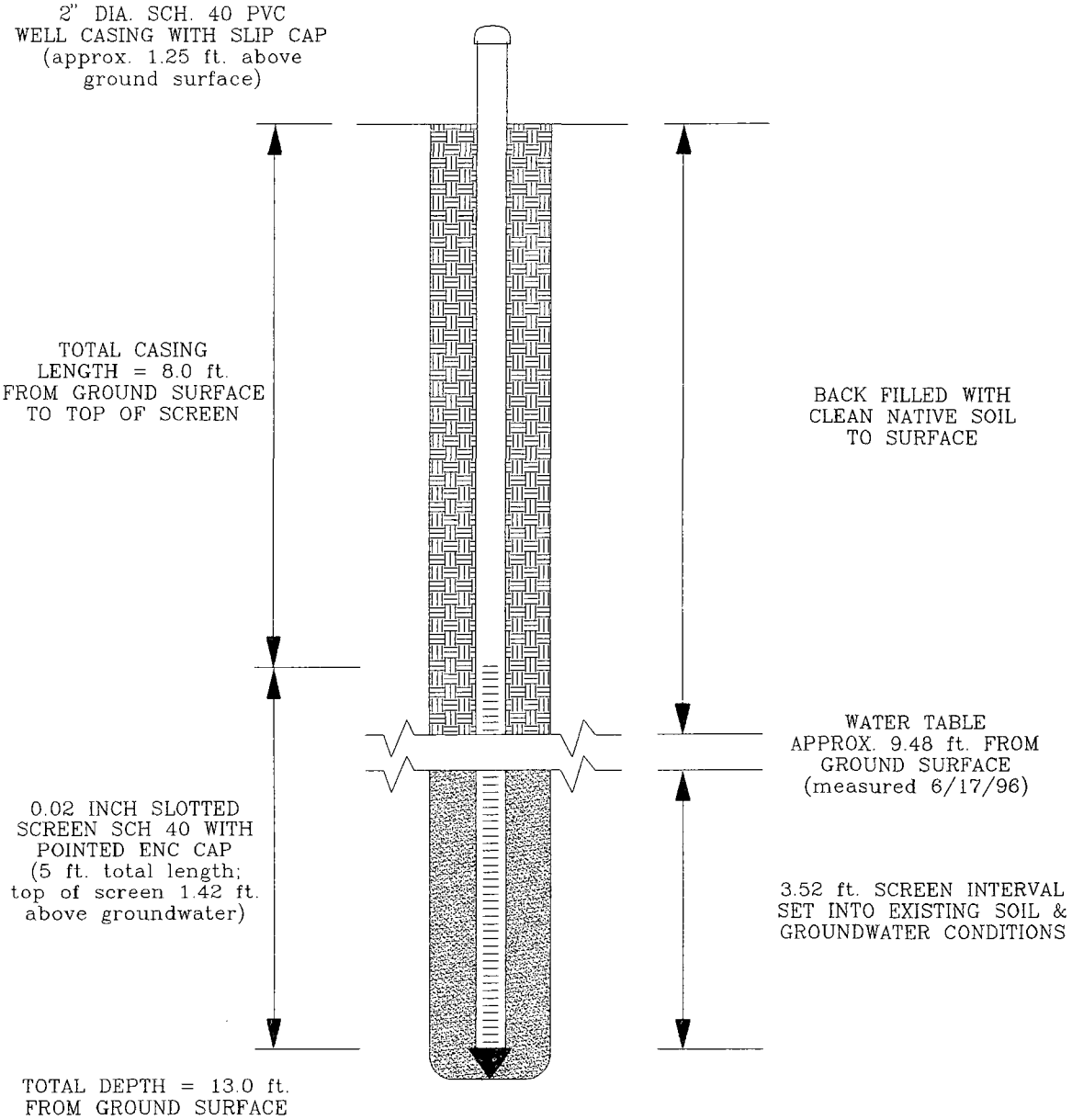
PHONE: (505) 632-1199

MONITOR WELL SCHEMATIC

DRAFTED BY: NJV

DATE: MAR. '97

FILENAME: MW-1



MONITOR WELL #2

AMOCO PRODUCTION COMPANY

GOOCH # 1E

MONITOR WELL CONSTRUCTION & COMPLETION

INSTALLED WITH MOBILE RIG

BLAGG ENGINEERING, INC.

CONSULTING PETROLEUM / RECLAMATION SERVICES

P.O. BOX 87

BLOOMFIELD, NEW MEXICO 87413

PHONE: (505) 632-1199

MONITOR WELL SCHEMATIC

DRAFTED BY: NJV

DATE: MAR. '97

FILENAME: MW-2

MONITOR WELL #3

AMOCO PRODUCTION COMPANY

GOOCH # 1E

MONITOR WELL CONSTRUCTION & COMPLETION

INSTALLED WITH MOBILE RIG

BLAGG ENGINEERING, INC.

CONSULTING PETROLEUM / RECLAMATION SERVICES

P.O. BOX 87

BLOOMFIELD, NEW MEXICO 87413

PHONE: (505) 632-1199

MONITOR WELL SCHEMATIC

DRAFTED BY: NJV

DATE: MAR. '97

FILENAME: MW-3

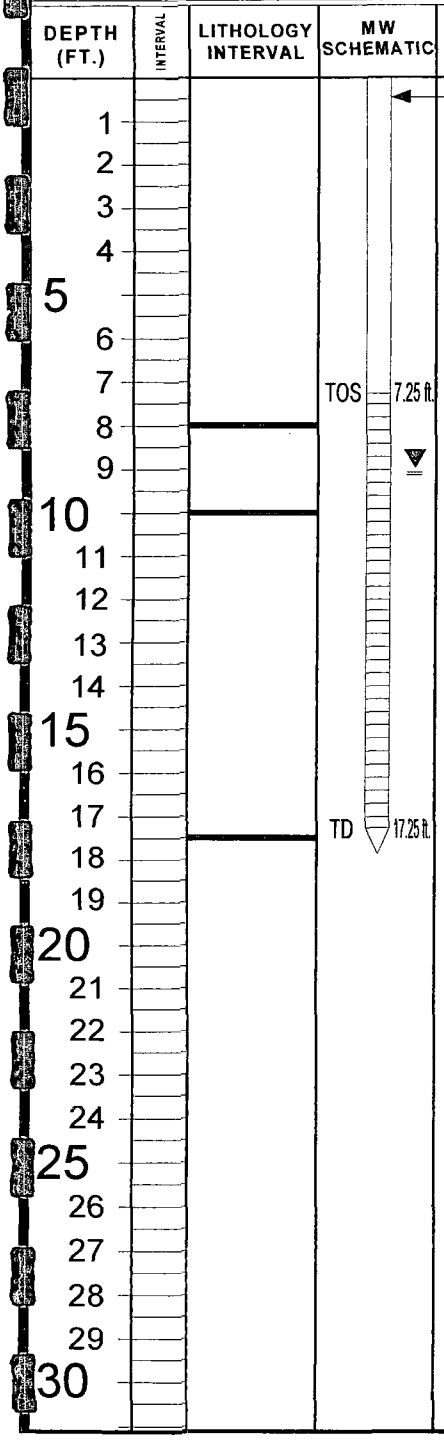
BLAGG ENGINEERING, Inc.
P.O. BOX 87
BLOOMFIELD, NM 87413
(505) 632-1199

MW #1R

BORE / TEST HOLE REPORT

CLIENT:	BP AMERICA PRODUCTION CO.
LOCATION NAME:	GOOCH # 1E - Riddle Dehy. Pit UNIT F, SEC. 20, T28N, R8W
CONTRACTOR:	BLAGG ENGINEERING, INC./ENVIROTECH, INC.
EQUIPMENT USED:	MOBILE DRILL RIG (CME 75)
BORING LOCATION:	99 FEET, S2.5W FROM WELL HEAD.

BORING #.....	BH - 10
MW #.....	1R
PAGE #.....	10
DATE STARTED	6/14/06
DATE FINISHED	6/14/06
OPERATOR.....	DP
PREPARED BY	NJV



FIELD CLASSIFICATION AND REMARKS

GROUND SURFACE

TOP OF CASING APROX. 2.60 FT. ABOVE GRADE.

DARK YELLOWISH ORANGE SAND, NON COHESIVE, SLIGHTLY MOIST TO WET, LOOSE TO FIRM, NO APPARENT HC ODOR DETECTED PHYSICALLY WITHIN CUTTINGS (0.0 - 8.0 FT. BELOW GRADE).

DEPTH TO WATER MEASURED AT APPROX. 9.11 FT. BELOW GRADE ON 6/15/06.
DARK YELLOWISH BROWN SAND, NON COHESIVE, SLIGHTLY MOIST TO WET, LOOSE TO FIRM, NO APPARENT HC ODOR DETECTED PHYSICALLY WITHIN CUTTINGS (8.0 - 10.0 FT. BELOW GRADE).

LIGHT MEDIUM TO DARK GRAY SAND, NON COHESIVE, WET TO SATURATED, LOOSE TO FIRM, SLIGHT APPARENT HC ODOR DETECTED PHYSICALLY WITHIN CUTTINGS (10.0 - 17.5 FT. BELOW GRADE).

NOTES: ☐ - SAND.

TOS - Top of screen of monitor well.
TD - Total depth/bottom extent of monitor well.

Monitor well consist of 2 inch PVC piping - casing from 2.60 ft. above grade to 7.25 ft. below grade, 0.010 slotted screen between 7.25 to 17.25 ft. below grade, sand packed annular to 5.0 ft. below grade, bentonite grout between 0.5 to 5.0 ft. below grade. Well protector encompassing above grade casing and secured with padlock.

DRAWING: GOOCH 1E BH10-MW1R. SKF | DATE: 6/14/06 | DWN BY: NJV

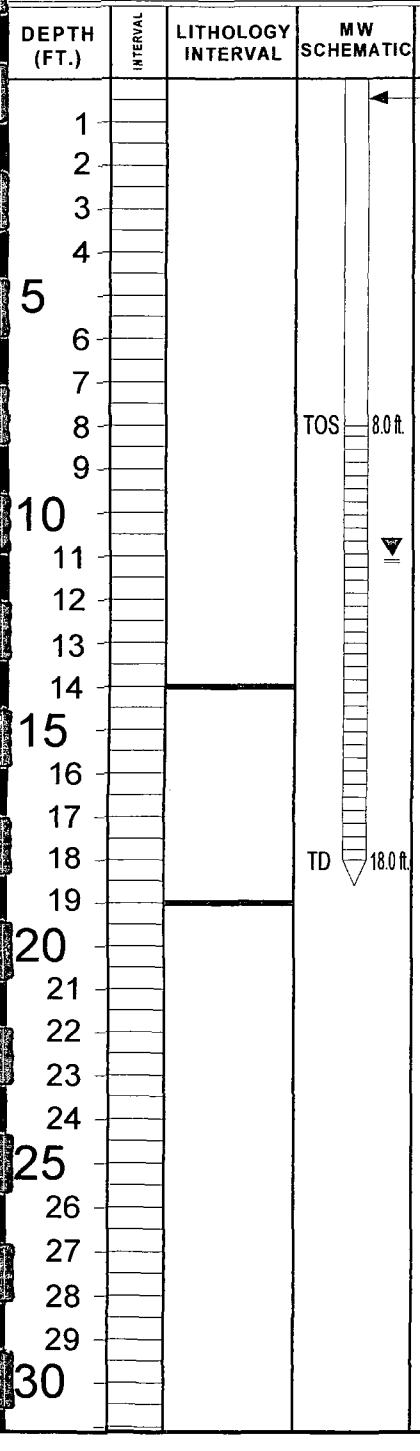
BLAGG ENGINEERING, Inc.
P.O. BOX 87
BLOOMFIELD, NM 87413
(505) 632-1199

MW #4

BORE / TEST HOLE REPORT

CLIENT:	BP AMERICA PRODUCTION CO.
LOCATION NAME:	GOOCH # 1E - UP GRADIENT UNIT F, SEC. 20, T28N, R8W
CONTRACTOR:	BLAGG ENGINEERING, INC./ENVIROTECH, INC.
EQUIPMENT USED:	MOBILE DRILL RIG (CME 75)
BORING LOCATION:	165 FEET, S51W FROM WELL HEAD.

BORING #.....	BH - 9
MW #.....	4
PAGE #.....	9
DATE STARTED	6/12/06
DATE FINISHED	6/12/06
OPERATOR.....	DP
PREPARED BY	NJV



FIELD CLASSIFICATION AND REMARKS

GROUND SURFACE

TOP OF CASING APROX. 2.00 FT. ABOVE GRADE.

DARK YELLOWISH ORANGE SAND, NON COHESIVE, SLIGHTLY MOIST TO WET, LOOSE TO FIRM, NO APPARENT HC ODOR DETECTED PHYSICALLY WITHIN CUTTINGS (0.0 - 14.0 FT. BELOW GRADE).

DEPTH TO WATER MEASURED AT APPROX. 11.13 FT. BELOW GRADE ON 6/15/06.

DARK YELLOWISH BROWN SAND, NON COHESIVE, WET, LOOSE TO FIRM, NO APPARENT HC ODOR DETECTED PHYSICALLY WITHIN CUTTINGS (14.0 - 19.0 FT. BELOW GRADE).

NOTES: ▭ - SAND.

TOS - Top of screen of monitor well.
TD - Total depth/bottom extent of monitor well.

Monitor well consist of 2 inch PVC piping - casing from 2.00 ft. above grade to 8.00 ft. below grade, 0.010 slotted screen between 8.00 to 18.00 ft. below grade, sand packed annular to 5.0 ft. below grade, bentonite grout between 0.5 to 5.0 ft. below grade. Well protector encompassing above grade casing and secured with padlock.

DRAWING: GOOCH 1E BH9-MW4. SKF DATE: 6/12/06 DWN BY: NJV

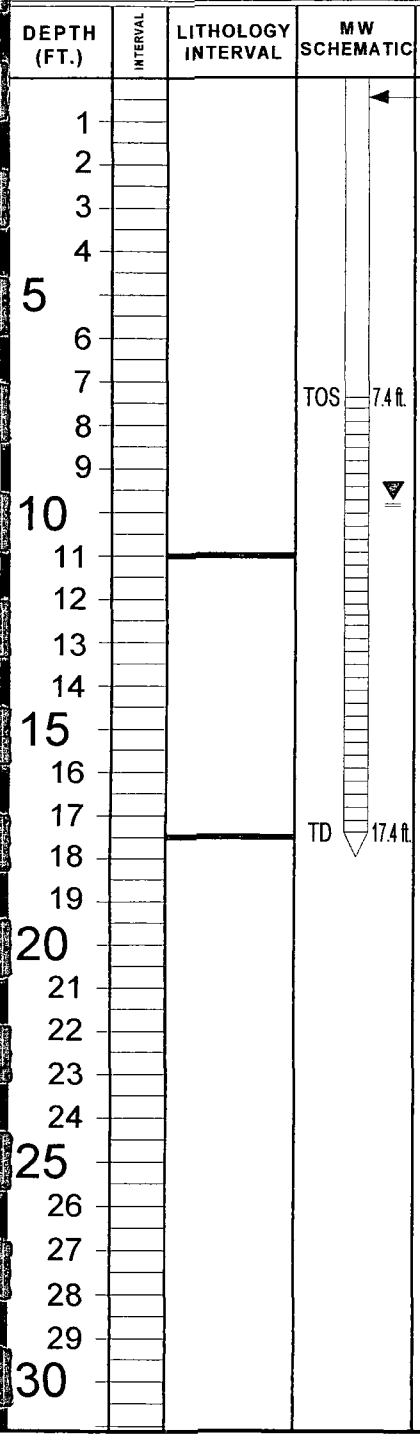
BLAGG ENGINEERING, Inc.
P.O. BOX 87
BLOOMFIELD, NM 87413
(505) 632-1199

MW #5

BORE / TEST HOLE REPORT

BORING #.....	BH - 8
MW #.....	5
PAGE #.....	8
DATE STARTED	6/9/06
DATE FINISHED	6/9/06
OPERATOR.....	KP
PREPARED BY	NJV

CLIENT: **BP AMERICA PRODUCTION CO.**
LOCATION NAME: GOOCH # 1E - ABAN. PIT UNIT F, SEC. 20, T28N, R8W
CONTRACTOR: **BLAGG ENGINEERING, INC./ENVIROTECH, INC.**
EQUIPMENT USED: **MOBILE DRILL RIG (CME 75)**
BORING LOCATION: 132 FEET, S63W FROM WELL HEAD.



FIELD CLASSIFICATION AND REMARKS

GROUND SURFACE

TOP OF CASING APROX. 1.60 FT. ABOVE GRADE.

DARK YELLOWISH ORANGE SAND, NON COHESIVE, SLIGHTLY MOIST TO SATURATED, LOOSE TO FIRM, NO APPARENT HC ODOR DETECTED PHYSICALLY WITHIN CUTTINGS (0.0 - 11.0 FT. BELOW GRADE).

DEPTH TO WATER MEASURED AT APPROX. 10.21 FT. BELOW GRADE ON 6/15/06.

PALE BROWN PHASING INTO MEDIUM LIGHT GRAY SAND, NON COHESIVE, SATURATED, LOOSE TO FIRM, NO APPARENT HC ODOR DETECTED PHYSICALLY WITHIN CUTTINGS (11.0 - 17.5 FT. BELOW GRADE).

NOTES: ☐ - SAND.

TOS - Top of screen of monitor well.
TD - Total depth/bottom extent of monitor well.

Monitor well consist of 2 inch PVC piping - casing from 1.60 ft. above grade to 7.40 ft. below grade, 0.010 slotted screen between 7.40 to 17.40 ft. below grade, sand packed annular to 5.0 ft. below grade, bentonite grout between 0.5 to 5.0 ft. below grade. Well protector encompassing above grade casing and secured with padlock.

DRAWING: GOOCH 1E BH8-MW5. SKF | DATE: 6/9/06 | DWN BY: NJV

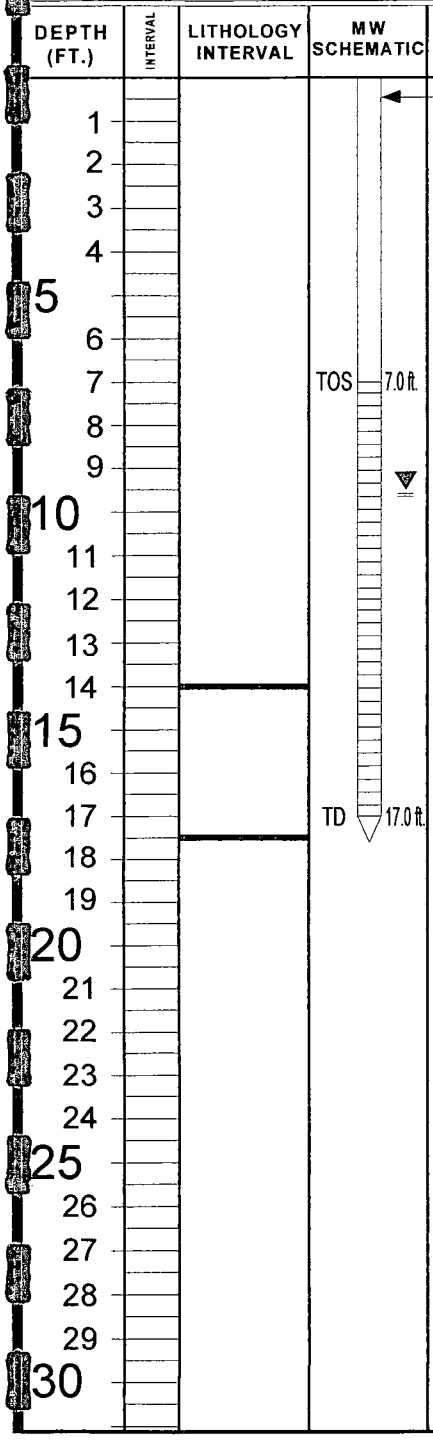
BLAGG ENGINEERING, Inc.
P.O. BOX 87
BLOOMFIELD, NM 87413
(505) 632-1199

MW #6

BORE / TEST HOLE REPORT

CLIENT:	BP AMERICA PRODUCTION CO.
LOCATION NAME:	GOOCH # 1E - DEHY. PIT UNIT F, SEC. 20, T28N, R8W
CONTRACTOR:	BLAGG ENGINEERING, INC./ENVIROTECH, INC.
EQUIPMENT USED:	MOBILE DRILL RIG (CME 75)
BORING LOCATION:	100 FEET, N61W FROM WELL HEAD.

BORING #.....	BH - 4
MW #.....	6
PAGE #.....	6
DATE STARTED	6/9/06
DATE FINISHED	6/9/06
OPERATOR.....	KP
PREPARED BY	NJV



FIELD CLASSIFICATION AND REMARKS

GROUND SURFACE

TOP OF CASING APROX. 2.00 FT. ABOVE GRADE.

DARK YELLOWISH ORANGE SAND, NON COHESIVE, SLIGHTLY MOIST TO SATURATED, LOOSE TO FIRM, NO APPARENT HC ODOR DETECTED PHYSICALLY WITHIN CUTTINGS (0.0 - 14.0 FT. BELOW GRADE).

DEPTH TO WATER MEASURED AT APPROX. 9.60 FT. BELOW GRADE ON 6/15/06.

OLIVE TO MEDIUM GRAY SAND, NON COHESIVE, SATURATED, LOOSE TO FIRM, NO APPARENT HC ODOR DETECTED PHYSICALLY WITHIN CUTTINGS (14.0 - 17.5 FT. BELOW GRADE).

NOTES: ▭ - SAND.

TOS - Top of screen of monitor well.

TD - Total depth/bottom extent of monitor well.

Monitor well consist of 2 inch PVC piping - casing from 2.00 ft. above grade to 7.00 ft. below grade, 0.010 slotted screen between 7.00 to 17.00 ft. below grade, sand packed annular to 5.0 ft. below grade, bentonite grout between 0.5 to 5.0 ft. below grade. Well protector encompassing above grade casing and secured with padlock.

DRAWING: GOOCH 1E BH4-MW6. SKF | DATE: 6/9/06 | DWN BY: NJV

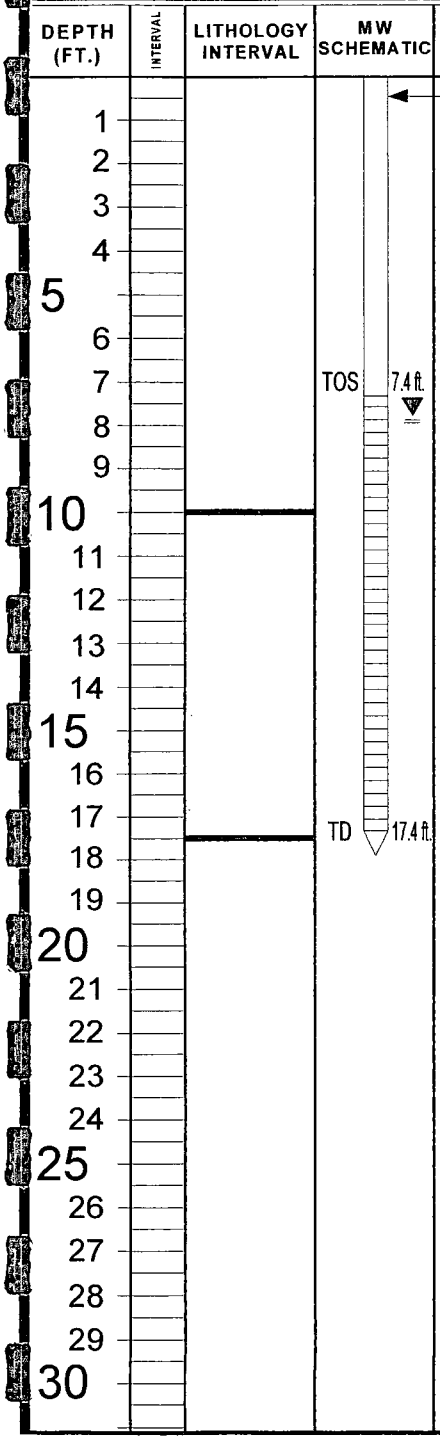
BLAGG ENGINEERING, Inc.
P.O. BOX 87
BLOOMFIELD, NM 87413
(505) 632-1199

MW #7

BORE / TEST HOLE REPORT

CLIENT:	BP AMERICA PRODUCTION CO.
LOCATION NAME:	GOOCH # 1E - DEHY. PIT UNIT F, SEC. 20, T28N, R8W
CONTRACTOR:	BLAGG ENGINEERING, INC./ENVIROTECH, INC.
EQUIPMENT USED:	MOBILE DRILL RIG (CME 75)
BORING LOCATION:	129 FEET, N8.5W FROM WELL HEAD.

BORING #.....	BH - 5
MW #.....	7
PAGE #.....	5
DATE STARTED	6/9/06
DATE FINISHED	6/9/06
OPERATOR.....	KP
PREPARED BY	NJV



FIELD CLASSIFICATION AND REMARKS

GROUND SURFACE

TOP OF CASING APROX. 2.60 FT. ABOVE GRADE.

DARK YELLOWISH ORANGE SAND, NON COHESIVE, SLIGHTLY MOIST TO SATURATED, LOOSE TO FIRM, NO APPARENT HC ODOR DETECTED PHYSICALLY WITHIN CUTTINGS (0.0 - 10.0 FT. BELOW GRADE).

DEPTH TO WATER MEASURED AT APPROX. 7.90 FT. BELOW GRADE ON 6/15/06.

PALE BROWN SAND, NON COHESIVE, SATURATED, LOOSE TO FIRM, NO APPARENT HC ODOR DETECTED PHYSICALLY WITHIN CUTTINGS (10.0 - 17.5 FT. BELOW GRADE).

NOTES: ▭ - SAND.

TOS - Top of screen of monitor well.

TD - Total depth/bottom extent of monitor well.

Monitor well consist of 2 inch PVC piping - casing from 2.60 ft. above grade to 7.40 ft. below grade, 0.010 slotted screen between 7.40 to 17.40 ft. below grade, sand packed annular to 5.0 ft. below grade, bentonite grout between 0.5 to 5.0 ft. below grade. Well protector encompassing above grade casing and secured with padlock.

DRAWING: GOOCH 1E BH5-MW7. SKF | DATE: 6/9/06 | DWN BY: NJV

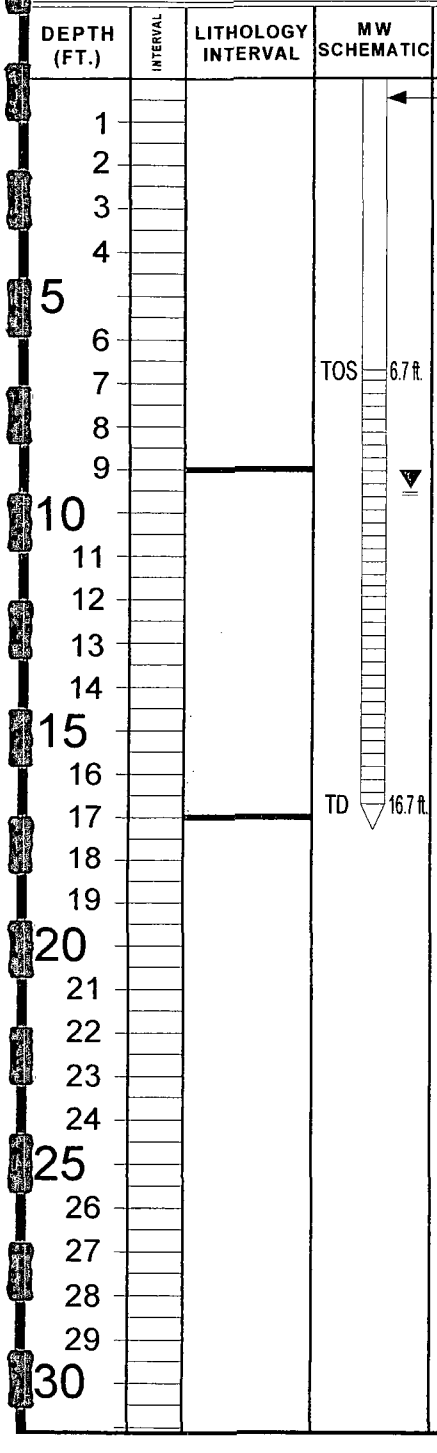
BLAGG ENGINEERING, Inc.
P.O. BOX 87
BLOOMFIELD, NM 87413
(505) 632-1199

MW #8

BORE / TEST HOLE REPORT

CLIENT:	BP AMERICA PRODUCTION CO.
LOCATION NAME:	GOOCH # 1E - SEP. PIT (down grad.) UNIT F, SEC. 20, T28N, R8W
CONTRACTOR:	BLAGG ENGINEERING, INC./ENVIROTECH, INC.
EQUIPMENT USED:	MOBILE DRILL RIG (CME 75)
BORING LOCATION:	36 FEET, N28E FROM WELL HEAD.

BORING #.....	BH - 6
MW #.....	8
PAGE #.....	6
DATE STARTED	6/9/06
DATE FINISHED	6/9/06
OPERATOR.....	KP
PREPARED BY	NJV



FIELD CLASSIFICATION AND REMARKS

GROUND SURFACE

TOP OF CASING APROX. 2.30 FT. ABOVE GRADE.

DARK YELLOWISH ORANGE SAND, NON COHESIVE, SLIGHTLY MOIST TO SATURATED, LOOSE TO FIRM, NO APPARENT HC ODOR DETECTED PHYSICALLY WITHIN CUTTINGS (0.0 - 9.0 FT. BELOW GRADE).

DEPTH TO WATER MEASURED AT APPROX. 9.60 FT. BELOW GRADE ON 6/15/06.

PALE BROWN SAND, NON COHESIVE, SATURATED, LOOSE TO FIRM, NO APPARENT HC ODOR DETECTED PHYSICALLY WITHIN CUTTINGS (9.0 - 17.0 FT. BELOW GRADE).

NOTES: ☐ - SAND.

TOS - Top of screen of monitor well.
TD - Total depth/bottom extent of monitor well.

Monitor well consist of 2 inch PVC piping - casing from 2.30 ft. above grade to 6.70 ft. below grade, 0.010 slotted screen between 6.70 to 16.70 ft. below grade, sand packed annular to 4.0 ft. below grade, bentonite grout between 0.5 to 4.0 ft. below grade. Well protector encompassing above grade casing and secured with padlock.

DRAWING: GOOCH 1E BH6-MW8. SKF | DATE: 6/9/06 | DWN BY: NJV

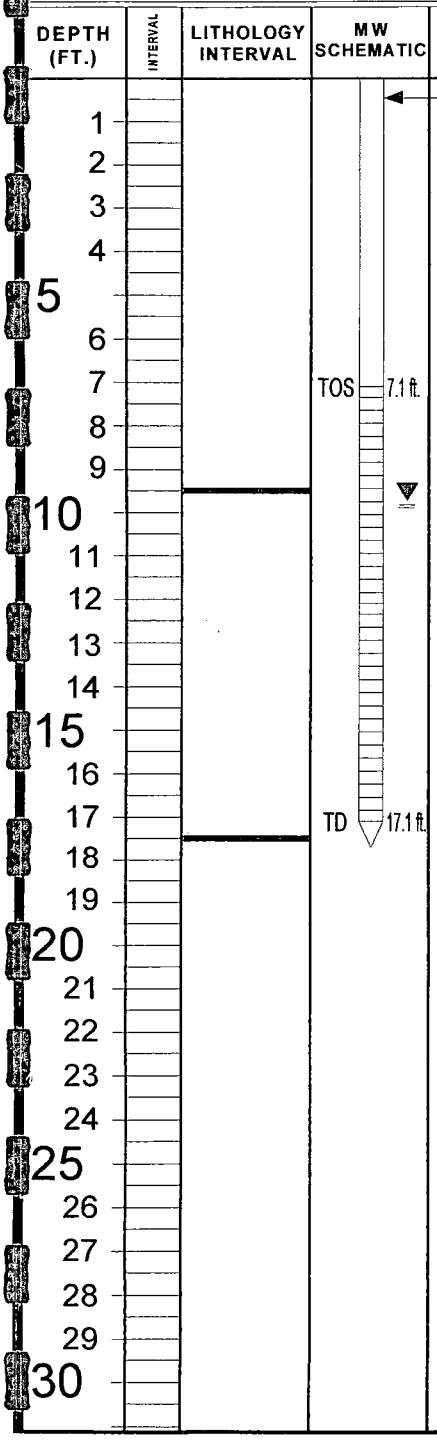
BLAGG ENGINEERING, Inc.
P.O. BOX 87
BLOOMFIELD, NM 87413
(505) 632-1199

MW #9

BORE / TEST HOLE REPORT

CLIENT:	BP AMERICA PRODUCTION CO.
LOCATION NAME:	GOOCH # 1E - RIDDLE DEHY. PIT (down grad.) UNIT F, SEC. 20, T28N, R8W
CONTRACTOR:	BLAGG ENGINEERING, INC./ENVIROTECH, INC.
EQUIPMENT USED:	MOBILE DRILL RIG (CME 75)
BORING LOCATION:	70 FEET, S67E FROM WELL HEAD.

BORING #.....	BH - 7
MW #.....	9
PAGE #.....	7
DATE STARTED	6/9/06
DATE FINISHED	6/9/06
OPERATOR.....	KP
PREPARED BY	NJV



FIELD CLASSIFICATION AND REMARKS

GROUND SURFACE

TOP OF CASING APROX. 1.90 FT. ABOVE GRADE.

DARK YELLOWISH ORANGE SAND, NON COHESIVE, SLIGHTLY MOIST TO SATURATED, LOOSE TO FIRM, NO APPARENT HC ODOR DETECTED PHYSICALLY WITHIN CUTTINGS (0.0 - 9.5 FT. BELOW GRADE).

DEPTH TO WATER MEASURED AT APPROX. 9.81 FT. BELOW GRADE ON 6/15/06.

PALE BROWN SAND, NON COHESIVE, SATURATED, LOOSE TO FIRM, NO APPARENT HC ODOR DETECTED PHYSICALLY WITHIN CUTTINGS (9.5 - 17.5 FT. BELOW GRADE).

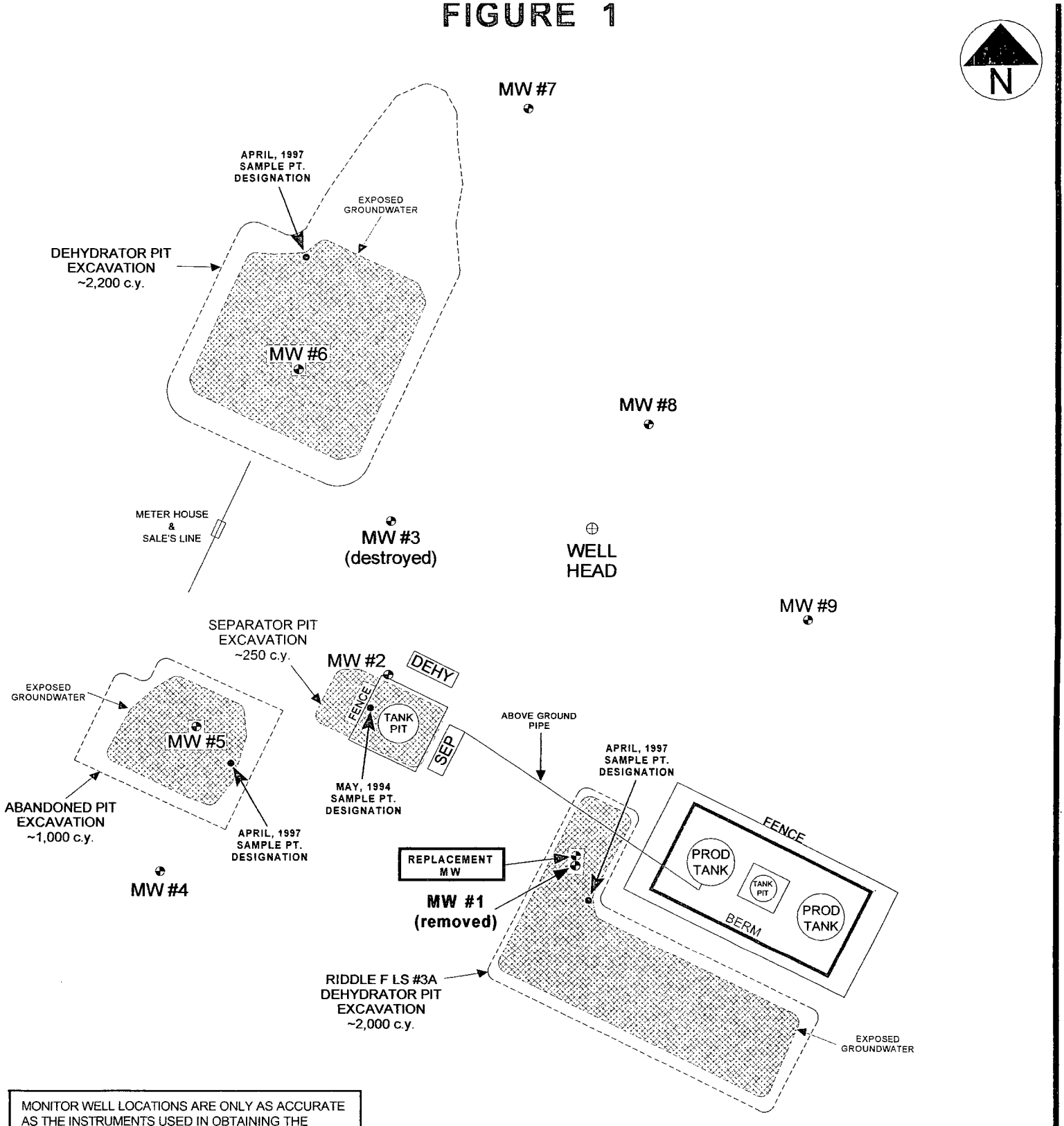
NOTES: ▭ - SAND.

TOS - Top of screen of monitor well.
TD - Total depth/bottom extent of monitor well.

Monitor well consist of 2 inch PVC piping - casing from 1.90 ft. above grade to 7.10 ft. below grade, 0.010 slotted screen between 7.10 to 17.10 ft. below grade, sand packed annular to 5.0 ft. below grade, bentonite grout between 0.5 to 5.0 ft. below grade. Well protector encompassing above grade casing and secured with padlock.

DRAWING: GOOCH 1E BH7-MW9. SKF | DATE: 6/9/06 | DWN BY: NJV

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.

1 INCH = 40 FEET

0 40 80 FT.

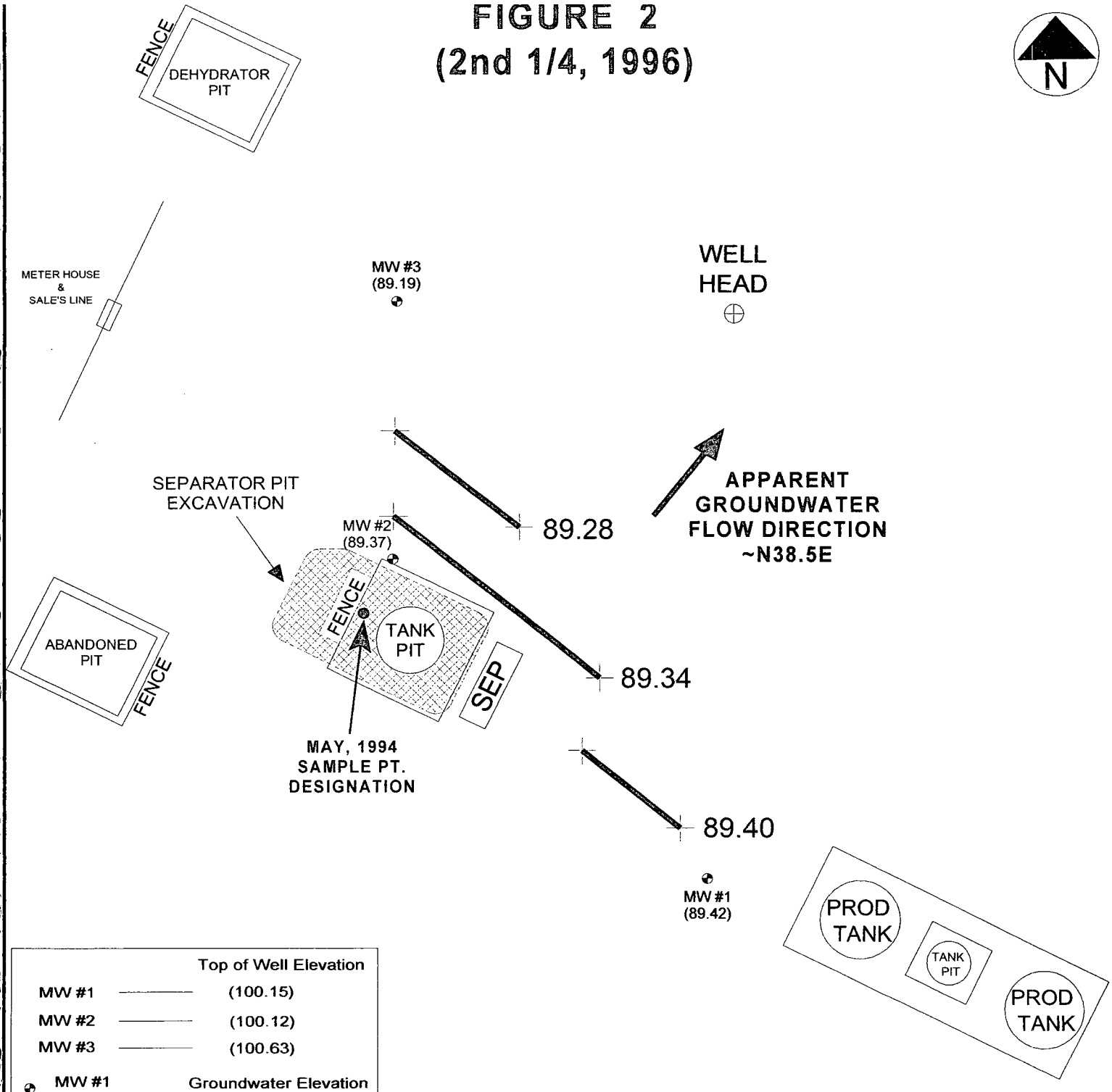
BP AMERICA PRODUCTION COMPANY
GOOCH 1E
SE/4 NW/4 SEC. 20, T28N, R8W
SAN JUAN COUNTY, NEW MEXICO

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

PROJECT: MW INSTALL.
DRAWN BY: NJV
FILENAME: GOOCH-1E-SM
REVISED: 6/12/06 NJV

SITE MAP
06/06

FIGURE 2
(2nd 1/4, 1996)



	Top of Well Elevation
MW #1	(100.15)
MW #2	(100.12)
MW #3	(100.63)
MW #1 (89.42)	Groundwater Elevation as of 6/17/96.

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 ARE NOT TO SCALE.

1 INCH = 25 FEET

0 25 50 FT.

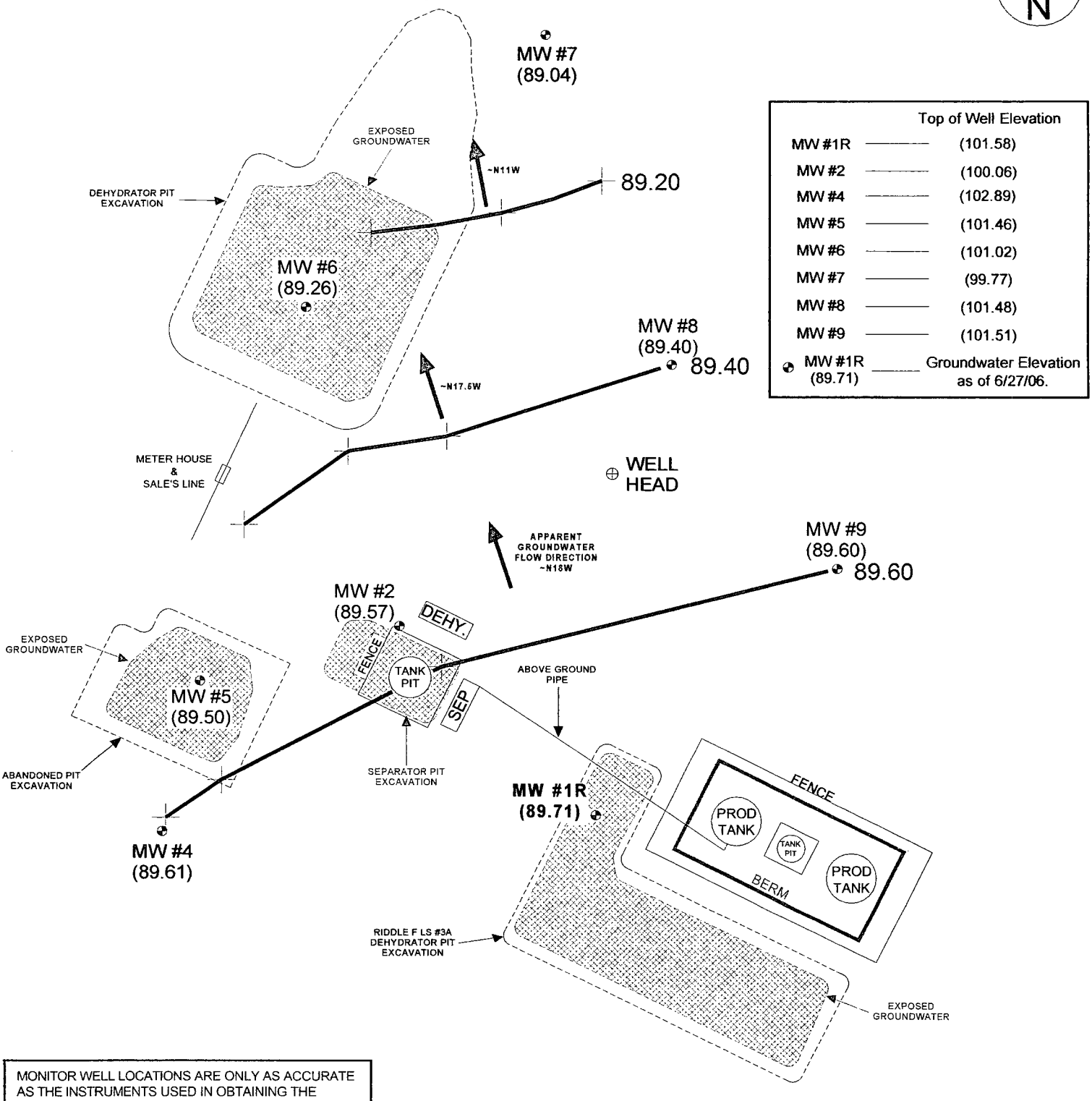
AMOCO PRODUCTION COMPANY
GOOCH 1E
SE/4, NW/4, SEC. 20, T28N, R08W
SAN JUAN COUNTY, NEW MEXICO

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: GOOCH-1E
REVISED: 10/27/07 NJV

GROUNDWATER GRADIENT MAP
6/96

FIGURE 3
(2nd 1/4, 2006)



	Top of Well Elevation
MW #1R	(101.58)
MW #2	(100.06)
MW #4	(102.89)
MW #5	(101.46)
MW #6	(101.02)
MW #7	(99.77)
MW #8	(101.48)
MW #9	(101.51)
MW #1R (89.71)	Groundwater Elevation as of 6/27/06.

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.

1 INCH = 40 FEET

0 40 80 FT.

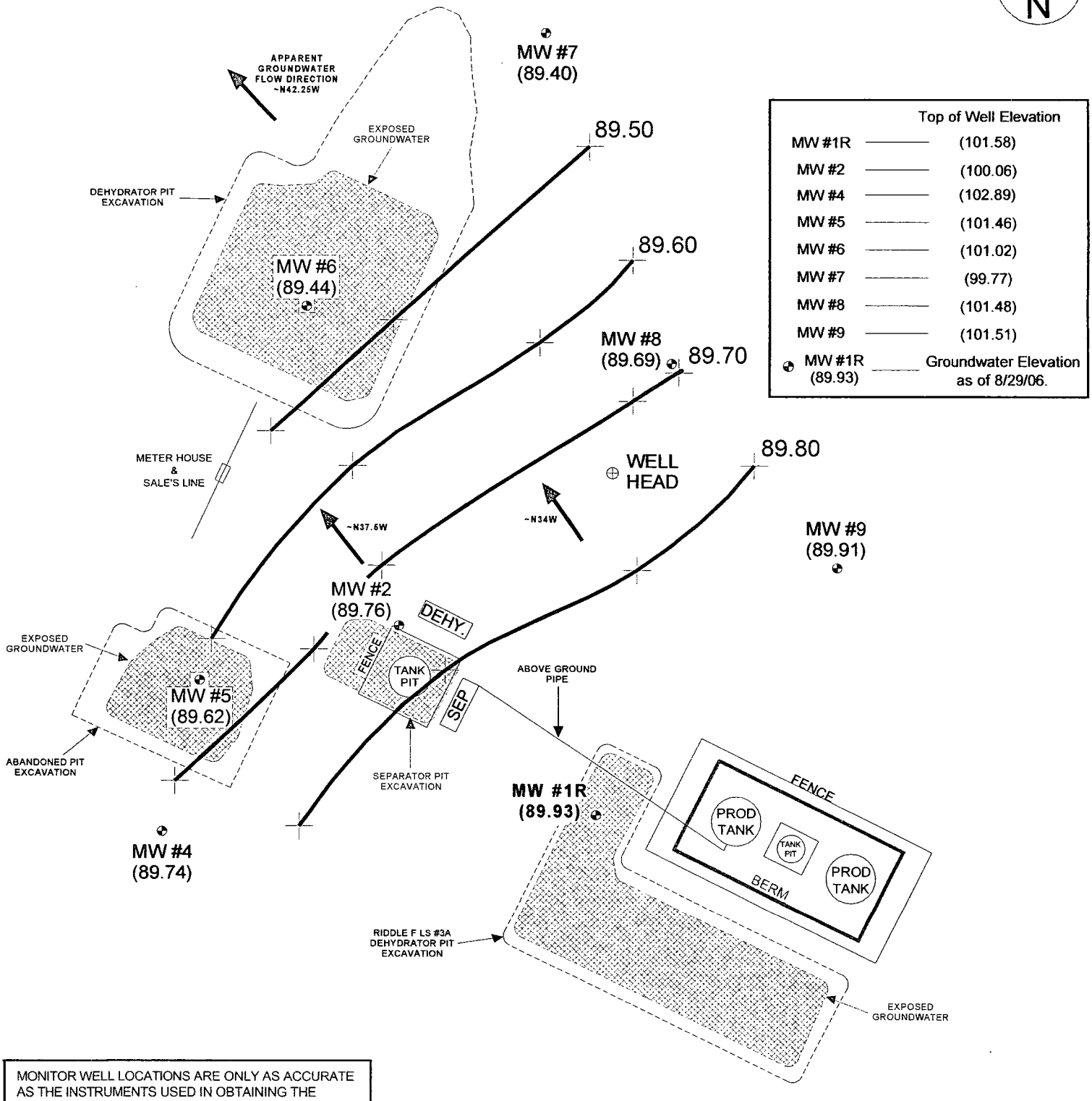
BP AMERICA PRODUCTION COMPANY
COOCH #1E
SE/4 NW/4 SEC. 20, T26N, R8W
SAN JUAN COUNTY, NEW MEXICO

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

PROJECT: MW DEVELOP.
DRAWN BY: NJV
FILENAME: 06-27-06-GW
REVISED: 6/27/06 NJV

GROUNDWATER CONTOUR MAP
06/06

FIGURE 4
(3rd 1/4, 2006)



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.

1 INCH = 40 FEET

0 40 80 FT.

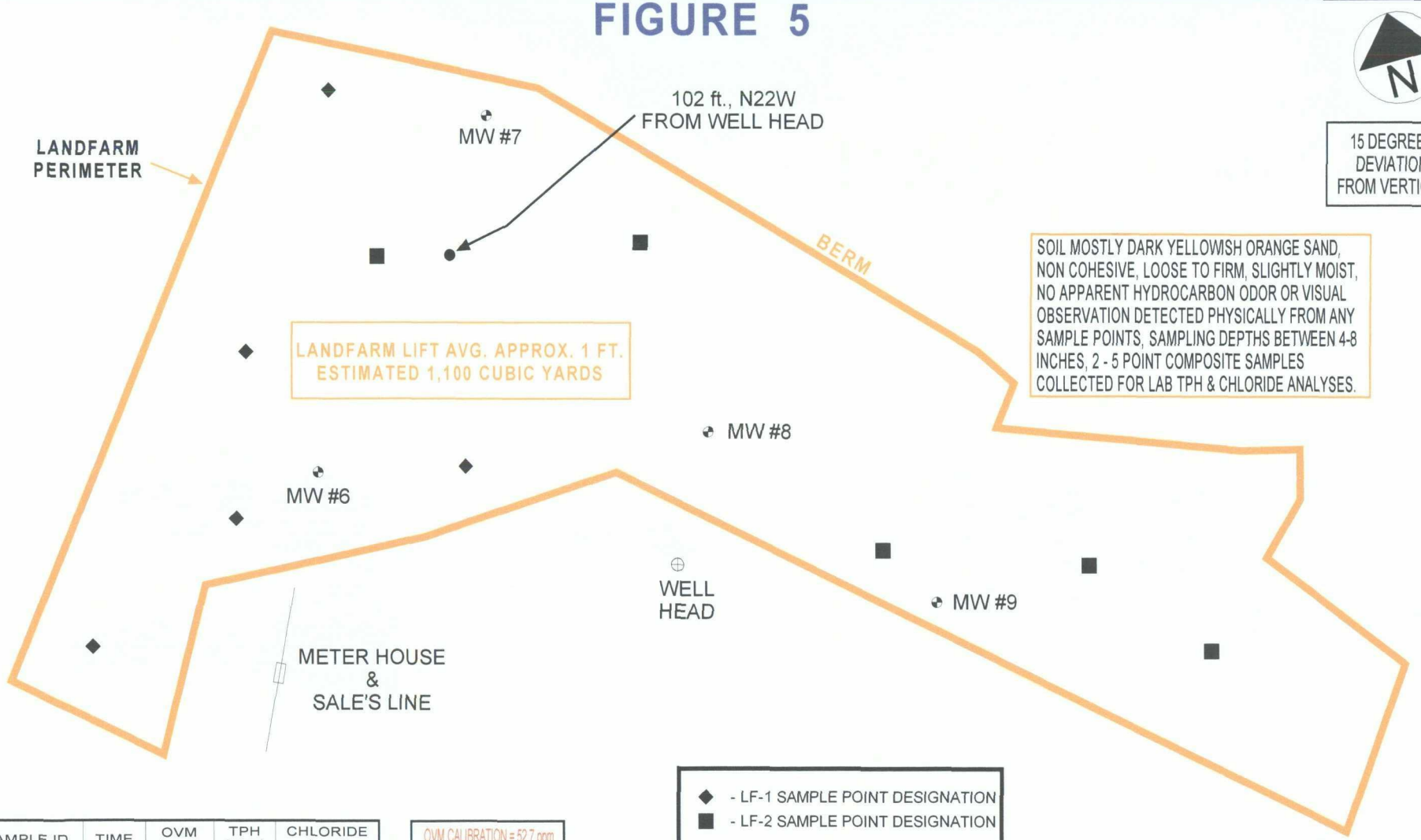
BP AMERICA PRODUCTION COMPANY
GOOCH 1E
SE/4 NW/4 SEC. 20, T28N, R8W
SAN JUAN COUNTY, NEW MEXICO

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

PROJECT: MW DEVELOP.
DRAWN BY: NJV
FILENAME: 08-29-06-GW
REVISED: 8/29/06 NJV

GROUNDWATER CONTOUR MAP
08/06

FIGURE 5



SAMPLE ID	TIME	OVM (ppm)	TPH (ppm)	CHLORIDE (ppm)
LF-1	1305	0.0	ND	ND
LF-2	1335	0.0	ND	39

OVM CALIBRATION = 52.7 ppm with 100 ppm Isobutylence gas & response factor set @ 0.52 ; DATE - 2/27/08, TIME - 1315.

OVM = Organic Vapor Meter or photoionization detector (PID).
TPH = Total Petroleum Hydrocarbon per US EPA method 8015B modified.
ppm = part per million or milligram per kilogram (mg/kg)
ND = Not detected at the Reporting Limits

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

BP AMERICA PRODUCTION CO.
GOOCH # 1E
SE/4 NW/4 SEC. 20, T28N, R8W
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: LANDFARM SAMPLING
DRAWN BY: NJV
FILENAME: GOOCH 1E-LF.SKF
REVISED: 02-27-08

LANDFARM SCHEMATIC
02/08

BLAGG ENGINEERING, INC.

MONITOR WELL SAMPLING DATA

CLIENT : AMOCO PRODUCTION CO.

CHAIN-OF-CUSTODY # : 2377

GOOCH # 1E - SEPARATOR PIT
UNIT F, SEC. 20, T28N, R8W

LABORATORY (S) USED : ANAITAS

Date : June 17, 1996

SAMPLER : R E O

Filename : 06-17-96.WK3

PROJECT MANAGER : R E O

WELL #	WELL ELEV. (ft)	WATER ELEV. (ft)	DEPTH TO WATER (ft)	TOTAL DEPTH (ft)	SAMPLING	pH TIME	CONDUCT (umhos)	VOLUME PURGED (gal.)	FREE PRODUCT (ft)
1	100.15	89.42	10.73	14.61	-	-	-	-	0.02
2	100.12	89.37	10.75	15.34	0930	7.2	4,800	1.00	-
3	100.63	89.19	11.44	15.35	0950	6.9	5,000	1.00	-

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:

1.25 " well diameter = 0.19 gallons per foot of water (or 24 oz.).

2 bails per foot - small teflon bailer.

3 bails per foot - 3 / 4 " teflon bailer.

2.00 " well diameter = 0.49 gallons per foot of water.

4.00 " well diameter = 1.95 gallons per foot of water.

Comments or note well diameter if not standard 2 ".

ANAITAS ENVIRONMENTAL LABS

PURGEABLE AROMATICS

Blagg Engineering, Inc.

Project ID:	Gooch 1E	Report Date:	07/03/96
Sample ID:	MW - 2	Date Sampled:	06/17/96
Lab ID:	3959	Date Received:	06/17/96
Sample Matrix:	Water	Date Analyzed:	06/28/96
Preservative:	Cool, $HgCl_2$		
Condition:	Intact		

Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	ND	0.50
Toluene	0.78	0.50
Ethylbenzene	ND	0.50
m,p-Xylenes	4.43	1.00
o-Xylene	0.50	0.50
Total BTEX	6.13	

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Trifluorotoluene	104	88 - 110%
Bromofluorobenzene	105	86 - 115%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:

Analyst

Review

ANAITAS ENVIRONMENTAL LABS

PURGEABLE AROMATICS

Blagg Engineering, Inc.

Project ID:	Gooch 1E	Report Date:	07/03/96
Sample ID:	MW - 3	Date Sampled:	06/17/96
Lab ID:	3960	Date Received:	06/17/96
Sample Matrix:	Water	Date Analyzed:	06/28/96
Preservative:	Cool, $HgCl_2$		
Condition:	Intact		

Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	1.39	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
m,p-Xylenes	ND	1.00
o-Xylene	ND	0.50
Total BTEX	1.39	

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Trifluorotoluene	98	88 - 110%
Bromofluorobenzene	102	86 - 115%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:

Analyst

Review

ANAITAS ENVIRONMENTAL LABS

General Water Quality

Blagg Engineering, Inc.

Project ID:	Gooch 1E	Date Reported:	07/03/96
Sample ID:	MW - 2	Date Sampled:	06/17/96
Laboratory ID:	3959	Time Sampled:	9:30
Sample Matrix:	Water	Date Received:	06/17/96

Parameter		Analytical Result	Units
General	Lab pH	7.8	s.u.
	Lab Conductivity @ 25° C	8,680	µmhos/cm
	Total Dissolved Solids @ 180°C	6,430	mg/L
	Total Dissolved Solids (Calc)	6,470	mg/L
Anions	Total Alkalinity as $CaCO_3$	955	mg/L
	Bicarbonate Alkalinity as $CaCO_3$	955	mg/L
	Carbonate Alkalinity as $CaCO_3$	NA	mg/L
	Hydroxide Alkalinity as $CaCO_3$	NA	mg/L
	Chloride	192	mg/L
	Sulfate	3,550	mg/L
	Nitrate + Nitrite - N	NA	
	Nitrate - N	NA	
	Nitrite - N	NA	
Cations	Total Hardness as $CaCO_3$	905	mg/L
	Calcium	327	mg/L
	Magnesium	21.8	mg/L
	Potassium	< 5.0	mg/L
	Sodium	1,800	mg/L
Data Validation			Acceptance Level
	Cation/Anion Difference	1.03	+/- 5 %
	TDS (180):TDS (calculated)	1.0	1.0 - 1.2

Reference U.S.E.P.A. 600/4-79-020, Methods for Chemical Analysis of Water and Wastes, 1983.
Standard Methods For The Examination Of Water And Wastewater, 18th ed., 1992.

Review

ANAITAS ENVIRONMENTAL LABS

General Water Quality
Blagg Engineering, Inc.

Project ID:	Gooch 1E	Date Reported:	07/03/96
Sample ID:	MW - 3	Date Sampled:	06/17/96
Laboratory ID:	3960	Time Sampled:	9:50
Sample Matrix:	Water	Date Received:	06/17/96

Parameter		Analytical Result	Units
General	Lab pH	7.7	s.u.
	Lab Conductivity @ 25° C	9,220	µmhos/cm
	Total Dissolved Solids @ 180°C	6,580	mg/L
	Total Dissolved Solids (Calc)	6,100	mg/L
Anions	Total Alkalinity as $CaCO_3$	1,000	mg/L
	Bicarbonate Alkalinity as $CaCO_3$	1,000	mg/L
	Carbonate Alkalinity as $CaCO_3$	NA	mg/L
	Hydroxide Alkalinity as $CaCO_3$	NA	mg/L
	Chloride	42.5	mg/L
	Sulfate	3,270	mg/L
	Nitrate + Nitrite - N	NA	
	Nitrate - N	NA	
	Nitrite - N	NA	
Cations	Total Hardness as $CaCO_3$	607	mg/L
	Calcium	331	mg/L
	Magnesium	< 0.1	mg/L
	Potassium	5.00	mg/L
	Sodium	1,900	mg/L
Data Validation			Acceptance Level
	Cation/Anion Difference	3.01	+/- 5 %
	TDS (180):TDS (calculated)	1.1	1.0 - 1.2

Reference U.S.E.P.A. 600/4-79-020, Methods for Chemical Analysis of Water and Wastes, 1983.
Standard Methods For The Examination Of Water And Wastewater, 18th ed., 1992.

Review

ANAITAS ENVIRONMENTAL LABS

807 S. CARLTON • FARMINGTON, NM 87401 • (505) 326-2395

CHAIN OF CUSTODY

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Page 1 of 1

PROJECT MANAGER:
Anaitas Lab I.D.:

Company: BLAGG
Address:

Phone: 632-1199
Fax:

Bill To: SAME
Company:
Address:

Sample ID	Date	Time	Matrix	Lab ID	Petroleum Hydrocarbons (418.1)	Gasoline / Diesel (mod. 8015)	Gasoline (GRO)	Aromatic HCs (BTEX) MTBE (602 / 8020)	Chlorinated Hydrocarbons (8010)	SDWA Volatiles (502.1 / 503.1)	Chlorinated Pesticides / PCBs (608 / 8080)	Herbicides (615 / 8150)	Volatiles GC/MS (624 / 8240 / 8260)	Base / Neutral / Acid GC/MS (625 / 8270)	Polynuclear Aromatic Hydrocarbons (8100)	TCLP Extraction	Other (specify):	Cation / Anion	Specific Cations (specify):	Specific Anions (specify):	BOD / Fecal / Total Coliform	Solids: TDS / TSS / SS	Nutrients: NH4+ / NO2- / NO3- / TKN	Oil and Grease	Other (specify):	Priority Pollutants	RCRA Metals (Total)	RCRA Metals TCLP (1311)	Other (specify):	COMMENTS
MW-2	6-17	0930	WATER					✓										✓											
MW-3	"	0950	"					✓										✓											

Project Information	Sample Receipt
Proj. #:	No. Containers:
Proj. Name: Amoco	Custody Seals: Y / N / NA
P. O. No:	Received Intact:
Shipped Via: DEL'D	Received Cold:

Required Turnaround Time (Prior Authorization Required for Rush)

GOOCH IE

Sampled By:	Relinquished By:	Relinquished By:
Signature / Date: REO 6-17-96	Signature / Date: REO 6-17-96	Signature / Date:
Company: BEI Time: —	Company: BEI Time: 1345	Company: Time:
Received By:	Received By:	Received By:
Signature / Date:	Signature / Date:	Signature / Date: [signature] 6/17
Company: Time:	Company: Time:	Company: Anaitas Time: 1:45

Please Fill Out Thoroughly.

Shaded areas for lab use only.

White/Yellow: Anaitas
Pink: Client

PURGEABLE AROMATICS

Quality Control Report

Method Blank Analysis

Sample Matrix:	Water	Report Date:	07/03/96
Lab ID:	MB35244	Date Analyzed:	06/28/96

Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
m,p-Xylenes	ND	1.00
o-Xylene	ND	0.50

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Trifluorotoluene	103	88 - 110%
Bromofluorobenzene	103	86 - 115%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:

Analyst

Review

Purgeable Aromatics

Matrix Spike Analysis

Lab ID:	3953Spk	Report Date:	7/3/96
Sample Matrix:	Water	Date Sampled:	6/17/96
Preservative:	Cool, HgCl2	Date Received:	6/17/96
Condition:	Intact	Date Analyzed:	6/27/96

Target Analyte	Spike Added (ug/L)	Original Conc. (ug/L)	Spiked Sample Conc. (ug/L)	% Recovery	Acceptance Limits (%)
Benzene	10	ND	10.8	105%	39 -150
Toluene	10	1.12	11.3	101%	46 - 148
Ethylbenzene	10	ND	10.8	104%	32 - 160
m,p-Xylenes	20	3.13	23.5	102%	NE
o-Xylene	10	1.11	11.4	102%	NE

ND - Analyte not detected at the stated detection limit.
NA - Not applicable or not calculated.
NE - Spike acceptance range not established by the EPA.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Trifluorotoluene	103	88 - 110%
Bromofluorobenzene	102	86 - 115%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:

Analyst

Review

Purgeable Aromatics

Duplicate Analysis

Lab ID:	3956Dup	Report Date:	07/03/96
Sample Matrix:	Water	Date Sampled:	06/17/96
Preservative:	Cool, $HgCl_2$	Date Received:	06/17/96
Condition:	Intact	Date Analyzed:	06/28/96

Target Analyte	Original Conc. (ug/L)	Duplicate Conc. (ug/L)	Acceptance Range (ug/L)
Benzene	230	220	183 - 267
Toluene	10.2	9.19	7.01 - 12.4
Ethylbenzene	77.7	77.7	50.4 - 105
m,p-Xylenes	30.4	27.8	NE
o-Xylene	2.14	2.88	NE

ND - Analyte not detected at the stated detection limit.
NA - Not applicable or not calculated.
NE - Duplicate acceptance range not established by the EPA.

	Surrogate	Percent Recovery	Acceptance Limits
Quality Control:	Trifluorotoluene	113	88 - 110%
	Bromofluorobenzene	110	86 - 115%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments: High toluene-d8 recovery is due to hydrocarbon interference at the d8 retention time.

Analyst

Review

General Water Quality

Quality Control Report

Blagg Engineering, Inc.

Report Date: 7/3/96

Parameter	Analytical Result	Certified Value	Acceptance Range	Units
Laboratory pH	9.07	9.09	8.89 - 9.29	s.u.
Conductivity	1263	1220	1040 - 1400	µmhos/cm
Total Dissolved Solids	900	913	794 - 1030	mg/L
Total Alkalinity	179	180	160 - 200	mg/L
Chloride	140	138	128 - 148	mg/L
Sulfate	115	124	107 - 141	mg/L
Total Hardness	269	254	218 - 290	mg/L
Calcium	59.8	54.6	47.0 - 62.2	mg/L
Magnesium	NA	NA	NA	mg/L
Potassium	120	123	105 - 141	mg/L
Sodium	170	173	147 - 199	mg/L

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983. Standard Methods For The Examination Of Water And Wastewater, 18th ed., 1992.

Comments:

Review

BLAGG ENGINEERING, INC.

MONITOR WELL DEVELOPMENT & / OR SAMPLING DATA

CLIENT : BP AMERICA PROD. CO.

CHAIN-OF-CUSTODY # : N / A & 14637

GOOCH # 1E - MULTIPLE PITS
UNIT F, SEC. 20, T28N, R8W

LABORATORY (S) USED : HALL ENVIRONMENTAL
ENVIROTECH

Date : June 27, 2006

SAMPLER : N J V

Filename : 06-27-06.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.)
MW - 1R	101.58	89.71	11.87	19.85	1110	7.13	5,300	21.2	4.00
MW - 2	100.06	89.57	10.49	15.00	0945	7.29	5,200	20.4	1.25
MW - 4	102.89	89.61	13.28	20.00	0950	7.26	5,300	19.9	3.25
MW - 5	101.46	89.50	11.96	20.00	1010	7.29	5,300	21.0	4.00
MW - 6	101.02	89.26	11.76	20.00	1020	7.20	4,900	20.4	4.00
MW - 7	99.77	89.04	10.73	20.00	1035	7.08	5,300	21.6	4.50
MW - 8	101.48	89.40	12.08	20.00	1045	7.11	5,500	22.7	4.00
MW - 9	101.51	89.60	11.91	20.00	1055	7.30	5,300	21.5	4.00
					INSTRUMENT CALIBRATIONS =	7.00	2,800		
					DATE & TIME =	06/26/06	0630		

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 all MW ' s except MW # 2 - fair / poor . Collected BTEX & major anions / cations from all MW ' s .

Survey conducted on 6 / 14 / 06 .

Top of casings : MW # 1R ~ 2.60 ft. , # 2 ~ 1.90 ft. , # 4 ~ 2.00 ft. , # 5 ~ 1.60 ft. , # 6 ~ 2.00 ft. , # 7 ~ 2.60 ft. , # 8 ~ 2.30 ft. , # 9 ~ 1.90 ft. above grade .

Hall Environmental Analysis Laboratory, Inc.

Date: *10-Jul-06*

CLIENT: Blagg Engineering
Project: Gooch #1E
Lab Order: 0606315

Lab ID: 0606315-01 **Collection Date:** 6/27/2006 11:10:00 AM
Client Sample ID: MW#1R **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	7/7/2006 2:12:33 PM
Toluene	ND	1.0		µg/L	1	7/7/2006 2:12:33 PM
Ethylbenzene	ND	1.0		µg/L	1	7/7/2006 2:12:33 PM
Xylenes, Total	ND	3.0		µg/L	1	7/7/2006 2:12:33 PM
Surr: 4-Bromofluorobenzene	94.8	72.2-125		%REC	1	7/7/2006 2:12:33 PM

Lab ID: 0606315-02 **Collection Date:** 6/27/2006 9:45:00 AM
Client Sample ID: MW#2 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	7/7/2006 2:41:43 PM
Toluene	ND	1.0		µg/L	1	7/7/2006 2:41:43 PM
Ethylbenzene	ND	1.0		µg/L	1	7/7/2006 2:41:43 PM
Xylenes, Total	ND	3.0		µg/L	1	7/7/2006 2:41:43 PM
Surr: 4-Bromofluorobenzene	100	72.2-125		%REC	1	7/7/2006 2:41:43 PM

Lab ID: 0606315-03 **Collection Date:** 6/27/2006 9:50:00 AM
Client Sample ID: MW#4 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	7/7/2006 3:10:44 PM
Toluene	ND	1.0		µg/L	1	7/7/2006 3:10:44 PM
Ethylbenzene	ND	1.0		µg/L	1	7/7/2006 3:10:44 PM
Xylenes, Total	ND	3.0		µg/L	1	7/7/2006 3:10:44 PM
Surr: 4-Bromofluorobenzene	95.2	72.2-125		%REC	1	7/7/2006 3:10:44 PM

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

Date: *10-Jul-06*

CLIENT: Blagg Engineering
Project: Gooch #1E
Lab Order: 0606315

Lab ID: 0606315-04 **Collection Date:** 6/27/2006 10:10:00 AM
Client Sample ID: MW#5 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	7/7/2006 3:39:53 PM
Toluene	ND	1.0		µg/L	1	7/7/2006 3:39:53 PM
Ethylbenzene	ND	1.0		µg/L	1	7/7/2006 3:39:53 PM
Xylenes, Total	ND	3.0		µg/L	1	7/7/2006 3:39:53 PM
Surr: 4-Bromofluorobenzene	92.4	72.2-125		%REC	1	7/7/2006 3:39:53 PM

Lab ID: 0606315-05 **Collection Date:** 6/27/2006 10:20:00 AM
Client Sample ID: MW#6 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	7/7/2006 4:08:52 PM
Toluene	ND	1.0		µg/L	1	7/7/2006 4:08:52 PM
Ethylbenzene	ND	1.0		µg/L	1	7/7/2006 4:08:52 PM
Xylenes, Total	ND	3.0		µg/L	1	7/7/2006 4:08:52 PM
Surr: 4-Bromofluorobenzene	98.2	72.2-125		%REC	1	7/7/2006 4:08:52 PM

Lab ID: 0606315-06 **Collection Date:** 6/27/2006 10:35:00 AM
Client Sample ID: MW#7 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	7/7/2006 4:38:04 PM
Toluene	ND	1.0		µg/L	1	7/7/2006 4:38:04 PM
Ethylbenzene	ND	1.0		µg/L	1	7/7/2006 4:38:04 PM
Xylenes, Total	ND	3.0		µg/L	1	7/7/2006 4:38:04 PM
Surr: 4-Bromofluorobenzene	92.3	72.2-125		%REC	1	7/7/2006 4:38:04 PM

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

Date: *10-Jul-06*

CLIENT: Blagg Engineering
Project: Gooch #1E
Lab Order: 0606315

Lab ID: 0606315-07
Collection Date: 6/27/2006 10:45:00 AM
Client Sample ID: MW#8
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	7/7/2006 5:07:14 PM
Toluene	ND	1.0		µg/L	1	7/7/2006 5:07:14 PM
Ethylbenzene	ND	1.0		µg/L	1	7/7/2006 5:07:14 PM
Xylenes, Total	ND	3.0		µg/L	1	7/7/2006 5:07:14 PM
Surr: 4-Bromofluorobenzene	94.5	72.2-125		%REC	1	7/7/2006 5:07:14 PM

Lab ID: 0606315-08
Collection Date: 6/27/2006 10:55:00 AM
Client Sample ID: MW#9
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	7/7/2006 7:03:37 PM
Toluene	ND	1.0		µg/L	1	7/7/2006 7:03:37 PM
Ethylbenzene	ND	1.0		µg/L	1	7/7/2006 7:03:37 PM
Xylenes, Total	ND	3.0		µg/L	1	7/7/2006 7:03:37 PM
Surr: 4-Bromofluorobenzene	93.2	72.2-125		%REC	1	7/7/2006 7:03:37 PM

Qualifiers:

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

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

CATION / ANION ANALYSIS

Client:	Blagg / BP	Project #:	94034-010
Sample ID:	MW #1R	Date Reported:	06-28-06
Laboratory Number:	37575	Date Sampled:	06-27-06
Chain of Custody:	14637	Date Received:	06-27-06
Sample Matrix:	Water	Date Extracted:	N/A
Preservative:	Cool	Date Analyzed:	06-28-06
Condition:	Cool & Intact		

Parameter	Analytical Result	Units		
pH	**7.32**	s.u.		
Conductivity @ 25° C	**9,500**	umhos/cm		
Total Dissolved Solids @ 180C	**6,000**	mg/L		
Total Dissolved Solids (Calc)	**6,050**	mg/L		
SAR	**30.1**	ratio		
Total Alkalinity as CaCO3	**652**	mg/L		
Total Hardness as CaCO3	**628**	mg/L		
Bicarbonate as HCO3	**652**	mg/L	10.69	meq/L
Carbonate as CO3	**<0.1**	mg/L	0.00	meq/L
Hydroxide as OH	**<0.1**	mg/L	0.00	meq/L
Nitrate Nitrogen	**<0.01**	mg/L	0.00	meq/L
Nitrite Nitrogen	**<0.01**	mg/L	0.00	meq/L
Chloride	**126**	mg/L	3.55	meq/L
Fluoride	**1.50**	mg/L	0.08	meq/L
Phosphate	**<0.01**	mg/L	0.00	meq/L
Sulfate	**3,540**	mg/L	73.70	meq/L
Iron	**0.738**	mg/L	0.03	meq/L
Calcium	**242**	mg/L	12.08	meq/L
Magnesium	**5.60**	mg/L	0.46	meq/L
Potassium	**10.6**	mg/L	0.27	meq/L
Sodium	**1,730**	mg/L	75.26	meq/L
Cations			88.06	meq/L
Anions			88.02	meq/L
Cation/Anion Difference			**0.05%**	

Reference: U.S.E.P.A., 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.
Standard Methods For The Examination of Water And Waste Water", 18th ed., 1992.

Comments: **Gooch #1E Grab Sample.**

Analyst

Review

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ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

CATION / ANION ANALYSIS

Client:	Blagg / BP	Project #:	94034-010
Sample ID:	MW #2	Date Reported:	06-28-06
Laboratory Number:	37576	Date Sampled:	06-27-06
Chain of Custody:	14637	Date Received:	06-27-06
Sample Matrix:	Water	Date Extracted:	N/A
Preservative:	Cool	Date Analyzed:	06-28-06
Condition:	Cool & Intact		

Parameter	Analytical Result	Units		
pH	**7.52**	s.u.		
Conductivity @ 25° C	**9,150**	umhos/cm		
Total Dissolved Solids @ 180C	**5,870**	mg/L		
Total Dissolved Solids (Calc)	**5,830**	mg/L		
SAR	**29.2**	ratio		
Total Alkalinity as CaCO3	**808**	mg/L		
Total Hardness as CaCO3	**592**	mg/L		
Bicarbonate as HCO3	**808**	mg/L	13.24	meq/L
Carbonate as CO3	**<0.1**	mg/L	0.00	meq/L
Hydroxide as OH	**<0.1**	mg/L	0.00	meq/L
Nitrate Nitrogen	**<0.01**	mg/L	0.00	meq/L
Nitrite Nitrogen	**<0.01**	mg/L	0.00	meq/L
Chloride	**101**	mg/L	2.85	meq/L
Fluoride	**1.52**	mg/L	0.08	meq/L
Phosphate	**0.58**	mg/L	0.02	meq/L
Sulfate	**3,300**	mg/L	68.71	meq/L
Iron	**0.020**	mg/L	0.00	meq/L
Calcium	**218**	mg/L	10.88	meq/L
Magnesium	**11.2**	mg/L	0.92	meq/L
Potassium	**80.8**	mg/L	2.07	meq/L
Sodium	**1,630**	mg/L	70.91	meq/L
Cations			84.77	meq/L
Anions			84.90	meq/L
Cation/Anion Difference			**0.15%**	

Reference: U.S.E.P.A., 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.
Standard Methods For The Examination of Water And Waste Water", 18th ed., 1992.

Comments: **Gooch #1E Grab Sample.**

Analyst

Review

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ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

CATION / ANION ANALYSIS

Client:	Blagg / BP	Project #:	94034-010
Sample ID:	MW #4	Date Reported:	06-28-06
Laboratory Number:	37577	Date Sampled:	06-27-06
Chain of Custody:	14637	Date Received:	06-27-06
Sample Matrix:	Water	Date Extracted:	N/A
Preservative:	Cool	Date Analyzed:	06-28-06
Condition:	Cool & Intact		

Parameter	Analytical Result	Units		
pH	**7.45**	s.u.		
Conductivity @ 25° C	**9,530**	umhos/cm		
Total Dissolved Solids @ 180C	**6,130**	mg/L		
Total Dissolved Solids (Calc)	**6,070**	mg/L		
SAR	**29.4**	ratio		
Total Alkalinity as CaCO3	**398**	mg/L		
Total Hardness as CaCO3	**612**	mg/L		
Bicarbonate as HCO3	**398**	mg/L	6.52	meq/L
Carbonate as CO3	**<0.1**	mg/L	0.00	meq/L
Hydroxide as OH	**<0.1**	mg/L	0.00	meq/L
Nitrate Nitrogen	**<0.01**	mg/L	0.00	meq/L
Nitrite Nitrogen	**<0.01**	mg/L	0.00	meq/L
Chloride	**31.4**	mg/L	0.89	meq/L
Fluoride	**1.89**	mg/L	0.10	meq/L
Phosphate	**<0.01**	mg/L	0.00	meq/L
Sulfate	**3,810**	mg/L	79.32	meq/L
Iron	**0.655**	mg/L	0.02	meq/L
Calcium	**223**	mg/L	11.13	meq/L
Magnesium	**13.2**	mg/L	1.09	meq/L
Potassium	**75.8**	mg/L	1.94	meq/L
Sodium	**1,670**	mg/L	72.65	meq/L
Cations			86.80	meq/L
Anions			86.83	meq/L
Cation/Anion Difference			**0.04%**	

Reference: U.S.E.P.A., 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.
Standard Methods For The Examination of Water And Waste Water", 18th ed., 1992.

Comments: **Gooch #1E Grab Sample.**

Analyst

Review

5796 U.S. Highway 64 • Farmington, NM 87401 • Tel 505 • 632 • 0615 • Fax 505 • 632 • 1865

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

CATION / ANION ANALYSIS

Client:	Blagg / BP	Project #:	94034-010
Sample ID:	MW #5	Date Reported:	06-28-06
Laboratory Number:	37578	Date Sampled:	06-27-06
Chain of Custody:	14637	Date Received:	06-27-06
Sample Matrix:	Water	Date Extracted:	N/A
Preservative:	Cool	Date Analyzed:	06-28-06
Condition:	Cool & Intact		

Parameter	Analytical Result	Units		
pH	**7.57**	s.u.		
Conductivity @ 25° C	**9,950**	umhos/cm		
Total Dissolved Solids @ 180C	**6,250**	mg/L		
Total Dissolved Solids (Calc)	**6,340**	mg/L		
SAR	**30.8**	ratio		
Total Alkalinity as CaCO3	**376**	mg/L		
Total Hardness as CaCO3	**626**	mg/L		
Bicarbonate as HCO3	**376**	mg/L	6.16	meq/L
Carbonate as CO3	**<0.1**	mg/L	0.00	meq/L
Hydroxide as OH	**<0.1**	mg/L	0.00	meq/L
Nitrate Nitrogen	**<0.01**	mg/L	0.00	meq/L
Nitrite Nitrogen	**<0.01**	mg/L	0.00	meq/L
Chloride	**30.5**	mg/L	0.86	meq/L
Fluoride	**1.17**	mg/L	0.06	meq/L
Phosphate	**<0.01**	mg/L	0.00	meq/L
Sulfate	**4,020**	mg/L	83.70	meq/L
Iron	**0.823**	mg/L	0.03	meq/L
Calcium	**216**	mg/L	10.78	meq/L
Magnesium	**20.7**	mg/L	1.70	meq/L
Potassium	**50.0**	mg/L	1.28	meq/L
Sodium	**1,770**	mg/L	77.00	meq/L
Cations			90.76	meq/L
Anions			90.78	meq/L
Cation/Anion Difference			**0.03%**	

Reference: U.S.E.P.A., 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.
Standard Methods For The Examination of Water And Waste Water", 18th ed., 1992.

Comments: **Gooch #1E Grab Sample.**

Analyst

Review

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ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

CATION / ANION ANALYSIS

Client:	Blagg / BP	Project #:	94034-010
Sample ID:	MW #6	Date Reported:	06-28-06
Laboratory Number:	37579	Date Sampled:	06-27-06
Chain of Custody:	14637	Date Received:	06-27-06
Sample Matrix:	Water	Date Extracted:	N/A
Preservative:	Cool	Date Analyzed:	06-28-06
Condition:	Cool & Intact		

Parameter	Analytical Result	Units		
pH	**7.41**	s.u.		
Conductivity @ 25° C	**8,230**	umhos/cm		
Total Dissolved Solids @ 180C	**5,170**	mg/L		
Total Dissolved Solids (Calc)	**5,240**	mg/L		
SAR	**21.6**	ratio		
Total Alkalinity as CaCO3	**556**	mg/L		
Total Hardness as CaCO3	**787**	mg/L		
Bicarbonate as HCO3	**556**	mg/L	9.11	meq/L
Carbonate as CO3	**<0.1**	mg/L	0.00	meq/L
Hydroxide as OH	**<0.1**	mg/L	0.00	meq/L
Nitrate Nitrogen	**<0.01**	mg/L	0.00	meq/L
Nitrite Nitrogen	**<0.01**	mg/L	0.00	meq/L
Chloride	**83.3**	mg/L	2.35	meq/L
Fluoride	**1.10**	mg/L	0.06	meq/L
Phosphate	**<0.01**	mg/L	0.00	meq/L
Sulfate	**3,120**	mg/L	64.96	meq/L
Iron	**0.578**	mg/L	0.02	meq/L
Calcium	**267**	mg/L	13.32	meq/L
Magnesium	**28.6**	mg/L	2.35	meq/L
Potassium	**16.7**	mg/L	0.43	meq/L
Sodium	**1,390**	mg/L	60.47	meq/L
Cations			76.57	meq/L
Anions			76.48	meq/L
Cation/Anion Difference			**0.12%**	

Reference: U.S.E.P.A., 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.
Standard Methods For The Examination of Water And Waste Water", 18th ed., 1992.

Comments: **Gooch #1E Grab Sample.**

Analyst

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ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

CATION / ANION ANALYSIS

Client:	Blagg / BP	Project #:	94034-010
Sample ID:	MW #7	Date Reported:	06-28-06
Laboratory Number:	37580	Date Sampled:	06-27-06
Chain of Custody:	14637	Date Received:	06-27-06
Sample Matrix:	Water	Date Extracted:	N/A
Preservative:	Cool	Date Analyzed:	06-28-06
Condition:	Cool & Intact		

Parameter	Analytical Result	Units		
pH	**7.62**	s.u.		
Conductivity @ 25° C	**9,550**	umhos/cm		
Total Dissolved Solids @ 180C	**6,020**	mg/L		
Total Dissolved Solids (Calc)	**6,080**	mg/L		
SAR	**25.5**	ratio		
Total Alkalinity as CaCO3	**390**	mg/L		
Total Hardness as CaCO3	**768**	mg/L		
Bicarbonate as HCO3	**390**	mg/L	6.39	meq/L
Carbonate as CO3	**<0.1**	mg/L	0.00	meq/L
Hydroxide as OH	**<0.1**	mg/L	0.00	meq/L
Nitrate Nitrogen	**0.07**	mg/L	0.00	meq/L
Nitrite Nitrogen	**<0.01**	mg/L	0.00	meq/L
Chloride	**38.9**	mg/L	1.10	meq/L
Fluoride	**1.40**	mg/L	0.07	meq/L
Phosphate	**<0.01**	mg/L	0.00	meq/L
Sulfate	**3,830**	mg/L	79.74	meq/L
Iron	**0.007**	mg/L	0.00	meq/L
Calcium	**259**	mg/L	12.92	meq/L
Magnesium	**28.9**	mg/L	2.38	meq/L
Potassium	**65.1**	mg/L	1.67	meq/L
Sodium	**1,620**	mg/L	70.47	meq/L
Cations			87.44	meq/L
Anions			87.30	meq/L
Cation/Anion Difference			**0.15%**	

Reference: U.S.E.P.A., 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.
Standard Methods For The Examination of Water And Waste Water", 18th ed., 1992.

Comments: **Gooch #1E Grab Sample.**

Analyst

Review

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ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

CATION / ANION ANALYSIS

Client:	Blagg / BP	Project #:	94034-010
Sample ID:	MW #8	Date Reported:	06-28-06
Laboratory Number:	37581	Date Sampled:	06-27-06
Chain of Custody:	14637	Date Received:	06-27-06
Sample Matrix:	Water	Date Extracted:	N/A
Preservative:	Cool	Date Analyzed:	06-28-06
Condition:	Cool & Intact		

Parameter	Analytical Result	Units		
pH	**7.40**	s.u.		
Conductivity @ 25° C	**9,920**	umhos/cm		
Total Dissolved Solids @ 180C	**6,400**	mg/L		
Total Dissolved Solids (Calc)	**6,320**	mg/L		
SAR	**24.3**	ratio		
Total Alkalinity as CaCO3	**404**	mg/L		
Total Hardness as CaCO3	**866**	mg/L		
Bicarbonate as HCO3	**404**	mg/L	6.62	meq/L
Carbonate as CO3	**<0.1**	mg/L	0.00	meq/L
Hydroxide as OH	**<0.1**	mg/L	0.00	meq/L
Nitrate Nitrogen	**<0.01**	mg/L	0.00	meq/L
Nitrite Nitrogen	**<0.01**	mg/L	0.00	meq/L
Chloride	**38.4**	mg/L	1.08	meq/L
Fluoride	**1.68**	mg/L	0.09	meq/L
Phosphate	**<0.01**	mg/L	0.00	meq/L
Sulfate	**3,990**	mg/L	83.07	meq/L
Iron	**0.402**	mg/L	0.01	meq/L
Calcium	**279**	mg/L	13.92	meq/L
Magnesium	**40.6**	mg/L	3.34	meq/L
Potassium	**89.8**	mg/L	2.30	meq/L
Sodium	**1,640**	mg/L	71.34	meq/L
Cations			90.90	meq/L
Anions			90.87	meq/L
Cation/Anion Difference			**0.04%**	

Reference: U.S.E.P.A., 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.
Standard Methods For The Examination of Water And Waste Water", 18th ed., 1992.

Comments: **Gooch #1E Grab Sample.**

Analyst

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ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

CATION / ANION ANALYSIS

Client:	Blagg / BP	Project #:	94034-010
Sample ID:	MW #9	Date Reported:	06-28-06
Laboratory Number:	37582	Date Sampled:	06-27-06
Chain of Custody:	14637	Date Received:	06-27-06
Sample Matrix:	Water	Date Extracted:	N/A
Preservative:	Cool	Date Analyzed:	06-28-06
Condition:	Cool & Intact		

Parameter	Analytical Result	Units		
pH	**7.63**	s.u.		
Conductivity @ 25° C	**10,010**	umhos/cm		
Total Dissolved Solids @ 180C	**6,390**	mg/L		
Total Dissolved Solids (Calc)	**6,380**	mg/L		
SAR	**53.5**	ratio		
Total Alkalinity as CaCO3	**374**	mg/L		
Total Hardness as CaCO3	**248**	mg/L		
Bicarbonate as HCO3	**374**	mg/L	6.13	meq/L
Carbonate as CO3	**<0.1**	mg/L	0.00	meq/L
Hydroxide as OH	**<0.1**	mg/L	0.00	meq/L
Nitrate Nitrogen	**<0.01**	mg/L	0.00	meq/L
Nitrite Nitrogen	**<0.01**	mg/L	0.00	meq/L
Chloride	**27.7**	mg/L	0.78	meq/L
Fluoride	**1.81**	mg/L	0.10	meq/L
Phosphate	**<0.01**	mg/L	0.00	meq/L
Sulfate	**4,030**	mg/L	83.90	meq/L
Iron	**0.825**	mg/L	0.03	meq/L
Calcium	**73.1**	mg/L	3.65	meq/L
Magnesium	**15.6**	mg/L	1.28	meq/L
Potassium	**73.8**	mg/L	1.89	meq/L
Sodium	**1,930**	mg/L	83.96	meq/L
Cations			90.77	meq/L
Anions			90.91	meq/L
Cation/Anion Difference			**0.15%**	

Reference: U.S.E.P.A., 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.
Standard Methods For The Examination of Water And Waste Water", 18th ed., 1992.

Comments: **Gooch #1E Grab Sample.**

Analyst

Review

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CHAIN-OF-CUSTODY RECORD

QA / QC Package:
Std ☐ Level 4 ☐
Other: _____

HALL ENVIRONMENTAL ANALYSIS LABORATORY
4901 Hawkins NE, Suite D
Albuquerque, New Mexico 87109
Tel. 505.345.3975 Fax 505.345.4107
www.hallenvironmental.com

Client: BLAGG ENGR. / BP AMERICA
Project Name: GOOCH #1E
Address: P.O. BOX 87 BLFD., NM 87413
Project #: nr
Project Manager: NV
Phone #: 632-1199
Sampler: NV
Fax #:
Sample Temperature: 1°

ANALYSIS REQUEST

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative $HgCl_2$	Preservative HNO_3	Preservative Cool	HEAL No. 0606315	BTEX + MTBE + TMB's (8021B)	BTEX + MTBE + TPH (Gasoline Only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	EDC (Method 8021)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F, Cl, NO_3, NO_2, PO_4, SO_4)	8081 Pesticides / PCB's (8082)	8260B (VOA)	8270 (Semi-VOA)					Air Bubbles or Headspace (Y or N)
6/27/06	1110	WATER	MW #1R	2-40ml	✓		✓	1	✓																
6/27/06	0945	WATER	MW #2	2-40ml	✓		✓	2	✓																
6/27/06	0950	WATER	MW #4	2-40ml	✓		✓	3	✓																
6/27/06	1010	WATER	MW #5	2-40ml	✓		✓	4	✓																
6/27/06	1020	WATER	MW #6	2-40ml	✓		✓	5	✓																
6/27/06	1035	WATER	MW #7	2-40ml	✓		✓	6	✓																
6/27/06	1045	WATER	MW #8	2-40ml	✓		✓	7	✓																
6/27/06	1055	WATER	MW #9	2-40ml	✓		✓	8	✓																

Date	Time	Relinquished By: (Signature)	Received By: (Signature)	
6/28/06	0700	Nelson Velez	[signature]	6-28-06 @ 1600
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)	

Remarks:

CHAIN OF CUSTODY RECORD

14637

Client / Project Name	Project Location	ANALYSIS / PARAMETERS
BLAGG / BP	GOOCH #1E	

Sampler:	Client No.
NV	94034-010

Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	No. of Containers	MAJOR ANIONS/ CATIONS						Remarks
												PRESERVED COOL
												GRAB SAMPLES
MW #1R	6/27/06	1110	37575	WATER	1	✓						
MW #2	6/27/06	0945	37576	WATER	1	✓						
MW #4	6/27/06	0950	37577	WATER	1	✓						
MW #5	6/27/06	1010	37578	WATER	1	✓						
MW #6	6/27/06	1020	37579	WATER	1	✓						
MW #7	6/27/06	1035	37580	WATER	1	✓						
MW #8	6/27/06	1045	37581	WATER	1	✓						
MW #9	6/27/06	1055	37582	WATER	1	✓						

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
[signature]	6/27/06	1357	[signature]	6/27/06	1357
Relinquished by: (Signature)			Received by: (Signature)		
Relinquished by: (Signature)			Received by: (Signature)		

ENVIROTECH INC.

5796 U.S. Highway 64
Farmington, New Mexico 87401
(505) 632-0615

Sample Receipt	Y	N	N/A
Received Intact	✓		
Cool - Ice/Blue Ice	✓		

QA/QC SUMMARY REPORT

ent: Blagg Engineering
oject: Gooch #1E **Work Order:** 0606315

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
lethod: SW8021									
ample ID: 5ML RB		*MBLK*			Batch ID:	**R19830**	Analysis Date:	7/7/2006 7:40:50 AM	
nzene	ND	µg/L	1.0						
oluene	ND	µg/L	1.0						
thylbenzene	ND	µg/L	1.0						
enes, Total	ND	µg/L	3.0						
ample ID: 100NG BTEX LCS		*LCS*			Batch ID:	**R19830**	Analysis Date:	7/7/2006 11:10:13 AM	
enzene	19.19	µg/L	1.0	95.9	85	115			
uene	19.10	µg/L	1.0	93.5	85	118			
ylbenzene	19.32	µg/L	1.0	96.6	85	116			
ylenes, Total	59.98	µg/L	3.0	97.4	85	119			

Qualifiers:

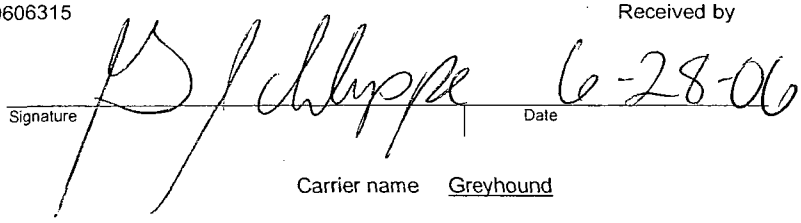
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name BLAGG | Date and Time Received: 6/28/2006

Work Order Number 0606315 | Received by GLS

Checklist completed by  6-28-06
Signature | Date

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 - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑	

Container/Temp Blank temperature? **1°** *4° C ± 2 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

GOOCH # 1E - MULTIPLE PITS
UNIT F, SEC. 20, T28N, R8W

LABORATORY (S) USED : HALL ENVIRONMENTAL

Date : August 29, 2006

SAMPLER : N J V

Filename : 08-29-06.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.)
MW - 1R	101.58	89.93	11.65	19.85	1535	7.16	4,500	20.9	4.00
MW - 2	100.06	89.76	10.30	15.00	1450	7.25	4,600	22.4	1.25
MW - 4	102.89	89.74	13.15	20.00	1405	7.21	4,600	21.8	3.50
MW - 5	101.46	89.62	11.84	20.00	1315	7.22	4,800	22.1	4.00
MW - 6	101.02	89.44	11.58	20.00	1240	7.31	4,300	22.7	4.25
MW - 7	99.77	89.40	10.37	20.00	1155	7.28	4,700	21.4	4.75
MW - 8	101.48	89.69	11.79	20.00	1110	7.06	4,800	21.7	4.00
MW - 9	101.51	89.91	11.60	20.00	1020	7.26	4,600	21.7	4.25
					INSTRUMENT CALIBRATIONS =	7.00	2,800		
					DATE & TIME =	08/29/06	1000		

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 all MW ' s except MW # 2 - fair / poor . Collected BTEX samples from all MW ' s .

Top of casings : MW # 1R ~ 2.60 ft. , # 2 ~ 1.90 ft. , # 4 ~ 2.00 ft. , # 5 ~ 1.60 ft. , # 6 ~ 2.00 ft. , # 7 ~ 2.60 ft. , # 8 ~ 2.30 ft. , # 9 ~ 1.90 ft. above grade .

Hall Environmental Analysis Laboratory, Inc.

Date: *07-Sep-06*

CLIENT: Blagg Engineering
Project: Gooch #1E

Lab Order: 0608354

Lab ID: 0608354-01 **Collection Date:** 8/29/2006 3:35:00 PM
Client Sample ID: MW #1R **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	9/6/2006 6:54:20 PM
Toluene	ND	1.0		µg/L	1	9/6/2006 6:54:20 PM
Ethylbenzene	ND	1.0		µg/L	1	9/6/2006 6:54:20 PM
Xylenes, Total	ND	3.0		µg/L	1	9/6/2006 6:54:20 PM
Surr: 4-Bromofluorobenzene	92.8	72.2-125		%REC	1	9/6/2006 6:54:20 PM

Lab ID: 0608354-02 **Collection Date:** 8/29/2006 2:50:00 PM
Client Sample ID: MW #2 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	9/6/2006 7:23:13 PM
Toluene	ND	1.0		µg/L	1	9/6/2006 7:23:13 PM
Ethylbenzene	ND	1.0		µg/L	1	9/6/2006 7:23:13 PM
Xylenes, Total	ND	3.0		µg/L	1	9/6/2006 7:23:13 PM
Surr: 4-Bromofluorobenzene	94.7	72.2-125		%REC	1	9/6/2006 7:23:13 PM

Lab ID: 0608354-03 **Collection Date:** 8/29/2006 2:05:00 PM
Client Sample ID: MW #4 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	9/6/2006 7:52:17 PM
Toluene	ND	1.0		µg/L	1	9/6/2006 7:52:17 PM
Ethylbenzene	ND	1.0		µg/L	1	9/6/2006 7:52:17 PM
Xylenes, Total	ND	3.0		µg/L	1	9/6/2006 7:52:17 PM
Surr: 4-Bromofluorobenzene	96.5	72.2-125		%REC	1	9/6/2006 7:52:17 PM

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

Date: *07-Sep-06*

CLIENT: Blagg Engineering
Project: Gooch #1E
Lab Order: 0608354

Lab ID: 0608354-04 **Collection Date:** 8/29/2006 1:15:00 PM
Client Sample ID: MW #5 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	9/6/2006 8:21:16 PM
Toluene	ND	1.0		µg/L	1	9/6/2006 8:21:16 PM
Ethylbenzene	ND	1.0		µg/L	1	9/6/2006 8:21:16 PM
Xylenes, Total	ND	3.0		µg/L	1	9/6/2006 8:21:16 PM
Surr: 4-Bromofluorobenzene	98.5	72.2-125		%REC	1	9/6/2006 8:21:16 PM

Lab ID: 0608354-05 **Collection Date:** 8/29/2006 12:40:00 PM
Client Sample ID: MW #6 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	9/6/2006 8:50:13 PM
Toluene	ND	1.0		µg/L	1	9/6/2006 8:50:13 PM
Ethylbenzene	ND	1.0		µg/L	1	9/6/2006 8:50:13 PM
Xylenes, Total	ND	3.0		µg/L	1	9/6/2006 8:50:13 PM
Surr: 4-Bromofluorobenzene	96.1	72.2-125		%REC	1	9/6/2006 8:50:13 PM

Lab ID: 0608354-06 **Collection Date:** 8/29/2006 11:55:00 AM
Client Sample ID: MW #7 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	9/6/2006 9:19:12 PM
Toluene	ND	1.0		µg/L	1	9/6/2006 9:19:12 PM
Ethylbenzene	ND	1.0		µg/L	1	9/6/2006 9:19:12 PM
Xylenes, Total	ND	3.0		µg/L	1	9/6/2006 9:19:12 PM
Surr: 4-Bromofluorobenzene	95.5	72.2-125		%REC	1	9/6/2006 9:19:12 PM

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

Date: *07-Sep-06*

CLIENT: Blagg Engineering
Project: Gooch #1E
Lab Order: 0608354

Lab ID: 0608354-07 **Collection Date:** 8/29/2006 11:10:00 AM
Client Sample ID: MW #8 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	9/7/2006 1:12:38 AM
Toluene	ND	1.0		µg/L	1	9/7/2006 1:12:38 AM
Ethylbenzene	ND	1.0		µg/L	1	9/7/2006 1:12:38 AM
Xylenes, Total	ND	3.0		µg/L	1	9/7/2006 1:12:38 AM
Surr: 4-Bromofluorobenzene	93.2	72.2-125		%REC	1	9/7/2006 1:12:38 AM

Lab ID: 0608354-08 **Collection Date:** 8/29/2006 10:20:00 AM
Client Sample ID: MW #9 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	9/7/2006 1:41:38 AM
Toluene	ND	1.0		µg/L	1	9/7/2006 1:41:38 AM
Ethylbenzene	ND	1.0		µg/L	1	9/7/2006 1:41:38 AM
Xylenes, Total	ND	3.0		µg/L	1	9/7/2006 1:41:38 AM
Surr: 4-Bromofluorobenzene	98.6	72.2-125		%REC	1	9/7/2006 1:41:38 AM

Qualifiers:

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

CHAIN-OF-CUSTODY RECORD

QA / QC Package:
Std ☐ Level 4 ☐
Other:

HALL ENVIRONMENTAL ANALYSIS LABORATORY
4901 Hawkins NE, Suite D
Albuquerque, New Mexico 87109
Tel. 505.345.3975 Fax 505.345.4107
www.hallenvironmental.com

Client: BLAGG ENGR. / BP AMERICA
Address: P.O. BOX 87 BLFD, NM 87413
Phone #: 632-1199
Fax #:

Project Name: GOOCH #1E
Project #: 9W
Project Manager: NV
Sampler: NV
Sample Temperature: 3°

ANALYSIS REQUEST

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative $HgCl_2$	Preservative HNO_3	HEAL No. 0608354	BTEX + ~~MTBE + TMB's~~ (8021B)	BTEX + MTBE + TPH (Gasoline Only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	EDC (Method 8021)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F, Cl, NO_3, NO_2, PO_4, SO_4)	8081 Pesticides / PCB's (8082)	8260B (VOA)	8270 (Semi-VOA)					Air Bubbles or Headspace (Y or N)
8/29/06	1535	WATER	MW #1R	2-40ml	✓		1	✓																
8/29/06	1450	WATER	MW #2	2-40ml	✓		2	✓																
8/29/06	1405	WATER	MW #4	2-40ml	✓		3	✓																
8/29/06	1315	WATER	MW #5	2-40ml	✓		4	✓																
8/29/06	1240	WATER	MW #6	2-40ml	✓		5	✓																
8/29/06	1155	WATER	MW #7	2-40ml	✓		6	✓																
8/29/06	1110	WATER	MW #8	2-40ml	✓		7	✓																
8/29/06	1020	WATER	MW #9	2-40ml	✓		8	✓																

Date	Time	Relinquished By: (Signature)	Received By: (Signature)		Remarks:
8/30/06	0700	Melissa Vig	Debbie Haase	8-30-06 1610	
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)		

QA/QC SUMMARY REPORT

Client: Blagg Engineering
Project: Gooch #1E **Work Order:** 0608354

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: SW8021									
Sample ID: 5ML REAGENT BLA		*MBLK*			Batch ID:	**R20581**	Analysis Date:	9/6/2006 11:07:46 AM	
Benzene	ND	µg/L	1.0						
Toluene	ND	µg/L	1.0						
Ethylbenzene	ND	µg/L	1.0						
Xylenes, Total	ND	µg/L	3.0						
Sample ID: 100NG BTEX LCS		*LCS*			Batch ID:	**R20581**	Analysis Date:	9/6/2006 10:45:52 PM	
Benzene	21.00	µg/L	1.0	105	85	115			
Toluene	21.78	µg/L	1.0	109	85	118			
Ethylbenzene	23.42	µg/L	1.0	117	85	116			S
Xylenes, Total	67.49	µg/L	3.0	111	85	119			
Sample ID: 100NG BTEX LCSD		*LCSD*			Batch ID:	**R20581**	Analysis Date:	9/6/2006 11:14:40 PM	
Benzene	20.84	µg/L	1.0	104	85	115	0.746	27	
Toluene	20.71	µg/L	1.0	104	85	118	5.06	19	
Ethylbenzene	21.79	µg/L	1.0	109	85	116	7.20	10	
Xylenes, Total	64.96	µg/L	3.0	107	85	119	3.83	13	

Qualifiers:

E	Value above quantitation range	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	Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name BLAGG | Date and Time Received: 8/30/2006

Work Order Number 0608354 | Received by GLS

Checklist completed by _____ 8-30-06
Signature | Date

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 - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑	
Container/Temp Blank temperature?	3°	*4° C ± 2 Acceptable* If given sufficient time to cool.		

COMMENTS:

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding _____

Comments: _____

Corrective Action _____

Hall Environmental Analysis Laboratory, Inc.

Date: *07-Mar-08*

CLIENT:	Blagg Engineering	**Client Sample ID:**	LF-1 5pt. Composite
Lab Order:	0802339	**Collection Date:**	2/27/2008 1:05:00 PM
Project:	Gooch #1E - Landfarm	**Date Received:**	2/29/2008
Lab ID:	0802339-01	**Matrix:**	SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE ORGANICS						Analyst: **SCC**
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	3/4/2008 6:43:02 PM
Surr: DNOP	94.2	61.7-135		%REC	1	3/4/2008 6:43:02 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	3/4/2008 7:21:30 PM
Surr: BFB	113	84-138		%REC	1	3/4/2008 7:21:30 PM
EPA METHOD 9056A: ANIONS						Analyst: **SLB**
Chloride	ND	1.5		mg/Kg	5	3/3/2008 11:38:22 PM

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank	
	E	Value above quantitation range	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			

Hall Environmental Analysis Laboratory, Inc.

Date: *07-Mar-08*

CLIENT:	Blagg Engineering	**Client Sample ID:**	LF-2 5pt. Composite
Lab Order:	0802339	**Collection Date:**	2/27/2008 1:35:00 PM
Project:	Gooch #1E - Landfarm	**Date Received:**	2/29/2008
Lab ID:	0802339-02	**Matrix:**	SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE ORGANICS						Analyst: **SCC**
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	3/4/2008 7:17:45 PM
Surr: DNOP	98.6	61.7-135		%REC	1	3/4/2008 7:17:45 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	3/4/2008 7:51:46 PM
Surr: BFB	113	84-138		%REC	1	3/4/2008 7:51:46 PM
EPA METHOD 9056A: ANIONS						Analyst: **SLB**
Chloride	39	1.5		mg/Kg	5	3/3/2008 11:55:47 PM

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value above quantitation range	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

QA / QC Package:
Std ☐ Level 4 ☐
Other:

Client: BLAGG ENER. / BP AMERICA

Project Name: GOOCH #1E - LANDFARM

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

Project #:

Project Manager: NV

Phone #: 632-1199

Sampler: NV

Fax #:

Sample Temperature: 4

HALL ENVIRONMENTAL ANALYSIS LABORATORY
4901 Hawkins NE, Suite D
Albuquerque, New Mexico 87109
Tel. 505.345.3975 Fax 505.345.4107
www.hallenvironmental.com

ANALYSIS REQUEST

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative $HgCl_2$	Preservative HNO_3	HEAL No.
2/27/08	1305	SOIL	LF-1 5 PT. COMPOSITE	1-4oz.			0802339 1
2/27/08	1335	SOIL	LF-2 5 PT. COMPOSITE	1-4oz.			2

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gasoline Only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	EDC (Method 8021)	8310 (PNA or PAH)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / PCB's (8082)	8260B (VOA)	8270 (Semi-VOA)	CHLORIDE				Air Bubbles or Headspace (Y or N)
		✓										✓				
		✓										✓				

Date	Time	Relinquished By: (Signature)	Received By: (Signature)	
2/28/08	1635			2/28/08 930
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)	

Remarks: GOR & DOR ON TPH ANALYSIS ONLY.

QA/QC SUMMARY REPORT

Client: Blagg Engineering
Project: Gooch #1E - Landfarm **Work Order:** 0802339

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: EPA Method 9056A: Anions									
Sample ID: MB-15268		*MBLK*			Batch ID: **15268**		Analysis Date:		3/3/2008 5:50:12 PM
Chloride	ND	mg/Kg	0.30						
Sample ID: LCS-15268		*LCS*			Batch ID: **15268**		Analysis Date:		3/3/2008 6:07:37 PM
Chloride	14.96	mg/Kg	0.30	99.7	90	110			
Method: EPA Method 8015B: Diesel Range Organics									
Sample ID: MB-15274		*MBLK*			Batch ID: **15274**		Analysis Date:		3/4/2008 8:16:23 AM
Diesel Range Organics (DRO)	ND	mg/Kg	10						
Sample ID: LCS-15274		*LCS*			Batch ID: **15274**		Analysis Date:		3/4/2008 8:51:23 AM
Diesel Range Organics (DRO)	43.20	mg/Kg	10	86.4	64.6	116			
Sample ID: LCSD-15274		*LCSD*			Batch ID: **15274**		Analysis Date:		3/4/2008 9:26:22 AM
Diesel Range Organics (DRO)	43.24	mg/Kg	10	86.5	64.6	116	0.102	17.4	
Method: EPA Method 8015B: Gasoline Range									
Sample ID: MB-15269		*MBLK*			Batch ID: **15269**		Analysis Date:		3/4/2008 10:52:49 PM
Gasoline Range Organics (GRO)	ND	mg/Kg	5.0						
Sample ID: LCS-15269		*LCS*			Batch ID: **15269**		Analysis Date:		3/4/2008 9:52:20 PM
Gasoline Range Organics (GRO)	25.89	mg/Kg	5.0	104	69.5	120			

Qualifiers:

E	Value above quantitation range	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: 2/29/2008

Work Order Number 0802339 | Received by: TLS

Checklist completed by: Bruce Shomin 2/29/08 (Signature / Date) | Sample ID labels checked by: MS (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°	*<6° C Acceptable* If given sufficient time to cool.		

COMMENTS:

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding _____

Comments: _____

Corrective Action _____