3R - 74

REPORTS

DATE:

1999

RECEIVED
MAR 31 2000
Oil Conservation Division

BURLINGTON RESOURCES

SAN JUAN DIVISION

March 29, 2000

Certified: P 895 114 539

Bill Olson
New Mexico Oil Conservation Division
2040 S. Pacheco
Santa Fe, NM 87505

RE: 1999 Annual Groundwater Investigation and Remediation Reports
San Juan Basin, New Mexico

Dear Mr. Olson:

As required in Burlington Resources' approved Groundwater Investigation and Remediation Plan dated August, 1998, enclosed are the 1999 annual reports for Burlington's groundwater impact sites in the San Juan Basin. Separate reports are enclosed for the following locations:

Cozzens B#1
Fogelson #4-1
Hampton #4M
Johnson Federal #4 Metering Station
Standard Oil Com. #1
Taylor Com. #2A

If you have questions or additional information is needed, please contact me at (505) 326-9841.

Sincerely,

Ed Hasely
Sr. Staff Environmental Representative

Attachments - Groundwater Investigation and Remediation Reports

cc: Denny Foust - NMOCD Aztec
Bruce Gantner - BR
PNM - Maureen Gannon (Cozzens B#1, Hampton #4M)
EPFS - Scott Pope (Fogelson #4-1, Johnson Fed. #4, Standard Oil Com.#1)
Facility Files
Correspondence

3535 East 30th St., 87402-8801, P.O. Box 4289, Farmington, New Mexico 87499-4289, Telephone 505-326-9700, Fax 505-326-9833

BURLINGTON RESOURCES 1999 ANNUAL GROUNDWATER REPORT

Standard Oil Com. #1

SITE DETAILS

Location: Unit Letter N, Section 36, Township 29N, Range 9 W; San Juan County, New Mexico
Land Type: State

PREVIOUS ACTIVITIES

El Paso Field Services excavated approximately 60 cubic yards from their pit at this location in 1994 and installed a monitoring well in 1995.

Burlington Resources conducted the initial site assessment of our pit in August, 1998. Excavation of approximately 1140 cubic yards of impacted soil to a depth of 31 feet occurred in December, 1998.

1999 ACTIVITIES

Clean overburden was used to partially backfill the excavation. The landfarm associated with the pit closure work tested below cleanup standards and was used to completely backfill the excavation. Vertical extent drilling encountered groundwater at approximately 26 feet and a groundwater monitoring well was installed on August 11, 1999. After developing the well and allowing it to stabilize for one week, the well was purged and sampled on August 18, 1999.

Quarterly groundwater monitoring continued through 1999. Groundwater analytical data are presented in Table 1. A site map is presented as Figure 1.

CONCLUSIONS

Analytical results of groundwater sampling from the monitoring well in the 4th quarter of 1999 show levels of benzene and total xylenes above New Mexico Groundwater Standards.

RECOMMENDATIONS

- Burlington Resources proposes to continue quarterly sampling at this site.
- Burlington Resources will initiate discussions with El Paso Field Service to assure proper assessment and closure of this site.

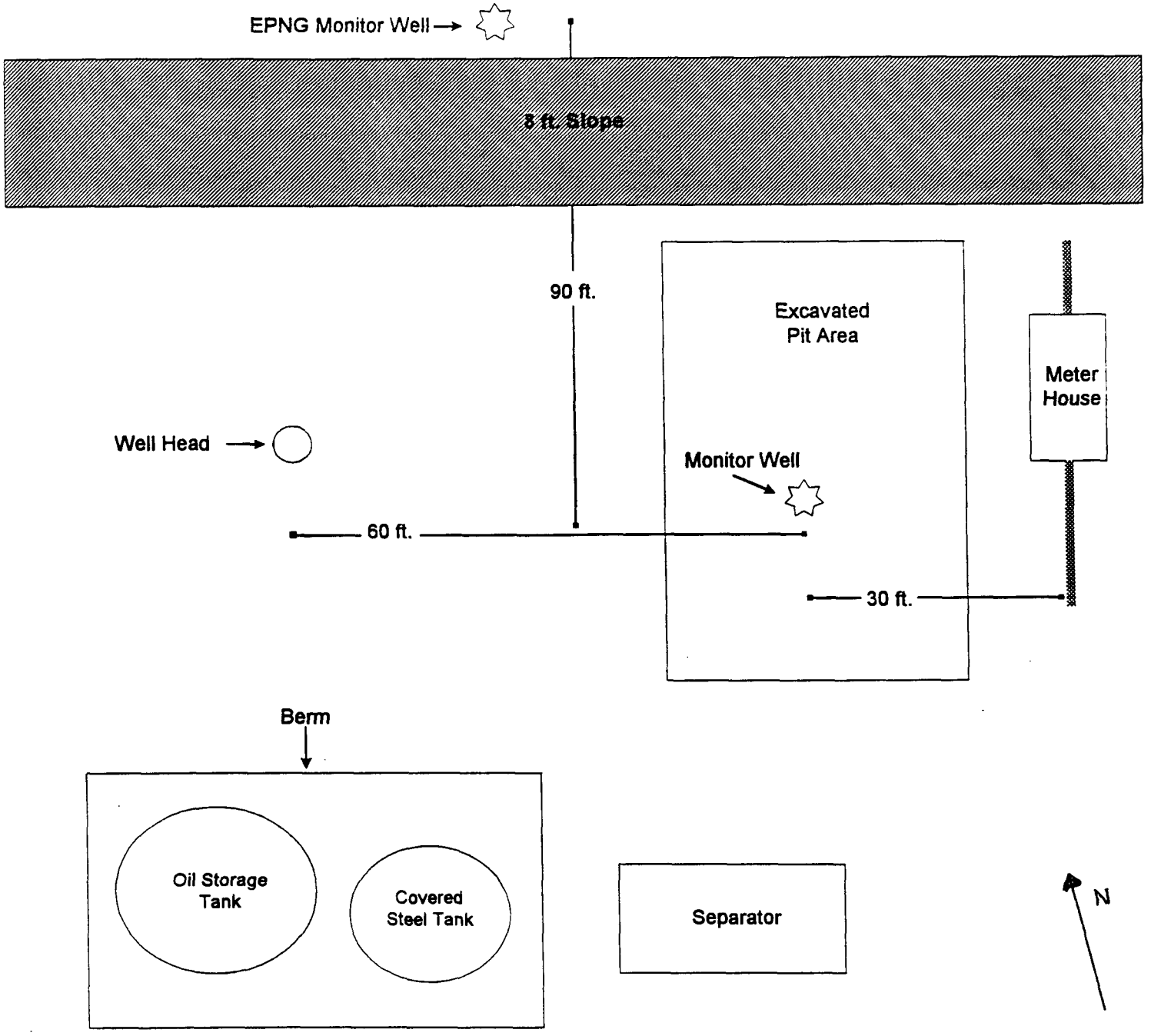
Attachments: Figure 1 - Site Map
Table 1 - Groundwater Sampling Results Summary
1999 Groundwater Analytical
Letter to Olson dated September 10, 1999 including the Drilling Log/Wellbore Diagram

Figure 1

BURLINGTON RESOURCES

STANDARD OIL COM NO. 1

MONITOR WELL INSTALLATION



Not to scale - distances are approximate

stdoil1.vsd 9/10/99

Table 1

Groundwater Monitoring Well Sampling

Well Name	MW #	Sample Date	B (ppb)	T (ppb)	E (ppb)	X (ppb)	BTEX (ppb)	DTW (ft)
Standard			*10*	*750*	*750*	*620*		
Standard Oil Com #1 (EPNG)	1	8/18/99	**1500**	135	106	586	2327	
		12/1/99	**78**	170	100	**1300**	1648	28.14
		1/19/00	**180**	**1100**	610	**5200**	7090	28.14

1999 GROUNDWATER ANALYTICAL RESULTS

ENVIROTECH INC.
FARMINGTON, NM 5796 HIGHWAY 64
MONITOR WELL DATA

Date: 8-18-99 Project No: 219201

Project Name: Temporary Monitor Well Chain of Custody No: 7285

Location: Standard Oil Com #1 - Largo Canyon

Project Manager: JAC Sampler: JAZ

MONITOR WELL DATA

WELL #	TIME	OVM ppm	pH	COND. µS	TEMP. °F	DEPTH TO WATER FT.	TOTAL DEPTH FT.	WATER COLUMN FT.	BAILED Water Gal.	PRODUCT Ft.	WATER LEVEL FT.
TMW1	9:30am	0	7.2	3.16	71°	28'	39.0	11.0	5.0	0	

Notes: TOC = Top of Casing
Bailed = 3 well volumnes:
1.25" well = 0.19 gal/ft.
2.00" well = 0.49 gal/ft.
4.00" well = 1.96 gal/ft.
Note well diameter if not one of the above.

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8021
AROMATIC VOLATILE ORGANICS

Client:	Burlington	Project #:	219701
Sample ID:	WS - 1	Date Reported:	08-19-99
Chain of Custody:	7285	Date Sampled:	08-18-99
Laboratory Number:	F932	Date Received:	08-18-99
Sample Matrix:	Water	Date Analyzed:	08-19-99
Preservative:	HgCl2 & Cool	Analysis Requested:	BTEX
Condition:	Cool & Intact		

Parameter	Concentration (ug/L)	Dilution Factor	Det. Limit (ug/L)
Benzene	**1,500**	**10**	**1.8**
Toluene	**135**	**10**	**1.7**
Ethylbenzene	**106**	**10**	**1.5**
p,m-Xylene	**409**	**10**	**2.2**
o-Xylene	**177**	**10**	**1.0**
Total BTEX	**2,330**		

ND - Parameter not detected at the stated detection limit.

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

References: Method 5030B, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.

Method 8021B, Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, SW-846, USEPA December 1996.

Comments: **Standard Oil Com #1.**

Analyst

Review

5796 U.S. Highway 64 • Farmington, NM 87401 • Tel 505 • 632 • 0615 • Fax 505 • 632 • 186

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

CATION / ANION ANALYSIS

Client:	Burlington	Project #:	219701
Sample ID:	WS - 2	Date Reported:	08-19-99
Laboratory Number:	F933	Date Sampled:	08-18-99
Chain of Custody:	7285	Date Received:	08-18-99
Sample Matrix:	Water	Date Extracted:	N/A
Preservative:	Cool	Date Analyzed:	08-19-99
Condition:	Cool & Intact		

Parameter	Analytical Result	Units		Units
pH	**7.10**	s.u.		
Conductivity @ 25° C	**16,170**	umhos/cm		
Total Dissolved Solids @ 180C	**8,070**	mg/L		
Total Dissolved Solids (Calc)	**7,930**	mg/L		
SAR	**18.5**	ratio		
Total Alkalinity as CaCO3	**780**	mg/L		
Total Hardness as CaCO3	**1,850**	mg/L		
Bicarbonate as HCO3	**780**	mg/L	12.78	meq/L
Carbonate as CO3	**<1**	mg/L	0.00	meq/L
Hydroxide as OH	**<1**	mg/L	0.00	meq/L
Nitrate Nitrogen	**10.5**	mg/L	0.17	meq/L
Nitrite Nitrogen	**1.72**	mg/L	0.04	meq/L
Chloride	**192**	mg/L	5.42	meq/L
Fluoride	**1.46**	mg/L	0.08	meq/L
Phosphate	**8.6**	mg/L	0.27	meq/L
Sulfate	**4,700**	mg/L	97.85	meq/L
Iron	**0.038**	mg/L		
Calcium	**650**	mg/L	32.44	meq/L
Magnesium	**53.7**	mg/L	4.42	meq/L
Potassium	**8.5**	mg/L	0.22	meq/L
Sodium	**1,830**	mg/L	79.61	meq/L
Cations			116.68	meq/L
Anions			116.61	meq/L
Cation/Anion Difference			**0.06%**	

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

Comments: **Standard Oil Com #1.**

Analyst

Review

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ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 1311
TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TRACE METAL ANALYSIS

Client:	Burlington	Project #:	219701
Sample ID:	WS - 3	Date Reported:	08-19-99
Laboratory Number:	F934	Date Sampled:	08-18-99
Chain of Custody:	7285	Date Received:	08-18-99
Sample Matrix:	Water	Date Analyzed:	08-19-99
Preservative:	Cool	Date Extracted:	N/A
Condition:	Cool & Intact	Analysis Needed:	TCLP metals

Parameter	Concentration (mg/L)	Det. Limit (mg/L)	Regulatory Level (mg/L)
Arsenic	**ND**	**0.001**	**5.0**
Barium	**5.20**	**0.01**	**21**
Cadmium	**ND**	**0.001**	**0.11**
Chromium	**0.05**	**0.01**	**0.60**
Lead	**ND**	**0.05**	**0.75**
Mercury	**ND**	**0.0001**	**0.025**
Selenium	**ND**	**0.001**	**5.7**
Silver	**ND**	**0.01**	**0.14**

ND - Parameter not detected at the stated detection limit.

References: Method 1311, Toxicity Characteristic Leaching Procedure, SW-846, USEPA, December 1996.

Methods 3010, 3020, Acid Digestion of Aqueous Samples and Extracts for Total Metals, SW-846, USEPA, December 1996.

Methods 7060, 7080, 7131, 7191, 7470, 7421, 7740, 7761 Analysis of Metals by GFAA and Cold Vapor Techniques, SW-846, USEPA. December 1996.

Note: Regulatory Limits based on 40 CFR part 261 subpart C section 261.24, August 24, 1998.

Comments: **Standard Oil Com #1.**

Analyst

Review

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CHAIN OF CUSTODY RECORD

7285

Client / Project Name	Project Location	ANALYSIS / PARAMETERS
Burlington	Standard Oil Com #1	
Sampler: James A. Coules	Client No. 92197-01	

Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	No. of Containers	8021 BTEX	Anion/Cation	RCRA Metals				Remarks
WS-1	8.18.99	9:30	F932	Water	2	X						
WS-2	8.18.99	9:35	F933	Water	1		X					
WS-3	8.18.99	9:40	F934	Water	1			X				

	Date	Time		Date	Time
Relinquished by: (Signature) James Coules	8.18.99	11:00a	Received by: (Signature) Ellen P. Ojeen	8.18.99	11:00
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	✓		

Water Sampling Data

PHILIP SERVICES CORP.

Serial No. WSD-

Location No. _____

Group List Number _____

Sample Type: ☒ Groundwater ☐ Surface Water ☐ Other _____ Date 12-1-99

Project Name Burlington Pit Project No. 62900025

Project Manager Cecil Ivey Phase.Task No. 35

Site Name Standard Oil Com #1

Sampling Specifications

Requested Sampling Depth Interval (feet) _____

Requested Wait Following Development/Purging (hours) _____

Initial Measurements

Time Elapsed From Final Development/Purging (hours) _____

Initial Water Depth (feet) _____

Nonaqueous Liquids Present (Describe) _____

Water Quality/Water Collection

DO = Dissolved Oxygen; Cond. = Conductivity

Date	Time	Sampler Initials	Water Quality Readings: Temp. (°C)	pH	DO (mg/L)	Cond. (µmhos/cm)	Water Collection Data: Volume Removed (gallons)	Removal Rate (gal/min)	Pump Intake Depth (feet)	Bail	Final Water Depth (feet)	Notes (Explain in Comments Below)
				See	Well	Development	Sheet					

Container Type: G = Clear Glass; A = Amber Glass; P = Plastic; V = VOA Vial (Glass); O = Other (Specify)

Sample Containers

Preservatives: H = HCl, N = HNO_3, S = H_2SO_4, A = NaOH, O = Other (Specify); — = None

Analytical Parameter List	Container: Number	Type	Volume (ml)	Field Filtered: Yes	No	Preserved	Cooled During Collection: Yes	No	Comments
BTEX	2	VOA	40		X	HCL	V		

Filter Type _____ Chain-of-Custody Form Number _____

Comments _____

Signature Cecil Ivey Date 12-1-99 Reviewer _____ Date _____

Form A0202 Rev. 02/24/94

PHILIP ENVIRONMENTAL

Well Number 1

☐ Development
☐ Purging

WELL DEVELOPMENT AND PURGING DATA

Page 1 of 2

Serial No. WDFD-

Project Name Burlington D/G

Project Manager C. Irby

Project No. 62800025

Client Company Burlington Resources

Phase/Task No. 35

Site Name Standard Oil Com #1

Site Address T29N R9W S36 Unit N

Development Criteria

☒ 3 to 5 Casing Volumes of Water Removal
☐ Stabilization of Indicator Parameters
☐ Other

Methods of Development

Pump	Bailer
☐ Centrifugal	☒ Bottom Valve
☐ Submersible	☐ Double Check Valve
☐ Peristaltic	☐ Stainless-steel Kemmerer

☐ Other

Water Volume Calculation

Initial Depth of Well (feet) 41
Initial Depth to Water (feet) 29.14
Height of Water Column in Well (feet) 12.86
Diameter (inches): Well 2 Gravel Pack

Item	Water Volume in Well: Cubic Feet	Gallons	Gallons to be Removed
Well Casing	1.652 x 12.86	2.1	6.3
Gravel Pack			
Drilling Fluids			
Total			

Instruments

	Serial No. (if applicable)
☒ pH Meter	
☐ DO Monitor	
☒ Conductivity Meter	
☒ Temperature Meter	
☐ Other	

Water Disposal

Water Removal Data

Date	Time	Development Method: Pump	Development Method: Bailer	Removal Rate (gal/min)	Intake Depth (feet)	Ending Water Depth (feet)	Water Volume Removed (gallons): Increment	Water Volume Removed (gallons): Cumulative	Product Volume Removed (gallons): Increment	Product Volume Removed (gallons): Cumulative	Temperature (°C)	pH	Conductivity (mmhos/cm)	Dissolved Oxygen (mg/l)	Comments
12-1-99	12:15		✓								63	6.9	11190		
	12:25										55.9	7.4	11830		
	12:30										55.2	7.4	11890		
	12:35										55.7	7.4	11840		

Circle the date and time that the development criteria are met

Comments Had To Wait 20 Minutes For recharge

Developer's Signature(s) Cecil Gf Date 12-1-99 Reviewer Date

Form A0101 Rev. 10/5/94

F:\NEWFORMS\PE_A0101.DOT 12/1/99

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021 MODIFIED
CLIENT : PHILIP ENVIRONMENTAL PINNACLE I.D.: 912012
PROJECT # : (none)
PROJECT NAME : (none)

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
04	SOC1299-1	AQUEOUS	12/1/99	NA	12/6/99	10
05	JF1299-1	AQUEOUS	12/1/99	NA	12/7/99	100

PARAMETER	DET. LIMIT	UNITS	SOC1299-1	JF1299-1
BENZENE	0.5	**UG/L**	**78**	**4700**
TOLUENE	0.5	**UG/L**	**170**	**1300**
ETHYLBENZENE	0.5	**UG/L**	**100**	**900**
TOTAL XYLENES	0.5	**UG/L**	**1300**	**10000**
METHYL-t-BUTYL ETHER	2.5	UG/L	< 25	< 250
SURROGATE:				
BROMOFLUOROBENZENE (%)			86	109
SURROGATE LIMITS	(80 - 120)			

CHEMIST NOTES:
N/A

Pinnacle Laboratories Inc.

CHAIN OF CUSTODY

DATE 12-2-99 PAGE 1 OF 1

PLI Accession #: 912012

SHADED AREAS ARE FOR LAB USE ONLY.

PLEASE FILL THIS FORM IN COMPLETELY.

PROJECT MANAGER: Cecil Irby

COMPANY: Philip Env. Srvcs

ADDRESS: 4000 Monroe
Farmington, NM 87401

PHONE: 505-326-2262

FAX:

BILL TO: Philip Env. Services

COMPANY:

ADDRESS:

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB I.D.	NUMBER OF CONTAINERS
COZ1299-1-2	12/2		AQ	01	2
COZ1299-1-1				02	2
FOG 1299-1	↓			03	2
SOC1299-1	12/1			04	2
JF 1299-1	↓		↓	05	2

Petroleum Hydrocarbons (418.1) TRPH
(MOD.8015) Diesel/Direct Inject
(M8015) Gas/Purge & Trap
8021 (BTEX)/8015 (Gasoline) MTBE
8021 (BTEX) ☐ MTBE ☐ TMB ☐ PCE
8021 (TCL)
8021 (EDX)
8021 (HALO)
8021 (CUST)
504.1 EDB ☐ / DBCP ☐
8260 (TCL) Volatile Organics
8260 (Full) Volatile Organics
8260 (CUST) Volatile Organics
8260 (Landfill) Volatile Organics
Pesticides /PCB (608/8081/8082)
Herbicides (615/8151)
Base/Neutral/Acid Compounds GC/MS (625/8270)
Polynuclear Aromatics (610/8310/8270-SIMS)
General Chemistry:
Priority Pollutant Metals (13)
Target Analyte List Metals (23)
RCRA Metals (8)
RCRA Metals by TCLP (Method 1311)
Metals:

PROJECT INFORMATION	
PROJ. NO.:	
PROJ. NAME:	
P.O. NO.:	
SHIPPED VIA:	
SAMPLE RECEIPT	
NO. CONTAINERS	10
CUSTODY SEALS	Y/N/NA
RECEIVED INTACT	Y/N
BLUE ICE/ICE	4C

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☐

CERTIFICATION REQUIRED: ☐ NM ☐ SDWA ☐ OTHER

METHANOL PRESERVATION ☐

COMMENTS: FIXED FEE ☐

RELINQUISHED BY: 1.	RELINQUISHED BY: 2
Signature: Cecil Irby Time: 12-2-99 16:50	Signature: Time:
Printed Name: Date:	Printed Name: Date:
Company: See reverse side (Force Majeure)	Company:
RECEIVED BY: 1.	**RECEIVED BY: (LAB) 2**
Signature: Time:	Signature: Time: 1135
Printed Name: Date:	Printed Name: Date: 12/3
Company:	Pinnacle Laboratories Inc.

LETTER TO MR. OLSON
DATED SEPTEMBER 10, 1999

BURLINGTON RESOURCES

SAN JUAN DIVISION

September 10, 1999

Certified Mail: Z 186 732 855

Bill Olson
New Mexico Oil Conservation Division
2040 S. Pacheco
Santa Fe, NM 87505

RE: Standard Oil Com #1
Unit Letter N, Section 36, Township 29N, Range 9W
Notification of Groundwater Impact

Dear Mr. Olson:

As per the e-mail notification dated August 31, 1999 (Mr. Hasely to Mr. Olson), this letter is Burlington Resources' (BR) written notification of groundwater impact at the subject location. The final analytical results and final paperwork from the consultant did not make it to my attention until recently.

Due to El Paso having groundwater impacts at this location, BR conducted an initial assessment of an earthen pit that was no longer in use on the Standard Oil Com #1 location. The former separator/tank drain earthen pit had levels above closure standards and BR excavated soils to 31 feet below ground surface. Groundwater seeped into the excavation at this depth. Soil samples from the bottom of the excavation were collected and tested above pit closure standards. Clean overburden was pushed into the excavation to partially backfill the hole. The excavated soils were landfarmed until the soils tested below cleanup standards, and then the landfarmed soils were used to finish backfilling the excavation. BR conducted vertical extent determination in the center of BR's former earthen pit and encountered groundwater at approximately 26 feet. BR installed a temporary groundwater monitoring well. After developing the well and allowing it to stabilize for one week, the well was purged and sampled on August 18, 1999. The sample results are as follows:

Benzene	1500 ppb
Toluene	135 ppb
Ethylbenzene	106 ppb
Total Xylenes	586 ppb

Included with this letter are the original Pit Remediation and Closure Reports for the BR earthen pit along with the analytical results of the soil testing. Also attached are the groundwater lab analysis, the drilling log, the monitoring well installation record, and a location diagram.

The temporary monitoring well will be completed as permanent. BR will conduct future activities at the site pursuant to Burlington Resources' Groundwater Management Plan, and it is our intention to work in conjunction with El Paso to assure proper assessment and closure. If you have questions or additional information is needed, please contact me at (505) 326-9841.

Sincerely,

Ed Hasely
Sr. Staff Environmental Representative

Attachments: Pit Remediation and Closure Report
Drilling Log/Wellbore Diagram
Analytical Results - Groundwater
Location Diagram

cc: Denny Foust - NMOCD Aztec
Sandra Miller - El Paso
Ken Raybon
Ward Arnold
Bruce Gantner
Facility File
Correspondence

Pit Remediation and Closure Report

District I
P.O. Box 1980, Hobbs, NM
District II
P.O. Drawer DD, Artesia, NM 88211
District III
1000 Rio Brazos Rd, Aztec, NM 87410

State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

SUBMIT 1 COPY TO APPROPRIATE DISTRICT OFFICE AND 1 COPY TO SANTA FE OFFICE

(Revised 3/9/94)

PIT REMEDIATION AND CLOSURE REPORT

Operator: Burlington Resources Telephone: (505) 326-9700

Address: 3535 E. 30th Farmington NM 87402

Facility Or: Standard Oil Com #1
Well Name

Location: Unit or Qtr/Qtr Sec N Sec 36 T 29N R 9W County San Juan

Pit Type: Separator X Dehydrator ___ Other Tank Drain

Land Type: BLM ___, State X, Fee ___, Other ___

Pit Location: (Attach diagram)

Pit dimensions: length 20, width 10, depth 1

Reference: wellhead X, other ___

Footage from reference: 60 ft

Direction from reference: 75 Degrees X East North ___ of ___ West South X

Depth To Ground Water: (Vertical distance from contaminants to seasonal high water elevation of ground water)	Less than 50 feet (20 points) 50 feet to 99 feet (10 points) Greater than 100 feet (0 Points)	20
Wellhead Protection Area: (Less than 200 feet from a private domestic water source, or; less than 1000 feet from all other water sources)	Yes (20 points) No (0 points)	0
Distance To Surface Water: (Horizontal distance to perennial lakes, ponds, rivers, streams, creeks, irrigation canals and ditches)	Less than 200 feet (20 points) 200 feet to 1000 feet (10 points) Greater than 1000 feet (0 points)	0
	RANKING SCORE (TOTAL POINTS):	20

Date Remediation Started: 12/10/98 Date Completed: _____

Remediation Method: (Check all appropriate sections) Excavation X Approx. cubic yards 1140

Landfarmed X Insitu Bioremediation ___

Other _____

Remediation Location: (ie. landfarmed onsite, name and location of offsite facility) Onsite X Offsite Standard Oil Com #1A - E Sec 36-29N-9W

General Description Of Remedial Action: Soils were removed to an approximate depth of 31 ft which was practical extent. Soil samples were collected. Groundwater seeped into excavation. The excavation was partially backfilled with clean overburden, the completely backfilled with the remediated landfarm soil. A groundwater monitoring well was installed in the center of the former excavation.

Ground Water Encountered: No ___ Yes X Depth 31 ft

Final Pit: Closure Sampling: (if multiple samples, attach sample results and diagram of sample locations and depths)

Sample location Bottom of excavation

Sample depth 31 ft

Sample date 12/14/98 Sample time 2:30 pm

Sample Results

Benzene(ppm) 1.7

Total BTEX(ppm) 126.9

Field headspace(ppm) 321

TPH 2160

Ground Water Sample: Yes ___ No X (If yes, attach sample results)

I HEREBY CERTIFY THAT THE INFORMATION ABOVE IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF

DATE 9/8/99

SIGNATURE Ed Hasely PRINTED NAME AND TITLE Ed Hasely Sr. Staff Environmental Rep.

PHILIP SERVICES CORP

PRODUCTION PIT REMEDIATION FORM

WELL NAME: Standard Oil Com #1 WELL NO.: _____ DP No.: _____

OPERATOR NAME: Burlington Resources P/L DISTRICT: _____

COORDINATES: LETTER: N SECTION: 36 TOWNSHIP: 029N RANGE: 009W

PIT TYPE: DEHYDRATOR: X LOCATION DRIP: _____ LINE DRIP: _____ OTHER: _____

FOREMAN NO.: ~~Wayne Ritter~~ Ward Arnold AREA: Largo Canyon

INITIAL REMEDIATION ACTIVITIES

DATE: 12-10-98 TIME: 7:00

GROUND WATER ENCOUNTERED? ☒ Y / N

INSIDE NMOCD ZONE

FINAL EXCAVATION DIMENSIONS: LENGTH: 53 WIDTH: 41 DEPTH: 31

APPROX. CUBIC YARDS: 2,642 FINAL PID READING: 321 ppm

REMEDIATION METHOD: ONSITE LANDFARM X 340 cu.yd

OFFSITE LANDFARM X LOCATION: Sundard Oil Com #1A 300 cu.yd

OTHER_

LANDFARM DIMENSIONS: LENGTH: _____ WIDTH: _____

OUTSIDE NMOCD ZONE

FINAL SAMPLE DEPTH: _____ FINAL PID READING: _____

EXCAVATION SAMPLING INFORMATION

IF PID READINGS ARE LESS THAN 100 PPM, SAMPLE TAKEN DURING EXCAVATION)

SAMPLE DATE: _____ SAMPLE NOS _____ _____

SAMPLE ANALYSIS: TPH METHOD 8015 MODIFIED

IF PID READINGS ARE GREATER THAN 100 PPM, NO SAMPLE WILL BE TAKEN DURING EXCAVATION. THE EXCAVATION WILL BE SAMPLED PRIOR TO BACKFILLING (SEE ADDITIONAL SAMPLING SECTION).

REMARKS: TPH - Bottom 1103 ppm
TPH - Composite 241 ppm
Contaminated Soil = 1,140 cu.yd.
Clean Soil = 1,502 cu.yd.

SIGNATURE: Robert Thompson DATE: 12/10/98

ADDITIONAL REMEDIATION ACTIVITIES

SOIL TILLING

DATE: _____ PID READING: _____ SIGNATURE: _____

REMARKS: _____

DATE: _____ PID READING: _____ SIGNATURE: _____

REMARKS: _____

DATE: _____ PID READING: _____ SIGNATURE: _____

REMARKS: _____

DATE: _____ PID READING: _____ SIGNATURE: _____

REMARKS: _____

ADDITIONAL SAMPLING INFORMATION

EXCAVATION SAMPLING(IF REQUIRED)

IF NO SAMPLE WAS TAKEN DURING EXCAVATION, THE EXCAVATION WILL BE SAMPLED BEFORE BACKFILLING).

SAMPLE DATE: _____ SAMPLE NOS_____ _____

SIGNATURE:_____

IF PID READINGS ARE LESS THAN 100 PPM , SAMPLE ANALYSIS: TPH METHOD 8015 MODIFIED

IF PID READINGS ARE GREATER THAN 100 PPM, SAMPLE ANALYSES: BTEX METHOD 8020 AND TPH METHOD 8015 MODIFIED

SOIL REMEDIATION VERIFICATION SAMPLE

SAMPLE DATE: _____ SAMPLE NOS_____ _____

SIGNATURE:_____

SAMPLE ANALYSIS: TPH METHOD 8015 MODIFIED

BACKFILLING INFORMATION

DATE: _____ TIME:_____

BACKFILL SOURCE: ONSITE LANDFARM: _____

OFFSITE SOURCE:_____ APPROX. VOLUME:_____

REMARKS:_____

_____

_____

SIGNATURE: **DATE:**

807 S. CARLTON AVE.
FARMINGTON, NEW MEXICO 87401
PHONE (505) 326-2588
FAX (505) 326-2875

Certificate of Analysis No. 9812099-01a

Philip Environmental Services
4000 Monroe Road
Farmington, NM 87401
Attn: Robert Thompson

		Date:	12/29/98
Project:	BR Pits	Project No:	20440
Site:	Farmington	Matrix:	Soil
Sampled By:	R. Thompson	Date Sampled:	12/14/98
Sample ID:	Standard Oil COM #1-BOT	Date Received:	12/15/98

Analytical Data

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Benzene	1700	1000 (P)	µg/Kg
Toluene	23000	1000 (P)	µg/Kg
Ethylbenzene	9200	1000 (P)	µg/Kg
Total Xylene	93000	1000 (P)	µg/Kg
Total Volatile Aromatic Hydrocarbons	126900		µg/Kg

Surrogate	% Recovery
1,4,Difluorobenzene	100
4-Bromofluorobenzene	127

Method 8020A***
Analyzed by: AA
Date: 12/19/98

ND-Not Detected MI-Matrix Interference (P)-Practical Quantitation Limit

Notes:
*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th Ed
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

Comments: Sample contains petroleum hydrocarbons from C10 - C24 that do not resemble a diesel pattern. (C10 - C24)RR

Billy G. Rich, Lab Director

ENVIRONMENTAL LABORATORY, INC.
307 S. CARLTON AVE.
FARMINGTON, NEW MEXICO 87401
PHONE (505) 326-2588
FAX (505) 326-2875

Certificate of Analysis No. 9812099-01b

Philip Environmental Services
4000 Monroe Road
Farmington, NM 87401
Attn: Robert Thompson

		Date:	12/29/98
Project:	BR Pits	Project No:	20440
Site:	Farmington	Matrix:	Soil
Sampled By:	R. Thompson	Date Sampled:	12/14/98
Sample ID:	Standard Oil COM #1-BOT	Date Received:	12/15/98

Analytical Data

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Gasoline Range Organics	2000	100 (P)	mg/kg
Surrogate	**% Recovery**		
1,4,Difluorobenzene	83		
4-Bromofluorobenzene	223MI		
Method 8015B*** for Gasoline			
Analyzed by: AA			
Date: 12/19/98			
Total Petroleum Hydrocarbons-Diesel	160	10 (P)	mg/kg
Surrogate	**% Recovery**		
n-Pentacosane	96		
Method 8015B*** for Diesel			
Analyzed by: RR			
Date: 12/18/98			

MI-Matrix interference (P)-Practical Quantitation Limit ND-Not Detected

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th Ed
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

Comments: Sample contains petroleum hydrocarbons from C10 - C24 that do not resemble a diesel pattern. (C10 - C24)RR

Billy G. Rich, Lab Director

807 S. CARLTON AVE.
FARMINGTON, NEW MEXICO 87401
PHONE (505) 326-2588
FAX (505) 326-2875

Certificate of Analysis No. 9812099-02a

Philip Environmental Services
4000 Monroe Road
Farmington, NM 87401
Attn: Robert Thompson

		Date:	12/29/98
Project:	BR Pits	Project No:	20440
Site:	Farmington	Matrix:	Soil
Sampled By:	R. Thompson	Date Sampled:	12/14/98
Sample ID:	Standard Oil COM #1-WALL	Date Received:	12/15/98

Analytical Data

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Benzene	ND	5.0 (P)	µg/Kg
Toluene	5.5	5.0 (P)	µg/Kg
Ethylbenzene	44	5.0 (P)	µg/Kg
Total Xylene	540	5.0 (P)	µg/Kg
Total Volatile Aromatic Hydrocarbons	589.5		µg/Kg

Surrogate	% Recovery
1,4,Difluorobenzene	100
4-Bromofluorobenzene	133

Method 8020A***
Analyzed by: AA
Date: 12/16/98

ND-Not Detected MI-Matrix Interference (P)-Practical Quantitation Limit

Notes:
*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th Ed
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

Comments: Sample contains petroleum hydrocarbons from C10 - C24 that do not resemble a diesel pattern. (C10 - C24) RR

Billy G. Rich, Lab Director

807 S. CARLTON AVE.
FARMINGTON. NEW MEXICO 87401
PHONE (505) 326-2588
FAX (505) 326-2875

Certificate of Analysis No. 9812099-02b

Philip Environmental Services
4000 Monroe Road
Farmington, NM 87401
Attn: Robert Thompson

Date: 12/29/98

Project:	BR Pits	Project No:	20440
Site:	Farmington	Matrix:	Soil
Sampled By:	R. Thompson	Date Sampled:	12/14/98
Sample ID:	Standard Oil COM #1-WALL	Date Received:	12/15/98

Analytical Data

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Gasoline Range Organics	12	0.5 (P)	mg/kg
Surrogate	**% Recovery**		
1,4,Difluorobenzene	93		
4-Bromofluorobenzene	533MI		
Method 8015B*** for Gasoline			
Analyzed by: AA			
Date: 12/16/98			
Total Petroleum Hydrocarbons-Diesel	190	10 (P)	mg/kg
Surrogate	**% Recovery**		
n-Pentacosane	80		
Method 8015B*** for Diesel			
Analyzed by: RR			
Date: 12/18/98			

MI-Matrix Interference (P)-Practical Quantitation Limit D-Diluted, limits not applicable

Notes:
*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th Ed
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

Comments: Sample contains petroleum hydrocarbons from C10 - C24 that do not resemble a diesel pattern. (C10 - C24) RR

Billy G. Rich, Lab Director

Chain of Custody Record

PHILIP

4000 Monroe Road
Farmington, NM 87401
(505) 326-2262 Phone
(505) 326-2388 FAX

COC Serial No. C 2327

Project Name

Project Number Phase . Task

Samplers

Laboratory Name

Location

Sample Number (and depth)	Date	Time	Matrix	Total Number of Bottles	Type of Analysis and Bottle	Comments
	12/04/98	11:31		1		1178 PPM
	12/04/98	11:32		1		521 PPM

Relinquished by:

Signature	Date	Time
	12/5/98	0700
	12/5/98	11:04 AM

Received By:

Signature	Date	Time
	12/5/98	11:04 AM
	12/5/98	

Samples Iced: ☐ Yes ☐ No

Preservatives (ONLY for Water Samples)

- ☐ Cyanide ..... Sodium hyroxide (NaOH)
- ☐ Volatile Organic Analysis ..... Hydrochloric acid (HCl)
- ☐ Metals ..... Nitric acid (HNO_3)
- ☐ TPH (418.1) ..... Sulfuric acid (H_2SO_4)
- ☐ Other (Specify)
- ☐ Other (Specify)

Carrier: Airbill No.

Shipping and Lab Notes:

PetroFLAG™

Hydrocarbon Test Kit - Field Data Sheet

Date: 12-14-98
Operator: Dave Archuleta
Location: Stevens Oil Co #1

Calibration Time/Date: 2:00 12-14-98
Calibration Temperature: 37.5

No.	Sample ID	Weight	Time/Date	Reading (ppm)	DF[1]	RF[2]	Actual (ppm)	Comments
1	#1	10g	2:10	241 ppm				Composite Sample
2	#2	10g	2:20	1103 ppm				Burn Sample
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

[1]DF = Dilution Factor, e.g., for 5 gram soil sample DF=10g/5g=2, and actual concentration equals reading times DF (reading (ppm) x DF = actual concentration).

[2]RF = Response Factor, selected for the hydrocarbon contamination at the site.

PetroFLAG™

Hydrocarbon Test Kit - Field Data Sheet

Date: 12/10/98
Operator: ______________
Location: Standard Oil Com #1

Calibration Time/Date: 10:30 12/10/98
Calibration Temperature: 23.5 C

No.	Sample ID	Weight	Time/Date	Reading (ppm)	DF[1]	RF[2]	Actual (ppm)	Comments
1	1	10 g	12:17 12/10/98	235 ppm				error Greater than 10° between calibration and the sample.
2	2	10 g	13:17 12/10/98	1276 ppm				
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

[1]DF = Dilution Factor. e.g., for 5 gram soil sample DF=10g/5g=2. and actual concentration equals reading times DF (reading (ppm) x DF = actual concentration).

[2]RF = Response Factor. selected for the hydrocarbon contamination at the site.

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PHILIP ENVIRONMENTAL

SITE SKETCH

Serial No. SS- _____ Title _____

Project Name BR PITS Project No. 20440

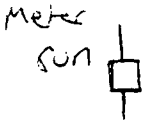
Project Manager Robert Thompson Phase.Task No. 4000.77

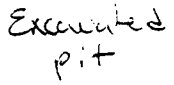
Client Company Burlington Resources

Site Name Standard oil Com #1

Site Address _____

(Include north arrow and scale or dimensions. If available, preprint CAD drawing of site on this form.)





Sketched by (signature) _____ Date _____

AGRA Earth & Environmental
ENGINEERING GLOBAL SOLUTIONS

AGRA Earth & Environmental, Inc.
2060 Afton Place
Farmington, NM 87401
Tel: (505) 327-7928
Fax: (505) 326-5721

December 15, 1998
AEE Project No. 8529-000203

Philip Environmental Services Corp.
4000 Monroe Road
Farmington, New Mexico 87401

Attention: **Mr. Robert Thompson**

Regarding: **Environmental Cleanup Excavation**
Burlington Resources Oil and Gas Company
Standard Oil Com # 1 Well Site
1090 Feet FSL and 1850 Feet FWL
Section 36 Township 29 North, Range 9 West, N.M.P.M.
Lease No. B-111221 - Elevation 5683
San Juan County, New Mexico

Ladies and Gentlemen:
In accordance with the request of Mr. Robert Thompson of Philip Environmental, AGRA Earth and Environmental, Inc. (AEE) personnel visited the referenced site on Friday, December 11, 1998. The purpose of this visit was to observe the existing excavation and provide guidelines for expanding the excavation. The excavation was about 31 feet deep at the time of our site visit. It is understood that the excavation will be expanded laterally until the contaminated soil is removed.

The soils observed consisted of a fairly loose silty sand which exhibited signs of sloughing in the open excavation. The west side of the excavation appeared to be sandstone. It is recommended that in all areas, where equipment will be working in the excavation, the sides of the excavation in the soil be laid-back at an angle not to exceed 2:1 (horizontal to vertical). The sandstone side of the excavation should be laid back at an angle not to exceed ¾:1 (horizontal to vertical). The equipment should not enter into the excavation any deeper than is absolutely necessary. In areas where existing facilities prevent the 2:1 layback, the sides may be benched at a minimum of 8 feet horizontal to 8 feet vertical. Work in areas where the benching is used should be for short periods of time as the instability of these areas will increase as the soils begin to dry. Spoils and equipment should be kept away from the edge of the excavation a distance at least equal to the depth of the excavation. The edges of the excavation should be checked regularly for tension cracks or other signs of possible slope failure. Any areas showing signs of slope failure should be repaired prior to personnel or equipment entering the excavation.

We appreciate the opportunity to be of service on this project. If you should have any questions, please do not hesitate to contact the undersigned.

Respectfully submitted,
AGRA Earth & Environmental, Inc.

Kim M. Preston, P.E.
Four Corners Area Manager

Copies: Addressee (3)

Drilling Log/Wellbore Diagram

ENVIROTECH INC.

FIELD BORING LITHOLOGY LOG **MW-1**

Soil Boring #	PROJECT #		CLIENT NAME: **Burlington Resources**		Page
MW-1	9219701		Standard Oil Com. #1		1 of 2
Date Started:	08/11/99	Location:	Largo Canyon, Blanco, New Mexico		
Date Completed:	08/11/99	Elevation:	TOC:		
Type of Drill:	Mobil B-61	Driller:	Matt Cain	Geotech:	James Cowles
Bit Size:	7" Hollow Stem Auger	Helper:	Donn Eisenhaure	Proj. Mg.:	James Cowles

Depth ft.	Completion: MW	Sample Type	TPH ppm (8015)	OVM PPM	Lithology	Description
0.0		A				0.0'- 1.0' fill dirt/ material
		A				
		A				
2.0		A				
		A				brown sand and silt, moist, loose, no odor.
		A				
		A				
4.0		SS		0.0		
		SS				
		A				
		A				
6.0		A				
		A				
		A				
		A				
8.0		A				
		A				
		SS		0.0		brown sand and silt, moist, loose, no odor.
		SS				
10.0		A				
		A				
		A				
		A				
12.0		A				
		A				
		A				
		A				
14.0		SS		4.0		brown sand and silt, moist, loose, no odor.
		SS				
		A				
		A				
16.0		A				
		A				
		A				
		A				
18.0		A				
		A				
		A				
		A				
		SS		0.0		brown sand and silt, moist, loose, no odor.
20.0		SS				
		A				
		A				
		A				
22.0		A				
		A				
		A				
		A				
24.0		SS				brown sand and silt, very moist, loose, no odor.
		SS				
		A				
		A				
26.0		A				
		A				
		A				
		A				Native Soil, clavey sands, very moist, gray-black, odor.
28.0		A				loose, sandy clay
		SS		320.0		
		SS				
30.0						
32.0						

Legend		Lithology		Monitor Well Completion
A	Auger Samples		Fill:	Cement Grout
SS	Split Spoon		Cobble	Screen PVC
CS	Continuous Sampler		Sand	Blank PVC Screen
AR	Air Rotary Cuttings		clay	Sand Pack
			silt	Bentonite Seal

Note: All depths are below ground level

ENVIROTECH INC.

FIELD BORING LITHOLOGY LOG **MW-1**

Soil Boring #	PROJECT =		CLIENT NAME: **Burlington Resources**	Page
MW-1	**9219701**		Standard Oil Com. #1	2 of 2
Date Started:	**08/11/99**	Location:	Largo Canyon, Blanco, New Mexico	
Date Completed:	**08/11/99**	Elevation:	TOC:	
Type of Drill:	Mobil B-61	Driller:	Matt Cain	Geotech: James Cowles
Bit Size:	7" Hollow Stem Auger	Helper:	Donn Eisenhaure	Proj. Mg.: James Cowles

Depth ft.	Completion: MW	Sample Type	TPH ppm (8015)	OVM PPM	Lithology	Description
32.0		A				
		A				
		A				
34.0		SS				Native Soil, clayey sands, dry, gray, no odor.
		SS				hard sandy clay
		A				
		A				
36.0		A		27.0		
		A				
		A				
		A				
38.0		A				
		A				TD 39', Native Soil, clayey sands, dry, gray, no odor.
39.0		SS				very hard

Legend:

Sample type:

A	Auger Samples
SS	Split Spoon
CS	Continuous Sampler
AR	Air Rotary Cuttings

Lithology

Fill:	
Cobble	
Sand	
clay	
silt	

Monitor Well Completion

	Cement Grout
	Screen PVC
	Blank PVC Screen
	Sand Pack
	Bentonite Seal

Note: All depths are below ground level

Analytical Results - Groundwater

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8021
AROMATIC VOLATILE ORGANICS

Client:	Burlington	Project #:	219701
Sample ID:	WS - 1	Date Reported:	08-19-99
Chain of Custody:	7285	Date Sampled:	08-18-99
Laboratory Number:	F932	Date Received:	08-18-99
Sample Matrix:	Water	Date Analyzed:	08-19-99
Preservative:	HgCl2 & Cool	Analysis Requested:	BTEX
Condition:	Cool & Intact		

Parameter	Concentration (ug/L)	Dilution Factor	Det. Limit (ug/L)
Benzene	**1,500**	**10**	**1.8**
Toluene	**135**	**10**	**1.7**
Ethylbenzene	**106**	**10**	**1.5**
p,m-Xylene	**409**	**10**	**2.2**
o-Xylene	**177**	**10**	**1.0**
Total BTEX	**2,330**		

ND - Parameter not detected at the stated detection limit.

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

References: Method 5030B, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.

Method 8021B, Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, SW-846, USEPA December 1996.

Comments: **Standard Oil Com #1.**

Analyst

Review

5796 U.S. Highway 64 • Farmington, NM 87401 • Tel 505 • 632 • 0615 • Fax 505 • 632 • 186

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8021
AROMATIC VOLATILE ORGANICS
QUALITY ASSURANCE REPORT

Client:	N/A	Project #:	N/A
Sample ID:	08-19-BTEX QA/QC	Date Reported:	08-19-99
Laboratory Number:	F932	Date Sampled:	N/A
Sample Matrix:	Water	Date Received:	N/A
Preservative:	N/A	Date Analyzed:	08-19-99
Condition:	N/A	Analysis:	BTEX

Calibration and Detection Limits (ug/L)	I-Cal RF:	C-Cal RF:	%Diff. Accept. Range 0 - 15%	Blank Conc.	Detect. Limit
Benzene	3.6219E-001	3.6335E-001	0.32%	ND	0.2
Toluene	2.7867E-002	2.7872E-002	0.02%	ND	0.2
Ethylbenzene	4.1931E-002	4.1981E-002	0.12%	ND	0.2
p,m-Xylene	3.6569E-002	3.6576E-002	0.02%	ND	0.2
o-Xylene	3.1955E-002	3.2051E-002	0.30%	ND	0.1

Duplicate Conc. (ug/L)	Sample	Duplicate	%Diff.	Accept Limit
Benzene	1,500	1,430	4.7%	0 - 30%
Toluene	135	130	3.8%	0 - 30%
Ethylbenzene	106	102	3.8%	0 - 30%
p,m-Xylene	409	408	0.4%	0 - 30%
o-Xylene	177	170	4.0%	0 - 30%

Spike Conc. (ug/L)	Sample	Amount Spiked	Spiked Sample	% Recovery	Accept Limits
Benzene	1,500	50.0	1,540	99%	39 - 150
Toluene	135	50.0	187	101%	46 - 148
Ethylbenzene	106	50.0	157	101%	32 - 160
p,m-Xylene	409	100.0	507	100%	46 - 148
o-Xylene	177	50.0	228	101%	46 - 148

ND - Parameter not detected at the stated detection limit.

* - Administrative Limits set at 80 - 120%.

References: Method 5030B, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.
Method 8021B, Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, SW-846, USEPA December 1996.

Comments: **QA/QC for sample F932.**

Analyst

Review

5796 U.S. Highway 64 • Farmington, NM 87401 • Tel 505 • 632 • 0615 • Fax 505 • 632 • 186

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

CATION / ANION ANALYSIS

Client:	Burlington	Project #:	219701
Sample ID:	WS - 2	Date Reported:	08-19-99
Laboratory Number:	F933	Date Sampled:	08-18-99
Chain of Custody:	7285	Date Received:	08-18-99
Sample Matrix:	Water	Date Extracted:	N/A
Preservative:	Cool	Date Analyzed:	08-19-99
Condition:	Cool & Intact		

Parameter	Analytical Result	Units		Units
pH	**7.10**	s.u.		
Conductivity @ 25° C	**16,170**	umhos/cm		
Total Dissolved Solids @ 180C	**8,070**	mg/L		
Total Dissolved Solids (Calc)	**7,930**	mg/L		
SAR	**18.5**	ratio		
Total Alkalinity as CaCO3	**780**	mg/L		
Total Hardness as CaCO3	**1,850**	mg/L		
Bicarbonate as HCO3	**780**	mg/L	12.78	meq/L
Carbonate as CO3	**<1**	mg/L	0.00	meq/L
Hydroxide as OH	**<1**	mg/L	0.00	meq/L
Nitrate Nitrogen	**10.5**	mg/L	0.17	meq/L
Nitrite Nitrogen	**1.72**	mg/L	0.04	meq/L
Chloride	**192**	mg/L	5.42	meq/L
Fluoride	**1.46**	mg/L	0.08	meq/L
Phosphate	**8.6**	mg/L	0.27	meq/L
Sulfate	**4,700**	mg/L	97.85	meq/L
Iron	**0.038**	mg/L		
Calcium	**650**	mg/L	32.44	meq/L
Magnesium	**53.7**	mg/L	4.42	meq/L
Potassium	**8.5**	mg/L	0.22	meq/L
Sodium	**1,830**	mg/L	79.61	meq/L
Cations			116.68	meq/L
Anions			116.61	meq/L
Cation/Anion Difference			**0.06%**	

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

Comments: **Standard Oil Com #1.**

Analyst

Review

5796 U.S. Highway 64 • Farmington, NM 87401 • Tel 505 • 632 • 0615 • Fax 505 • 632 • 186

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 1311
TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TRACE METAL ANALYSIS

Client:	Burlington	Project #:	219701
Sample ID:	WS - 3	Date Reported:	08-19-99
Laboratory Number:	F934	Date Sampled:	08-18-99
Chain of Custody:	7285	Date Received:	08-18-99
Sample Matrix:	Water	Date Analyzed:	08-19-99
Preservative:	Cool	Date Extracted:	N/A
Condition:	Cool & Intact	Analysis Needed:	TCLP metals

Parameter	Concentration (mg/L)	Det. Limit (mg/L)	Regulatory Level (mg/L)
Arsenic	**ND**	**0.001**	**5.0**
Barium	**5.20**	**0.01**	**21**
Cadmium	**ND**	**0.001**	**0.11**
Chromium	**0.05**	**0.01**	**0.60**
Lead	**ND**	**0.05**	**0.75**
Mercury	**ND**	**0.0001**	**0.025**
Selenium	**ND**	**0.001**	**5.7**
Silver	**ND**	**0.01**	**0.14**

ND - Parameter not detected at the stated detection limit.

References: Method 1311, Toxicity Characteristic Leaching Procedure, SW-846, USEPA, December 1996.

Methods 3010, 3020, Acid Digestion of Aqueous Samples and Extracts for Total Metals, SW-846, USEPA, December 1996.

Methods 7060, 7080, 7131, 7191, 7470, 7421, 7740, 7761 Analysis of Metals by GFAA and Cold Vapor Techniques, SW-846, USEPA. December 1996.

Note: Regulatory Limits based on 40 CFR part 261 subpart C section 261.24, August 24, 1998.

Comments: **Standard Oil Com #1.**

Analyst

Review

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ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 1311
TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TRACE METAL ANALYSIS
Quality Assurance Report

Client:	QA/QC	Project #:	N/A
Sample ID:	08-19-TCM QA/QC	Date Reported:	08-19-99
Laboratory Number:	F925	Date Sampled:	N/A
Sample Matrix:	TCLP Extract	Date Received:	N/A
Analysis Requested:	TCLP Metals	Date Analyzed:	08-19-99
Condition:	N/A	Date Extracted:	N/A

Blank & Duplicate Conc. (mg/L)	Instrument Blank	Method Blank	Detection Limit	Sample	Duplicate	% Diff.	Acceptance Range
Arsenic	ND	ND	0.001	ND	ND	0.0%	0% - 30%
Barium	ND	ND	0.01	0.20	0.20	0.0%	0% - 30%
Cadmium	ND	ND	0.001	ND	ND	0.0%	0% - 30%
Chromium	ND	ND	0.01	0.01	0.01	0.0%	0% - 30%
Lead	ND	ND	0.05	ND	ND	0.0%	0% - 30%
Mercury	ND	ND	0.0001	ND	ND	0.0%	0% - 30%
Selenium	ND	ND	0.001	ND	ND	0.0%	0% - 30%
Silver	ND	ND	0.01	ND	ND	0.0%	0% - 30%

Spike Conc. (mg/L)	Spike Added	Sample	Spiked Sample	Percent Recovery	Acceptance Range
Arsenic	0.100	ND	0.098	98.0%	80% - 120%
Barium	1.00	0.20	1.20	100.0%	80% - 120%
Cadmium	0.500	ND	0.490	98.0%	80% - 120%
Chromium	0.50	0.01	0.51	100.0%	80% - 120%
Lead	2.00	ND	2.00	100.0%	80% - 120%
Mercury	0.0250	ND	0.0248	99.2%	80% - 120%
Selenium	0.100	ND	0.097	97.0%	80% - 120%
Silver	0.50	ND	0.49	98.0%	80% - 120%

ND - Parameter not detected at the stated detection limit.

References: Method 1311, Toxicity Characteristic Leaching Procedure, SW-846, USEPA, Dec. 1996

Methods 3010, 3020, Acid Digestion of Aqueous Samples and Extracts for Total Metals, SW-846, USEPA, December 1996.

Methods 7060B, 7081, 7131A, 7191, 7470A, 7421, 7740, 7761 Analysis of Metals by GFAA and Cold Vapor Techniques, SW-846, USEPA, December 1996.

Comments: **QA/QC for samples F925, F928, F931, F934 and F922.**

Analyst

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CHAIN OF CUSTODY RECORD

7285

Client / Project Name	Project Location	ANALYSIS / PARAMETERS
Burlington	Standard Oil Com #1	
Sampler: James A. Coules	Client No. 92197-01	

Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	No. of Containers	8021 BTEX	Anion/Cation	RCRA 8 Metals				Remarks
WS-1	8-18-99	9:30	F932	Water	2	X						
WS-2	8-18-99	9:35	F933	Water	1		X					
WS-3	8-18-99	9:40	F934	Water	1			X				

	Date	Time		Date	Time
Relinquished by: (Signature) James A. Coules	8-18-99	11:00a	Received by: (Signature) Allen P. Applegate	8.18.99	11:00
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

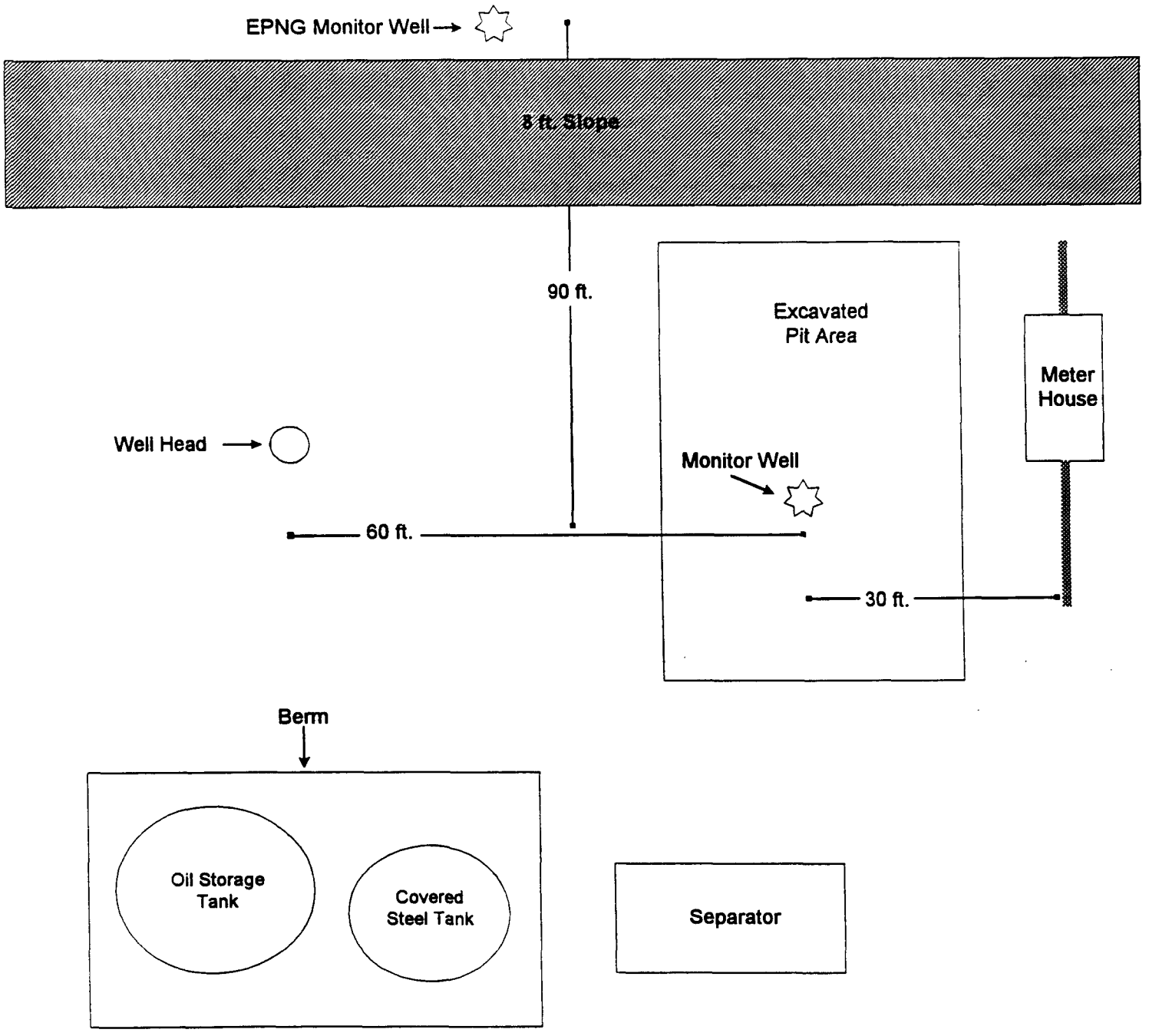
Sample Receipt	Y	N	N/A
Received Intact	✓		
Cool - Ice/Blue Ice	✓		

Location Diagram

BURLINGTON RESOURCES

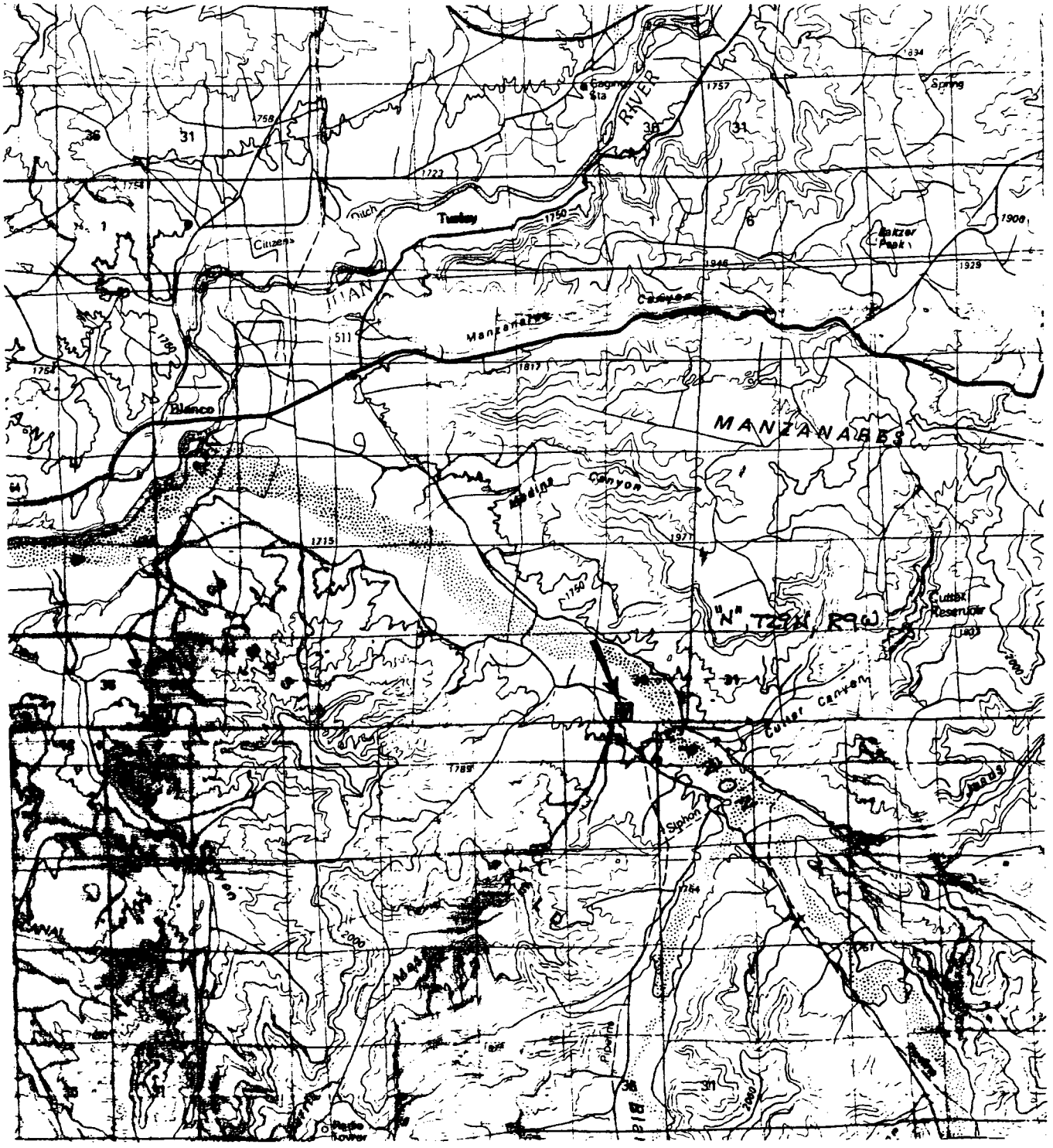
STANDARD OIL COM NO. 1

MONITOR WELL INSTALLATION



Not to scale - distances are approximate

stdoil1.vsd 9/10/99



All angles, directions, and distances determined by sighting and pacing from existing site features. Accuracy of measurements implied only to the degree of accuracy of method.

Burlington Resources Standard Oil Com #1 Monitor Well Installation Largo Canyon Blanco, New Mexico San Juan County, NM Project No.: 92197-01	Envirotech Inc. Environmental Scientists & Engineers 5796 US Highway 64 Farmington, New Mexico	Vicinity Map Figure 1 | Date: 08/99 DRW: JAC | PRJ MGR: JAC