STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
DIVISION FOR THE PURPOSE OF
CONSIDERING:

CASE NO. 9232
Order No. R-8541

THE APPLICATION OF SHELL WESTERN
E & P, INC. FOR A WATERFLOOD
PROJECT, LEA COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on September 24, 1987, at Santa Fe, New Mexico, before Examiner David R. Catanach.

NOW, on this 9th day of November, 1987, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner, and having been fully advised in the premises,

FINDS THAT:

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

(2) Division Cases Nos. 9230, 9231, and 9232 were consolidated at the time of the hearing for the purpose of testimony.

(3) The applicant, Shell Western E & P, Inc. (Shell), seeks authority to institute a waterflood project in its Northeast Drinkard Unit Area by the injection of water into the unitized interval which shall include the oil-bearing portions of the Blinebry, Tubb, and Drinkard formations which extend from an upper limit of 5530 feet (2101 feet sub-sea) to a lower limit of 6680 feet (3251 feet sub-sea), on the log run June 21, 1951 on the Shell Argo Well No. 8 located 660 feet from the South line and 2310 feet from the West line of Section 15, Township 21 South, Range 37 East, NMPM, Lea County, New Mexico, through 37 initial injection wells as shown on Exhibit "A" attached to this order.

(4) The proposed initial injection wells are planned conversions of existing producing wells.

(5) The applicant proposes to utilize a five spot injection pattern within the proposed waterflood project.

(6) The producing formations in the proposed project area are in an advanced stage of depletion and the area is suitable for waterflooding.

(7) The proposed waterflood project should result in the recovery of otherwise unrecoverable oil, thereby preventing waste, and should otherwise protect correlative rights.

(8) The applicant should be required, insofar as is practical, to avoid injection into any gas-bearing zones undergoing primary production within any or all of the three formations and to otherwise restrict injection to the oil-bearing portions of the pool.

(9) Evidence presented at the hearing shows the gas-bearing portions of the Blinebry formation are limited to the upper two producing zones but that gas-bearing portions in the Tubb formation are distinct zones which are separated from the oil-bearing zones by permeability barriers.

(10) Water injection into the several formations comprising the unitized formation can be conducted without endangering the gas reserves and said gas reserves can be recovered concurrently with the enhanced oil recovery project provided adequate precautions are taken.

(11) Said gas wells should continue to be prorated as Blinebry or Tubb, as the case may be, gas wells and receive allowables equal to the wells in said pools as shown on the monthly proration schedules.

(12) In order to prevent loss of recoverable gas reserves, no gas well in the Tubb or Blinebry formations should be entered for recompletion to other use until a suitable replacement well has been completed and connected to the appropriate gas gathering facility.

(13) There are twelve wells, shown on Exhibit "B" attached to this order, which are located within or adjacent to the proposed project which may not have been completed or cemented in such a manner which will assure that their wellbores will not serve as a conduit for movement of injected fluid out of the injection interval.

(14) Prior to initiating injection within one-half mile of any of the wells shown on Exhibit "B", the applicant should be required to perform remedial cement operations on said wells in a manner which will assure that these wellbores will not serve as a conduit for migration of injected fluid to the satisfaction of the supervisor of the Hobbs district office of the Division.

(15) There are also nine wells, shown on Exhibit "C" attached to this order, located within or adjacent to the proposed project which require further investigation in order to determine if they are completed and cemented in such a manner that will assure that their wellbores will not serve as a conduit for movement of injected fluid out of the injection interval.

(16) Prior to initiating injection within one-half mile of any of the wells shown on Exhibit "C", the applicant should be required to present additional calculations, temperature surveys, cement bond logs, or other pertinent information to the supervisor of the Division's district office in Hobbs who, after review of such additional information, may require additional testing, logging, or remedial cement operations to be conducted on the subject wells.

(17) The operator should otherwise take all steps necessary to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface from injection, production, or plugged and abandoned wells.

(18) The injection wells or injection pressurization system should be so equipped as to limit injection pressure at the wellhead to no more than 0.2 psi per foot of depth from the surface to the top injection perforation in any injection well, but the Division Director should have authority to increase said pressure limitation upon a proper showing that said pressure increase would not result in the fracturing of the injection formation or confining strata.

(19) Prior to initiating injection into any of the injection wells, the applicant should be required to pressure test the casing in each of the proposed injection wells from the surface to the proposed packer-setting depth to assure the integrity of said casing.

(20) Subsequent to the hearing, J. R. Cone, an offset operator to the proposed project who appeared at the hearing, requested that the applicant not be allowed to inject into Wells Nos. 615, 709, and 808 until such time as the applicant files with the Division an approved lease line agreement between Shell and J. R. Cone.

(21) This request is fair and reasonable and should be granted.

(22) The application should be approved and the project should be governed by the provisions of Rules 701 through 708 of the Oil Conservation Division Rules and Regulations.

IT IS THEREFORE ORDERED THAT:

(1) The applicant, Shell Western E & P, Inc., is hereby authorized to institute a waterflood project in the Northeast Drinkard Unit Area (described in Ordering Paragraph No. (2) of Division Order No. R-8540), by the injection of water into the unitized interval which shall include the Blinebry, Tubb, and Drinkard formations which extend from an upper limit of 5530 feet (2101 feet sub-sea) to a lower limit of 6680 feet (3251 feet sub-sea), on the log run June 21, 1951 on the Shell Argo Well No. 8 located 660 feet from the South line and 2310 feet from the West line of Section 15, Township 21 South, Range 37 East, NMPM, Lea County, New Mexico, through 37 initial injection wells as shown on Exhibit "A" attached to this order.

(2) The injection wells herein authorized and/or the injection pressurization system shall be so equipped as to limit injection pressure at the wellhead to no more than 0.2 psi per foot of depth from the surface to the top injection perforation, provided however, the Division Director may authorize a higher surface injection pressure upon satisfactory showing that such higher pressure will not result in fracturing of the injection formation or confining strata.

(3) Injection into each of said wells shall be through plastic or cement-lined tubing set in a packer which shall be located as near as practicable to the uppermost perforations, or, in the case of open hole completions, as near as practicable to the casing-shoe; the casing-tubing annulus shall be loaded with an inert fluid and equipped with an approved pressure gauge or attention-attracting leak-detection device.

(4) Prior to initiating injection within one-half mile of any of the wells shown on Exhibit "B" attached to this order, the applicant shall perform remedial cement operations on said wells shown on Exhibit "B" in a manner which will assure that these wellbores will not serve as a conduit for migration of injected fluid to the satisfaction of the supervisor of the Hobbs district office of the Division.

(5) Prior to initiating injection within one-half mile of any of the wells shown on Exhibit "C" attached to this order, the applicant shall present additional calculations, temperature surveys, cement bond logs, or other pertinent information to the supervisor of the Division's district office in Hobbs who, after review of such additional information, may require additional testing, logging, or remedial cement operations to be conducted on the subject wells.

(6) Prior to initiating injection into any of the injection wells shown on Exhibit "A", the applicant shall pressure-test the casing in each of the proposed injection wells from the surface to the proposed packer setting depth to assure the integrity of said casing.

(7) The applicant shall notify the supervisor of the Hobbs district office of the Division prior to performing any remedial cement operations on the wells shown on Exhibit "B" or Exhibit "C" or prior to conducting any casing pressure-test on any injection well shown on Exhibit "A".

(8) The applicant shall, insofar as is practical, avoid injection into any gas-bearing zones undergoing primary production within any or all of the three formations and otherwise restrict injection to the oil-bearing portions of the pool.

(9) No gas well in the Blinebry or Tubb formation shall be entered for recompletion for other use until a suitable replacement well has been completed and connected to the appropriate gas gathering facility.

(10) The applicant shall immediately notify the supervisor of the Hobbs district office of the Division of the failure of the tubing or packer in any of the injection wells, the leakage of water or oil from or around any producing well, or the leakage of water or oil from any plugged and abandoned well within the project area, and shall take such timely steps as may be necessary or required to correct such failure or leakage.

(11) The authorized subject waterflood is hereby designated the Northeast Drinkard Unit Waterflood Project and shall be governed by the provisions of Rules 701 through 708 of the Division Rules and Regulations.

(12) Injection into Unit Well Nos. 615, 709, and 808 shall not commence until such time that the applicant files with the Division a signed lease line agreement between Shell and J. R. Cone.

(13) Monthly progress reports of the waterflood project herein authorized shall be submitted to the Division in accordance with Rules 704 and 1120 of the Division Rules and Regulations.

(14) Jurisdiction of this cause is retained for the entry of such further orders as the Division may deem necessary.

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

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

WILLIAM J. LEMAY
Director

S E A L

EXHIBIT "A"
CASE NO. 9232
ORDER NO. R-8541
NORTHEAST DRINKARD UNIT (NEDU)
UNIT INJECTION WELLS

WELL	UNIT WELL DESIGNATION	LOCATION (ALL IN T-21S, R-37E)
SECTION 2:		
Meridian Oil State "2" No. 6	114	906 FNL, 660 FWL, Unit D
Meridian Oil State "2" No. 2	115	1896 FNL, 660 FWL, Unit E
Chevron Leonard No. 10	121	2220 FNL, 2307 FEL, Unit G
Meridian Oil State "2" No. 1	214	3300 FSL, 660 FWL, Unit M
Shell Western State "2" No. 16	218	3546 FNL, 1700 FWL, Unit K
Chevron Leonard No. 6	221	2983 FSL, 2317 FEL, Unit O
Shell Western State "2" No. 9	315	1980 FSL, 1880 FWL, Unit S
SECTION 3:		
Shell Western Taylor Glenn No. 11	105	2080 FNL, 660 FWL, Unit E
Conoco Hawk B-3 No. 15	109	660 FNL, 1980 FEL, Unit B
Conoco Hawk B-3 No. 24	111	2232 FNL, 2310 FEL, Unit H
Shell Western Livingston No. 11	205	3300 FSL, 660 FWL, Unit M
Shell Western Taylor Glenn No. 1	206	3226 FNL, 1980 FWL, Unit K
Conoco Hawk B-3 No. 2	209	3150 FSL, 1650 FEL, Unit O
Shell Western Taylor Glenn No. 2	211	4620 FSL, 660 FEL, Unit I
Shell Western Livingston No. 1	303	1980 FSL, 1980 FWL, Unit S
Shell Western Livingston No. 2	307	660 FSL, 1980 FEL, Unit W
Conoco Hawk B-3 No. 7	309	1830 FSL, 660 FEL, Unit Q

EXHIBIT "A"

SECTION 10

Conoco Hawk B-10 No. 10	403	460 FNL, 1980 FWL, Unit C
Conoco Hawk B-10 No. 8	407	1980 FNL, 2310 FEL, Unit G
Exxon NM "V" State No. 11	503	2080 FSL, 2080 FWL, Unit K
Exxon NM "V" State No. 3	506	660 FSL, 1980 FEL, Unit O

SECTION 11

Conoco Nolan No. 1	511	660 FSL, 660 FWL, Unit E

SECTION 14

Bravo Energy Eva Owen No. 1	615	1980 FNL, 660 FWL, Unit E

SECTION 15

Texaco State "S" No. 6	605	760 FNL, 1980 FWL, Unit C
Shell Western State "15" No. 3	610	2210 FNL, 2310 FEL, Unit G
Texaco State "S" No. 8	612	660 FNL, 660 FEL, Unit A
Shell Western Argo No. 3	703	1980 FSL, 1980 FWL, Unit K
Marathon Warlick No. 2	708	660 FSL, 1980 FEL, Unit O
Marathon Warlick No. 4	709	1980 FSL, 660 FEL, Unit I

SECTION 22

Shell Western Argo "A" No. 3	803	660 FNL, 1980 FWL, Unit C
Chevron Eubank No. 8	807	1750 FNL, 2310 FEL, Unit G
Chevron Eubank No. 2	808	660 FNL, 660 FEL, Unit A
Shell Western Turner No. 12	904	2065 FSL, 1700 FWL, Unit K
Shell Western Turner No. 5	909	1980 FSL, 660 FEL, Unit I

EXHIBIT "A"

SECTION 23

Texaco Williamson No. 2	811	1980 FNL, 660 FWL, Unit E
Arco Barton No. 4	815	1750 FNL, 1980 FEL, Unit G
Arco Sarkeys No. 1	915	1980 FSL, 1980 FEL, Unit J

EXHIBIT "B"
CASE NO. 9232
ORDER NO. R-8541

OPERATOR, WELL NAME, AND NUMBER	LOCATION
Leonard Oil Elliot Federal No. 1	1659 FSL & 330 FWL Section 1, T-21S, R-37E
Stanolind Southland Royalty "C" No. 5	1980 FSL & 660 FEL Section 4, T-21S, R-37E
Conoco Inc. Hawk B-10 Federal No. 3	1980 FNL & 1980 FEL Section 10, T-21S, R-37E
Cities Service States No. 4	3390 FSL & 4520 FEL Section 15, T-21S, R-37E
Tidewater Oil State "S" No. 7	600 FNL & 990 FWL Section 15, T-21S, R-37E
Cities Service State "S" No. 6	2310 FNL & 990 FWL Section 15, T-21S, R-37E
Cities Service State "S" No. 3	3375 FSL & 3225 FEL Section 15, T-21S, R-37E
Gulf Oil Corporation Leonard "E" No. 5	2310 FNL & 330 FEL Section 16, T-21S, R-37E
Mid-Continent Petroleum State "15" No. 5	330 FSL & 330 FEL Section 16, T-21S, R-37E
Sunray Oil Elliott Federal "A" No. 3	980 FNL & 330 FEL Section 21, T-21S, R-37E
Sunray Oil Elliott Federal "A" No. 4	2030 FNL & 330 FEL Section 21, T-21S, R-37E
Gulf Oil Corporation Eubank "C" No. 8	1750 FNL & 2310 FEL Section 22, T-21S, R-37E

EXHIBIT "C"
CASE NO. 9232
ORDER NO. R-8541

OPERATOR, WELL NAME, AND NUMBER	LOCATION
Gulf Oil Corporation Harry Leonard "E" No. 6	1980 FSL & 1980 FEL Section 2, T-21S, R-37E
Shell Western E & P State "2" No. 20	990 FSL & 2300 FWL Section 2, T-21S, R-37E
Shell Western E & P State "2" No. 21	2205 FSL & 988 FWL Section 2, T-21S, R-37E
Shell Western E & P Livingston No. 3	560 FSL & 2030 FEL Section 3, T-21S, R-37E
Shell Western E & P Livingston No. 5	660 FSL & 330 FWL Section 3, T-21S, R-37E
Aztec Dauron No. 3	330 FNL & 990 FEL Section 10, T-21S, R-37E
Humble NM State "V" No. 11	2080 FSL & 2080 FWL Section 10, T-21S, R-37E
Tidewater Oil State "S" No. 6	760 FNL & 1980 FWL Section 15, T-21S, R-37E
Conoco Inc. Lockhart A-27 No. 3	330 FNL & 1650 FWL Section 27, T-21S, R-37E