

CASE 3413: Application of AMERADA
for a waterflood project, Lea
County, New Mexico.

Case Number

3413

Application
Transcripts.

Small Exhibits

ETC.

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. 3413
Order No. R-3078

APPLICATION OF AMERADA PETROLEUM
CORPORATION FOR A WATERFLOOD PROJ-
ECT, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on June 8, 1966,
at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 15th day of June, 1966, 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 applicant, Amerada Petroleum Corporation,
seeks permission to institute a waterflood project in the Saunders
Permian-Pennsylvanian Pool by the injection of water into the Permian-
Pennsylvanian zone through three injection wells in Section 3,
Township 15 South, Range 33 East, NMPK, Lea County, New Mexico.

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

(4) That the proposed waterflood project should result in
the 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 Rules 701, 702,
and 703 of the Commission Rules and Regulations.

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CASE No. 3413

Order No. R-3078

IT IS THEREFORE ORDERED:

(1) That the applicant, Amerada Petroleum Corporation, is hereby authorized to institute a waterflood project in the Saunders Perno-Pennsylvanian Pool by the injection of water into the Perno-Pennsylvanian zone through the following-described wells in Section 3, Township 15 South, Range 33 East, NMPM, Lea County, New Mexico:

<u>WELL - LEASE</u>	<u>WELL NO.</u>	<u>UNIT</u>
Amerada-State S "B"	2	C
Amerada-State S "B"	3	G
Amerada-State S "DB"	4	K


(2) That the subject waterflood project is hereby designated the Amerada Saunders SB Waterflood Project and shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

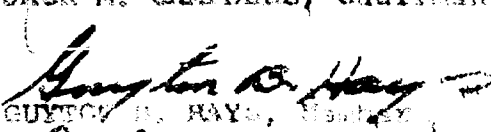
(3) That monthly progress reports of the waterflood project herein authorized shall be submitted to the Commission in accordance with Rules 704 and 1120 of the Commission Rules and Regulations.

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

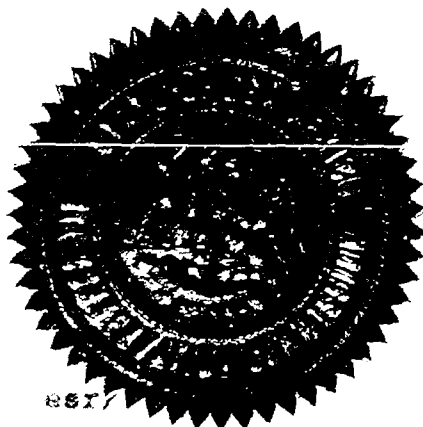
DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION


JACK M. CAMPBELL, Chairman


GUYTON B. HAYS, Member


A. L. JONES, Jr., Secretary



GOVERNOR
JACK M. CAMPBELL
CHAIRMAN

State of New Mexico
Oil Conservation Commission



LAND COMMISSIONER
GUYTON B. HAYS
MEMBER

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

P. O. BOX 2088
SANTA FE

June 15, 1966

Mr. Jason Kellahin
Kellahin & Fox
Attorneys at Law
Post Office Box 1769
Santa Fe, New Mexico

Re: Case No. 3413
Order No. R-3078
Applicant:

Amerada Petroleum Corporation

Dear Sir:

Enclosed herewith is a copy of the above-referenced Commission order recently entered in the subject case. Letter pertaining to conditions of approval and maximum allowable to follow.

Very truly yours,

A. L. Porter, Jr.
A. L. PORTER, Jr.
Secretary-Director

ALP/ir

Carbon copy of order also sent to:

Hobbs OCC X
Artesia OCC
Aztec OCC

Other Mr. Frank Irby

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO

July 6, 1966

C
O
P
Y

Mr. Jason Kellahin
Kellahin & Fox
Attorneys at Law
Post Office Box 1769
Santa Fe, New Mexico

Dear Sir:

Reference is made to Commission Order No. R-3078 recently entered in Case No. 3413, approving the Amerada Saunders SB Waterflood Project.

Injection is to be through the three authorized water injection wells which shall be equipped with internally coated tubing and packers, with the packers being set within 100 feet of the uppermost perforation.

As to allowable, our calculations indicate that 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 1272 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

OIL CONSERVATION COMMISSION
P. O. BOX 2088
SANTA FE, NEW MEXICO

-2-

Mr. Jason Kellahin

July 6, 1966

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

ALP/ir

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

Oil Conservation Commission
Hobbs, New Mexico

C
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P
Y

JUNE 8, 1966, EXAMINER HEARING

CASE 3413: Application of Amerada Petroleum Corporation for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project by the injection of water into the Permo-Pennsylvanian zone through three injection wells located in Section 3, Township 15 South, Range 33 East, Saunders Permo-Pennsylvanian Pool, Lea County, New Mexico.

CASE 3414: Application of Phillips Petroleum Company for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water in the lower San Andres formation, below the oil-water contact, in the following wells, Vacuum Field, Lea County, New Mexico:

TOWNSHIP 17 SOUTH, RANGE 34 EAST
Phillips Hale No. 11, Unit K Section 35

TOWNSHIP 17 SOUTH, RANGE 35 EAST
Phillips Santa Fe No. 97, Unit N Section 33
Phillips Santa Fe No. 86, Unit C Section 26
Phillips Santa Fe No. 58, Unit G Section 35

Applicant further seeks establishment of an administrative procedure whereby additional wells could be placed on salt water disposal below the oil-water contact in the San Andres formation of the Vacuum Field.

CASE 3415: Application of Sun Oil Company for a non-standard gas proration unit, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of a 790-acre non-standard gas proration unit comprising all of Section 5 and 150 acres in the eastern portion of Section 6, Township 22 South, Range 23 East, Indian Basin-Upper Pennsylvanian Gas Pool, Eddy County, New Mexico. Said unit would be dedicated to applicant's Bogle Flats Unit Well No. 8 located in Unit G of said Section 5. Although applicant has drilled a non-commercial well in the NE/4 of said Section 6, it contends that there are approximately 150 acres in said Section 6 which are underlain by the Indian Basin-Upper Pennsylvanian Gas Pool.

CASE 3416: Application of Signal Oil & Gas Company for a dual completion and salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the dual completion (conventional) of its State "AP" Well No. 1 located in Unit 1 of Section 17, Township 10 South, Range 34 East, Simanola-Pennsylvanian Pool, Lea County, New Mexico, in such a manner as to produce oil from the Pennsylvanian formation through perforations from 9962 feet to 9966 feet and to dispose of produced salt water into the San Andres and Glorieta formations through the annulus between the 8 5/8 inch and the 5 1/2 inch casing in the interval from 4100 feet to 9260 feet.

CASE 2844 (Reopened):

In the matter of Case No. 2844 being reopened pursuant to the provisions of Order No. R-2627, which order established temporary 320-acre gas proration units for the Teas-Pennsylvanian Gas Pool, Lea County, New Mexico, for a period of one year from the date of first pipeline connection. The Commission will consider indefinite extension of Order R-2627 in the absence of evidence to the contrary.

Docket No. 14-66

DOCKET: EXAMINER HEARING - WEDNESDAY - JUNE 8, 1966

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

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

- CASE 3410: Application of Pennzoil Company for the creation of a new pool and for special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new oil pool for Morrow production for its Bridges-State Well No. 1 in Unit A of Section 11, Township 17 South, Range 34 East, Lea County, New Mexico, and for the promulgation of special pool rules therefor including a provision for 80-acre spacing and a limiting gas-oil ratio of 12,000 to one. In the alternative, applicant requests that the subject well be classified as a gas well and a new Morrow gas pool be created.
- CASE 3411: Application of SEC Operating for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project by the injection of water into the Yates formation through one well in Unit A of Section 14, Township 20 South, Range 33 East, Teas Pool, Lea County, New Mexico. Applicant further seeks an administrative procedure whereby said project could be expanded to include additional lands and injection wells in Sections 11, 13, 14 and 15, Township 20 South, Range 33 East, under cooperative offset operating agreements.
- CASE 3412: Application of SEC Operating for an exception to Commission Order No. R-111-A, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an exception to the potash-oil area casing and cementing rules as set forth in Commission Order No. R-111-A. Applicant proposes to drill and complete a well in Unit D of Section 14, Township 20 South, Range 33 East, Teas Pool, Lea County, New Mexico, with surface casing set at approximately 950 feet, cement circulated, and production casing set at approximately 3400 feet and cemented to approximately 2500 feet above the casing point. The well would be plugged and abandoned in accordance with the provisions of Order No. R-111-A.

CASE 3261 (Reopened):

In the matter of Case No. 3261 being reopened at the request of Amerada Petroleum Corporation to consider the amendemnt of the special rules for the Jenkins-Cisco Pool, Lea County, New Mexico, to provide for 160-acre oil proration units. Applicant also seeks the extension of said pool to include certain lands in Township 9 South, Ranges 34 and 35 East. The present temporary special rules promulgated by Order No. R-2931 in Case 3261 provide for 80-acre proration units, and are subject to reconsideration in July, 1966.

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

APPLICATION OF AMERADA PETROLEUM CORPORATION)
FOR AUTHORITY TO CONDUCT A WATERFLOOD PROJECT)
ON ITS STATE "SB" LEASE LOCATED IN SECTIONS)
3 AND 4, TOWNSHIP 15 SOUTH, RANGE 33 EAST,)
LEA COUNTY, NEW MEXICO.)

CASE NO. 2413

APPLICATION

Applicant Amerada Petroleum Corporation states that:

1. Applicant owns and operates a producing lease known as the State "SB" Lease, located in Sections 3 and 4, Township 15 South, Range 33 East, Saunders Permo-Pennsylvanian Pool, Lea County, New Mexico, as shown on the attached plat marked Exhibit A.

2. The Saunders Permo-Pennsylvanian Pool is a common source of supply of oil established by Order No. R-17 (dated 4-27-50), which pool is now in an advanced stage of depletion.

3. Applicant proposes to conduct waterflood operations on a lease basis by injecting water into the Permo-Pennsylvanian zone through three injection wells as shown in the tabulation of general data marked Exhibit B.

4. Attached as Exhibits C through E are logs of the proposed injection wells, and attached as Exhibits F through H are schematic diagrams showing the proposed completion of such injection wells.

Applicant therefore requests that this matter be set for hearing before an Examiner, that notice of hearing be given as required by law, and that an order be issued granting this application.

AMERADA PETROLEUM CORPORATION

By Thomas W. Lynch
Thomas W. Lynch, Attorney
P. O. Box 2040
Tulsa, Oklahoma 74102

By Jason W. Kellahin
Jason W. Kellahin, Attorney
Kellahin & Fox
P. O. Box 1769
Santa Fe, New Mexico 87501

DOCKET MAILED

Date

TEXACO
INC.

PETROLEUM PRODUCTS



DOMESTIC PRODUCING DEPARTMENT
MIDLAND DIVISION

J. H. MARKLEY, DIVISION MANAGER

MAIN OFFICE

'66 MAY 31 AM 8 26

P. O. BOX 3109
MIDLAND, TEXAS 79704

May 24, 1966

SAUNDERS PERMO-PENNSYLVANIAN POOL
LEA COUNTY, NEW MEXICO

New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico

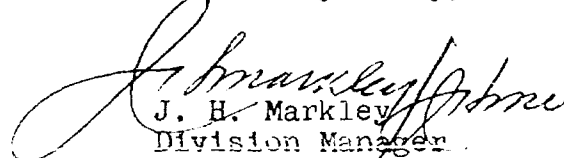
Attn: Mr. A. L. Porter, Jr.

Gentlemen:

Please refer to Amerada's letter dated May 18, 1966 concerning their application before the Oil Conservation Commission of the State of New Mexico for authority to conduct waterflood operations in the Saunders Permo-Pennsylvanian Pool, Lea County, New Mexico.

Texaco is currently reviewing a proposal from Amerada concerning the formation of a 640-acre waterflood unit in the area covered by the proposed application which would include Texaco's State "AQ" Lease. Texaco plans to continue negotiating with Amerada to make the unit effective as soon as possible. The preliminary plan of operation would be to convert Texaco's State "AQ" well No. 2, along with the three wells proposed by Amerada, to complete the 80-acre five-spot injection pattern. Texaco as an offset operator, therefore, supports Amerada Petroleum Corporation's application.

Yours very truly,


J. H. Markley
Division Manager

FEF-MM

cc: Amerada Petroleum Corp.
P. O. Box 2040
Tulsa 2, Oklahoma 74102



SHELL OIL COMPANY

WESTERN DIVISION
P. O. BOX 1509
MIDLAND, TEXAS 79701

June 1, 1966

Subject: Proposed Waterflood Project
Saunders Permo-Pennsylvanian Pool
Lea County, New Mexico

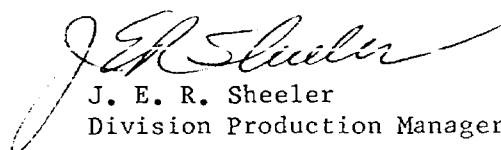
Amerada Petroleum Corporation
P.O. Box 2040
Tulsa 2, Oklahoma

Attention Mr. Thomas W. Lynch

Gentlemen:

In accordance with your letter of May 18, 1966, this is to advise that Shell Oil Company has no objection to your application to waterflood the Amerada State SB Lease in the Saunders Permo-Pennsylvanian Pool, Lea County, New Mexico.

Yours very truly,


J. E. R. Sheeler
Division Production Manager

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

May 23, 1966

P. O. Drawer 1938
Roswell, New Mexico 88201

Amerada Petroleum Corporation
Post Office Box 2040
Tulsa, Oklahoma 74102

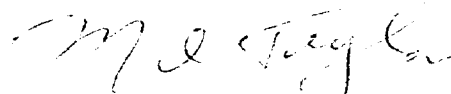
Attention: Mr. Thomas W. Lynch

Gentlemen:

As requested by your letter of May 18, 1966, please be advised that Gulf Oil Corporation has no objection to Amerada's application for authority to waterflood the State "SB" Lease in the Saunders Fermo-Pennsylvanian Pool, Lea County, New Mexico.

When this waterflood is initiated, Gulf would appreciate receiving a copy of your periodic reports on the project.

Yours very truly,


M. I. Taylor

COF:sz



Case 3413

Heard 6-8-66

Res. 6-10-66

- 1 Grant Amerada permission to convert.
3 well to injection for their Scurwader.
penn Penn waterflood unit.
2. Annulus on all wells shall be filled with
inert fluid with a pressure gauge
at the surface.
3. ~~Injection~~ shall be thin tubing sand
under ~~expander~~.

The three wells are.

Amerada - St. 5 "B" #2 C - 3-155-33E
" " " " " #3 S - 3-155-33E
" " St. 5 - 'DB' #^{B-4}BT #2 - 3-155-33E.

Trust

dearnley-meier reporting service, inc.

SPECIALIZING IN: DEPOSITIONS, HEARINGS, STATEMENTS, EXPERT TESTIMONY, DAILY COPY, CONVENTIONS

1120 SIMMS BLDG. • P. O. BOX 1092 • PHONE 243-6691 • ALBUQUERQUE, NEW MEXICO



PAGE 1

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

Examiner HEARING

IN THE MATTER OF:

Application of Amerada Petroleum
Corporation for a waterflood project,
Lea County, New Mexico.

Case No. 3413

BEFORE: Elvis A. Utz, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: The meeting will come to order. The next case is No. 3413.

MR. HATCH: Application of Amerada Petroleum Corporation for a waterflood project, Lea County, New Mexico.

MR. KELLAHIN: Jason Kellahin, appearing on behalf of the applicant in association with Mr. Thomas W. Lynch, member of the Oklahoma Bar. We will have one witness I would like to have sworn, please.

(Witness sworn.)

MR. UTZ: Other appearances.

DAVID G. GRIFFIN

called as a witness, having been duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name?

A My name is David G. Griffin.

Q By whom are you employed and what position?

A I am employed by Amerada Petroleum Corporation as a petroleum engineer, in our Tulsa office.

Q In connection with your assignment in Tulsa do you have anything to do with the area involved in the application of Amerada in Case 3413?

A Yes, I have. I prepared the Exhibits that we are

about to present.

Q Have you made a study of this?

A Yes, I have.

Q Have you ever testified before the Oil Conservation Commission?

A No, I have not.

Q For the benefit of the Examiner, would you briefly outline your education and experience as a petroleum engineer?

A I was graduated from Oklahoma State University in June of 1960 with a B.S. degree in mechanical engineering petroleum option, and have worked since that time with Amerada Petroleum Corporation.

Q Where have you been assigned in connection with this work?

A I have worked in North Dakota, South Louisiana, Tulsa.

Q All right.

MR. KELLAHIN: Are the witness's qualifications accepted?

MR. UTZ: Yes, they are.

Q (By Mr. Kellahin) Are you familiar with the application of Amerada Petroleum Corporation in Case 3413?

A Yes, I am.

Q Would you state briefly what Amerada proposes in



this application?

A We propose a lease waterflood project located on Amerada Site FB Lease in the Saunders Permo-Pennsylvania Pool.

(Whereupon, Applicant's Exhibit No. 1 marked for identification.)

Q Now, referring to what has been marked as Exhibit No. 1, would you identify that exhibit and discuss what is shown on it?

A Exhibit No. 1 is a structural contour map drawn on the top of a correlative marker which lies approximately 100 feet into the Gross Permo-Pen section. The contours illustrate an anticlinal nature of the structure. The hydrocarbon accumulation in this area is also controlled to some degree by porosity development and we subsequently classify this accumulation as a combination structural and stratigraphic trap. Outlined on this map, Exhibit 1, and shown in yellow is Amerada's proposed lease waterflood. On State SB lease also shown in red are the three proposed injection wells. The map also shows the outline of Amerada's initial pilot pressure main project which is authorized by Order No. R 2236 dated May 8, 1962.

You will also notice, Mr. Examiner, on this exhibit that our proposed lease waterflood excludes Texaco AQ lease and the center of lease colored yellow. You have in your possession

a letter from Texaco supporting our application in this matter and also indicating that they plan, that they are in the process of evaluating a proposal by Amerada for a unit agreement and a waterflood project which would include their AQ lease and would also convert their AQ No. 2 well to an injection well which would complete the five-spot flood pattern.

Q What is the present status of your existing pressure main project, the one approved by Order R 2236?

A This injection into the one injection well in this project has been temporarily suspended and we are evaluating and observing pressure and production data in the project area.

Q Now, would you discuss the characteristic of the reservoir rock in the area involved in this application?

A The Permo-Pen reservoir which is found at an average depth of 9865 feet in this area is of medium crystalline limestone with a vugular porosity in the range of approximately 8%. This reservoir has about an average permeability of approximately 40 millidarcies.

Q The exhibit shows a discovery well, I take it, to be just immediately north of the area of the lease flood, is that correct?

A Yes, the discovery well in the field is Gulf's



Saunders No. 1 Well which was completed in January 1950.

Since that time the field has been developed on State-wide 40-acre spacing and produces under the influence of a solution gas and fluid expansion type drive mechanism.

Q How many wells are producing in the pool at the present time?

A We currently have 109 producing wells which produce exclusively by either gas lift or pump and produce 1908 barrels of oil in 2443 barrels of water per day which calculates to be an average of 17 1/2 barrels of oil per day per well and 22 1/2 barrels of water per day per well.

(Whereupon, Applicant's Exhibits No. 2 and 3 marked for identification.)

Q Now, referring to what has been marked as Exhibits No. 2 and 3, would you discuss those exhibits, please?

A Exhibit No. 2 is a performance curve of the Saunders Pool. It shows monthly oil production rate and monthly total fluid rate and also the number of wells. Exhibit No. 3 is a tabulation of production data which supports the performance curve and shows the accumulative oil production to April 1, 1966 to be approximately 25 million barrels. This figure represents approximately 90% of the expected primary reserve and indicates that the reservoir is in an advanced state of depletion.

Q According to your figures then it has already produced on primary approximately 90% of its primary reserve?

A Correct.

Q Then in your opinion as an engineer it is ready for second recovery project?

A Yes.

(Whereupon, Applicant's Exhibit No. 4 marked for identification.)

Q Referring to what has been marked as Exhibit No. 4, would you identify that exhibit?

A Exhibit No. 4 is a plat which shows the proposed lease waterflood shaded in yellow. The three proposed injection wells colored in red and the locations of four permitted locations for the production of Ogalalla fresh water.

Q You say those are permitted wells. What do you mean by permitted? Have they been approved by the State Engineer?

A They have been authorized by the State Engineer to produce 580 acre feet or water per well per year and initially we plan to inject exclusively Ogalalla water into these proposed injection wells.

Q Will the produced water be recycled at a later date?

A Yes, it will.



Q What is the status of these water wells at the present time?

A These wells have been drilled and completed.

Q Now, referring again to Exhibit No. 4 and the Texaco Company lease in particular, is the lease ownership of that lease common other than the working interest with the Amerada lease?

A Yes, it is same lessor as the State of New Mexico, common school land.

Q So, it will be merely a matter of working out an agreement with Texaco in order to move ahead in the flood project?

A Correct. As I mentioned in talking about Exhibit 1 that it might be a little bit plainer on Exhibit 4 that Texaco's AQ No. 2 Well will ultimately be converted to an injection well which will complete the five-spot flood pattern in this area. It is a matter of their approval of our proposal and they are in the process of approving it.

Q But Amerada is prepared to go ahead with the flood at this stage before approving?

A That's correct.

(Whereupon, Applicant's Exhibit No. 5 marked for identification.)

Q Now, referring to what has been marked as Exhibit No. 5, would you identify that exhibit?



A Exhibit 5 is a general data sheet. Most of the material here has been covered previously under the general heading. There is some pressure data indicating an initial pressure of 3660 PSI and a current estimated pressure of approximately 700 PSI which supports our belief that the reservoir is producing under the influence of solution gas top draw. There are also shown on this exhibit some fluid and reservoir rock properties and on Page 2 of the exhibit the fluid and injection well data. We initially plan to inject exclusively Ogalalla fresh water which is found at an average depth of approximately 115 feet and with an average thickness of the water-saturated section of some 140 feet into the three proposed injection wells. We plan to inject approximately 2000 barrels of water per day at an injection pressure of 1500 PSI.

Q Now, when the additional injection well is added as you contemplate, will the same amount of water be injected?

A We anticipate that the same volumes and pressures will apply to that also.

Q Now, what type of system do you expect to install? Will it be in the close system?

A The system will be closed, yes.

Q And I believe you already testified that you will reinject produced water, recycle the water?



A As it is needed, yes.

(Whereupon, Applicant's Exhibits 6, 7, and 8 marked for identification)

Q Referring to Exhibits 6, 7, and 8, would you identify those exhibits?

A Exhibits 6, 7, and 8 are log sections from the State SB No. 2, State SB No. 3, and State SDB No. B4 Wells, which are the three proposed injection wells. These log sections show the perforated intervals and also the open hold interval which is presently producing from the well.

MR. UTZ: What is the top of the open hold there? Is this the top of the log or what?

A The top of the open hole is indicated down in the well bore. It is open hole from there down, from 9905, which is the casing, to 9980 and then are two open hole sections and one State SDB No. B4 does not have an open hold section.

(Whereupon, Applicant's Exhibits 9, 10, and 11 marked for identification)

Q Now, referring to what has been marked as Exhibits 9, 10, and 11, are those schematic diagrams of the proposed injection well?

A Yes, they are. They show the downhold completion equipment in these wells, the perforated intervals, and the packer settings in these, the annulus in these three



proposed injection wells will be equipped with a pressure gauge and periodically checked in order to detect any deletion that might occur in the casing and the annulus. will also be filled with an inhibited water to prevent the occurrence of corrosion.

Q Are you going to use an internal coated tubing?

A Yes, we plan to entirely coat the tubing.

Q And you said you had a closed system for the injection?

A That is correct.

Q Is this because you plan to recycle the produced water?

A Yes.

Q Although initially you will be using fresh water?

A Correct.

Q Now, in your opinion, will the approval of this application increase all the producing of the oil from the Saunders Pool?

A Yes, it will.

Q It will result in prevention of waste and recovery of oil that would not otherwise be recovered?

A Yes, it will.

Q Will the completion of the injection wells as you planned them adequately protect any other producing horizon



or fresh water zone?

A Yes, the completions will protect such fresh water strata.

Q Have you any particular recommendations to make in connection with this application?

A Well, we recommend that the proposed lease waterflood, and this we have outlined with the three injection wells be approved and that the allowable for this project be determined as provided for in accordance with a State-wide Rule No. 701, which would provide for 42 barrels of oil per day per well for injection wells and offsets and according to our calculations at the proportional depth factor of 3.77 our eight classifying wells would result in a project allowable of approximately 1267 barrels of oil per day.

Q Were Exhibits 1 through 11 prepared by you or under your supervision?

A Yes, they were.

MR. KELLEHIN: At this time I would like to offer Exhibits 1 through 11, inclusive.

MR. UTZ: Without objection Exhibits 1 through 11 will be entered into the record in this case.

(Whereupon, Applicant's Exhibits 1 through 11 admitted in evidence.)

MR. KELLEHIN: With the Examiner's permission I

think the letter from Texaco has already been submitted to the Commission and we do have letters from Shell Oil Company and Gulf Oil Corporation stating they have no objection to the proposed order injection program, they being the offset operators. We have one other problem in connection with this application and that is under the permits which were granted by the New Mexico State Engineer we have already secured one extension time and under the present status of those permits we are required to apply water to beneficial use not later than June 27th. This, of course, means that we will have to-- and we are in the process of asking for a further extension, but at the same time, in an effort to show good faith on the part of the Amerada Petroleum Corporation, wells have been drilled and we do want to be able to report to the State Engineer we have commenced the application of water to beneficial use by that date. For that reason we would appreciate action on this application as soon as possible so the water injection program can be commenced by June 27th if at all possible. The equipment is ready for this purpose is my understanding.

That is all I have.

MR. UTZ: Questions of the witness.

MR. IRBY: Frank Irby, State Engineer Office.



CROSS EXAMINATION

BY MR. IRBY:

Q Mr. Griffin, on your Exhibit No. 1 you have a red circle there in Section 3/4, labeled "Wine Well." Now, I didn't get your explanation of what that is.

A Well, that is Gulf's discovery well for this pool. That is their Saunders No. 1 Well.

Q Then in your testimony you stated that the produced water would be reinjected as needed. Could you elaborate on that point just a little bit for me?

A Well, as I also mentioned the amount of produced water in the field now totals about 2400 barrels per day and we anticipate injecting 2000 barrels per day per well into these injection wells and with the completion of the project and the additional of the Texaco's injection well this will amount to a total of 8000 barrels of water per day needed, so that we will use the produced water in addition to the Ogallala fresh water.

Q Now, until such time as this produced water is needed, what disposal will be made of it?

A Well, there is presently in the field a saltwater disposal system with a disposal well. This water will be disposed into that system.

Q Is that the place that is on this 2400 barrels per



day you mentioned, is now going?

A That is correct.

Q On your Exhibit 9 that is your schematic drawing on State SD No. 2.

A Yes, sir.

Q You have a 4 inch OD liner set in there. Has the seal between the liner and the casing been tested or will it be tested before this well goes on as an injector.

A I am quite sure, although not positive, that this liner top was pressure tested when it was set. This is our procedure. It is our practice and I wouldn't anticipate it be made for any further testing of that liner top.

Q Would you have the information in your office concerning this test?

A Yes, sir.

Q Would you send me a copy of that?

A Yes, sir.

MR. IREY: Thank you. That is all the questions I have, Mr. Examiner.

MR. UTZ: Are there other questions? Witness may be excused. Other statements in this case? Case will be taken under advisement.

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SPECIALIZING IN: DEPOSITIONS, HEARINGS, STATEMENTS, EXPERT TESTIMONY, DAILY COPY, CONVENTIONS

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STATE OF NEW MEXICO)
COUNTY OF BERNALILLO)

I, KAY EMBREE, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission Examiner at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF I have affixed my hand this 22nd day of JUNE, 1966.

Kay Embree
Court Reporter

I do hereby certify that the foregoing is a complete record of the proceedings in the Bernalillo hearing of case No. 4313, heard by me on June 8, 1966.
Thos C. O'Neil
New Mexico Oil Conservation Commission Examiner

FIG.

TABULATION OF PRODUCTION
SAUNDERS PERMO-PENN POOL
LEA COUNTY, NEW MEXICO

<u>Year</u>	<u>Oil Production</u>	<u>Cumulative Oil Production</u>	<u>Water Production</u>
1950	79,380	79,380	22,228
1951	704,235	783,615	59,341
1952	1,544,601	2,328,216	375,872
1953	2,140,766	4,468,982	906,722
1954	2,184,083	6,653,065	1,430,428
1955	1,898,300	8,551,365	921,857
1956	1,714,045	10,265,410	848,070
1957	1,549,535	11,814,945	796,037
1958	1,844,799	13,659,744	712,497
1959	2,437,149	16,096,893	1,122,012
1960	2,305,616	18,402,509	1,284,017
1961	1,948,023	20,350,532	1,219,237
1962	1,422,360	21,772,892	1,211,927
1963	1,118,115	22,891,007	1,199,328
1964	1,085,204	23,976,211	1,185,191
1965	823,537	24,799,748	928,864

Cumulative Oil Produced
to 4-1-66

24,977,229

AMERADA PETROLEUM CORP.

EXHIBIT 3

NO. 3413

DATE 6-8-66

GENERAL DATA
PROPOSED LEASE WATERFLOOD
SAUNDERS PERMO-PENNSYLVANIAN POOL
LEA COUNTY, NEW MEXICO

General

Producing Horizon	Permo-Pennsylvanian
Average Depth	9865'
Average Gross Thickness	200'
Discovery Date	January, 1950
Current Number Producing Wells in Pool	109
Well Spacing	40 Acres

Pressure Data

Initial Reservoir Pressure @ -5600'	3660 psi
Current Reservoir Pressure @ -5600'	700 psi
Saturation Pressure @ 130° F	3660 psi

Fluid Properties

Stock Tank Oil Gravity	42.7°
Oil Formation Volume Factor @ 3660 psi and 130° F	1.905
Solution Gas-Oil Ratio	1678 SCF/Bbl
Current Average Producing Gas-Oil Ratio (March 1966)	2762 SCF/Bbl
Oil Viscosity @ 3660 psi and 130° F	0.4 cp
Total Water Saturation (Core Analysis)	30%

Reservoir Rock Properties

Porosity	8%
Permeability (Core Analysis)	40 md

AMERADA PETROLEUM CORP.

EXHIBIT 5

NO. 3413

DATE 6-8-66

General Data

Page 2

Supply Water Data

Supply Water Source

Ogallala

Type Water

Fresh

Average Depth to Water Table

115'

Average Thickness of Water Saturated Section

140'

Injection Well Data

Number of Proposed Injection Wells

3

Expected Per Well Injection Volume

2000 Bbls/Day

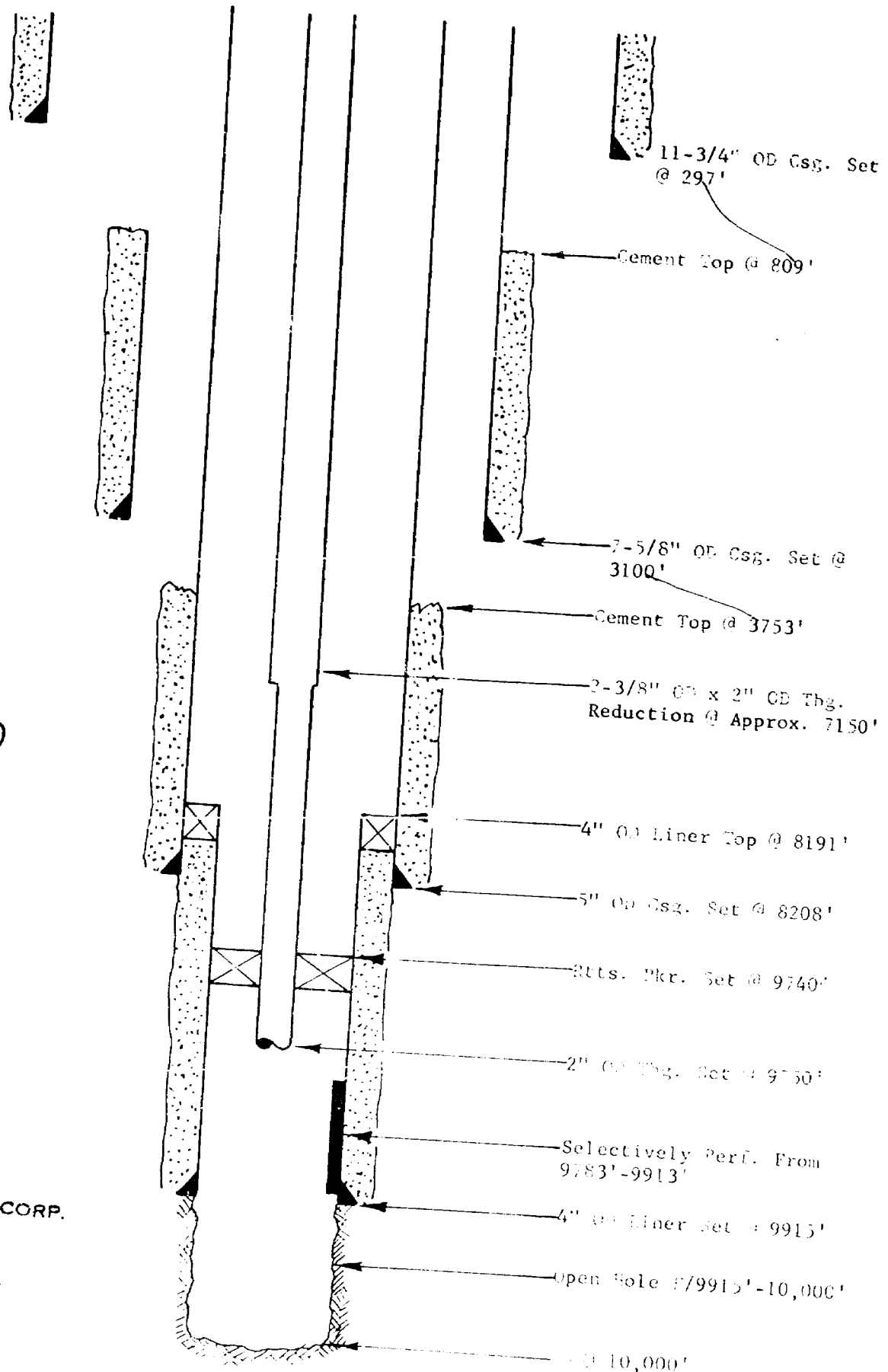
Expected Injection Pressure

1500 psi

SCHEMATIC DIAGRAM
STATE S "D" #2
SAUNDERS FIELD
LEA COUNTY, NEW MEXICO

9783
9740
43

AMERADA PETROLEUM CORP.
EXHIBIT. 9
NO. 3413
DATE 6-8-66



SCHEMATIC DIAGRAM
STATE S "B" #3
SAUNDERS FIELD
LEA COUNTY, NEW MEXICO

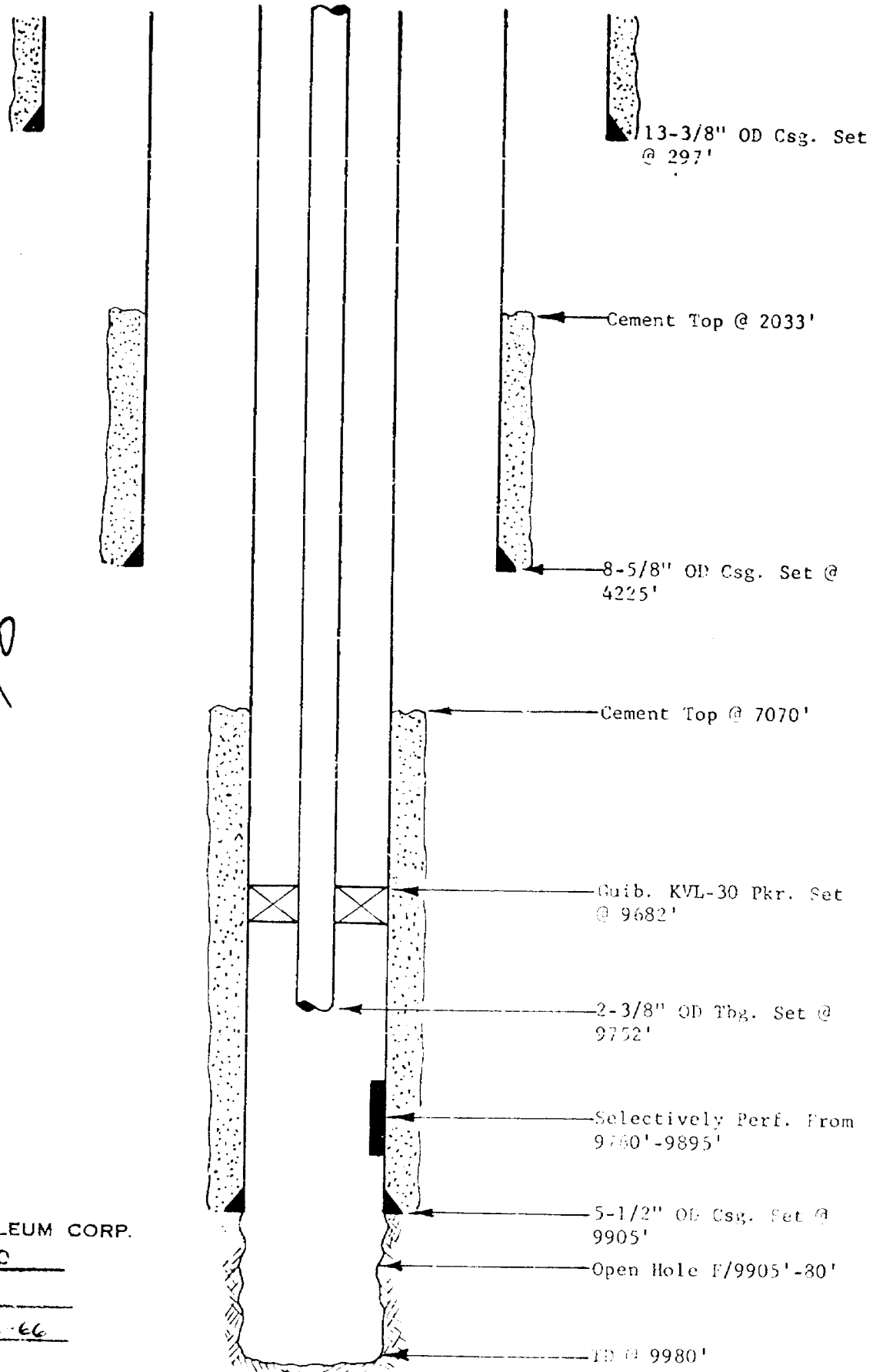
9760
9682
78

AMERADA PETROLEUM CORP.

EXHIBIT 10

NO. 3413

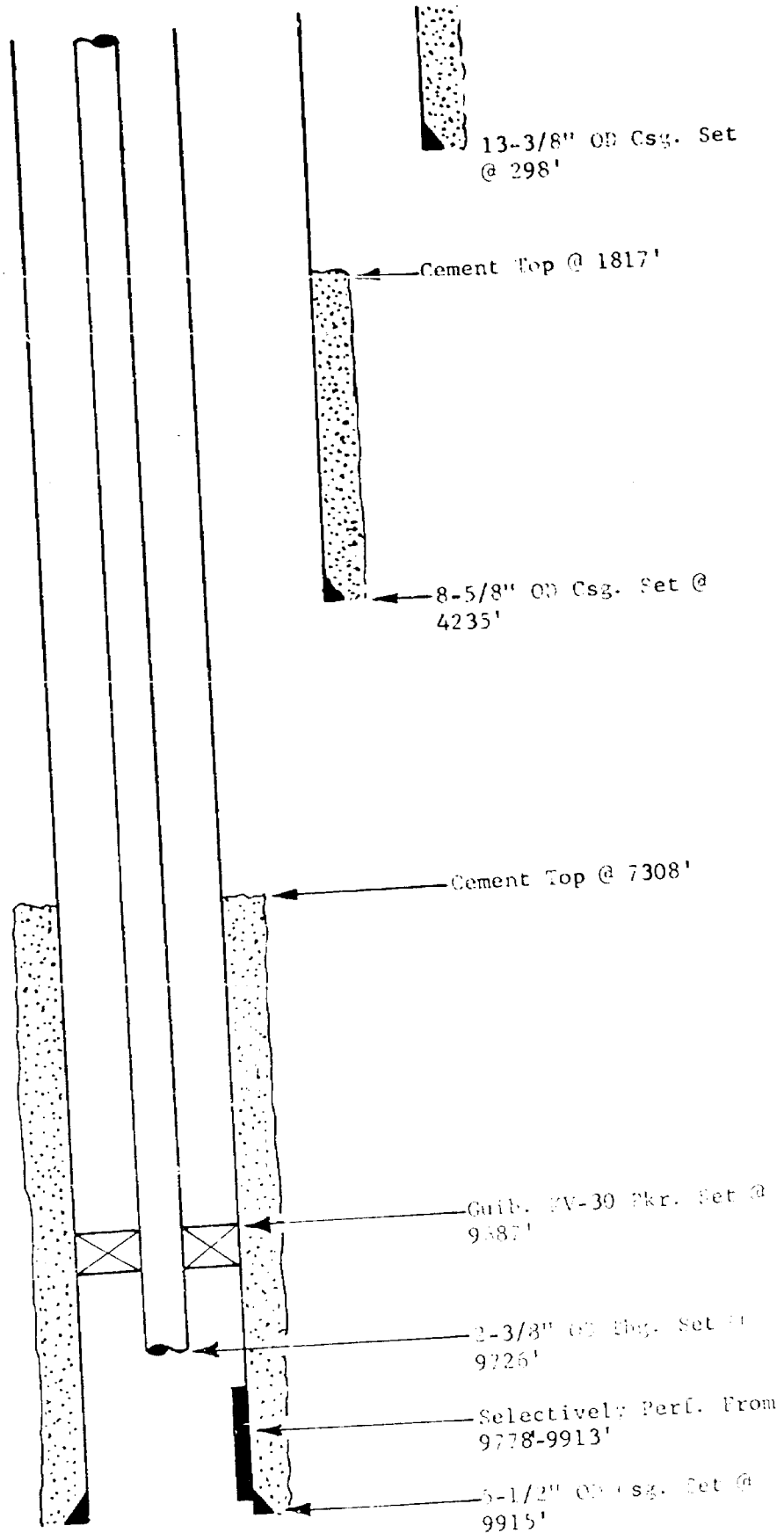
DATE 6-8-66



SCHEMATIC DIAGRAM
STATE S "DB" #B-4
SAUNDERS FIELD
LEA COUNTY, NEW MEXICO

9718
8123
9687
91

AMERADA PETROLEUM CORP.
EXHIBIT 11
NO. 3413
DATE 6-8-66



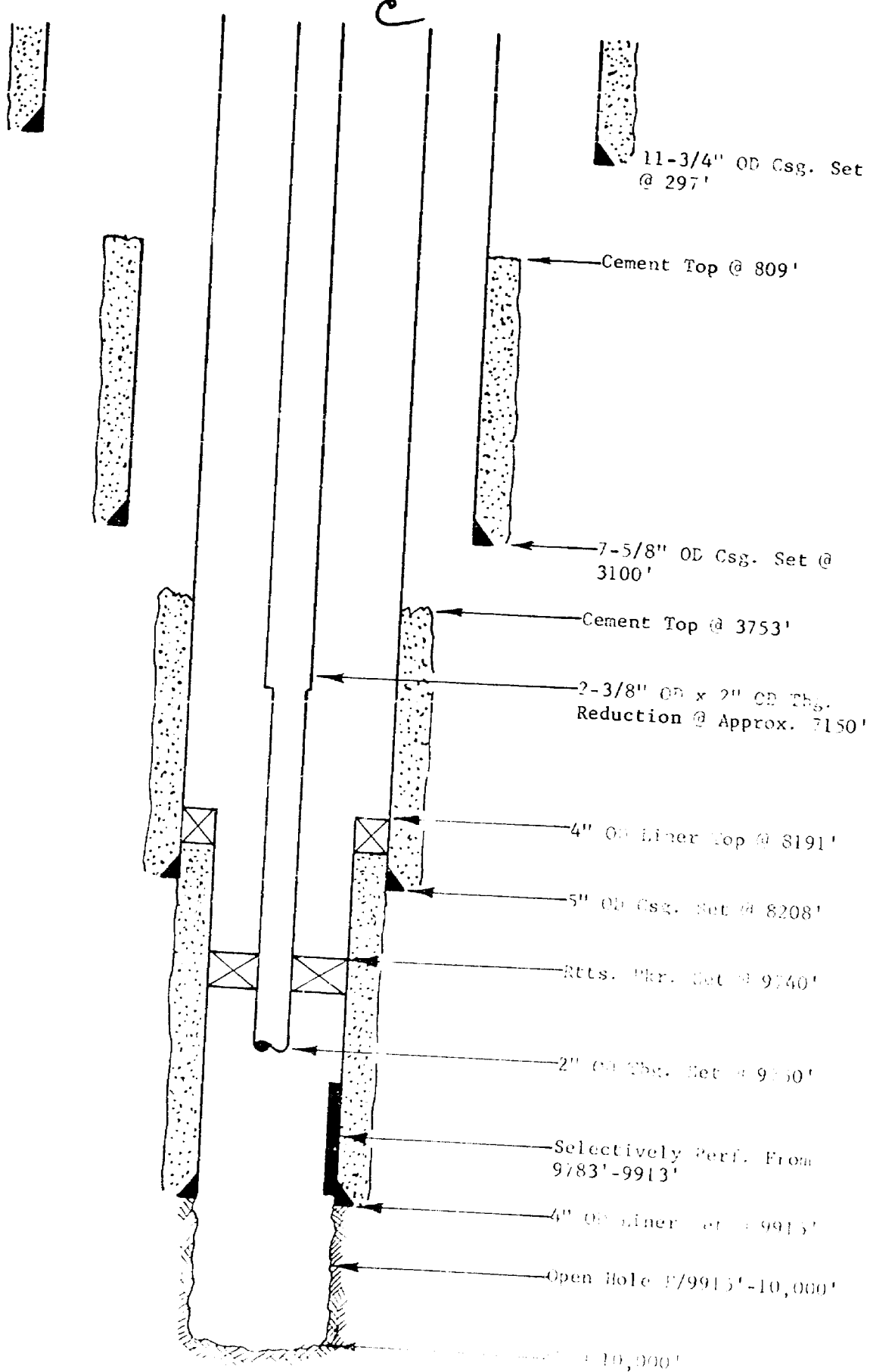
GENERAL DATA
PROPOSED LEASE WATERFLOOD
SAUNDERS PERMO-PENNSYLVANIAN POOL
LEA COUNTY, NEW MEXICO

Producing Horizon	Permo-Pennsylvanian
Discovery Date	January, 1950
Current Number Producing Wells in Pool	115
Average Depth of Pay	9865'
Average Gross Thickness	200'
Initial Reservoir Pressure (-5600')	3660 psi
Approximate Current Reservoir Pressure	700 psi
Supply Water Source	Ogallala
Type Water	Fresh
Average Depth to Water Table	115'
Average Thickness of Water Saturated Section	140'
Expected Per Well Injection Volume	2000 bbls
Expected Injection Pressure	1500 psi
Number of Proposed Injection Wells	3

*Page 1413
Exhibit B*

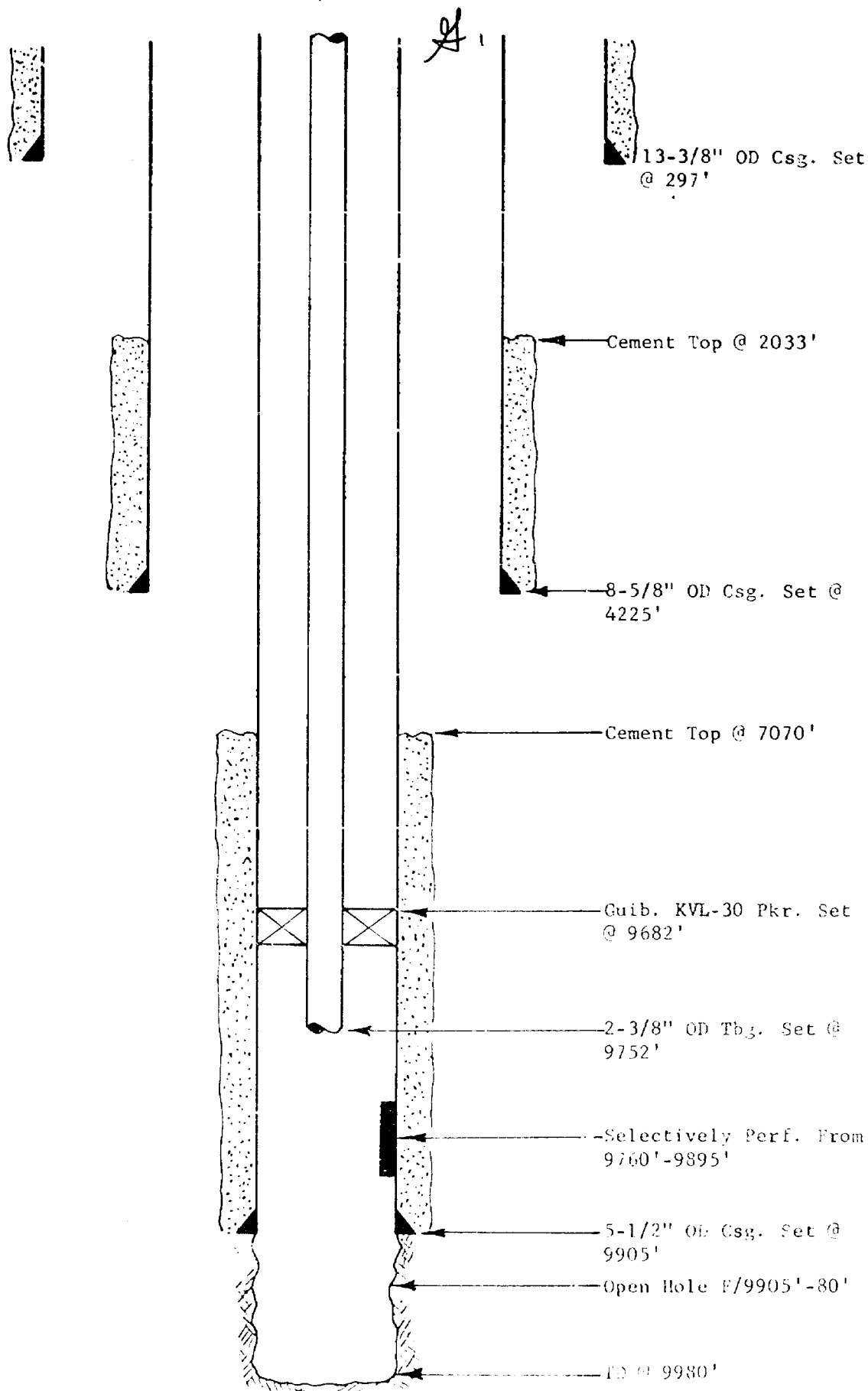
SCHEMATIC DIAGRAM
STATE S "B" #2
SAUNDERS FIELD
LEA COUNTY, NEW MEXICO

Exhibit A
Case 3413



SCHEMATIC DIAGRAM
STATE S "B" #3
SAUNDERS FIELD
LEA COUNTY, NEW MEXICO

Exhibit 1
Page 34/3



SCHEMATIC DIAGRAM
STATE S "DB" #B-4
SAUNDERS FIELD
LEA COUNTY, NEW MEXICO

Exhibit 21
Page 34.5

