STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501

FORM C-108
Revised 7-1-81

3

9511

APPLICATION FOR AUTHORIZATION TO INJECT

I. Purpose: ☐ Secondary Recovery ☐ Pressure Maintenance ☒ Disposal ☐ Storage
Application qualifies for administrative approval? ☒ yes ☐ no

II. Operator: PHILLIPS PETROLEUM COMPANY

Address: 4001 PENBROOK; ODESSA, TEXAS 79762

Contact party: L. M. SANDERS Phone: (915) 367-1488

III. Well data: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? ☐ yes ☒ no
If yes, give the Division order number authorizing the project _____.

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

* VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geological data on the injection zone including appropriate lithologic detail, geological name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such source known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

* X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division they need not be resubmitted.)

* XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification

I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

Name: W. F. MUELLER Title Asst. Engr. Supv.

Signature: W. F. Mueller Date: 24 Oct 1985

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be duplicated and resubmitted. Please show the date and circumstance of the earlier submittal. _____

DISTRIBUTION

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

(1) Lease name; Well No.; location by Section, Township, and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

(1) The name, address, phone number, and contact party for the applicant;

(2) the intended purpose of the injection well; with the exact location of single wells or the section, township, and range location of multiple wells;

(3) the formation name and depth with expected maximum injection rates and pressures; and

(4) a notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico 87501 within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

Application for Authorization to Inject

PHILLIPS PETROLEUM COMPANY
LAMBIRTH A NO. 6

III. WELL DATA
(see Attachment No. 1)

A.	1. Name and Location:	Lambirth A Well Number 6 1830' FSL and 1980' FEL Section 30, T-5-S, R-33-E, NMPM Roosevelt County, New Mexico
	2. Casing Surface:	13-3/8" OD, 48#, H-40 set at 355' (17 1/2" hole). Cemented with 600 sacks; TOC at surface (circulated 180 sacks).
	Intermediate:	8-5/8" OD, 24#, K-55 set at 3454' (11" hole). Cemented with 2300 sacks; TOC at surface (circulated 124 sacks).
	Production:	5-1/2" OD, 17#/14.5#, K-55 set at 8100' (7 hole). Cemented with 475 sacks; TOC at 6120' (temperature survey).
	3. Tubing:	2-3/8" OD, 4.7#, J-55 set at 7850' (internally plastic coated).
	4. Packer:	Baker Lok-Set Retrievable Packer with Baker Model "FL" On/Off Tool set at 7850'.
B.	1. Formation:	Fusselman-Montoya
	2. Interval:	7892' - 7944' perforated at 2 SPF (52' total and 104 shots)
	3. Original Intent:	Well was drilled for oil production.
	4. Perforated Intervals:	see schematic -- Attachment No. 1
	5. Productive Zones Higher:	Bough (7564') Cisco (7693')

APPLICATION for AUTHORIZATION to INJECT

PHILLIPS PETROLEUM COMPANY
LAMBIRTH A WELL NO 6

VI. WELLS WITHIN THE AREA OF INTEREST
(radius of investigation = 5/8 mile)

Operator	Well Name	Location	Date Completed (Depth ft)	Well Type	Surface Casing			Intermediate Casing			Production Casing			Initial Completion (zone)	Current Completion (zone)
					Size (in)	Depth (ft)	Cement (sx)	Size (in)	Depth (ft)	Cement (sx)	Size (in)	Depth (ft)	Cement (sx)		
Amoco Production Company	Lambirth Gas Com #1	660' FNL & 1980' FEL Sec 30, T-5-S, R-33-E Roosevelt County, NM	22 January 1973 (7852)	oil	8 5/8	1927	800	--	--	--	5 1/2	7852	250	7650' - 7800' (Penn)	plugged (Attachment No. 2)
	Peterson B #1	1980' FNL & 660' FWL Sec 29, T-5-S, R-33-E Roosevelt County, NM	22 January 1973 (7877)	oil	13 3/8	344	425	8 5/8	3472	800	5 1/2	7877	250	7562' - 7692' (Penn)	plugged (Attachment No. 3)
Energy Reserves Group	Radcliff #1	1980' FNL & 660' FWL Sec 30, T-5-S, R-33-E Roosevelt County, NM	11 June 1981 (8100)	gas	13 3/8	372	350	8 5/8	3256	1200	4 1/2	8098	500	7647' - 7870' (Fusselman-Montoya)	plugged (Attachment No. 4)
H. P. Operating Company	* Lambirth #7	510' FSL & 660' FEL Sec 30, T-5-S, R-33-E Roosevelt County, NM	16 June 1979 (7872)	oil	13 3/8	305	300	8 5/8	1991	750	5 1/2	7850	450	7824' - 7829' (Fusselman-Montoya)	7628' - 7710' (Penn)
	* Lambirth #8	1980' FSL & 810' FWL Sec 30, T-5-S, R-33-E Roosevelt County, NM	27 October 1979 (7960)	oil	13 3/8	355	350	9 5/8	1998	720	7	7950	600	7816' - 7828' (Fusselman-Montoya)	7584' - 7737' (Penn)
Phillips Petroleum Company	Lambirth A #4	560' FNL & 560' FEL Sec 31, T-5-S, R-33-E Roosevelt County, NM	30 September 1979 (8000)	oil	13 3/8	360	420	8 5/8	3500	500	5 1/2	8000	960	7814' - 7920' (Fusselman-Montoya)	no change
	Lambirth A #5	660' FSL & 660' FWL Sec 30, T-5-S, R-33-E Roosevelt County, NM	05 May 1980 (8000)	oil	13 3/8	357	420	8 5/8	3500	900	5 1/2	7990	480	7664' - 7798' (Penn)	no change
	Peterson H #1	660' FSL & 510' FWL Sec 29, T-5-S, R-33-E Roosevelt County, NM	15 December 1980 (8000)	oil	13 3/8	350	420	8 5/8	3496	1000	5 1/2	7982	800	7792' - 7806' (Fusselman-Montoya)	plugged (Attachment No. 5)

* Indicates wells within 1/2 mi radius

Application for Authorization to Inject

PHILLIPS PETROLEUM COMPANY
LAMBIRTH A NO. 6

VII. PROPOSED INJECTION OPERATIONS

1. Rates:	average - 900 bwpd maximum - 2000 bwpd
2. System:	closed
3. Pressures:	average - < 1000 psi maximum - 1578 psi
4. Fluid:	Produced water analyses from the Phillips Lambirth A and B Leases (Fusselman-Montoya formation); see Attachments No. 6 and 7.
5. Disposal Zone:	The Fusselman-Montoya is not hydrocarbon productive below the OWC in this area.

VIII. GEOLOGICAL DATA

A. Injection Zone:	The Fusselman-Montoya Formation in this well (7810'-8020') consists of 210' of dolomite with porosities ranging from 1% to 15%. Mudlogs and cores in offset wells describe a tan, sucrosic, cherty dolomite. This unit is transitional down into red-brown sands and shales of the underlying Granite Wash. The top of the unit is truncated by Pennsylvanian age shales and limestones.
B. Fresh Water Sources:	There is potential for surface recharged fresh water from the surface to the bottom of the Triassic Red Beds at 1860'. No other potable water exists above or below the salt water disposal zones.

Application for Authorization to Inject

PHILLIPS PETROLEUM COMPANY
LAMBIRTH A NO. 6

IX. PROPOSED STIMULATION PROGRAM

The Fusselman-Montoya perforated interval, 7892'-7944', will be acidized with 5,500 gallons of 15% NEFe HCl acid with 1 ball sealer (SG = 1.3) dropped in every 46 gallons (120 balls total).

Maximum surface treating pressure = 4000 psi
Maximum surface treating rate = 3 to 4 bpm

X. LOGGING DATA

Well logs were filed after well was drilled in 1982; well name has not changed since that time.

XI. FRESH WATER ANALYSES

Fresh Water Well Locations -- see Attachment No. 8.

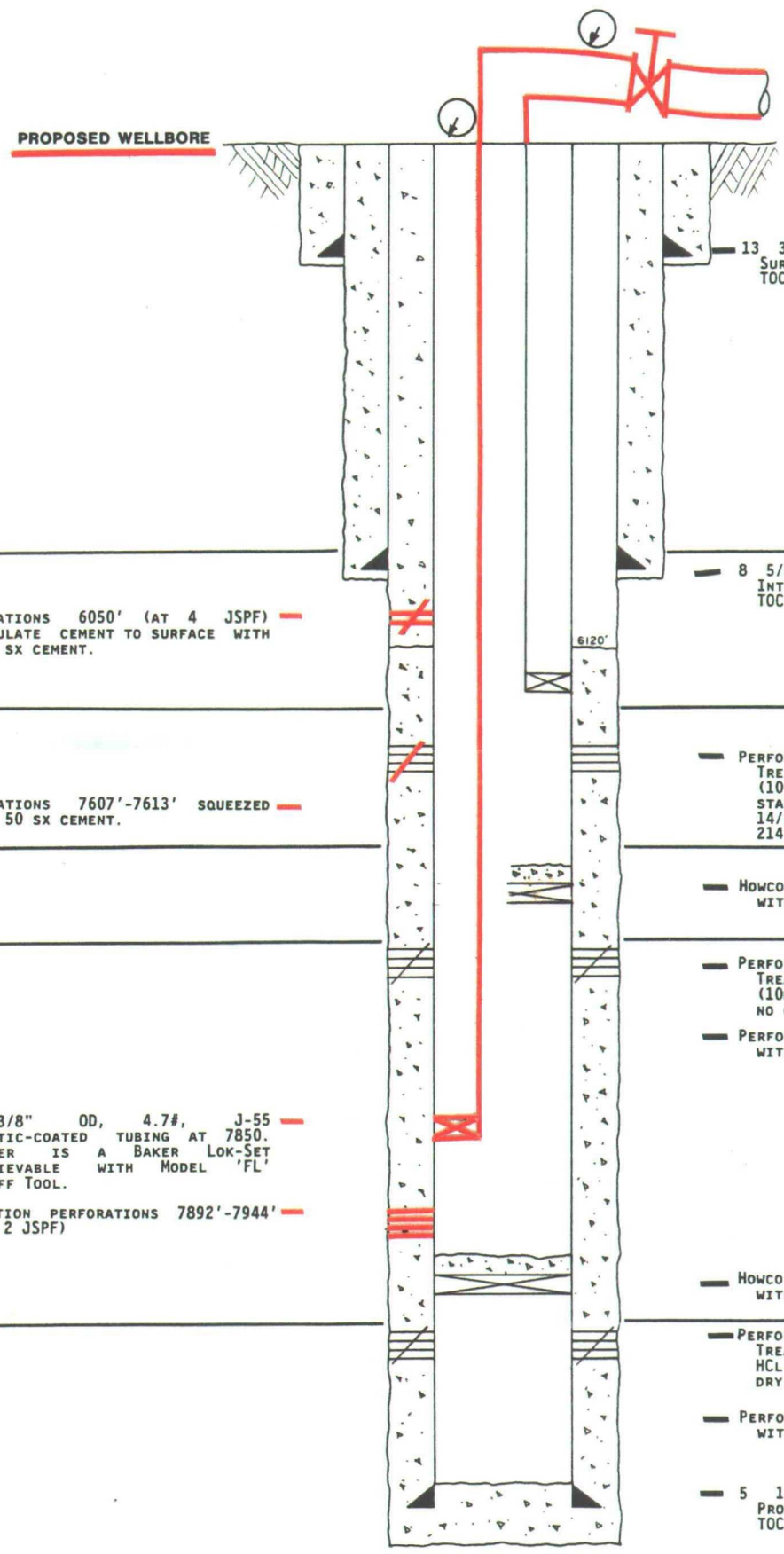
Fresh Water Analyses -- see Attachments No. 9 and 10.

XII. AFFIRMATIVE STATEMENT

There is no evidence of faulting in the area at depths less than 7700'. All wells within the Area of Review have been properly cased, cemented or plugged. Therefore, there is no evidence of any hydrologic connection between the disposal zone and any underground source of drinking water.

PROPOSED INJECTION WELL SCHEMATIC

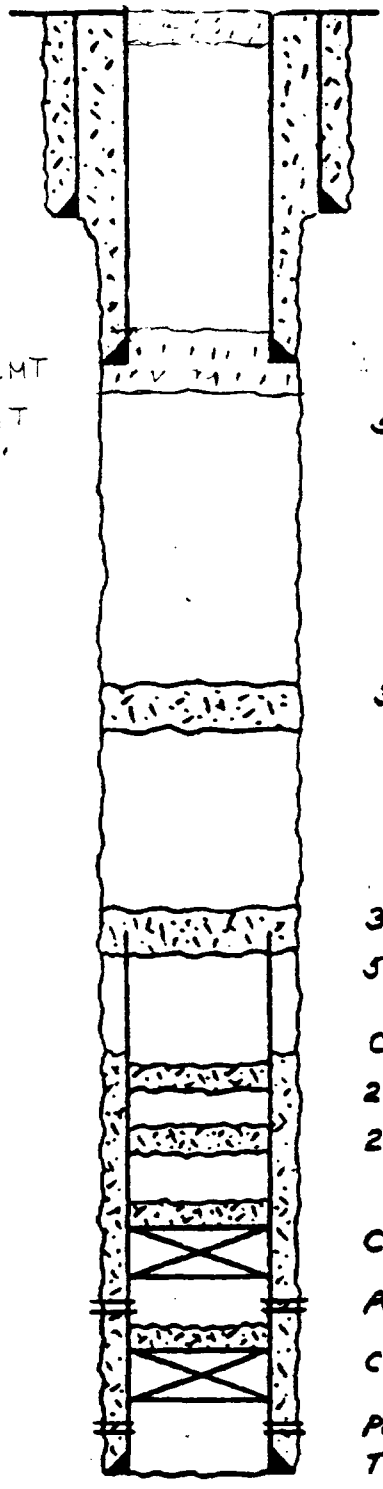
PHILLIPS PETROLEUM COMPANY
LAMBIRTH A WELL #6
1830'FSL & 1980'FEL
SEC 30, T-5-S, R-33- E, NMPM
ROOSEVELT CO., NEW MEXICO



FORMATION TOPS	PROPOSED WELLBORE	EXISTING WELLBORE	SEQUENCE
		13 3/8" OD, 24#, H-40, ST & C SURFACE CASING AT 355' TOC AT SURFACE (420 SX).	1
SAN ANDRES (3080')			
	PERFORATIONS 6050' (AT 4 JSPF) CIRCULATE CEMENT TO SURFACE WITH 1000 SX CEMENT.	8 5/8" OD, 24#, K-55, ST & C INTERMEDIATE CASING AT 3454'. TOC AT SURFACE (2176 SX).	2
BOUGH (7564')			
	PERFORATIONS 7607'-7613' SQUEEZED WITH 50 SX CEMENT.	PERFORATIONS 7607'-7613'(AT 2 JSPF) TREATED WITH 800 GAL 15% NEFE HCL (10 MIN SIP = 0#). SWABBED AND STARTED FLOWING; IP(FLOWING ON 14/64" CHOKE) 16 BO, 3 BW AND 214 MCF.	8
CISCO (7693')			
		HOWCO EZ-DRIL RETAINER AT 7741' WITH 8 SX CEMENT ON TOP.	7a
FUSSELMAN-MONTOYA (7808')			
		PERFORATIONS 7814'-7824'(AT 2 JSPF) TREATED WITH 1000 GAL 15% NEFE HCL (10MIN SIP = 800#). SWABBED DRY; NO OIL/GAS SHOWS.	6
		PERFORATIONS 7814'-7824' SQUEEZED WITH 50 SX CEMENT.	7
	2 3/8" OD, 4.7#, J-55 PLASTIC-COATED TUBING AT 7850. PACKER IS A BAKER LOK-SET RETRIEVABLE WITH MODEL 'FL' ON/OFF TOOL.		
	INJECTION PERFORATIONS 7892'-7944' (AT 2 JSPF)		
		HOWCO EZ-DRIL RETAINER AT 7963' WITH 3 1/2 SX CEMENT ON TOP.	5a
GRANITE (8022')			
		PERFORATIONS 8042'-8056'(AT 2 JSPF) TREATED WITH 1000 GAL 7 1/2% NEFE HCL (10 MIN SIP = 220#). SWABBED DRY; NO OIL/GAS SHOWS.	4
		PERFORATIONS 8042'-8056' SQUEEZED WITH 50 SX CEMENT.	5
		5 1/2" OD, 17# TO 14.5#, K-55 PRODUCTION CASING AT 8100'. TOC AT 6120' (475 SX).	3

7892
.2
1478.4

ATTACHMENT NO. 1



10 SX CEMENT PLUG AT SURFACE.

8⅝", 24#/FT, K-55 SURFACE CASING @ 1927', TOP OF CEMENT AT SURFACE (800 SX)

75 SX CMT PLUG AT 2100'

5½", 15.5#/FT, K-55 PRODUCTION CASING @ 3090', TOP OF CEMENT AT SURFACE (550 SX), HOLE SIZE 7⅞"

35 SX CEMENT PLUG 4290'-4390'

35 SX CEMENT PLUG 5750'-5850'

5½", 14#/FT - 17#/FT, K-55 CASING @ 7852', CUT AND PULLED ABOVE 5800'

CALCULATED T.O.C. OUTSIDE 5½" CSG @ 6300'

25 SX CEMENT PLUG 6466'-6566'

25 SX CEMENT PLUG 7140'-7240'

CIBP @ 7560' W/35' CEMENT ON TOP

PERFS 7650'-7658'

CIBP @ 7780' W/10' CEMENT ON TOP

PERFS 7796'-7800'

TD 7852'

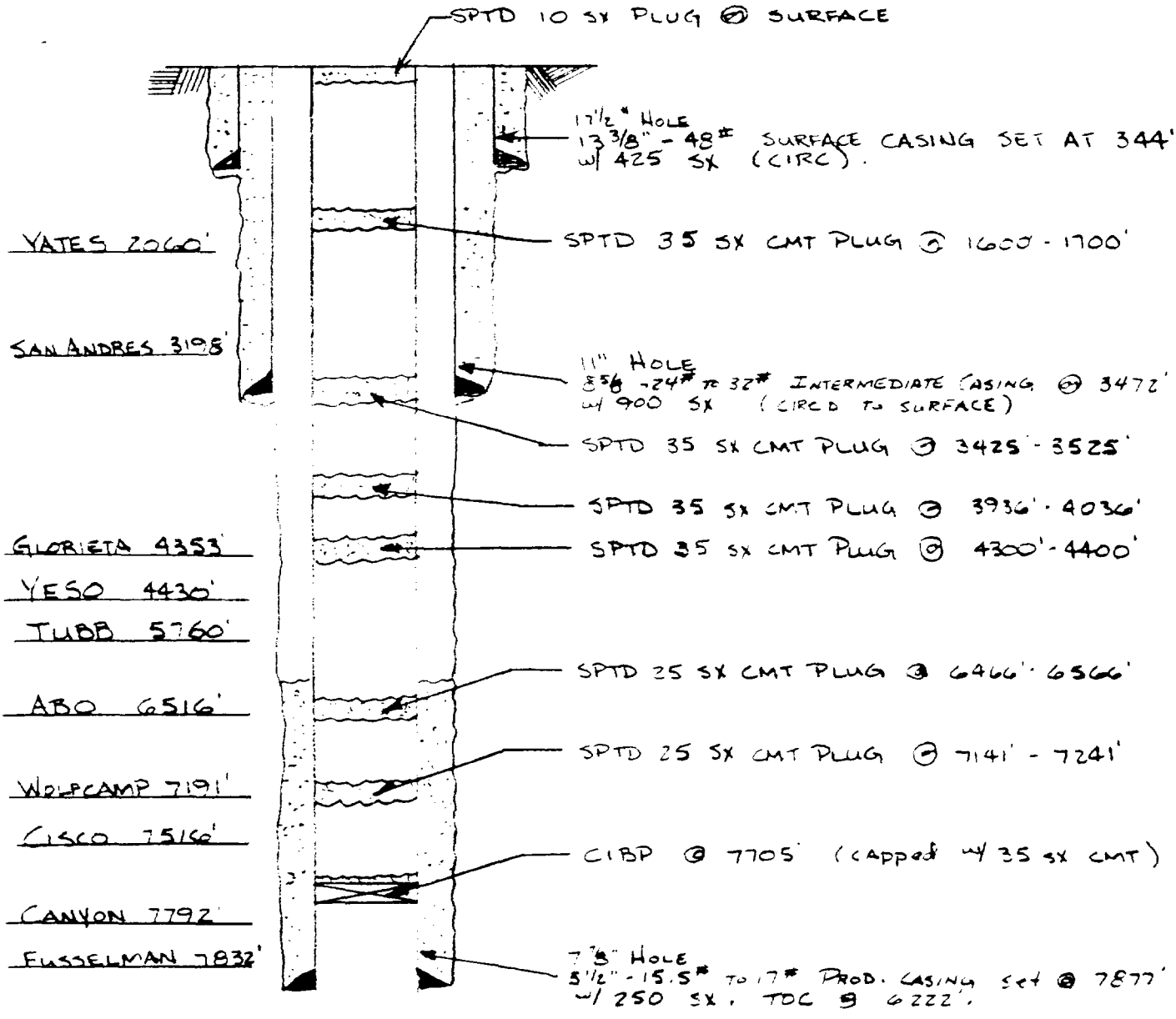
ATTACHMENT NO. 2

WELL SCHEMATIC

NO.	REVISION	BY	DATE	CHKD	APP'D

FOR BIDS	PHILLIPS PETROLEUM COMPANY BARTLESVILLE, OKLAHOMA	JA NO.	FILE CODE
FOR APPR		AFE NO.	SCALE NONE
FOR CONST	AMOCO – LAMBIRTH GAS COM #1 660' FNL & 1980' FEL, SECTION 30, T-5-S, R-33-E NMPM ROOSEVELT COUNTY, NEW MEXICO	DWG NO.	
DRAWN 10/24/86 JCC		SH NO.	
CHECKED			
APP'D			

DATE OF ABANDONMENT: 2-17-76



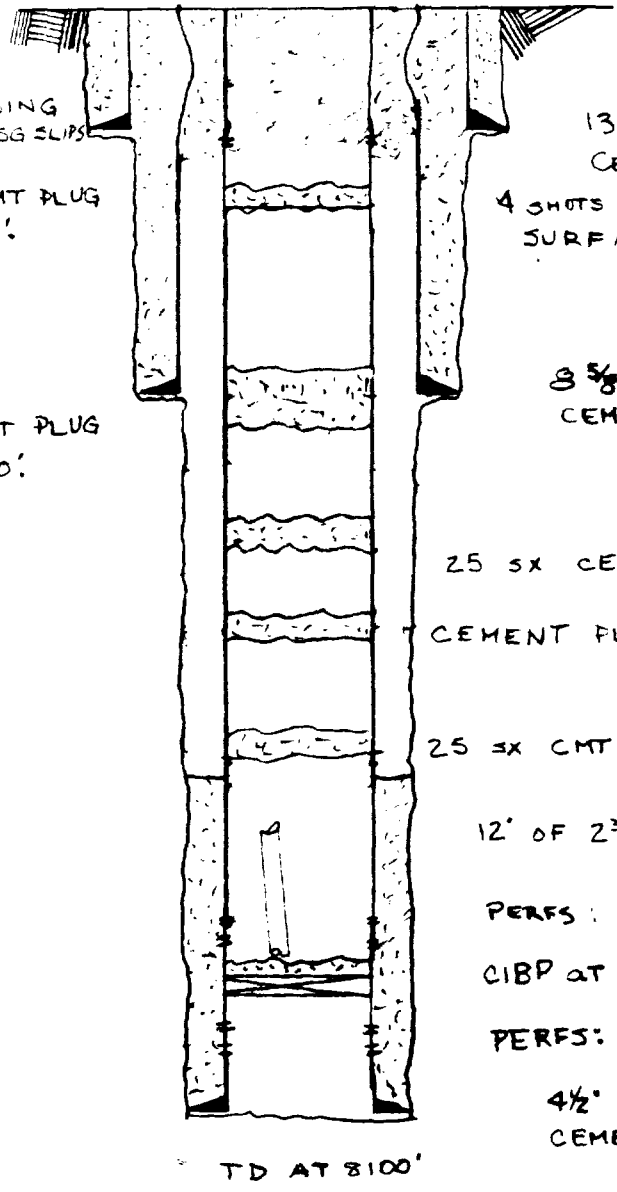
ATTACHMENT NO. 3

NO.	REVISION	BY	DATE	CHKD	APP'D

FOR BIDS	PHILLIPS PETROLEUM COMPANY	JA NO	FILE CODE
FOR APPR	BARTLESVILLE, OKLAHOMA	AFE NO	SCALE
FOR CONST	AMOCO - PETERSON "B" WELL # 1 1980' FSL & 660' FWL, UNIT E SEC 29, T-5-S, R-33-E ROOSEVELT CO., NEW MEXICO	DWG NO	
DRAWN		SH NO	
CHECKED			
APP'D			

RC — ORIGINAL

FORM 1779-S 7-84



13 3/8" SURFACE CASING @ 372' W/ 350 SX CEMENT AT SURFACE (CIRC).

4 SHOTS AT 380'; CIRCULATE 90 SX CMT TO SURFACE IN 4 1/2" CASING ANNULUS.

8 5/8" INTERMEDIATE CASING @ 3303' W/ 1200 SX CEMENT TO SURFACE (CIRC).

25 SX CEMENT PLUG AT 4400'.

CEMENT PLUG AT 4769'.

25 SX CMT PLUG AT 5090'.

12' OF 2 3/8" TBG, TAC AND BULL PLUG IN HOLE.

PERFS: 7647-7760'.

CIBP AT 7838' WITH 20' CMT ON TOP.

PERFS: 7850'-7878'.

4 1/2" PROD. CASING @ 8100' W/ 500 SX CEMENT AT 6750' (TEMP. SURVEY).

ATTACHMENT NO. 4

NO.	REVISION	BY	DATE	CHKD	APP'D

FOR BIDS
FOR APPR
FOR CONST

DRAWN
CHECKED
APP'D

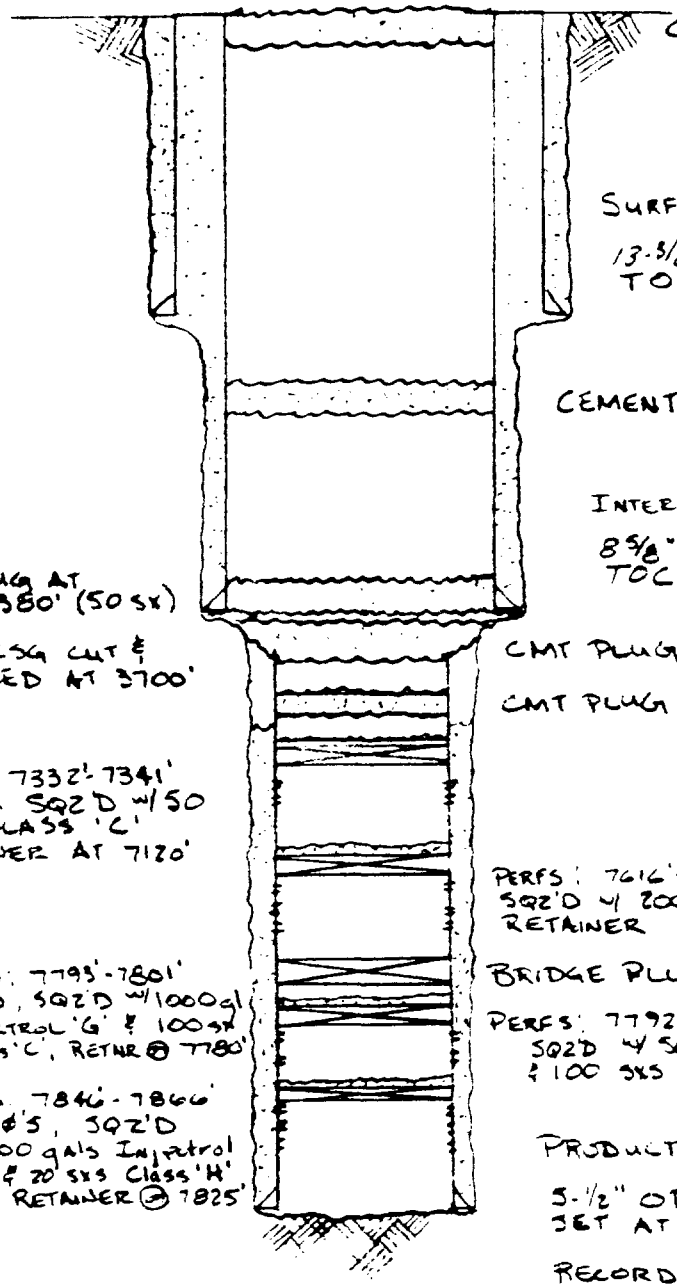
PHILLIPS PETROLEUM COMPANY
BARTLESVILLE, OKLAHOMA

ENERGY RESERVES GROUP
RADCLIFF WELL # 1
1980' FNL & 660' FWL SEC 30, T-5-S, R-33-E, ROOSEVELT CO., NEW MEXICO

JA NO. | FILE CODE
AFE NO. | SCALE
DWG NO.
SH NO.

RC — ORIGINAL

FORM 1779-S 7-84



CMT PLUG AT 100' - SURFACE (27 SX)

SURFACE CASING
13-5/8" OD 48# K-55 SET AT 351'
TOC AT SURFACE.

CEMENT PLUG AT 1800'-1660' (50 SX)

INTERMEDIATE CASING
8 5/8" OD 24# K-55 ST&C SET AT 3496'
TOC AT SURFACE.

CMT PLUG AT 3550'-3380' (50 SX)

5½" CSG CUT & PULLED AT 3700'

CMT PLUG 3750'-3555' (50 SX)

CMT PLUG 3975'-3832' (25 SX)

PERFS: 7332'-7341'
18 ϕ's. SQZ'D W/50 SX CLASS 'C'
RETAINER AT 7120'

PERFS: 7616'-7760' 110 ϕ's
SQZ'D W/ 200 SX CLASS 'H'
RETAINER AT 7499'

PERFS: 7795'-7801'
32 ϕ's, SQZ'D W/1000 gal INJECTROL 'G' & 100 SX CLASS 'C', RETNR @ 7780'

BRIDGE PLUG AT 7768'

PERFS: 7792'-7806' 14 ϕ's
SQZ'D W/ 5000 gal INJECTROL 'G' & 100 SXS OF CLASS 'C'.

PERFS: 7846'-7866'
20 ϕ's, SQZ'D W/1000 gals INJECTROL 'G' & 20 SXS CLASS 'H' CMT RETAINER @ 7825'

PRODUCTION CASING
5-½" OD 14# K-55 TO 15.5# K-55
SET AT 7982', TOC AT 5210 (800 SX)

RECORD TD AT 7994'

ATTACHMENT NO. 5

NO	REVISION	BY	DATE	CHK'D	APP'D

FOR BIDS	PHILLIPS PETROLEUM COMPANY	JA NO	FILE CODE
FOR APPR	BARTLESVILLE, OKLAHOMA	AFE NO	SCALE
FOR CONST	PETERSON "H" WELL #1 660' FSL & 510' FWL SEC 29, T-5-S, R-33-E	DWG NO	
DRAWN B. HESTER		SH NO.	
CHECKED			
APP'D			

Unichem International

707 North Leech P.O.Box 1499

Hobbs, New Mexico 88240

Company : Phillips Petroleum Company
Date : 08-22-1988
Location: Lambirth "A" Battery (on 08-12-1988)

	Sample 1
Specific Gravity:	1.068
Total Dissolved Solids:	95789
pH:	6.33
IONIC STRENGTH:	1.843

CATIONS:		me/liter	mg/liter
Calcium	(Ca^{+2})	231	4610
Magnesium	(Mg^{+2})	108	1310
Sodium	(Na^{+1})	1320	30500
Iron (total)	(Fe^{+2})	1.43	39.8
Barium	(Ba^{+2})	0.019	1.30
ANIONS:			
Bicarbonate	(HCO_3^{-1})	8.39	512
Carbonate	(CO_3^{-2})	0	0
Hydroxide	(OH^{-1})	0	0
Sulfate	(SO_4^{-2})	18.7	900
Chloride	(Cl^{-1})	1640	58000

SCALING INDEX (positive value indicates scale)

Temperature		Calcium Carbonate	Calcium Sulfate
86°F	30°C	0.01	-24

ATTACHMENT NO. 6

Unichem International

707 North Leech P.O.Box 1499

Hobbs, New Mexico 88240

Company : Phillips Petroleum Company
Date : 08-22-1988
Location: Lambirth Unit - "B" Well (on 08-12-1988)

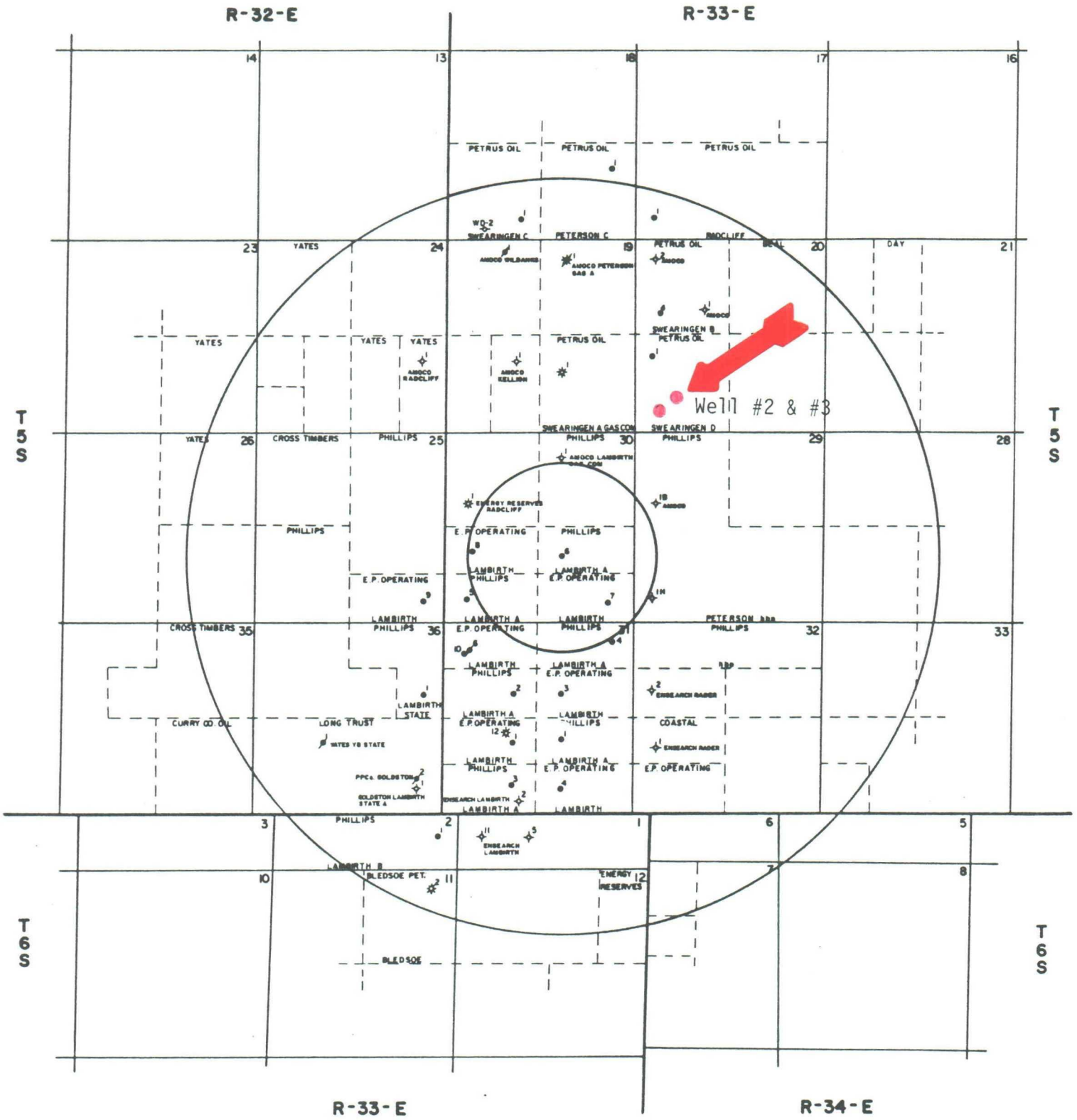
	Sample 1
Specific Gravity:	1.001
Total Dissolved Solids:	754
pH:	8.05
IONIC STRENGTH:	0.019

CATIONS:		me/liter	mg/liter
Calcium	(Ca^{+2})	4.00	80.0
Magnesium	(Mg^{+2})	6.20	75.3
Sodium	(Na^{+1})	1.36	31.3
Iron (total)	(Fe^{+2})	0.218	6.10
Barium	(Ba^{+2})	0.001	0.100
ANIONS:			
Bicarbonate	(HCO_3^{-1})	4.20	256
Carbonate	(CO_3^{-2})	0	0
Hydroxide	(OH^{-1})	0	0
Sulfate	(SO_4^{-2})	3.97	191
Chloride	(Cl^{-1})	3.38	120

SCALING INDEX (positive value indicates scale)

Temperature		Calcium Carbonate	Calcium Sulfate
86°F	30°C	0.83	-16

ATTACHMENT NO.7



AREA OF REVIEW

PHILLIPS PETROLEUM COMPANY

LAMBIRTH A 6

ROOSEVELT COUNTY, NEW MEXICO

ATTACHMENT NO. 8

Unichem International

707 North Leech **P.O.Box 1499**

Hobbs, New Mexico 88240

Company : Phillips Petroleum Company
Date : 08-22-1988
Location: Peterson - Water Well #2 (on 08-12-1988)

	Sample 1
Specific Gravity:	1.001
Total Dissolved Solids:	1077
pH:	7.33
IONIC STRENGTH:	0.024

CATIONS:		me/liter	mg/liter
Calcium	(Ca^{+2})	3.00	60.0
Magnesium	(Mg^{+2})	4.40	53.5
Sodium	(Na^{+1})	8.77	202
Iron (total)	(Fe^{+2})	0.118	3.30
Barium	(Ba^{+2})	0.003	0.200
ANIONS:			
Bicarbonate	(HCO_3^{-1})	3.40	207
Carbonate	(CO_3^{-2})	0	0
Hydroxide	(OH^{-1})	0	0
Sulfate	(SO_4^{-2})	8.07	388
Chloride	(Cl^{-1})	4.70	167

SCALING INDEX (positive value indicates scale)

Temperature		Calcium Carbonate	Calcium Sulfate
86°F	30°C	-0.13	-15

ATTACHMENT NO. 9

Unichem International

707 North Leech P.O.Box 1499

Hobbs, New Mexico 88240

Company : Phillips Petroleum Company
Date : 08-22-1988
Location: Peterson - Water Well #3 (on 08-12-1988)

	Sample 1
Specific Gravity:	1.001
Total Dissolved Solids:	1969
pH:	7.15
IONIC STRENGTH:	0.056

CATIONS:		me/liter	mg/liter
Calcium	(Ca^{+2})	18.0	360
Magnesium	(Mg^{+2})	14.4	175
Sodium	(Na^{+1})	1.59	36.5
Iron (total)	(Fe^{+2})	0.054	1.50
Barium	(Ba^{+2})	0.003	0.200
ANIONS:			
Bicarbonate	(HCO_3^{-1})	1.40	85.4
Carbonate	(CO_3^{-2})	0	0
Hydroxide	(OH^{-1})	0	0
Sulfate	(SO_4^{-2})	12.5	600
Chloride	(Cl^{-1})	20.1	713

SCALING INDEX (positive value indicates scale)

Temperature		Calcium Carbonate	Calcium Sulfate
86°F	30°C	-0.05	-4.9

ATTACHMENT NO. 10