3R-177

GW Remediation Report

DATE:
Feb. 2008

3R 177

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

RECEIVED
2008 MAR 19 PM 3 45

March 17, 2008

Mr. Glenn von Gonten, Senior Hydrologist
New Mexico Oil Conservation Division-NMOCD
Environmental Bureau
1220 St. Francis Drive
Santa Fe, New Mexico 87505

RE: REQUEST FOR PERMANENT CLOSURE
BP America Production Company (formerly Amoco Production Co.)
Groundwater Monitoring Report
Gallegos Canyon Unit (GCU) # 145E, Unit D, Sec. 26, T29N, R12W, NMPM
San Juan County, New Mexico

NMOCD Administrative/Environmental Order #: 3RP-177-0

Dear Mr. von Gonten:

BP America Production Company (**BP**) has retained Blagg Engineering, Inc. (**BEI**) to conduct environmental monitoring of groundwater at the GCU # 145E.

BP has followed its NMOCD approved groundwater management plan and is requesting permanent closure for this site.

If you have any questions concerning the enclosed documentation, please contact either myself or Jeffrey C. Blagg at (505) 632-1199. Thank you for your cooperation and assistance.

Respectfully submitted:
Blagg Engineering, Inc.

Nelson J. Velez
Staff Geologist

Attachment: Groundwater Report (2 copies)

cc: Mr. Brandon Powell, Environmental Specialist, NMOCD District III Office, Aztec, NM
Mr. Larry Schlotterback, Environmental Coordinator, BP, Farmington, NM (without lab report)

NJV/njv GCU 145E 03-17-08 CVL.DOC

BP AMERICA PRODUCTION CO.

GROUNDWATER REMEDIATION REPORT

GALLEGOS CANYON UNIT (GCU) #145E
(D) SECTION 26, T29N, R12W, 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
Gallegos Canyon Unit (GCU) #145E
Nw/4 Nw/4, Sec. 26, T29N, R12W

Historical Information:

Pit Closure Dates:	January, 1996
Monitor Well Installation Date:	December, 2006
Reclamation Procedures:	Excavation (Jan., 1996)
Monitor Well Sampling Dates:	12/27/06

Groundwater was encountered at a depth of approximately 7 feet below surface grade during excavation of impacted soils from a blow pit in January, 1996 (documentation attached). The excavation perimeter was measured at approximately 50 X 40 X 7 feet depth. Approximately 300 cubic yards of soils were removed and landfarmed on-site. The groundwater within the excavation perimeter was pumped via water hauling trucks and disposed at an approved facility. Afterwards, the exposed groundwater was sampled and tested for benzene, toluene, ethylbenzene, and total xylenes (**BTEX**) per US EPA method 8020 on January 16, 1996. Upon receipt of the laboratory results, the New Mexico Oil Conservation Division (**NMOCD**) was notified with letter dated March 5, 1996 of the groundwater impact (attached). A subsequent sampling of the groundwater was conducted on January 23, 1996. The BTEX results of the groundwater sampling from the excavation are as follows;

Sample ID	Date	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Total Xylenes (ppb)
Pit Water	01/16/96	**162**	420	60.9	**964**
Pit Water	01/23/96	8.90	15.0	1.54	48.84
NMWQCC regulatory standards		**10**	**750**	**750**	**620**

Note: NMWQCC = New Mexico Water Quality Control Commission, ppb = parts per billion.

Soil Lithology and Groundwater Investigation:

During the pit closure activity, it was noted that the soil removed and excavation sidewalls consisted of a sandy silt and that bedrock was encountered at approximately 7 feet below grade. During the boring advancement in December, 2006, no evidence of either case was observed. Instead, soil lithology at the pit area consists of primarily sand (probably backfill material), non cohesive, and firm. Medium gray discoloration with an apparent hydrocarbon odor was detected/observed physically from the auger cuttings between 8-11 feet below grade.

One (1) groundwater monitor well was installed in December, 2006 to test groundwater quality within the source area (see Figure 1). The boring log of the monitor well along with well completion information is contained within this report. There does not appear to be any known receptors ever impacted by the previous discovery of impacted soil and/or groundwater. In addition, there does not appear to be any physical evidence to indicate that a nearby swamp area immediately down gradient from the excavation has ever been impacted by the past operational use of the pit (see Pit Closure Verification pit perimeter diagram).

Groundwater Monitor Well Sampling Procedures:

Groundwater samples were collected from the site monitor well 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 from the site monitor well was sampled and tested in December, 2006. The general water chemistry does not reveal any abnormalities. The testing also indicates all BTEX constituents were at non-detectable or at very low levels, well below New Mexico Water Quality Control Commission (**NMWQCC**) standards. The following is a summary of laboratory BTEX analytical result;

Sample ID	Date	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Total Xylenes (ppb)
Pit Water	12/27/06	ND	ND	ND	12
NMWQCC regulatory standards		**10**	**750**	**750**	**620**

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

Since only one (1) site monitor well was installed, no groundwater contour map of relative water table elevations was obtainable. However, the general groundwater flow direction in all probability is toward the north.

Summary and Recommendations:

Hydrocarbon impacted soil and groundwater at the site has been remediated via excavation of impacted soils. The site monitor well within the source area meets NMWQCC standards for groundwater. Permanent site closure is recommended. Following approval by the NMOCD, the monitor well will be abandoned pursuant to the approved BP Ground Water Management Plan.

RCO

RESULTS TO BOB NICOL 1-19-96 + 1-24-96

CLIENT: Amoco	BLAGG ENGINEERING, INC. P.O. BOX 87, BLOOMFIELD, NM 87413 (505) 632-1199	LOCATION NO: B0319 C.O.C. NO: —

FIELD REPORT: PIT CLOSURE VERIFICATION

LOCATION: GCU 195 E PIT TYPE: BLOW

QUAD/UNIT: D SEC: 26 TWP: 29 N RNG: 12 W BM: NM CNTY: SJ ST: NM

QTR/FOOTAGE: NW/NW CONTRACTOR: PAUL

DATE STARTED: 1-16-96
DATE FINISHED: 1-23-96

ENVIRONMENTAL SPECIALIST: RCO

EXCAVATION APPROX. 50 FT. x 40 FT. x 3-7 FT. DEEP. CUBIC YARDS: ~300

DISPOSAL FACILITY: ON SITE REMEDIATION METHOD: LANDFARM

LAND USE: RESID. / AGRI. LEASE: SF-079907 FORMATION: Dk

FIELD NOTES & REMARKS: PIT LOCATED APPROXIMATELY 150 FEET WEST FROM WELLHEAD.

DEPTH TO GROUNDWATER: 7' NEAREST WATER SOURCE: <1000' NEAREST SURFACE WATER: <1000'

NMOCD RANKING SCORE: 40 NMOCD TPH CLOSURE STD: 100 PPM

SOIL AND EXCAVATION DESCRIPTION: PIT DISPOSITION: ABANDONED.

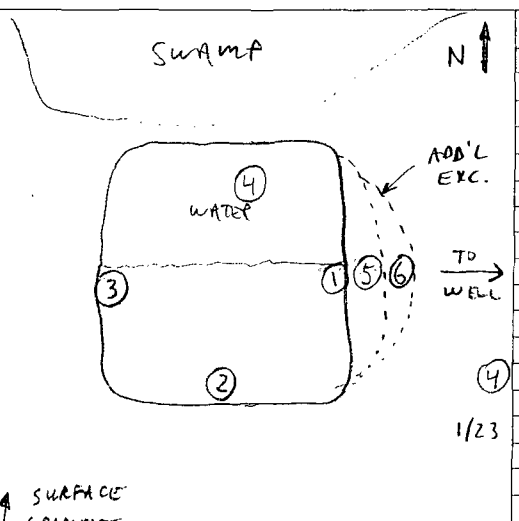
PIT EXCAVATED TO BEDROCK BOTTOM - WATER COLLECTED IN NORTH END OF PIT.
BROWN, SANDY SILT SIDEWALLS, GRAY STAINED BEDROCK BOTTOM.
RECOMMEND ADDITIONAL EXCAVATION TO EAST.
SAMPLED AGAIN AFTER ADDITIONAL EXCAVATION - OK.
WATER BAD - PUMP IT. THEN SAMPLE AGAIN - PROBABLY PERCHED WATER FROM NEARBY SWAMP.
1/23 WATER COVERED WITH ICE.

FIELD 418.1 CALCULATIONS

	SAMPLE I.D.	LAB No:	WEIGHT (g)	mL. FREON	DILUTION	READING	CALC. ppm
① 1/16	ES@5'	1653	10.0	20	1	146	292
⑥ 1/18	ES@6'	1659	10.0	20	1	7	14

SCALE 0 10 20 FT

PIT PERIMETER

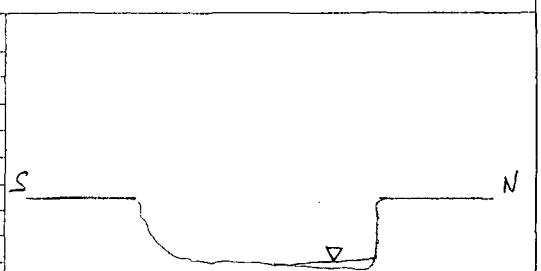


OVM RESULTS

SAMPLE ID	FIELD HEADSPACE PID (ppm)
1 ES-5'	35
2 SS-5'	5
3 WS-6'	2
4	
5 ES-6'	92
6 ES-6'	2

	LAB SAMPLES
④ PIT WATER-7'	BTEX
1/23 PIT WATER	BTEX

PIT PROFILE



TRAVEL NOTES: CALLOUT: 1-16-96 ONSITE: 1-16-96 1345

FORM REVISED 7/95

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

FIELD MODIFIED EPA METHOD 418.1
TOTAL PETROLEUM HYDROCARBONS

Client:	Amoco	Project #:	
Sample ID:	East Side @ 5'	Date Analyzed:	1-16-96
Project Location:	GCU 145E	Date Reported:	1-16-96
Laboratory Number:	TPH-1653	Sample Matrix:	Soil

Parameter	Result, mg/kg	Detection Limit, mg/kg
Total Recoverable Petroleum Hydrocarbons	**290**	**10**

ND = Not Detectable at stated detection limits.

QA/QC:	QA/QC Sample TPH mg/kg	Duplicate TPH mg/kg	% *Diff.
	13,700	12,100	12

*Administrative Acceptance limits set at 30%.

Method: Modified Method 418.1, Petroleum Hydrocarbons, Total Recoverable, Chemical Analysis of Water and Waste, USEPA Storet No.4551, 1978

Comments: Blow Pit - B0319

R. E O'Neill
Analyst

Review 1/4/96

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

FIELD MODIFIED EPA METHOD 418.1
TOTAL PETROLEUM HYDROCARBONS

Client:	Amoco	Project #:	
Sample ID:	East Side @ 6'	Date Analyzed:	1-18-96
Project Location:	GCU 145E	Date Reported:	1-18-96
Laboratory Number:	TPH-1659	Sample Matrix:	Soil

Parameter	Result, mg/kg	Detection Limit, mg/kg
Total Recoverable Petroleum Hydrocarbons	**14**	**10**

ND = Not Detectable at stated detection limits.

QA/QC:	QA/QC Sample TPH mg/kg	Duplicate TPH mg/kg	% *Diff.
	13,700	12,100	12

*Administrative Acceptance limits set at 30%.

Method: Modified Method 418.1, Petroleum Hydrocarbons, Total Recoverable, Chemical Analysis of Water and Waste, USEPA Storet No.4551, 1978

Comments: Blow Pit - B0319

R. E. O'Neill
Analyst

Review

ANALYTICA
ENVIRONMENTAL LABORATORY

PURGEABLE AROMATICS

Blagg Engineering, Inc.

Project ID:	Amoco/GCU 145E	Report Date:	01/22/96
Sample ID:	Pit Water at 7' Blow Pit	Date Sampled:	01/16/96
Lab ID:	2423	Date Received:	01/17/96
Sample Matrix:	Water	Date Analyzed:	01/18/96
Preservative:	Cool, $HgCl_2$		
Condition:	Intact		

Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	162	10.0
Toluene	420	10.0
Ethylbenzene	60.9	10.0
m,p-Xylenes	797	20.0
o-Xylene	167	10.0
Total BTEX	**1,610**	

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Trifluorotoluene	105	88 - 110%

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

Comments:

Analyst

Review

ANALYTICA
ENVIRONMENTAL LABORATORY

PURGEABLE AROMATICS

Blagg Engineering, Inc.

Project ID:	Amoco/ GCU 145E	Report Date:	01/24/96
Sample ID:	Pit Water	Date Sampled:	01/23/96
Lab ID:	2496	Date Received:	01/23/96
Sample Matrix:	Water	Date Analyzed:	01/24/96
Preservative:	Cool, $HgCl_2$		
Condition:	Intact		

Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	8.90	0.20
Toluene	15.0	0.20
Ethylbenzene	1.54	0.20
m,p-Xylenes	39.6	0.40
o-Xylene	9.24	0.20
Total BTEX	**74.3**	

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Trifluorotoluene	107	88 - 110%
Bromofluorobenzene	92	86 - 115%

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

Comments:

Analyst

Review

ANALYTICA

ENVIRONMENTAL LABORATORY

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

CHAIN OF COUSTODY

PROJECT MANAGER:

Analytica Lab I.D.:

Company: BLAGG ENGR,

Address: P.O. BOX 87

Phone: 632-1199

Fax:

Bill To: SAME

Company:

Address:

ORGANIC ANALYSES | WATER ANALYSES | METALS | COMMENTS

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: PRES:
PIT WATER @ 7'	1-16-96	1400	WATER					✓																						HgCl2 - COOL
BLOW PIT																														

Project Information	Sample Receipt
Proj. #: AMOCO	No. Containers:
Proj. Name: GCU 145 E	Custody Seals: Y / N / NA
P. O. No:	Received Intact:
Shipped Via: DEL'D	Received Cold:

Required Turnaround Time (Prior Authorization Required for Rush)

PLEASE CALL WITH RESULTS

Sampled By:	Relinquished By:	Relinquished By:
Signature: R. E. O'Neill Date: 1-16-96	Signature: R. E. O'Neill Date: 1-17-96	Signature: Date:
Company: BEI Time: —	Company: BEI Time: 0950	Company: Time:

Received By:	Received By:	Received By:
Signature: Date:	Signature: Date:	Signature: [signature] Date: 1/17
Company: Time:	Company: Time:	Company: Analytica Time: 9:55

Please Fill Out Thoroughly.

Shaded areas for lab use only.

White/Yellow: Analytica
Pink: Client

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

CHAIN OF CUSTODY

PROJECT MANAGER:
Analytica Lab I.D.:

Company: BLAGG ENGR.
Address: P.O. Box 87

Phone: 632-1199
Fax:

Bill To: SAME
Company:
Address:

Sample ID	Date	Time	Matrix	Lab ID
PIT WATER	1-23-96	0950	WATER	

ORGANIC ANALYSES														
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):
			✓									

WATER ANALYSES								
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):

METALS			
Priority Pollutants	RCRA Metals (Total)	RCRA Metals TCLP (1311)	Other (specify):

COMMENTS

PRES:
$HgCl_2$ - cool

Project Information	Sample Receipt
Proj. #: Amoco	No. Containers:
Proj. Name: 6C4 145 E	Custody Seals: Y / N / NA
P. O. No:	Received Intact:
Shipped Via: DEL'D	Received Cold:

Required Turnaround Time (Prior Authorization Required for Rush)

✓ CALL A.S.A.P.

Sampled By:	Relinquished By:	Relinquished By:
Signature: P. T. O'Neill	Signature: P. T. O'Neill	Signature:
Date: 1-23-96	Date: 1-23-96	Date:
Company: BEI	Company: BEI	Company:
Time: –	Time: 1022	Time:
Received By:	**Received By:**	**Received By:**
Signature:	Signature:	Signature: [illegible]
Date:	Date:	Date: 1/25/96
Company:	Company:	Company: Analytica
Time:	Time:	Time: 10:22

Please Fill Out Thoroughly.

Shaded areas for lab use only.

White/Yellow: Analytica
Pink: Client

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

March 5, 1996

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: GCU 145E Well site
Legal Description: Unit D, Sec. 26, T29N, R12W
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 Blow pit was conducted January 16, 1996. Listed below are summary analytical results for Benzene, Toluene, Ethylbenzene, and total Xylenes (BTEX):

Parameter	Blow Pit (parts per billion)
Benzene	**162**
Toluene	420
Ethylbenzene	60.9
Total Xylenes	**964**

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 GCU145E.LTR

CLIENT: BP

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

LOCATION NO: B0319
C.O.C. NO: HALL

FIELD REPORT: LANDFARM/COMPOST PILE CLOSURE VERIFICATION

LOCATION: NAME: GCU WELL #: 145E PITS: BLOW
QUAD/UNIT: D SEC: 26 TWP: 29N RNG: 12W PM: NM CNTY: SJ ST: NM
QTR/FOOTAGE: NW/4 NW/4 CONTRACTOR: N/A

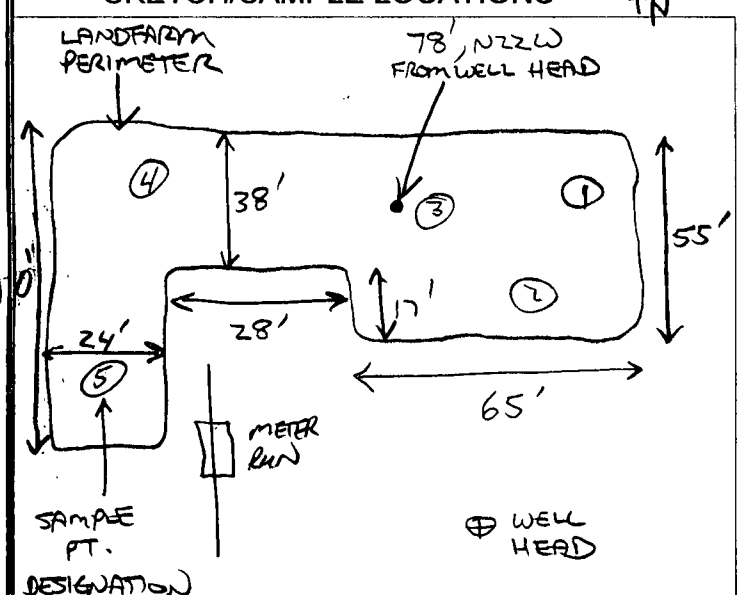
DATE STARTED: 2/27/08
DATE FINISHED:
ENVIRONMENTAL SPECIALIST: NV

SOIL REMEDIATION:
REMEDIATION SYSTEM: LANDFARM
LAND USE: RANGE / RESIDENTIAL
APPROX. CUBIC YARDAGE: ~300
LIFT DEPTH (ft): 1-1.5

FIELD NOTES & REMARKS:
DEPTH TO GROUNDWATER: <50'
NEAREST SURFACE WATER: < 200'
NEAREST WATER SOURCE: >1,000'
NMOCD RANKING SCORE: 40
NMOCD TPH CLOSURE STD: 100 PPM

SOIL TYPE: (SAND) / SILTY SAND / SILT / SILTY CLAY / CLAY / GRAVEL / OTHER SOME GRAVEL/COBBLE MIX
SOIL COLOR: DK. YELL. ORANGE
COHESION (ALL OTHERS): (NON COHESIVE) / SLIGHTLY COHESIVE / COHESIVE / HIGHLY COHESIVE
CONSISTENCY (NON COHESIVE SOILS): (LOOSE) (FIRM) / DENSE / VERY DENSE
~~PLASTICITY (CLAYS)~~: NON PLASTIC / SLIGHTLY PLASTIC / COHESIVE / MEDIUM PLASTIC / HIGHLY PLASTIC
~~DENSITY (COHESIVE CLAYS & SILTS)~~: SOFT / FIRM / STIFF / VERY STIFF / HARD
MOISTURE: DRY / (SLIGHTLY MOIST) / MOIST / WET / SATURATED / SUPER SATURATED
CLOSED
DISCOLORATION/STAINING OBSERVED: YES / (NO) EXPLANATION -
HC ODOR DETECTED: YES / (NO) EXPLANATION -
SAMPLING DEPTHS (LANDFARMS): 4-12 (INCHES)
SAMPLE TYPE: GRAB / (COMPOSITE) # OF PTS. 5
ADDITIONAL COMMENTS:

SKETCH/SAMPLE LOCATIONS



OVM CALIB. READ. = 52.7 ppm
OVM CALIB. GAS = 100 ppm RF = 0.52
TIME: 1:15 am/(pm) DATE: 2/27/08

OVM RESULTS

SAMPLE ID	FIELD HEADSPACE (ppm)
LF-1	0.0

LAB SAMPLES

SAMPLE ID	ANALYSIS	TIME	RESULTS
LF-1	TPH (8015B)	1535	NO

SCALE
0 FT

TRAVEL NOTES: CALLOUT: ONSITE:

Hall Environmental Analysis Laboratory, Inc.

Date: *07-Mar-08*

CLIENT:	Blagg Engineering	**Client Sample ID:**	LF-1 5pt. Composite
Lab Order:	0802340	**Collection Date:**	2/27/2008 3:35:00 PM
Project:	GCU #145E - Landfarm	**Date Received:**	2/29/2008
Lab ID:	0802340-01	**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 7:52:26 PM
Surr: DNOP	99.0	61.7-135		%REC	1	3/4/2008 7:52:26 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	3/4/2008 8:22:00 PM
Surr: BFB	113	84-138		%REC	1	3/4/2008 8:22:00 PM
EPA METHOD 9056A: ANIONS						Analyst: **SLB**
Chloride	17	1.5		mg/Kg	5	3/4/2008 12:13:11 AM

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

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 #:

QA/QC Package: Std ☐ Level 4 ☐

Other:

Project Name: GCU #145E-LANDFARM

Project #:

Project Manager: NV

Sampler: NV

Sample Temperature: 4

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative $HgCl_2$	Preservative HNO_3	Preservative	HEAL No. 0802340	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)
2/27/08	1535	SOIL	LF-1 5 PT. COMPOSITE	1 - 4 oz.				-1			✓										✓				

Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)
2/28/08	1635	[signature]	[signature] 2/29/08 0930
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)

Remarks: GOR & DOR ON TPH ANALYSIS ONLY.

QA/QC SUMMARY REPORT

Client: Blagg Engineering
Project: GCU #145E - Landfarm **Work Order:** 0802340

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 0802340 | Received by: TLS

Checklist completed by: Tanya Shamin (Signature) 2/29/08 (Date) | Sample ID labels checked by AS (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:

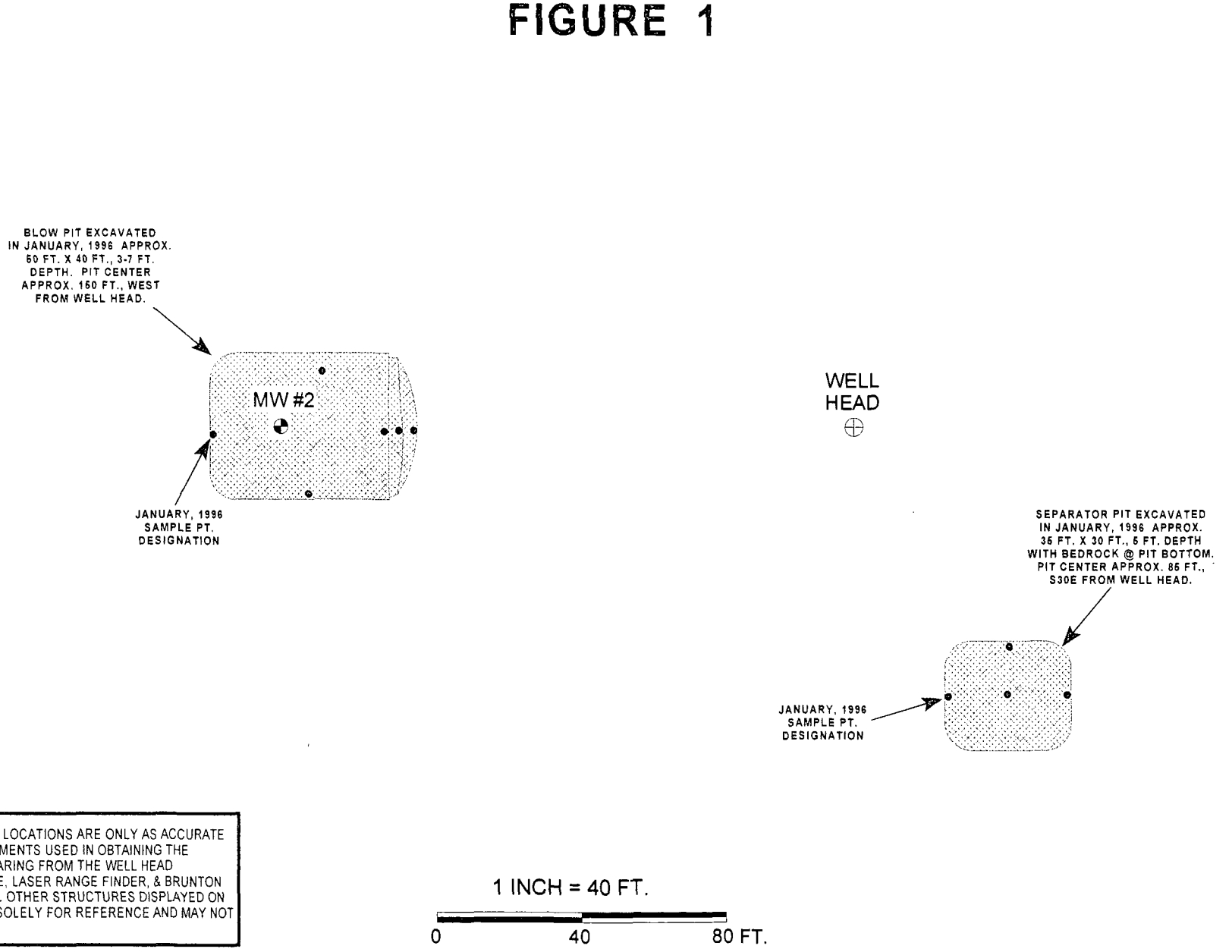
Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding _____

Comments: _____

Corrective Action _____

FIGURE 1



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.

1 INCH = 40 FT.

0 40 80 FT.

BP AMERICA PRODUCTION CO

GCU #145E

NW/4 NW/4 SEC. 26, T29N, R12W

SAN JUAN COUNTY, NEW MEXICO

BLAGG ENGINEERING, INC.

CONSULTING PETROLEUM / RECLAMATION SERVICES

P.O. BOX 87

BLOOMFIELD, NEW MEXICO 87413

PHONE: (505) 632-1199

PROJECT: MW INSTALLATION

DRAWN BY: NJV

FILENAME: GCU 145E-SM.SKF

DRAFTED: 02-05-07

SITE MAP

12/06

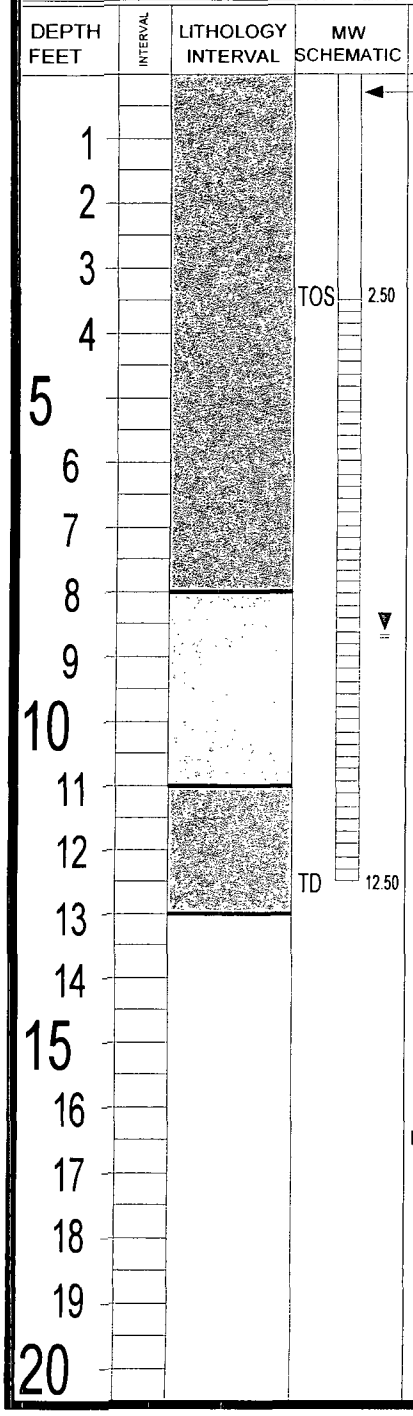
BLAGG ENGINEERING, INC.
P.O. BOX 87
BLOOMFIELD, NM 87413
(505) 632-1199

MW #2

BORE / TEST HOLE REPORT

CLIENT:	BP AMERICA PRODUCTION CO.
LOCATION NAME:	GCU #145E UNIT D, SEC. 26, T29N, R12W
CONTRACTOR:	BLAGG ENGINEERING, INC. / ENVIROTECH, INC.
EQUIPMENT USED:	MOBILE DRILL RIG (CME 75)
BORING LOCATION:	159 FT., WEST FROM WELL HEAD.

BORING #.....	BH-1
MW #.....	2
PAGE #.....	1
DATE STARTED	12/15/06
DATE FINISHED	12/15/06
OPERATOR.....	DP
PREPARED BY	NJV



FIELD CLASSIFICATION AND REMARKS

GROUND SURFACE

TOP OF CASING APPROX. 2.50 FEET ABOVE GRADE.

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

DEPTH TO WATER APPROX. 8.66 FT. FROM GROUND SURFACE MEASURED ON 12/27/06.

MEDIUM GRAY SAND, NON COHESIVE, WET, LOOSE TO FIRM, APPARENT HYDROCARBON ODOR DETECTED PHYSICALLY WITHIN CUTTINGS (8.0 - 11.0 FT. BELOW GRADE).

GRAYISH BROWN SAND, NON COHESIVE, WET TO SATURATED, FIRM TO LOOSE, SLIGHT APPARENT HYDROCARBON ODOR DETECTED PHYSICALLY WITHIN CUTTINGS (11.0 - 13.0 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 2.50 ft. above grade to 2.50 ft. below grade, 0.010 slotted screen between 2.50 to 12.50 ft. below grade, sand packed annular to 2.0 ft. below grade, bentonite grout between 0.0 to 2.0 ft. below grade. Well protector encompassing above grade casing and secured with padlock.

DRAWING: GCU 145E MW2-BH1. SKF | DATE: 12/15/06 | DWN BY: NJV

BLAGG ENGINEERING, INC.

MONITOR WELL DEVELOPMENT & / OR SAMPLING DATA

CLIENT : BP AMERICA PROD. CO.

CHAIN-OF-CUSTODY # : N / A & 14686

GCU # 145E - BLOW PIT
UNIT D, SEC. 26, T29N, R12W

LABORATORY (S) USED : HALL ENVIRONMENTAL
ENVIROTECH

Date : December 27, 2006

SAMPLER : N J V

Filename : 12-27-06.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 - 2	-	-	11.16	15.00	1040	7.08	1,100	8.6	2.00
					INSTRUMENT CALIBRATIONS =	7.00	2,800		
					DATE & TIME =	12/27/06	0900		

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 / good recovery . Murky brown in appearance with no apparent hydrocarbon odor detected physically within purged water . Collected samples for BTEX and major anions / cations analyses .

Top of casing MW # 2 ~ 2.50 ft. above grade .

Hall Environmental Analysis Laboratory, Inc.

Date: *02-Jan-07*

CLIENT:	Blagg Engineering	**Client Sample ID:**	MW #2
Lab Order:	0612286	**Collection Date:**	12/27/2006 10:40:00 AM
Project:	GCU #145E	**Date Received:**	12/28/2006
Lab ID:	0612286-01	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **LMM**
Benzene	ND	1.0		µg/L	1	12/28/2006 5:24:49 PM
Toluene	ND	1.0		µg/L	1	12/28/2006 5:24:49 PM
Ethylbenzene	ND	1.0		µg/L	1	12/28/2006 5:24:49 PM
Xylenes, Total	12	3.0		µg/L	1	12/28/2006 5:24:49 PM
Surr: 4-Bromofluorobenzene	82.5	70.2-105		%REC	1	12/28/2006 5:24:49 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		

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

CATION / ANION ANALYSIS

Client:	Blagg / BP	Project #:	94034-010
Sample ID:	MW #2	Date Reported:	12-29-06
Laboratory Number:	39600	Date Sampled:	12-27-06
Chain of Custody:	14686	Date Received:	12-27-06
Sample Matrix:	Water	Date Extracted:	N/A
Preservative:	Cool	Date Analyzed:	12-28-06
Condition:	Cool & Intact		

Parameter	Analytical Result	Units		
pH	**7.48**	s.u.		
Conductivity @ 25° C	**1,000**	umhos/cm		
Total Dissolved Solids @ 180C	**696**	mg/L		
Total Dissolved Solids (Calc)	**679**	mg/L		
SAR	**0.6**	ratio		
Total Alkalinity as CaCO3	**309**	mg/L		
Total Hardness as CaCO3	**496**	mg/L		
Bicarbonate as HCO3	**309**	mg/L	5.06	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	**<0.1**	mg/L	0.00	meq/L
Nitrite Nitrogen	**0.002**	mg/L	0.00	meq/L
Chloride	**26.8**	mg/L	0.76	meq/L
Fluoride	**1.08**	mg/L	0.06	meq/L
Phosphate	**<0.1**	mg/L	0.00	meq/L
Sulfate	**256**	mg/L	5.33	meq/L
Iron	**0.009**	mg/L	0.00	meq/L
Calcium	**144**	mg/L	7.19	meq/L
Magnesium	**33.2**	mg/L	2.73	meq/L
Potassium	**1.05**	mg/L	0.03	meq/L
Sodium	**29.0**	mg/L	1.26	meq/L
Cations			11.21	meq/L
Anions			11.20	meq/L
Cation/Anion Difference			**0.02%**	

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: **GCU #145E Grab Sample**

Analyst

Review

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

CHAIN-OF-CUSTODY RECORD

Client: BLAGG ENGR. / BP AMERICA

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

Phone #: 632-1199

Fax #:

QA / QC Package: Std ☐ Level 4 ☐

Other:

Project Name: GCU #145E

Project #: NV

Project Manager: NV

Sampler: NV

Sample Temperature: 2°

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

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative: $HgCl_2$	Preservative: HNO_3	Preservative	HEAL No. 0612286
12/27/06	1040	WATER	MW #2	2 - 40ml	✓			-1

ANALYSIS REQUEST

Sample	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)
MW #2	✓																

Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)	
12/27/06	1145	[signature]	[signature]	12-28-06 905
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)	

Remarks:

14686

CHAIN OF CUSTODY RECORD

Client / Project Name	Project Location	ANALYSIS / PARAMETERS
BLAGG / BP	ECH #145E	

Sampler:	Client No.	No. of Containers	MAJOR ANIONS/ CATIONS	Remarks
NV	94034-010			PRESERVED COOL

Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix				Remarks
								GRAB SAMPLE
MW #2	12/27/06	1040	39600	WATER	1	✓		

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
	12/27/06	12:12		12/27/06	12:12
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	X		
Cool - Ice/Blue Ice	X		

QA/QC SUMMARY REPORT

Client: Blagg Engineering
Project: GCU #145E

Work Order: 0612286

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: SW8021									
Sample ID: 5ML RB		*MBLK*			Batch ID:	**R21975**	Analysis Date:	12/28/2006 9:42:29 AM	
Benzene	ND	µg/L	1.0						
Toluene	ND	µg/L	1.0						
Ethylbenzene	ND	µg/L	1.0						
Xylenes, Total	ND	µg/L	3.0						
Sample ID: 100NG BTEX LCS		*LCS*			Batch ID:	**R21975**	Analysis Date:	12/28/2006 11:30:42 AM	
Benzene	18.08	µg/L	1.0	90.4	85.9	113			
Toluene	18.48	µg/L	1.0	92.4	86.4	113			
Ethylbenzene	18.09	µg/L	1.0	90.4	83.5	118			
Xylenes, Total	55.05	µg/L	3.0	91.8	83.4	122			
Sample ID: 100NG BTEX LCSD		*LCSD*			Batch ID:	**R21975**	Analysis Date:	12/28/2006 3:51:55 PM	
Benzene	17.77	µg/L	1.0	88.8	85.9	113	1.72	27	
Toluene	17.59	µg/L	1.0	87.9	86.4	113	4.94	19	
Ethylbenzene	17.33	µg/L	1.0	86.7	83.5	118	4.28	10	
Xylenes, Total	52.35	µg/L	3.0	87.3	83.4	122	5.02	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	Spike recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name BLAGG | Date and Time Received: 12/28/2006

Work Order Number 0612286 | Received by GLS

Checklist completed by D Schlyppe (Signature) 12-28-06 (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? **2°** *4° C ± 2 Acceptable* If given sufficient time to cool.

COMMENTS:

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding _____

Comments: _____

Corrective Action _____