3RP-177

GW Remediation Report

DATE: Feb. 2008



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.

FORM REVISED 7/95

	RES	145 10 BOB 1	41107 1-19-91	6 + 1-2	24-96
CLIENT: A MOCO		37, BLOOMF	IELD, NM		LOCATION NO: <u>80319</u> C.O.C. NO:
		(505) 632-	-1199		
FIELD	REPORT:	PIT CLOS	URE VERI	FICATIO)N
LOCATION: G(4 QUAD/UNIT: D SEC: 26 1				J	DATE STARTED: 1-16-96 DATE FINISHED: 1-23-96
QTR/FOOTAGE: NW	,			Į.	ENVIRONMENTAL PLO-
EXCAVATION APPROX DISPOSAL FACILITY: _					
LAND USE:RESID. /	AGRI.	EASE: SF-0	71907	FORMA	TION: <u>At</u>
FIELD NOTES & REMAR DEPTH TO GROUNDWATER:					
NMOCD RANKING SCORE: 40	NMOCD TPH C	LOSURE STD: 100	PPM		
SOIL AND EXCAVATION D					
PIT EXCHUTTED TO BE BROWN, SAMY SILT SIDE OF RECOMMEND ANDITIONAL SAMPLED AGAW AFTER WATER BAD-PUMPLIT.	LX CAUATION TO EX CAUATION TO ADDITIONAL O THEN SAMPLE A	TALMOO BED ROCH EMIT. EX CAUAT LON	Bonon.		
	D. LAB No: WE		ON DILUTION RE		
SCALE 1/18 ES@ 6	1653	10.0 20	1	7	72
O 10 sold		0777) (
PIT PERIM	ETER	OVM RESULTS		PIT	PROFILE
Swamt	5. ADD'L 4	ES-5'.	HEADSPACE D (ppm) 355 5 2		. I
water 3	SO TO WELL	ĒŠ- 6°	72 S		N
2			PLES Brey Brey		
4 SURPACE GASIEPT					
TRAVEL NOTES: CALLOUT:	1-16-96	ON	SITE:	16-26	1345

事

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

Sample ID:

East Side @ 5'

Laboratory Number:

Project Location:

GCU 145E

TPH-1653

Project #:

Date Analyzed: Date Reported: 1-16-96 1-16-96

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

13,700

Duplicate TPH mg/kg

% *Diff.

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

E o'nell

Mulan Vel 11/4/96

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:

Sample ID:

East Side @ 6'

Laboratory Number:

Project Location:

Amoco

GCU 145E

TPH-1659

Project #:

Date Analyzed:

1-18-96 1-18-96

Date Reported: 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

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'Nall

^{*}Administrative Acceptance limits set at 30%.



PURGEABLE AROMATICS

Blagg Engineering, Inc.

Project ID:

Amoco/GCU 145E

01/22/96

Sample ID:

Pit Water at 7' Blow Pit

Report Date:

Lab ID:

2423

Date Sampled: 01/16/96 Date Received: 01/17/96

Sample Matrix:

Water

Cool, HgCl₂

Date Analyzed: 01/18/96

Preservative:

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

PERSONAL PROPERTY.		可被教育工
Total BTE	(3.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4	valetar et i

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:

Ome Pole Review



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: Preservative:

Water Cool, HgCl₂ Date Analyzed:

01/24/96

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

THE REPORT OF THE PARTY OF THE	Special Services School Control of the Services of the Control of	San San Change Commission of March 1985 and Asset San Asset Commission and Asset San Asset Commission and Asset San
1 由於公司所屬公司 2 中心, 何可,或以此, 心思, 不一, 严禁的激烈, 相關中國國際國際	A CHANGE TO A CASE OF THE WAY A PARTY OF THE PROPERTY OF THE PROPERTY OF THE PARTY	[14] a 1 [26] a 1 [24] b 2 [24] b 2 [24] [25] b 2 [25] b
 In a Walking of the end of the 20th of th		la la limatraŭ la Prima la 128 featible Y finadible di 115 la lib. ▮
	The state of the s	■ A m → 3.2 (**) ** ** ** ** ** ** ** ** ** ** ** **
I A COLOTON HILL X COMMON SERVICE	The same and the second	6 ∠1 09.★109.5 u tribbangail law aratu 1907
	To the Charles and the Control of th	* □ • ○ **************** 1 44 1 4.44 12 14 14 14 14 14 14 14 14 14 14 14 14 14
	Carlotte and the control of the cont	siのから136 イビス 間があるけい 4をもと いっかった しきした】
The control of the broken was also because the control of the cont	BECAN BE A LONGERY WILL A CREATED AND	1. 251 1. 1070 1. 114 1. 114 Responsable 2011 1. 114 180 190 1. 124 1. 125
1 UP TO TENERAL ROOM PART AND TO DEVOTE SELECTION OF A TENERAL PLANSAGE.	Francisco de la composición dela composición de la composición de la composición de la composición de la composición dela composición dela composición dela composición de la composición de la composición de la composición dela composición del composición dela composició	silver a business of many transfer of the silver specification of

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate

Percent Recovery

Acceptance Limits

Trifluorotoluene

107

88 - 110%

Bromofluorobenzene

92

86 - 115%

1 Daniel ht

Reference:

Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209,

Oct. 1984.

Comments:

Review

Please Fill Out Thoroughly. White/Yellow: Analytica Pink: Client Page to of COMMENTS Shaded areas for lab use only. (1) A Ofher (specify): METALS RCRA Metals TCLP (1311) HCRA Metals (Total) Priority Pollutants Relinquished By: Received By: Other (specify): WATER ANALYSES Oil and Grease Nutrients: NH4+ / NO2- / NO3- / TKN SS / SSI / SQI :spiloS CHAIN OF CUSTODY 1-1796 0820 BOD / Fecal / Total Coliform ine: Specific Anions (specify): Specific Cations (specify): Cation / Anion 1/2 p/2/ Relinquished By: Other (specify): Received By: 800 TCLP Extraction Signature Company: Company: Polynuclear Aromatic Hydrocarbons (8100) ORGANIC ANALYSES Base / Neutral / Acid GC/MS (625 / 8270) Volatiles GC/MS (624 / 8240 / 8260) 1-15-96 Time: Time: Date: Herbicides (615 / 8150) Chlorinated Pesticides / PCBs (608 / 8080) (1.502 \ 1.502) selitslov AWQ2 Birdo 3 Chlorinated Hydrocarbons (8010) Aromatic HCs BTEX/MTBE (602 / 8020) Required Turnaround Time (Prior Authorization Required for Rush) Received By: Sampled By: Gasoline (GRO) RAH Company: Company: Gasoline / Diesel (mod. 8015) Signature ς_Σ Petroleum Hydrocarbons (418.1) Lab ID Custody Seals: Y / N / NA 26546T Sample Receipt 807 S. CARLTON • FARMINGTON, NM 87401 • (505) 326-2395 A. C. C. 632-1199 Matrix CARROLL STATES No. Containers: Received Intact ج 0 م SAME Received Cold: 86466 رب ص Time 古言 1-16-96 PROJECT MANAGER: Date 550 DE1.0 145 Project Information Analytica Lab I.D.: Awro co Proj. Name: $\zeta \zeta \zeta \zeta$ PLENTE. (a) supported 1-12 Sample ID Shipped Via: Company: Company: Address: Address: Blow Phone: Bill To: Proj. #: P. O. No: Fax:

The state of the s

Charles Control	Page of	MMEN	*				PRES!	Hod. Coc	,									Please Fill Out Thoroughly.		Shaded areas	for lab use only.	White/Yellow: Analytica Pink: Client	
		METALS			(ttɛt) q_	/ Metals TCL (specify):											Date:		Time:			, Date: 	€€:-?
ara .		Z				toT) alsteM /]				i.		ズ/、	`
						y Pollutants	Priori]	}					17.13	
		ES				d Grease (specify):										Relinquished By:					Received By:		MA
				II / =£ON	/ -ZON /	+ 4HV :stne		#					-			l iii	Signature	:	Company:		ğ	hatura (2)	nga 🌂
a		WATER ANALYSES				SST / SQT :		-							-	LE.	Sig		ខ		æ		3/1/2
	≿	HH				StoT \ Fecal \ Tota		╢──				ļ	<u> </u>		 	ł		9		\sim		l	1
480	CUSTODY					e) snoinA oif		-								1	Date:	.23.86	Time:	02		Date:	Tine:
m	SI	≥ -				ic Cations (-					 			1		.,		5)			
	ರ	1				noinA \ r		╢					 			1							
	N OF					(sbecify):			-							Relinquished By:	10.	F. P. ONO. A			By:		
41	CHAIN					Extraction	PLOT									ini		Ö		H	ved	.	i.
670	5		(0018)	ocstpous	atic Hydr	uclear Arom	Polyn									i ii	Signature	<i>د</i>	Company:	BET	Received By:	Signature	Сотрапу:
		ORGANIC ANALYSES	(072	S (625 / 8	cid GC/M	A \ Neutral \ A	Base		,				1			٣	Sig		8		ď	Sig	<u>වී</u>
en.			Volatiles GC/MS (624 / 8240 / 8260)]		-23.46							
en en		AN			8120)	(615 / 3 tə) səbio	Herbi]	Date:	23.	Time:	j		Date:	Time:
		<u> </u>	(0808	\ 808) e8:	Od \ sebic	inated Pestin	СЫОГ											_		,			
		JAN L		(1.8	105.1 / 503	3) selitslov <i>f</i>	MOS	<u> </u>]					}		
		<u> </u>				inated Hydro]	5	Æ			,	1	
III			50)	08 / 209)		TB SOH oits		1					Ĺ.			ڿۣٳ	ν	ಕ್ಷ			<u>ښ</u>		
		_				(ORD) eni		\					<u> </u>			l a		$\mathcal{O}_{\mathbb{R}}$		W	g e		i
1.00		<u> </u> _				lesei V eni		<u> </u>		, .	¥					Sampled By:	Signature	A SOLOSA	Company:	BEI	Çej	Signature	Сотралу:
200	,	Ш		(1.811	sarbons (4	enm Hydroc	Petrol									Sa	Sig.	9∡ 	ខ		8	Sign	So
majer maje		AVIRONIARIANAL LASORATORY SATE A CARL TASORATORY AND SATE A CARL TASORATORY AND SATE AS A SATE A	o) occ-coso	P.O. BOX RJ	632-1199	SAME	Matrix Lab ID	water								Sample Receipt	iners:	Custody Seals: Y / N / NA	Intact:	Cold;	Required Turnardund Time (Prior Authorization Required for Rush) Received By:	Ò	C _{Po}
		909)	(nc)	8 LÍNGO	63	\$		-								Sa	ontai	φ S	pey.) ped	zatic	- N	
	_ =	M 07404	0.00	800			Time	0820									No. Containers:	Custo	Received Intact:	Received Cold.	. Authori	A.S. A.P	
	ICA		ž Š				Date	1-23.16	Y									E			(Prio	~	
	TE	LABORATOR	PROJECT MANAGER: Analytica Lab I.D.:				ă	#——					57	7.	ý	Project Information	SA MOGO	145		JE1.0	ınd Time	W/CALL	
an .	*		MA ab					WATER					19	A.	177	ig i	× ×	٥(٧	11	1 1	narou		
	4	- INIT	Sa L	iny: s:		.; ::	Sample ID	3						ı		oject	()	ne:		Via:	1 Turi	, ,	
	4NA	ENV	PROJECT MANAG Analytica Lab I.D.:	Company: Address:	Phone: Fax:	Bill To: Company:	San	₽17								Ŗ	Proj. #:	Proj. Name:	P. O. No:	Shipped Via:	Requirec		
		1 0	5 LL ⋖	∪ ∢	டிய	⊕ () <	\	u									-		_	<u> </u>			

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

Denny Foust, Deputy Oil & Gas Inspector, NMOCD, Aztec, NM

Buddy Shaw, Environmental Coordinator, Amoco Production Company, Farmington, NM

NV/nv

cc:

GCU145E.LTR

		<u> </u>	
CLIENT: BP	BLAGG ENG P.O. BOX 87, BLC (505)	LOCATION NO: <u>80319</u> C.O.C. NO: <u>HALL</u>	
FIELD REPORT: LA	NDFARM/COMPOST F	PILE CLOSURE VERIFICA	TION
LOCATION: NAME: GCU QUAD/UNIT: D SEC: 26 QTR/FOOTAGE:		PMIN CNTY: SJ STUM	DATE STARTED: 2(2)/08 DATE FINISHED: ENVIRONMENTAL SPECIALIST: NV
	M: LANDFARM WEE/RESURNIAL	APPROX. CUBIC YAR LIFT DEPTH (ft):	DAGE: ~300 /-1.5
FIELD NOTES & REMARK	<u></u>	CORE: 40 NMOCD TPH CLOS	
CONSISTENCY (NON COHESIVE	COHESIVE SLIGHTLY COHES SOILS LOOSE FIRM DENS STIC / SLIGHTLY PLASTIC / COINTERS): SOFT / FIRM / STIFF / VIOLET / SATURATION SERVED: YES (NO EXPLANATION - UNCHES) DISTE # OF PTS. 5	HESIVE / MEDIUM PLASTIC / HIGHLY ERY STIFF / HARD ED / SUPER SATURATED	
28' 28' merer eun	OCATIONS IN 78, NZZW FROMWELL HEAD 55'	OVM CALIB. READ. = 52.7 OVM CALIB. GAS = 100 TIME: 115 am(pm) DAT OVM RESULTS SAMPLE FIELD HEADSPACE (ppm) LF - 1 9.0 LF - 1	ppm ppm RF = 0.52 RE: Z/Z 7/08 LAB SAMPLES ANALYSIS TIME RESULTS (80/58) /535
SAMPE PT. DESIGNATION	HEUD MELL	SCALE 0 FT	
TRAVEL NOTES: CALLOUT: revised: 07/16/01		ONSITE:	bei1006A.skd

bei1006A.skd

Hall Environmental Analysis Laboratory, Inc.

Date: 07-Mar-08

CLIENT:

Blagg Engineering

Lab Order:

0802340

Project:

GCU #145E - Landfarm

Lab ID:

0802340-01

Client Sample ID: LF-1 5pt. Composite

Collection Date: 2/27/2008 3:35:00 PM

Date Received: 2/29/2008

Matrix: SO	IL
------------	----

Analyses	Result	PQL Q	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 RAN	NGE .				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

- Value exceeds Maximum Contaminant Level
- Value above quantitation range Е
- Analyte detected below quantitation limits J
- ND Not Detected at the Reporting Limit
 - Spike recovery outside accepted recovery limits
- В Analyte detected in the associated Method Blank
- Н Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- RL Reporting Limit

(M no Y) epeqabaeh no aeldduB niA TAL AMMYSTS Albuquerque, New Mexico 87109 Tel. 505.345.3975 Fax 505.345.4107 HALL ENVIRONMENTAL **ANALYSIS LABORATORY** -1 ķ CHLORIDE (AOV-ima2) OSS8 www.hallenvironmental.com 4901 Hawkins NE, Suite D *ş*, ANALYSIS REQUEST (AOV) 808S8 8081 Pesticides / PCB's (8082) , Anions (F, Cl, MO₃, MO₂, PO₄, SO₄) GOR + DOR RCRA 8 Metals (HA9 10 AN9) O1:8 : 7 EDC (Method 8021) · ÷ EDB (Method 504.1) TPH (Method 418.1) e^{m.} TPH Method 8015B (Gas/Diesel) Remarks: 8TEX + MTBE + TPH (Gasoline Only) BTEX + MTBE + TMB's (8021) #14K1-ANDERE STATE OF THE PARTY. Std Office Level 4 On the state of the state 18 3 d 17 3 d 24. Orassyo · 有 好 的 解 () () Repeived By: (Signature 2/09 (OK 30) HEAL No. 7 通常さる ; ; OA / QC Package: Preservative 10 17 13 30 E State, it 4 , K. f And E Received By: (Signature) HgCl, HNO. 17.5 · 11. 1 が発 1 H 5 5000 Sample Temperature: Project Manager Number/Volume 20 Project Name: Other: Project # Sampler: 1 S. DT. COMPOSITE AMERICA Chain-of-Custody Record Sample I.D. No. 87413 Relinquished By: (Signature) "一个" { 00.80×87 9 632-1199 77 河南三百四 Client. RAGE ENCK. * Matrix . total describit de Maria de Maria de Caracter de Carac 201 ñ 1535 * * 5 " X" . * * īme Phone #: Address: 80/4 7/2 20/82/2 . . Date Fax #: Date:

Sec.

1

Date: 07-Mar-08

QA/QC SUMMARY REPORT

Client:

Blagg Engineering

Project:

GCU #145E - Landfarm

Work Order:

0802340

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD RPE	DLimit Qual
Method: EPA Method 9056A: A	nions							
Sample ID: MB-15268		MBLK			Batch II	D: 15268	Analysis Date:	3/3/2008 5:50:12 PM
Chloride	ND	mg/Kg	0.30					
Sample ID: LCS-15268		LCS			Batch II	D: 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: D	iesel Range	Organics						
Sample ID: MB-15274	_	MBLK			Batch II	D: 15274	Analysis Date:	3/4/2008 8:16:23 AM
Diesel Range Organics (DRO)	ND	mg/Kg	10					
Sample ID: LCS-15274		LCS			Batch II	D: 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 II	D: 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: G	asoline Rar	nge						
Sample ID: MB-15269		MBLK			Batch II	D: 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 II	D: 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:

S Spike recovery outside accepted recovery limits

E Value above quantitation range

J Analyte detected below quantitation limits

R RPD outside accepted recovery limits

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name BLAGG		Date Received:	2/29/2008
Nork Order Number 0802340		Received by: TLS	
Checklist completed by: 100 Shomic		Sample ID labels checked	by Initials
Matrix Car	rier name <u>UPS</u>		
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 🗆	
, .	A vials submitted	Yes No 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	
COMMENTS:		If given sufficient time to cool.	
Client contacted Date con	tacted:	Person contacted	
Contacted by: Regardin	9		•
Comments:			
		· · · · · · · · · · · · · · · · · · ·	
Corrective Action			
	,		

F GCR



likeri e

4

ATO TO

10 St.

1.50

.

1

6

10 mg

Sales Sales

100

MW #2 $\widetilde{\bullet}$ JANUARY, 1996 SAMPLE PT. DESIGNATION BLOW PIT EXCAVATED IN JANUARY, 1936 APPROX. 60 FT. X 40 FT. 3-7 FT. DEPTH. PIT CENTER APPROX. 160 FT. WEST FROM WELL HEAD.

WELL HEAD

SEPARATOR PIT EXCAVATED IN JANUARY, 1988 A PROX.
36 FT. X 30 FT., 6 FT. DEPTH WITH BEDROCK @ PIT BOTTOM.
PIT CENTER APPROX. 86 FT., S30E FROM WELL HEAD. JANUARY, 1996 SAMPLE PT. DESIGNATION

> 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. MONITOR WELL LOCATIONS ARE ONLY AS ACCURATE

1 INCH = 40 FT. 64

80 FT.

BLAGG ENGINEERING, INC.

CONSULTING PETROLEUM / RECLAMATION SERVICES P.O. BOX 87

BLOOMFIELD, NEW MEXICO 87413 PHONE: (505) 632-1199

Sean athean gottinase niam maxigo.

NW. C. NW. A SIES, 26, 725N, R. ZW

BIP AIMERICA PRODUCTION GO

FILENAME: GCU 145E-SM.SKF DRAFTED: 02-05-07 DRAWN BY: NJV

PROJECT: MW INSTALLATION

SITE MAP

12/06

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

MW #2

BORE / TEST HOLE REPORT

CLIENT: LOCATION NAME: CONTRACTOR: EQUIPMENT USED:

BORING LOCATION:

BP AMERICA PRODUCTION CO

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

BLAGG ENGINEERING, INC. / ENVIROTECH, INC

MOBILE DRILL RIG (CME 75)

159 FT., WEST FROM WELL HEAD.

 BORING #.....
 BH-1

 MW #.....
 2

 PAGE #.....
 1

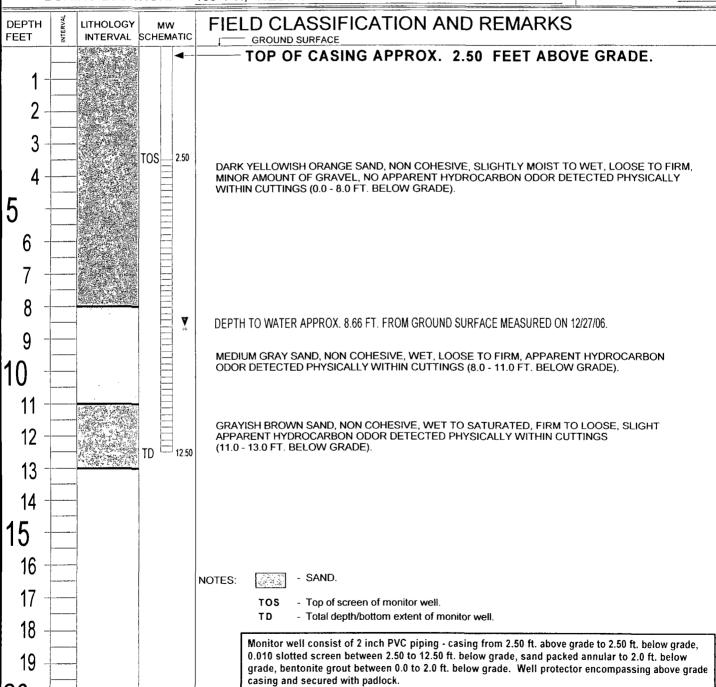
 DATE STARTED
 12/15/06

 DATE FINISHED
 12/15/06

 OPERATOR......
 DP

 PREPARED BY
 NJV

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



MONITOR WELL DEVELOPMENT & / OR SAMPLING DATA

CLIENT: BP AMERICA PROD. CO. CHAIN-OF-CUSTODY #: N/A & 14686 GCU #145E - BLOW PIT LABORATORY (S) USED: HALL ENVIRONMENTAL UNIT D, SEC. 26, T29N, R12W **ENVIROTECH** NJVDate: December 27, 2006 SAMPLER: NJVFilename: 12-27-06.WK4 PROJECT MANAGER: **WELL** WATER DEPTH TO TOTAL SAMPLING CONDUCT TEMP. **VOLUME** WELL рН **DEPTH** TIME **PURGED** # ELEV. ELEV. WATER (umhos) (celcius) (ft) (ft) (ft) (ft) (gal.) MW - 2 11.16 15.00 1040 7.08 1,100 8.6 2.00 2,800 7.00 INSTRUMENT CALIBRATIONS = 12/27/06 0900 DATE & TIME = 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

Lab Order:

0612286

Project:

GCU #145E

Lab ID:

0612286-01

Client Sample ID: MW #2

ment Sample 1D. MW #2

Collection Date: 12/27/2006 10:40:00 AM

Date Received: 12/28/2006

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

Qu	al	li	fi	er	·s	

Value exceeds Maximum Contaminant Level

E Value above quantitation range

J Analyte detected below quantitation limits

ND Not Detected at the Reporting Limit

S Spike recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank

H Holding times for preparation or analysis exceeded

MCL Maximum Contaminant Level

RL Reporting Limit

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROY

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		

Darameter	Analytical Result	Units		
Parameter 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 Muselen

Review C. Oples

HALL ENVIRONMENTAL ANALYSIS LABORATORY 4901 Hawkins NE, Suite D Albuquerque, New Mexico 87109 Tel. 505.345.3975 Fax 505.345.4107 www.hallenvironmental.com	### PARALYS Col. Co		
	BTEX + MTBE + TPH (Gasoline Only)		Remarks:
QA/QC Package: Std □ Level 4 □ Other: Project Name: GCL # 14SE	Project #: Project Manager: NUV Sample Temperature: Sample Temperature: Number/Volume HeAL No.		Received By/(Signature) 12-28-06.2 Ren
CHAIN-OF-CUSTODY RECORD Client: Ling Co. L. S. C. L. S. L.	Address: 1.0. 80x 87. 8.±D. Nm. 87413 Phone #: 63 2 -1199 Date Time Matrix Sample I.D. No.	12/2/26 1040 WORER MW # 2	Date: Time: Relinquished By; (Signature) The Relinquished By: (Signature) Date: Relinquished By: (Signature)

当時

1

13

作がない

1

好

The second

のない

の

海山

學學

1

14686

1

72 6

200

100

ж. Ц

が東北

CHAIN OF CUSTODY RECORD

CLACE BP	GCH #	# 1456		ANALYS	ANALYSIS / PARAMETERS			
Sampler: $\mathcal{N}\mathcal{V}$ Clie	Client No. 94634-510		of ainers	mason		Remarks	rks	ã
Sample No./ Sample Sample Identification Date Time	Lab Number	Sample Matrix		Spallitis	8	GRAB SAMPLE	July	7 (4)
0401 80/27/21 C# MW	39600	WATER		>				
					,			
Relinquishød-by: Æigpature)	_	Date. Time Re	Received bv: (Signature)	nature)		Date		Time
- (Mon (1)	721	21/2/ 20/12/		P. Colum		1771	1,	21.
Relinquished by: (Signature) 🖊		<u>-</u>	Received by: (Signature)	inature) (
Relinquished by: (Signature)		8	Received by: (Signature)	nature)				
		DVIROTECH INC	HOH H	ည		Sample Receipt	ipt .	
							z >	N/A
		5796 U.S. Highway 64 Farmington, New Mexico 87401	lighway 64 v Mexico 87	401	Received Intact		X	
		(505) 632-0615	2-0615		Cool - Ice/Blue Ice			

QA/QC SUMMARY REPORT

Client:

Blagg Engineering

Project:

GCU #145E

Work Order:

0612286

						_		
rte	Result	Units	PQL	%Rec	LowLimit Hig	jhLimit	%RPD F	RPDLimit Qual
d: SW8021								
e ID: 5ML RB		MBLK			Batch ID:	R21975	Analysis Date	: 12/28/2006 9:42:29 AN
ne ·	ND	μg/L	1.0					
е	ND	μg/L	1.0					
enzene	ND	µg/L	1.0					
s, Total	ND	μg/L	3.0					
e ID: 100NG BTEX LCS		LCS			Batch ID:	R21975	Analysis Date	: 12/28/2006 11:30:42 AN
ne	18.08	μg/L	1.0	90.4	85.9 1	13		
е	18.48	μg/L	1.0	92.4	86.4 1	13		
enzene	18.09	μg/L	1.0	90.4	83.5 1	18		
s, Total	55.05	μg/L	3.0	91.8	83.4 1	22		
e ID: 100NG BTEX LCSD		LCSD			Batch ID:	R21975	Analysis Date	: 12/28/2006 3:51:55 PM
ne	17.77	µg/L	1.0	88.8	85.9 1	13	1.72	27
e	17.59	μg/L	1.0	87.9	86.4 1	13	4.94	19
enzene	17.33	μg/L	1.0	86.7	83.5 1	18	4.28	10
s, Total	52.35	μg/L	3.0	87.3	83.4 1	20	F 00	13
	d: SW8021 e ID: 5ML RB ne e e enzene s, Total e ID: 100NG BTEX LCS ne e enzene s, Total e ID: 100NG BTEX LCS ne e enzene	d: SW8021 e ID: 5ML RB ne ND e ND e ND enzene ND s, Total ND e ID: 100NG BTEX LCS ne 18.08 e 18.48 enzene 18.09 s, Total 55.05 e ID: 100NG BTEX LCSD ne 17.77 e 17.59 enzene 17.33	d: SW8021 e ID: 5ML RB ND pg/L 1.0 e ND pg/L 1.0 e ND pg/L 1.0 e nzene ND pg/L 1.0 s, Total E ID: 100NG BTEX LCS 18.08 pg/L 1.0 90.4 85.9 18.08 pg/L 1.0 90.4 85.9 1 e IB: 10: 100NG BTEX LCS LCS Batch ID: 18.08 pg/L 1.0 90.4 85.9 1 e IB: 10: 100NG BTEX LCS LCS Batch ID: 10: 10: 10: 10: 10: 10: 10: 10: 10: 10:	d: SW8021 e ID: 5ML RB ND pg/L 1.0 e ND pg/L 1.0 Batch ID: R21975 Batch ID: R21975 Batch ID: R21975 Batch ID: R21975 De 18.08 pg/L 18.08 pg/L 18.09 pg/L 1.0 90.4 85.9 113 e 18.48 pg/L 1.0 90.4 86.4 113 enzene 18.09 pg/L 1.0 90.4 83.5 118 Batch ID: R21975 Batch ID: R21975 De 10: 100NG BTEX LCSD Batch ID: R21975 De 17.77 pg/L 1.0 88.8 85.9 113 Batch ID: R21975 De 17.77 pg/L 1.0 88.8 85.9 113 Batch ID: R21975 De 17.77 pg/L 1.0 88.8 85.9 113 Batch ID: R21975 De 17.77 pg/L 1.0 88.8 85.9 113 Batch ID: R21975 De 17.77 pg/L 1.0 88.8 85.9 113 Batch ID: R21975 De 17.77 pg/L 1.0 88.8 85.9 113 Batch ID: R21975 De 17.77 pg/L 1.0 88.8 85.9 113	d: SW8021 e ID: 5ML RB MBLK Batch ID: R21975 Analysis Date ND pg/L 1.0 enzene ND pg/L 1.0 s, Total e ID: 100NG BTEX LCS Batch ID: R21975 Analysis Date 18.08 pg/L 1.0 90.4 85.9 113 enzene 18.09 pg/L 1.0 90.4 83.5 118 enzene 18.09 pg/L 3.0 Proceding the service of the servic			

\sim	1.0	iers:
	2111	erc.
Vu.	***	

- E Value above quantitation range
- J Analyte detected below quantitation limits
- RPD outside accepted recovery limits

- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- S Snike recovery outside accepted recovery limits 2/3

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name BLAGG				Date and Time	Received:	12/28/200
Work Order Number 0612286	•			Received by	GLS	·
Checklist completed by Signature	lype		12-0 Date	28-06		
Matrix	Carrier name	Grey	<u>hound</u>			
Shipping container/cooler in good condition?		Yes	✓	No 🗆	Not Present	
Custody seals intact on shipping container/co	ooler?	Yes	\checkmark	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 a	nd received?	Yes	✓	No 🗌		
Chain of custody agrees with sample labels?		Yes	✓	No 🗌		
Samples in proper container/bottle?		Yes	~	No 🗌		
Sample containers intact?		Yes	V	No 🗆		
Sufficient sample volume for indicated test?		Yes	\checkmark	No 🗆		
All samples received within holding time?		Yes	\checkmark	No 🗆		
Water - VOA vials have zero headspace?	No VOA vials sub	mitted		Yes 🗹	No 🗆	
Water - pH acceptable upon receipt?		Yes		No 🗆	N/A 🗹	
Container/Temp Blank temperature?		;	2°	4° C ± 2 Accepta		
COMMENTS:						
					٠	
					====	
Client contacted	Date contacted:			Pers	son contacted	
Contacted by:	Regarding					
Comments:					***************************************	
				· · · · · · · · · · · · · · · · · · ·		
				· 		
Corrective Action						