

THE UNIVERSITY OF CALIFORNIA
THE DIVISION OF GRAYBURN-JACKSON
INTERFLOOD PROJECT, Eddy County.

CASE No.

2909

Application,
TRANSCRIPTS,
SMALL Exhibits
ETC.



TONEY ANAYA
GOVERNOR

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

50 YEARS



1935 - 1985

March 27, 1985

POST OFFICE BOX 2084
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501
(505) 827-5800

N. H. Truitt, Area
Production Superintendent
ARCO Oil and Gas Company
P. O. Box 1710
Hobbs, New Mexico 88240

Dear Mr. Truitt:

Your letter of March 15, 1985, to Mr. Les Clements relative to temporary shut-in of Keel West Area Waterflood injection wells has been forwarded to me for reply.

As this shut-in period is for a period of one year and is for the purpose of evaluating how and if the waterflood project should be continued, this will not be considered as a shut-in period under Division Rule 705B. However, prior to April 1, 1986, ARCO must contact the supervisor of the Division's Artesia district office with a plan for restarting the project, extending the shut-in period, or the plugging of injection wells which are not to be used for injection or production.

Sincerely,

R. L. STAMETS
Director

RLS/fd

cc: Prentiss Childs
Les Clements

BEFORE THE OIL CONSERVATION COMMISSION OF THE
STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION
OF SINCLAIR OIL & GAS COMPANY FOR
APPROVAL OF A WATERFLOOD EXPANSION
PROJECT IN THE GRAYBURG-JACKSON
POOL, EDDY COUNTY, NEW MEXICO }

CASE No. 2909

ORDER No. 13

A P P L I C A T I O N

SINCLAIR OIL & GAS COMPANY, a Maine corporation with an operating office in Midland, Texas, hereby makes application for approval of a waterflood expansion project in the Grayburg-Jackson Pool, Eddy County, New Mexico, and for such application represents:

1.

That Sinclair Oil & Gas Company is the owner and operator of the following described leases located in the Grayburg-Jackson Pool, Eddy County, New Mexico:

H. E. West "A" Lease

N/2 of Section 3 and E/2 of
Section 4, Township 17-South,
Range 31-East, N.M.P.M.

H. E. West "B" Lease

S/2 of Section 3; W/2 of Sec-
tion 4; all of Sections 9 and
10, Township 17-South, Range
31-East, N.M.P.M.

Keel "A" Lease

All of Section 7, Township
17-South, Range 31-East, N.M.P.M.

Keel "B" Lease

All of Sections 5, 6 and 8,
Township 17-South, Range 31-
East, N.M.P.M.

Said leases are producing from the Grayburg and San Andres forma-
tions at the interval of 3100 feet to 3500 feet below the surface
and these are the zones proposed to be flooded. The wells in the
proposed project area are in the advance stage of depletion and
should be classified as "stripper" wells. By Commission Order No.
R-2268, dated June 21, 1962, applicant was authorized to institute
a waterflood project with the injection of water through the follow-
ing described wells in Township 17-South, Range 31-East, N.M.P.M.
and pursuant to such order, applicant has converted said wells to

DOCKET MAILED

Date 7/13-63

R

water injection wells and is injecting water currently:

West "A" Well No. 8, Unit E, Section 3
West "A" Well No. 4, Unit G, Section 4
West "A" Well No. 7, Unit A, Section 4
West "A" Well No. 9, Unit I, Section 4
West "B" Well No. 3, Unit C, Section 4
West "B" Well No. 6, Unit E, Section 4
West "B" Well No. 11, Unit K, Section 4

Applicant now seeks approval of the Commission to expand the flooding operations to include the remainder of the West "A" and "B" leases and all of the Keel "A" and "B" leases. Applicant proposes to expand the flooding operations in four (4) stages as shown on the attached plat and as set out below:

Stage 1 - Second Half of 1963:

Convert the following wells to injection wells;

West "B" Well No. 9, Unit M, Section 4
West "B" Well No. 19, Unit C, Section 10
West "B" Well No. 23, Unit K, Section 3
Keel "B" Well No. 16, Unit I, Section 5
Keel "B" Well No. 12, Unit A, Section 8
Keel "B" Well No. 13, Unit O, Section 5

Drill 1 injection well located on the
West "B" lease in Unit A of Section 9.

Stage 2 - First Half of 1964:

Convert the following wells to injection wells;

West "B" Well No. 10, Unit E, Section 9
Keel "B" Well No. 7, Unit C, Section 8
Keel "B" Well No. 8, Unit G, Section 8

Drill 1 injection well located on the
West "B" lease in Unit C of Section 9.

Stage 3 - Second Half of 1964:

Convert the following wells to injection wells;

West "B" Well No. 14, Unit K, Section 10
West "B" Well No. 17, Unit I, Section 9
Keel "B" Well No. 2, Unit M, Section 8
Keel "B" Well No. 4, Unit O, Section 8
Keel "B" Well No. 17, Unit E, Section 8
Keel "A" Well No. 5, Unit O, Section 7
Keel "A" Well No. 7, Unit L, Section 7
Keel "A" Well No. 9, Unit G, Section 7
Keel "A" Well No. 10, Unit I, Section 7
Keel "A" Well No. 12, Unit A, Section 7
Keel "A" Well No. 14, Unit D, Section 7
West "A" Well No. 1, Unit C, Section 3

15
1
Drill 2 injection wells located on the Keel "B" lease in Units I and K of Section 8; drill 1 injection well located on the West "B" lease in Unit K of Section 9.

Stage 4 - First Half of 1965:

Convert the following wells to injection wells;

11
West "A" Well No. 3, Unit A, Section 3
West "B" Well No. 24, Unit A, Section 10
West "B" Well No. 26, Unit I, Section 3
Keel "B" Well No. 1, Unit D, Section 6
Keel "B" Well No. 19, Unit J, Section 5
Keel "B" Well No. 21, Unit J, Section 6
Keel "B" Well No. 22, Unit L, Section 5
Keel "B" Well No. 25, Unit L, Section 6

11
Drill 3 injection wells located on the West "B" lease in Unit P of Section 9 and in Units I and N of Section 10.

In the event applicant is unable to convert an existing well to water injection, applicant desires permission to drill a new injection well at the same approximate location. The fluid to be injected is fresh water from the Lea County Underground Water Basin. The anticipated volumes to be injected are 300 to 400 barrels of water per day for each injection well.

2.

Attached to the original of this application and to the copy of the application being sent to the State Engineer Office is a copy of all available logs from the proposed injection wells.

3.

Attached to each copy of this application is a diagrammatic sketch of the proposed injection wells showing all casing strings including diameters, setting depths, quantities used and tops of cement, perforated or open hole intervals, tubing strings including diameters and setting depths and the type and location of packers, if any.

4.

A copy of this application complete with all attachments has been sent to the State Engineer Office, Box 1079, Santa Fe, New Mexico.

5.

Applicant proposes that the waterflood expansion project should be governed by the provisions of Rule 701 of the Commission's Rules and Regulations, including those provisions regarding allocation of allowables. Applicant also proposes to submit to the Commission monthly progress reports of the waterflood project in accordance with Rule 704 and Rule 1119 of the Commission's Rules and Regulations.

6.

Applicant further alleges that the granting of this application will prevent waste and will not impair correlative rights.

WHEREFORE, applicant prays that the Commission set this application for public hearing before an Examiner in Santa Fe, New Mexico, that notice be issued according to law and that upon hearing, said waterflood expansion project be authorized by the Commission.

HORACE N. BURTON
P. O. Box 1470
Midland, Texas

GILBERT, WHITE AND GILBERT

DOCKET MAILED

Date 9-13-63
[Signature]

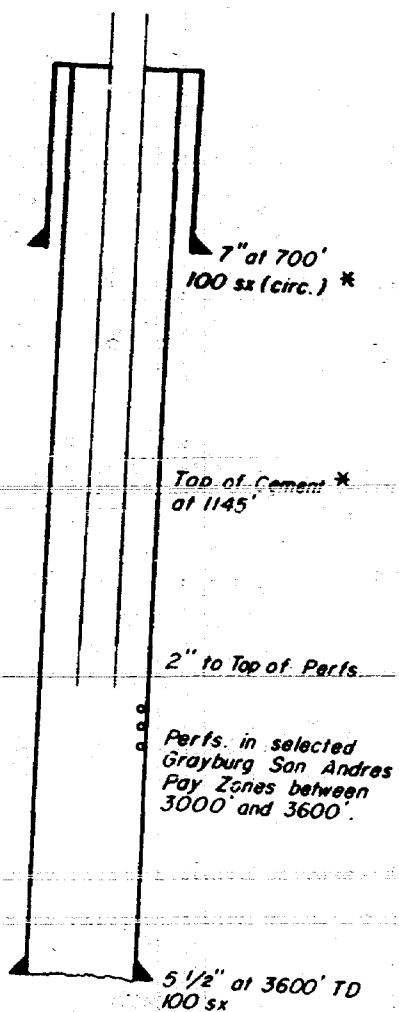
By

[Signature]

Bishop Building
Santa Fe, New Mexico

ATTORNEYS FOR APPLICANT

TYPICAL COMPLETION OF WELL DRILLED FOR INJECTION



* Theoretical Fillup

SINCLAIR OIL & GAS CO.	
MIDLAND, TEXAS	
PROPOSED INJECTION WELLS	
KEEL - WEST WATERFLOOD PROJECT	
GRAYBURG - JACKSON POOL	
Eddy County, New Mexico	
DRAWN BY <u>RPG</u>	CHECKED BY <u>RMA</u> DATE <u>8/22/63</u>
NO SCALE	REVISED _____

GOVERNOR
JACK M. CAMPBELL
CHAIRMAN

State of New Mexico
Oil Conservation Commission



LAND COMMISSIONER
E. S. JERRY WALKER
MEMBER

P. O. BOX 871
SANTA FE

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

October 18, 1963

Mr. Charlie White
Gilbert, White & Gilbert
Attorneys at Law
Post Office Box 787
Santa Fe, New Mexico

Re: Case No. 2868
Order No. A-2868-A
Applicant:
Sinclair Oil & Gas Company

Dear Sir:

Enclosed herewith are ⁽¹⁾two copies of the above-referenced
Commission order recently entered in the subject case.

Very truly yours,

A. L. Porter, Jr.

A. L. PORTER, Jr.
Secretary-Director

ix/

Carbon copy of order also sent to:

Hobbs OCC X

Artesia OCC X

Antec OCC

OTHER

Alluvial Computation

Memo

From
D. S. NUTTER
CHIEF ENGINEER

To
Present development
1940 acre units 778

Completion Stage I
3740 acre units 1554

Completion Stage II
4240 acre units 1764

Completion Stage III
6840 acre units
+ one unit with wells 2912

Completion Stage IV
8140 acre units
+ one unit w/ 2 wells 3458

DRAFT

JMD/esr
October 11, 1963

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. 2909

Order No. R-2268-A

APPLICATION OF SINCLAIR OIL & GAS
COMPANY FOR THE EXTENSION OF A
WATERFLOOD PROJECT, EDDY COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on September 25, 1963, at Santa Fe, New Mexico, before Daniel S. Nutter, Examiner duly appointed by the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," in accordance with Rule 1214 of the Commission Rules and Regulations.

NOW, on this day of October, 1963, the Commission, a quorum being present, having considered the application, the evidence adduced, and the recommendations of the Examiner, Daniel S. Nutter, 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 by Order No. R-2268 dated June 21, 1962, the Commission authorized Sinclair Oil & Gas Company to institute a waterflood project in the Grayburg-Jackson Pool with the injection of water through seven wells in Township 17 South, Range 31 East, NMPM, Eddy County, New Mexico.
- (3) That the applicant, Sinclair Oil & Gas Company, seeks authority to expand its ~~Grayburg-Jackson~~ ^{Kel-West} Waterflood Project ~~approved by Order No. R-2268~~ ^{in the Grayburg-Jackson Pool} in four separate stages.
- (4) That an administrative procedure should be established whereby wells may be converted to injection by stages rather than after experiencing substantial response to water injection as required by Rule 701-E (5).

(5) That approval of the subject application will not alter the manner in which allowable will be assigned to the waterflood project area under the provisions of Rule 701.

(6) That approval of the subject application will afford the applicant greater operating conveniences, and that expansion of the waterflood project should result in the recovery of otherwise unrecoverable oil, thereby preventing waste.

(7) That the applicant should not be authorized to utilize any casing or tubing program ~~that has not been approved by the Commission and the State Engineer for use~~ in expansion of the waterflood project *unless approval has been obtained or is obtained from the Commission and the State Engineer.*

IT IS THEREFORE ORDERED:

(1) That the applicant, Sinclair Oil & Gas Company, is hereby authorized to expand its Keel-West Waterflood Project in the Grayburg-Jackson Pool in Township 17 South, Range 31 East, NMPM, Eddy County, New Mexico, in four stages as follows:

COMMENCED PRIOR TO
STAGE I - TO BE COMPLETED AFTER DECEMBER 31, 1963

Convert the following wells to injection wells;

West "B" Well No. 9, Unit M, Section 4
West "B" Well No. 19, Unit C, Section 10
West "B" Well No. 23, Unit K, Section 3
Keel "B" Well No. 16, Unit I, Section 5
Keel "B" Well No. 12, Unit A, Section 8
Keel "B" Well No. 13, Unit O, Section 5

Drill 1 injection well located on the
West "B" lease in Unit A of Section 9.

COMMENCED COMPLETION OF
STAGE II - TO BE COMPLETED SUBSEQUENT TO STAGE I
BUT NOT PRIOR TO AND AFTER JUNE 30, 1964 DECEMBER JANUARY 1, 1964

Convert the following wells to injection wells;

West "B" Well No. 10, Unit E, Section 9
Keel "B" Well No. 7, Unit C, Section 8
Keel "B" Well No. 8, Unit G, Section 8

Drill 1 injection well located on the
West "B" lease in Unit C of Section 9.

COMMENCED COMPLETION OF
STAGE III - TO BE COMPLETED SUBSEQUENT TO STAGE II
BUT NOT PRIOR TO AND AFTER DECEMBER 31, 1964 TO JUNE 30 JULY 1, 1964

Convert the following wells to injection wells;

West "B" Well No. 14, Unit K, Section 10
West "B" Well No. 17, Unit I, Section 9
Keel "B" Well No. 2, Unit M, Section 8
Keel "B" Well No. 4, Unit O, Section 8

Keel "B" Well No. 17, Unit E, Section 8
Keel "A" Well No. 5, Unit O, Section 7
Keel "A" Well No. 7, Unit L, Section 7
Keel "A" Well No. 9, Unit G, Section 7
Keel "A" Well No. 10, Unit I, Section 7
Keel "A" Well No. 12, Unit A, Section 7
Keel "A" Well No. 14, Unit D, Section 7
West "A" Well No. 1, Unit C, Section 3

Drill 2 injection wells located on the Keel "B" lease in Units I and K of Section 8; drill 1 injection well located on the West "B" lease in Unit K of Section 9.

~~STAGE IV - TO BE COMPLETED SUBSEQUENT TO STAGE III~~
~~NOT NOT FROM AND AFTER JUNE 30, 1965 TO JANUARY 1, 1965~~

Convert the following wells to injection wells;

West "A" Well No. 3, Unit A, Section 3
West "B" Well No. 24, Unit A, Section 10
West "B" Well No. 26, Unit I, Section 3
Keel "B" Well No. 1, Unit D, Section 6
Keel "B" Well No. 19, Unit J, Section 5
Keel "B" Well No. 21, Unit J, Section 6
Keel "B" Well No. 22, Unit L, Section 5
Keel "B" Well No. 25, Unit L, Section 6

Drill 3 injection wells located on the West "B" lease in Unit P of Section 9 and in Units I and N of Section 10.

(2) That the applicant is hereby authorized to drill and substitute injection wells for the injection wells authorized above provided the substitute well will be drilled at a standard location in the same 40-acre tract as the well it is to replace, the usual forms to obtain approval to drill a well are filed with the Commission, and the applicant notifies the Commission in writing of the proposed substitution.

(3) That the applicant shall not utilize any casing or tubing program in expansion of the waterflood project as approved by this order unless the Commission and the State Engineer have approved ~~of the~~ said casing or tubing program.

(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.

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

October 21, 1963

C
O
P
Y
Mr. Charles C. White
Gilbert, White & Gilbert
Attorneys at Law
Post Office Box 787
Santa Fe, New Mexico

Dear Sir:

Reference is made to Commission Order No. B-2200-A entered by the Commission on October 17, 1963, which authorized Sinclair Oil & Gas Company to expand its Neal-Wheat Waterflood Project in the Grayburg-Jackson Pool in four separate stages.

According to our calculations, when all of the authorized injection wells in each stage have been placed on active injection, the maximum allowable which the project will be eligible to receive under the provisions of Rule 701-B-3 will be as follows:

Present Development	19 40-acre tracts	798 BOPD
Completion Stage I	37 40-acre tracts	1554 BOPD
Completion Stage II	42 40-acre tracts	1764 BOPD
Completion Stage III	68 40-acre tracts plus one unit with two wells	2912 BOPD
Completion Stage IV	81 40-acre tracts plus one unit with two wells	3458 BOPD

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.

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

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C
O
P
Y

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 substitution, 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. FURBER, Jr.
Secretary-Director

AMF/ir

cc: Oil Conservation Commission
Artesia, New Mexico

Case File No. 2909

DOCKET: EXAMINER HEARING - WEDNESDAY - SEPTEMBER 25, 1963

9:00 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

The following cases will be heard before Daniel S. Nutter, or Elvis A. Utz, as alternate examiner:

- CASE 2883: (Continued from the August 21st examiner hearing)
Application of Pan American Petroleum Corporation for an unorthodox location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to drill a Tubb gas, Blinebry oil and Paddock gas triple completion, Fowler Field, at an unorthodox location for the Fowler Blinebry Oil Pool 990 feet from the South line and 1650 feet from the East line of Section 15, Township 24 South, Range 37 East, Lea County, New Mexico.
- CASE 2901: Application of Pan American Petroleum Corporation for an unorthodox location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks permission to drill its SMU Well No. 17 at an unorthodox location 1980 feet from the North line and 1980 feet from the East line of Section 15, Township 24 South, Range 37 East, Fowler Ellenburger Pool, Lea County, New Mexico.
- CASE 2902: Application of Pioneer Production Corporation for compulsory pooling, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks an order force-pooling all mineral interests in the Blanco Mesaverde and Basin-Dakota Gas Pools underlying the S/2 of Section 28, Township 30 North, Range 12 West, San Juan County, New Mexico.
- CASE 2903: Application of Coastal States Gas Producing Company for a dual completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the dual completion (conventional) of its Gulf State Well No. 1, located in Unit F of Section 20, Township 17 South, Range 36 East, Lea County, New Mexico, to produce oil from the Double-A Abo Pool and an undesignated Lower Leonard pool through parallel strings of tubing.
- CASE 2904: Application of Coastal States Gas Producing Company for the creation of a new Abo Pool and special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new oil pool for Abo production in Sections 15 and 16, Township 9 South, Range 33 East, Lea County, New Mexico, and for the establishment of temporary rules therefor, including provisions for 80-acre spacing and fixed well locations.
- CASE 2905: Application of Robert N. Enfield for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the West Indian Basin Unit Area comprising 4,278.29 acres of Federal, State and fee lands in Township 21 South, Range 23 East, Eddy County, New Mexico.
- CASE 2906: Application of Western Oil Fields, Inc. for a quadruple completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the quadruple completion (tubingless) of its Gulf Hill No. 4 located in Unit S of Section 4, Township 21 South, Range 37 East, Lea County, New Mexico, to produce oil from the Penrose-Skelly, Tubb, Drinkard and Wantz Abo

Pools, through parallel strings of 2 7/8 inch casing cemented in a common well bore.

CASE 2907: Application of Penroc Oil Corporation for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order force-pooling all mineral interests in the Indian Hills-Upper Pennsylvanian Gas Pool underlying Section 19, Township 21 South, Range 24 East, Eddy County, New Mexico.

CASE 2908: Application of Penroc Oil Corporation for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order force-pooling all mineral interests in the Morrow section of the Pennsylvanian formation underlying Section 19, Township 21 South, Range 24 East, Indian Hills Field, Eddy County, New Mexico.

CASE 2909: Application of Sinclair Oil & Gas Company for the extension of a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to expand its Grayburg-Jackson Waterflood Project, Grayburg Jackson Pool, Eddy County, New Mexico, by the injection of water into 7 additional wells located in Sections 3, 4, 5, 8, 9, and 10, Township 17 South, Range 31 East. Applicant further seeks an administrative procedure for further expansion of the project by the conversion to water injection of 30 additional wells in three 6-month stages commencing in early 1964, said wells to be located in Sections 3, 5, 6, 7, 8, 9 and 10 of said township.

CASE 2910: Application of Big (6) Drilling Company for extension of an existing oil pool and special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the extension of the Scharb Bone Spring Oil Pool to comprise the W/2 of Section 5, all of Section 6, and the N/2 of Section 7, Township 19 South, Range 35 East, Lea County, New Mexico, and for special rules therefor, including 80-acre spacing and proration units to comprise any two contiguous 40-acre tracts, and for fixed well locations.

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
SEPTEMBER 25, 1963

EXAMINER HEARING

IN THE MATTER OF:

Application of Sinclair Oil & Gas Company
for extension of a waterflood project,
Eddy County, New Mexico, Grayburg-Jackson
Waterflood Project, Grayburg-Jackson Pool,
Eddy County, New Mexico.

Case No. 2909

BEFORE:

DANIEL S. NUTTER, EXAMINER

TRANSCRIPT OF HEARING

DEARNLEY-MEIER REPORTING SERVICE, Inc.

FARMINGTON, N. M.
PHONE 328-1182

SANTA FE, N. M.
PHONE 963-3971

ALBUQUERQUE, N. M.
PHONE 243-8991

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
September 25, 1963.

EXAMINER HEARING

IN THE MATTER OF:

Application of Sinclair Oil & Gas
Company for extension of a waterflood
project, Eddy County, New Mexico, Grayburg-
Jackson Waterflood Project, Grayburg-
Jackson Pool.

CASE NO. 2909

BEFORE:

DANIEL S. NUTTER, EXAMINER

TRANSCRIPT OF HEARING

MR. NUTTER: Call Case 2909.

MR. DURRETT: Application of Sinclair Oil & Gas Company
for the extension of a waterflood project, Eddy County, New Mexico.

MR. WHITE: Charles White of Santa Fe, New Mexico,
appearing on behalf of Sinclair. We have one witness.

(Witness sworn)

DOUGLAS W. CUNNINGHAM,
called as a witness herein, having been first duly sworn on oath,
was examined and testified as follows:

DIRECT EXAMINATION

BY MR. WHITE:

DEARNLEY, MEIER, WILKINS and CROWNOVER

General Court Reporting Service

Suite 1120 Simms Building Albuquerque, New Mexico Phone 243-6691



DEARNLEY, MEIER, WILKINS and CROWNOVER

General Court Reporting Service

Suite 1120 Simms Building Albuquerque, New Mexico Phone 243-6691

Q Will you state your name?

A My name is Douglas W. Cunningham.

Q By whom are you employed?

A Employed by Sinclair Oil & Gas Company as Petroleum Engineer.

Q Are you or have you testified previously before the Oil Conservation Commission?

A Yes, sir, I have.

Q Have your qualifications as a petroleum engineer been accepted?

A Yes, sir, they have.

Q Will you briefly state what Sinclair proposes by the subject application?

A Sinclair is proposing and requesting to be allowed, to expand the waterflood, which we have designated as our Keel-West Waterflood, in four stages of expansion rather than by the method whereby we must save kick in production before we can flood a well.

Q Is Sinclair currently conducting a waterflood program on the sub leases?

A Yes, sir. On June 21, 1962, Order Number R-2268, authorized Sinclair to start a waterflood on the H. E. West A-B leases.

Q Now, refer to Exhibit Number One, continue on it, please?

A Exhibit One is the map which was attached to the application. It shows in different colors the states of expansion that



DEARNLEY, MEIER, WILKINS and CROWNOVER

General Court Reporting Service

Suite 1120 Simms Building Albuquerque, New Mexico Phone 243-6691

Sinclair is proposing. The red indicates the second half of the 1963 expansion, and green, one half the '64 expansion. The gold or yellow, the second half of the 1964, and the blue, the 1965 expansion.

Q Would you point out where the present waterflood project is?

A Yes. The present waterflood project is the double five spot, with seven injection wells located on the H. E. West A and H. E. West B lease, in Section Four. H. E. West A wells are No. 7, No. 4, No. 9, No. 8.

Q Is that in effect, reflected in Order R-2268?

A Yes, sir.

MR. WHITE: If the Examiner please, we at this time would like to request that the examiner take administrative notice of the testimony and exhibits in Case 2576, upon which Order R-2268 is based.

MR. NUTTER: The testimony in the record in Case No. 2576 will be incorporated by reference in this case and notice taken thereof.

Q (By Mr. White) The wells you intend to convert into water injection stripper wells?

A Yes.

Q Do you have any information to support this classification?

A Well, the average production for July, 1963 on the Keel A lease, which is Section 7 there in 17 South and 33 East, was 5.5



barrels of oil per day per well. On the Keel B, which is Section 5, 6 & 8, the average production during July, 1963 was 2.3 barrels of oil per day per well. And the wells on the West A and the B lease, which are outside the present waterflood project here, the West A well averaged 2.6 barrels of oil per day and the West B well averaged 5.- -

Q Should you be unable to convert designated wells into injection wells, what relief do you desire?

A We request permission, the Commission to grant us permission to drill a well in the same approximate location.

Q What is the anticipated volume of water you expect to inject into each well?

A Initially, we inject to - - from three to 400 barrels per day per well in the injection wells. We fill it up and check it. The injection rate will be decreased to approximately 260 barrels of water per day.

Q What will be your source of injection fluid?

A We are obtaining water for our flood from the Lea County Water Basin, which is in the vicinity of our lease. We have water rights appropriated from the State there in the amount of about 1200 acre feet per year. We have constructed a pipe line, about 12½ mile pipe line up to our water rights, and we are presently bringing in water down to our plant here, located at the present waterflood area here.

Q That is fresh water?

DEARNLEY, MEIER, WILKINS and CROWNOVER

General Court Reporting Service

Suite 1120 Simms Building Albuquerque, New Mexico Phone 243-6691



DEARNLEY, MEIER, WILKINS and CROWNOVER

General Court Reporting Service

Suite 1120 Simms Building

Albuquerque, New Mexico

Phone 243-6691

A Yes, that is fresh water.

Q Will you refer to what has been marked Exhibit Two, and is that the same exhibit as was attached to your application, and if not, will you point out what distinction or what variance there might be?

A Exhibit Two shows the present completion and casing program and tubing program on the proposed injection wells in the section, half of the 1963 expansion. This exhibit was attached to our application, however, we have subsequently found that there was one mistake on the exhibit. The original exhibit that we distributed had the Keel B-6, that is the first well on the left-hand side, as a proposed injection well. Actually, that should have been the Keel B-16. The revised exhibit, Exhibit Two, that we have distributed here at the hearing has the correct data and the correct well name, Keel B-16.

O All right, sir.

MR. WHITE: If the Examiner please, we would like to substitute Two in place of the attached exhibit on the application.

MR. NUTTER: Very well.

Q (By Mr. White) Mr. Cunningham, now, will you explain Exhibit Two through Six, collectively, please?

A Yes, sir. Exhibit Two through Six, and as I have stated, show the present completions of the proposed injection wells. These are more or less self explanatory. I only wish to make a note on the Exhibit Number Four, which is the second half of the



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1964 Expansion. The Keel A-10 shown in the approximate center of the exhibit there, is presently a Friend producer. It is producing from the Friend Oil Pool. The Grayburg-Jackson is plugged off with a bridge plug. By the time we get to it, around in the second half of the '64, converting this well to the injection, it will depend on what the well is producing from the Friend formation. We will want to make this well a dual project, or - Pardon, injector-producer, producing from the Friend, and injecting into the Grayburg-Jackson. If the well is significantly down in production at that time, then, we will probably just squeeze off the Friend completion, and go ahead and make it a single injector, into the Grayburg-Jackson.

MR. NUTTER: What well is that again?

A Keel A-10. Also, in that respect, the West A-1, which is shown on the map, shows the proposed program, if we are able to get back into this well, which was originally completed and plugged and abandoned.

Q (By Mr. White) There are apparently three strings of casing in the hole now shot off below the surface of the ground.

A In looking at it some, it may be impossible for us to get into that well, which case we have asked for permission to be allowed to drill another injection well at that approximate same location.

Q Is it possible you may want to put packers in some of the wells?



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A Yes, sir. The wells are on the present exhibit are the present completion of wells as producers and we convert to injection on these wells, may be possible that we may want to put one more packer on the well.

Q In your opinion, will fresh water in the area be adequately protected from contamination?

A Yes, sir. Fresh water on the area is found at the depth of two to four hundred feet. These depths have been cased off in all proposed injection wells by the surface casing, which cement will circulate into surface. In addition, we are injecting actually fresh water and I am almost certain that the water we are injecting is comparable to - - in quality to any water that may be found in the fresh water any way.

Q Has a copy of the application and- - together with the attachments been sent to the State Engineer's office?

A Yes, sir.

Q Is the present waterflood program, which you have undertaken, does it indicate that it might be successful?

A Yes, sir. We have had an increase, a significant increase in oil production.

Q Is that shown by Exhibit Seven?

A Yes, sir. Exhibit Seven is a project area performance curve of the producing wells in the present project area. The green curve on the graph is the water production per month. Red curve is the oil production. The dotted curve is the gas production,



and the curve at the top of the graph there is the water injection. You can see that the water injection was started in the middle of September of 1962, and in March and April of 1963, we had a significant increase in oil production from the project area. During July the project area was producing approximately 8,300 barrels per month.

Q If the Commission sees fit to grant your application and make an exception to Rule 701, will any economic waste be prevented? If so, explain?

A Yes, sir. As I have already stated, we have laid a water line from the Lea County water basin to supply ourselves with water. Initially, we purchased water from Newmont Oil Company, who had a flood to the north of our acreage here. They provided us with water for four or five months. Then, we could see that we were going to need a quite large amount of water to flood this eight sections project area. In addition to this eight section project area, we intend to extend to the south, shown in Section 18 and Section 20. Our Russell lease, or Turner A and Turner B lease are more wells that we have completed in the Grayburg-Jackson Pool. And within the next, say, six or seven years, we intend to expand the flood on down to those wells, so we needed a large supply of injection water. We laid this line at the approximate cost of \$250,000.00 and right now, if we are forced to stick to 701, and only expand when we get an increase on an offset well, we are going to have that large investment sitting there and not

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being used. And we believe that we will make quicker use of our \$250,000.00 investment, if we are allowed to expand in this area in stages as shown on Exhibit One.

Q You anticipate in the overall waterflood project as expanded to exceed the allowable as provided by Rule 701?

A No. At the peak rate of production, which will occur approximately in 1968, waterflood area will produce 34 barrels of oil per day per well.

Q Would this prevent waste and protect correlative rights?

A Yes, sir.

Q Were the exhibits prepared by you?

A Yes, sir, they were.

Q At this time we offer Exhibits One through Seven.

MR. NUTTER: Sinclair's Exhibits One through Seven will be admitted in evidence.

MR. WHITE: Do you have anything further you care to add to the case?

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

MR. IRBY: Frank Irby, State Engineer's office. Mr. Cunningham, in response to Mr. White's question, you said that the packers would possibly be used in certain instances. Now, is this to confine the water to the formation which you are injecting into?

A Yes, sir. And also to give us a better water injection. In other words, we will get more water injection below a packer than

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we had casing all the way up. Water moves to the surface there.

MR. IRBY: And approximately what is your injection pressure, what will your injection pressures be?

A I believe our plant is designed to go by 1300 pounds, Mr. Irby. Right now, I don't believe our pressures are that high. Our plant must be designed for a greater pressure than average injection pressures. At this time, it is approximately 2,000 pounds.

MR. IRBY: Do you anticipate that will be your maximum?

A I would say it would be 2500 probably.

MR. IRBY: 2500. Now, as I understood you before, if your pressures are sufficient to raise the flood level to the top of the well, you intend to put packers on the end of your tubing?

A we intend to put packers on our tubing, yes, sir. The seven wells that we have converted so far all have packers.

MR. IRBY: And as I understand you, now, it is your intention to put packers on all of them?

A Yes, sir. One or more. In other words, we may inject into the Grayburg-San Andres formation, not all in one section, but we might pack part of it over and inject down one string of tubing into part of the formation, and inject down another string of tubing into another formation.

MR. IRBY: Those are differences in porosity?

A Yes, sir. Try to balance our flood better.

MR. IRBY: Now, do you plan to put any fluid between the tubing and the casing?

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A It may be that we would want to, yes, sir. In that case we may desire to have - -

MR. IRBY: Will your produced water be recycled?

A Yes, sir, sure will.

MR. IRBY: Now, in Case 2576, of which this is an expansion- -

A Yes, sir.

MR. IRBY: --you testified that all the surface casing was cemented into the anhydrite or red shell. Is that true of these wells we are talking about today?

A Yes, sir, I believe it is. I certainly do.

MR. IRBY: That is all I have. Thank you.

EXAMINATION

BY MR. NUTTER:

Q Mr. Cunningham, what is the section or sections location of the water supply wells 12½ miles away, do you know where those water rights are and where the wells are?

A Yes, sir, I do. The section is Section 31 of Township 15 South, Range 32 East, in Lea County. Now, our rights, to my understanding, apply over the entire township there.

Q But, you wells are in Section 31?

A Our wells at the present time are in Section 31. We may have one in the diagonal section there.

Q What size of a line is that that runs across there?

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A It has two sizes of pipe. On the water line itself, 10 3/4 and eight inch, or approximately eight and a quarter, or something, the lateral supply line, and then, from the water supply wells themselves are 4 1/2, I believe.

Q Now, for that well that you stated might be a dual completion, to produce from the Friend and inject into the Grayburg-Jackson, you realize that you have to have approval, separate approval as a dual completion for that well, if that would be the case?

A Yes, sir. Yes, sir. We don't know at the present time whether we will want it that way, or not. We will have to handle it administratively, I hope. Is it possible that we could?

Q I don't believe there is provision for administrative approval.

A Well, we will ask for a hearing.

Q We might see you up here on a hearing?

A Certainly will.

Q You have not prepared any production estimate by stages here; you haven't offered them at any rate. Do you know what your rate of production will be in these various stages of development, as you go along?

A Mr. Nutter, I have prepared a curve which is the estimated production from the entire expanded flood which I will be glad to submit as an exhibit, if you so desire.

Q Now, it shows- - It is the production estimate of the



flood as it exists from stage to stage?

A Not from stage to stage, but in total.

Q Well, as time goes on, it would be taken in additional stages?

A Yes, sir, that is correct.

Q We would like to have it as an exhibit, Mr. Cunningham, if you would testify to it and explain the rate of your production as you proceed. I have this numbered as Exhibit Number Eight.

A It reflects the estimate that I testified earlier that at peak rate, which occurs in 1966, the water flood area, it will be producing at 34.3 barrels per day per project well. The actual calculation for this prediction was made by our reservoir engineering section. Of course, there is quite a bit of guess work that went into the preparation of this curve. You will notice in 1963, the actual production is graphed and it looks like it would fit the predictions fairly well. What was done on this, the oil recoverable recovery, waterflood oil, for each stage of expansion, was calculated and then, he estimated that 33 percent of that oil would be produced at top allowable rate, or 42 barrels of oil per day per well. Then, he estimated at the end of the live, or economic limits, or all those wells would be five barrels of oil per day per well, at which time we will be lifting a considerable amount of water for oil production. That is another reason for five. Then, he went backward and calculated the decline rate during that time, and he added all of those expanded calculations then, and put them on one

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curve and then, through a smooth curve, through it, which results in Exhibit Number Eight.

MR. WHITE: This exhibit was not prepared by you?

A Not actually by me, no, sir. He did the work for me.

Q (By Mr. Nutter) Peak rate then would be 1966. I believe you might have said 1968.

A I believe I did. I was two years in error at that time. In other words, the peak rate will occur after the entire thing has been expanded there.

Q What is the present rate of production in your project area? You are up to about 8,000 barrels per month now. What is-

A Individually you are talking about?

Q Yes.

A I have a Form C-120 for July, which showed the Keel B-9 which is the direct offset for our injection well, West B-6, produced 60 barrels of oil during July. Keel B-16 produced 60 barrels of oil, and West A-2, three wells, on our project as one, 5,460. H. E. West A-2, 149. That well is enclosed in the five spot. H. E. West No. 6, 1358 barrels. The H. E. West A-10, 55 barrels. H. E. West B lease, Number Four, 85 barrels. Number Five, 296 barrels. Number Seven, 83 barrels, Number 9, 83 barrels, Number 16, 143 barrels, Number 23, 358 barrels, and our total oil from tubing on the waterflood is 8,290 barrels.

Q Actually, your biggest well is your West A-2, isn't it?

A Yes, sir, it is. It is the well which has responded best

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to the flood at this date.

Q Are there any other questions of Mr. Cunningham?

MR. DURRETT: Yes, sir. Mr. Cunningham, did I understand that you desire the order to permit a producer at any proposed injection location, if you can't convert it?

A No, sir. An injection well, if we can't convert to an injection at the existing location, shown on the exhibit one, we want to be able to drill an injection at that location.

MR. DURRETT: I see. If you can't convert it to an injection well, you want to drill one?

A Yes, sir. We have two or three that were plugged and abandoned. It is possible we may not be able to get back into the hole, but if we don't get back in it, we don't -- we want to drill a well to keep the flood balanced.

MR. NUTTER: The substitute well would be a standard location, as far as lines, or 40 acre lines?

A Yes, sir. Producing wells, which we will have some to drill. If you look closely at Exhibit One, you would see the five spot there, that don't have producer on it, but they will handle it by the normal channels of forms in any case.

MR. DURRETT: All right. Thank you.

MR. NUTTER: Are there any other questions.

MR. IRBY: On these substitute wells, Mr. Cunningham, the general construction program with regard to casing and cementing and so forth will be as indicated for the other wells; is that correct?

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A Yes, sir. And we submitted an exhibit which, I believe, is Number Six, showed the casing program, or a typical well tubing drilled and it was in essence the same as what has -- will be done on the injection wells that we are going to convert.

MR. IRBY: Thank you.

MR. NUTTER: Are there any other questions of Mr. Cunningham? He may be excused. Do you have any further, Mr. White?

MR. WHITE: Nothing further. I offer Exhibit Eight. I thought it would be automatically admitted since you requested it.

MR. NUTTER: Do you want to offer Exhibit Number Eight for the record, Mr. White?

MR. WHITE: Yes, sir.

MR. NUTTER: Does anyone have anything they wish to offer? Take the case under advisement. The hearing is adjourned.

* * * * *

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STATE OF NEW MEXICO X

COUNTY OF BERNALILLO I

I, ROY D. WILKINS, 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 of Office, this 18th day of November, 1963.

Roy D. Wilkins
NOTARY PUBLIC

My Commission Expires:
September 6, 1967.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 2909 heard by me on 9/25, 1963.
[Signature], Examiner
New Mexico Oil Conservation Commission

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**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. 2909
Order No. R-2268-A**

**APPLICATION OF SINCLAIR OIL & GAS
COMPANY FOR THE EXTENSION OF A
WATERFLOOD PROJECT, EDDY COUNTY,
NEW MEXICO.**

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on September 25, 1963, at Santa Fe, New Mexico, before Daniel S. Nutter, Examiner duly appointed by the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," in accordance with Rule 1214 of the Commission Rules and Regulations.

NOW, on this 17th day of October, 1963, the Commission, a quorum being present, having considered the application, the evidence adduced, and the recommendations of the Examiner, Daniel S. Nutter, 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 by Order No. R-2268 dated June 21, 1962, the Commission authorized Sinclair Oil & Gas Company to institute a waterflood project in the Grayburg-Jackson Pool with the injection of water through seven wells in Township 17 South, Range 31 East, NMPM, Eddy County, New Mexico.

(3) That the applicant, Sinclair Oil & Gas Company, seeks authority to expand its East-West Waterflood Project in the Grayburg-Jackson Pool in four separate stages.

(4) That an administrative procedure should be established whereby wells may be converted to injection by stages rather than after experiencing substantial response to water injection as required by Rule 701-E (5).

(5) That approval of the subject application will not alter the manner in which allowable will be assigned to the waterflood project area under the provisions of Rule 701.

CASE No. 2909
Order No. R-2268-A

(6) That approval of the subject application will afford the applicant greater operating conveniences; that expansion of the waterflood project should result in the recovery of otherwise unrecoverable oil, thereby preventing waste.

(7) That the applicant should not be authorized to utilize any casing or tubing program in expansion of the waterflood project unless approval has been obtained or is obtained from the Commission and the State Engineer.

IT IS THEREFORE ORDERED:

(1) That the applicant, Sinclair Oil & Gas Company, is hereby authorized to expand its Keel-West Waterflood Project in the Grayburg-Jackson Pool in Township 17 South, Range 31 East, Huerfano, Elbert County, New Mexico, in four stages as follows:

STAGE I - TO BE COMMENCED PRIOR TO DECEMBER 31, 1963

Convert the following wells to injection wells;

West "B" Well No. 9, Unit M, Section 4
West "B" Well No. 19, Unit C, Section 10
West "B" Well No. 23, Unit K, Section 3
Keel "B" Well No. 16, Unit I, Section 5
Keel "B" Well No. 12, Unit A, Section 8
Keel "B" Well No. 13, Unit O, Section 5

Drill 1 injection well located on the West "B" lease in Unit A of Section 9.

STAGE II - TO BE COMMENCED SUBSEQUENT TO COMPLETION OF STAGE I BUT NOT PRIOR TO JANUARY 1, 1964

Convert the following wells to injection wells;

West "B" Well No. 10, Unit E, Section 9
Keel "B" Well No. 7, Unit C, Section 8
Keel "B" Well No. 8, Unit G, Section 8

Drill 1 injection well located on the West "B" lease in Unit C of Section 9.

STAGE III - TO BE COMMENCED SUBSEQUENT TO COMPLETION OF STAGE II BUT NOT PRIOR TO JULY 1, 1964

Convert the following wells to injection wells;

West "B" Well No. 14, Unit K, Section 10
West "B" Well No. 17, Unit I, Section 9
Keel "B" Well No. 2, Unit M, Section 8

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Keel "B" Well No. 4, Unit O, Section 8
Keel "B" Well No. 17, Unit E, Section 8
Keel "A" Well No. 5, Unit O, Section 7
Keel "A" Well No. 7, Unit L, Section 7
Keel "A" Well No. 9, Unit G, Section 7
Keel "A" Well No. 10, Unit I, Section 7
Keel "A" Well No. 12, Unit A, Section 7
Keel "A" Well No. 14, Unit D, Section 7
West "A" Well No. 1, Unit C, Section 3

Drill 2 injection wells located on the Keel "B" Lease in Units I and K of Section 8; drill 1 injection well located on the West "B" lease in Unit K of Section 9.

STAGE IV - TO BE COMMENCED SUBSEQUENT TO COMPLETION OF STAGE III NOT LATER THAN TO JANUARY 1, 1965

Convert the following wells to injection wells:

West "A" Well No. 3, Unit A, Section 3
West "B" Well No. 24, Unit A, Section 10
West "B" Well No. 26, Unit I, Section 3
Keel "A" Well No. 1, Unit D, Section 6
Keel "B" Well No. 19, Unit J, Section 5
Keel "B" Well No. 21, Unit J, Section 6
Keel "B" Well No. 22, Unit L, Section 5
Keel "B" Well No. 25, Unit L, Section 6

Drill 3 injection wells located on the West "B" lease in Unit P of Section 9 and in Units I and K of Section 10.

(2) That the applicant is hereby authorized to drill and substitute injection wells for the injection wells authorized above provided the substitute well will be drilled at a standard location in the same 40-acre tract as the well it is to replace, the usual forms to obtain approval to drill a well are filed with the Commission, and the applicant notifies the Commission in writing of the proposed substitution.

(3) That the applicant shall not utilize any casing or tubing program in expansion of the waterflood project as approved by this order unless the Commission and the State Engineer have approved said casing or tubing program.

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

-4-

CASE No. 2909
Order No. R-2268-A

DONE at Santa Fe, New Mexico, on the day and year herein-
above designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Jack M. Campbell

JACK M. CAMPBELL, Chairman

E. S. Walker

E. S. WALKER, Member

A. L. Porter, Jr.

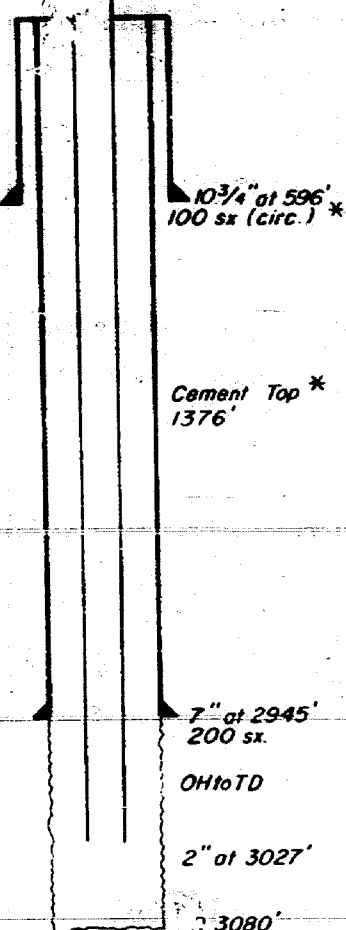
A. L. PORTER, JR., Member & Secretary

202/

FIRST HALF 1964 EXPANSION

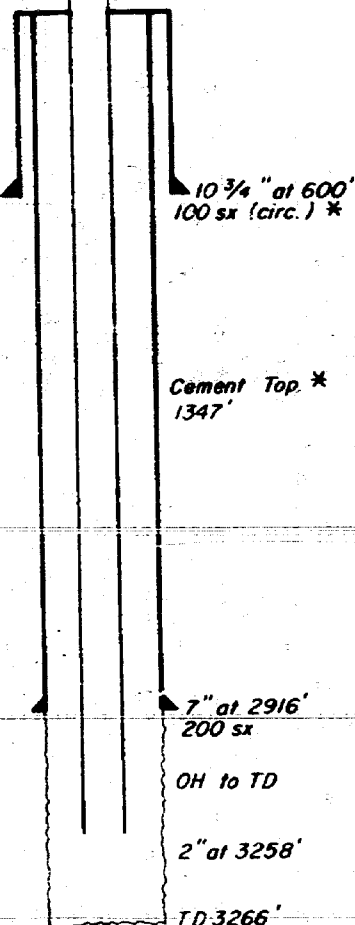
Keel B-8

Comp. 3/12/51



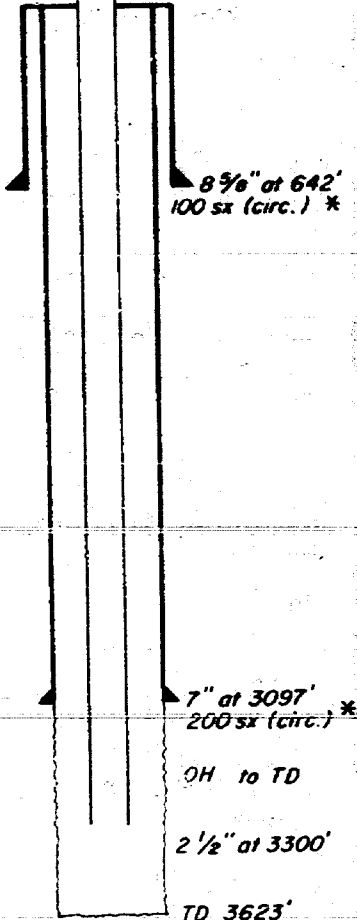
Keel B-7

Comp. 7/10/51



West B-10

Comp. 4/14/53



Sinclair Oil & Gas Co.
Exhibit No. 3

* Theoretical Fillup

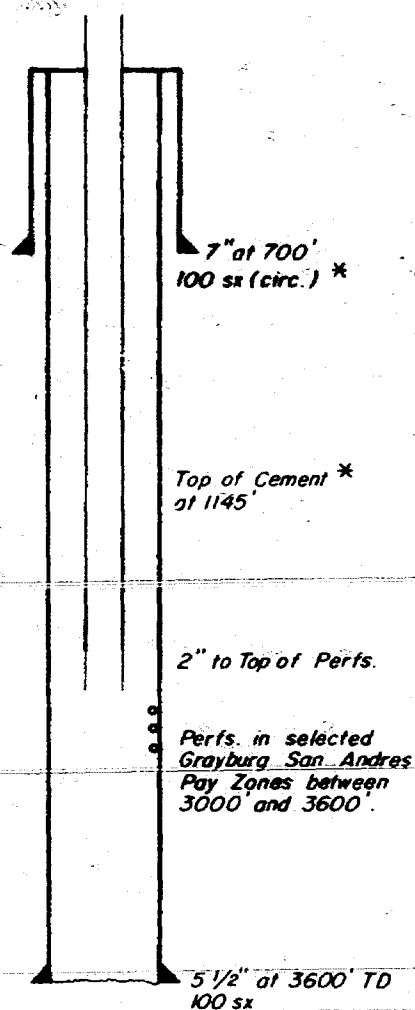
SINCLAIR OIL & GAS CO.
MIDLAND, TEXAS

PROPOSED INJECTION WELLS

KEEL - WEST WATERFLOOD PROJECT
GRAYBURG - JACKSON POOL
Eddy County, New Mexico

DRAWN BY RPG CHECKED BY RMA DATE 8/22/63
NO SCALE REVISED _____

TYPICAL COMPLETION OF WELL DRILLED FOR INJECTION



Sinclair Oil & Gas Co.

Exhibit No. 6

* Theoretical Fillup

Case 2909

SINCLAIR OIL & GAS CO.
MIDLAND, TEXAS

PROPOSED INJECTION WELLS

KEEL - WEST WATERFLOOD PROJECT
GRAYBURG - JACKSON POOL
Eddy County, New Mexico

DRAWN BY RPG CHECKED BY RMA DATE 8/22/63
NO SCALE REVISED _____

OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

Date 9/30/63

CASE

2909

Hearing Date

9 am 9/25/63

DSN @ S.F.

My recommendations for an order in the above numbered cases are as follows:

Enter an order authorizing Sinclair Oil & Gas Co to expand its Keel-West Waterflood Proj. in Grayburg Gaskow Pool Eddy Co NM in four stages as follows (all in Township 17 South, Range 31 East):

Stage I - Second Half of 1963: *To Be Completed No Later Than Dec. 31, 1963*

Convert the following wells to injection wells;

West "B" Well No. 9, Unit M, Section 4
West "B" Well No. 19, Unit A, Section 1
West "B" Well No. 23, Unit E, Section 3
Keel "B" Well No. 16, Unit I, Section 5
Keel "B" Well No. 12, Unit A, Section 3
Keel "B" Well No. 13, Unit E, Section 5

Drill 1 injection well located on the West "B" lease in Unit A of Section 9.

Stage II - First Half of 1964: *To Be Completed No Sooner Than Jan. 1, 1964*

Convert the following wells to injection wells;

West "B" Well No. 10, Unit E, Section 9
Keel "B" Well No. 7, Unit C, Section 8
Keel "B" Well No. 8, Unit A, Section 2

Drill 1 injection well located on the West "B" lease in Unit C of Section 9.

Stage III - Second Half of 1964: *To Be Completed No Sooner Than July 1, 1964*

Convert the following wells to injection wells;

West "B" Well No. 14, Unit K, Section 10
West "B" Well No. 17, Unit I, Section 9
Keel "B" Well No. 2, Unit M, Section 8
Keel "B" Well No. 4, Unit O, Section 8
Keel "B" Well No. 17, Unit E, Section 8
Keel "A" Well No. 5, Unit A, Section 7
Keel "A" Well No. 7, Unit L, Section 7
Keel "A" Well No. 9, Unit G, Section 7
Keel "A" Well No. 10, Unit I, Section 7

Keel "B" lease in Units I and K of Section 8; drill 1 injection well located on the West "B" lease in Unit K of Section 9.

Stage IV - First Half of 1965: *To Be Completed No Sooner Than Jan. 1, 1965*

Convert the following wells to injection wells;

West "A" Well No. 3, Unit A, Section 3
West "B" Well No. 24, Unit A, Section 10
West "B" Well No. 26, Unit I, Section 3
Keel "P" Well No. 1, Unit D, Section 6
Keel "B" Well No. 19, Unit J, Section 5
Keel "B" Well No. 21, Unit J, Section 6
Keel "B" Well No. 22, Unit L, Section 5
Keel "B" Well No. 25, Unit L, Section 6

Drill 3 injection wells located on the West "B" lease in Unit P of Section 9 and in Units I and N of Section 10.

See under

111

TO THE COMMISSIONER OF THE LAND OFFICE
FROM THE COMMISSIONER OF THE LAND OFFICE

RECEIVED BY THE COMMISSIONER OF THE LAND OFFICE
RECEIVED BY THE COMMISSIONER OF THE LAND OFFICE
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RECEIVED BY THE COMMISSIONER OF THE LAND OFFICE

Use Findings similar to Finding 3
no 3, 4, & 5 of Order No R-2178-B. Also are
that casing and tubing programs for wells
to be converted and drilled for water
should be similar to those proposed at the
hearing.

Provide that in the event it becomes
necessary, a well may be drilled at
a standard location in the same 40 acre
tract as a substitute for any of the
above wells which will be converted to
water upon filing forms for the drilling
of said well in the normal manner
and, also letter notifying the Commission
of the substitution.

Kendall
Chairman