

CASE 3779: Appli. of SHENANDOAH
OIL CORPORATION FOR A WATERFLOOD
PROJECT, EDDY COUNTY, NEW MEXICO.

Case Number

3779

Application
Transcripts.

Small Exhibits

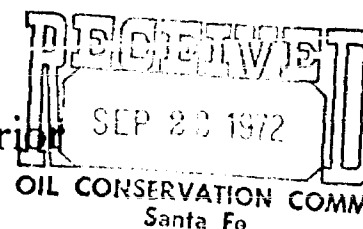
ETC.



United States Department of the Interior

GEOLOGICAL SURVEY

P. O. Drawer U
Artesia, New Mexico 88210



September 21, 1972

Jennings, Christy, and Copple
Post Office Box 1180
Roswell, New Mexico 88201

Gentlemen:

Your letter of September 19, 1972 requests approval for Shenandoah Oil Corporation to expand the Shugart Waterflood Project to include that portion of oil and gas lease NM-12211 described as the NW1/4 sec. 33, T. 18 S., R. 31 E., N.M.P.M., Eddy County, New Mexico. It is proposed to re-enter and convert to water injection the No. 5-Shugart "B" well located 330/44N of said section above.

The expansion of this project as proposed in the application is satisfactory to this office and hereby approved subject to the following:

1. This expansion will be operated in compliance with the New Mexico Oil Conservation Commission regulations governing waterflood operations and be included on the project monthly progress report, duplicate copies of which will be submitted to this office.
2. This approval does not preclude the necessity to file the usual notice and reports on all wells involved.

Sincerely yours,

(Orig. Sgd.) ROBERT L. BECKMAN

Robert L. Beckman
Assistant District Engineer

cc:
N.M.O.C.C., Santa Fe ✓
Roswell



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

P. O. Drawer 5
Artesia, New Mexico 88210

IN REPLY REFER TO:

APR 7 1971
APR 6 1971
3777

Jennings, Christy & Copple
Post Office Box 1180
Roswell, New Mexico 88201

Gentlemen:

Your letter of March 18, 1971 requests approval for Shamandah Oil Corporation to operate a water project of the Premier Zone of the Grayburg formation in T. 17 S., R. 28 and 29 E., N.M.P.M., Eddy County, New Mexico, involving that portion of Federal oil and gas leases described as follows:

Las Cruces 062407
T. 17 S., R. 29 E.
Sec. 30: ~~NE1/4~~, ~~SW1/4~~

New Mexico 0555569
T. 17 S., R. 29 E.
Sec. 31: ~~NE1/4~~, ~~SW1/4~~, ~~SE1/4~~

This project includes State lands in sections 25 and 36, T. 17 S., R. 28 E., and sec. 30, T. 17 S., R. 29 E. The flood pattern would be nonsymmetrical and the project operator proposes to convert to water injection the following wells on Federal leases, and to drill as an injection a well in the ~~SW1/4~~ sec. 31, also on Federal land:

<u>Well Number and Lease</u>	<u>Location</u>
3-Atsai Federal	NE1/4 sec. 30
1-Green Federal	NE1/4 sec. 31
5-Green Federal	SW1/4 sec. 31
7-Green Federal	NE1/4 sec. 31

The plan for operating the Federal leases in the waterflood project as proposed in the application is satisfactory to this office and hereby approved subject to approval by the New Mexico Oil Conservation Commission and the following:

1. This project will be operated in compliance with the New Mexico Oil Conservation Commission regulations governing waterflood operations.

2. Duplicate copies of a monthly progress report (N.M.O.C.C. form C-120 acceptable) are to be submitted to this office showing the volume of water injected and average pressures for the injection wells and production for the producing wells in the project area.
3. This approval does not preclude the necessity for further approval when the project is expanded to include other wells and leases or the necessity to submit the usual notices and reports on wells involved on Federal leases. When this project is expanded to involve other operators and interests, the correlative rights of all concerned should be considered.

Sincerely yours,

(SIGNED) JAMES A. KNAUF

James A. Knauf
District Engineer

cc:
N.M.O.C.C., Santa Fe
Roswell
Accounts

RLBeckman:rh 4/6/71

SHENANDOAH OIL CORPORATION

1018 COMMERCE BUILDING
FORT WORTH, TEXAS 76102

B. J. KELLENBERGER
PRESIDENT

TELEPHONE
ED 2-7381

October 23, 1968

Mr. A. L. Porter, Jr.
Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

file
Re: Shenandoah Oil Corporation
Shugart Waterflood Project,
Eddy County, New Mexico

Dear Mr. Porter:

In accordance with Rule 703(a) of the New Mexico Rules and Regulation Book, this is to advise you that water injection into the five wells as set forth in Case No. 3779 was commenced October 17, 1968. These wells are all located in Sections 29 and 30, Township 18 South, Range 31 East, Eddy County, New Mexico as follows:

<u>Lease</u>	<u>Well No.</u>	<u>Location</u>
Kenwood-Federal	3	Unit F - Section 29
Shugart "A"	8	Unit N - Section 29
Shugart "D"	1	Unit G - Section 30
Shugart "D"	8	Unit A - Section 30
Shugart "C"	3	Unit I - Section 30

68 OCT 25 PM 5 34

Attached is a plat showing the location of the above wells within the Project Area.

Very truly yours,

T. P. Bates

T. P. Bates
Supervisor, Secondary Recovery

TPB:anc

Attachment

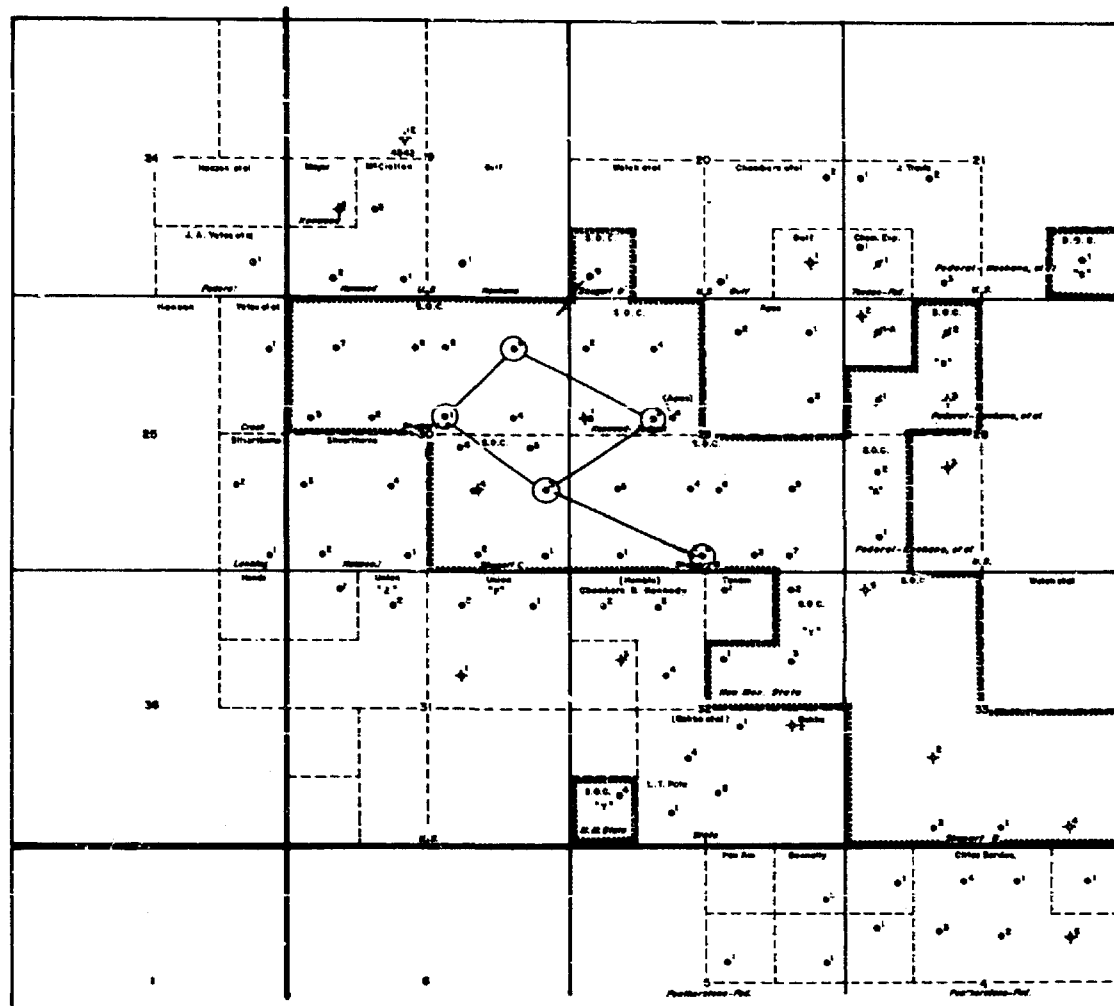
cc: Oil Conservation Commission
Drawer DD
Artesia, New Mexico

U. S. Geological Survey
Drawer U
Artesia, New Mexico 88210
Attention: Mr. James A. Knauf

U.S. Geological Survey
Drawer 1857
Roswell, New Mexico
Attention: Mr. Gressett

R 31 E

**T
18
S**



-LEGEND-

***** LEAD BOUNDARY



SHENANDOAH OIL CORPORATION

FLOOD NO. 4
SHUGART
EDDY COUNTY, NEW MEXICO

JUNE 1962

OIL CONSERVATION COMMISSION
P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

July 16, 1968

Mr. James T. Jennings
Attorney at Law
Post Office Box 1180
Roswell, New Mexico 88201

Re: Case No. 3779
Order No. R-3431
Applicant:
Shenandoah Oil Corporation

Dear Mr. Jennings:

Attached are two copies of page 1 of the subject order. This page has been corrected to complete Finding (3). Please acknowledge receipt of this letter and substitute these corrected pages for the ones on the copies of the subject order mailed to you on June 12, 1968.

Thank you, and we are sorry of the inconvenience we have caused.

Very truly yours,

DANIEL E. BUTTER
Chief Engineer

DSH/esr
Enclosures

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OIL CONSERVATION COMMISSION
P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

July 16, 1968

Mr. Joe D. Raney
Supervisor, District 1
Oil Conservation Commission
P. O. Box 1980
Hobbs, New Mexico

Re: Case No. 3779
Order No. R-3431
Applicant:
Shenandoah Oil Corporation

Dear Joe:

Attached is a copy of page 1 of the subject order.
This page has been corrected to complete Finding (3).
Please acknowledge receipt of this letter and substitute
this corrected page for the one on the copy of the subject
order mailed to you on June 18, 1968.

Thank you, and we are sorry of the inconvenience
we have caused.

Very truly yours,

DANIEL S. NUTTER
Chief Engineer

DSN/esr
Enclosure

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OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

July 16, 1968

C
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Mr. Bill Gressett
Supervisor, District 2
Oil Conservation Commission
Drawer DD
Artesia, New Mexico

Re: Case No. 3779
Order No. R-3431
Applicant:
Shenandoah Oil Corporation

Dear Bill:

Attached is a copy of page 1 of the subject order. This page has been corrected to complete Finding (2). Please acknowledge receipt of this letter and substitute this corrected page for the one on the copy of the subject order mailed to you on June 18, 1968.

Thank you, and we are sorry of the inconvenience we have caused.

Very truly yours,

DANIEL S. NUTTER
Chief Engineer

DSN/esr
Enclosure

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

July 16, 1968

C
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P
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Mr. D. E. Gray
State Engineer Office
Capitol Building
Santa Fe, New Mexico

Re: Case No. 3779
Order No. R-3431
Applicant:
Shenandoah Oil Corporation

Dear Mr. Gray:

Attached is a copy of page 1 of the subject order. This page has been corrected to complete Finding (3). Please acknowledge receipt of this letter and substitute this corrected page for the one on the copy of the subject order sent to you June 18, 1968.

Thank you, and we are sorry of the inconvenience we have caused.

Very truly yours,

DANIEL S. MUTTER
Chief Engineer

DSM/ear
Enclosure

OIL CONSERVATION COMMISSION

P. O. BOX 2068

SANTA FE, NEW MEXICO 87501

July 16, 1968

**Mr. R. W. Byram
R. W. Byram & Company
Drawer M - Capitol Station
Austin, Texas**

**Re: Case No. 3779
Order No. R-3431
Applicant:
Shenandoah Oil Corporation**

Dear Mr. Byram:

**Attached is a copy of page 1 of the subject order.
This page has been corrected to complete Finding (3).
Please acknowledge receipt of this letter and substitute
this corrected page for the one on the copy of the subject
order dated June 18, 1968.**

**Thank you, and we are sorry of the inconvenience
we have caused.**

Very truly yours,

**DANIEL S. MUTTER
Chief Engineer**

**DSM/ear
Enclosure**

C
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SHENANDOAH OIL CORPORATION

1500 COMMERCE BUILDING
FORT WORTH, TEXAS 76102

B. J. KELLENBERGER
PRESIDENT

March 27, 1970

TELEPHONE
ED 2-7361

MAILED 1000

70 MAR 30 AM 8 18

Oil Conservation Commission
Box 2088
Santa Fe, New Mexico 87501

Attn: Mr. A. L. Porter

Case 3779

Not a unit

Re: Administrative Order
WFX No. 332

Dear Mr. Porter:

In accordance with rule 703(a) of the New Mexico Rules and Regulations Book, this is to advise you that water injection was commenced March 23, 1970, into the six wells as set forth in Case No. 3779. (See attached plat.)

Very truly yours,

SHENANDOAH OIL CORPORATION

T. P. Bates

T. P. Bates
Vice President - Secondary
Operations

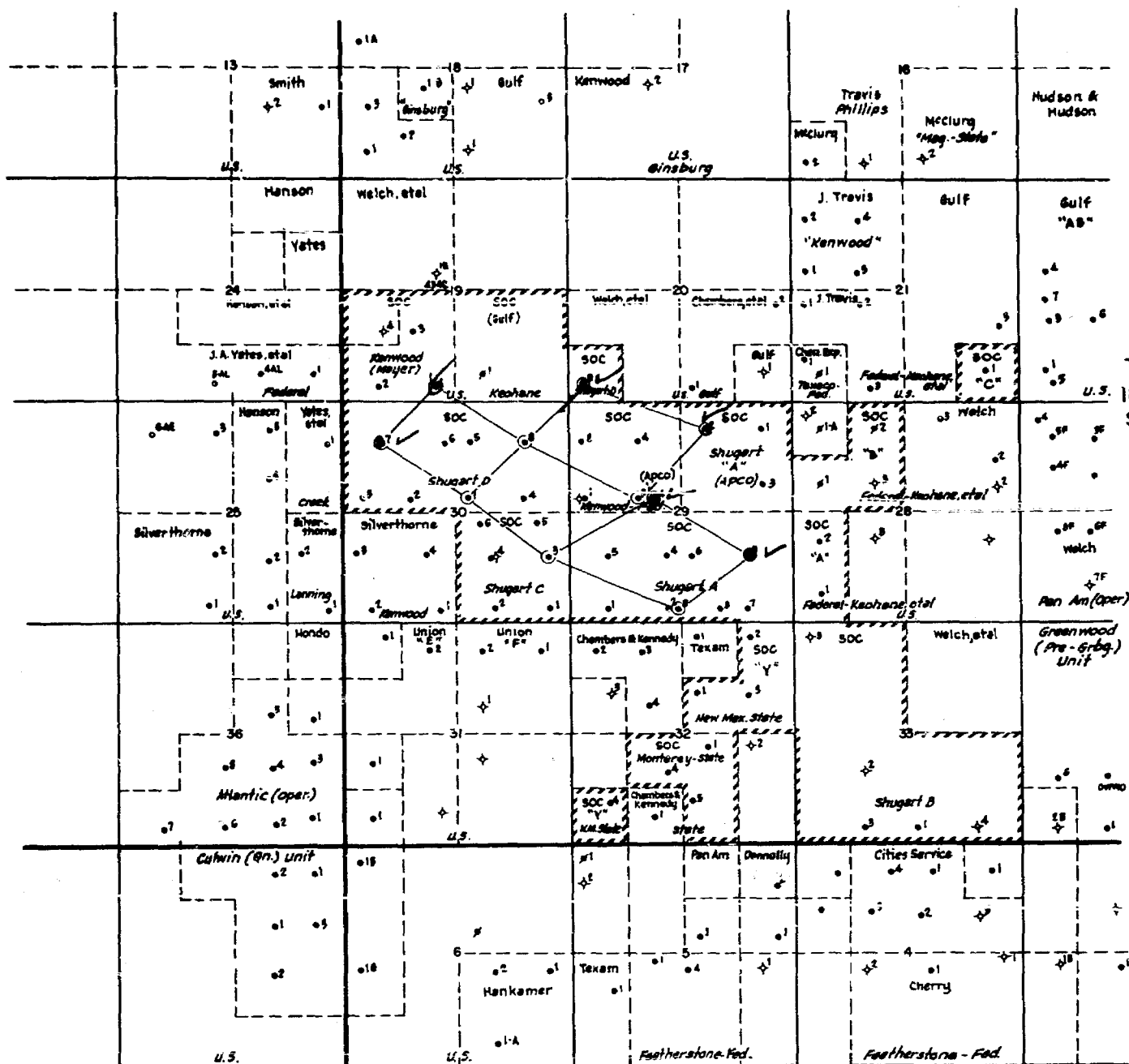
TPB/lh

Attachment

cc: New Mexico Oil Conservation Commission
P. O. Drawer DD
Artesia, New Mexico 88210
U. S. Department of Interior
Geological Survey
P. O. Drawer U
Artesia, New Mexico 88210
Jennings & Copple
P. O. Box 1180
Roswell, New Mexico
Mr. C. W. Downey
P. O. Box 2189
Hobbs, New Mexico 88240

R 30 E

R 31 E



-LEGEND-

- Lease Boundaries
 Injection Well
 Injection Pattern



SHENANDOAH OIL CORPORATION

FLOOD NO. 4
SHUGART
EDDY COUNTY, NEW MEXICO

SCALE
1/4" = 1 MI.

FEB., 1970

**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. 3779
Order No. R-3431**

**APPLICATION OF SHENANDOAH OIL CORPORATION
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 June 5, 1968, at Santa Fe, New Mexico, before Examiner Daniel S. Mutter.

NOW, on this 18th day of June, 1968, 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, Shenandoah Oil Corporation, seeks permission to institute a waterflood project in the Shugart Pool by the injection of water into the Yates, Seven Rivers, Queen, and Grayburg formations through five injection wells located in Units F and H of Section 29, and Units A, G, and I of Section 30, all in Township 18 South, Range 31 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.

-2-

CASE No. 3779
Order No. R-3431

(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, Shenandoah Oil Corporation, is hereby authorized to institute a waterflood project in the Shugart Pool by the injection of water into the Yates, Seven Rivers, Queen, and Grayburg formations through the following-described wells in Township 18 South, Range 31 East, NMPM, Eddy County, New Mexico:

<u>LEASE</u>	<u>WELL NUMBER</u>	<u>LOCATION</u>
Kenwood-Federal	3	Unit F - Section 29
Shugart "A"	8	Unit N - Section 29
Shugart "D"	8	Unit A - Section 30
Shugart "D"	1	Unit G - Section 30
Shugart "C"	3	Unit I - Section 30

(2) That the subject waterflood project is hereby designated the Shenandoah Shugart 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 Shenandoah Shugart Waterflood Project to include such additional lands and injection wells in the area of the 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 before obtaining administrative approval for the conversion of additional wells to water injection.

-3-

CASE No. 3779

Order No. R-3431

(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

esx/

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

July 16, 1968

Mr. K. W. Byram
R. W. Byram & Company
Drawer M - Capitol Station
Austin, Texas

Re: Case No. 3779
Order No. R-3431
Applicant:
Shenandoah Oil Corporation

Dear Mr. Byram:

Attached is a copy of page 1 of the subject order.
This page has been corrected to complete Finding (3).
Please acknowledge receipt of this letter and substitute
this corrected page for the one on the copy of the subject
order dated June 18, 1968.

Thank you, and we are sorry of the inconvenience
we have caused.

Very truly yours,

DANIEL S. MUTTER
Chief Engineer

DSM/esr
Enclosure

C
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P
Y

JAMES T. JENNINGS
ROGER L. COPPLE
BRIAN W. COPPLE

LAW OFFICES OF
JENNINGS & COPPLE
1012 SECURITY NATIONAL BANK BUILDING
P. O. BOX 1180
ROSWELL, NEW MEXICO 88201

TELEPHONE 622-8432
AREA CODE 505

July 19, 1968

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

Attention: Daniel S. Nutter, Chief Engineer

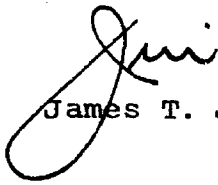
RE: CASE NO. 3779, ORDER R-3431
APPLICANT: SHENANDOAH OIL
CORPORATION

Dear Dan:

Thank you for your letter of July 16 enclosing the corrected copies of page 1 of the corrected Order. A copy of your letter and the Order as corrected is being transmitted to Shenandoah.

Yours very truly,

JENNINGS & COPPLE


James T. Jennings

JTJ/mb

cc: Shenandoah Oil Corporation

OIL CONSERVATION COMMISSION
P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

July 16, 1968

Mr. James T. Jennings
Attorney at Law
Post Office Box 1180
Roswell, New Mexico 88201

Re: Case No. 3779
Order No. R-3431
Applicant:
Shenandoah Oil Corporation

Dear Mr. Jennings:

Attached are two copies of page 1 of the subject order. This page has been corrected to complete Finding (3). Please acknowledge receipt of this letter and substitute these corrected pages for the ones on the copies of the subject order mailed to you on June 18, 1968.

Thank you, and we are sorry of the inconvenience we have caused.

Very truly yours,

DANIEL S. MUTTER
Chief Engineer

DSM/ear
Enclosures

C
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GOVERNOR
DAVID F. CARCO
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

July 16, 1968

Attn: Dan

Mr. Joe D. Ramey
Supervisor, District 1
Oil Conservation Commission
P. O. Box 1980
Hobbs, New Mexico

Re: Case No. 3779
Order No. R-3431
Applicant:
Shenandoah Oil Corporation

Dear Joe:

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Very truly yours,

Daniel S. Nutter
DANIEL S. NUTTER
Chief Engineer

MAIN OFFICE

'68 JUL 26 PM 1 13

DSN/esr
Enclosure

*Received and substitution
made.
Melba*

OIL CONSERVATION COMMISSION

P. O. BOX 2080

SANTA FE, NEW MEXICO 87501

July 16, 1968

C
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Y

Mr. Joe D. Ramsey
Supervisor, District 1
Oil Conservation Commission
P. O. Box 1980
Hobbs, New Mexico

Re: Case No. 3779
Order No. R-3431
Applicant:
Shenandoah Oil Corporation

Dear Joe:

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Very truly yours,

~~DANIEL S. HOFFER~~
Chief Engineer

DSH/ear
Enclosure

GOVERNOR
DAVID F. CARGO
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
GUYTON B. HAYS
MEMBER



P. O. BOX 2083
SANTA FE

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

July 16, 1968

RECEIVED

JUL 19 1968

O. C. C.
ARTESIA OFFICE

Bill Gressett

Mr. Bill Gressett
Supervisor, District 2
Oil Conservation Commission
Drawer DD
Artesia, New Mexico

Re: Case No. 3779
Order No. R-3431
Applicant:
Shenandoah Oil Corporation

Dear Bill:

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Very truly yours,

Daniel S. Nutter

DANIEL S. NUTTER
Chief Engineer

DSN/esr
Enclosure

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

July 16, 1968

C
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P
Y

Mr. Bill Gressett
Supervisor, District 2
Oil Conservation Commission
Drawer DD
Artesia, New Mexico

Re: Case No. 3779
Order No. R-3431
Applicant:
Shenandoah Oil Corporation

Dear Bill:

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Very truly yours,

DANIEL S. HUTTER
Chief Engineer

DSH/esr
Enclosure



STATE OF NEW MEXICO
STATE ENGINEER OFFICE
SANTA FE

S. E. REYNOLDS
STATE ENGINEER

July 19, 1968

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

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

Attn. Mr. Daniel S. Nutter
Chief Engineer

Re: Case No. 3779
Order No. R-3431
Applicant:
Shenandoah Oil Corp.

Dear Mr. Nutter:

This is to acknowledge receipt of the corrected copy of
Page 1 of the above numbered Order.

DEG/ma

Very truly yours,

S. E. Reynolds
State Engineer

By: *D. E. Gray*
D. E. Gray
Chief
Water Rights Div.

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

July 16, 1968

C
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**Mr. D. E. Gray
State Engineer Office
Capitol Building
Santa Fe, New Mexico**

**Re: Case No. 3779
Order No. R-3431
Applicant:
Shenandoah Oil Corporation**

Dear Mr. Gray:

**Attached is a copy of page 1 of the subject order.
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Please acknowledge receipt of this letter and substitute
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order sent to you June 18, 1968.**

**Thank you, and we are sorry of the inconvenience
we have caused.**

Very truly yours,

**DANIEL S. NUTTER
Chief Engineer**

**DSN/ear
Enclosure**

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

June 21, 1968

Mr. James T. Jennings
Attorney at Law
Post Office Box 1180
Roswell, New Mexico 88201

Dear Sir:

Reference is made to Commission Order No. R-3431, recently entered in Case No. 3779, approving the Shenandoah Shugart Waterflood Project.

Injection is to be through the five authorized water injection wells, all of which will be multiple completions except the Shugart A Well No. 8. This well will be a single completion, and injection shall be down plastic-coated tubing set in a packer near the shoe. Injection into the multiply-completed wells shall be down tubing through Baker flow valves into each of the zones being flooded. Packers shall be used to separate the zones and a packer shall be installed above the uppermost injection zone in each well. The casing-tubing annulus in all of the wells shall be filled with an inert fluid and left open or equipped with a pressure gauge to facilitate detection of tubing or packer leaks.

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 910 barrels per day when the Southeast New Mexico normal unit allowable is 42 barrels per day or less, provided all leases where there is any diversity of ownership (in working interest, overriding royalty, or royalty) have been unitized or otherwise consolidated and all owners therein have agreed to such consolidation and allocation of allowable and production.

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

-2-

**Mr. James T. Jennings
Attorney at Law
Post Office Box 1180
Roswell, New Mexico**

June 21, 1968

In the absence of such agreements, each lease will stand on its own as an individual project area without benefit of transfer of allowable across lease lines.

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

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

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

Very truly yours,

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

ALP/DSH/ir

**cc: Oil Conservation Commission:
Hobbs and Artesia, New Mexico**

Mr. D. E. Gray, State Engineer Office, Santa Fe, New Mexico

U. S. G. S. - Artesia, New Mexico

SHENANDOAH OIL CORPORATION

1018 COMMERCE BUILDING
FORT WORTH, TEXAS 76102

June 6, 1968

B. J. KELLENBERGER
PRESIDENT

TELEPHONE
ED 2-7381

Re: Docket No. 17-68: Case No. 3779
Application of Shenandoah Oil Corporation
for a Waterflood Project, Shugart Field,
Eddy County, New Mexico

Mr. D. S. Nutter
Oil Conservation Commission
State Land Office Building
Santa Fe, New Mexico

1968 JUN 10 AM 11 28

Dear Mr. Nutter:

Reference is made to Exhibit "C" of Shenandoah's application presented at the State Hearing on June 5, whereby the Xerox machine failed to show clearly the perforated intervals in the Kenwood-Federal No. 3 well. The following are the perforated intervals as reflected from the well record.

Interval 3774-3792' (Upper of Lower Grayburg)
3799-3823' (Lower Grayburg)

Mr. Nutter, Shenandoah's interpretation of the pay section in this well is that the well is completed in the Lower Grayburg and that the lower Grayburg formation consists of two zones of porosity of which the interval 3774-3792' is referred to as the Upper of Lower Grayburg.

Very truly yours,

SHENANDOAH OIL CORPORATION



T. P. Bates, Supervisor
Secondary Recovery

cc: Mr. Jim Jennings
Box 1180
Roswell, New Mexico 88201

JAMES T. JENNINGS
PODER L. COPPLE
BRIAN W. COPPLE

LAW OFFICES OF
JENNINGS & COPPLE
1012 SECURITY NATIONAL BANK BUILDING
P. O. BOX 1180
ROSWELL, NEW MEXICO 88201

TELEPHONE 622-8432
AREA CODE 505

May 14, 1968

Case 3779

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

Attention: Ida Rodriguez

RE: SHENANDOAH OIL CORPORATION
APPLICATION FOR WATERFLOOD

Dear Ida:

Enclosed herewith you will find Shenandoah's Application for Waterflood Project in the Shugart Pool in Eddy County, New Mexico. We discussed this sometime ago and you said that you thought you could get it on the June 5 docket. I would like to have a hearing on that date.

I am enclosing an additional copy of the Application and while I know the rule has been changed, I thought you might need this for the State Engineer's Office. If there is any question or if you need any further information, please call me.

Yours very truly,

JENNINGS & COPPLE


James T. Jennings

JTJ/mb

Encl.

cc: Shenandoah Oil Corporation

DOCKET MAILED

Date 5/23/68

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BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF
SHENANDOAH OIL CORPORATION TO
INSTITUTE A WATERFLOOD PROJECT BY THE
INJECTION OF WATER INTO THE YATES, SEVEN
RIVERS, QUEEN AND GRAYBURG FORMATIONS
THROUGH FIVE INJECTION WELLS TO BE LOCATED
IN SECTIONS 29 AND 30, TOWNSHIP 18 SOUTH,
RANGE 31 EAST, SHUGART FIELD, EDDY COUNTY,
NEW MEXICO.

NO. 3779

APPLICATION FOR APPROVAL OF

SHENANDOAH OIL CORPORATION WATERFLOOD PROJECT

Comes now the Applicant, Shenandoah Oil Corporation, and
hereby makes application for approval of a waterflood project pur-
suant to Rule 701 of the Rules and Regulations of the Commission
and in support thereof states:

1. Applicant desires to initiate a waterflood project to
inject fresh water into the Yates, Seven Rivers, Queen (Upper and
Lower) and Grayburg formations in the five existing wells on the
following described tracts:

<u>WELL NUMBER</u>		<u>LOCATION</u>
Shugart A-8	N	SE $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 29, T-18-S, R-31-E
Shugart D-1	G	SW $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 30, T-18-S, R-31-E
Shugart D-8	A	NE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 30, T-18-S, R-31-E
Shugart C-3	I	NE $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 30, T-18-S, R-31-E
Kenwood-Federal No. 3	F	SE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 29, T-18-S, R-31-E

2. That the above wells and all other wells in the area
have reached an advanced state of depletion and are stripper wells.

3. That the Applicant feels that the waterflooding of
the Yates, Seven Rivers, Queen (Upper and Lower) and Grayburg

formations is feasible, and that flooding will result in the increased ultimate recovery of oil and prevent waste.

4. That the Hondo (Operator) Culwin Queen Unit located in Section 36, Township 18 South, Range 30 East, and Section 1, Township 19 South, Range 30 East, and the Ray Smith Shugart 18 Queen Unit located in Section 18, Township 18 South, Range 31 East, and Section 13, Township 18 South, Range 30 East, are currently under flood.

5. That negotiations are currently under way with Chambers and Kennedy and Union Oil Company of California, the owners of the leases immediately South of Applicant's leases, whereby Chambers and Kennedy have tentatively agreed to place their No. 3 Well located in the NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 32, Township 18 South, Range 31 East, on injection, and Union Oil Company of California has agreed to place its No. F-1 located in the NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 31, Township 18 South, Range 31 East, on injection.

6. That when the need arises, upon administrative approval, Applicant should be permitted to convert to water injection wells additional wells within its lease boundaries as shown on Exhibit B attached hereto.

7. Applicant proposes to inject fresh to brackish water in the Yates, Queen and Grayburg formations, ranging in a depth of 2550 feet (Yates) to 3750 feet (Lower Grayburg), and to inject approximately 350 barrels per well per day where only the Yates section is being flooded and 600 barrels per well per day where the Queen and Grayburg sections are being flooded simultaneously as shown in Exhibit C. Injection water will be acquired from a commercial water company operating in the area.

Applicant will install water injection facilities on its Shugart "A" Lease near their Shugart A-1 Well and the system will be so designed as to handle and treat all of the produced water on the project for reinjecting.

Applicant expects a secondary recovery of $\pm 1,000,000$ barrels and/or a 1:1 ratio to primary.

8. That in support of this application and in accordance with the provisions of Rule 701, Applicant submits herewith the following exhibits:

Exhibit A - A plat showing the location of Applicant's project relative to the ownership of all other leases within a two-mile radius of which are producing from one or more of the same geologic formations.

Exhibit B - A plat showing Applicant's pilot injection well and proposed field pattern.

Exhibit C - A diagrammatic sketch of the proposed injection wells showing tops of cement, perforations and depths.

Exhibit D - Tabulation of cementing data.

Exhibit E - A monthly performance curve that includes cumulative production data figures for the total project.

Such logs as are available will be submitted at the time of the hearing.

WHEREFORE, Applicant requests the Commission set this matter down for hearing before an examiner at an early date, publish the notice as required by law and, after hearing, issue its Order:

1. Authorizing the waterflood project and the injection of water into the Yates, Seven Rivers, Queen (Upper and Lower) and Grayburg formations in the five injection wells located in Sections 29 and 30, Township 18 South, Range 31 East.

2. Establishing rules for the operation of the flood within the area and for administrative expansion and conversion of additional wells to water injection wells.

Respectfully submitted,

SHENANDOAH OIL CORPORATION

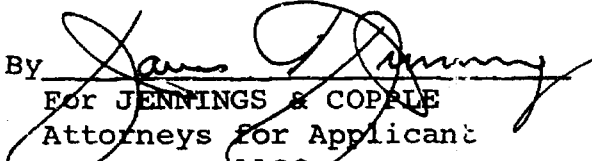
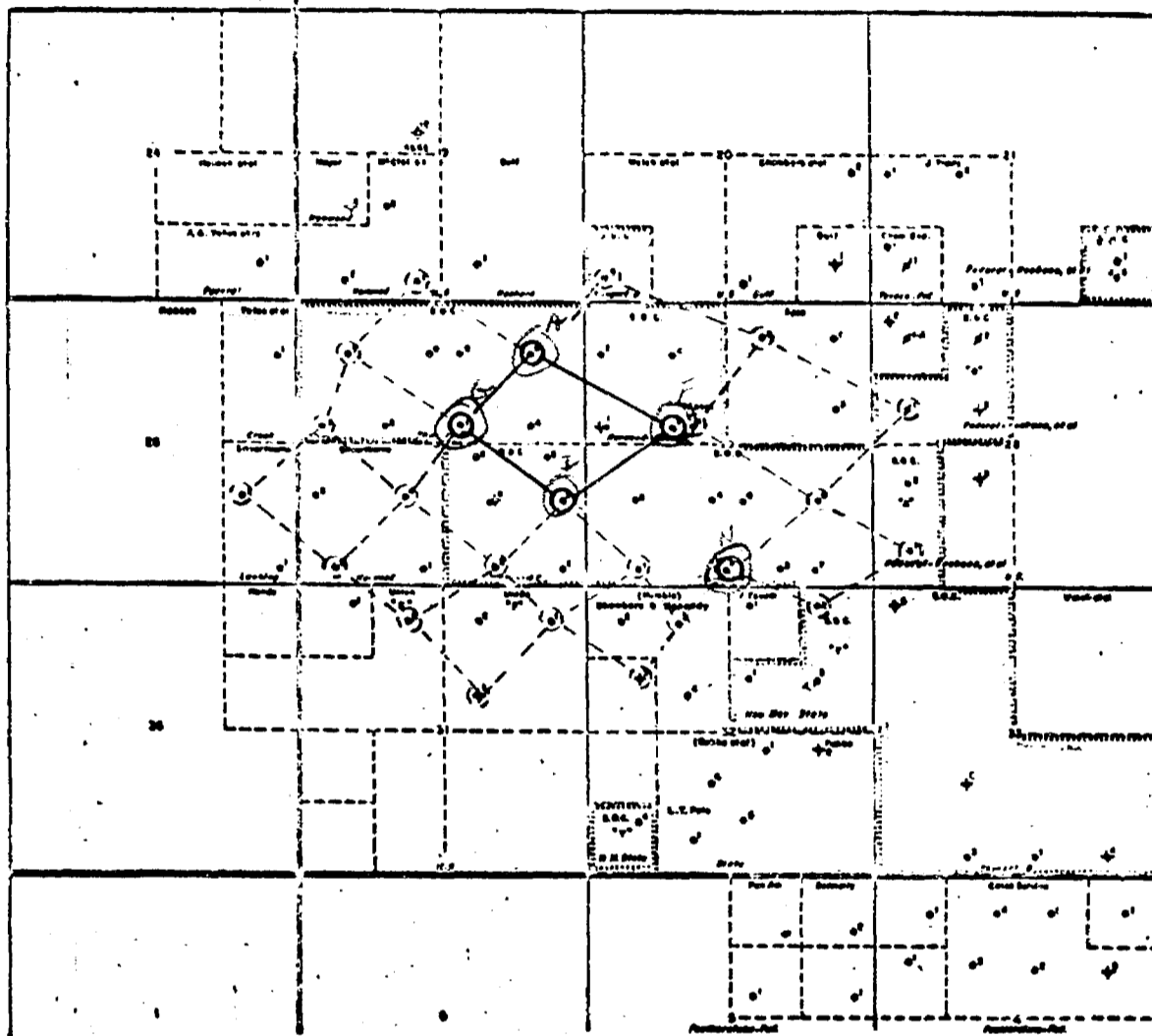
By 
For JENNINGS & COPPLE
Attorneys for Applicant
P. O. Box 1180
Roswell, New Mexico

EXHIBIT "B"

R 30 E

R 31 E


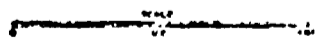
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LEGEND

SHENANDOAH LEASE BOUNDARIES

- Pilot
- - - Proposed Field Pattern
- ⊙ Converted Pilot Inj. Well
- ⊗ Proposed Conversion

 SHENANDOAH OIL CORPORATION
FLOOD NO. 4 SHUGART EDDY COUNTY, NEW MEXICO
 SEPT 1947

Case 3779

SHENANDOAH OIL CORPORATION
FORT WORTH, TEXAS

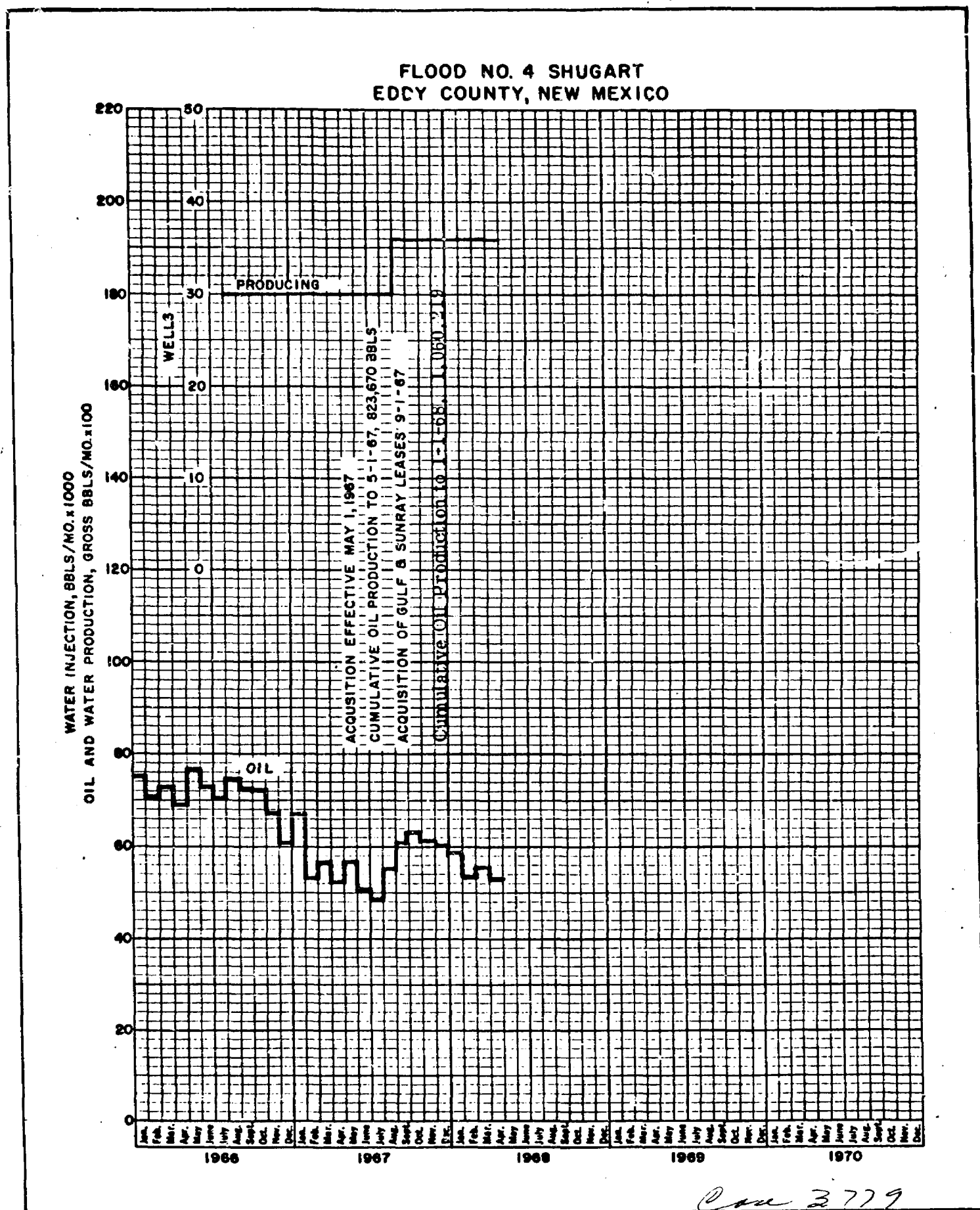
Exhibit C

SHUGART A - 8	SHUGART D - 1	SHUGART D - 8	SHUGART C - 3	KENWOOD-FED. 3
27' - 8 5/8" Csg. Circ. w/10 Sks.	763' - 8 5/8" Csg. 110 Sks. Cement	755' - 8 5/8" Csg. 75 Sks. Cement	757' - 8 5/8" Csg. 75 Sks Cement	750' - 8 5/8" Cs 50 Sks Cement
2692'-4 1/2" Csg. 250 Sks Cement Perf. 2590-2610'	3808'-5 1/2" Csg. 125 Sks. Cement Perf. 3387-3404 3620-3630 3761-3777	3835'-5 1/2" Csg. 175 Sks Cement Per. 3418-3426 3466-3476 3760-3778	3751'-5 1/2" Csg. 100 Sks Cement Perf. 3640-3656	3895'-5 1/2" Csg. 150 Sks Cemen Perf. 3774-379 3799-382
T.D. 2692' Note: Tension Pkr will be set near shoe on plastic coated tbj.	T.D. 3808' Note: The 3 zones will be isolated by using Baker flow valve and pkr. arrangement w/1 string of 2" tbj.	T.D. 3850' Note: The 3 zones will be isolated w/Baker flow valves & pkrs. run w/ 1 string of 2" plastic coated Tbj.	T.D. 3804' Note: Panrose Sec will be perf. & will be dually compl. f/inj using Baker flow valve arrangement	T.D. 3895' Note: Rights from 3500' these two zones will be isola- ted using pkr & flow valves

666 3779

<u>Lease and Well No.</u>	Hole Size	Size and Depth of Casing	Sacks of Cement Used	Lbs. Feet per Sack	Calculated Top of Cement
Shugart A-8	6-1/4"	8-5/8" @ 27' 4-1/2" @ 2,692'	10 250	7.87 10.71	Circulated 16'
	10"			7.87	173"
	6-1/4"			10.75	2,676'
Shugart C-3	10"	8-5/8" @ 757' 5-1/2" @ 3,751'	75 100		
	7"			7.87	Circulated 2,465'
	10"		110	10.75	
	7"	8-5/8" @ 763' 5-1/2" @ 3,808'	125		
Shugart D-1	10"			7.87	173'
	7"		75	10.75	1,954'
	10"	8-5/8" @ 755' 5-1/2" @ 3,835'	175		
Shugart D-8	10"			7.87	357'
	7"		50	10.75	2,283'
	10"	8-5/8" @ 750' 5-1/2" @ 3,895'	150		
Kenwood Fed. 3	10"				
	7"				

Exhibit E



DOCKET: EXAMINER HEARING - WEDNESDAY - JUNE 5, 1968

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 3777: Application of Atlantic Richfield Company for salt water disposal, Roosevelt County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Bough "C" zone of the Pennsylvanian formation in its State AE Well No. 2 located in Unit L of Section 36, Township 8 South, Range 36 East, Allison-Pennsylvanian Pool, Roosevelt County, New Mexico, in the perforated interval from 9662 feet to 9672 feet.
- CASE 3778: Application of Atlantic Richfield Company for a dual completion and salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dually complete its State BH Well No. 1 located 660 feet from the North and West lines of Section 13, Township 19 South, Range 34 East, Quail-Queen Pool, Lea County, New Mexico, in such a manner as to permit production of oil from 5080 feet to 5136 feet in the lower Queen formation through tubing and the disposal of produced salt water into the upper Queen formation through the casing-tubing annulus in the perforated interval from 4820 feet to 4830 feet.
- CASE 3779: Application of Shenandoah Oil Corporation 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 Yates, Seven Rivers, Queen, and Grayburg formations through five wells located in units F and N of Section 29, and units A, G, and I of Section 30, all in Township 18 South, Range 31 East, Shugart Pool, Eddy County, New Mexico.
- CASE 3780: Application of Amerada Petroleum Corporation for an amendment to Order No. R-3407, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the amendment of Order No. R-3407, which authorized the drilling of a water injection well in its Langlie-Mattix Woolworth unit waterflood project at an unorthodox location 75 feet from the North line and 2635 feet from the West line of Section 27, Township 24 South, Range 37 East, Lea County, New Mexico. Applicant now proposes to locate said well 75 feet from the North line and 2540 feet from the West line of said Section 27.

- CASE 3781: Application of Sinclair Oil & Gas Company for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water by injection into the Permo-Pennsylvanian formation in the interval 10,434 feet to 11,537 feet in the Cities Service State "AW" Well No. 4 located in Unit I of Section 35, Township 15 South, Range 36 East, Dean Field, Lea County, New Mexico.
- CASE 3782: Application of Pan American 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 Seven Rivers and Queen formations underlying its Cortland Myers unit area through three wells located in units F, J, and P of Section 22, Township 24 South, Range 37 East, Langlie-Mattix Pool, Lea County, New Mexico.
- CASE 3783: Application of Pan American Petroleum Corporation for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Cortland Myers Unit Area comprising 240 acres, more or less, of Federal lands in Section 22, Township 24 South, Range 37 East, Langlie-Mattix Pool, Lea County, New Mexico.
- CASE 3784: Application of Pan American Petroleum Corporation for a unit agreement, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks approval of the North King Camp Unit Area comprising 14,697 acres, more or less, of State, Federal, and fee lands in Township 13 South, Ranges 29 and 30 East, Chaves County, New Mexico.
- CASE 3785: Application of Pan American Petroleum Corporation for an unorthodox gas well location, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks authority to drill its Poitevent Gas "Com" Well No. 1 at an unorthodox gas well location 990 feet from the North line and 1650 feet from the East line of Section 11, Township 15 South, Range 27 East, Buffalo Valley-Pennsylvanian Gas Pool, Chaves County, New Mexico, in exception to the pool rules which require wells in said pool to be located in the NW/4 or SE/4 of the section.

Page -3-

Docket No. 17-68

June 5, 1968 Examiner Hearing

CASE 3786: Application of Texaco Inc. for special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the promulgation of special pool rules for the North Paduca-Delaware Pool, Lea County, New Mexico, including a provision for classification of oil and gas wells in said pool, a limiting gas-oil ratio of 3000 to one, and 40-acre spacing for oil wells and 160-acre spacing for gas wells. Locations would be no nearer than 330 feet to a quarter-quarter section line.

CASE 3776: (Continued from the May 22, 1968 Examiner Hearing)

Application of J. M. Huber Corporation for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Union-State Unit Area comprising 1360 acres, more or less, of State lands in Township 15 South, Range 32 East, Lea County, New Mexico.

ir/

dearnley-meier reporting service, inc.

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

1123 SIMAS BLDG. • P. O. BOX 1072 • PHONE 243-4491 • ALBUQUERQUE, NEW MEXICO



BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
June 5, 1968

EXAMINER HEARING

IN THE MATTER OF:)

Application of Shenandoah Oil)
Corporation for a waterflood)
project, Eddy County, New Mexico.)

Case No. 3779

BEFORE: Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

MR. NUTTER: We will call next Case 3779.

MR. HATCH: Application of Shenandoah Oil Corporation for a waterflood project, Eddy County, New Mexico.

MR. JENNINGS: James T. Jennings of Jennings and Copple, Roswell, appearing on behalf of Shenandoah Oil Corporation. I have one witness, Mr. T. P. Bates.

(Witness sworn.)

(Whereupon, Exhibits A through E were marked for identification.)

PAT BATES

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

DIRECT EXAMINATION

BY MR. JENNINGS:

Q Would you state your name and occupation, please?

A My name is Pat Bates. I am supervisor, secondary operations, for Standard Oil Corporation.

Q Have you previously appeared and testified before the Commission and had your qualifications accepted?

A Yes, I did, in I believe November 1966.

MR. JENNINGS: Do you wish me to further qualify the witness?

MR. NUTTER: No, the witness is qualified.

Q (By Mr. Jennings) Mr. Bates, this is an application filed on behalf of Shenandoah Oil Corporation to institute a waterflood project by the injection of water into the Yates, Seven Rivers, Queen and Grayburg formations through five injection wells. Where are these wells located and what pool?

A These five wells are located in the Shugart Pool, Eddy County, New Mexico, and the five wells are the Shugart A No. 8, which is located in the Southwest Quarter of Section 29, Township 18 South, Range 31 East; the Shugart D No. 1, located in the Southwest Quarter of the Northeast Quarter, Section 30, Township 18 South, Range 31 East; the Shugart D No. 8, located in the Northeast Quarter and the Northeast Quarter, Section 30, Township 18 South, Range 31 East; the Shugart C No. 3, located in the Northeast Quarter, Southeast Quarter, Section 30, Township 18 South, Range 31 East; the Kenwood Federal No. 3, located in the Southeast Quarter, Northwest Quarter, Section 29, Township 18 South, Range 31 East.

Q What is the present status of production from these wells?

A The average daily production per well is approximately five barrels.

Q Are they continuing to decline?

A They are declining slowly now. They're leveling off at the present time.

Q Do you feel that waterflooding any of the zones where the wells are completed would be beneficial and result in ultimate recovery of additional oil?

A Yes.

Q In what zones are the wells producing from generally?

A Well, of course, the wells are producing at different intervals perforated but some of the wells are producing from the Yates, Penrose and Middle and Lower Grayburg formations.

Q Do you feel that these zones are susceptible to flood?

A Yes, I do, there are other floods in the immediate vicinity of this project.

Q What are they and where are they?

A Well, the Grace Smith Shugart 18 Queen Unit is located north and slightly west of this project and the Atlantic Kuhlman Queen Unit is located southwest of the proposed project.

Q Are there other proposed floods in the immediate vicinity also?

A I understand that there are other floods, one by

J. J. Travis, which is located in Section 21.

Q Have you made any effort to either communitize the area or to work out some deal with your offset operators in connection with your proposed flood?

A Yes, I have. I have contacted both verbally and by letter Chambers and Kennedy and Union of California, of which both are located to the south of this proposed unit, and also with Mr. Jack McClellan, who has three wells located in Section 19 just north of this unit.

Q What is the status of your negotiations?

A At the present time they have informed me that they will offset us there with injection wells. Union of California has agreed to place their F-1 well on injection located in Section 31, and the Chambers and Kennedy have tentatively agreed to place their No. 3 well in Section 32 on injection. These are direct offsets south of our C and A lease.

Q How do you propose to flood the area?

A At the present time we are planning on separating each one of these zones where possible by use of packers, and flow nipples down-hole, whereby we can control water into each zone, the amount of water.

Q Have you made arrangements for a water supply?

A Yes. Water supply is available. There is a

commercial water line crossing our lease, and we have made contact and will probably work up an agreement with them.

Q How much water do you propose to inject, Mr. Bates?

A Initially, whereby we have one well, the A No. 8, which will be completed in the Yates only, we propose to inject approximately 350 barrels per day into that well, and where we have three zones completed in a well we expect to inject approximately 200 barrels per day per zone per well. So it would be a total of 600 barrels per day.

Q Where do you plan to install your facilities, or have they been installed?

A No. No facilities have been installed yet. Our plans are to install waterflood facilities near our A No. 1 well, located in Section 29, and this water plant will be set up to take care of all produced water, to treat and recycle this water.

Q What is your expected recovery, Mr. Bates?

A We expect one to one ratio to primary, or approximately a million barrels.

Q What has been the primary?

A That's 1,060,219.

Q That is reflected by Exhibit E?

A Yes. And that's to 1-1-68.

Q Mr. Bates, I hand you here what has been marked as Exhibit A and will ask you to identify it and tell just what it is and what it reflects.

A Exhibit A is a plat showing the location of the proposed project relative to the ownership of all other leases within a two-mile radius and which are producing from one or more of the same geologic formations. Our area is bounded with yellow and I might add that these are all Federal leases with the exception of our State Y lease, located in the Northeast Quarter of Section 32.

Q Approximately how many acres does this embrace?

A Just under 1900 acres.

Q The entire area?

A Yes.

Q How many producing wells do you now have in the area?

A We have 36 active producing wells.

Q Mr. Bates, I hand you what has been marked as Exhibit B and ask you to identify that and state what it reflects.

A Exhibit B is a plat showing the pilot injection wells in the proposed field pattern. The proposed pilot wells are those wells which are connected with the solid line and the wells are circled with a solid line. The dashed

line connecting the other well are the proposed field pattern.

Q This reflects the five proposed injection wells?

A Right.

Q I hand you what has been marked Exhibit C and ask you to state what that reflects.

A Exhibit C is a diagrammatic sketch of a proposed injection well showing the tops of cement, perforations and depths. I have listed on Exhibit C Wells A-8, D-1, D-8, C-3 and Kenwood Federal 3. Would you like for me to go down this?

Q I think if you could briefly tell us what the casing program is, it would be helpful.

A The Shugart A No. 8 has 27 feet of 8-5/8ths casing and that was, and the cement was circulated with ten sacks. It has 2692 feet of 4-1/2-inch casing and was cemented with 250 sacks of cement. The well is perforated at 2590 to 2610; total depth being 2692. In this particular well it's completed in the Yates and it is expected that a tension packer will be set near the shoe and injection will be down internally-coated plastic-coated tubing.

The Shugart D No. 1 has 763 feet of 8-5/8ths casing set with 110 sacks. It has 3808 feet of 5-1/2-inch casing set with 125 sacks. This well is perforated from 3387 to

3404, 3620 to 3630, 3761 to 3777. This well was drilled at a total depth of 3808 feet. As noted here, this is one of the wells where that three zones will be isolated by the use of flow valve arrangement.

Shugart D No. 8 has 755 feet of 8-5/8ths casing cemented with 75 sacks, has 3835 feet of 5-1/2 casing, cemented with 175 sacks. This well is perforated from 3418 to 3426, from 3466 to 3476, 3760 to 3778, and has a total depth of 3850.

Shugart C No. 3 has 757 feet of 8-5/8ths casing, cemented with 75 sacks, 3751 feet of 5-1/2 casing cemented with 100 sacks; perforated from 3640 to 3656, at a total depth of 3804.

Kenwood Federal No. 3, 750 feet of 8-5/8ths casing, cemented with 50 sacks, 3895 feet of 5-1/2 casing cemented with 150 sacks. This well is perforated from 3774, I don't have the original, and it looks like our copy machine shorted us a little bit there, so I don't have that last --

MR. NUTTER: Have you got it marked on the logs?

THE WITNESS: I don't have it marked on these logs.

MR. NUTTER: You can furnish us this perforated interval.

THE WITNESS: All right.

MR. NUTTER: It's not on any of these here.

THE WITNESS: I will mail the perforations in on Federal Number 3.

Q (By Mr. Jennings) Mr. Bates, I hand you what has been marked Exhibit D and ask you to identify that, please.

A Exhibit D is a tabulation of cementing data on these wells.

Q Have you generally testified about this data in your testimony concerning Exhibit D?

A Yes. That's in Exhibit --

Q Exhibit C?

A Right.

MR. NUTTER: I think while you are on that exhibit, Mr. Bates, one part of Exhibit D that you did not testify to would be the calculated top of the cement, if you could go through that for each of these strings of the pipe.

A In the Shugart A No. 8, on the surface at 27 feet of 8-5/8ths, 10 sacks of cement was used. The theoretical fillup per foot per sack, 7.87, it showed to have circulated. On the oil string, which is 4-1/2 casing at 2692, cemented with 250 sacks, theoretical fillup per foot per sack is 10.71, and it showed to be 16 feet.

Shugart C-3, 8-5/8 casing at 757, whereby 75 sacks

were used. Theoretical fillup, 7.87 feet per sack, calculated to be 173 feet. The 5-1/2 casing set at 3751 with a hundred sacks, theoretical fillup feet per sack, 10.75; calculated top, 2676.

Shugart D No. 1, 8-5/8ths casing set at 763 feet with 110 sacks, fillup is 7.87 feet per sack and showed as circulated. 5-1/2-inch casing is set at 3808 with 125 sacks, and calculated top of cement was 2,465 feet.

Shugart D No. 8, 8-5/8 casing set at 755 feet with 75 sacks; calculated top of cement, 173 feet. 5-1/2-inch casing at 3835 with 175 sacks; calculated top of cement, 1954.

Kenwood Federal No. 3, 8-5/8ths-inch casing set at 750 feet, 50 sacks; calculated top of cement, 357 feet. 5-1/2-inch casing at 3895 with 150 sacks; calculated top, 2,283 feet.

Q Mr. Bates, is it contemplated that additional wells will be placed on injection as the flood progresses?

A Yes, and probably as Exhibit B shows the field pattern, I think these will be the wells that will be placed on injection later.

Q Do you desire to obtain administrative approval to place these additional wells on injection?

A Yes, we do.

Q Mr. Bates, do you have logs of the wells, of all the injection wells?

A Yes, I have a set of logs. Two sets, in fact, of all the initial injection wells.

MR. JENNINGS: We have and will offer either as an exhibit or to the Commission the tendered logs on each of the injection wells. If you would mark these, please.

(Whereupon, Exhibit F was marked for identification.)

Q (By Mr. Jennings) Mr. Bates, I hand you here what has been marked as Exhibit E and ask you to identify that and state what it reflects.

A Exhibit E is a monthly performance curve that includes the cumulative production for the project and also, in addition, shows the number of producing wells in this unit.

Q I believe you have already testified as to the cumulative production shown by this?

A Yes. It's reflected on this exhibit.

Q Mr. Bates, do you feel that this program, this waterflood program will prevent waste and result in the ultimate recovery of additional oil?

A Yes, I do.

Q Were Exhibits A through E prepared by you or under your supervision?

A Yes, they were prepared by me.

Q As to Exhibit F, the logs, by whom were they prepared?

A The logs were obtained -- You want the name of the company that ran the logs?

Q Yes.

A The Shugart A No. 8 log was run by the Lane Wells Company; the Shugart C No. 3 was the Lane Wells Company; Shugart D No. 1 by the Lane Wells Company; Shugart D No. 8, the Lane Wells Company; Kenwood Federal No. 3 by Log Core, Inc., Artesia.

Q When do you contemplate beginning your flooding operations, assuming that the Commission authorizes this, Mr. Bates?

A We should begin within 90 days.

MR. JENNINGS: We would like at this time to offer Exhibits A through F, and we have nothing further to offer.

MR. NUTTER: Applicant's Exhibits A through F will be admitted in evidence.

(Whereupon, Exhibits A through F were offered and admitted in evidence.)

MR. NUTTER: Does anyone have any questions of Mr. Bates?

MR. JENNINGS: Mr. Examiner, excuse me, one further question.

Q (By Mr. Jennings) Mr. Bates, have you sought and obtained the approval of the United States Geological Survey as to your proposed flooding operation?

A Yes, that's right. We have, and have obtained approval from them.

MR. JENNINGS: For the record, I believe the Commission has received advice of this approval direct.

MR. NUTTER: Yes. If we have, it's not in the case file, Mr. Jennings.

MR. JENNINGS: We will offer that.

MR. NUTTER: Is that your original copy?

MR. JENNINGS: We have a copy. Would you mark this?

(Whereupon, Exhibit G
was marked
for identification.)

Q (By Mr. Jennings) I hand you here a letter dated May 29, 1968 and ask you to identify that.

A This is a letter from Shenandoah Oil Company to United States Geological Survey in Artesia, New Mexico, requesting approval to initiate a waterflood project as set

forth in this application. In this letter they have agreed to this in its entirety.

Q Is this letter of May 29, the original copy of which is Exhibit G?

A Right.

MR. JENNINGS: We would offer Exhibit G.

MR. NUTTER: Applicant's Exhibit G will be admitted in evidence.

(Whereupon, Exhibit G was offered and admitted in evidence.)

MR. JENNINGS: We have nothing further.

CROSS EXAMINATION

BY MR. NUTTER:

Q I believe you testified that the producing zones here in these wells are the Yates, Penrose and Middle and Lower Grayburg?

A Yes, that is correct.

Q Now, this Shugart A-8 has perforations 2590 to 2610, that would be in the Yates?

A Yes, sir.

Q That's the only perforations this has is in the Yates formation?

A Yes, that's right.

Q Why don't you refer to your Exhibit C, Mr. Bates, and then we can go through and identify these various zones that are perforated in these wells.

A All right. I would like to add also that there are some zones that have not been opened and we are planning on running logs and reinterpreting this entire pay section, and there may be some additional perforations later. This is where the wells are completed at the present time and we haven't done anything with them.

Q Just for the present perforations so I can get an idea where these formations are, now we had the A-8 perforated in the Yates. Now, the next well on your Exhibit C is Shugart D-1, this set of perforations, thirty-three to thirty-four hundred, that would be the Penrose?

A Penrose, that is correct.

Q The 3600 group of perforations are the Middle Grayburg and the other group, the thirty-seven would be the Lower Grayburg?

A Yes, sir. Then on the Shugart D No. 8 --

Q One second please. And the D-8, sir?

A The D-8, this has an additional zone, a lower zone in the Penrose sections.

Q You have two sets of perforations in the Penrose?

A Yes, 3418 to 3426, and 3466 to 3476.

Q And then your Lower Grayburg?

A Lower Grayburg, 3760 to 3778. Then we have the Shugart C No. 3; one set of perforations in this well, 3640 to 3656, which would be the Middle Grayburg. Again, we are cut out on this Kenwood Federal No. 3.

Q And you do propose to open the Penrose?

A I think that we probably will, yes, sir.

Q In this C-3, which would be up around 3400, probably?

A Yes, correct.

Q Then your fifth well on here is the Kenwood, and these are the two Grayburg sections?

A Yes, sir. These are the -- Here's what we call maybe an Upper-Lower Grayburg, 3774, and I will send this information along with the other.

Q For the A-8, which is in the Yates only, you will inject about 350 barrels of water per day, and in the multiple zone it will be 200 barrels per zone per day?

A Yes, sir, that is correct.

Q What is the arrangement for using these Baker flow valves, Mr. Bates? You have one string of tubing and the flow valves are installed on that string of tubing, is that right?

A Yes, sir. I have diagrams here showing dual zone completions sketches and triple completions which we would like to make an exhibit.

Q That might simplify the testimony here.

(Whereupon, Exhibit H
was marked for
identification.)

Q For the triple zone type of completion, which is on the right-hand side of this exhibit, Mr. Bates, --

A Yes.

Q -- will you use the one to the left or the one to the right? In other words, will you have a packer on top of your uppermost flow valve?

A I will use the one on the extreme right. I will not inject behind the casing on the top zone.

Q In other words, we are going to have the annulus isolated in each of these wells?

A That is correct.

Q Will this annulus be loaded with an inert fluid?

A Right, and with a pressure valve installed.

Q With a pressure valve?

A Yes.

Q Now, in the case of the single completions, the Shugart A-8, you will have a packer set immediately above the

shoe and that will be similarly equipped with the annulus loaded and a gauge installed?

A That is correct. It will have a gauge installed to surface, and loaded.

MR. NUTTER: I believe that's all I have. Does anyone have any questions of Mr. Bates? He may be excused.

(Witness excused.)

MR. NUTTER: Do you have anything further, Mr. Jennings?

MR. JENNINGS: No. I thought we ought to offer Exhibit H.

MR. NUTTER: Applicant's Exhibit H will be admitted.

(Whereupon, Exhibit H was offered and admitted in evidence.)

MR. NUTTER: Does anyone have anything further they wish to offer in Case 3379? We will take the case under advisement.

I N D E X

<u>WITNESS</u>	<u>PAGE</u>
PAT BATES	
Direct Examination by Mr. Jennings	2
Cross Examination by Mr. Nutter	15

<u>EXHIBIT</u>	<u>MARKED</u>	<u>OFFERED AND ADMITTED</u>
Exhibits A - E	2	13
Exhibit F	12	13
Exhibit G	14	15
Exhibit H	18	19

STATE OF NEW MEXICO)
COUNTY OF BERNALILLO) ss

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

Witness my Hand and Seal this 8th day of July, 1968.

Ada Dearnley
NOTARY PUBLIC

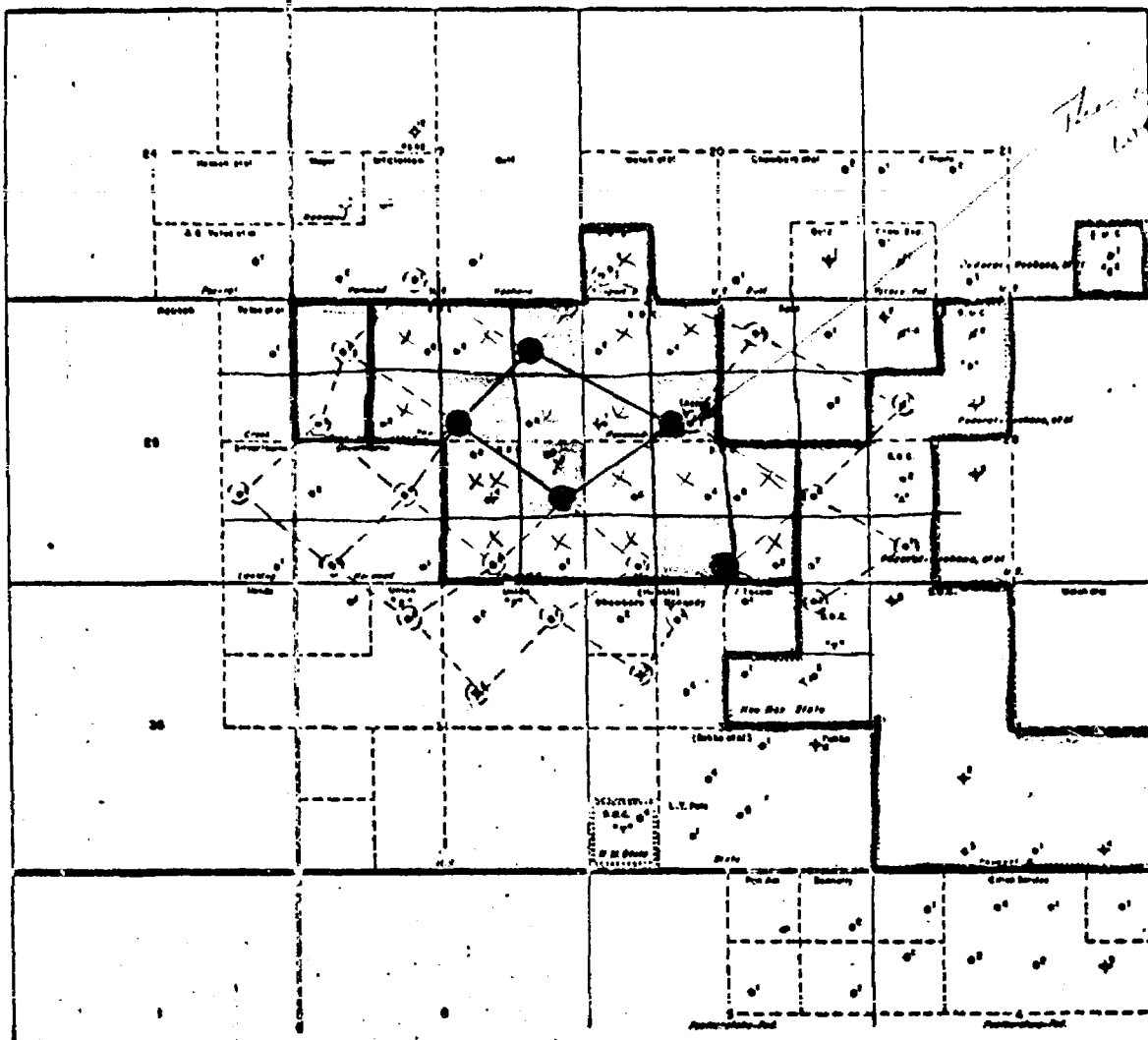
My Commission Expires:
June 19, 1971.

I do hereby certify that the foregoing is a complete record of the proceedings in the Bernalillo hearing of Case No. 3719, 1968.
6/5
[Signature], Examiner
New Mexico Oil Conservation Commission

EXHIBIT "B"

R 30 E

R 31 E



FORE EXAMINER: NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. B
CASE NO. 3779

LEGEND

- LEASE BOUNDARIES
- Pilot
- Proposed Field Pattern
- ⊙ Converted Pilot Inj. Well
- ⊙ Proposed Conversion

42
21
42
84
88-2
28
910

5 inj 40's 1 extra
16 prod 40's 1 extra
20 40's 2 extra

SOC
SHENANDOAH OIL CORPORATION

FLOOD NO. 4
SHUGART
EDDY COUNTY, NEW MEXICO

SEPT 1947

SHENANDOAH OIL CORPORATION
FORT WORTH, TEXAS

Exhibit C

SHUGART A - 8	SHUGART D - 1	SHUGART D - 8	SHUGART C - 3	KENWOOD-FED. 3
<p>27' - 8 5/8" Csg. Circ. w/10 Sks. <i>Calc top: circ</i></p>	<p>763' - 8 5/8" Csg. 110 Sks. Cement <i>173' circ</i></p>	<p>755' - 8 5/8" Csg. 75 Sks. Cement <i>173'</i></p>	<p>757' - 8 5/8" Csg. 75 Sks Cement <i>173'</i></p>	<p>750' - 8 5/8" Cs 50 Sks Cement <i>357</i></p>
<p>2692' - 4 1/2" Csg. 250 Sks Cement Perf. 2590-2610' <i>Calc top 16' gates</i></p>	<p>3808' - 5 1/2" Csg. 125 Sks. Cement Perf. 3387-3404 3620-3630 3761-3777 <i>Calc top 2092-2475-2465</i></p>	<p>3835' - 5 1/2" Csg. 175 Sks Cement Perf. 3418-3426 3466-3476 <i>3760-3778</i></p>	<p>3751' - 5 1/2" Csg. 100 Sks Cement Perf. 3640-3656 <i>3676-3677</i></p>	<p>3895' - 5 1/2" Csg. 150 Sks Cement Perf. 3774-379 3799-382</p>
<p>T.D. 2692' Note: Tension Pkr will be set near shoe on plastic coated tbq.</p>	<p>T.D. 3808' Note: The 3 zones will be isolated by using Baker flow valve and pkr. arrangement w/1 string of 2" tbq.</p>	<p>T.D. 3850' Note: The 3 zones will be isolated w/Baker flow valves & pkrs. run w/1 string of 2" plastic coated Tbg.</p>	<p>T.D. 3804' Note: Panrose Sec will be perf. & will be dually compl. f/inj using Baker flow valve arrangement</p>	<p>T.D. 3895' Note: Rights from 3500' these two zones will be isolated using pkr: & flow valves</p>

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
Appeal EXHIBIT NO. *3779*
CASE NO. *3779*

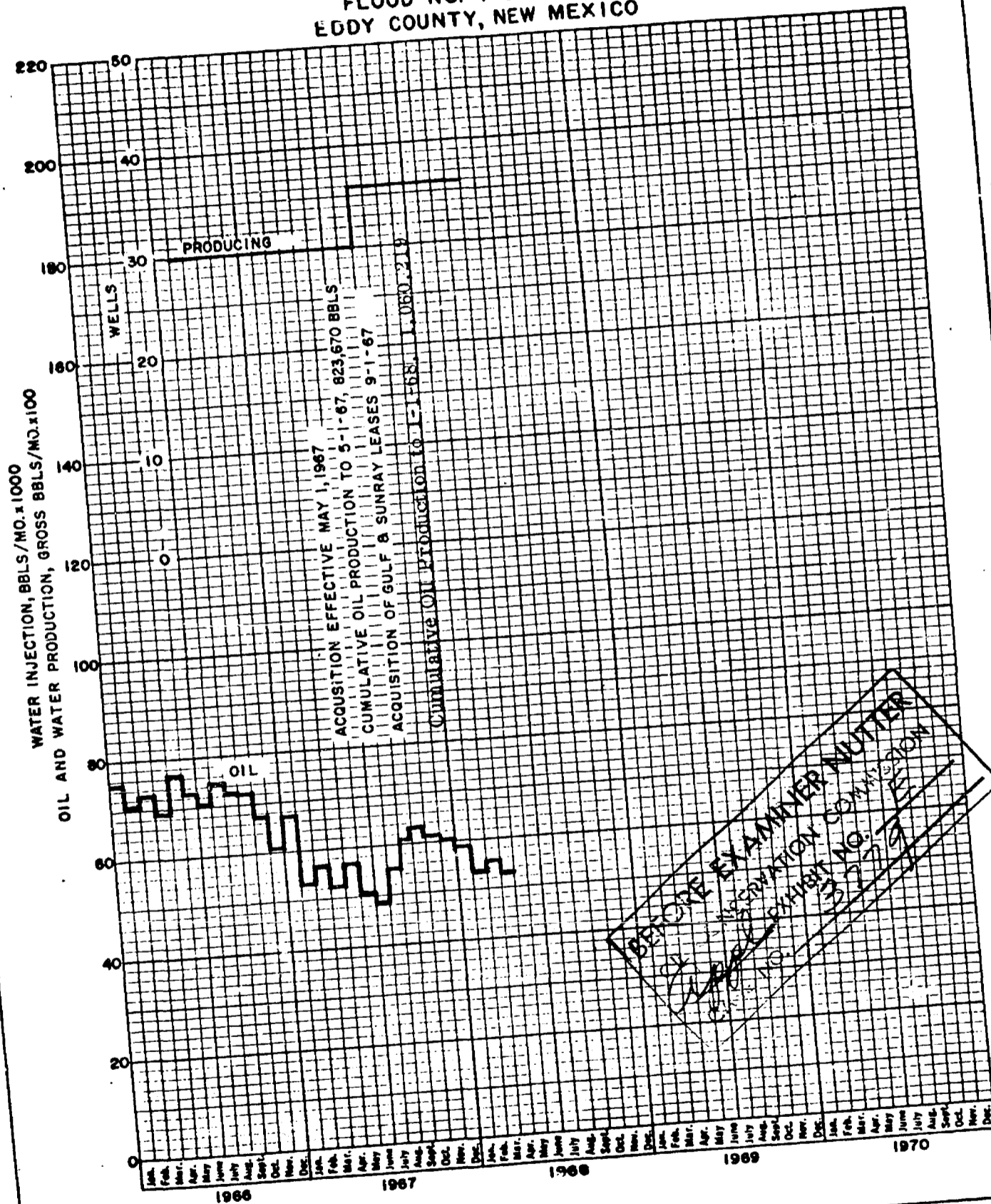
Exhibit D

Lease and Well No.	Hole Size	Size and Depth of Casing	Sacks of Cement Used	Lin. Feet per Sack	Calculated Top of Cement
Shugart A-8	10" 6-1/4"	8-5/8" @ 27' 4-1/2" @ 2,692'	10 250	7.87 10.71	Circulated 16'
Shugart C-3	10" 7"	8-5/8" @ 757' 5-1/2" @ 3,751'	75 100	7.87 10.75	173" 2,676'
Shugart D-1	10" 7"	8-5/8" @ 763' 5-1/2" @ 3,803'	110 125	7.87 10.75	Circulated 2,465'
Shugart D-8	10" 7"	8-5/8" @ 755' 5-1/2" @ 3,835'	75 175	7.87 10.75	173' 1,354'
Kenwood Fed. 3	10" 7"	8-5/8" @ 750' 5-1/2" @ 3,895'	50 150	7.87 10.75	357' 2,283'

BEFORE EXAMINER NUTTER
 C. E. CONSERVATION COMMISSION
 CASE NO. 3779 EXHIBIT NO. D

Exhibit E

FLOOD NO. 4 SHUGART EDDY COUNTY, NEW MEXICO



SHENANDOAH OIL CORPORATION
FORT WORTH, TEXAS



IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
P. O. Drawer U
Artesia, New Mexico 88210

May 29, 1968

Shenandoah Oil Corporation
% Jennings and Copple
Post Office Box 1180
Roswell, New Mexico 88201

Gentlemen:

Your letter of May 23, 1968 requests approval to operate a waterflood of the Yates, Seven Rivers, Queen, and Grayburg formations in T. 18 S., R. 31 E., N.M.P.M., Eddy County, New Mexico, on that portion of Oil and Gas leases described as follows:

<u>Lease Number</u>	<u>Description</u>
Las Cruces 029387(a)	sec. 29: S $\frac{1}{2}$
Las Cruces 029387(b)	sec. 20: SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 30: N $\frac{1}{2}$ SE $\frac{1}{4}$
Las Cruces 029387(c)	sec. 29: NW $\frac{1}{4}$
Las Cruces 029390(a)	sec. 28: SW $\frac{1}{4}$ NW $\frac{1}{4}$
New Mexico 055648	sec. 28: W $\frac{1}{2}$ SW $\frac{1}{4}$

Initially, you propose to convert to water injection the following wells:

<u>Well No. & Lease</u>	<u>Location</u>
8 Shugart "A"	N SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 29
3 Shugart "C"	I NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 30
1 Shugart "D"	G SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 30
8 Shugart "D"	A NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 30
3 Kenwood	F SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 29

The flood pattern would be an 80-acre 5-spot pattern, and any lease line agreement with adjoining operators should provide for equitable exchange of injection wells along lease lines on all sides of the project. The proposal also plans for expansion of the project by subsequently converting to water injection the following wells:

BEFORE EXAMINER NUTTER

ON CONSERVATION COMMISSION

EXHIBIT NO. 3779

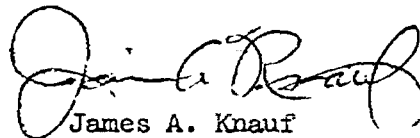
Well No. & LeaseLocation

1 Shugart "A"	SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 29
2 Shugart "A"	SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 29
9 Shugart "A"	NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 29
2 Shugart "C"	SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 30
3 Shugart "D"	SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 30
7 Shugart "D"	NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 30
9 Shugart "D"	SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 20
1 Keohane "A"	SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 28
1 Keohane "B"	SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 28

The plans for operating the above described waterflood project as proposed in the application is satisfactory to this office and hereby approved subject to like approval by the New Mexico Oil Conservation Commission and the following:

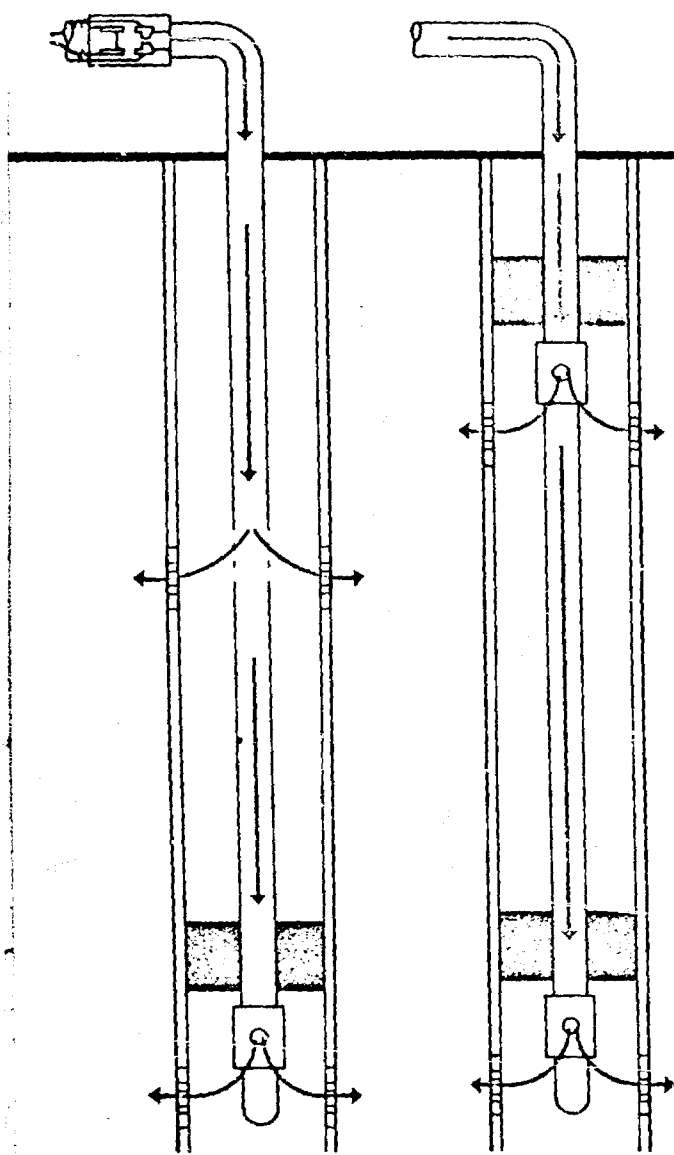
1. This project will be operated in compliance with the New Mexico Oil Conservation Commission regulations governing waterflood operations.
- ✓ 2. Duplicate copies of a monthly progress report (N.M.O.C.C. Form C-120 acceptable) are to be submitted to this office showing the volume of water injected and average pressures for the injection wells and production for the producing wells in the project area.
3. This approval does not preclude the necessity for further approval when the project is expanded to include other wells and leases or the necessity to submit the usual notices and reports on wells involved. When this project is expanded to involve other operators and interests, the correlative rights of all concerned should be considered.

Sincerely yours,


James A. Knauf
District Engineer

cc: N.M.O.C.C., Santa Fe
Roswell
Accounts

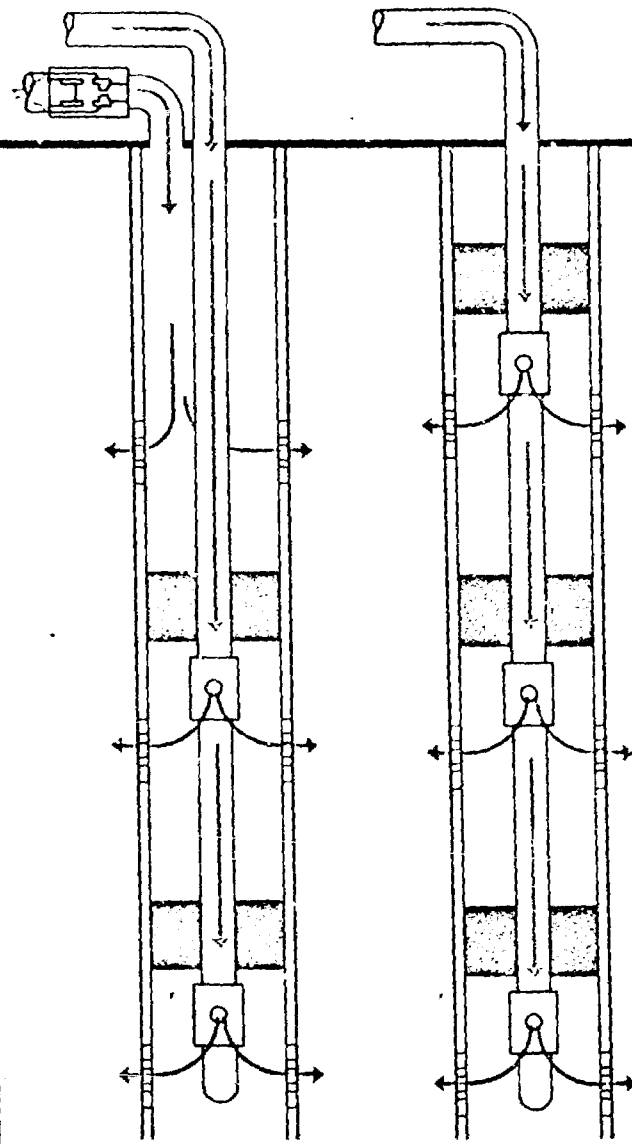
RLBeekman:mh 5/29/68



DUAL ZONE

Hookup at left shows Surface Flow Regulator controlling total flow, and Subsurface Flow Regulator controlling lower zone flow. Balance of total flow injects into upper zone at desired rate, provided that upper zone injection pressure is higher than lower. (Two Surface Regulators could also be used with one controlling flow through tubing to lower zone, the other controlling flow in annulus to upper zone.)

Hookup at right shows straightforward, two-packer, dual-zone flood.



TRIPLE ZONE

Shown are two alternate methods.

Hookup at left uses a Surface Flow Regulator for annulus injection of uppermost zone and Subsurface Regulators for lower zones.

Hookup at right uses three packers with Subsurface Regulators for each zone.

EXAMINER NUMBER
3779 H
Appl.