

CASE 3066: Application of GULF
for a waterflood project, Lea
County, New Mexico.

CASE NO.

3066

Application,

TRANSCRIPTS,

SMALL Exhibits

ETC.

Docket No. 16-64

DOCKET: EXAMINER HEARING - WEDNESDAY - JUNE 10, 1964

9 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

The following cases will be heard before Daniel S. Nutter, Examiner, or Elvis A. Utz, Alternate Examiner:

- CASE 3063: Application of R. C. Davoust Company for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Turkey Track Section 3 Unit Area comprising 480 acres of State land in Section 3, Township 19 South, Range 29 East, Eddy County, New Mexico.
- CASE 3064: Application of R. C. Davoust Company for a waterflood expansion, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the expansion of the Turkey Track Queen Waterflood Project in Section 34, Township 18 South, Range 29 East and Section 3, Township 19 South, Range 29 East, Turkey Track Field, Eddy County, New Mexico, to include the Grayburg formation.
- CASE 3065: Application of Gulf Oil Corporation for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the approval of the West Pearl Queen Unit Area comprising 2520 acres, more or less, of State, Fee and Federal lands in Township 19 South, Range 35 East, Lea County, New Mexico.
- CASE 3066: Application of Gulf Oil Corporation for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in the Pearl Queen Pool by the injection of water into the Queen formation through 30 wells in Sections 28, 29, 30, 31, 32, and 33, Township 19 South, Range 35 East, Lea County, New Mexico.
- CASE 3067: Application of Texaco Inc., for the creation of a new oil pool and for special temporary pool rules, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new oil pool for Pennsylvanian production for its Navajo Tribal AL Well No. 1 located in Unit H of Section 28, Township 26 North, Range 18 West, San Juan County, New Mexico, and for the establishment of temporary pool rules including a provision for 80-acre spacing and a GOR limitation of 4000 to 1.
- CASE 3068: Application of Amerada Petroleum Corporation for a salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water in the interval from 9005 to 9033 feet, Pennsylvanian formation, through its L. H. Chambers Well No. 2 located in Unit C of Section 11, Township 12 South, Range 33 East, Bagley Field, Lea County, New Mexico.
- CASE 3069: Application of Continental Oil Company for a pressure maintenance project and a dual completion, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a pressure maintenance project in the Pennsylvanian "CD" formation underlying its Rattlesnake lease in Sections 1, 2, 11, and 12, Township 29 North, Range 19 West, Rattlesnake-Pennsylvanian "CD" Pool, San Juan County, New Mexico.

Initial injection to be through two wells located in Units B and H of Section 11, one of which, No. 146 in Unit B, would be dually completed for water injection through tubing and Pennsylvanian "B" Gas Pool production through the casing tubing annulus. Applicant further seeks the promulgation of special rules for the operation of said project.

CASE 3038: Application of Kennedy Oil Company for a waterflood buffer zone and capacity allowables, Eddy County, New Mexico, or a determination that an offset well is producing primary oil. Applicant, in the above-styled cause, seeks the designation of the N/2 SW/4 of Section 20, Township 16 South, Range 31 East, Square Lake Pool, Eddy County, New Mexico, as a buffer zone adjacent to a waterflood project operated in the S/2 SW/4 of said Section 20 by Newmont Oil Company and the assignment of capacity allowables to applicant's Rowley Federal Wells Nos. 1 and 2 located in Units K and L, respectively, of said Section 20. In the alternative, applicant seeks a determination that the Newmont well located in Unit N and applicant's wells in Units K and L of Section 20 are producing primary oil and are not affected by the Newmont waterflood. Upon such determination, applicant seeks the assignment of normal primary allowables to the wells located in Units K, L and N of Section 20.

Gulf Oil Corporation

ROSWELL PRODUCTION DISTRICT

W. B. Hopkins
DISTRICT MANAGER
M. I. Taylor
DISTRICT PRODUCTION
MANAGER
F. O. Mortlock
DISTRICT EXPLORATION
MANAGER
H. A. Rankin
DISTRICT SERVICES MANAGER

June 11, 1964

1964 JUN 12 PM 1:32 P. O. Drawer 1938
Roswell, New Mexico 88201

Oil Conservation Commission
Post Office Box 2088
Santa Fe, New Mexico 87501

Attention: Mr. Dan S. Nutter,
Chief Engineer

Re: Case No. 3066
West Pearl Queen Unit Waterflood

Gentlemen:

In testimony before the Oil Conservation Commission at the June 10, 1964 Examiner Hearing pertaining to Case No. 3066, Gulf offered two plans for dually injecting water into the Queen reservoir underlying the West Pearl Queen Unit. These two plans were described in Exhibits 8-11, which were entered in evidence, and outlined proposals for dually injecting through either two strings of coated tubing or simultaneously through one string of tubing and the tubing-casing annulus. Gulf indicated that neither plan had definitely been decided on since there were pros and cons for each which would have to be weighed and analyzed by our field personnel prior to a final decision. A decision has now been reached; Gulf plans to dually inject water into the Queen reservoir through injection wells equipped with dual strings of tubing as illustrated in Exhibit No. 8 and detailed in tabular form in Exhibit No. 9.

Yours very truly,

M. I. Taylor
M. I. Taylor

DGB:sz

cc: Mr. Frank E. Irby
Chief, Water Rights Division
State Engineer's Office
Capitol Building
Santa Fe, New Mexico 87501

Mrs. Marian M. Rhea
Supervisor, Unit Division
State Land Office
Post Office Box 1148
Santa Fe, New Mexico 87501



OIL CONSERVATION COMMISSION
P. O. BOX 871
SANTA FE, NEW MEXICO

June 19, 1964

C
O
P
Y

Mr. Bill Kastler
Gulf Oil Corporation
Post Office Box 1938
Roswell, New Mexico

Dear Mr. Kastler:

Enclosed herewith is Commission Order No. R-2729, entered in Case No. (3066) approving the West Pearl Queen Waterflood Project. Injection shall be through plastic coated tubing, and, in the case of dual injection wells, through parallel strings of plastic coated tubing, with separation of the zones by means of packers.

According to our calculations, when all of the authorized injection wells have been placed on active injection, the maximum allowable which this project will be eligible to receive under the provisions of Rule 701-E-3 is 2310 barrels per day.

Please report any error in this calculated maximum allowable immediately, both to the Santa Fe Office of the Commission and the appropriate district proration office.

In order that the allowable assigned to the project may be kept current, and in order that the operator may fully benefit from the allowable provisions of Rule 701, it behooves him to promptly notify both of the aforementioned Commission offices by letter of any change in the status of wells in the project area, i.e., when active injection commences, when additional injection or producing wells are drilled, when additional wells are acquired through purchase or unitization, when wells have received a response to water injection, etc.

OIL CONSERVATION COMMISSION
P. O. BOX 871
SANTA FE, NEW MEXICO

-2-

Mr. Bill Kastler

Your cooperation in keeping the Commission so informed as to the status of the project and the wells therein will be appreciated.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

Enclosure

cc: Oil Conservation Commission
Hobbs, New Mexico

Mr. Frank Irby
State Engineer Office
Santa Fe, New Mexico

C
O
P
Y

GOVERNOR
EDWIN L. MECHEM
CHAIRMAN

State of New Mexico
Oil Conservation Commission



LAND COMMISSIONER
E. S. JOHNNY WALKER
MEMBER

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

P. O. BOX 2088
SANTA FE
87501

Mr. Bill Kastler
Gulf Oil Corporation
Post Office Box 1938
Roswell, New Mexico

_____, 19____

Gentlemen:

Enclosed herewith is Commission Order No. R. 2729, entered in Case No. 3066, approving the West Pearl Queen Water Flood Project. *Injection shall be through plastic coated tubing, and, in the case of dual injection wells, through parallel strings of plastic coated tubing with operation of valves possible.*

According to our calculations, when all of the authorized injection wells have been placed on active injection, the maximum allowable which this project will be eligible to receive under the provisions of Rule 701-E-3 is 2310 barrels per day.

Please report any error in this calculated maximum allowable immediately, both to the Santa Fe office of the Commission and the appropriate District proration office.

In order that the allowable assigned to the project may be kept current, and in order that the operator may fully benefit from the allowable provisions of Rule 701, it behooves him to promptly notify both of the aforementioned Commission offices by letter of any change in the status of wells in the project area, i.e., when active injection commences, when additional injection or producing wells are drilled, when additional wells are acquired through purchase or unitization, when wells have received a response to water injection, etc.

Your cooperation in keeping the Commission so informed as to the status of the project and the wells therein will be appreciated.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

cc: Hobbs OCC
Frank Irby

DRAFT

JMD/esr

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE No. 3066

Order No. R- 2739

APPLICATION OF GULF OIL CORPORATION
FOR A WATERFLOOD PROJECT, LEA COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on June 10, 1964, at Santa Fe, New Mexico, before Daniel S. Nutter, Examiner duly appointed by the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," in accordance with Rule 1214 of the Commission Rules and Regulations:-

NOW, on this day of June, 1964, the Commission, a quorum being present, having considered the ~~application and the~~ testimony, the record, ~~evidence and the~~ and the recommendations of the Examiner, , and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the West Pearl Queen Unit Agreement has been approved by the Commission by Order No. R- 2728 that the West Pearl Queen Unit Area comprises 2,520 acres, more or less, of State, Fee, and Federal lands in Township 19 South, Range 35 East, NMPM, Lea County, New Mexico, as more fully described in said order.

(3) That of said 2,520 acres, 160 acres being the NW 1/4 of Section 28, Township 19 South, Range 35 East, NMPM, has not been ~~committed to~~ and evidently will not be committed to said unit agreement.

(4) That the applicant, Gulf Oil Corporation, seeks permission to institute a waterflood project in the Pearl-Queen Pool in the West Pearl Queen Unit Area by the injection of water into the

(4) That the proposed waterflood project is in the interest of conservation and should result in recovery of otherwise unrecoverable oil, thereby preventing waste.

(5) That the subject application should be approved and the project should be governed by the provisions of Rule 701 of the Commission Rules and Regulations.

(6) That Jake L. Hamon, owner of the NW 1/4 of Section 28, Township 19 South, Range 35 East, NMPM, should be ~~permitted~~ permitted to convert any wells on said acreage only after notice and hearing.

IT IS THEREFORE ORDERED:

(1) That the applicant, Gulf Oil Corporation, is hereby authorized to institute a waterflood project in the Pearl-Queen Pool in the West Pearl Queen Unit Area by the injection of water into the Queen formation through the following-described ²⁸ ~~30~~ wells in Township 19 South, Range 35 East, NMPM, Lea County, New Mexico:

<u>WELL</u>	<u>UNIT</u>	<u>SECTION</u>
Jake L. Hamon State Well No. 3	B	28
Jake L. Hamon State Well No. 4	F	28
Cabot Carbon State Well No. 5	J	28
Cabot Carbon State Well No. 1	L	28
Cabot Carbon State Well No. 4	N	28
Cabot Carbon State Well No. 7	P	28
<u>Section 29</u>		
Curtis R. Inman Superior Federal Well No. 2	B	29
Shell State Well No. 2	D	29
Cactus Parks Well No. 1	F	29
Skelly Hobbs State Well No. 1	H	29
Gulf Lea State Well No. 1	J	29
Gulf Lea State Well No. 4	L	29
Cactus Gulf State Well No. 4	N	29
Cactus Gulf State Well No. 2	P	29
<u>Section 30</u>		
Gulf Lea State Well No. 3	H	30
Gulf Lea State Well No. 1	P	30
<u>Section 31</u>		
Cactus Aztec State Well No. 2	B	31
Cactus Aztec State Well No. 6	F	31
Cactus Aztec State Well No. 4	H	31
Cactus Aztec State Well No. 7	J	31
<u>Section 32</u>		
Gulf Lea State Well No. 2	B	32
Gulf Lea State Well No. 4	D	32
Cactus Lea State Well No. 5	F	32
Cactus Lea State Well No. 7	H	32
Phillips Ranch Well No. 1	J	32
<u>Section 33</u>		
Gulf Lea State Well No. 3	B	33
Gulf Lea State Well No. 1	D	33
Gulf Lea State Well No. 6	F	33

(2) That the subject waterflood project shall be governed by the provisions of Rule 701 of the Commission Rules and Regulations, including the allowable provisions thereof, and including the provisions with respect to expansion of the waterflood project.

(3) That monthly progress reports of the waterflood project herein authorized shall be submitted to the Commission in accordance with Rules 704 and 1119 of the Commission Rules and Regulations.

(4) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

**BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO**

**IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:**

**CASE No. 3066
Order No. R-2729**

**APPLICATION OF GULF OIL CORPORATION
FOR A WATERFLOOD PROJECT, LEA COUNTY,
NEW MEXICO.**

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on June 10, 1964, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 18th day of June, 1964, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the West Pearl Queen Unit Agreement has been approved by the Commission by Order No. R-2728; that the West Pearl Queen Unit Area comprises 2520 acres, more or less, of State, Fee, and Federal lands in Township 19 South, Range 35 East, NMPM, Lea County, New Mexico, as more fully described in said order.

(3) That of said 2520 acres, 160 acres being the NW/4 of Section 28, Township 19 South, Range 35 East, NMPM, has not been and evidently will not be committed to said unit agreement.

(4) That the applicant, Gulf Oil Corporation, seeks permission to institute a waterflood project in the Pearl-Queen Pool in the West Pearl Queen Unit Area by the injection of water into the

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CASE No. 3066
Order No. R-2729

Queen formation through 28 wells located within that portion of the unit area which has been or will be committed to the unit agreement.

(5) That the wells in the project area are in an advanced state of depletion and should properly be classified as "stripper" wells.

(6) That the proposed waterflood project is in the interest of conservation and should result in recovery of otherwise unrecoverable oil, thereby preventing waste.

(7) That the subject application should be approved and the project should be governed by the provisions of Rule 701 of the Commission Rules and Regulations.

(8) That Jake L. Hamon, owner of the NW/4 of Section 28, Township 19 South, Range 35 East, NMPM, should be permitted to convert any wells on said acreage only after notice and hearing.

IT IS THEREFORE ORDERED:

(1) That the applicant, Gulf Oil Corporation, is hereby authorized to institute a waterflood project in the Pearl-Queen Pool in the West Pearl Queen Unit Area by the injection of water into the Queen formation through the following-described 28 wells in Township 19 South, Range 35 East, NMPM, Lea County, New Mexico:

<u>WELL</u>	<u>UNIT</u>
<u>Section 28</u>	
Cabot Carbon State "G" Well No. 5	J
Cabot Carbon State "G" Well No. 1	L
Cabot Carbon State "G" Well No. 4	N
Cabot Carbon State "G" Well No. 7	P
<u>Section 29</u>	
Curtis R. Inman Superior Federal Well No. 2	B
Shell State "PK" Well No. 2	D
Cactus Parks Well No. 1	F
Skelly Hobbs-State "J" Well No. 1	H
Gulf Lea-State "IH" Well No. 1	J

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CASE No. 3066

Order No. R-2729

Gulf Lea-State "IH" Well No. 4	L
Cactus Gulf-State "A" Well No. 4	N
Cactus Gulf-State "A" Well No. 2	P

Section 30

Gulf Lea-State "AP" Well No. 3	M
Gulf Lea-State "AP" Well No. 1	P

Section 31

Cactus Aztec-State Well No. 2	B
Cactus Actec-State Well No. 6	F
Cactus Aztec-State Well No. 4	H
Cactus Aztec-State Well No. 7	J

Section 32

Gulf Lea-State "AQ" Well No. 2	B
Gulf Lea-State "AQ" Well No. 4	D
Cactus Lea-State "AQ" Well No. 5	F
Cactus Lea-State "AQ" Well No. 7	H
Phillips New Mex "C" Well No. 1	J

Section 33

Gulf Lea-State "BG" Well No. 3	B
Gulf Lea-State "BG" Well No. 1	D
Gulf Lea-State "BG" Well No. 6	F
Gulf Lea-State "BG" Well No. 8	H
Gulf Lea-State "AR" Well No. 4	J

(2) That the subject waterflood project shall be governed by the provisions of Rule 701 of the Commission Rules and Regulations, including the allowable provisions thereof, and including the provisions with respect to expansion of the waterflood project.

(3) That monthly progress reports of the waterflood project herein authorized shall be submitted to the Commission in accordance with Rules 704 and 1119 of the Commission Rules and Regulations.

-4-

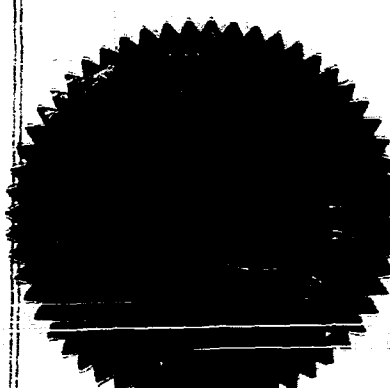
CASE No. 3066

Order No. R-2729

(4) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION



Jack M. Campbell

JACK M. CAMPBELL, Chairman

E. S. Walker

E. S. WALKER, Member

A. L. Porter, Jr.

A. L. PORTER, Jr., Member & Secretary

esr/

3066

MAIN OFFICE OCC

1964 JUN 16 AM 7:44

June 15, 1964

87501

C
O
P
Y

Mr. M. I. Taylor
Gulf Oil Corporation
P. O. Drawer 1938
Roswell, New Mexico 88201

Dear Mr. Taylor:

Receipt of your letter dated June 11, 1964 which states that the injection wells in the West Pearl Queen Unit waterflood, (OCC Case 3066) will be equipped with dual strings of tubing as illustrated in Exhibit No. 8 and detailed in tabular form in Exhibit No. 9 is gratefully acknowledged.

Very truly yours,

S. E. Reynolds
State Engineer

By:

Frank E. Irby
Chief
Water Rights Division

FEI/na
cc-A. L. Porter, Jr.

(Enc 3066)

Gulf Oil Corporation

ROSWELL PRODUCTION DISTRICT
May 19, 1964

W. B. Hopkins
DISTRICT MANAGER
M. I. Taylor
DISTRICT PRODUCTION
MANAGER
F. O. Mortlock
DISTRICT EXPLORATION
MANAGER
H. A. Rankin
DISTRICT SERVICES MANAGER

P. O. Drawer 1938
Roswell, New Mexico 88201

1964

Secretary Director
New Mexico Oil Conservation Commission
Post Office Box 2088
Santa Fe, New Mexico 87501

Re: Application of Gulf Oil Corporation for the Approval of the
West Pearl Queen Unit Agreement Providing for Secondary
Recovery Operations in a Portion of the Pearl Queen Pool,
Lea County, New Mexico.

Dear Sir:

Gulf Oil Corporation, as the proposed Unit Operator, respectfully herein requests the Commission's approval of the West Pearl Queen Unit Agreement, on the grounds that the proposed unit plan will in principle tend to promote the conservation of oil and gas and the prevention of waste. In support of the application, Gulf states as follows:

1. That the Unit Area shall be

T. 19 S., R. 35 E.

Section 20: SW/4 SE/4

Section 21: SW/4 SW/4

Section 28: W/2, W/2 SE/4 and SE/4 SE/4

Section 29: All

Section 30: E/2 SE/4, SE/4 NE/4 and SW/4 SE/4

Section 31: NE/4, E/2 NW/4, N/2 SE/4 and NE/4 SW/4

Section 32: N/2, N/2 SW/4 and NW/4 SE/4

Section 33: N/2 and N/2 SE/4

Containing 2,520 acres, more or less, more fully shown
on the enclosed plat.

2. That the Unit Area described above includes all producing Pearl Queen wells in Township 19 South, Range 35 East, west of Shell Oil Company's East Pearl Queen Unit and that no Pearl Queen wells are contiguous to the Unit Area other than those in the East Pearl Queen Unit.

3. That the average daily production for the wells in the proposed Unit Area has declined to approximately nine (9) barrels per day and that said wells have reached an advanced stage of depletion as is described in Rule 701 (E) (1).

4. That applicant proposes to convert thirty (30) wells to water injection wells, detailed descriptions of which are summarized and outlined in the enclosed tables and diagrammatic sketches. A copy of a log on a typical injection well is also enclosed.



DOCKET MAILED

Date 6-1-64

QR

Secretary Director
New Mexico Oil Conservation Commission

Page 2

May 19, 1964

5. That applicant plans to inject 500 barrels per day of fresh water into each injection well into the Queen formation in the approximate depth interval 4800-5000 feet. The source of water will be wells in Section 3, Township 19 South, Range 36 East, producing from the Ogallala formation.

6. Prior to any expansion of the Unit, applicant will request that the expansion be authorized by administrative approval. Unit Operator will agree to file with the Commission an executed original or an executed counterpart of the West Pearl Queen Unit Agreement within 30 days after the effective date thereof.

7. That the order of the Commission should become effective upon the final approval of said Unit Agreement by the Commissioner of Public Lands of the State of New Mexico and shall terminate ipso facto upon the termination of said Unit Agreement.

Gulf Oil Corporation has previously obtained a preliminary approval of the Unit Agreement from the Commissioner of Public Lands, U.S.G.S., and a copy of this application, complete with all attachments, has been sent to the State Engineer Office, Santa Fe, New Mexico.

It is requested that this matter be set for hearing before an examiner.

Respectfully submitted,

GULF OIL CORPORATION


M. I. Taylor

Enclosures

DGB:bc

CC With Enclosures:

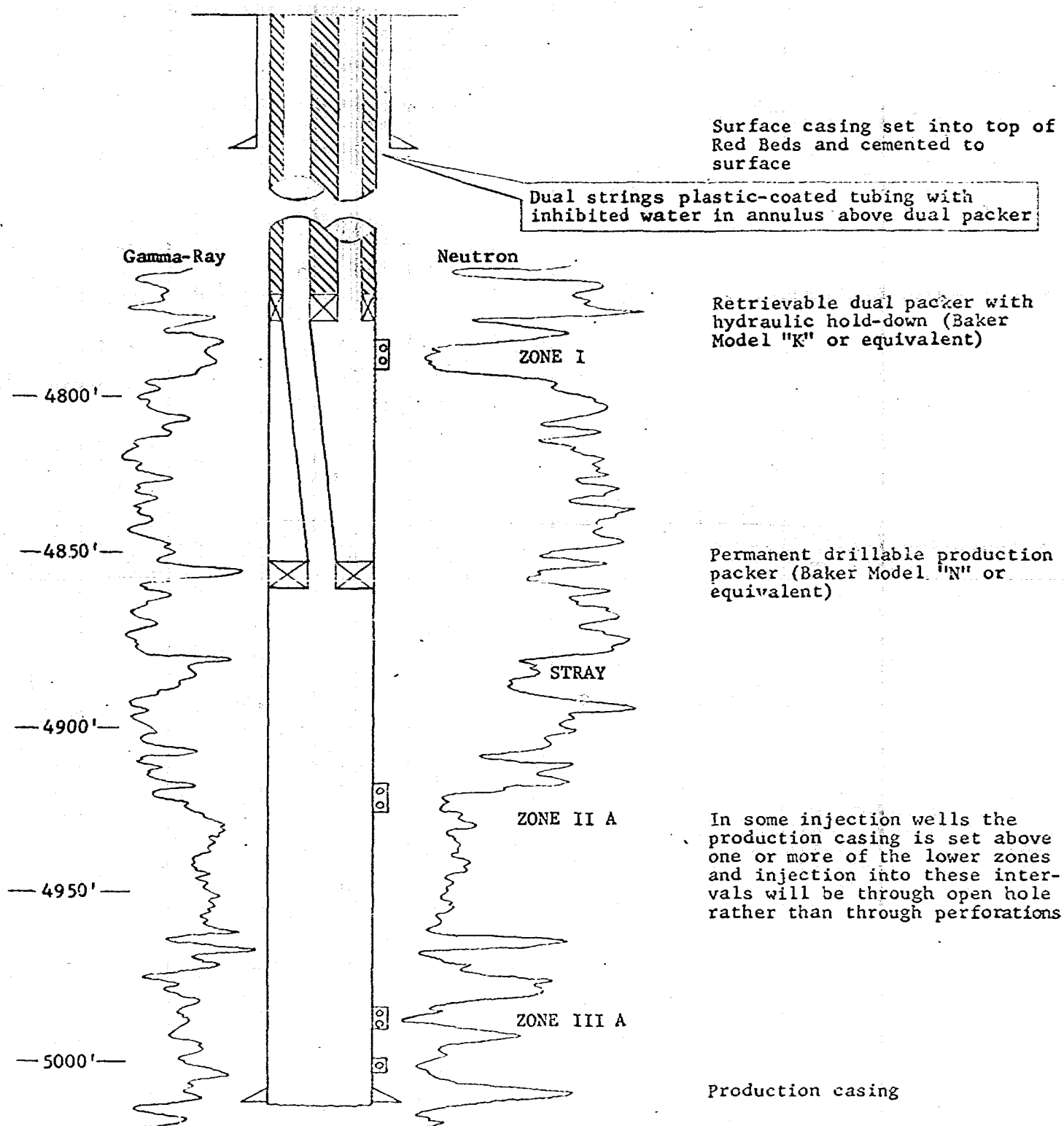
Commissioner of Public Lands
State of New Mexico
Post Office Box 1148
Santa Fe, New Mexico 87501

State Engineer Office
State of New Mexico
Capitol Building
Santa Fe, New Mexico 87501

New Mexico Oil Conservation Commission
Post Office Box 2045
Hobbs, New Mexico 88240

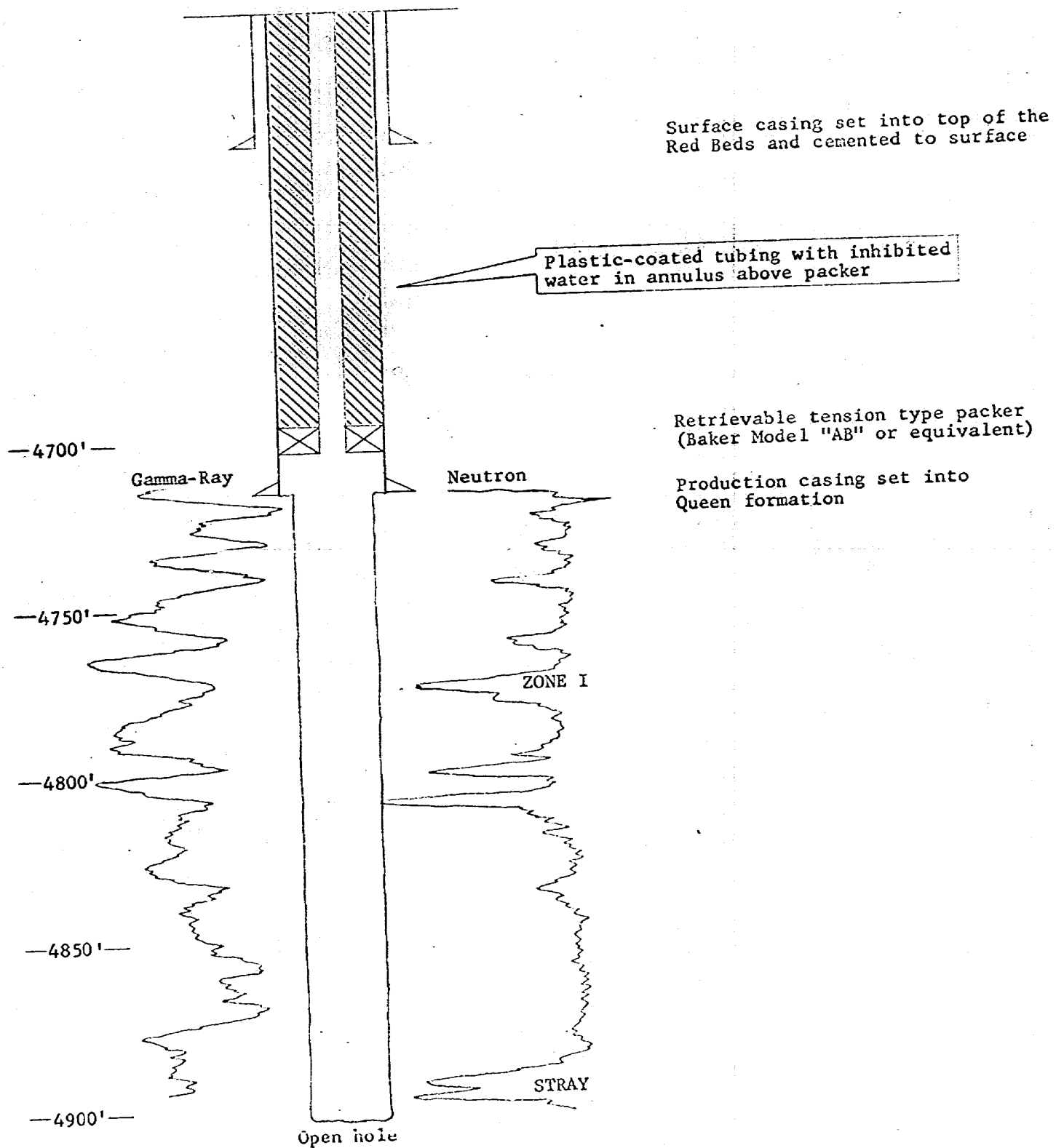
DIAGRAMMATIC SKETCH
TYPICAL DUAL INJECTION WELL

West Pearl Queen Unit
Lea County, New Mexico



DIAGRAMMATIC SKETCH
TYPICAL SINGLE INJECTION WELL

West Pearl Queen Unit
Lea County, New Mexico



INJECTION WELL DETAIL
TWO TUBING STRINGS IN ALL DUAL WELLS
WEST PEARL QUEEN UNIT
LEA COUNTY, NEW MEXICO

SECTION I
CASING AND CEMENT

INJECTION WELL		UNIT DESIG- NATION	SURFACE CASING				PRODUCTION CASING					ADDITIONAL CEMENTED INTERVALS #
			SIZE (INCHES)	DEPTH (FEET)	CEMENT (SACKS)	TOP CEMENT (FEET)	SIZE (INCHES)	DEPTH (FEET)	CEMENT (SACKS)	TOP CEMENT (FEET)	*	
RAMON ST. E-8182	NO. 3	28- 4	8-5/8	327	300	Surface	4-1/2	4991	350	3423	E	
	NO. 4	28- 6	8-5/8	326	300	Surface	4-1/2	4961	350	3393	E	
CABOT ST. NEW MEX. "C"	NO. 5	28-10	8-5/8	304	300	Surface	5-1/2	4931	200	3753	E	
	NO. 1	28-12	8-5/8	313	300	Surface	5-1/2	4904	300	3180	E	
	NO. 4	28-14	8-5/8	302	300	Surface	5-1/2	4919	200	3920	E	
	NO. 7	28-16	8-5/8	305	300	Surface	4-1/2	4932	200	4036	E	
INMAN SUPERIOR-FED.	NO. 2	29- 2	8-5/8	328	265	Surface	4-1/2	5049	240	2980	E	
SHELL ST. "PK"	NO. 2	29- 4	8-5/8	96	85	Surface	5-1/2	5145	200	3967	E	
CACTUS PARKS	NO. 1	29- 6	13-3/8	100	80	Surface	7	4932	150	3061	E	
SKELLY HOBBS "J" ST.	NO. 1	29- 8	13-3/8	88	80	Surface	5-1/4	4920	300	3153	E	
GULF LEA ST. "IH"	NO. 1	29-10	8-5/8	308	300	Surface	4-1/2	5009	2050	795	S	
	NO. 4	29-12	8-5/8	144	100	Surface	4-1/2	4974	250	4078	E	1914-1864
CACTUS GULF ST.	NO. 4	29-14	13-3/8	100	50	Surface	5-1/2	4965	350	3026	E	
	NO. 2	29-16	13-3/8	90	80	Surface	5-1/2	4939	300	3277	E	
GULF LEA ST. "AP"	NO. 3	30- 8	8-5/8	143	100	Surface	4-1/2	5075	250	3597	E	1875-1825
	NO. 1	30-16	8-5/8	137	100	Surface	4-1/2	4981	250	4085	E	1924-1874
CACTUS AZTEC ST.	NO. 2	31- 2	13-3/8	107	100	Surface	7	4832	125	3273	E	
	NO. 6	31- 6	13-3/8	108	90	Surface	7	4714	150	2843	E	
	NO. 4	31- 8	13-3/8	102	100	Surface	7	4874	150	3003	E	
	NO. 7	31-10	13-3/8	105	100	Surface	7	4714	150	3300	E	
GULF LEA ST. "AQ"							5-1/2 Liner					
								4984	40	4144	E	
	NO. 2	32- 2	8-5/8	108	60	Surface	4-1/2	4959	250	4063	E	1895-1845
	NO. 4	32- 4	8-5/8	101	100	Surface	4-1/2	4948	250	4052	E	1935-1885
	NO. 5	32- 6	8-5/8	130	100	Surface	4-1/2	4936	250	4040	E	1920-1870
PHILLIPS NEW MEX. "C"	NO. 7	32- 8	8-5/8	145	100	Surface	4-1/2	4979	250	4081	E	1909-1859
	NO. 1	32-10	8-5/8	144	145	Surface	5-1/2	5060	300	3293	E	
	NO. 3	33- 2	8-5/8	327	300	Surface	4-1/2	4932	1850	465	S	
	NO. 1	33- 4	8-5/8	349	300	Surface	4-1/2	4969	1800	415	S	
GULF LEA ST. "BG"	NO. 6	33- 6	8-5/8	146	100	Surface	4-1/2	4965	250	3487	E	1882-1833
	NO. 8	33- 8	8-5/8	141	100	Surface	4-1/2	5005	250	3527	E	1896-1846
GULF LEA ST. "AR"	NO. 4	33-10	8-5/8	140	100	Surface	4-1/2	5011	250	3533	E	1865-1815

* E - Estimated S - Temperature Survey

Two-stage cementing tool set at lower depth and 50 sacks cement spotted at top of salt and anhydrite section.

INJECTION WELL DETAIL
TWO TUBING STRINGS IN ALL DUAL WELLS
WEST PEARL QUEEN UNIT
LEA COUNTY, NEW MEXICO

SECTION II
TUBING, PACKERS AND PERFORATIONS

UPPER INJECTION INTERVAL

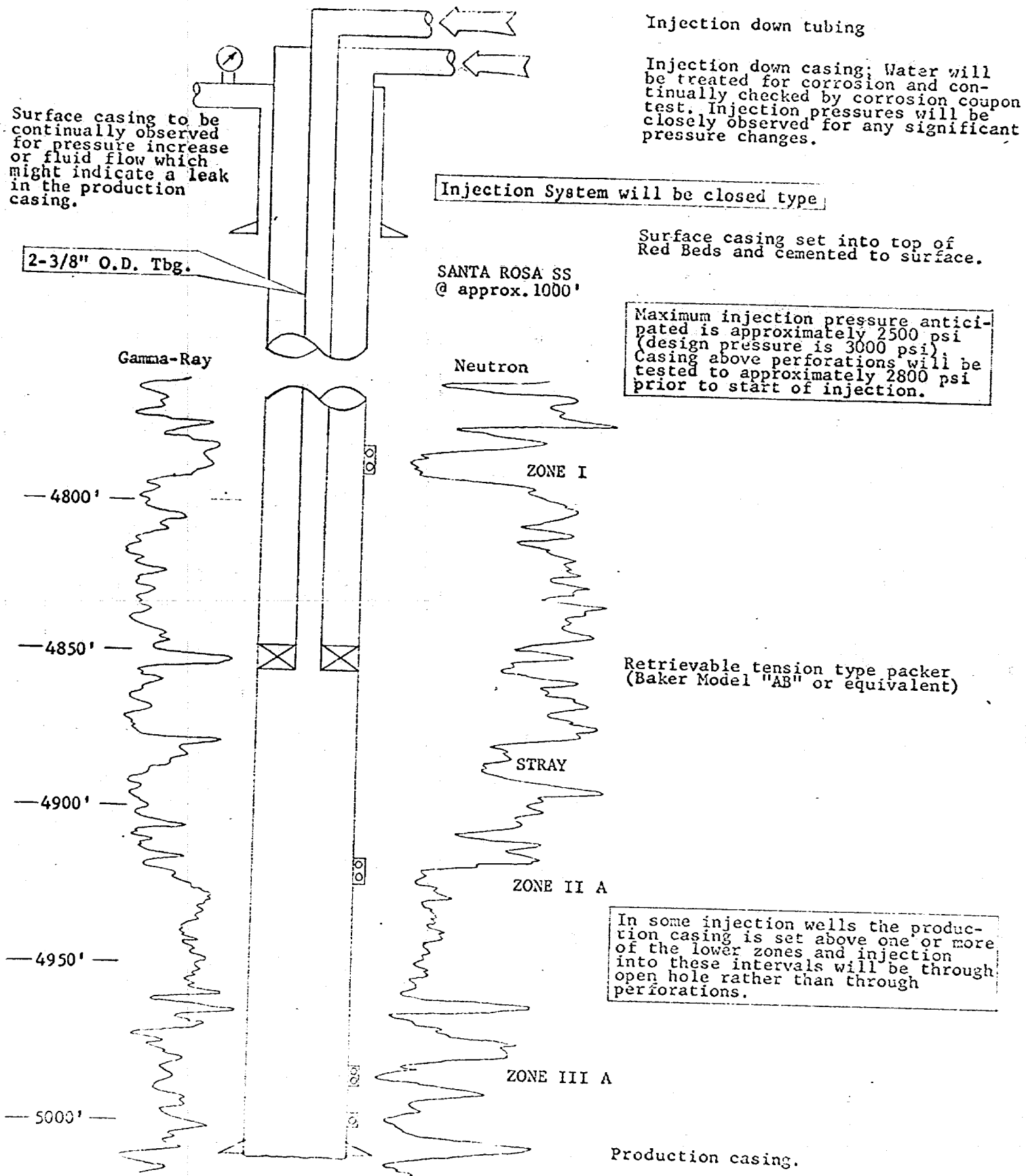
LOWER INJECTION INTERVAL

INJECTION WELL		UNIT DESIG- NATION	UPPER INJECTION INTERVAL				GROSS PERF. AND/OR OPEN				LOWER INJECTION INTERVAL			
			HOLE INTERVALS	TUBING		PACKER		HOLE INTERVALS	TUBING		PACKER			
				SIZE (OD)	DEPTH	TYPE	DEPTH		SIZE (OD)	DEPTH	TYPE	DEPTH		
HAMON ST. E-8182	NO.3	28- 4	4762-4772	1.660	4700	RD W/HH	4700	4880-4910	1.660	4850	Permanent	4850		
	NO.4	28- 6	4700-4710	1.660	4650	RD W/HH	4650	4814-4895	1.660	4750	Permanent	4750		
CABOT ST. NEW MEX. "G"	NO.5	28-10	4710-4720	2.063	4650	RD W/HH	4650	4826-4910	2.063	4775	Permanent	4775		
	NO.1	28-12	4733-4747	2.063	4700	RD W/HH	4700	4860-4946	2.063	4800	Permanent	4800		
	NO.4	28-14	4774-4786	2.063	4725	RD W/HH	4725	4854-4949	2.063	4825	Permanent	4825		
	NO.7	28-16	4726-4736	1.660	4675	RD W/HH	4675	4842-4851	1.660	4800	Permanent	4800		
INMAN SUPERIOR-FED.	NO.2	29- 2	4814-4820	1.660	4775	RD W/HH	4775	4934-5008	1.660	4900	Permanent	4900		
SHELL STATE "PK"	NO.2	29- 4	4870-4880	2.063	4825	RD W/HH	4825	5026-5054	2.063	4950	Permanent	4950		
CACTUS PARKS	NO.1	29- 6	4810-4820	2.375	4750	RD W/HH	4750	4932-5030	2.375	4875	Permanent	4875		
SKELLY HOBBS "J" ST.	NO.1	29- 8	4770-4785	2.063	4725	RD W/HH	4725	4898-5000	2.063	4850	Permanent	4850		
GULF LEA STATE "IH"	NO.1	29-10	4782-4790	1.660	4750	RD W/HH	4750	4914-5000	1.660	4850	Permanent	4850		
	NO.4	29-12	4819-4821	1.660	4775	RD W/HH	4775	4957-5050	1.660	4900	Permanent	4900		
CACTUS GULF ST. "A"	NO.4	29-14	4775-4790	2.063	4725	RD W/HH	4725	4910-4993	2.063	4850	Permanent	4850		
	NO.2	29-16	4746-4761	2.063	4700	RD W/HH	4700	4888-4962	2.063	4825	Permanent	4825		
GULF LEA STATE "AP"	NO.3	30- 8	4848-4850	1.660	4800	RD W/HH	4800	4927-5037	1.660	4900	Permanent	4900		
	NO.1	30-16	4803-4805	1.660	4750	RD W/HH	4750	4947-5060	1.660	4900	Permanent	4900		
CACTUS AZTEC ST.	NO.2	31- 2	4790-4800	2.375	4750	RD W/HH	4750	4835-5030	2.375	4825	Permanent	4825		
	NO.6	31- 6	4714-4900	2.375	4700	RS Tension	4700	Commingled Injection w/Upper Interval in Open Hole.						
	NO.4	31- 8	4784-4790	2.375	4750	RD W/HH	4750	4877-4930	2.375	4825	Permanent	4825		
	NO.7	31-10	4767-4772	2.375	4700	RD W/HH	4700	4880-4997	2.375	4825	Permanent	4825		
GULF LEA-STATE "AQ"	NO.2	32- 2	4774-4776	1.660	4725	RD W/HH	4725	4924-5015	1.660	4850	Permanent	4850		
	NO.4	32- 4	4785-4787	1.660	4725	RD W/HH	4725	4929-5020	1.660	4850	Permanent	4850		
	NO.5	32- 6	4786-4788	1.660	4725	RD W/HH	4725	4884-5025	1.660	4825	Permanent	4825		
	NO.7	32- 8	4802-4804	1.660	4750	RD W/HH	4750	4949-5040	1.660	4875	Permanent	4875		
PHILLIPS NEW MEX. "C"	NO.1	32-10	4790-4806	2.063	4750	RD W/HH	4750	4898-5022	2.063	4850	Permanent	4850		
GULF LEA ST. "BG"	NO.3	33- 2	4737-4741	1.660	4700	RD W/HH	4700	4881-4975	1.660	4800	Permanent	4800		
	NO.1	33- 4	4773-4785	1.660	4725	RD W/HH	4725	4920-5010	1.660	4850	Permanent	4850		
	NO.6	33- 6	4767-4782	1.660	4700	RD W/HH	4700	4927-5020	1.660	4850	Permanent	4850		
	NO.8	33- 8	4750-4752	1.660	4700	RD W/HH	4700	4890-4962	1.660	4800	Permanent	4800		
GULF LEA ST. "AR"	NO.4	33-10	4776-4778	1.660	4725	RD W/HH	4725	4876-4998	1.660	4825	Permanent	4825		

RD W/HH -Retrievable Dual with Hydraulic Hold-down Similar to Baker Model "K"
RS Tension -Retrievable Single Tension Type Packer Similar to Baker Model "AB"
Permanent -Drillable Packer Similar to Baker Model "N" (Tubing Set)

DIAGRAMMATIC SKETCH
Typical Dual Injection Well

West Pearl Queen Unit
Lea County, New Mexico



INJECTION WELL DETAIL
DUALS EQUIPPED WITH SINGLE TUBING STRING
WEST PEARL QUEEN UNIT
LEA COUNTY, NEW MEXICO

														INJECTION INTERVALS AND EQUIPMENT SETTING DEPTHS			
INJECTION WELL		UNIT DESIG- NATION	SURFACE CASING				PRODUCTION CASING				ADDITIONAL CEMENTED INTERVALS #	GROSS PERFORATED AND/OR		APPROXIMATE TUBING AND PACKER DEPTH			
			SIZE (INCHES)	DEPTH (FEET)	CEMENT (SACKS)	TOP CEMENT (FEET)	SIZE (INCHES)	DEPTH (FEET)	CEMENT (SACKS)	TOP CEMENT (FEET) *		OPEN HOLE UPPER	INTERVALS LOWER				
HAMON ST. E-8182	NO. 3	28- 4	8-5/8	327	300	Surface	4-1/2	4991	350	3423	E		4762-4772	4880-4910	4850		
	NO. 4	28- 6	8-5/8	326	300	Surface	4-1/2	4961	350	3393	E		4700-4710	4814-4895	4750		
CABOT ST. NEW MEX. "G"	NO. 5	28-10	8-5/8	304	300	Surface	5-1/2	4931	200	3753	E		4710-4720	4826-4910	4775		
	NO. 1	28-12	8-5/8	313	300	Surface	5-1/2	4904	300	3180	E		4733-4747	4860-4946	4800		
	NO. 4	28-14	8-5/8	302	300	Surface	5-1/2	4919	200	3920	E		4774-4786	4854-4949	4825		
	NO. 7	28-16	8-5/8	305	300	Surface	4-1/2	4932	200	4036	E		4726-4736	4842-4851	4800		
INMAN SUPERIOR-FED.	NO. 2	29- 2	8-5/8	328	265	Surface	4-1/2	5049	240	2980	E		4814-4823	4934-5008	4900		
SHELL ST. "PK"	NO. 2	29- 4	8-5/8	96	85	Surface	5-1/2	5145	200	3967	E		4870-4880	5026-5059	4950		
CACTUS PARKS	NO. 1	29- 6	13-3/8	100	80	Surface	7	4932	150	3061	E		4810-4820	4932-5030	4875		
SKELLY HOBBS "J" ST.	NO. 1	29- 8	13-3/8	88	80	Surface	5-1/4	4920	300	3153	E		4770-4785	4898-5000	4850		
GULF LEA ST. "IH"	NO. 1	29-10	8-5/8	308	300	Surface	4-1/2	5009	2050	795	S		4782-4790	4914-5000	4850		
	NO. 4	29-12	8-5/8	144	100	Surface	4-1/2	4974	250	4078	E	1914-1864	4819-4821	4957-5050	4900		
CACTUS GULF ST.	NO. 4	29-14	13-3/8	100	50	Surface	5-1/2	4965	350	3026	E		4775-4790	4910-4993	4850		
	NO. 2	29-16	13-3/8	90	80	Surface	5-1/2	4939	300	3277	E		4746-4761	4888-4962	4825		
GULF LEA ST. "AP"	NO. 3	30- 8	8-5/8	143	100	Surface	4-1/2	5075	250	3597	E	1875-1825	4848-4850	4927-5037	4900		
	NO. 1	30-16	8-5/8	137	100	Surface	4-1/2	4981	250	4085	E	1924-1874	4803-4805	4947-5060	4900		
CACTUS AZTEC ST.	NO. 2	31- 2	13-3/8	107	100	Surface	7	4832	125	3273	E		4790-4800	4835-5030	4820		
	NO. 6	31- 6	13-3/8	108	90	Surface	7	4714	150	2843	E		4714-4900	NOT DUAL	4700		
	NO. 4	31- 8	13-3/8	102	100	Surface	7	4874	150	3003	E		4784-4790	4877-4930	4825		
	NO. 7	31-10	13-3/8	105	100	Surface	7	4714	150	3300	E		4767-4772	4880-4997	4825		
GULF LEA ST. "AQ"							5-1/2 Liner	4984	40	4144	E						
	NO. 2	32- 2	8-5/8	108	60	Surface	4-1/2	4959	250	4063	E	1895-1845	4774-4776	4924-5015	4850		
	NO. 4	32- 4	8-5/8	101	100	Surface	4-1/2	4948	250	4052	E	1935-1885	4785-4787	4929-5020	4850		
	NO. 5	32- 6	8-5/8	130	100	Surface	4-1/2	4936	250	4040	E	1920-1870	4786-4788	4884-5025	4825		
	NO. 7	32- 8	8-5/8	145	100	Surface	4-1/2	4979	250	4081	E	1909-1859	4802-4804	4949-5040	4875		
PHILLIPS NEW MEX. "C"	NO. 1	32-10	8-5/8	144	145	Surface	5-1/2	5060	300	3293	E		4790-4806	4898-5022	4850		
GULF LEA ST. "BG"	NO. 3	33- 2	8-5/8	327	300	Surface	4-1/2	4932	1850	465	S		4737-4741	4881-4975	4800		
	NO. 1	33- 4	8-5/8	349	300	Surface	4-1/2	4969	1800	415	S		4773-4785	4920-5010	4850		
	NO. 6	33- 6	8-5/8	146	100	Surface	4-1/2	4965	250	3487	E	1882-1833	4767-4782	4927-5020	4850		
	NO. 8	33- 8	8-5/8	141	100	Surface	4-1/2	5005	250	3527	E	1896-1846	4750-4752	4890-4962	4800		
GULF LEA ST. "AR"	NO. 4	33-10	8-5/8	140	100	Surface	4-1/2	5011	250	3533	E	1865-1815	4776-4778	4876-4998	4825		

* E - Estimated S - Temperature Survey

§ Two-stage cementing tool set at lower depth and 50 sacks cement spotted at top of sale and anhydrite section.

§ 2-3/8" OD Tubing and retrievable tension type packer (Baker Model "AB" or equivalent).

DATA FOR
PROPOSED WEST PEARL QUEEN UNIT
OIL CONSERVATION COMMISSION HEARING
CASE NUMBER 3066

I. GENERAL

Operator Gulf Oil Corporation Date June 10, 1964
Project West Pearl Queen Unit Waterflood
Number of Wells 63 Unit and Project Area 2,520 Acres
Location Township 19 South, Range 35 East, Lea County, New Mexico,
approximately 20 miles southwest of Hobbs.
Pool Pearl Queen Reservoir Queen
Other Waterflood Projects in Pool East Pearl Queen Unit Project,
operated by Shell Oil Company.

II. RESERVOIR INFORMATION, PROJECT AREA

A. Geology

1. Reservoir Depth Approximately 4,900 feet
2. Productive Zones Series of sandstone stringers within a 200-
foot gross interval of the Queen formation. (Exhibits No. 4 and
6)
3. Maximum Net Pay Per Zone 8 to 14 feet
4. Stratigraphy Gray, fine-grained, dolomitic and anhydritic
sandstone rocks rhythmically interbedded with gray to tan, dense
anhydritic and shaly dolomite rocks.
5. Structure Northeast-southwest trending monoclinical nose plunging
to the southwest at 50 feet per mile. (Exhibit No. 5)
6. Reservoir Limits Oil-water contact defines down-dip productive
limit and porosity and permeability deterioration defines up-dip
productive limit of each productive zone.

B. Rock and Fluid Properties

1. Average Porosity 16.7% Range 10-22.8%

2. Average Permeability 22.8 md. Range 1-244 md.
3. Original Reservoir Pressure 1776 psi
4. Bubble Point Pressure 1400 psi
5. Reservoir Temperature 100° F.
6. Formation Volume Factor 1.176 @ original conditions
7. Oil Gravity 35° API

III. OPERATIONS

A. Primary (Exhibit No. 2)

1. Date of First Completion January 1, 1958
2. Total Number Wells Drilled 63, including 4 dry holes in the Queen formation.
3. Cumulative Production, 4-1-64 2,198,858 barrels
4. Average Daily Oil Production Per Well, March, 1964 9 barrels
5. Drive Mechanism Solution-gas, or depletion type
6. State of Depletion Late. Reservoir is approximately 80% depleted of primary oil reserves.
7. Estimated Oil Recovery Through Primary Operations 2,686,000 barrels, or 11.8% of original oil-in-place.

B. Waterflood

1. Pattern 80-acre five-spot (Exhibit No. 1)
2. Number of Injection Wells 30
3. Estimated Initial Injection Rate 500 barrels per day per well
4. Estimated Injection Pressures Initially 1500 to 2000 psi increasing to a maximum of 2500 psi during life of flood.

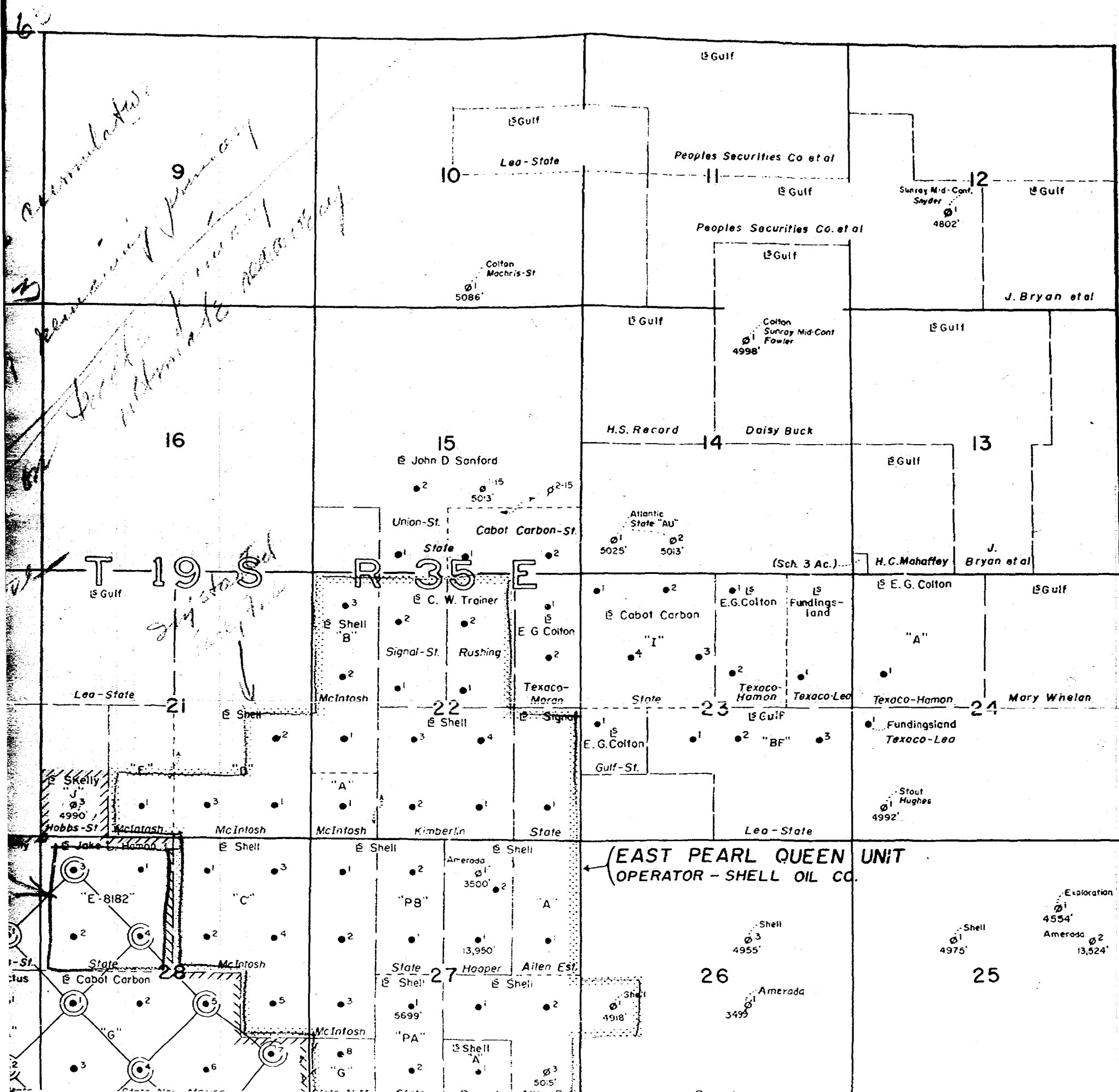
5. Plan of Injection The uppermost pay, Zone I, will be isolated from the lower zones through use of packers. Water will then be dually injected in all but one injection well either through two strings of coated tubing (Exhibits 8 and 9) or simultaneously down tubing and the tubing-casing annulus (Exhibits 10 and 11).
6. Source of Injection Water Shallow Ogallala wells located in Section 3-19S-36E, approximately 6 miles east of the project area. Water will be shared with East Pearl Queen Unit.
7. Type of Water Fresh. Produced formation water will be mixed with Ogallala water and injected into reservoir during latter stages of project.
8. Treatment of Water None is initially anticipated if injection is down dual strings of coated tubing; however, if injection is down uncoated tubing and the tubing-casing annulus, the Ogallala water will be treated to reduce oxygen content to 0.20 ppm. When recycled water is used additional corrosion treatment of the water will be initiated if necessary (See Exhibits 12 and 13).

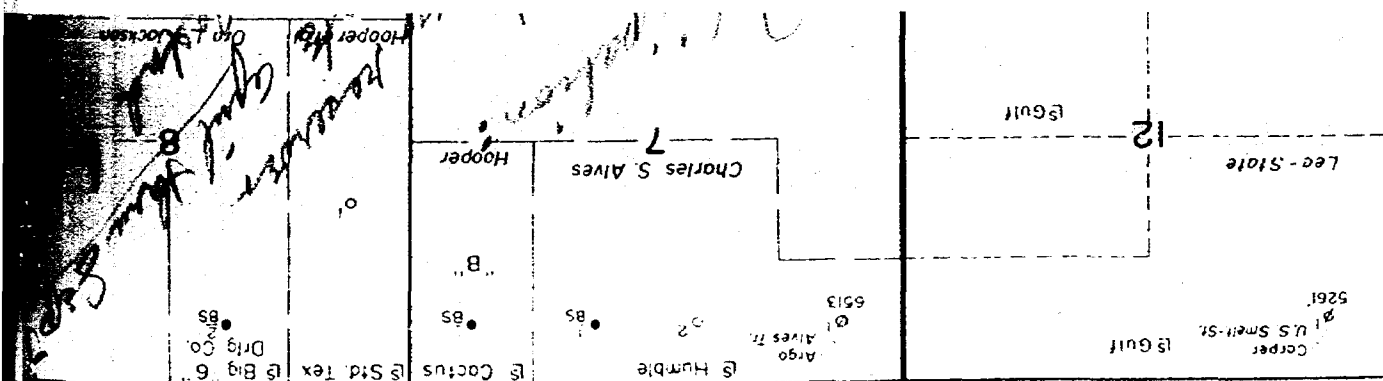
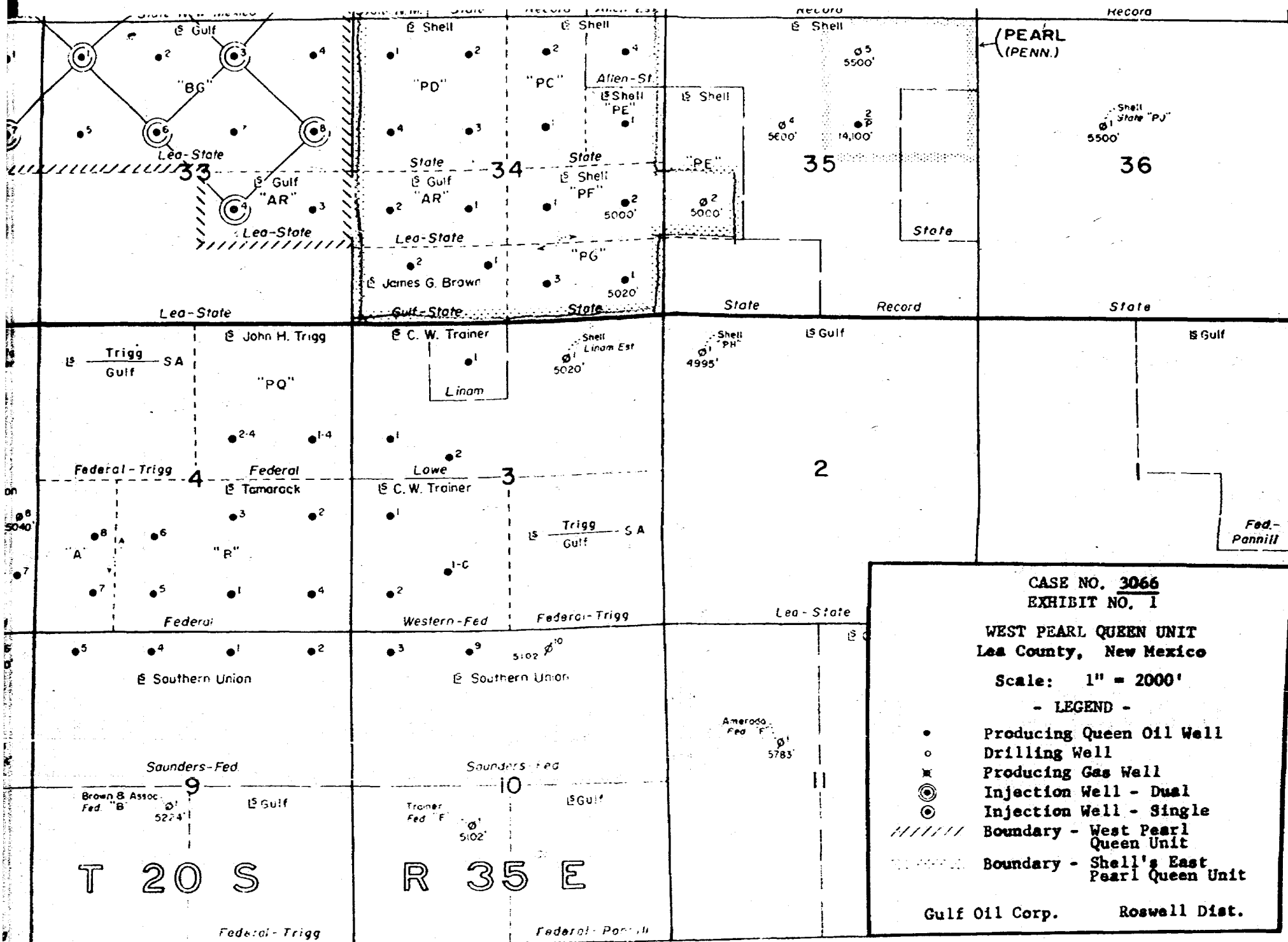
IV. ANTICIPATED RESULTS OF WATERFLOOD PROJECT

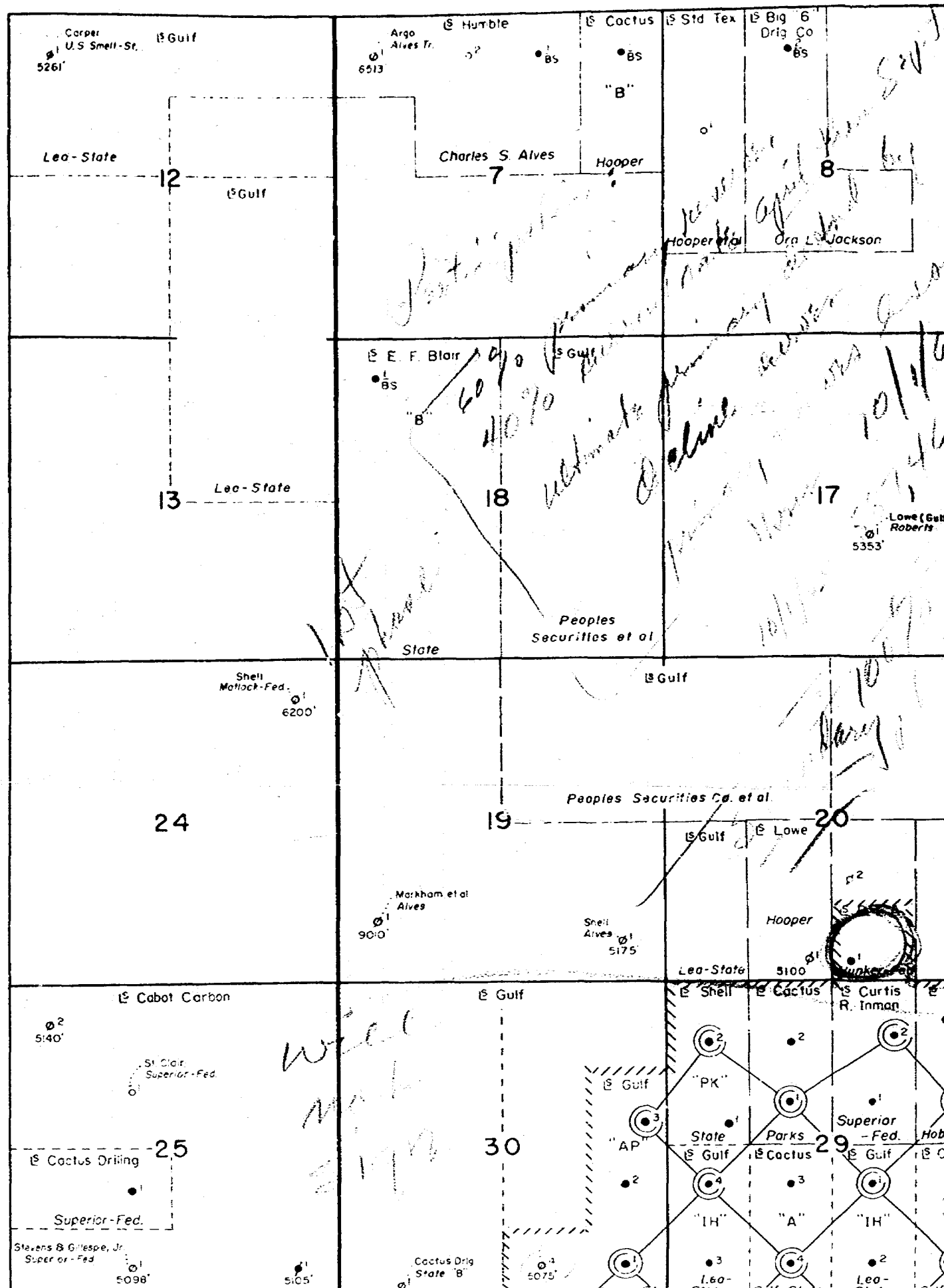
- A. Secondary Recovery, Per Cent of Primary 150%
- B. Additional Oil Recovery 4,029,000 barrels
- C. Increase in Life of Unit Wells 6 years

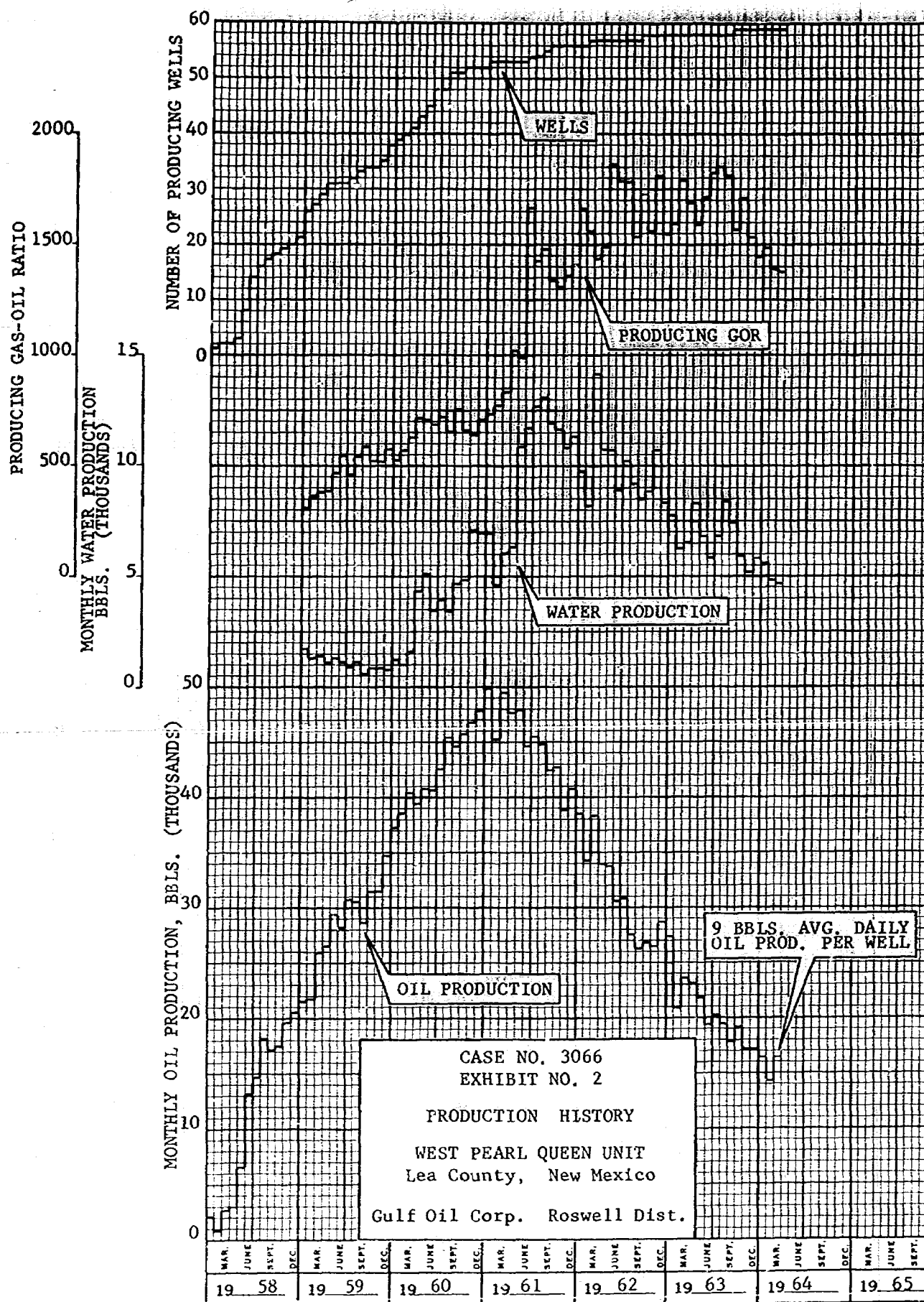
V. SUMMARY AND RECOMMENDATIONS

- A. The Pearl Queen Pool produces by solution-gas-drive and as a result it is estimated that only 11.8% of the original oil-in-place beneath the West Pearl Queen Unit will be recovered through primary operations. Large amounts of oil will remain unrecovered unless a secondary recovery project is installed to increase recovery.
- B. This portion of the Pearl Queen Pool is 80% depleted and the average daily oil production per well is only 9 barrels.
- C. Engineering and geological studies indicate the Queen reservoir under the project area can be successfully waterflooded, thus increasing the life and ultimate recovery per well in the West Pearl Queen Unit.
- D. Therefore, Gulf, in association with the other operators, concludes that unitization of the 63 wells and 2,520 acres outlined in Exhibit No. 1 for the purpose of waterflooding the Queen formation is in the best interest of conservation and prevention of waste.
- E. Gulf, as West Pearl Queen Unit Operator, respectfully requests that the Oil Conservation Commission approve the proposed waterflood project and grant a Unit oil allowable for the 59 producing wells in the waterflood area as provided in Rule 701 (E), Subparagraph 3 of the Commission Rules and Regulations.





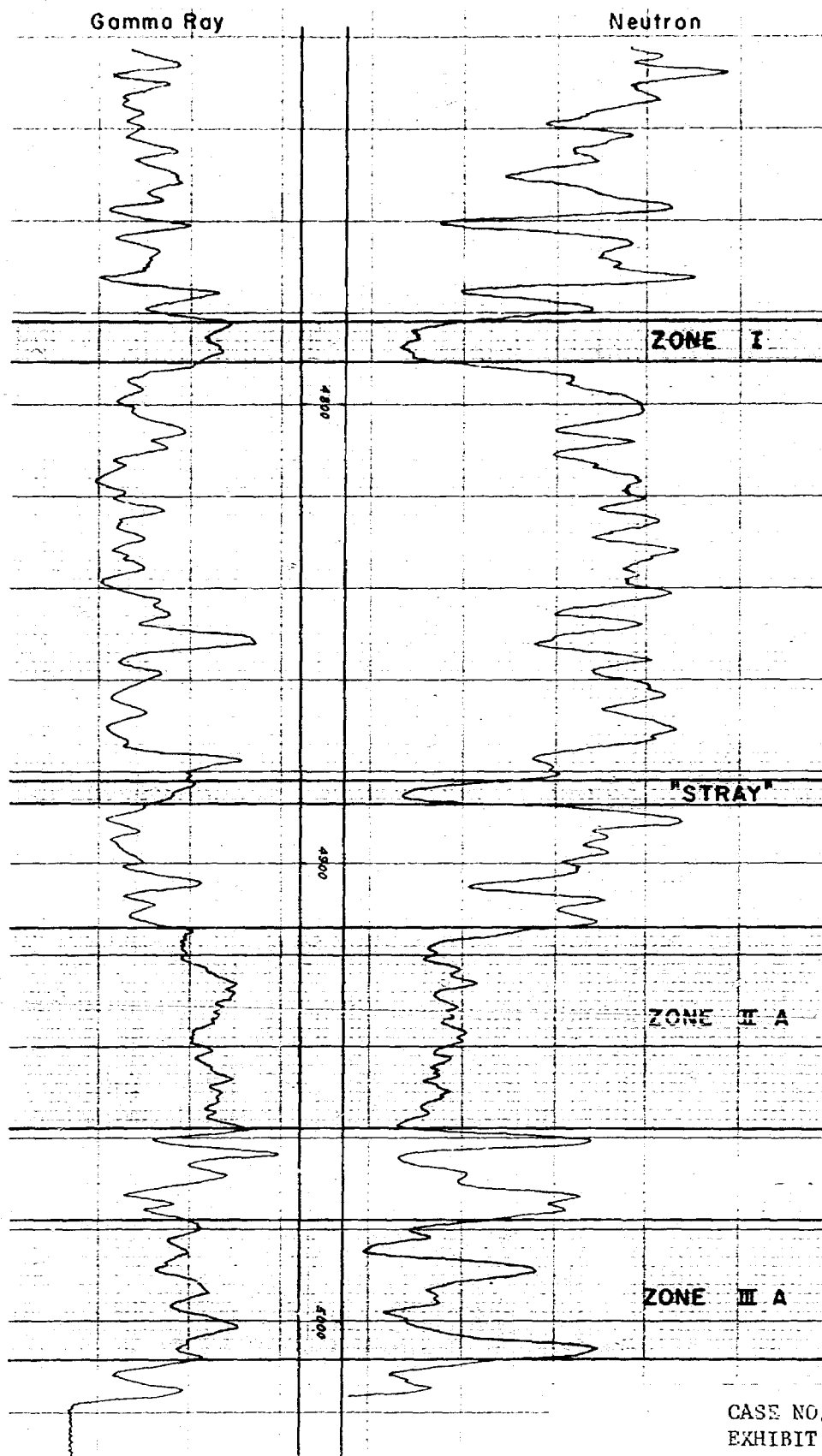




MONTHLY OIL, WATER AND GAS PRODUCTION
WEST PEARL QUEEN UNIT
LEA COUNTY, NEW MEXICO

	Oil (Bbls)	Water (Bbls)	Gas (MCF)		Oil (Bbls)	Water (Bbls)	Gas (MCF)
<u>1964</u>				<u>1963</u>			
Jan.	16,490	5,567	24,548	Jan.	27,434	7,734	43,646
Feb.	14,226	4,832	19,772	Feb.	20,956	6,220	37,485
Mar.	16,398	4,569	22,583	Mar.	23,676	6,493	39,853
Apr.				Apr.	23,076	7,279	36,490
May				May	21,941	6,854	37,512
June				June	19,442	5,826	35,420
July				July	20,085	6,814	37,163
Aug.				Aug.	19,534	8,454	35,289
Sept.				Sept.	17,946	7,445	28,110
Oct.				Oct.	19,061	5,896	32,434
Nov.				Nov.	17,065	5,204	26,235
Dec.				Dec.	17,079	5,843	24,735
Total	47,114	14,968	66,903	Total	247,295	80,062	414,372
<u>1962</u>				<u>1961</u>			
Jan.	38,433	9,740	64,007	Jan.	49,902	6,945	36,402
Feb.	34,157	8,195	53,458	Feb.	45,214	4,550	34,760
Mar.	38,347	14,109	54,972	Mar.	49,529	6,049	41,241
Apr.	34,074	10,657	50,903	Apr.	47,668	6,304	48,668
May	33,895	10,659	63,091	May	47,977	10,829	47,406
June	30,551	8,914	54,501	June	44,641	11,775	74,581
July	30,733	10,190	54,943	July	45,486	12,712	64,732
Aug.	27,659	9,203	42,263	Aug.	44,890	13,030	66,621
Sept.	26,227	8,513	45,259	Sept.	42,261	11,923	56,541
Oct.	26,890	8,807	41,763	Oct.	42,772	11,679	55,736
Nov.	26,543	10,697	47,980	Nov.	38,897	10,781	52,591
Dec.	28,862	8,337	44,718	Dec.	41,776	11,276	58,584
Total	376,371	118,021	617,858	Total	541,013	117,853	637,863
<u>1960</u>				<u>1959</u>			
Jan.	37,227	1,200	19,364	Jan.	21,503	1,703	6,667
Feb.	38,553	997	21,546	Feb.	21,744	1,285	7,710
Mar.	40,356	1,581	25,235	Mar.	26,021	1,352	9,791
Apr.	39,342	4,313	28,109	Apr.	26,524	1,096	10,111
May	40,821	5,083	28,652	May	29,432	1,261	13,735
June	40,752	3,497	27,716	June	28,068	1,090	15,381
July	42,475	3,910	30,317	July	30,727	867	14,205
Aug.	45,446	3,472	29,550	Aug.	30,514	1,062	16,496
Sept.	44,547	4,691	33,542	Sept.	28,578	561	16,691
Oct.	45,768	4,779	30,027	Oct.	31,387	837	16,253
Nov.	46,867	7,062	30,091	Nov.	31,391	853	16,188
Dec.	47,954	6,937	33,641	Dec.	34,712	767	19,774
Total	510,108	47,522	337,790	Total	340,601	12,734	163,002
<u>1958</u>							
Jan.	2,122						
Feb.	893						
Mar.	2,762						
Apr.	2,999						
May	6,652						
June	13,132						
July	14,762						
Aug.	18,124						
Sept.	17,195						
Oct.	17,447						
Nov.	19,666						
Dec.	20,554						
Total	57,667						

CASE NO. 3066
EXHIBIT NO. 3

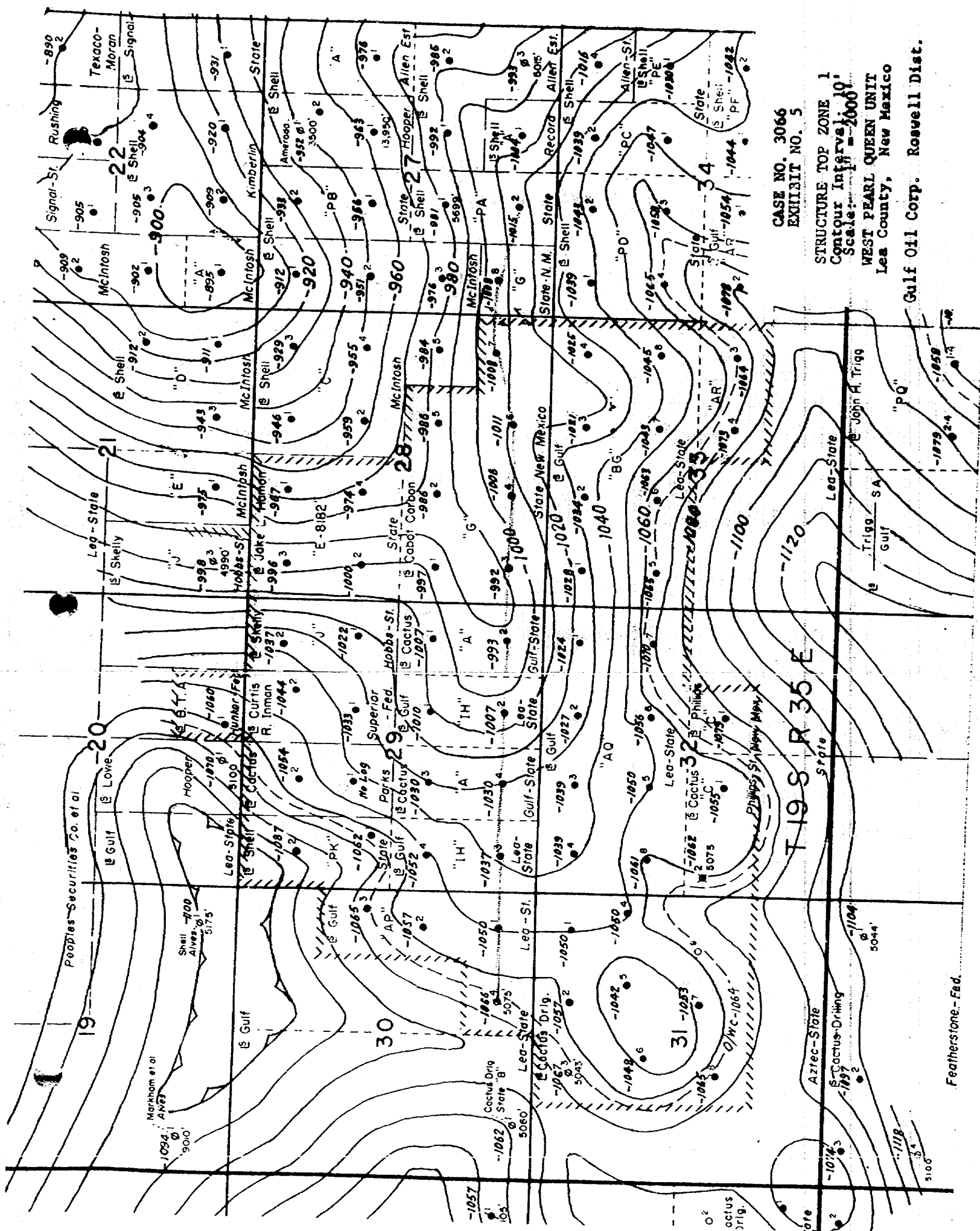


CASE NO. 3066
EXHIBIT NO. 4

TYPICAL RADIOACTIVITY LOG

(One complete set of Logs on proposed
Injection Wells also supplied
to NMCC as part of exhibits)

WEST PEARL QUEEN UNIT
Lea County, New Mexico
Gulf Oil Corp. Roswell Dist.



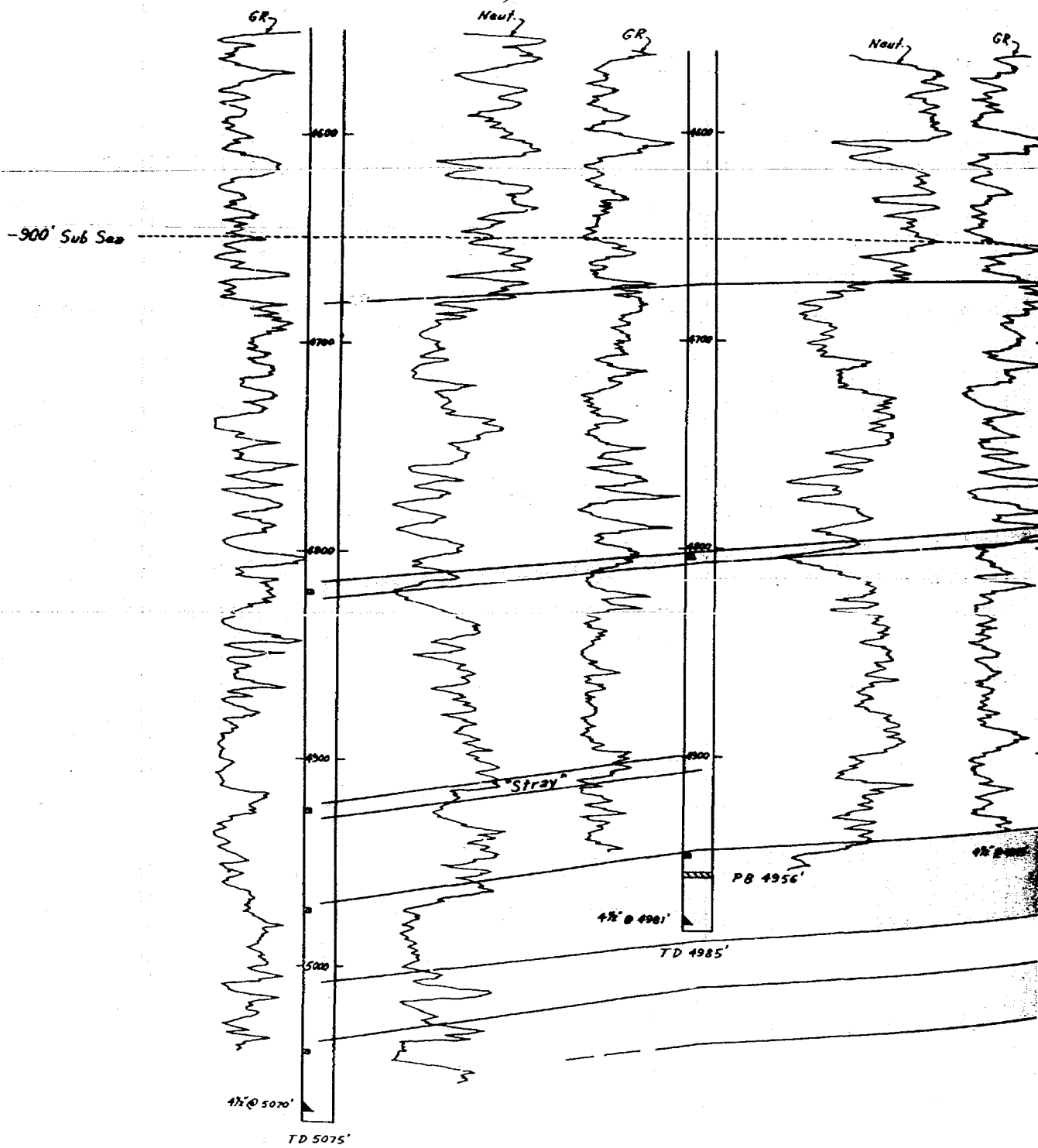
CASE NO. 3066
 EXHIBIT NO. 5
 STRUCTURE TOP ZONE 1
 Contour Interval: 10'
 Scale: 1" = 2000'
 WEST PEARL QUEEN UNIT
 Lea County, New Mexico
 Gulf Oil Corp. Roswell Dist.

GULF NO. 4 "AP"
Lca State
0-30-19-35
Dry Hole (Out of Unit)

GULF NO. 1 "AP"
Lea State
P-30-19-35
Injection

GULF N.
Lea St
M-29-1.
Produc

WEST



0.3 'H'

ate

1-35

ing

CACTUS DRLG

Gulf-State A No. 4

N-29-19-35

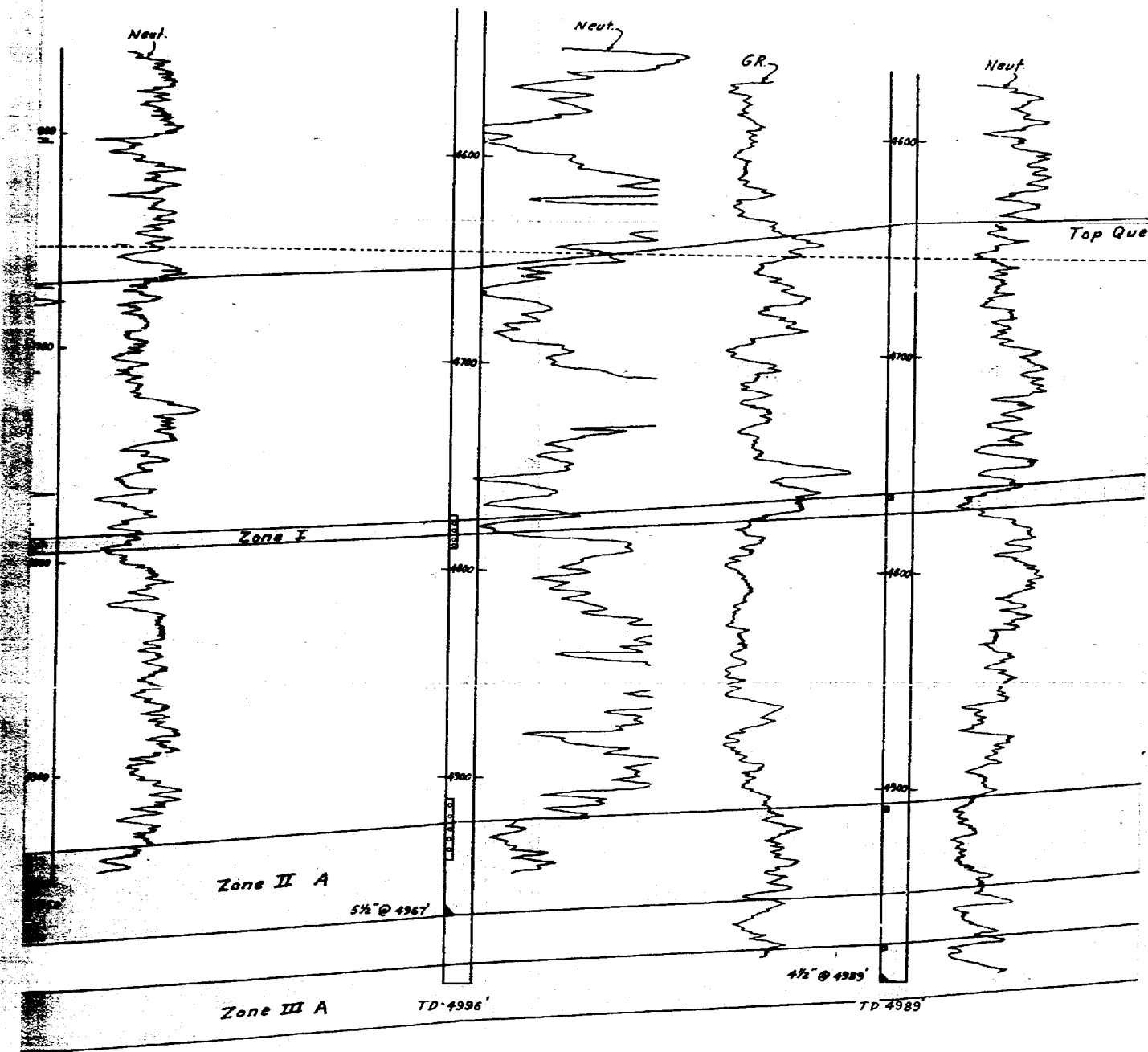
Injection

GULF NO. 2 'H'

Lea State

O-29-19-35

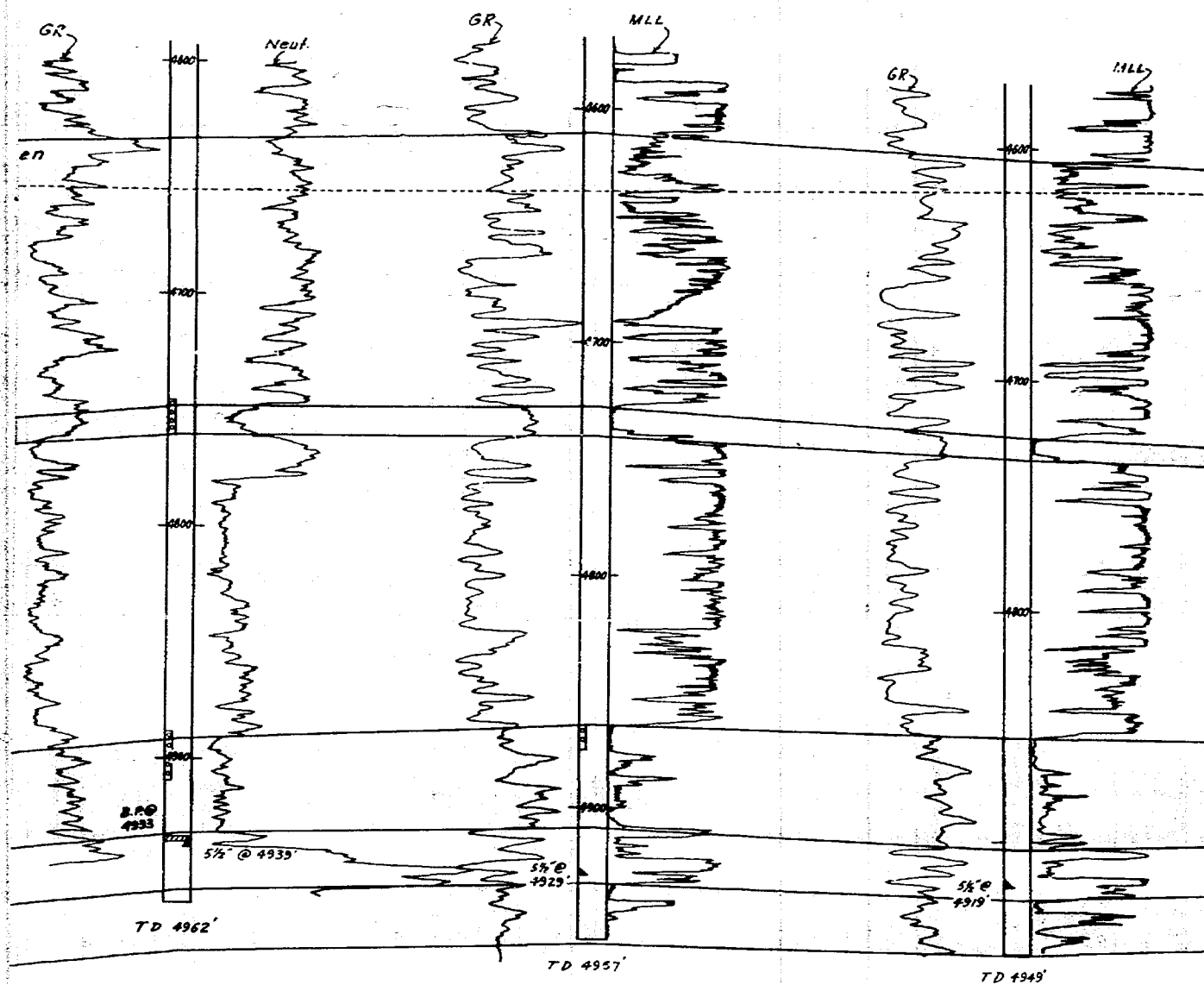
Producing



CACTUS DRLG.
Gulf-State "A" No. 2
P-29-19-35
Injection

CABOT CARBON NO. 3 "G"
State New Mexico
M-28-19-35
Producing

CABOT CARBON NO. 4 "G"
State New Mexico
N-28-19-35
Injection



CABOT CARBON NO. 6 'G'

State New Mexico

0-28-19-35

Producing

CABOT CARBON NO. 7 'G'

State New Mexico

P-28-19-35

Injection

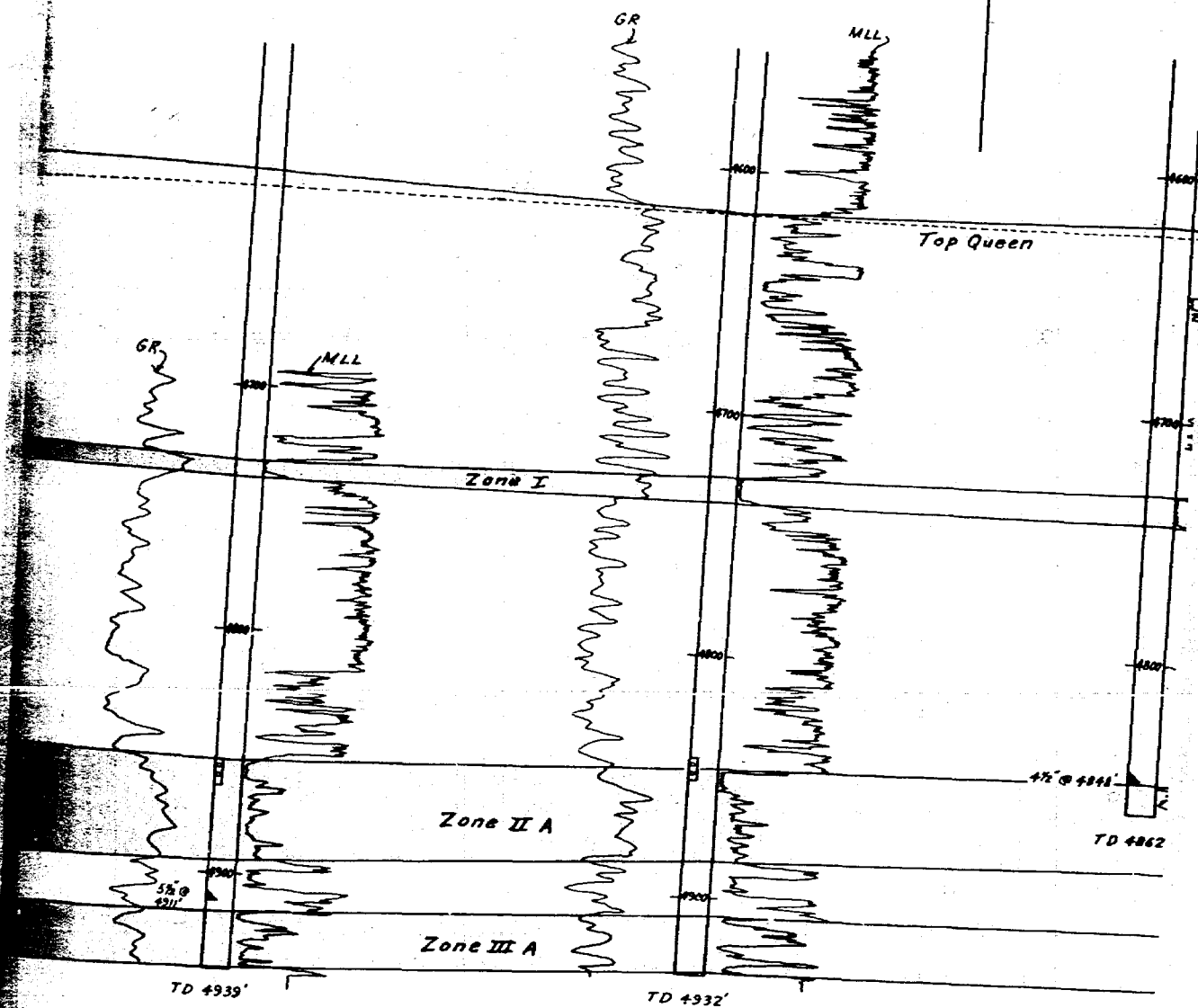
CABOT CAR

State N

M-27-

Produci

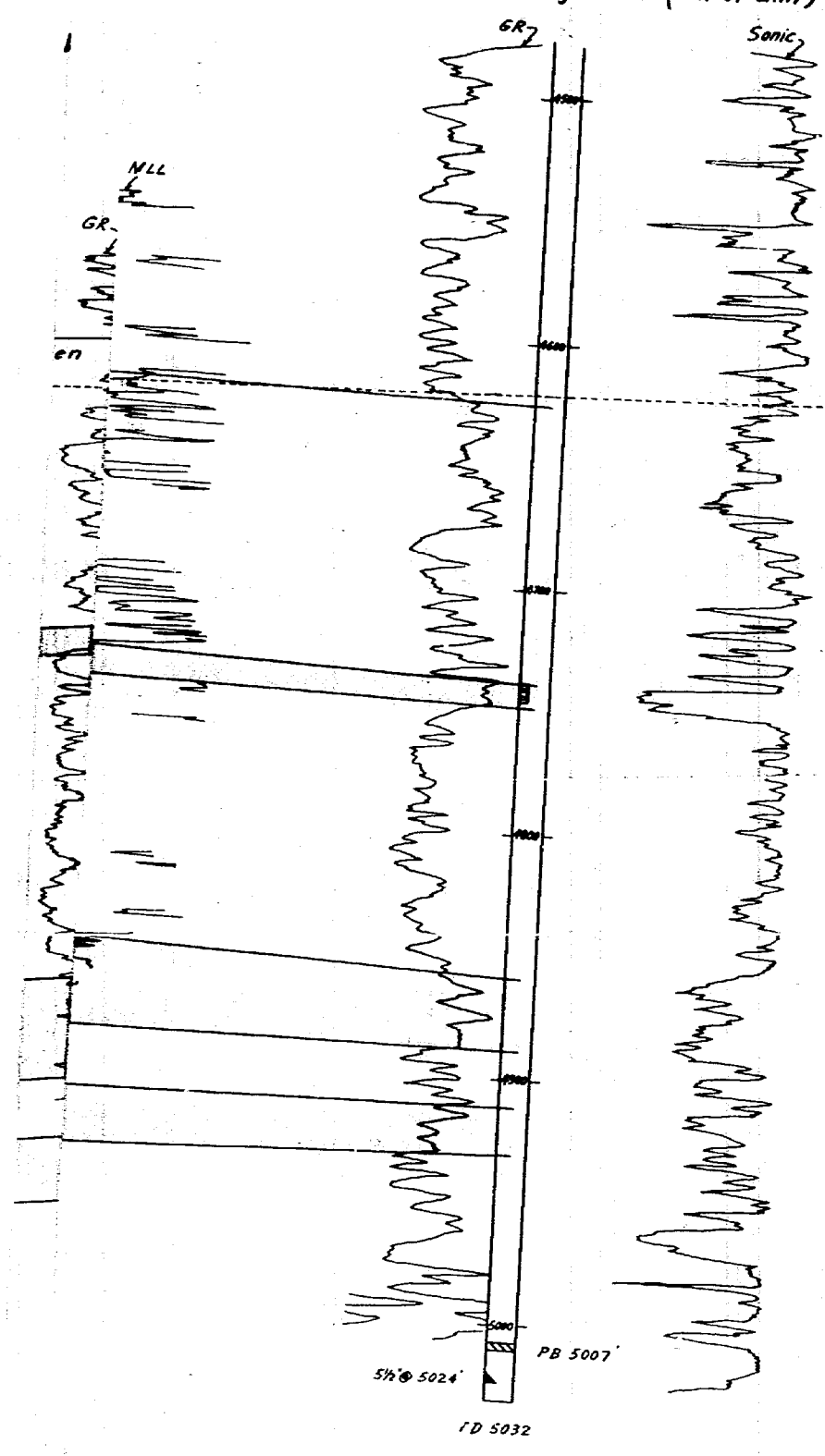
Unit Boundry



BON NO. 8 'G'
9w Mexico
19-35
19 (Out of Unit)

SHELL NO. 2 'PA'
State
N-27-19-35
Injection (Out of Unit)

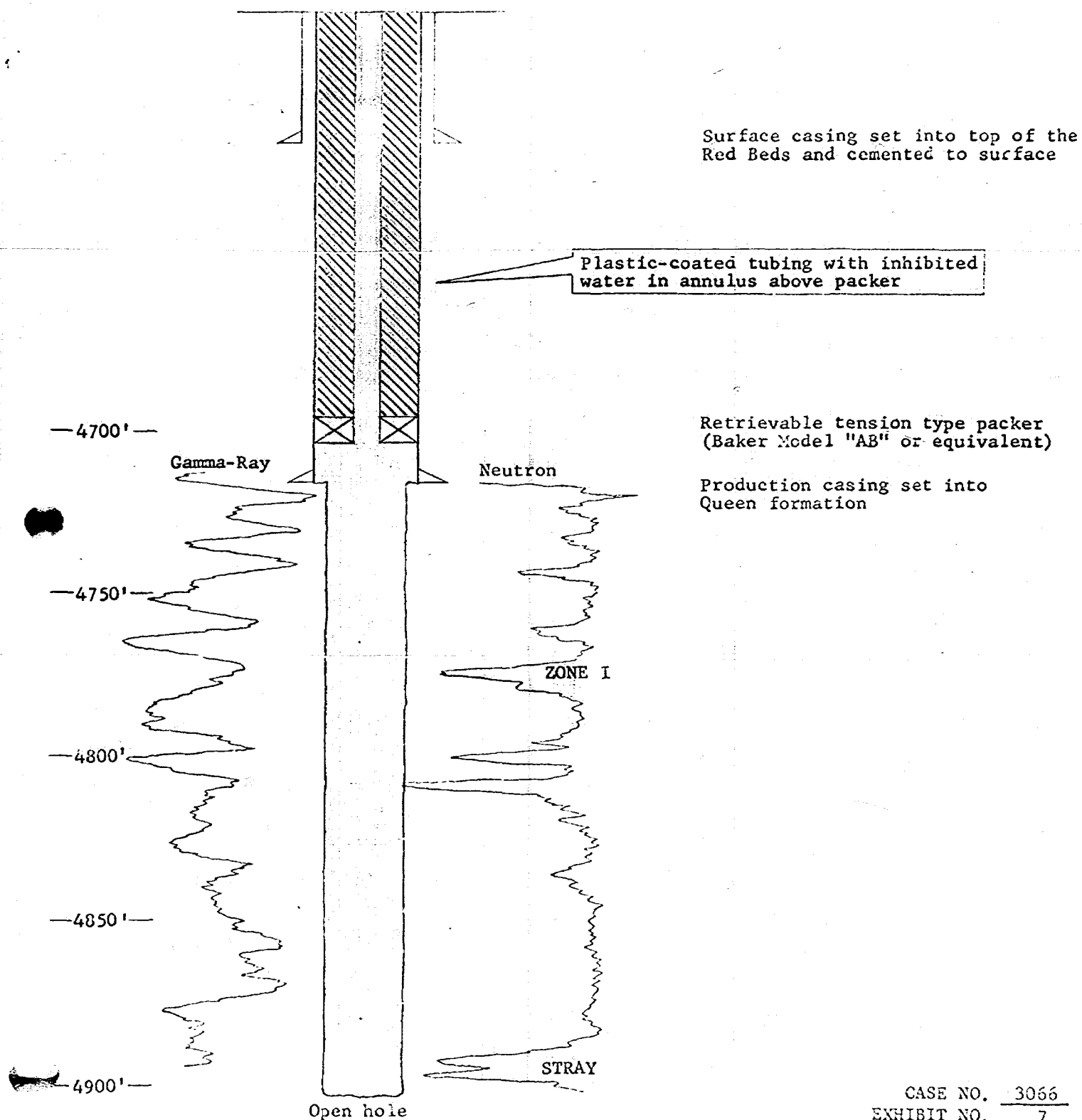
EAST



CASE NO. 3066
EXHIBIT NO. 6
EAST-WEST CROSS-SECTION
WEST PEARL QUEEN UNIT
Lea County, New Mexico
Gulf Oil Corp. Roswell Dis

DIAGRAMMATIC SKETCH
TYPICAL SINGLE INJECTION WELL

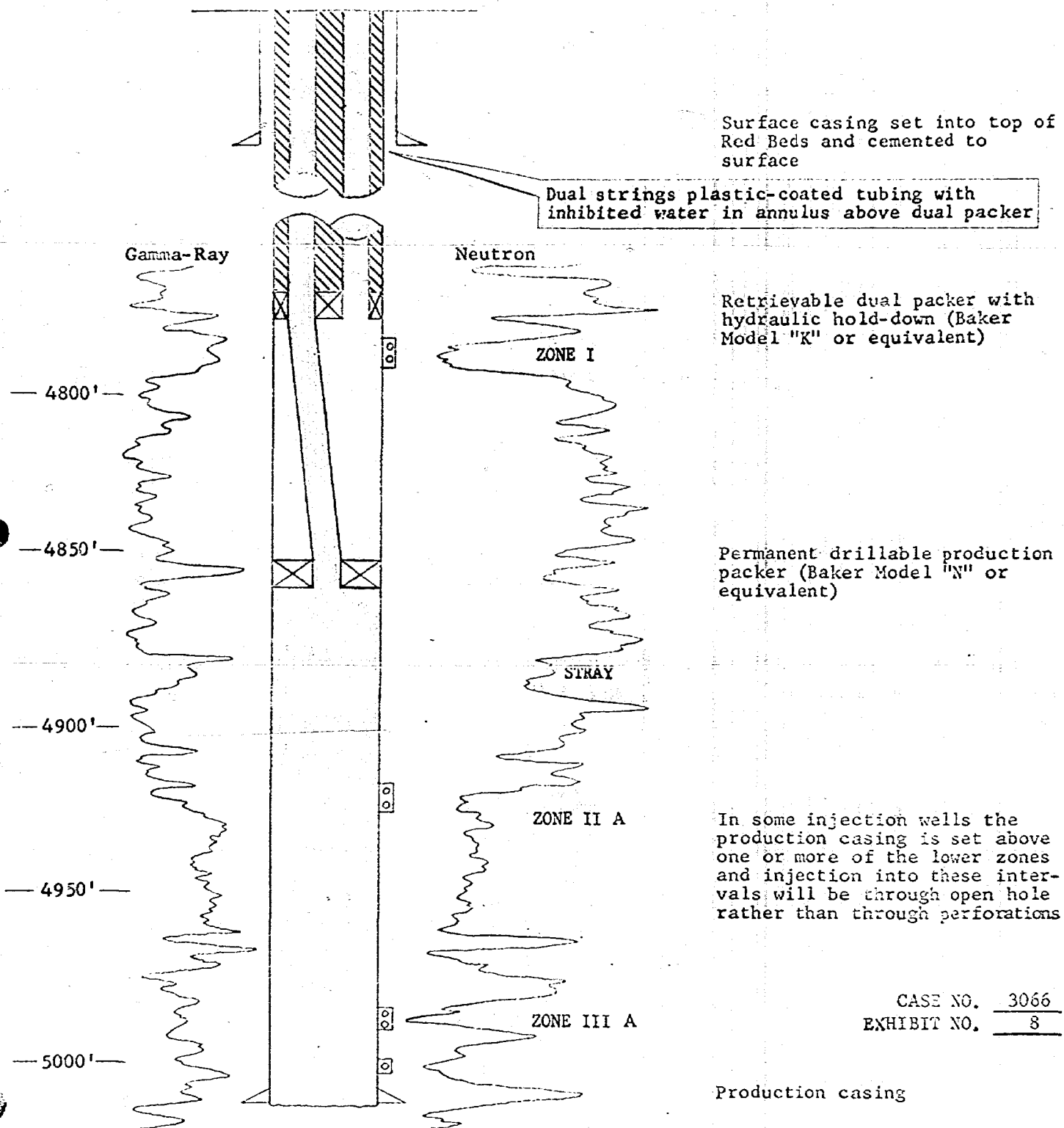
West Pearl Queen Unit
Lea County, New Mexico



CASE NO. 3066
EXHIBIT NO. 7

DIAGRAMMATIC SKETCH
TYPICAL DUAL INJECTION WELL

West Pearl Queen Unit
Lea County, New Mexico



INJECTION WELL DETAIL
TWO TUBING STRINGS IN ALL DUAL WELLS
WEST PEARL QUEEN UNIT
LEA COUNTY, NEW MEXICO

SECTION I
CASING AND CEMENT

INJECTION WELL	UNIT DESIG- NATION	NO.	SURFACE CASING				PRODUCTION CASING				ADDITIONAL CEMENTED INTERVALS #
			SIZE (INCHES)	DEPTH (FEET)	CEMENT (SACKS)	TOP CEMENT (FEET)	SIZE (INCHES)	DEPTH (FEET)	CEMENT (SACKS)	TOP CEMENT (FEET) *	
HAMON ST. E-8182	NO. 3	28- 4	8- 5/8	327	300	Surface	4- 1/2	4991	350	3423 E	
	NO. 4	28- 6	8- 5/8	326	300	Surface	4- 1/2	4961	350	3393 E	
CABOT ST. NEW MEX. "G"	NO. 5	28-10	8- 5/8	304	300	Surface	5- 1/2	4931	200	3753 E	
	NO. 1	28-12	8- 5/8	313	300	Surface	5- 1/2	4904	300	3180 E	
	NO. 4	28-14	8- 5/8	302	300	Surface	5- 1/2	4919	200	3920 E	
	NO. 7	28-16	8- 5/8	305	300	Surface	4- 1/2	4932	200	4036 E	
INMAN SUPERIOR-FED.	NO. 2	29- 2	8- 5/8	328	265	Surface	4- 1/2	5049	240	2980 E	
SHELL ST. "PK"	NO. 2	29- 4	8- 5/8	96	85	Surface	5- 1/2	5145	200	3967 E	
CACTUS PARKS	NO. 1	29- 6	13- 3/8	100	80	Surface	7	4932	150	3061 E	
SKELLY HOBBS "J" ST.	NO. 1	29- 8	13- 3/8	88	80	Surface	5- 1/4	4920	300	3153 E	
GULF LEA ST. "IH"	NO. 1	29-10	8- 5/8	308	300	Surface	4- 1/2	5009	2050	795 S	
	NO. 4	29-12	8- 5/8	144	100	Surface	4- 1/2	4974	250	4078 E	1914-1864
CACTUS GULF ST.	NO. 4	29-14	13- 3/8	100	50	Surface	5- 1/2	4965	350	3026 E	
	NO. 2	29-16	13- 3/8	90	80	Surface	5- 1/2	4939	300	3277 E	
GULF LEA ST. "AP"	NO. 3	30- 8	8- 5/8	143	100	Surface	4- 1/2	5075	250	3597 E	1875-1825
	NO. 1	30-16	8- 5/8	137	100	Surface	4- 1/2	4981	250	4085 E	1924-1874
CACTUS AZTEC ST.	NO. 2	31- 2	13- 3/8	107	100	Surface	7	4832	125	3273 E	
	NO. 6	31- 6	13- 3/8	108	90	Surface	7	4714	150	2843 E	
	NO. 4	31- 8	13- 3/8	102	100	Surface	7	4874	150	3003 E	
	NO. 7	31-10	13- 3/8	105	100	Surface	7	4714	150	3300 E	
							5- 1/2 Liner	4984	40	4144 E	
GULF LEA ST. "AQ"	NO. 2	32- 2	8- 5/8	108	60	Surface	4- 1/2	4959	250	4063 E	1895-1845
	NO. 4	32- 4	8- 5/8	101	100	Surface	4- 1/2	4948	250	4052 E	1935-1885
	NO. 5	32- 6	8- 5/8	130	100	Surface	4- 1/2	4936	250	4040 E	1920-1870
	NO. 7	32- 8	8- 5/8	145	100	Surface	4- 1/2	4979	250	4081 E	1909-1859
PHILLIPS NEW MEX. "C"	NO. 1	32-10	8- 5/8	144	145	Surface	5- 1/2	5060	300	3293 E	
GULF LEA ST. "BG"	NO. 3	33- 2	8- 5/8	327	300	Surface	4- 1/2	4932	1850	465 S	
	NO. 1	33- 4	8- 5/8	349	300	Surface	4- 1/2	4969	1800	415 S	
	NO. 6	33- 6	8- 5/8	146	100	Surface	4- 1/2	4965	250	3487 E	1882-1833
	NO. 8	33- 8	8- 5/8	141	100	Surface	4- 1/2	5005	250	3527 E	1896-1846
GULF LEA ST. "AR"	NO. 4	33-10	8- 5/8	140	100	Surface	4- 1/2	5011	250	3533 E	1865-1815

* E - Estimated S - Temperature Survey

Two-stage cementing tool set at lower depth and 50 sacks cement spotted at top of salt and anhydrite section.

CASE NO. 3066
EXHIBIT NO. 9

INJECTION WELL DETAIL
TWO TUBING STRINGS IN ALL DUAL WELLS
WEST PEARL QUEEN UNIT
LEA COUNTY, NEW MEXICO

SECTION II
TUBING, PACKERS AND PERFORATIONS

UPPER INJECTION INTERVAL

LOWER INJECTION INTERVAL

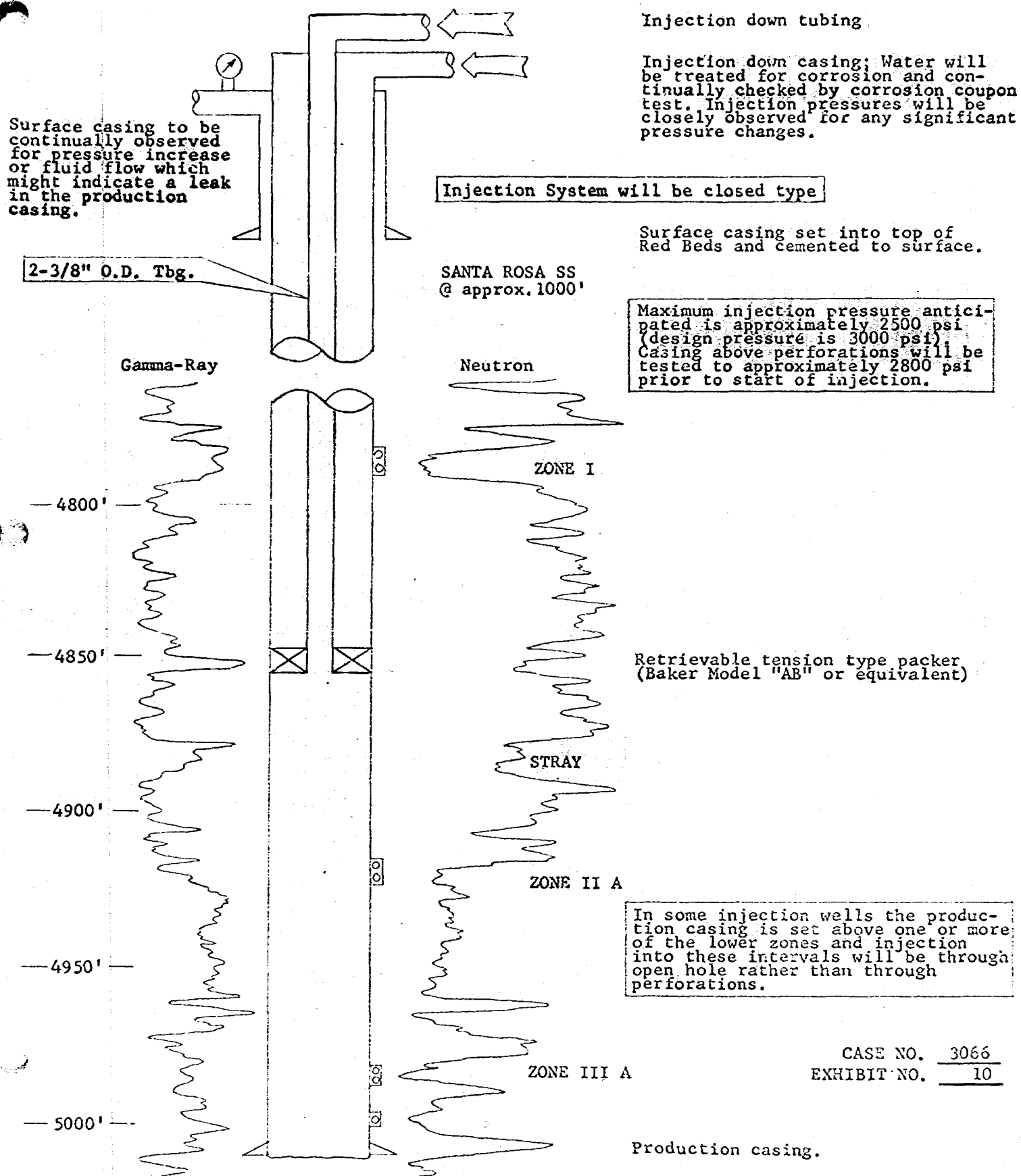
INJECTION WELL		UNIT DESIG- NATION	GROSS PERF. AND/OR OPEN HOLE INTERVALS	TUBING		PACKER		GROSS PERF. AND/OR OPEN HOLE INTERVALS	TUBING		PACKER	
				SIZE (OD)	DEPTH	TYPE	DEPTH		SIZE (OD)	DEPTH	TYPE	DEPTH
HAYON ST. E-8182	NO. 3	28- 4	4762-4772	1.660	4700	RD W/HH	4700	4880-4910	1.660	4850	Permanent	4850
	NO. 4	28- 6	4700-4710	1.660	4650	RD W/HH	4650	4814-4895	1.660	4750	Permanent	4750
CABOT ST. NEW MEX. "G"	NO. 5	28-10	4710-4720	2.063	4650	RD W/HH	4650	4826-4910	2.063	4775	Permanent	4775
	NO. 1	28-12	4733-4747	2.063	4700	RD W/HH	4700	4860-4946	2.063	4800	Permanent	4800
	NO. 4	28-14	4774-4786	2.063	4725	RD W/HH	4725	4854-4949	2.063	4825	Permanent	4825
	NO. 7	28-16	4726-4736	1.660	4675	RD W/HH	4675	4842-4851	1.660	4800	Permanent	4800
INMAN SUPERIOR-FED.	NO. 2	29- 2	4814-4820	1.660	4775	RD W/HH	4775	4934-5008	1.660	4900	Permanent	4900
SHELL STATE "PK"	NO. 2	29- 4	4870-4880	2.063	4825	RD W/HH	4825	5026-5054	2.063	4950	Permanent	4950
CACTUS PARKS	NO. 1	29- 6	4810-4820	2.375	4750	RD W/HH	4750	4932-5030	2.375	4875	Permanent	4875
SKELLY HOBBS "J" ST.	NO. 1	29- 8	4770-4785	2.063	4725	RD W/HH	4725	4898-5000	2.063	4850	Permanent	4850
GULF LEA STATE "IH"	NO. 1	29-10	4782-4790	1.660	4750	RD W/HH	4750	4914-5000	1.660	4850	Permanent	4850
	NO. 4	29-12	4819-4821	1.660	4775	RD W/HH	4775	4957-5050	1.660	4900	Permanent	4900
CACTUS GULF ST. "A"	NO. 4	29-14	4775-4790	2.063	4725	RD W/HH	4725	4910-4993	2.063	4850	Permanent	4850
	NO. 2	29-16	4746-4761	2.063	4700	RD W/HH	4700	4888-4962	2.063	4825	Permanent	4825
GULF LEA STATE "AP"	NO. 3	30- 8	4848-4850	1.660	4800	RD W/HH	4800	4927-5037	1.660	4900	Permanent	4900
	NO. 1	30-16	4803-4805	1.660	4750	RD W/HH	4750	4947-5060	1.660	4900	Permanent	4900
CACTUS AZTEC ST.	NO. 2	31- 2	4790-4800	2.375	4750	RD W/HH	4750	4835-5030	2.375	4825	Permanent	4825
	NO. 6	31- 6	4714-4900	2.375	4700	RS Tension	4700	Commingled Injection w/Upper Interval in Open Hole.				
	NO. 4	31- 8	4784-4790	2.375	4750	RD W/HH	4750		4877-4930	2.375	4825	Permanent
	NO. 7	31-10	4767-4772	2.375	4700	RD W/HH	4700	4880-4997	2.375	4825	Permanent	4825
GULF LEA-STATE "AQ"	NO. 2	32- 2	4774-4776	1.660	4725	RD W/HH	4725	4924-5015	1.660	4850	Permanent	4850
	NO. 4	32- 4	4785-4787	1.660	4725	RD W/HH	4725	4929-5020	1.660	4850	Permanent	4850
	NO. 5	32- 6	4786-4788	1.660	4725	RD W/HH	4725	4884-5025	1.660	4825	Permanent	4825
	NO. 7	32- 8	4802-4804	1.660	4750	RD W/HH	4750	4949-5040	1.660	4875	Permanent	4875
PHILLIPS NEW MEX. "C"	NO. 1	32-10	4790-4806	2.063	4750	RD W/HH	4750	4898-5022	2.063	4850	Permanent	4850
GULF LEA ST. "BG"	NO. 3	33- 2	4737-4741	1.660	4700	RD W/HH	4700	4881-4975	1.660	4800	Permanent	4800
	NO. 1	33- 4	4773-4785	1.660	4725	RD W/HH	4725	4920-5010	1.660	4850	Permanent	4850
	NO. 6	33- 6	4767-4782	1.660	4700	RD W/HH	4700	4927-5020	1.660	4850	Permanent	4850
	NO. 8	33- 8	4750-4752	1.660	4700	RD W/HH	4700	4890-4962	1.660	4800	Permanent	4800
GULF LEA ST. "AR"	NO. 4	33-10	4776-4778	1.660	4725	RD W/HH	4725	4876-4998	1.660	4825	Permanent	4825

RD W/HH -Retrievable Dual with Hydraulic Hold-down Similar to Baker Model "K"
RS Tension -Retrievable Single Tension Type Packer Similar to Baker Model "AB"
Permanent -Drillable Packer Similar to Baker Model "N" (Tubing Set)

CASE NO. 3066
EXHIBIT NO. 9

DIAGRAMMATIC SKETCH
Typical Dual Injection Well

West Pearl Queen Unit
Lea County, New Mexico



INJECTION WELL DETAIL
DUALS EQUIPPED WITH SINGLE TUBING STRING
WEST PEARL QUEEN UNIT
LEA COUNTY, NEW MEXICO

												INJECTION INTERVALS AND EQUIPMENT SETTING DEPTHS			
INJECTION WELL		UNIT DESIG- NATION	SURFACE CASING				PRODUCTION CASING				ADDITIONAL CEMENTED INTERVALS #	GROSS PERFORATED AND/OR		APPROXIMATE TUBING AND PACKER DEPTH #	
			SIZE (INCHES)	DEPTH (FEET)	CEMENT (SACKS)	TOP CEMENT (FEET)	SIZE (INCHES)	DEPTH (FEET)	CEMENT (SACKS)	TOP CEMENT (FEET) *		OPEN HOLE UPPER	INTERVALS LOWER		
HAMON ST. E-8182	NO. 3	28- 4	8-5/8	327	300	Surface	4-1/2	4991	350	3423	E		4762-4772	4880-4910	4850
	NO. 4	28- 6	8-5/8	326	300	Surface	4-1/2	4961	350	3393	E		4700-4710	4814-4895	4750
CABOT ST. NEW MEX. "C"	NO. 5	28-10	8-5/8	304	300	Surface	5-1/2	4931	200	3753	E		4710-4720	4826-4910	4775
	NO. 1	28-12	8-5/8	313	300	Surface	5-1/2	4904	300	3180	E		4733-4747	4860-4946	4800
	NO. 4	28-14	8-5/8	302	300	Surface	5-1/2	4919	200	3920	E		4774-4786	4854-4949	4825
	NO. 7	28-16	8-5/8	305	300	Surface	4-1/2	4932	200	4036	E		4726-4736	4842-4851	4800
INMAN SUPERIOR-FED.	NO. 2	29- 2	8-5/8	328	265	Surface	4-1/2	5049	240	2980	E		4814-4820	4934-5008	4900
SHELL ST. "PK"	NO. 2	29- 4	8-5/8	96	85	Surface	5-1/2	5145	200	3967	E		4870-4880	5026-5059	4950
CACTUS PARKS	NO. 1	29- 6	13-3/8	100	80	Surface	7	4932	150	3061	E		4810-4820	4932-5030	4875
SKELLY HOBBS "J" ST.	NO. 1	29- 8	13-3/8	88	80	Surface	5-1/4	4920	300	3153	E		4770-4785	4898-5000	4850
GULF LEA ST. "IH"	NO. 1	29-10	8-5/8	308	300	Surface	4-1/2	5009	2050	795	S		4782-4790	4914-5000	4850
	NO. 4	29-12	8-5/8	144	100	Surface	4-1/2	4974	250	4078	E	1914-1864	4819-4821	4957-5050	4900
CACTUS GULF ST.	NO. 4	29-14	13-3/8	100	50	Surface	5-1/2	4965	350	3026	E		4775-4790	4910-4993	4850
	NO. 2	29-16	13-3/8	90	80	Surface	5-1/2	4939	300	3277	E		4746-4761	4888-4962	4825
GULF LEA ST. "AP"	NO. 3	30- 8	8-5/8	143	100	Surface	4-1/2	5075	250	3597	E	1875-1825	4848-4850	4927-5037	4900
	NO. 1	30-16	8-5/8	137	100	Surface	4-1/2	4981	250	4085	E	1924-1874	4803-4805	4947-5060	4900
CACTUS AZTEC ST.	NO. 2	31- 2	13-3/8	107	100	Surface	7	4832	125	3273	E		4790-4800	4835-5030	4820
	NO. 6	31- 6	13-3/8	108	90	Surface	7	4714	150	2843	E		4714-4900	NOT DUAL	4700
	NO. 4	31- 8	13-3/8	102	100	Surface	7	4874	150	3003	E		4784-4790	4877-4930	4825
	NO. 7	31-10	13-3/8	105	100	Surface	7	4714	150	3300	E		4767-4772	4880-4997	4825
							5-1/2 Liner	4984	40	4144	E				
GULF LEA ST. "AQ"	NO. 2	32- 2	8-5/8	108	60	Surface	4-1/2	4959	250	4063	E	1895-1845	4774-4776	4924-5015	4850
	NO. 4	32- 4	8-5/8	101	100	Surface	4-1/2	4948	250	4052	E	1935-1885	4785-4787	4929-5020	4850
	NO. 5	32- 6	8-5/8	130	100	Surface	4-1/2	4936	250	4040	E	1920-1870	4786-4788	4884-5025	4825
	NO. 7	32- 8	8-5/8	145	100	Surface	4-1/2	4979	250	4081	E	1909-1859	4802-4804	4949-5040	4875
PHILLIPS NEW MEX. "C"	NO. 1	32-10	8-5/8	144	145	Surface	5-1/2	5060	300	3293	E		4790-4806	4898-5022	4850
GULF LEA ST. "BG"	NO. 3	33- 2	8-5/8	327	300	Surface	4-1/2	4932	1850	465	S		4737-4741	4881-4975	4800
	NO. 1	33- 4	8-5/8	349	300	Surface	4-1/2	4969	1800	415	S		4773-4785	4920-5010	4850
	NO. 6	33- 6	8-5/8	146	100	Surface	4-1/2	4965	250	3487	E	1882-1833	4767-4782	4927-5020	4850
	NO. 8	33- 8	8-5/8	141	100	Surface	4-1/2	5005	250	3527	E	1896-1846	4750-4752	4890-4962	4800
GULF LEA ST. "AR"	NO. 4	33-10	8-5/8	140	100	Surface	4-1/2	5011	250	3533	E	1865-1815	4776-4778	4876-4998	4825

* E - Estimated S - Temperature Survey

Two-stage cementing tool set at lower depth and 50 sacks cement spotted at top of sale and anhydrite section.

\$ 2-3/8" OD Tubing and retrievable tension type packer (Baker Model "AB" or equivalent).

CASE NO. 3066
EXHIBIT NO. 11

May 19, 1964

Mr. Frank Irby, State Engineer
Test Office Box 1079
Santa Fe, New Mexico 87501

Dear Mr. Irby:

As you suggested in the May 14, 1964 telephone conversation with Mr. D. C. Hilbrey of our office, we are writing this letter outlining briefly one of several possible water injection programs which Gulf might employ in the West Pearl (Queen Unit) waterflood project in hopes of obtaining your approval prior to our waterflood hearing before the OSC.

As pointed out by Mr. Hilbrey, none of the 30 injection wells in the proposed waterflood has the production casing cemented across the Santa Rosa formation, found from approximately 900 to 1300 feet in this area. Since Gulf might wish to dually inject into two separate intervals simultaneously down the tubing and the tubing-casing annulus, you wanted to know precisely what steps we would take to insure that the Santa Rosa would not be endangered by contamination from injected waters through possible casing leaks. The following steps, which are also briefly described on the attached diagrammatic sketch, would be taken during injection operations to insure that the Santa Rosa formation would be adequately protected:

- (1) The maximum injection pressure anticipated during the waterflood is 2500 psi and the casing above the perforations would be tested to approximately 2300 psi (slightly lower than the 3000 psi design pressure of the system) prior to start of water injection.
- (2) The injection system would be of the closed type to minimize oxygen corrosion. The Ogallala water, which will be utilized to flood the Queen reservoir, would be treated to reduce its oxygen content to 0.20 ppm. When recycled water is used in the injection wells additional corrosion treatment would be initiated.
- (3) To check the effectiveness of our water treating program, corrosion coupon tests would be continually conducted at the injection wells.

CASE NO. 3066
EXHIBIT NO. 12

Mr. Frank Irby

- 2 -

May 19, 1964

- (4) To detect any leak in the production casing which might occur even after all precaution had been taken, frequent observation of the surface casing for increase in pressure or actual fluid flow would be maintained. At the same time injection pressure at the well head, especially that on the annulus, would be closely watched for any significant change.

We believe this injection program with the safeguards outlined would insure that the Santa Rosa or any other shallow fresh water sands would be protected from contamination during the ten years of waterflood operations. Dual injection, which we believe to be very important in this reservoir, simultaneously down the tubing and the tubing-casing annulus could effect sizable monetary savings to the West Pearl Queen Unit as compared to injection down two strings of small-size coated-tubing.

We hope this program will be acceptable to you; however, if you have any suggestions or objections concerning this possible approach, please notify us as soon as possible.

Yours very truly,

GULF OIL CORPORATION

M. I. Taylor

Attachment
DGB:ers

CASE NO. 3066
EXHIBIT NO. 12



STATE OF NEW MEXICO

STATE ENGINEER OFFICE

SANTA FE

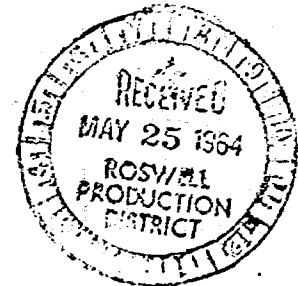
S. E. REYNOLDS
STATE ENGINEER

May 22, 1964

ADDRESS CORRESPONDENCE TO:
STATE CAPITOL
SANTA FE, N. M.

87501

Mr. M. I. Taylor
District Production Manager
Gulf Oil Corporation
P. O. Drawer 1938
Roswell, New Mexico 88201



Dear Mr. Taylor:

Your letter of May 19, 1964 referring to my telephone conversation with Mr. D. G. Bilbrey is gratefully acknowledged.

It appears from your outline of the protective measures set forth in your letter and a perusal of your diagrammatic sketch that I can refrain from objecting to your proposal provided your statements 1 through 4 and the paragraph following statement 4 and the diagrammatic sketch are entered in the record for the Oil Conservation Commission without change.

If you find a change necessary, it would be advisable to inform me in order that I may have an opportunity to review it before appearing at the hearing.

Very truly yours,

S. E. Reynolds
State Engineer

By: *Frank E. Irby*
Frank E. Irby
Chief
Water Rights Division

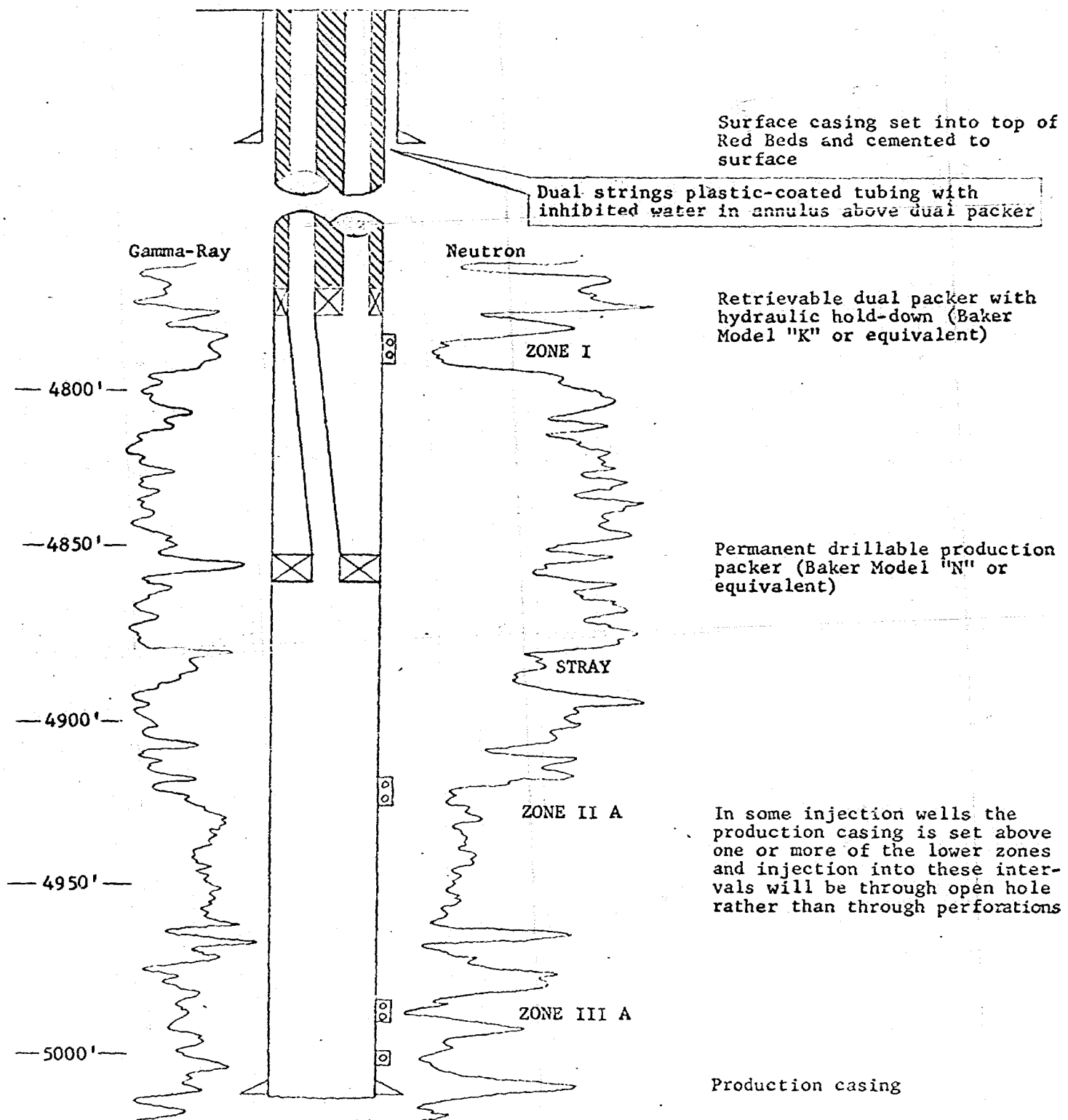
FEI/ma

CASE NO. 3066
EXHIBIT NO. 13

See Ex 12

DIAGRAMMATIC SKETCH
TYPICAL DUAL INJECTION WELL

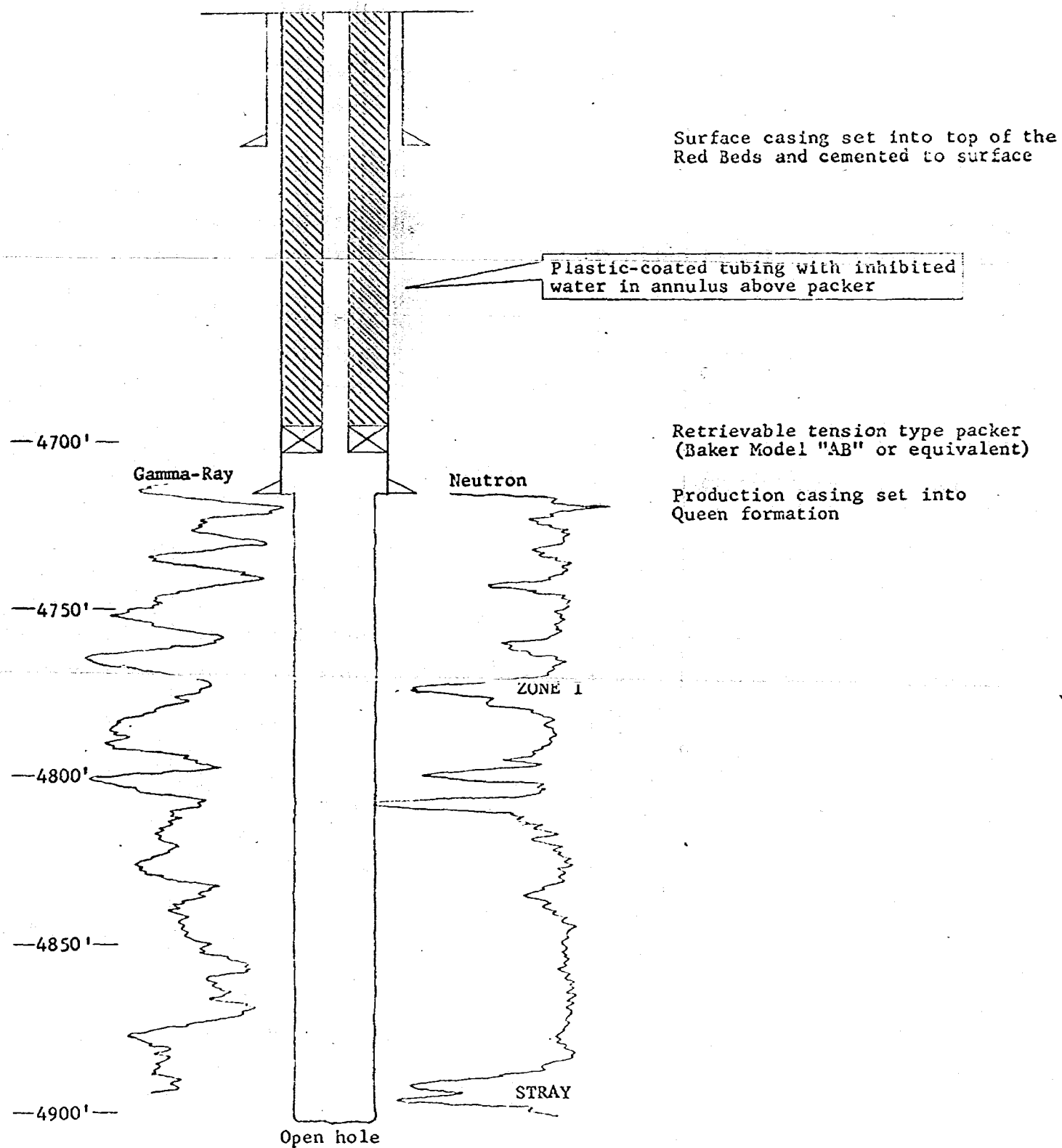
West Pearl Queen Unit
Lea County, New Mexico



Chen-3-6-60

DIAGRAMMATIC SKETCH
TYPICAL SINGLE INJECTION WELL

West Pearl Queen Unit
Lea County, New Mexico



INJECTION WELL DETAIL
TWO TUBING STRINGS IN ALL DUAL WELLS
WEST PEARL QUEEN UNIT
LEA COUNTY, NEW MEXICO

SECTION I
CASING AND CEMENT

INJECTION WELL		UNIT DESIG- NATION	SURFACE CASING				PRODUCTION CASING				ADDITIONAL CEMENTED INTERVALS #	
			SIZE (INCHES)	DEPTH (FEET)	CEMENT (SACKS)	TOP CEMENT (FEET)	SIZE (INCHES)	DEPTH (FEET)	CEMENT (SACKS)	TOP CEMENT (FEET) *		
HAMON ST. E-8182	NO. 3	28- 4	8-5/8	327	300	Surface	4-1/2	4991	350	3423	E	
	NO. 4	28- 6	8-5/8	326	300	Surface	4-1/2	4961	350	3393	E	
CABOT ST. NEW MEX. "G"	NO. 5	28-10	8-5/8	304	300	Surface	5-1/2	4931	200	3753	E	
	NO. 1	28-12	8-5/8	313	300	Surface	5-1/2	4904	300	3180	E	
	NO. 4	28-14	8-5/8	302	300	Surface	5-1/2	4919	200	3920	E	
	NO. 7	28-16	8-5/8	305	300	Surface	4-1/2	4932	200	4036	E	
INMAN SUPERIOR-FED.	NO. 2	29- 2	8-5/8	328	265	Surface	4-1/2	5049	240	2980	E	
SHELL ST. "PK"	NO. 2	29- 4	8-5/8	96	85	Surface	5-1/2	5145	200	3967	E	
CACTUS PARKS	NO. 1	29- 6	13-3/8	100	80	Surface	7	4932	150	3061	E	
SKELLY HOBBS "J" ST.	NO. 1	29- 8	13-3/8	88	80	Surface	5-1/4	4920	300	3153	E	
GULF LEA ST. "IH"	NO. 1	29-10	8-5/8	308	300	Surface	4-1/2	5009	2050	795	S	
	NO. 4	29-12	8-5/8	144	100	Surface	4-1/2	4974	250	4078	E	1914-1864
CACTUS GULF ST.	NO. 4	29-14	13-3/8	100	50	Surface	5-1/2	4965	350	3026	E	
	NO. 2	29-16	13-3/8	90	80	Surface	5-1/2	4939	300	3277	E	
GULF LEA ST. "AP"	NO. 3	30- 8	8-5/8	143	100	Surface	4-1/2	5075	250	3597	E	1875-1825
	NO. 1	30-16	8-5/8	137	100	Surface	4-1/2	4981	250	4085	E	1924-1874
CACTUS AZTEC ST.	NO. 2	31- 2	13-3/8	107	100	Surface	7	4832	125	3273	E	
	NO. 6	31- 6	13-3/8	108	90	Surface	7	4714	150	2843	E	
	NO. 4	31- 8	13-3/8	102	100	Surface	7	4874	150	3003	E	
	NO. 7	31-10	13-3/8	105	100	Surface	7	4714	150	3300	E	
						5-1/2 Liner	4984	40	4144	E		
GULF LEA ST. "AQ"	NO. 2	32- 2	8-5/8	108	60	Surface	4-1/2	4959	250	4063	E	1895-1845
	NO. 4	32- 4	8-5/8	101	100	Surface	4-1/2	4948	250	4052	E	1935-1885
	NO. 5	32- 6	8-5/8	130	100	Surface	4-1/2	4936	250	4040	E	1920-1870
	NO. 7	32- 8	8-5/8	145	100	Surface	4-1/2	4979	250	4081	E	1909-1859
PHILLIPS NEW MEX. "C"	NO. 1	32-10	8-5/8	144	145	Surface	5-1/2	5060	300	3293	E	
GULF LEA ST. "BG"	NO. 3	33- 2	8-5/8	327	300	Surface	4-1/2	4932	1850	465	S	
	NO. 1	33- 4	8-5/8	349	300	Surface	4-1/2	4969	1800	415	S	
	NO. 6	33- 6	8-5/8	146	100	Surface	4-1/2	4965	250	3487	E	1832-1833
	NO. 8	33- 8	8-5/8	141	100	Surface	4-1/2	5005	250	3527	E	1896-1846
GULF LEA ST. "AR"	NO. 4	33-10	8-5/8	140	100	Surface	4-1/2	5011	250	3533	E	1865-1815

* E - Estimated S - Temperature Survey

Two-stage cementing tool set at lower depth and 50 sacks cement spotted at top of salt and anhydrite section.

INJECTION WELL DETAIL
TWO TUBING STRINGS IN ALL DUAL WELLS
WEST PEARL QUEEN UNIT
LEA COUNTY, NEW MEXICO

SECTION II
TUBING, PACKERS AND PERFORATIONS

UPPER INJECTION INTERVAL

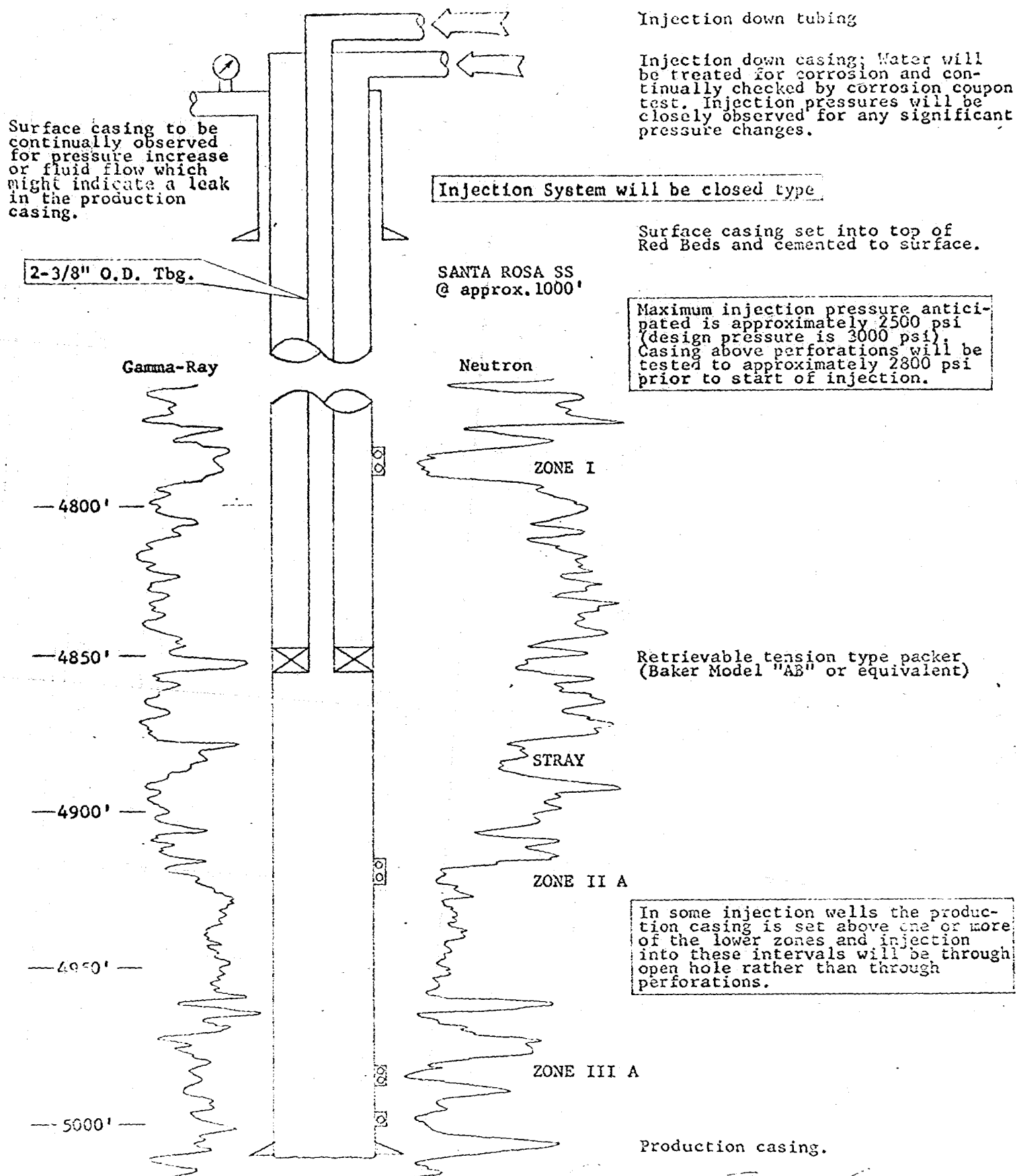
LOWER INJECTION INTERVAL

INJECTION WELL		UNIT DESIG- NATION	GROSS PERF. AND/OR OPEN HOLE INTERVALS	TUBING		PACKER		GROSS PERF. AND/OR OPEN HOLE INTERVALS	TUBING		PACKER	
				SIZE (OD)	DEPTH	TYPE	DEPTH		SIZE (OD)	DEPTH	TYPE	DEPTH
HAMON ST. E-8182	NO. 3	28- 4	4762-4772	1.660	4700	RD W/HH	4700	4880-4910	1.660	4850	Permanent	4850
	NO. 4	28- 6	4700-4710	1.660	4650	RD W/HH	4650	4814-4895	1.660	4750	Permanent	4750
CABOT ST. NEW MEX. "G"	NO. 5	28-10	4710-4720	2.063	4650	RD W/HH	4650	4826-4910	2.063	4775	Permanent	4775
	NO. 1	28-12	4733-4747	2.063	4700	RD W/HH	4700	4860-4946	2.063	4800	Permanent	4800
	NO. 4	28-14	4774-4786	2.063	4725	RD W/HH	4725	4854-4949	2.063	4825	Permanent	4825
	NO. 7	28-16	4726-4736	1.660	4675	RD W/HH	4675	4842-4851	1.660	4800	Permanent	4800
INMAN SUPERIOR-FED.	NO. 2	29- 2	4814-4820	1.660	4775	RD W/HH	4775	4934-5008	1.660	4900	Permanent	4900
SHELL STATE "PK"	NO. 2	29- 4	4870-4880	2.063	4825	RD W/HH	4825	5026-5054	2.063	4950	Permanent	4950
CACTUS PARKS	NO. 1	29- 6	4810-4820	2.375	4750	RD W/HH	4750	4932-5030	2.375	4875	Permanent	4875
SKELLY HOBBS "J" ST.	NO. 1	29- 8	4770-4785	2.063	4725	RD W/HH	4725	4898-5000	2.063	4850	Permanent	4850
GULF LEA STATE "IH"	NO. 1	29-10	4782-4790	1.660	4750	RD W/HH	4750	4914-5000	1.660	4850	Permanent	4850
	NO. 4	29-12	4819-4821	1.660	4775	RD W/HH	4775	4957-5050	1.660	4900	Permanent	4900
CACTUS GULF ST. "A"	NO. 4	29-14	4775-4790	2.063	4725	RD W/HH	4725	4910-4993	2.063	4850	Permanent	4850
	NO. 2	29-16	4746-4761	2.063	4700	RD W/HH	4700	4888-4962	2.063	4825	Permanent	4825
GULF LEA STATE "AP"	NO. 3	30- 8	4848-4850	1.660	4800	RD W/HH	4800	4927-5037	1.660	4900	Permanent	4900
	NO. 1	30-16	4803-4805	1.660	4750	RD W/HH	4750	4947-5060	1.660	4900	Permanent	4900
CACTUS AZTEC ST.	NO. 2	31- 2	4790-4800	2.375	4750	RD W/HH	4750	4835-5030	2.375	4825	Permanent	4825
	NO. 6	31- 6	4714-4900	2.375	4700	RS Tension	4700	Commingled Injection w/Upper Interval in Open Hole.				
	NO. 4	31- 8	4784-4790	2.375	4750	RD W/HH	4750	4877-4930	2.375	4825	Permanent	4825
	NO. 7	31-10	4767-4772	2.375	4700	RD W/HH	4700	4880-4997	2.375	4825	Permanent	4825
GULF LEA-STATE "AQ"	NO. 2	32- 2	4774-4776	1.660	4725	RD W/HH	4725	4924-5015	1.660	4850	Permanent	4850
	NO. 4	32- 4	4785-4787	1.660	4725	RD W/HH	4725	4929-5020	1.660	4850	Permanent	4850
	NO. 5	32- 6	4786-4788	1.660	4725	RD W/HH	4725	4884-5025	1.660	4825	Permanent	4825
	NO. 7	32- 8	4802-4804	1.660	4750	RD W/HH	4750	4949-5040	1.660	4875	Permanent	4875
PHILLIPS NEW MEX. "C"	NO. 1	32-10	4790-4806	2.063	4750	RD W/HH	4750	4898-5022	2.063	4850	Permanent	4850
GULF LFA ST. "BG"	NO. 3	33- 2	4737-4741	1.660	4700	RD W/HH	4700	4881-4975	1.660	4800	Permanent	4800
	NO. 1	33- 4	4773-4785	1.660	4725	RD W/HH	4725	4920-5010	1.660	4850	Permanent	4850
	NO. 6	33- 6	4767-4782	1.660	4700	RD W/HH	4700	4927-5020	1.660	4850	Permanent	4850
	NO. 8	33- 8	4750-4752	1.660	4700	RD W/HH	4700	4890-4962	1.660	4800	Permanent	4800
GULF LEA ST. "AR"	NO. 4	33-10	4776-4778	1.660	4725	RD W/HH	4725	4876-4998	1.660	4825	Permanent	4825

RD W/HH -Retrievable Dual with Hydraulic Hold-down Similar to Baker Model "K"
RS Tension -Retrievable Single Tension Type Packer Similar to Baker Model "AB"
Permanent -Drillable Packer Similar to Baker Model "N" (Tubing Set)

DIAGRAMMATIC SKETCH
Typical Dual Injection Well

West Pearl Queen Unit
Lea County, New Mexico



**INJECTION WELL DETAIL
DUALS EQUIPPED WITH SINGLE TUBING STRING
WEST PEARL QUEEN UNIT
LEA COUNTY, NEW MEXICO**

INJECTION WELL		UNIT DESIG- NATION	SURFACE CASING				PRODUCTION CASING					ADDITIONAL CEMENTED INTERVALS #	INJECTION INTERVALS AND EQUIPMENT DEPTHS		
			SIZE (INCHES)	DEPTH (FEET)	CEMENT (SACKS)	TOP CEMENT (FEET)	SIZE (INCHES)	DEPTH (FEET)	CEMENT (SACKS)	TOP CEMENT (FEET)	GROSS PERFORATED AND/OR OPEN HOLE UPPER		INTERVALS LOWER	APPROXIMATE TUBING AND PACKER DEPTH #	
HAMON ST. E-8182	NO. 3	28- 4	8- 5/8	327	300	Surface	4- 1/2	4991	350	3423	E	4762-4772	4880-4910	4850	
	NO. 4	28- 6	8- 5/8	326	300	Surface	4- 1/2	4961	350	3393	E	4700-4710	4814-4895	4750	
CABOT ST. NEW MEX. "G"	NO. 5	26-10	8- 5/8	304	300	Surface	5- 1/2	4931	200	3753	E	4710-4720	4826-4910	4775	
	NO. 1	28-12	8- 5/8	313	300	Surface	5- 1/2	4904	300	3180	E	4733-4747	4860-4946	4800	
	NO. 4	28-14	8- 5/8	302	300	Surface	5- 1/2	4919	200	3920	E	4774-4786	4854-4949	4825	
	NO. 7	28-16	8- 5/8	305	300	Surface	4- 1/2	4932	200	4036	E	4726-4736	4842-4851	4800	
INMAN SUPERIOR-FED.	NO. 2	29- 2	8- 5/8	328	265	Surface	4- 1/2	5049	240	2980	E	4814-4820	4934-5008	4900	
SHELL ST. "PK"	NO. 2	29- 4	8- 5/8	96	85	Surface	5- 1/2	5145	200	3967	E	4870-4880	5026-5059	4950	
CACTUS PARKS	NO. 1	29- 6	13-3/8	100	80	Surface	7	4932	150	3061	E	4810-4820	4932-5030	4875	
SKELLY HOBBS "J" ST.	NO. 1	29- 8	13-3/8	88	80	Surface	5- 1/4	4920	300	3153	E	4770-4785	4898-5060	4850	
GULF LEA ST. "IH"	NO. 1	29-10	8- 5/8	308	300	Surface	4- 1/2	5009	2050	795	S	4782-4790	4914-5000	4850	
	NO. 4	29-12	8- 5/8	144	100	Surface	4- 1/2	4974	250	4078	E	1914-1864	4819-4821	4957-5050	4900
CACTUS GULF ST.	NO. 4	29-14	13-3/8	100	50	Surface	5- 1/2	4965	350	3026	E	4775-4790	4910-4993	4850	
	NO. 2	29-16	13-3/8	90	80	Surface	5- 1/2	4939	300	3277	E	4746-4761	4888-4962	4825	
GULF LEA ST. "AP"	NO. 3	30- 8	8- 5/8	143	100	Surface	4- 1/2	5075	250	3597	E	1875-1825	4848-4850	4927-5037	4900
	NO. 1	30-16	8- 5/8	137	100	Surface	4- 1/2	4981	250	4085	E	1924-1874	4803-4805	4947-5060	4900
CACTUS AZTEC ST.	NO. 2	31- 2	13-3/8	107	100	Surface	7	4832	125	3273	E	4790-4800	4835-5020	4820	
	NO. 6	31- 6	13-3/8	108	90	Surface	7	4714	150	2343	E	4714-4900	NOT DUAL	4700	
	NO. 4	31- 8	13-3/8	102	100	Surface	7	4874	150	3003	E	4784-4790	4877-4930	4825	
	NO. 7	31-10	13-3/8	105	100	Surface	7	4714	150	3300	E	4767-4772	4880-4997	4825	
						5- 1/2 Liner		4984	40	4144	E				
GULF LEA ST. "AQ"	NO. 2	32- 2	8- 5/8	108	60	Surface	4- 1/2	4959	250	4063	E	1895-1845	4774-4776	4924-5015	4850
	NO. 4	32- 4	8- 5/8	101	100	Surface	4- 1/2	4948	250	4052	E	1935-1885	4785-4787	4929-5020	4850
	NO. 5	32- 6	8- 5/8	130	100	Surface	4- 1/2	4936	250	4040	E	1920-1870	4786-4788	4884-5025	4825
	NO. 7	32- 8	8- 5/8	145	100	Surface	4- 1/2	4979	250	4081	E	1909-1859	4802-4804	4949-5040	4875
PHILLIPS NEW MEX. "C"	NO. 1	32-10	8- 5/8	144	145	Surface	5- 1/2	5060	300	3293	E	4790-4806	4898-5022	4850	
GULF LEA ST. "BC"	NO. 3	33- 2	8- 5/8	327	300	Surface	4- 1/2	4932	1850	465	S	4737-4741	4881-4975	4800	
	NO. 1	33- 4	8- 5/8	349	300	Surface	4- 1/2	4969	1800	415	S	4773-4785	4920-5010	4850	
	NO. 6	33- 6	8- 5/8	146	100	Surface	4- 1/2	4965	250	3487	E	1882-1833	4767-4782	4927-5020	4850
	NO. 8	33- 8	8- 5/8	141	100	Surface	4- 1/2	5005	250	3527	E	1896-1846	4750-4752	4890-4962	4800
GULF LEA ST. "AR"	NO. 4	33-10	8- 5/8	140	100	Surface	4- 1/2	5011	250	3533	E	1865-1815	4776-4778	4876-4998	4825

* E - Estimated S - Temperature Survey

Two-stage cementing tool set at lower depth and 50 sacks cement spotted at top of sale and anhydrite section.

\$ 2-3/8" OD Tubing and retrievable tension type packer (Baker Model "AB" or equivalent).

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico

June 10, 1964

EXAMINER HEARING

IN THE MATTER OF: Application of Gulf Oil
Corporation for a unit agreement, Lea County,
New Mexico.

Application of Gulf Oil Corporation
for a waterflood project, Lea County, New
Mexico.

Case No. 3065 &
3066

BEFORE: NEW MEXICO OIL CONSERVATION COMMISSION
DANIEL S. NUTTER, EXAMINER

TRANSCRIPT OF HEARING

MR. NUTTER: We will call Case 3065.

MR. DURRETT: Application of Gulf Oil Corporation for
a unit agreement, Lea County, New Mexico.

MR. KASTLER: I am Bill Kastler appearing on the behalf
of Gulf, and I would like to move that Case 3065 and Case 3066
be consolidated for the purposes of Hearing.

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MR. NUTTER: We will call 3066.

MR. DURRETT: Application of Gulf Oil Corporation for a Unit Agreement, Lea County, New Mexico and Application of Gulf Oil Corporation for a Waterflood project, Lea County, New Mexico.

MR. NUTTER: Cases 3065 and 3066 will be consolidated for the purpose of testimony.

MR. KASTLER: Mr. Examiner, our two witnesses in this case will be Mr. Don Bilbrey and Mr. Bates Boles. I would like to have them sworn.

MR. DURRETT: Would you stand and be sworn, please?

(Witnesses sworn.)

MR. KASTLER: I would like to have these marked for identification as Applicant's Exhibits One through Four; and I would like to submit those at this time.

(Whereupon, Applicant's Exhibits One through Four marked for identification.)

DIRECT EXAMINATION

BY MR. KASTLER:

Q Please state your name and address, for whom you work and what is your current position?

A My name is Don Bilbrey and I reside at 1201 W. McGaffey in Roswell, New Mexico. I work for Gulf Oil Corporation in Roswell as a Petroleum Engineer.



Q Would you briefly outline your educational and professional background?

A In 1953, I was graduated from the University of Texas with a B.S. in Geology and a B.S. in Petroleum Engineering. After two years in the Service I returned to the University of Texas and entered graduate school in 1957. I received my Masters Degree in Geology. In May of 1957 I went to work for Gulf in Roswell as a geologist. I worked fourteen months in that capacity in both Roswell and Hobbs. At that time I was transferred back to Roswell where I was in the Reservoir Engineering Section as a Reservoirs Engineer and I have worked as a Reservoir Engineer since that time in Hobbs, and now in Roswell.

Q And have you worked closely with the West Pearl Queen Producing Unit Agreement, and are you thoroughly familiar with all of the geological and engineering aspects of it?

A I have done very little else besides work on the Queen. So, I think I am fairly well familiar with it.

Q Will you briefly outline the purpose of this Hearing?

A Gulf, as major interest owner and prospective unit operator, would like to unitize 2,520 acres in sixty-three wells in the western portion of the Pearl Queen Pool which is located in Township 19 South, Range 35 East, in Lea County, New Mexico. The purpose of this unit would be to waterflood portions



of the Queen formation underlying this area. If you will please look at Exhibit One, which is a fold out map, (plat), you will see the Unit Area proposed outlined in yellow. The injection wells are shown in circles, two circles will be dual wells, one circle will be just a single zone injection well. We will discuss that later.

Q Are there any other unitized waterflood projects in this pool?

A Yes. Directly east of our outlined flood here, you will see, not shown nearly as brightly, but outlined nevertheless, the Shell East Pearl Queen waterflood unit. It is my understanding they have been injecting water there since early in February.

Q Will the two units cooperate?

A Yes, we have already discussed that with Shell. As soon as they are unitized, we will make line agreements and cooperate with Shell. The flood, by the way, is on the same pattern on the Shell unit and it will make it easier to cooperate with them.

Q Will you describe the geology pertinent to this project?

A Referring to the data over here on the first page, the Pearl Queen is located on the western edge of the Central Basin Platform. Wells are completed in one or more sandstone



stringers within the Queen formation. The depth, ranged from 4,800 to around 5,000 feet in the West Pearl Queen Unit Area. These stringers generally are composed of gray, fine grained dolomitic and anhydritic sandstone rocks and are interbedded with gray to tan, dense, anhydritic and shaly dolomitic rocks. The maximum net pay, I should say, for each zone ranges from eight to fourteen feet, but generally in no bore hole is the maximum net pay in each zone encountered.

Q Do you have an Exhibit which shows the subsurface structure?

A Yes, Exhibit Number Five is a structure map on what we will, in a minute, describe Zone One which is the uppermost zone we plan to flood. That structure typifies, the structure of all zones which we plan to inject water into.

Q Exhibit Five?

A Exhibit Five shows a northeast-southwestward trending monoclinical nose which plunges toward the southwest at about fifty feet per mile.

Q Is this a stratigraphic or structural trap?

A We think structure probably plays very little part in the trapping of the hydrocarbons here, in fact, we consider it primarily a stratigraphic trap with the up-dip productive limits being determined by porosity deterioration. The down-dip limits in most of the zones are determined by oil water contact.



Q How many stringers, or zones, are productive in the West Pearl Queen Unit Area?

A Well, I refer back to Exhibit Number Four in the booklet, and colored in yellow, you will see four zones on a typical radioactivity log. Zone One, "Stray", Zone Two A, and Zone Three A; and in Exhibit Number Six, which is a cross section, an east-west cross section across the same zones which have been again colored in yellow. You can see that Zones One, Two A and Three A are rather continuous over the entire area.

What we have defined, the "Stray" is limited to the southwest portion primarily as shown on Exhibit One but it is a good zone and we plan to waterflood it along with the more widespread zones, One, Two A, and Three A.

Q Do those Zones One and Two A constitute most of the secondary oil?

A We believe so. I personally believe that probably, maybe as much as 75% of the secondary oil comes from Zones One and Two A.

Q In isolated instances where wells are open stringers, those are extremely open and limited in aerial extent?

A That is right. There are several individual wells, I would say not over two or three down in the southwest corner that have open zones, rather thin zones other than the ones I have outlined here in yellow. Generally, I would say in all



instances these are not even found in the adjacent or offsetting wells and probably will call for little secondary recovery.

Q Will any attempt be made to flood them?

A No, with no connection from one well to the next, I don't believe there will be any value in trying.

Q Not initially, at least?

A No.

Q What will the unitized interval be?

A That will be from the top of the Queen formation to fifty feet below the bottom of Zone Three A.

Q Can you describe the Queen Reservoir rock and fluid properties?

A Yes, I will just refer back over here to the data sheet again. The average porosity in all but the "Stray" zone is 16.7% and ranges from 10 to 22.8%, what we consider the net pay. Average "K" is 22.8 millidarcies ranging again from one to 244 millidarcies. The original reservoir pressure was 1,776 psi and the bubble point pressure is 1,400 per square inch. Reservoir temperature is 100 degrees Fahrenheit and the formation volume factor was 1.176 at original reservoir conditions. Oil gravity is approximately 35 degrees API.

Q Briefly summarize primary operations in the West Pearl Queen Unit Area.

A The first well in our area was drilled in January of



1958 and since that time there has been a total number of sixty-three wells, or holes, drilled. Four of these have been dry in the interval we plan to unitize. Fifty-nine have been productive. In something like six years the approximate production from these is 2,200,000 barrels of oil. There are no dual completions in the unit area.

Q What is the present state of depletion?

A We anticipate in the fifty-nine wells that the ultimate recovery for the Unit will be 2,686,000 barrels. With cumulative production to date of 2,200,000 barrels, it appears that the reservoir is right at 80% depleted. The fact we are late in the life of this pool is further evident by the fact that the average production per well per day is only nine barrels.

Q What type of drive is the pool producing under?

A Solution-gas-drive, 100% solution-gas-drive. It looks like we will only get 11.8% through primary oil operations. This means that nearly 90% of the oil will be left in the ground unless secondary recovery project is instituted.

Q In waterflooding this area, how many injection wells will there be and what flood pattern will be used?

A Well, I think I briefly touched on that already. It is an eighty acre five-spot; and out of fifty-nine producing wells, thirty of them will be made injection wells.

Q What volumes of water do you plan to inject and what



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pressures do you anticipate?

A Initially, we plan to inject up to five hundred barrels every day per well. Based on what we know about the East Pearl Queen Flood injection wells, we should encounter initial pressures of 1,500 to 2,000 pounds per square inch. We anticipate the maximum pressure of around 2,500 pounds per square inch. We are designing our installation for 3,000.

Q What kind of water will you inject and where is the source of this water?

A We will inject fresh water which we will pipe approximately six miles from Shell Oil wells in Section 3 of Township 19 South, Range 36 East which is east of the Pearl Queen Pool.

Q Does Gulf have a vested interest in this water?

A Yes, Gulf, as does Shell and Trainer, owns one-third interest in water Easement W-306 which I believe is dated April 29, 1963 and was issued to Kemac Potash covering all of Section 3-19 South - 36 East, Lea County, New Mexico.

Q Now, Gulf owns one-third, Shell owns one-third, and C. W. Trainer owns one-third?

A Shell and Gulf both purchased the third interest, purchased it from Cornell.

Q All right. Proceed.

A We also, at the same time, purchased a third interest



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in the water rights. I think the Application Numbers there were L-5170 through L-5170-X-4.

Q Could you give them all?

A I will. L-5170, L-5170-X, L-5170-X-2, L-5170-X-3, L-5170-X-4. These permit us to, for all three parties concerned, to appropriate the same 1,600 acre feet of Ogallala water annually for the purpose of waterflooding the Pearl Queen.

Q How will you get this water to your waterflood area?

A At the suggestion of Shell and Gulf, Shell has designed and built a water pipeline system from Section 3 where wells later will be drilled. There is one there already. They have built this pipe and Gulf and Trainer as prospective unit operators will have the right to join in this system when their units are formed.

Q Will this volume of water be sufficient to adequately waterflood the West Pearl Queen Unit Area?

A We think so. In this 1,600 acre feet of water, this amounts to 375 barrels per day per well for each of our thirty injection wells. Of course, we can't put five hundred barrels per day into each of the thirty wells, we don't expect to. Initially, we will step things up and try to get fill up along the east line there, along Shell's line, and we will inject the maximum five hundred barrels probably, but by the time the whole area is under flood, all thirty injection wells will have been



converted. We think 375 barrels will be adequate because we have re-cycled water. We have to reduce our injection probably to balance production with allowables and such.

Q How do you plan to inject water into the Queen Reservoir?

A I would like to refer you now, to Exhibits Seven through Eleven, I believe, which are diagramatic sketches of several possible means of injection.

Exhibit Seven shows a typical single zone injection well, where we will simply set a packer on tubing, inject down tubing -- the tubing by the way, will be coated for corrosion. We will inject below a retrievable tension type packer, in this instance as shown here, and will be into the open hole, but it might equally well be into perforations, if it calls for it. Right now, it looks like we are going to only have one single zone injection well.

Q What well will that be?

A That is the Cactus-Aztec State Number Six down there in the southwest corner on Exhibit Number One.

Q Is the location in Section 31, 19 South, 35 East?

A That is correct.

Q That is the single injection well, but it would be into Zone One and --

A In this particular well, this is marked as a typical



single injection well. It is actually a diagramatic sketch of the well I have mentioned but if through further study and when we get ready to convert these wells, we decide that three, four, five or more will not have, say Zone One of sufficient size there, it may be economically advisable to dual. We will just try to watch down there into it, and all of the rest of them and try to cut down some of our cost. In other words, if we think it is advisable to dual inject, we will, and if further study says is necessary, we might have three or four more wells we want to treat in the same manner.

MR. NUTTER: You talk about single injection wells, and dual injection wells; what do you consider to be the dividing point, the Zone One as against Zone Two, and what is the other one?

A Right. The three lower zones.

MR. NUTTER: Two A and Three A?

A Right. We will wash it into the three lower zones and try to put it into Zone One.

MR. NUTTER: In other words, into two?

A The "Stray" is limited down there into the --

MR. NUTTER: Zone One is the other zone?

A Zone One is -- well, many people consider it the main Queen pay in this area. As I pointed out before, we think maybe 75% of the oil secondary and primary are in Zones One and



Two A, therefore, we want to separate the stream of water and be sure we get those two zones flooded.

MR. NUTTER: These are the two important zones?

A Right. We think that is important to dual inject the water.

MR. NUTTER: Primarily to keep Zone One and Two A apart?

A Right. That's correct. If you look at Exhibit Number Eight, this I have listed or have designated as a typical dual injection well, which I think it's rather straight forward two strings of coated tubing, with a dual packer above Zone One and a permanent drill able production packer between Zone One and the "Stray" or the Two A, which ever one happens to be open in the particular well, but anyway separating Zone One from the lower zones, and I don't think there is --

MR. KASTLER: The remaining twenty-nine wells will be completed for this dual injection such as is shown on Exhibit Eight?

A Possibly, I have another exhibit which is Exhibit Number Ten. After our field people looked at this and gave us cost estimates, they found that when we had to go to two strings of tubing which were rather limited because of the size of our casing which in most instances is four and a half and five and a half, we would have to take out at least the 2 3/8 tubing.



We would have to coat them; that would run the cost up. We would have to run a dual packer in each one and that would run the cost up. It would cost us many more thousand dollars per acre to go this way than possibly it would cost us to go this way as shown on Exhibit Ten. The particular set-up for the injection well is very similar to the single zone injection with a retrievable tension type packer to separate Zone One from the lower three zones, but from this instance we inject down both the annulus and tubing. The tubing would be the same as we have in the hole right now. I might say here that, of course, our treating cost for the water would go up by this method but we still think it would be cheaper in the Pearl Queen to go this method.

Q I believe that you had about four primary features that this method of dual injection would achieve. Would you outline those?

A Yes. Let me be sure I get this right. It would eliminate the need for additional strings of tubing, eliminate the need for dual packers, eliminate the need for coating the tubing and it would allow the use of larger tubing with which I believe we could inject higher volumes at lower pressures.

Q Have you discussed this proposed alternative method as shown on Exhibit Ten with the State Engineers Office?

A Yes, we came up here in April and talked to Mr. Irby



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about injecting this method down the annulus and the tubing system. He indicated then that is proper precautions were taken and the Santa Rosa Sandstone was adequately protected by cement he would go along with this. I went back to Roswell and made a special trip to Hobbs to the OCC Office there to check all of the cementing programs and I found out there is only three of the thirty injection wells that are cemented across the Santa Rosa. So, because of the monetary savings we thought we could save by going this method, I sat down and tried to go into more detail on this program and think of how we could protect that Santa Rosa. I then wrote a letter to Mr. Irby which is Exhibit Number Twelve in which I outlined our proposal for protecting the Santa Rosa and assuring it is protected, and yet still allow us to go down the annulus with the injection water. Mr. Irby, by return mail, sent us a letter which is Exhibit Number Thirteen in which he indicated that he would not object to our proposal provided that certain statements that had been included in my letter were entered into the record at this Hearing.

Q That is the purpose of your incorporating these as Exhibits Number Twelve and Thirteen?

A Right. I specifically point out which statements and paragraphs he would like to have in. Of course, they are in the letter and included in the exhibits we have here.



Q Which plan of dual injection do you favor at this time?

A We still haven't made up our minds. We think we did save a lot of money personally on the initial investment by going down the annulus; but also, we realize the treating the cost of water to protect the casing over a period of years would run up in cost too. We are still working on it to see if one is better to our way of thinking than the other. We might have to take so many producing and keep such a close eye on it it is not worth it to us. We would like to have permission to go either way because of the possibility of the great savings in money and equipment that we have already invested in.

MR. NUTTER: When do you think you will make the determination which direction you will go?

A Well, I think possibly within the next week or two. We have our Hobbs office working up details, information and such, and I think they are going to give us a final recommendation here soon.

MR. NUTTER: Off the record.

(Whereupon, a discussion was held off the record.)

MR. NUTTER: On the record, please.

Q (By Mr. Kastler) What does Exhibit No. 9 consist of?

A Well, Exhibit No. 9 is simply an injection well detail.



Since we have thirty injection wells, we do not include a diagrammatic sketch of each well as such, we use this diagrammatic sketch, and these then, on these tables we have tried to give you the surface casing, production casing, size, data and etc., the cement program, and also the tubing, packers, perforations and all items such as that that will be permanent to each injection well in the unit. Likewise, on Exhibit No. 11, we have done the same thing, which is pertaining to the diagrammatic sketch in Exhibit No. 10, same type of information.

Q When do you expect to start work on the project?

A We would like to start work on July 1st; we are shooting at July for target date for this unit. As soon as it is unitized we will start to work. Shell is waiting for us to start injecting before they move down their line and expand their flood to full.

Q All materials and equipment are on order, I take it?

A No, they are not on order.

Q In stock?

A Not in stock. We are in the process of designing the equipment, what pumps and etc. that we will need.

MR. NUTTER: You don't know yet what equipment to order?

A No, not specifically in the way of tubing, we don't know which way we are going.



Q (By Mr. Kastler) When do you start expecting the initial response?

A We expect, with dual injection planned, that we will get a kick within probably six months. That rate will increase rather rapidly, I thin, up to about 2,500 barrels per day per unit and it will hold there for maybe two or three years and taper off by 1974.

Q What in the way of increased oil recovery do you anticipate as a result of these flood projects?

A We anticipate about 150% of primary and this --

Q In numbers of barrels?

A Number of barrels; that is 4,029,000 barrels of additional oil because of the waterflood operations.

Q Does Gulf seek approval of a project area recovering the entire unit as authorized under 701-E?

A Yes, we do.

Q Do you believe that this unitization for the purpose of waterflooding this area is in the best interest of conservation and prevention of waste?

A Yes, as I stated before, it looks like we are going to only get 11.8% through primary operations. We think we can increase that by 150%, or a total of 30% of the original oil in place. Through the secondary recovery of the area, 80% depleted, the wells are down nine barrels, average, and we think it is



imperative we start with the flooding as soon as possible.

Q Has the primary and secondary oil been agreed upon among other operators in this pool, or in this proposed area?

A To my knowledge, with one exception.

Q And will all steps be taken to protect correlative rights by any owner?

A Yes.

Q Were Exhibits One through Eleven prepared by you or under your direct supervision?

A They were; yes.

Q And are Exhibits Twelve and Thirteen copies of correspondence between you and the State Engineer's Office?

A That's right.

MR. KASTLER: That concludes my examination.

MR. NUTTER: Does anyone have any questions of the Witness?

MR. DURRETT: I have one question, please.

CROSS EXAMINATION

BY MR. DURRETT:

Q Mr. Bilbrey, I believe you stated that the average production at this time was approximately nine barrels per day per well?

A That's right.

Q What are your wells making in there?



A There are some still down on the Aztec State Cactus Lease that are making, I believe, their top allowable.

Q How many?

A They are recent completions.

Q Those are recent completions?

A Yes, sir.

Q How many of those would you estimate that there are that are close to top allowable wells?

A There are nine wells on the lease, I believe.

Q Referring now to Exhibit Number One?

A Right. I would believe that maybe at least half of them are capable of making top allowable, based on the last production figures I know of, which figure may be I believe the last I had access to for them.

Q Is that in Section 31?

A Section 31, Cactus Drilling and Aztec State Lease.

Q And you think there are four or five of those, you say?

A I think that is probably about right, those wells -- I will put it this way: Cactus has made a practice of going in there and drilling continuously; they drill a well every six months, or a year, or something like that, and they are still -- well, you can see there is one well No. 10 there that they have since gone in and started drilling. I understand that now, for



the record, that this is a dry hole.

Q This Number Ten?

A That Number Ten is a dry hole. They are always re-working their wells and as I say, there are four stringers, and they have gone down in many of the wells and opened one zone and depleted it and go back and open another and deplete it, and they have managed to keep their production kind of up and down, and it is kind of hard to work with concerning this equity in their Unit and they have since agreed to their equity as given.

Q I believe I understand they have definitely agreed to commit this interest?

A We have a telegram that says they will commit; they have four tracts, the Aztec State they were holding up on for a while because of another reworking they went through several months ago. I think production has fallen off rather rapidly in some of those wells that they have worked over and they have since said that they will commit that acreage along with the other.

Q And you do believe that these are the only wells that are making close to top allowable?

A I believe so. I think you will find the older wells up here along the east line already at the peak limit, one, two, three barrels a day, quite a few wells.



Q What is the allowable per day on these wells on this Aztec State Lease?

A Well, it is in the neighborhood of thirty-five, thirty-six, thirty-seven.

Q That is just the normal unit allowable?

A Yes.

MR. DURRETT: I believe that's all I have.

MR. NUTTER: Mr. Kastler, what is your other witness going to testify on?

MR. KASTLER: He is going to testify to the form and style of the unit agreement and the process of the completion and execution.

MR. NUTTER: And testify as to the perimeter of it?

MR. KASTLER: Mr. Bilbrey is more familiar with that and I might ask him just to outline what the percentages are.

MR. NUTTER: I would appreciate that, what they are based on.

MR. KASTLER: For each lease we have prepared -- Mr. Bilbrey, you may need to refer to any agreement or anything else which is not yet in evidence.

MR. BILBREY: Well, I had not intended to present this in evidence; that was prepared for the operator in this unit to unitize; and I will refer to it just as my notes.

REDIRECT EXAMINATION



BY MR. KASTLER:

Q Mr. Bilbrey, what was the formula used and agreed upon for the remaining primary participation after unitization?

A Sixty percent primary reserves, forty percent current rate, the current rate being April through September of 1963; based on those months of production. The ultimate primary is determined from performance curves setting the ultimate primary and then, of course, subtracting from that the cumulative production, giving the primary reserves.

Q And it is my understanding; that the working interest owners in this proposed unit area have formed operators and engineers committees?

A That's right.

Q And that these formulas were derived from the working of that committee and by agreement of all parties whose signature appear on the unit?

A Yes.

Q And have they been reviewed and approved in preliminary form, at least by the United States Geological Survey in Roswell and Washington?

A They have.

Q And have they been studied and approved and explained to the Land Commissioner?

A That is right. We covered that on the same trip when



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when we talked to Mr. Irby in April.

Q What were the number of barrels remaining on October 1, 1963?

A Remaining primary reserve total units?

Q Yes.

A Five hundred eighty seven thousand.

Q And as soon as this number of barrels has been produced since October 1, but actually since whatever lesser amount now remains from the effective date to the first of the month after which that number of barrels has been produced, is the cut off time from the primary participation?

A That's right.

Q And in calculating the rate, what six months period did you use?

A April through September of 1963.

Q Up to October 1, 1963?

A That's right, it includes September.

Q And is that formula written into and subscribed as a part of the Unit Agreement?

A That is right.

Q Now, what is the percentage of participation of each tract during the secondary --

A It is based on 100% of the tracts primary ultimate recovery as determined from the same curves that I previously



discussed.

Q In other words, if one operator had certain proportions of the entire pools production in primary --

A If he had --

Q If he had that same percentage?

A If he had ten percent of the primary he would get 10% of the secondary.

Q And acreage wasn't considered as such?

A That's right.

Q And rate of production for secondary recovery was not considered?

A It was not considered. Of course, it is used in your interpretation of your performance curve, and in that respect it comes into play.

MR. KASTLER: I believe those are the only questions I needed to ask.

CROSS EXAMINATION

BY MR. NUTTER:

Q Let me see if I understand this: Your participation is divided in two phase systems?

A First phase and second phase.

Q The first phase is based on 60% primary reserve and 40% current rate as determined April through September of last year?



A That's right.

Q And the primary reserves were determined from production decline curves less production up through --

A The primary ultimate was determined through the use of the decline curves.

Q Right.

A And from that we got the reserves.

Q Your primary reserves less your cumulative production through what date?

A I believe it is October 1st, let me check for sure, though. Primary reserves as of 10-1-63.

Q October 1, 1963, and at that time you calculated there were 587 plus, remaining?

A 585.

Q And as soon as that 585 is produced it goes into the secondary recovery and that is --

A And that is from this date of 10-1-63, not from the date of unitization.

Q As soon as 587,000 barrels have been produced after --

A October 1st.

Q -- October the 1st, then it goes into the secondary phase and that is 100 percent?

A 100 percent.

Q Of primary --



A Primary.

Q -- ultimate recovery.

A Yes.

MR. KASTLER: I can think of one other question that should be asked.

REDIRECT EXAMINATION

BY MR. KASTLER:

Q Does this 587,461 barrels cover the remaining reserves for the entire Unit Area?

A That is right, for this outlined in the yellow on Exhibit Number One.

Q Now, in the event less than all tract owners should commit their interests to the Unit, would that be reduced in proportion to the primary reserves of the non-consenting or non-committing tracts?

A That's right.

Q And is such production provided for in the Unit Agreement?

A It is.

RECROSS EXAMINATION

BY MR. NUTTER:

Q Now, Mr. Bilbrey, you stated that you had not actually determined yet which means you should use for the casing tubing program on the dual injection wells. Exhibit Number Nine which



showing cementing and other detailed information on these wells indicates that at the time it was prepared you were thinking of the dual tubing. What was this thinking based on?

A Yes. Well, after I talked to Mr. Irby and he said if the Santa Rosa was protected he would permit this other method, I went back and found out there weren't too many protected in that manner. I had just personally about given up the idea of going down the annulus and thought we would just have to go with the two strings of tubing; and I would say that for several weeks of my work I just assumed that was the way we would go. And then Hobbs came up with some preliminary estimates on the casings, and the management in Roswell thought we had better consider this other method, if we could do it, and I have since gone both ways because of this.

Q Then your Exhibits Eight and Ten are the two possible means of using these two injections wells?

A Yes, sir.

Q Now, these are the two methods that were offered in your letter of May 19th, to Mr. Irby; that is correct?

A That letter of May 19th to Mr. Irby, I was still under the impression that we would go -- I was under the impression we were to try at this Hearing to go with this one method as shown on --

Q Ten?



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A -- Ten; that is the annulus method, and then there had been some talk from Hobbs and Roswell since that time that indicates that the treating cost might near offset any savings on the equipment; so therefore, we still haven't made up our mind.

Q Now in his letter of May 22nd, you referred to a diagramatic sketch you furnished him; was that the same as Exhibit Ten?

A That's right.

Q He also says he can refrain from objecting to your proposal providing that Statements One through Four in the Paragraph following Statement Four, and the diagramatic sketches are entered into the record for the Oil Conservation Commission without change; do you subscribe to Paragraphs 1 through 4, or Section 1 through 4 and the Paragraph following One through Four, and submit that you would follow this program without change if you went this route?

A If we do go this method we will do this as pointed out in the letter.

REDIRECT EXAMINATION

BY MR. KASTLER:

Q Which method of dual injection is Shell using in the Queen?

A They are dual injecting but they are going through two



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strings of tubing, I don't know whether they are form fit or not, but they use -- for the most part I think 5 and 1/2 is their smallest, whereas half of ours is -- half of our casing is 4 and 1/2.

MR. NUTTER: You have got everything from 4 and 1/2 to 7"?

A All the way, yes. Cactus drills a lot of their wells with 7".

Q (By Mr. Kastler) But their plan is outlined in Exhibit Eight is it not?

A Yes, that is my understanding that is Shell's program, Exhibit Eight.

Q If 2,686,000 barrels is 11.8, how much original oil was there in place, have you calculated that?

A Forty four million something. Let me refer to my engineering report here, I could do it better with a slide rule, I believe. No, I double it, 22,657,000 originally in place.

Q And you expect that the secondary recovery would be 150% of the primary, or approximately four million barrels?

A Right, I think actually 4, 029,000; this is off of the record, but we are hoping that by the time 1974 rolls around, maybe we can find some way to get the remaining oil.

Q A little higher than that 150 percent?



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A We are hoping that we will actually get more than 150 percent.

Q Do you anticipate we put all --

A It won't be like shooting a shotgun and running them out, once we cooperate with Shell and just move along from the east and --

Q From east to west?

A Yes, from east to west.

Q Now, you stated from as far as you knew the Cactus Lease over there on the west end was declining rather rapidly at this time, so you would anticipate by the time you got to that end of the unit, with conversion, that they would have fallen off?

A That has been our impression. When this engineering report was prepared we stated just that, that the better wells were down there on the Cactus Aztec State, and by the time we got down there we felt their production would be down to such that we could start flooding.

Q About how long do you think it will take if you start conversions on the Unit down below on the east and start moving west, how long will the entire program take for conversion?

A I don't think I can intelligently answer your question, I don't know how fast our people down in Hobbs can work.

Q Now, the water source facilities and the water



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injection plant will be built for ultimate --

A For thirty injections --

Q Initially, was it?

A Right.

Q It will just mean a matter of laying the line and converting the line?

A The water supply itself from the Shell system is already at our boundary and ready to be used, so all we have to do is start converting plant and facilities.

Q Can it be stated that by the working interest owners interest in this that such completions will be done with all due haste?

A I will see to that. Our production is going to pot.

RECROSS EXAMINATION

BY MR. NUTTER:

Q I don't suppose Shell has had any response?

A I don't believe they have. They started in February, February, March, four or five months. I don't think they are injecting theirs. I might state this: Not having kept too close a tab on this, but they started injecting up in the north-east, away from our line, and they have a so-called zone Four which we do not have down in our other, and we started injecting in our zone first, and I am not too familiar with that zone.

Q They have commenced injection in their wells that are



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immediately east of your Unit Line?

A No, they have not started on the line, to my knowledge.

Q And do you anticipate that you will be able to start injection at the same time they are ready to start injection in their wells?

A I assume we will, yes.

MR. NUTTER: Are there any other questions of Mr. Bilbrey? You may be excused.

MR. KASTLER: We will call Mr. Bates Boles.

* * *

B A T E S B O L E S, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KASTLER:

Q Please state your full name, title and employer?

A Bates Boles, District Clerical Supervisor, Gulf Oil Corporation at Roswell.

Q What is your educational background?

A I have a degree from Oklahoma State University and School of Business with an accounting major, I graduated in 1947.

Q Would you state your professional experience?

A I have approximately seventeen years with Gulf in various clerical capacities, five years were spent at Hobbs and five years at Odessa, as Area Clerical Supervisor, three



years at Houston, and the past year at Roswell as District Clerical Supervisor.

Q Are you familiar with the Unit Agreement, the Exhibit for the Unit and Unit Operator Agreement and the status and royalty interest owners classifications?

A Yes.

Q Would you give the status of the working interest owners sign up?

A To date, we have signed ratifications on sixty-five percent of the working interest owners, and we have verbal approval of 30 percent, which is, we feel we have 95 percent approval.

Q Have any owners stated they would not sign the ratification forms?

A Yes, Hammon, who owns approximately three percent has a tract over the east side, has stated that he will not join the Unit Agreement at this time.

Q And are matters being considered concerning either the working interest owners purchasing his land or entering into a cooperative Line Agreement with him in the event the purchase breaks down?

A Yes, there will be an attempt to purchase this tract. However, Mr. Hammon stated that he would cooperate with his tract.



MR. NUTTER: Now, Jake Hammon tract comprises the north-west quarter of Section 28 and has four wells on it?

A Yes. Now, the whole tract has approximately three percent, Hammon has -- There are a couple of other working interest owners.

Q (By Mr. Kastler) You would expect those working interest owners to go along with Jake Hammon?

A Yes, we have a letter from the other working interest owners stating that being as Mr. Hammon is not going to sign they will not sign at this time either.

Q Would you state the status of the royalty owners signup?

A There is only one fee tract within the Unit Area, and we have signed ratifications for 47 and 1/2 percent of the royalty, the remaining 52 and 1/2 percent is owned by three members of one family, and one of the members of this family was in the office last week and stated that they would sign, and we're expecting their ratifications in the next day or two.

Q Therefore, you have every reason to expect by the effective date you will have 100 percent royalty on the commitment?

A Yes.

Q Has the West Pearl Queen Unit Agreement been drafted after approval of the oil and gas leases involved?



A Yes, the working interest owners formed a committee which met and drafted the instruments to the satisfaction of all the leases involved.

Q Does this follow the ordinary prescribed form for waterflooding Unit Agreements involved in State and Federal Lands?

A Yes.

Q Have instruments been submitted of the Unit Agreement to the State Land Office for their approval?

A Yes, sir, and representatives of Gulf at Roswell enlisted the Unit division in connection with these instruments.

Q And has Gulf received approval and consent, preliminary approval from the State Land Office?

A Yes.

Q Has the Unit Agreement been examined by the USGS, both in Roswell and Washington?

A Yes, and the acting director gave his preliminary approval to the Unit Area by his letter dated April 30, 1964.

Q Does the Unit Agreement provide for expansion of the Unit Area?

A Yes.

Q Does the unit agreement provide for selection of a successor unit operator in the event of the removal of Gulf so to insure continued responsibility of operations?



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A Yes, a successor operator will be selected by 75 percent of the voting interest subject to the approval of the Commission and Director.

Q What does the Unit Agreement provide for non joinder and subsequent joinders?

A On non joinder, any tract which failed to qualify on the effective date, the Unit Operator will recompute the tract participation using the original formula, and will revise Exhibit "A" and "B" to the Unit Agreement which will be effective upon approval of the Commissioner and Supervisor.

Q Subsequent?

A Subsequent joinders, any tract committed after the effective date will be on such a basis as negotiated by the working interest owners and the owners of this tract, and will be subject to the approval of the Commissioner and Director.

Q Were Exhibits Fourteen and Fifteen, are they two copies of the Unit and Unit Operating Agreements respectively which are being finally approved and executed at this time?

A Yes.

Q And do you understand that the order of the Commission will be so worded that your effective date and your approval will not become effective without the preliminary or the final approval, the preceeding final approval by the Commissioner of Public Lands and the Director of the USGS?



A Yes.

MR. KASTLER: I think this concludes the questioning of the witness.

MR. NUTTER: Are there any questions of Mr. Boles?

MR. DURRETT: I have a question.

CROSS EXAMINATION

BY MR. DURRETT:

Q Mr. Boles, if Jake Hammon doesn't commit his acreage here, which is the northwest of Section 28 and you will have a forty acre tract here, I believe, belonging to Skelly; and in Section 21, which is the southwest of the southwest which would be continuous only by a corner; isn't that correct?

A That's right.

Q And that still would remain within the Unit?

A Well that, of course, is a dry hole, and Skelly, of course, has already ratified the instruments, and we have discussed this matter, but to my knowledge, we haven't been, as Jake Hammon will cooperate, we have not decided to take it out of the Unit.

Q It would still participate then?

A To my knowledge, yes.

Q Who owns the east half of the south half of Section 20 it's undesignated on the previous Exhibit here; is that Fee Land?

A Which one is that?

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Q I am referring to Section 20, the southeast of the --
I mean the east half of the southeast, 80 acre tract directly
offsetting the Skelly tract to the east?

A I don't know. Do you have this tract, that is Skelly,
the same lease, that is the same lease?

MR. KASTLER: It is undeveloped.

A It is undeveloped.

Q (By Mr. Durrett) It is uncommitted, then?

MR. KASTLER: No.

MR. DURRETT: And Jake Hammon has stated he will enter
into line agreements at any rate and cooperate with the flood;
is that correct?

A Yes, we have a letter from Hammon to that effect.

Q (By Mr. Durrett) Thank you. That's all I have.

CROSS EXAMINATION

BY MR. NUTTER: Just as a matter of curiosity, since this
participation formula is based on primary reserve and primary
rates, how do you compute that tract participation since it was
a dry hole?

A Well, you know, it is a --

MR. BILBREY: It has no participation.

Q (By Mr. Nutter) So, that tract is actually not par-
ticipating?

MR. BILBREY: That's right, same with three other



wells.

Q But in the case of the three other wells there was some production on the lease, so the lease would be participating?

MR. BILBREY: That is the same lease as the Skelly tract down here, the two 80 acre tracts directly offsetting the Hammon on the west; that is the same Skelly "J" Hobbs State.

A They are both tracts.

MR. BILBREY: Wells 1, 2 and 3, same tracts.

Q So that lease will be participating on that 40 acre tract, and likewise the 40 acre tract in Unit C of Section 31 where that dry hole is.

MR. BILBREY: And that just to the northeast Number 4 there is a gas well in the Phillips straight tract down in the southwest of Section 32 that was drilled to the Queen, is non productive in the Queen, it came up to the Seven Rivers.

Q So it is not participating?

MR. BILBREY: Right.

Q Now, Mr. Boles, you said that you had all the royalty committed except a couple of members of one family. In other words, you are assuming that you have the approval of the Commissioner of Public Land and the approval of USGS and then the one tract that is Fee land is that Parks tract?

A That's right. And part of the Parks tract has agreed to it.

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Q And some of the family just hasn't signed the papers?

A Yes, we have, of course, our records where we were corresponding with Guy Hopper, and originally -- as we corresponded we found out he had given it to three of his children, so we had in turn to go to them, that is the reason we are late on that, but one of the children was in the office and they said they would sign, and he has signed in another waterflood that we have, so we feel sure that he will.

Q You feel that you will get his signature on this?

A Yes.

Q And then your working interest, you have 69 percent signed, 30 percent with verbal consent, 3 percent that say they will not sign; where is the two other percent?

A One of the tracts is this BTA Tract Number 1 which is the federal tract.

MR. BILBREY: It is the No.

A Now, BTA represents twenty-four working interest owners, and he is in the process of trying to sign his twenty-four before he will sign with us, and he hasn't gotten all of them yet, so I really don't know what his progress is.

Q I see, you are hoping that that tract will come in and be signed?

A He feels sure he can get the working interest.

Q And that will account for 100 percent of the working



interest?

A Yes, sir.

Q Are there any further questions of Mr. Boles? You may be excused.

MR. KASTLER: I would like to move for the Exhibits One through Fifteen to be introduced into evidence or admitted into evidence at this time.

(Whereupon, Applicant's Exhibits One through Fifteen were offered into evidence.)

MR. NUTTER: Gulf's Exhibits One through Fifteen will be admitted into evidence.

(Whereupon, Applicant's Exhibits One through Fifteen were admitted into evidence.)

Do you have anything further? Does anyone have anything they wish to offer in Cases 3065 and 3066?

We will take the case under advisement and call a fifteen minute recess.

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STATE OF NEW MEXICO }
COUNTY OF BERNALILLO } ss.

I, CHARLES WALKER, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me; and that the same is a true and correct record of the said proceedings, to the best of my knowledge, skill and ability.

Witness my Hand and Seal this 14th day of August, 1964.

Charles Floyd Walker
NOTARY PUBLIC

My Commission Expires:
March 25, 1968.

I do hereby certify that the foregoing is a complete record of the proceedings in the hearing of Case No. 3065-3066 heard by us on June 10, 1964.

[Signature], Examiner
New Mexico Oil Conservation Commission

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