CASE 3587: Application of MORRIS R. ANTWEIL for a waterflood project, Eddy County, N. Mex.

CASE NO.
3587

Application,
Transcripts,
Small Exhibits
ETC.

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
May 24, 1967

EXAMINER HEARING

IN THE MATTER OF: Application of Morris R. Antweil for a unit agreement, Eddy County, New Mexico.	CASE NUMBER 3586

and

IN THE MATTER OF: Application of Morris R. Antweil for a waterflood project, Eddy County, New Mexico.	CASE NUMBER 3587 (Consolidated)

BEFORE:

ELVIS A. UTZ, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: Case 3586 and Case 3587.

MR. HATCH: Case 3586, Application of Morris R. Antweil for a unit agreement, Eddy County, New Mexico. Case 3587, Application of Morris R. Antweil for a waterfloor project, Eddy County, New Mexico.

MR. KELLAHIN: If the Examiner please, Jason Kellahin, Kellahin and Fox, appearing for the applicant and we would like to have the two cases that have just been called consolidated for the purposes of the record.

MR. UTZ: They will be consolidated for purposes of testimony, a separate order. Any other appearances? Will the witness stand and be sworn, please.

(Witness sworn.)

MR. KELLAHIN: If the Examiner please, attached to the applications that were filed with the Commission are the exhibits which are required to be filed at that time and we would like to utilize those exhibits in connection with the testimony that will be presented at this Hearing. It consists of the --

MR. UTZ: In both cases?

MR. KELLAHIN: In both cases, yes, sir.

MR. UTZ: You may proceed.

ROBERT M. WILLIAMS

called as a witness on behalf of the applicant, first having

been duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A Robert M. Williams.

Q What business are you engaged in, Mr. Williams?

A I am a petroleum engineer for Morris R. Antweil.

Q Are you employed by Morris R. Antweil?

A Yes.

Q Have you ever testified before the Oil Conservation Commission?

A No, I haven't.

Q Where are you located, Mr. Williams?

A In Hobbs, New Mexico.

Q Would you state briefly, for the benefit of the Examiner, your education and experience as a petroleum engineer?

A I am a graduate of Pennsylvania State University with a degree, Bachelor's degree in petroleum and natural gas engineering. I graduated in 1953, was employed by Shell Oil Company from 1953 to 1957 in the capacity of a field engineer and a reservoir engineer. In 1957 I went to work for Monterey Oil Company in Hobbs, New Mexico; employment with Shell was also there in Hobbs. I worked with Monterey and subsequently Humble Oil Company who purchased Monterey from 1957 until 1966

in the capacity of unit reservoir engineer for the Fullerton-Clear Fork Unit, which was engaged in a waterflood operation in Andrews County, Texas.

In 1966 in October I went to work for Morris R. Antweil in the capacity of an engineer.

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

MR. UTZ: Yes, sir, they are.

Q (By Mr. Kellahin) Now, Mr. Williams, are you familiar with the application of Morris R. Antweil in Cases 3586 and 3587?

A Yes, sir. I prepared these applications.

Q And 3586 is an application for approval of a unit agreement, is that correct?

A That's correct.

Q Has a copy of the unit agreement been filed with the Commission?

A With the application, yes, sir.

Q Is Morris R. Antweil designated as unit operator in the proposed unit?

A Yes, sir.

Q What is the name of the unit?

A It is the Malaga Unit.

Q Now, what acreage does it cover?

A It covers 838 acres of Federal and fee lands located in Sections 12 and 13 of Township 24 South, Range 28 East, and Sections 7 and 18, Township 24 South, Range 29 East, all in Eddy County, New Mexico.

Q Now, is there attached to the exhibit a map showing the unit area?

A Yes, sir, a map showing the unit area is attached with the exhibit and also, of course, encompassed in the unit agreement.

Q And in addition to that, there is an exhibit attached to the unit agreement showing the acreage and the ownership of working interests and royalty interests, is that correct?

A Yes.

Q As a normal unit?

A Exhibits A, B and C of the unit agreement.

Q Has the unit agreement been submitted to the U.S.G.S. for approval?

A Yes, sir. We submitted it to the U.S.G.S. by application for final approval on the 11th of May and is currently being processed.

Q Now, Mr. Williams, have all of the working interest owners signed the unit agreement?

A The one working interest owner, Tenneco, who is the

working interest owner in Tract 1 of the designated unit will not ratify the unit agreement and we are proposing to proceed with the unitization and the Tract 1 and the adjoining Tract 3 will not be included in the proposed unit, in the participating area of the proposed unit.

Q So other than the Tracts 1 and 3, all the other units will be committed by the working interest owners?

A Yes, sir. A hundred per cent of the working interest has ratified the unit agreement.

Q Now, attached to the statement which I handed to the Examiner, is there a summary of the status of ratification of the unit agreement?

A Yes. The status gives the ratification by all working interest owners and royalty interest owners involved in the unit.

MR. KELLAHIN: If the Examiner please, we could have that marked as an exhibit. I see no necessity of putting it into the record, however. Would you like to have it marked as an exhibit?

MR. UTZ: It doesn't make any difference to me.

MR. KELLAHIN: I think the testimony will cover it.

Q (By Mr. Kellahin) Mr. Williams, what is the situation as to the royalty interest ownership?

A The royalty interest ownership, a majority of the

royalty interest ownership, has ratified the unit agreement. There was one difficulty with the royalty owner ratification encountered on Tracts 12 and 13, which are each an 80 acre tract, a total of 160 acres. The basic royalty interest owner is the Valley Land Company at Carlsbad and they refuse to ratify the unit agreement out of a problem of land management that they had. This 160 acres was a portion of a 5,000 acre lease that they had made in 1949 and they are in the process of trying to break this lease. These 160 acres are the only productive acreage in the entire 5,000 acre lease so they felt that they would jeopardize their position in their suit if they ratified the unit agreement. They have no objection to the unit and have indicated that they would probably ratify the unit as to this 160 acres if they could break their lease and not hold the entire 5,000 acre lease with this acreage.

There are small interests on several of the other tracts, small royalty interests that we have been unable to get a reply to as to their ratification, but these are small royalty interests.

Q Mr. Williams, this unit is being formed for the purpose of the secondary recovery project, is it not?

A Yes, sir. The --

Q Will the acreage you just referred to be affected by this secondary recovery project in the immediate future?

A Not immediately. When we get into our application, for our injection wells are located removed from these two unsigned royalty interest tracts and as we foresee we are looking at eighteen months to two years before we would be in a position to expand the unit into this area of the field.

Q Now, is this unit in a form that it has heretofore been approved by this Commission and by the U.S.G.S.?

A Yes. The unit agreement, I think, will follow the normal form of statement there, the normal API form for a unit agreement.

Q And do you have the ratifications to the unit agreement from the working interest owners?

A Yes. They were marked as an exhibit here, the ratification --

(Whereupon, Applicant's Exhibit Number 1 was marked for identification.)

Q Referring to what has been marked as Exhibit Number 1, a ten-page exhibit, is that the ratifications?

A Yes, sir. This is the ratifications from each of the working interest owners with the exception of Morris R. Antweil. The unit agreement that we submitted with our application is an executed copy by Morris R. Antweil.

Q And there was an amendment to the unit agreement from the form originally submitted, is that correct?

A That's right.

Q Was a copy of that filed with the Commission, the amendment?

A Yes, sir.

Q Do you have any particular effective date for the unit agreement?

A We are proposing to make the unitization effective as of July 1, 1967, pending the approval of the U.S.G.S., but we believe that we will obtain this in time to make it effective the 1st of July.

MR. KELLAHIN: Would you mark that, please?

(Whereupon, Applicant's Exhibit Number 2 was marked for identification.)

Q Mr. Williams, as you have stated, this unit is being formed for the purpose of a secondary recovery project. Do you have a planned operation for the secondary recovery project?

A Yes, sir. Included with the presentation here that has been marked Exhibit 2 is a plan of waterflood operation which basically discusses the history of the Malaga Field which was discovered in 1951 and developed with twenty producing wells. The field produces from the Delaware Sand Formation at a depth of approximately 2700 feet. The geology of the Delaware Sand, there is a stratigraphic accumulation located

on a northeast, southwest trending structural nose. The sand is a blanket sand that occurs in this area. The actual oil reservoir, we find, is actually a laminated alternating intervals of high oil saturation and low oil saturation with accompanying high water saturation. The average net pay thickness, we feel, is approximately ten feet in this Delaware Sand zone. The rock properties and fluid characteristics are given in the plan of operations here in Section 3.

The primary recovery from the field to the 1st of January, 1967, 641,091 barrels have been recovered under primary production from a solution gas drive reservoir. The reservoir energy has now been depleted, the primary recovery is virtually complete. The twenty active wells in the field produced 942 barrels during February of 1967 for an average of 1.68 barrels per well per day and a production range from .04 to 6.2 barrels per well per day.

Q Would you say this reservoir is at a stripper stage?

A Yes, sir. The primary energy has been depleted. The proposed secondary recovery operation has predicted to recover 591,000 barrels based on the similar waterfloods which are indicated to be recovering approximately nine-tenths times the primary recovery and secondary.

The proposed water injection pattern is shown on the attached map here to the plan of operations. We are proposing

basically a five-spot injection pattern for the Malaga Unit. The pattern conforms very well to the development configuration in the southern part of the unit and these seven wells marked on the map and which were listed in our application we proposed to convert to water injection wells in the immediate future. Also shown on the map are three additional wells which we anticipate to be injection wells in the future if we can work out our royalty interest ratification and our remaining working interest ratification in the northern part of the proposed unit.

Q As I understand, then, you are asking for approval of seven injection wells at the present time, is that correct?

A This is right.

Q Now, do you ask that the Commission set up some administrative procedure for the addition of injection wells whether they have had a response from the flood or not in order to complete your injection pattern for the unit?

A Yes, sir. We would like to request this. In the event that we can clarify our ownership situation and ratification situation in the northern area, we would propose to proceed with these wells.

Q Now, what is the participating formula under the terms of the unit agreement?

A The participating formula was based one hundred per cent on the cumulative primary recovery to January 1st, 1963, when an engineering study of the field was made.

Q What is the source of water you are going to use in this flood?

A The water for injection purposes will be obtained from the shallow water sands underlying the unit area which produce in this area for agricultural use, a water lease authorizing withdrawal from these sands which are contained in the Carlsbad underground water basin has been obtained and a water supply well has been drilled and tested.

Q Has a transfer of the use of the water been approved by the State Engineer?

A Yes, sir, we have a permit from the State Engineer.

Q And this is fresh water that will be injected, is that correct?

A Yes, sir.

Q Now, will you use produced water in connection with your injection program?

A When produced water is obtained from the producing wells, it will be reinjected along with the fresh water into the injection wells.

Q Will this cause any corrosion problems?

A Yes. The produced water we would anticipate would

be corrosive and a corrosion resistive tubing and line pipe would have to be used.

Q And you would install such equipment at such time as you started using the produced water, is that correct?

A Yes, sir. The diagramatic sketches that we filed with our application indicated that we will be injecting down tubing under a packer and we will use corrosion resistant material lining in this tubing.

Q Now, each of your injection wells will be completed for injection through tubing under a packer?

A Yes, sir.

Q Will you use an inert fluid in the casing tubing annulus?

A Yes, and inhibited water would be circulated into this annular space after the packer is set.

Q What volume of water do you anticipate you will inject into this waterflood project?

A We anticipate injection rates of 200 barrels of water per day per each injection well.

Q And will your source of water be adequate to supply this volume?

A Yes, sir. Our permit is adequate to supply this volume of water and the indicated test of the water injection well indicated that this volume of water is available.

Q In your opinion, will the approval of this application result in the recovery of oil that would not otherwise be recovered?

A Yes. The primary recovery mechanism of this reservoir as you stated, is virtually complete and the reservoir energy has been depleted and we anticipate an additional 591,000 barrels can be recoverd from a successful secondary recovery operation.

Q Exhibit Number 1 is a ten-page exhibit consisting of the ratifications to the unit agreement, is that correct?

A Yes. This gives the ratifications to the unit agreement and also the ratifications of the amendment that was made to the unit agreement.

Q And your Exhibit Number 2 is a multiple-page exhibit consisting of the plan of the waterflood operation and pertinent information pertaining to the waterflood, is that correct?

A Yes, sir.

Q Was that prepared by you or under your supervision?

A Yes, I prepared this.

MR. KELLAHIN: At this time I would like to offer in evidence Exhibits1 and 2.

MR. UTZ: Without objection, Exhibits 1 and 2 will be entered into the record of this case.

MR. KELLAHIN: That's all I have on direct examination.

CROSS EXAMINATION

BY MR. UTZ:

Q The list of seven injection wells which you submitted with your application are wells that you are asking for injection wells in this case?

A Yes, sir.

Q Now, what will actually be the names of the wells? You have given the location and you said they were formerly Morris R. Antweil and so forth. What will they be called now?

A With the unitization we would propose to change the designation of these units to a tract-well type designation normally used in the unit and I think the designation was given with the application and is also, this designation is also used on the second page of Exhibit 2 that was given to you. The wells would be called Unit Wells 4-1, 5-1, 7-1, 9-2, 10-2, 11-1 and 11-3. These correspond to the tract designations that are shown on all the unit maps and the unitization agreement which has been furnished.

Q And you would call them the Malaga Unit Wells Number 4-1 and so forth?

A Yes, sir. The normal tract well designations.

Q I believe the State Engineer called our attention

to the fact you didn't show the cement tops, is that correct?

A Yes, sir. The cement tops are unavailable by any measurements that, as far as a temperature survey that were available on these wells. From our records, we do not have available temperature surveys. I have made calculations from the indicated hole size and volumes of cement that were used where the calculated tops of cement would be, which I could furnish.

Q Do you have them there handy?

A Yes, sir. You have the diagramatic sketch that we filed with our application on Well 4-1, the ten and three-quarter inch casing, the 180 sacks of cement was sufficient to have circulated cement to surface. The 100 sacks of cement used on the five and a half inch casing would indicate a calculated top of the cement at 2060. On Well 5-1, the 125 sacks on the eight and five-eighths casing was sufficient to circulate. The 75 sacks used on the five and a half inch casing would give an indicated top of cement at 1820 feet.

On Well 7-1, the 150 sacks on the eight and five-eighths casing was sufficient to circulate. 75 sacks on five and a half inch casing gives a calculated top of cement at 1830 feet. On Well 10-2, the 200 sacks of cement were sufficient to circulate the ten and three-quarter casing. The 608 sacks used on five and a half inch casing calculates to be sufficient to

circulate this annular space.

On Well 11-1, 400 sacks used on a nine and five-eighths casing was sufficient to circulate. The 125 sacks used on five and a half inch casing would give a calculated top of cement at 1940 feet. The Well 11-3, the 300 sacks used on ten and three-quarter inch casing should circulate. The 125 sacks used on seven inch casing gives a calculated top of cement at 1870 feet and on Well 9-2, the 125 sacks should circulate the eight and five-eighths casing and the 200 sacks on the five and a half inch casing gives a calculated top of cement at 1450 feet.

The four and a half inch liner, our records do not reflect the amount of cement used with this liner, but it was a cemented liner and with a short liner of this length, a short liner, our assumption would be that it was circulated to the liner hanger and this should be a fully cemented liner.

Q On your 4-1, that seems to be the only one that would be in question. The top of cement at 2660 and your packer at 2675, you don't have your packer fifteen feet below the top of the cement, right?

A 2060 feet of the calculated top of the cement.

Q Okay. I got 2660.

MR. UTZ: Any other questions of the witness?

CROSS EXAMINATION

BY MR. STAMMETS:

Q You spoke of other floods in this formation. Where are those located?

A The one that we have been particularly interested in in our consideration of flooding the Delaware Sand at Malaga has been the Tunston Flood, which is located about what, thirty, forty miles on down the Pecos River, but in Texas. This is a Delaware Sand Flood that has been in operation now some three or four years and a good response to the water injection has been realized at Tunston and there is every indication that an economic waterflood is in progress there.

MR. UTZ: What is the name of this pool?

THE WITNESS: The Malaga Pool.

MR. UTZ: Any other questions? The witness may be excused.

(Witness excused.)

MR. UTZ: Any further statements in this case? The case will be taken under advisement.

STATE OF NEW MEXICO)
)
COUNTY OF BERNALILLO)

I, JERRY POTTS, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached transcript of hearing was reported by me in stenotype and that the same was reduced to typewritten transcript under my personal supervision and contains a true and correct record of said proceedings, to the best of my knowledge, skill and ability.

Jerry Potts
NOTARY PUBLIC

My Commission Expires:

July 10, 1970

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3566 87
heard by me on May 26 67
New Mexico Oil Conservation Commission

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

June 6, 1967

C

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

Dear Sir:

P Reference is made to Commission Order No. R-3244, recently entered in Case No. 3587, approving the Antweil Malaga-Delaware Sand Waterflood Project.

Y Injection is to be through the seven authorized water injection wells, each of which shall be equipped with a string of tubing and a packer, said packer being set within at least 50 feet of production casing shoe.

As to allowable, our calculations indicate that when the seven 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 630 barrels per day when the Southeast normal unit allowable is 42 barrels or less.

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

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

Mr. Jason Kellahin
Kellahin & Fox
Attorneys at Law
Santa Fe, New Mexico
June 6, 1967

C 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.

O 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,

P

A. L. PORTER, Jr.
Secretary-Director

Y ALP/DSN/ir

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

Oil Conservation Commission
Artesia, New Mexico

U. S. Geological Survey
Artesia, New Mexico

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. 3587
Order No. R-3245

APPLICATION OF MORRIS R. ANTWEIL
FOR A WATERFLOOD PROJECT, EDDY COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on May 24, 1967, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 1st day of June, 1967, 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, Morris R. Antweil, seeks permission to institute a waterflood project in the Malaga Unit Area, Malaga Pool, by the injection of water into the Deleware Sand through seven injection wells in Sections 12 and 13, Township 24 South, Range 28 East, and in Section 18, Township 24 South, Range 29 East, NMPM, Eddy County, New Mexico.

(3) That the applicant further seeks an administrative procedure whereby said project could be expanded to include additional lands and injection wells in the area of said project as may be necessary in order to complete an efficient injection pattern; that said administrative procedure should provide for administrative approval for conversion to water injection in exception to the well response requirements of Rule 701 E-5 of the Commission Rules and Regulations.

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

(5) That the proposed waterflood project should result in the recovery of otherwise unrecoverable oil, thereby preventing waste.

(6) 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; provided, however, that the showing of well response as required by Rule 701 E-5 shall not be necessary before obtaining administrative approval for the conversion of additional wells to water injection.

IT IS THEREFORE ORDERED:

(1) That the applicant, Morris R. Antweil, is hereby authorized to institute a waterflood project in the Malaga Unit Area, Malaga Pool, by the injection of water into the Delaware Sand through the following-described wells in Eddy County, New Mexico:

TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM

Unit	Tract No.	Well No.	Unit	Section
Malaga	4	4-1	B	13
Malaga	5	5-1	J	13
Malaga	7	7-1	P	13
Malaga	9	9-2	H	13
Malaga	10	10-2	P	12

TOWNSHIP 24 SOUTH, RANGE 29 EAST, NMPM

Unit	Tract No.	Well No.	Unit	Section
Malaga	11	11-1	D	18
Malaga	11	11-3	L	18

(2) That the subject waterflood project is hereby designated the Malaga-Delaware Sand Waterflood Project and shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations;

PROVIDED HOWEVER, that the Secretary-Director of the Commission may approve expansion of the Malaga-Delaware Sand Waterflood Project to include additional lands and injection wells in the area of said project as may be necessary to complete an efficient water injection pattern; that the showing of well response as required by Rule 701 E-5 shall not be necessary for the conversion of additional wells to water injection.

(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

DAVID F. CARGO, Chairman

GUYTON B. HAYS, Member

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

esr/

GOVERNOR
DAVID F. CARGO
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
GUYTON B. HAYS
MEMBER

P. O. BOX 2088
SANTA FE

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

June 1, 1967

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

Re: Case No. 3587
Order No. R-3245
Applicant:
Morris R. Antweil

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 x
Aztec OCC
State Engineer x

Other

Morris R. Antweil
OIL OPERATOR
P. O. Box ~~xxxxx~~ 2010
HOBBS, NEW MEXICO 88240

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Case 3587

May 8, 1967

New Mexico Oil Conservation Commission
State Land Office Building
Santa Fe, New Mexico

Attention: Mr. D. S. Nutter, Chief Engineer

Re: Application for Approval of Unitization and Waterflood Project in Malaga Field, Eddy County, New Mexico.

Gentlemen:

Morris R. Antweil, the designated Unit Operator of the proposed Malaga Unit, requests a hearing for the consideration of the approval of the proposed Malaga Unit and the approval of the initiation of a waterflood project in such Unit.

The proposed Malaga Unit encompasses 838.24 acres of federal and fee land located in Sections 12 and 13, T-24S, R-28E, and Sections 7 and 18, T-24S, R-29E, in Eddy County, New Mexico. A copy of the Unit Agreement and Unit Operating Agreement and an amendment to that agreement is enclosed. Ratifications by the working interest owners and royalty interest owners sufficient to qualify all tracts, except 1 and 3 (80 acres), have been obtained. It is proposed to proceed with the unitization without the participation of these two tracts.

The Malaga Unit proposes to initiate a waterflood project injecting water into the Delaware Sand formation of the Malaga Pool at a depth of approximately 2700 feet in sufficient quantities and under sufficient pressure to stimulate the secondary recovery of oil from this primarily depleted reservoir. Permission is requested to inject water into seven currently producing wells located in Sections 12 and 13, T-24S, R-28E and Section 18, T-24S, R-29E, Eddy County, New Mexico. It is anticipated that 200 barrels of water per day will be injected into each injection well. Water for

injection purposes will be obtained from the shallow water sands underlying the Unit area. A water lease authorizing withdrawal from these sands, contained in the Carlsbad Underground Water Basin, has been obtained and a water supply well has been drilled.

Enclosed are the following exhibits as specified in Rule 701:

a. A plat showing the location of the proposed injection wells and the location of other wells within a radius of two miles.

b. Logs of the proposed injection wells. (Logs not available on Wells 11-1 and 11-3).

c. A diagrammatic sketch of each of the proposed injection wells showing the casing, cementing, completion, tubing and packer program.

d. A certified mail receipt as evidence of the transmittal of a copy of this application to the State Engineer Office, Capitol Building, Santa Fe, New Mexico.

The request for scheduling of this application for hearing is respectfully submitted.

Very truly yours,

R M Williams

R. M. Williams
Morris R. Antweil
Unit Operator
Malaga Unit

RMW/rs
Enclosures

Docket No. 16-67

DOCKET: EXAMINER HEARING - WEDNESDAY - MAY 24, 1967

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 3572: Application of Jones Exploration Company for a dual completion and for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dually complete its State Well No. 1 located in Unit H of Section 35, Township 17 South, Range 35 East, Vacuum Field, Lea County, New Mexico, in such a manner as to permit the production of Abo Reef oil through the tubing and the disposal of produced salt water down the casing-tubing annulus into the Paddock formation in the perforated interval from 6955 to 6995 feet.

CASE 3573: Application of Aztec Oil & Gas Company for special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the promulgation of special pool rules for the South Corbin Strawn Oil Pool, including a provision for 160-acre proration units and the establishment of a 4000 to one gas-oil ratio limitation.

CASE 3574: Application of Cima Capitan, Inc. 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 Grayburg-San Andres formations through one well located in Unit C of Section 3, Township 17 South, Range 32 East, Maljamar Pool, Lea County, New Mexico.

CASE 3575: Application of Harvey E. Yates for a triple completion, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for the triple completion of his Stebbins Deep Federal Well No. 1 located in Unit H of Section 30, Township 20 South, Range 29 East, Eddy County, New Mexico, to produce oil from the Scanlon Delaware Oil Pool through one string of tubing and to selectively produce gas from an undesignated Strawn gas pool and from an undesignated Morrow gas pool through another string of tubing. Selective production of one of the two gas zones at a time would be accomplished by means of a sliding side door and tubing plug.

CASE 3576: Application of Jomar Industries, Inc. for water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, has proposed to drill certain wells in the S/2 NW/4 SE/4 and the N/2 SW/4 SE/4 of Section 30, Township 18 South, Range 38 East, Lea County, New Mexico, for production of oil from the Ogallala formation. Applicant anticipates that fresh water will be produced from the Ogallala formation incidental to the production of said oil and now seeks authority to dispose of said water back into the Ogallala formation through an injection well or wells to be located no nearer than 330 feet to the outer boundaries of the above-described acreage.

CASE 3577: Application of El Paso Natural Gas Company for four non-standard units, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks approval of the following non-standard gas proration units in Township 29 North, Range 7 West, Basin-Dakota Gas Pool, Rio Arriba County, New Mexico:

A 327.78-acre non-standard unit comprising the W/2 of Section 6 and the NW/4 of Section 7, to be dedicated to the San Juan 29-7 Unit Well No. 100 located 790 feet from the South line and 950 feet from the West line of said Section 6;

A 345.19-acre non-standard unit comprising the SW/4 of Section 7 and the W/2 of Section 18;

A 361.64-acre non-standard unit comprising the W/2 of Section 19 and the NW/4 of Section 30;

A 375.28-acre non-standard unit comprising the SW/4 of Section 30 and the W/2 of Section 31.

Each of the latter three non-standard units will be dedicated to a well to be drilled at an as yet undetermined standard location on the respective unit.

CASE 3578: Application of Texas Pacific Oil Company for several non-standard gas proration units, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the dedication and rededication of certain acreage and the establishment of the following non-standard gas proration units in Township 22 South, Range 36 East, Jalmat Gas Pool, Lea County, New Mexico.

A 120-acre non-standard gas proration unit comprising the N/2 NE/4 and the SE/4 NE/4 of Section 7, to be dedicated to the State "A" A/c-2 Well No. 5, located in Unit A of said Section 7, and also to the State "A" A/c-2 Well No. 6 located in Unit B of said Section 7;

A 160-acre non-standard gas proration unit comprising the W/2 W/2 of Section 5, to be dedicated to the State "A" A/c-2 Well No. 41, located in Unit M of said Section 5;

An 80-acre non-standard gas proration unit comprising the E/2 NW/4 Section 5, to be dedicated to the State "A" A/c-2 Well No. 44, located in Unit F of said Section 5;

A 160-acre non-standard gas proration unit comprising the N/2 SE/4 and the E/2 SW/4 Section 5, to be dedicated to the State "A" A/c-2 Well No. 28, located in Unit I of said Section 5;

(Case 3578 continued)

An 80-acre non-standard gas proration unit comprising the S/2 SE/4 of Section 5, to be dedicated to the State "A" A/c-2 Well No. 27, located in Unit P of said Section 5;

A 160-acre non-standard gas proration unit comprising the W/2 SW/4, SE/4 SW/4, and SW/4 SE/4 Section 8, to be dedicated to the State "A" A/c-2 Well No. 54, located in Unit O of said Section 8;

A 160-acre non-standard gas proration unit comprising the S/2 NW/4, NE/4 SW/4, and NW/4 SE/4 of Section 8, to be dedicated to the State "A" A/c-2 Well No. 56, located in Unit J of said Section 8;

An 80-acre non-standard gas proration unit comprising the S/2 NE/4 of Section 8, to be dedicated to the State "A" A/c-2 Well No. 43, located in Unit H of said Section 8;

An 80-acre non-standard gas proration unit comprising the N/2 NW/4 Section 8, to be dedicated to the State "A" A/c-2 Well No. 49, located in Unit C of said Section 8;

A 240-acre non-standard gas proration unit comprising the NE/4 and E/2 NW/4 of Section 9, to be dedicated to the State "A" A/c-2 Well No. 40, located in Unit A of said Section 9;

A 240-acre non-standard gas proration unit comprising the E/2 SE/4 Section 8, and the SW/4 Section 9, to be dedicated to the State "A" A/c-2 Well No. 38, located in Unit K of said Section 9;

A 160-acre non-standard gas proration unit comprising the N/2 NE/4 Section 8, and the W/2 NW/4 of Section 9, to be dedicated to the State "A" A/c-2 Well No.29,located in Unit D of said Section 9.

CASE 3579: Application of Texas Pacific Oil Company for three dual completions, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dually complete its State "A" A/c-2 Wells Nos. 28 54, and 29, located in Unit I of Section 5, Unit O of Section 8, and Unit D of Section 9, respectively, Township 22 South, Range 36 East, Lea County, New Mexico, in such a manner as to produce gas from the Jalmat Gas Pool and oil from the South Eunice Oil Pool.

CASE 3580: Application of Sunray DX Oil Company for a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project by the injection of water into the Grayburg formation through one well located in Unit C of Section 17, Township 17 South, Range 31 East, Grayburg-Jackson Pool, Eddy County, New Mexico.

CASE 3581: Application of Sunray DX Oil Company for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the San Andres formation from 4248 feet to 4286 feet in its Harris State Well No. 5 located in Unit I of Section 23, Township 10 South, Range 32 East, Mescalero-San Andres Pool, Lea County, New Mexico.

CASE 3582: Application of Tenneco Oil Company for two unorthodox gas well locations, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox Blanco-Mesaverde Gas Pool location of its Jicarilla C Well No. 6, located 1780 feet from the North line and 1455 feet from the West line of Section 14, and its Jicarilla C Well No. 4 located 1650 feet from the North and West lines of Section 24, all in Township 26 North, Range 5 West, Rio Arriba County, New Mexico.

CASE 3583: Application of Stoltz & Company for special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the promulgation of special pool rules for the North Bagley-Lower Pennsylvanian Pool, Lea County, New Mexico, including a provision for 80-acre spacing and proration units.

CASE 3584: Application of Gulf Oil Corporation for an unorthodox gas well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to drill its Eddy "BD" State Well No. 1 at an unorthodox location 660 feet from the South line and 990 feet from the East line of Section 32, Township 20 South, Range 30 East, in an undesignated Strawn gas pool, Eddy County, New Mexico.

CASE 3585: Application of Gulf Oil Corporation for compulsory pooling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the force-pooling of all mineral interests in the North Bagley-Pennsylvanian Oil Field, SW/4 SE/4 and SE/4 SE/4 of Section 9, Township 11 South, Range 33 East, Lea County, New Mexico, to be dedicated to the Lea State "OE" Well No. 1 to be drilled 660 feet from the South line and 1980 feet from the East line of said Section 9.

CASE 3586: Application of Morris R. Antweil for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of its Malaga Unit Area comprising 839 acres, more or less, of Federal and Fee lands in Sections 12 and 13, Township 24 South, Range 28 East, and Sections 7 and 18, Township 24 South, Range 29 East, Eddy County, New Mexico.

CASE 3587: Application of Morris R. Antweil for a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project by the injection of water into the Delaware Sand through seven injection wells located in Sections 12 and 13, Township 24 South, Range 28 East, and Section 18, Township 24 South, Range 29 East, Malaga Pool, Eddy County, New Mexico.

CASE 3588: Application of Pan American Petroleum Corporation for an unorthodox gas well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the unorthodox location in an undesignated Morrow and/or Devonian gas pool for its Poker Lake Unit Federal Well No. 26 at a location 660 feet from the South and East lines of Section 28, Township 24 South, Range 31 East, Eddy County, New Mexico, to be dedicated to a standard unit comprising the S/2 of said Section 28.

CASE 3589: Application of Claude C. Kennedy for special pool rules, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks the establishment of special pool rules for the Slick Rock-Dakota Oil Pool comprising the S/2 SE/4 of Section 36, Township 30 North, Range 17 West, including a provision for development on 2 1/2 acre spacing with the provision that each 40-acre tract be subject to the Northwest New Mexico normal unit allowable.

CASE 3590: Application of Texaco Inc. for a pilot waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a pilot waterflood project by the injection of water into the Pennsylvanian formation in the interval from 9650 feet to 9800 feet in its State BV Well No. 1 located in Unit E of Section 26, Township 13 South, Range 33 East, Lazy-J Pennsylvanian Pool, Lea County, New Mexico.

CASE 3591: Application of Anadarko Production Company for a waterflood expansion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to expand its Langlie-Mattix Penrose Sand Unit Waterflood Project by the injection of water into the Penrose Sand through eight additional injection wells located in Sections 20, 28, 29, 32, and 33, all in Township 22 South, Range 37 East, Langlie-Mattix Pool, Lea County, New Mexico.

No. 322435

RECEIPT FOR CERTIFIED MAIL—30¢

SENT TO
State Engineer Office

STREET AND NO.
Capitol Building

P. O., STATE, AND ZIP CODE
Santa Fe, New Mexico

POSTMARK
OR DATE
MAY 9 1967
N. MEX.

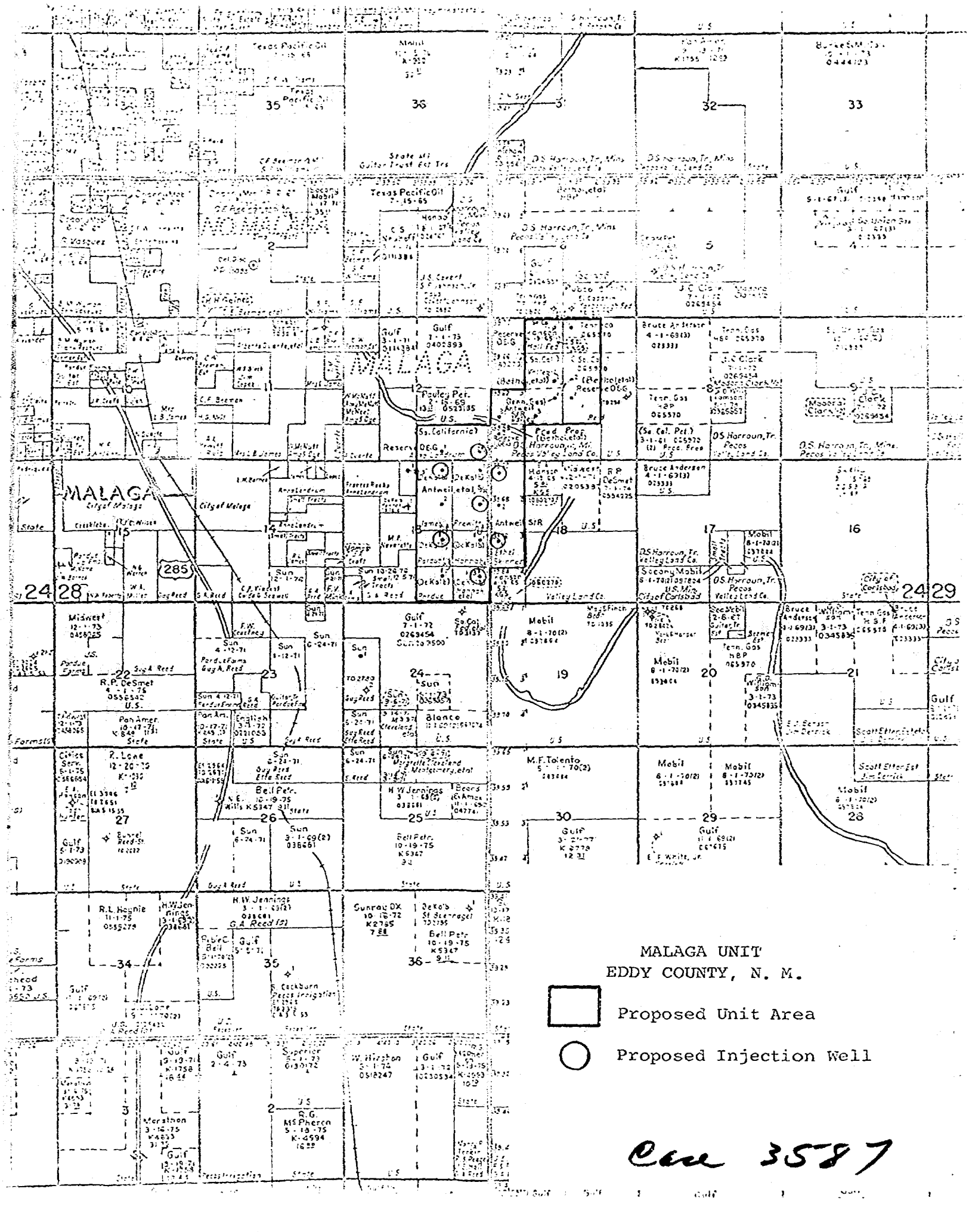
EXTRA SERVICES FOR ADDITIONAL FEES

Return Receipt		Deliver to Addressee Only
Shows to whom and date delivered	Shows to whom, date, and where delivered	
☐ 10¢ fee	☐ 35¢ fee	☐ 50¢ fee

POD Form 3800
Mar. 1966

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL

(See other side)


MALAGA
City of Malaga
285
MALAGA UNIT
EDDY COUNTY, N. M.
Proposed Unit Area
Proposed Injection Well
Case 3587

Case 3587
Heard 5-24-67
Rec. 5-29-67

1. Approve Morris Antweil's request for a water flood and 7 injection wells as listed on the attached list. Flood to be known as the Malaga-Delaware Sand Flood.
2. All injection shall down tubing and below a packer. The packer to be set ~~as shown on exhibit~~ at least 100' below the top of the cement on the production string.

Thos. A. Utz.

P.S. Adm. approval for expansion - Etc.

CASE 3587: The Application of Morris R. Antweil for Approval of a Waterflood Project, Malaga Unit, Eddy County, New Mexico, May 24, 1967.

Morris R. Antweil, designated Unit Operator of the Malaga Unit, seeks authority for the Malaga Unit to institute a waterflood project by the injection of water into the Delaware Sand formation of the Malaga Field through seven injection wells located in Sections 12 and 13, T-24S, R-28E, and Section 18, T-24S, R-29E, Eddy County, New Mexico.

The "Plan of Waterflood Operations" for the Malaga Unit is attached. The plan sets forth the history of the Malaga Delaware Sand reservoir indicating that the solution gas drive reservoir energy has been depleted and the primary recovery is virtually complete. It is proposed to inject water into the Delaware Sand at a depth of approximately 2700 feet in sufficient quantities and under sufficient pressures to stimulate the secondary recovery of additional oil reserves from this reservoir. Water for injection purposes will be obtained from the shallow water sands underlying the Unit area. A water lease authorizing withdrawal from these sands, contained in the Carlsbad Underground Water Basin, has been obtained and a water supply well has been drilled. It is proposed to iniatate injection into seven wells on a five-spot pattern in the southern portion of the Unit. Injection will be down tubing under a hookwall type packer. A diagrammatic sketch of the proposed injection wells showing the casing, cementing, completion, tubing and packer program was filed with the application. Injection wolumes are anticipated to average 200 barrels of water per day per injection well.

The Malaga Unit requests authority to institute a waterflood project in the Malaga Field and approval to inject water into the following wells:

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 2
CASE NO. 3586

Well 4-1 - Unit B, Sec. 13-24S-28E

Well 5-1 - Unit J, Sec. 13-24S-28E

Well 7-1 - Unit P, Sec. 13-24S-28E

Well 9-2 - Unit H, Sec. 13-24S-28E

Well 10-2- Unit P, Sec. 12-24S-28E

Well 11-1- Unit D, Sec. 18-24S-29E

Well 11-3- Unit L, Sec. 18-24S-29E

It is anticipated that injection will begin as soon as the waterflood facilities can be installed after unitization of the Malaga Unit, which is expected to be made effective July 1, 1967.

PLAN OF WATERFLOOD OPERATIONS

FOR
MALAGA UNIT

EDDY COUNTY, NEW MEXICO

Submitted by:

MORRIS R. ANTWEIL
Unit Operator

May 1, 1967

I. HISTORY

The field discovery well, Southern California Petroleum Corporation's Valley Land Company No. 1-F, located in Unit F, SE/4 NW/4 Sec. 7, T-24-S, R-29-E, (now Reserve Oil and Gas Company's Valley Land No. 1) was completed on June 19, 1951, for 30 BOPD. By the close of 1952, a total of twenty (20) active wells and one (1) temporarily abandoned well were drilled and completed. The productive acreage in this field lies within Section 12 and 13, T-24-S, R-28-E and Section 7 and 18, T-24-S, R-29-E, both in Eddy County, New Mexico.

The drilling method used to develop the field consisted of cable tools to total depth with production casing set on top of the pay zone and hydraulic fractive treatment in the open hole. The casing program normally consisted of 8-5/8" or 10-3/4" OD surface casing to approximately 300 feet and approximately 2,740 feet of 5-1/2" or 7" OD casing as a production string. Table I presents other pertinent well completion data.

Initial production rates ranged from 26 to 94 BOPD following fracture treatment, with the average being 40 to 50 BOPD. Production followed the normal decline of a solution gas drive mechanism. Wells completed below +230 datum normally produced some water; however, no active water drive appears to have been present.

II. GEOLOGY

The producing horizon in the Malaga Field is the Delaware sand of the Guadalupe Series, Bell Canyon Group of the Permian System. The reservoir consists of a stratigraphic accumulation trending northeast-southwest along a local structural nose. The pay zone exists as a general blanket sand which is gray to green, fine to uniform grained, well sorted, calcareous cemented sandstone highly laminated into randomly alternating intervals of high oil saturation to low oil saturation, with accompanying high water saturation. The sand is encountered at an average depth of 2739 feet from the surface, some 10 to 15 feet below the Delaware limestone. Enclosed is a typical radioactivity well log for correlation purposes.

The average net oil pay thickness is estimated at 10 feet. The oil pay occurs in the middle zone of the Delaware sand, with the upper zone being a barren or low-pressure gas-bearing sand, which may conduct injected water under the proposed waterflood program. If this upper zone member proves to present an injection problem, it is proposed to control the injection into the oil pay by cementing liners through the open hole section and selectively perforating the oil zone. This method has been successfully employed in nearby Delaware sand floods.

III. ROCK AND FLUID CHARACTERISTICS

Average rock and fluid properties were reported in the New Mexico Geological Symposium Book, as follows:

Avg. Porosity	24%
Avg. Permeability	55 md (horizontal)
Saturations:	
Connate Water	38%
Remaining Oil	48%
Formation Volume Factor	1.10 est.
Pay Thickness, Avg.	10 ft.
Depth to Pay	2,730 ft.
Oil Gravity	42° API Sweet
Original Gas in Solution	420 SCF/bbl. est.

IV. PRIMARY RECOVERY AND PREDICTED SECONDARY RECOVERY

The cumulative primary oil production from the wells within the proposed Unit area as of January 1, 1967 has been 641,091 barrels. The solution gas drive reservoir energy has been depleted and the primary recovery is virtually complete with the majority of the wells operating near their economic limit.

The twenty (20) active wells in the field produced 942 barrels of oil during February, 1967, which is an average of 1.68 barrels per well per day, with a range from 0.04 to 6.2 barrels per well per day.

Predicted secondary oil recovery resulting from a successful waterflood venture is 591,000 barrels, based on an average secondary recovery for similar waterfloods of approximately 0.9 times primary recovery.

V. UNIT PARTICIPATION FORMULA

The Operator's Committee unanimously agreed that the most valid criterion for a participation formula for the Unit would be a formula based 100% on accumulative primary recovery to July 1, 1963. Primary recovery is the most revealing factor in ascertaining reservoir capacity and remaining reserves since few good primary producing fields, which were produced by solution gas drive, have failed under a waterflood program.

A volumetric type formula was discarded due to the peculiar productive nature of the Delaware Sand. Even where excellent log control is existent, leading reservoir analyst agree that net pay determinations are virtually impossible or at the best inconclusive. This basically is because of the noncorrelatable situation between porosity, permeability, and occurrence of commercial oil production. One authority, Core Laboratories, contends that net pay determinations are almost impossible to make and if so, are of questionable validity.

VI. UNIT AREA DESIGNATION

The attached map, Exhibit "A", depicts the limits of the proposed unit. The unit is comprised partially in Sections 12 and 13, T-24-S, R-28-E and Sections 7 and 18, T-24-S, R-29-E, of Eddy County, New Mexico. All of the productive acreage in the Malaga Field is included in the proposed area.

VII. UNDEVELOPED TRACTS

The only undeveloped tract in the Unit, Tract 3, originally had a well drilled on it and produced oil from the subject Delaware Sand. It was a small commercial well and was plugged and abandoned in 1952. The tract has been included in the Unit since it could serve as an injection well under successful flood operations.

The participation formula appropriately accomodates the fact that no well currently exists and that only a small volume of primary oil was recovered from the well.

VIII. WATER SOURCE

Water for injection purposes will be obtained from the shallow water sands underlying the Unit area which produce for agriculatural use in the local area. A water lease authorizing withdrawal from these sands, contained in the Carlsbad Underground Water Basin, has been obtained and a water supply well has been drilled.

When produced water from the pay zone commences, it will be re-injected along with the above water.

IX. WATER STATION AND INJECTION EQUIPMENT

Development of the injection system and water station will be completed in one stage, at flood initiation. It is planned to utilize only one pressure pump for the project. Distribution of injection water is planned through a system of buried lines which will be internally and externally coated to control corrosion.

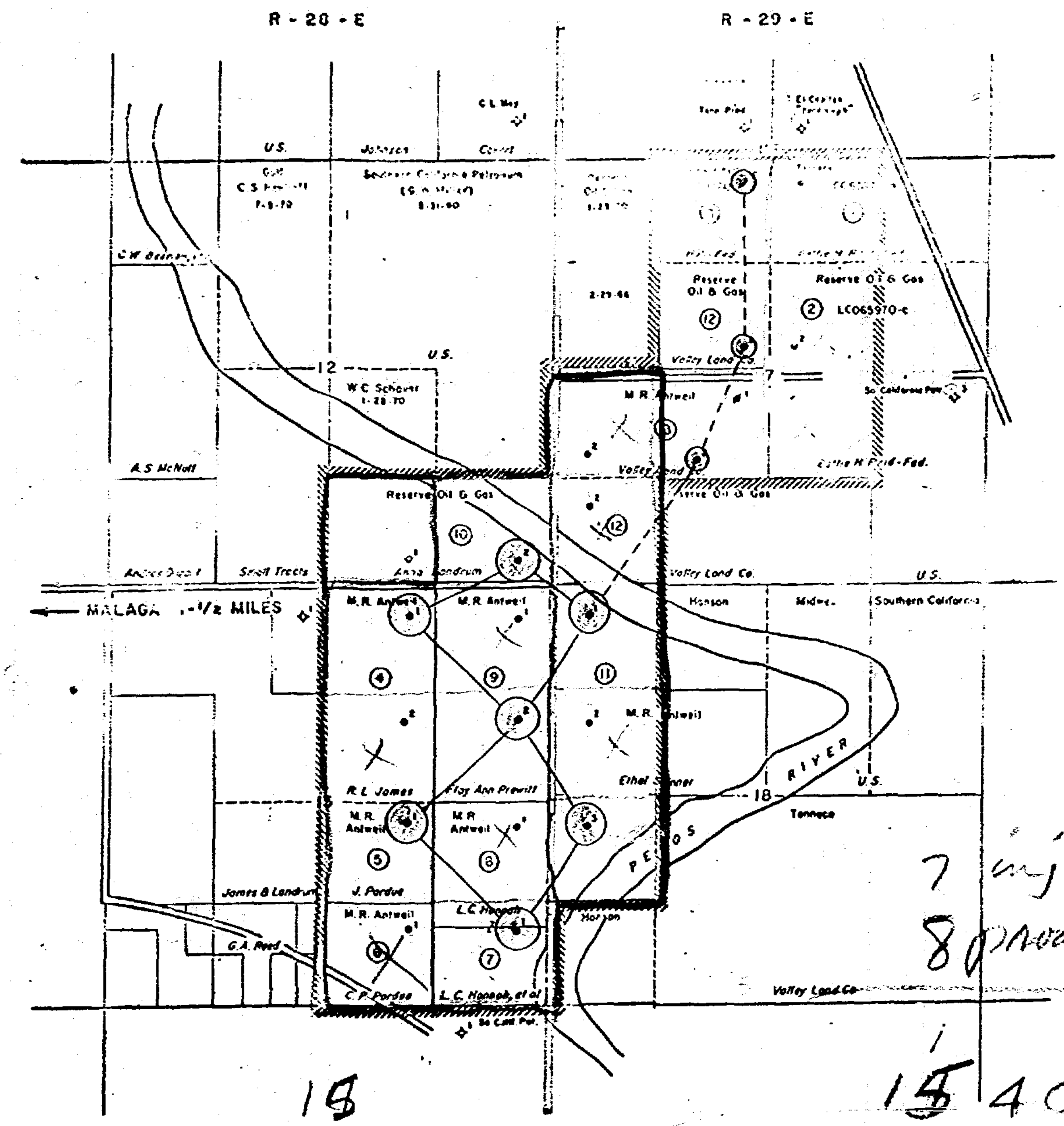
X. INJECTION PATTERN

A basic five-spot injection pattern has been selected for the Malaga Unit waterflood project. Such a pattern conforms well with the development configuration in the southern portion of the Unit area, but requires modification to meet the less extensive development in the northern portion of the Unit. The proposed injection pattern is shown on the attached map, Exhibit "A".

It is planned to initiate the waterflood with injection into the seven wells in the southern portion of the Unit shown on Exhibit "A" as proposed injection wells. The waterflood program will be expanded to the wells shown as future injection wells after results are obtained to indicate the waterflood program is successful in stimulating oil production.

XI. PRODUCTION EQUIPMENT

Pumping equipment, surface and subsurface, will be enlarged as necessary to adequately handle the production generated. Consolidation of individual tank batteries into a central location to facilitate and expedite handling of the produced fluids will be considered when a production response is realized. Provisions will be made to allow periodic production testing of all producing wells.



7 inj 40's

8 prod 40's

15 40's

15
42
30
60
680

LEGEND

Unit Boundary

Proposed injection well

Future injection well

MORRIS R. ANTWE...

MALAGA UNIT

EDDY COUNTY, NEW MEXICO

EXHIBIT "A"

TABLE 1

MALAGA DELAWARE SAND UNIT - EDDY COUNTY, NEW MEXICO

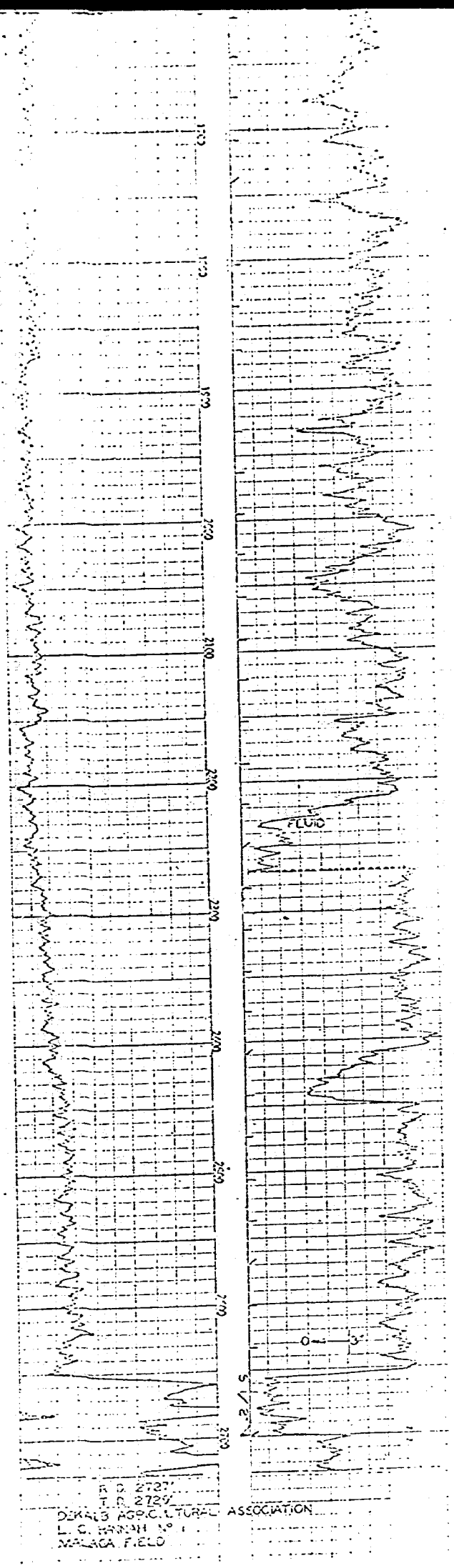
WELL COMPLETION DATA

Company & Lease Name	Well	Comp.			CASING			Delaware Pay	Stimu-	Current
Reserve Oil & Gas	No.	Date	Elev.	T.D.	Size	Depth	Cement	Section	lation	Status
Landrum	1	4/9/52	2953	2754	10-3/4	275	58	2747-54	Frac 1500 g.	Producing
	2	5/29/52	2948	2756	10-3/4	294	200	2752-56	Frac 1500 g.	Producing
					5-1/2	2737	608			
Morris R. Antweil										
L. C. Hannah	1	7/28/52	2949	2727	6-5/8	316	125	2718-27	Frac 1500 g.	Producing
					5-1/2	2694	50			
L. C. Hannah et al	1	9/11/52	2942	2739	8-5/8	324	150	2731-2939	Frac 1500 g.	Producing
					5-1/2	2694	75			
R. L. James	1	3/7/52	2963	2748	10-3/4	280	180	2740-48	Frac 1500 g.	Producing
					5-1/2	2700	100			
	2	4/24/52	2966	2757	8-5/8	299	100	2748-57	Frac 1500 g.	Producing
					5-1/2	2730	100			
James & Pardue	1	8/16/52	2965	2742	8-5/8	301	125	2734-42	Frac 1500 g.	Producing
					5-1/2	2683	75			
C. P. Pardue	1	3/7/53	2937	2726	8-5/8	306	125	2716-26	Frac 1500 g.	Producing
					5-1/2	2701	50			
Floy Prewitt	1	5/28/52	2962	2754	8-5/8	289	100	2744-54	Frac 1500 g.	Producing
					5-1/2	2739	100			
Floy Prewitt	2	6/23/52	2956	2742	8-5/8	312	125	2731-42	Frac 1500 g.	Producing
					5-1/2	2734	200			
					4-1/2	Liner-2665-2746				
Valley Land	2	9/17/52	2955	2752	8-5/8	332	200	2750-52	Frac 1500 g.	S. I.
					5-1/2	2712	500			
Valley Land	3	1/ 9/52	2942	2797 P.B. 2774	8-5/8	313	200	2755-66	Frac 1500 g.	Producing
					5-1/2	2796	100			
Valley Land	1	9/ 4/57	2970	2796	8-5/8	1465	450	2765-96	Frac 1500 g. Shot 108 q.	P & A

TABLE 1 (Cont'd)

Company & Lease Name	Well No.	Comp. Date	Elev.	T.D.	CASING Size	CASING Depth	CASING Cement	Delaware Pay Section	Stimulation	Current Status
Reserve Oil & Gas										
Valley Land	1	5/16/51	2962	2779	10-3/4	127-	250	2774-79	Frac 750 g.	Producing
					8-5/8	1008-1293	0			
					7	484-2555	40			
					5-1/2	2728	280			
Valley Land	2	6/ 8/52	2950	2737	10-3/4	294	350	2735-37	Frac 1500 g.	Producing
					5-1/2	2737	200			
Bettie H. Reid	1	8/23/51	2980	2792	13-3/8	152	98	2782-92	Frac 750 g.	Producing
					8-5/8	982	125			
					5-1/2	2765	147			
Bettie H. Reid	2	10/3/	2781	2791	13-3/8	173	96	2783-91	Frac 750 g.	Producing
					5-1/2	2775	280			
(Southern California)										
Hall-Federal (Now E.A.Hanson)	1	6/ 1/52	2979	2817	10-3/4	314	250	2813-17	Frac 1500 g.	P & A
					5-1/2	2793	550			
Manana Gas Company										
Ethel Skinner	1	6/18/52	2963	2755	9-5/8	275	400	2754-55	Frac 1500 g.	Producing
					5-1/2	2736	125			
Ethel Skinner	2	8/ 4/52	2951	2720	9-5/8	290	400	2715-20	Frac 3000 g.	Producing
					5-1/2	2712	125			
Ethel Skinner	3	8/19/52	2946	2734	10-3/4	278	300	2728-34	Frac 1500 g.	Producing
					7	2716	125			

now Morris R. Antweil



TYPE LOG

DeKalb (now Morris R. Antweil)
L. C. Hannah #1

Located 330 fel and 2970 fnl
Section 13-24S-28E

Elevation 2449'

Delaware Sand
2710' - 2720'

STATE OF NEW MEXICO

STATE ENGINEER OFFICE

SANTA FE

S. E. REYNOLDS
STATE ENGINEER

May 22, 1967

ADDRESS CORRESPONDENCE TO:
STATE CAPITOL
SANTA FE, NEW MEXICO 87501

3587

Mr. A. L. Porter, Jr.
Secretary-Director
Oil Conservation Commission
Santa Fe, New Mexico

Dear Mr. Porter:

Reference is made to the application of Morris R. Antweil which seeks approval for a waterflood project in Sections 12 and 13, T. 24 S., R. 28 E., and Sections 7 and 18, T. 24 S., R. 29 E., which is docketed as Oil Conservation Commission case #3587.

No cement tops are given on any of the wells. It is suggested that the packers on the end of the tubing be set well below the top of cement surrounding the production casing on the 7 wells and that an adequate seal be provided between the 5½" casing and the 4½" liner in Well 9-2.

FEI/ma
cc-M. R. Antweil
F. H. Hennighausen

Yours truly,

S. E. Reynolds
State Engineer

By: Frank E. Irby
Frank E. Irby
Chief
Water Rights Div.

PROPOSED WATER INJECTION WELLS
MALAGA UNIT, EDDY COUNTY, NEW MEXICO

Malaga unit. — 4-1 file

WELL 4-1 formerly Morris R. Antweil - R. L. James 1
located in Unit B, Sec. 13-24S-28E

WELL 5-1 formerly Morris R. Antweil-James Pardue 1
located in Unit J, Sec. 13-24S-28E

WELL 7-1 formerly Morris R. Antweil-L. C. Hannah, et al 1
located in Unit P, Sec. 13-24S-28E

WELL 9-2 formerly Morris R. Antweil-Floy Prewitt 2
located in Unit H, Sec. 13-24S-28E

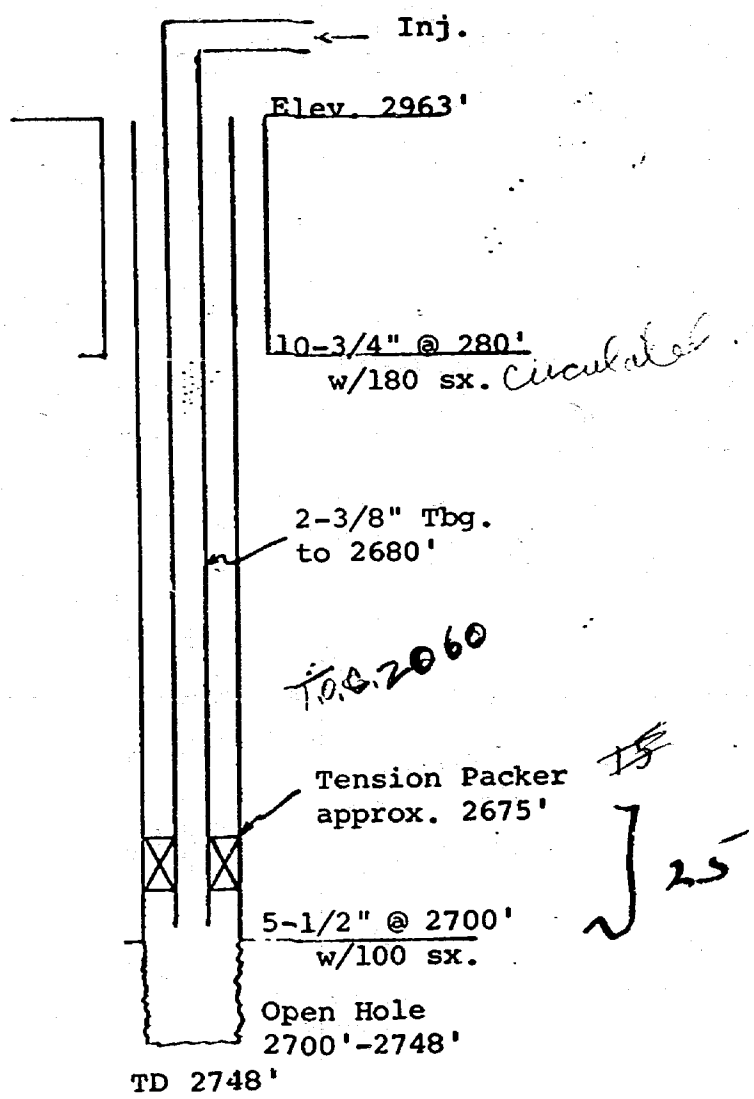
WELL 10-2 formerly Reserve Oil & Gas Company-Landrum 2
located in Unit P, Sec. 12-24S-28E

WELL 11-1 formerly Morris R. Antweil-Ethel Skinner 1
located in Unit,D, Sec. 18-24S-29E

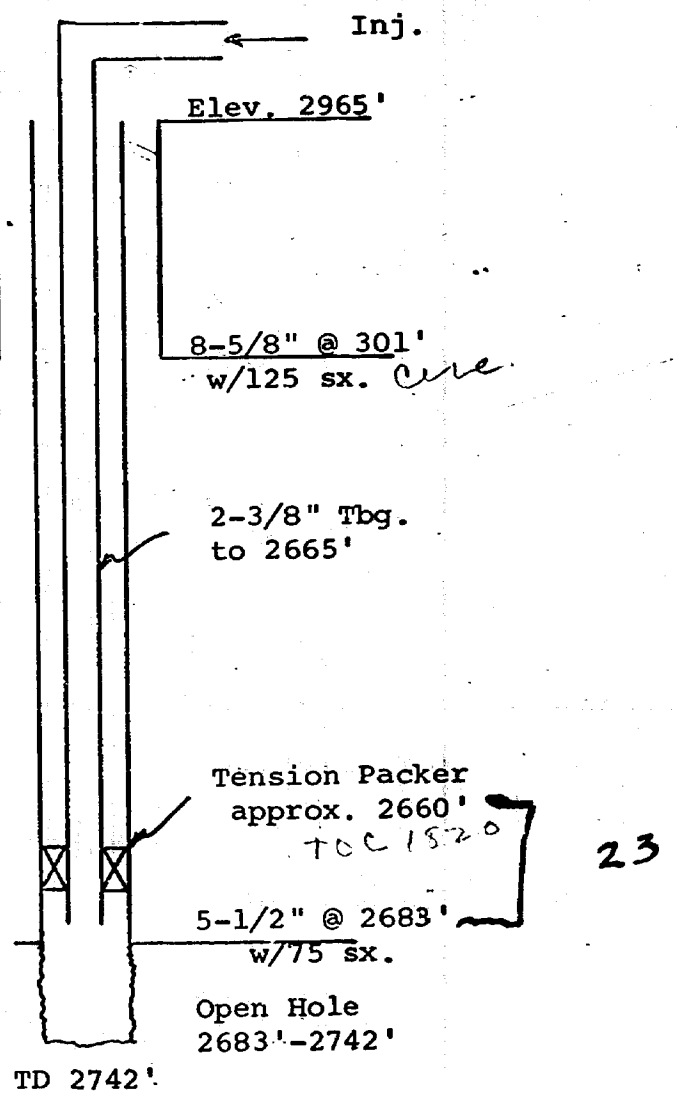
WELL 11-3 formerly Morris R. Antweil-Ethel Skinner 3
located in Unit L, Sec. 18-24S-29E

Malaga Delaware unit.

INJECTION WELL 4-1
NW/4 NE/4 Sec. 13

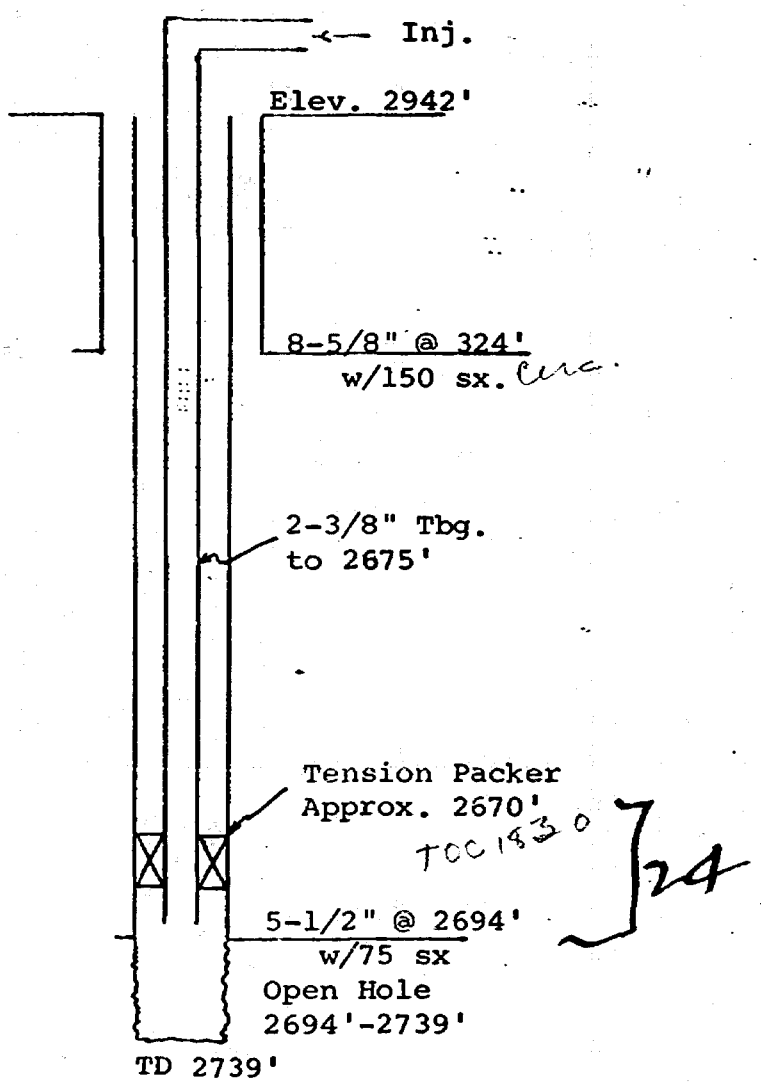


INJECTION WELL 5-1
NW/4 SE/4 Sec. 13

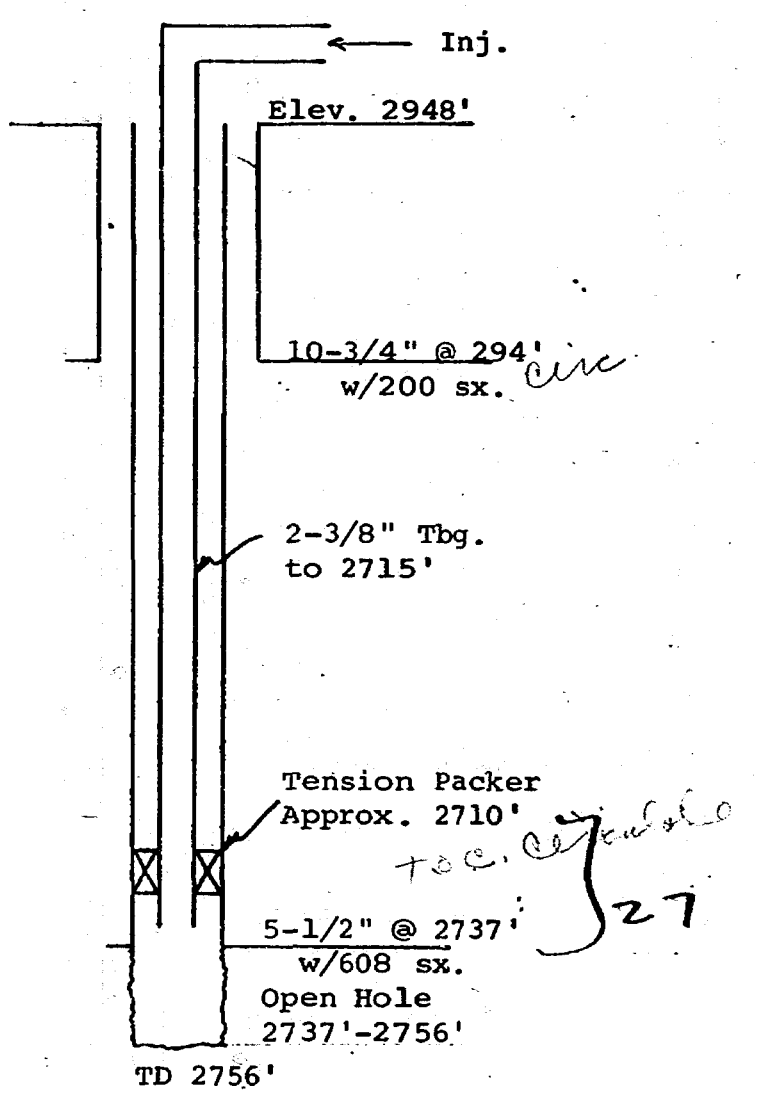


DIAGRAMMATIC SKETCH
INJECTION WELLS
MALAGA UNIT

INJECTION WELL 7-1
SE/4 SE/4 Sec.13

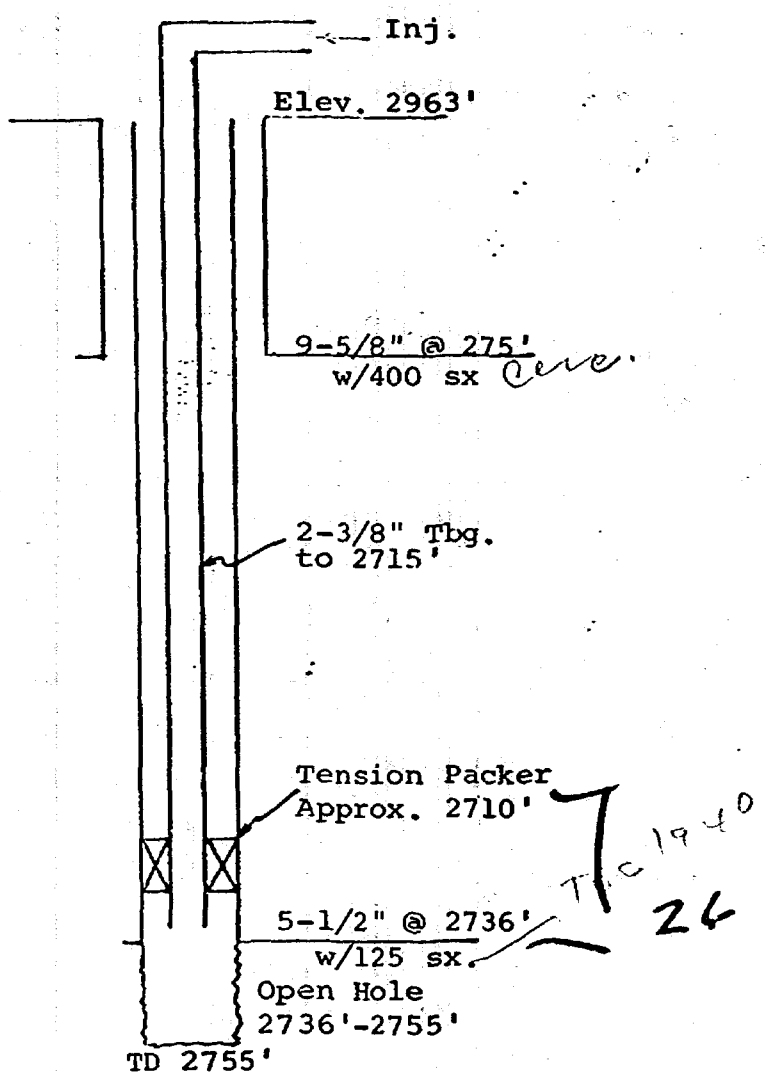


INJECTION WELL 10-2
SE/4 SE/4 Sec. 12

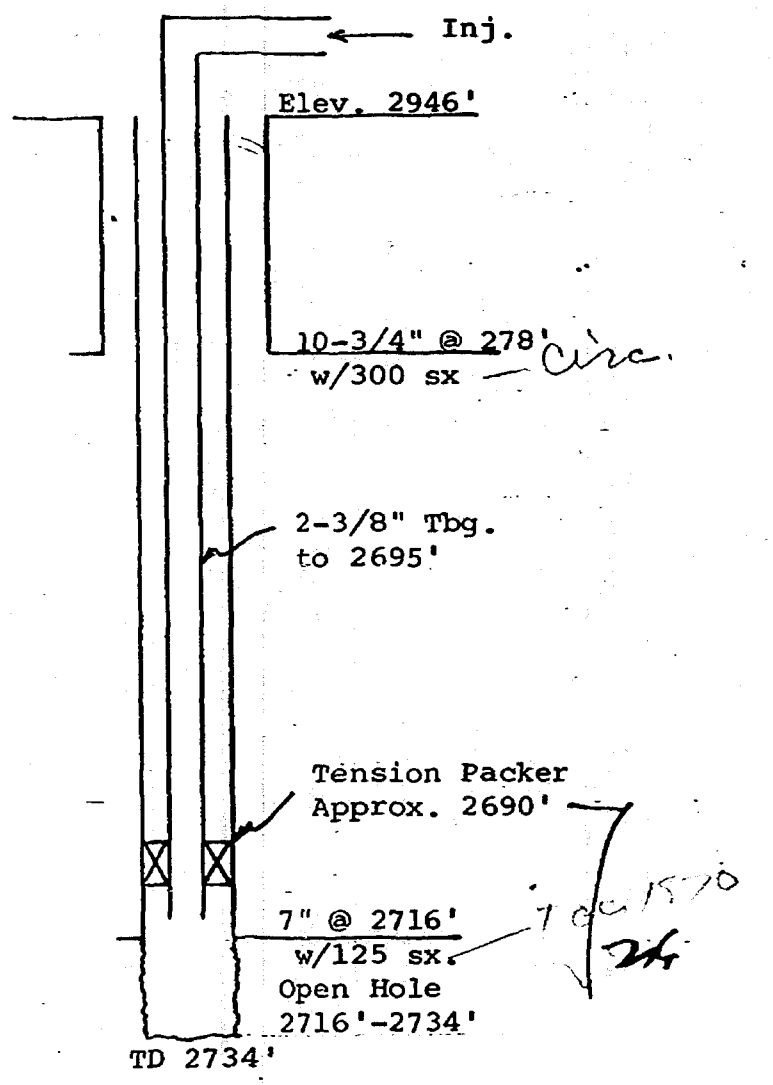


DIAGRAMMATIC SKETCH
INJECTION WELLS
MALAGA UNIT

INJECTION WELL 11-1
NW/4 NW/4 Sec.18

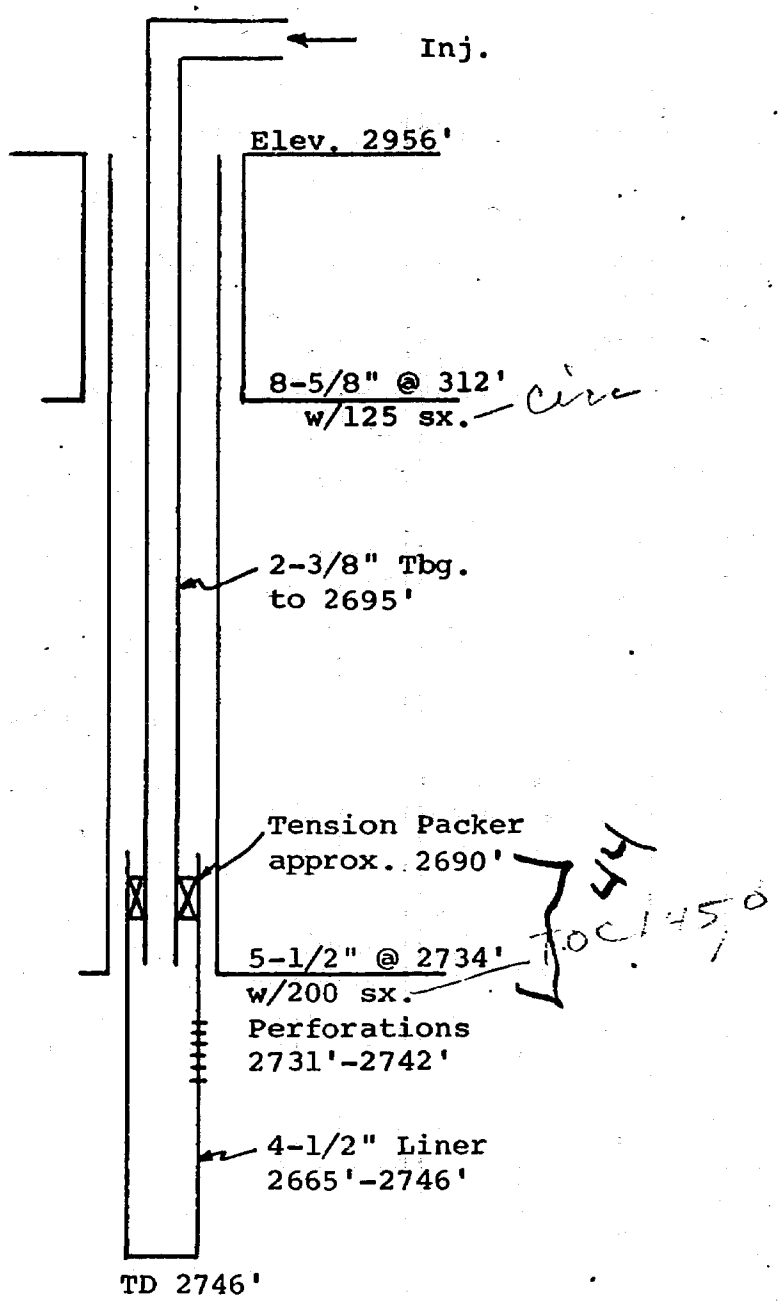


INJECTION WELL 11-3
NW/4 SW/4 Sec. 18

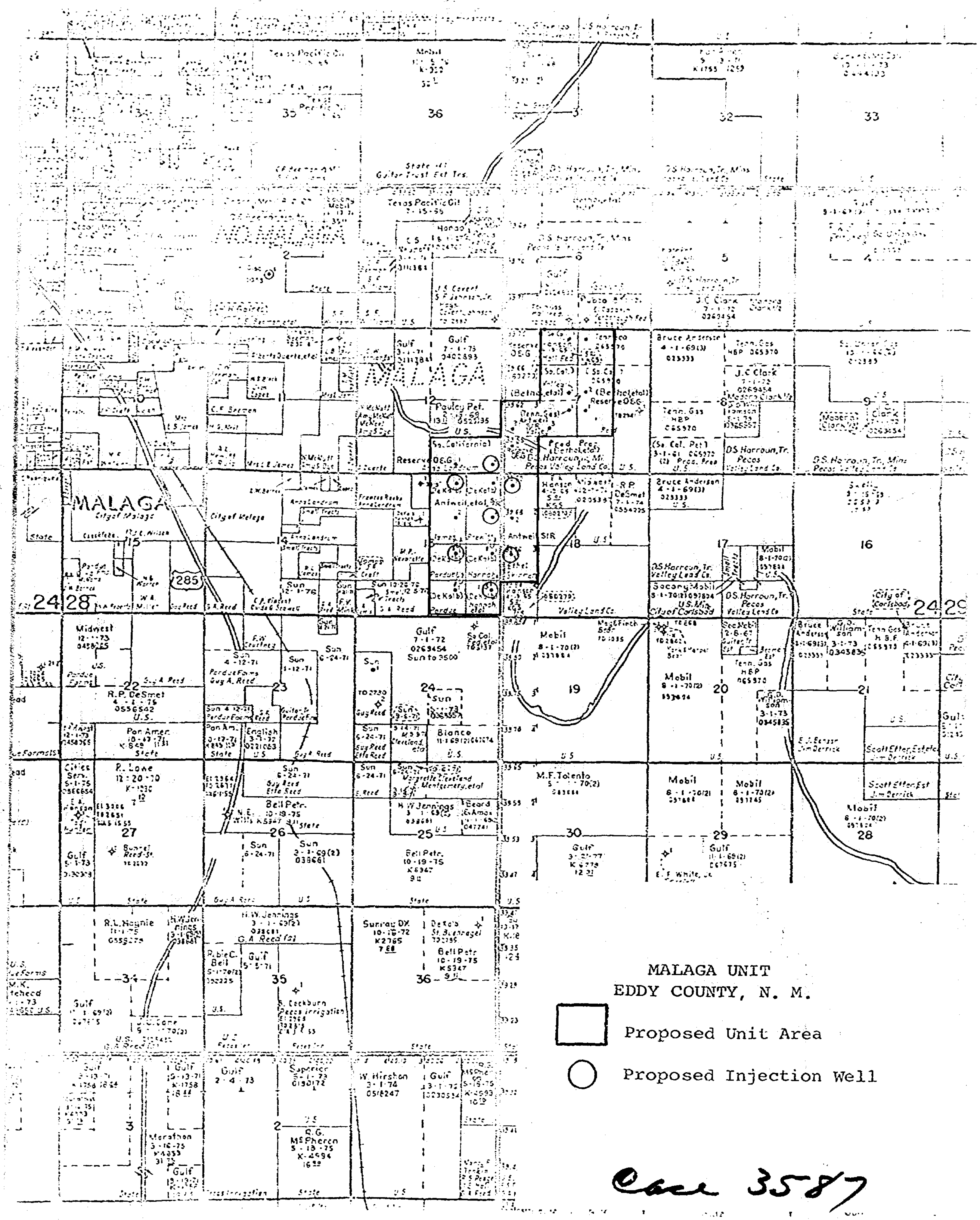


DIAGRAMMATIC SKETCH
INJECTION WELLS
MALAGA UNIT

INJECTION WELL 9-2
SE/4 NE/4 Sec.13



DIAGRAMMETIC SKETCH
INJECTION WELLS
MALAGA UNIT



MALAGA UNIT
EDDY COUNTY, N. M.

Proposed Unit Area

Proposed Injection Well

Case 3587

No. 322435

RECEIPT FOR CERTIFIED MAIL—30¢

SENT TO
State Engineer Office

STREET AND NO.
Capitol Building

P. O., STATE, AND ZIP CODE
Santa Fe, New Mexico

POSTMARK
MAY 9 1967
N. MEX.

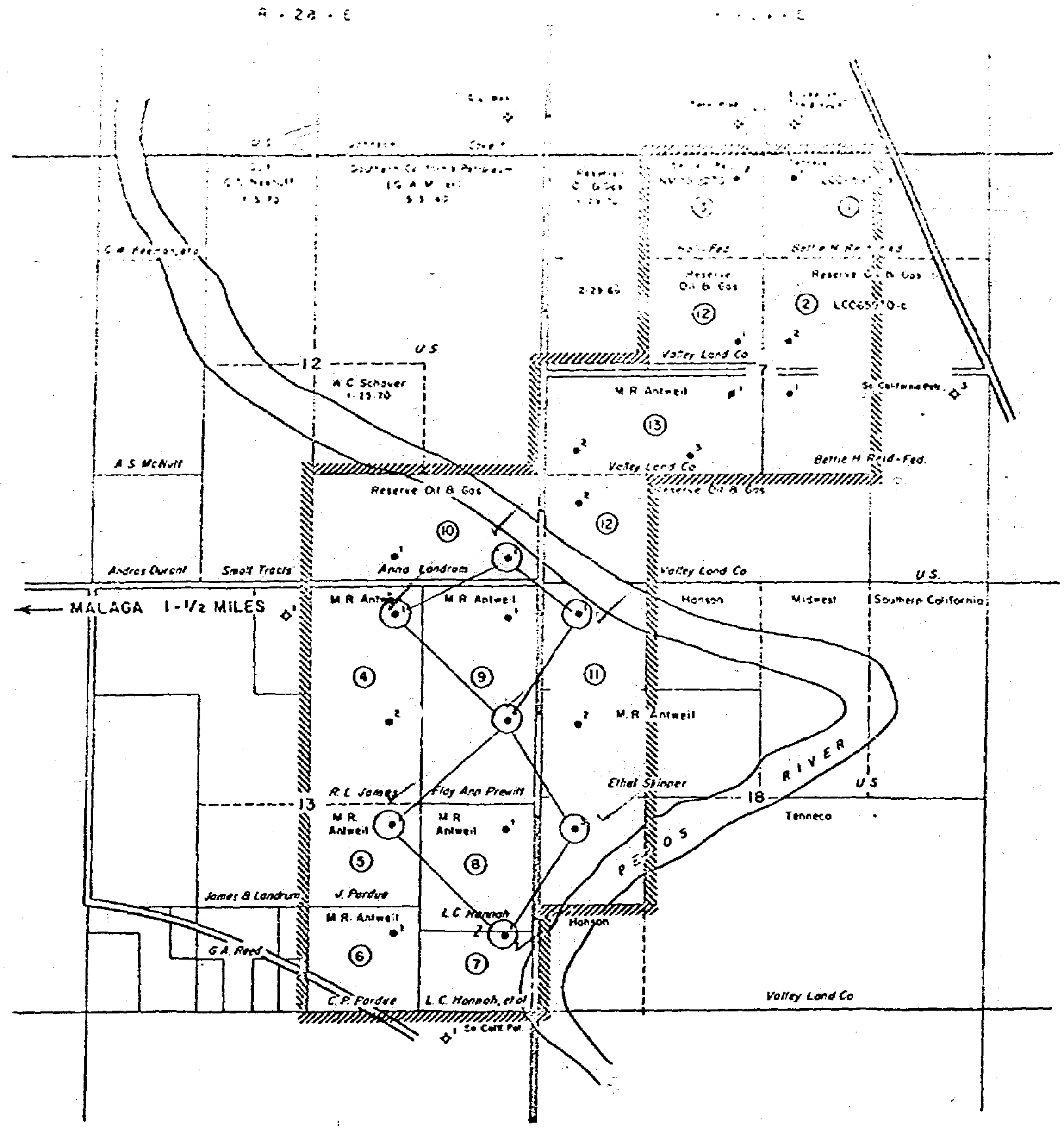
EXTRA SERVICES FOR ADDITIONAL FEES

Return Receipt		Deliver to Addressee Only
Shows to whom and date delivered	Shows to whom, date, and where delivered	
☐ 10¢ fee	☐ 35¢ fee	☐ 50¢ fee

POD Form 3800
Mar. 1966

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL

(See other side)



LEGEND

- Oil Well
- Plugged & Abandoned
- Dry & Abandoned
- County Roads
- Tract No
- Unit Boundary

⊙ PROPOSED INJECTION WELL

MORRIS R. ANTWEIL

MALAGA UNIT

EDDY COUNTY, NEW MEXICO

EXHIBIT "A"

0 500 1000 2000 3000 4000

SCALE - FEET

DATE 2-21-66