

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. 10220
Order No. R-6906-B

APPLICATION OF CONOCO INC. FOR
EXPANSION AND REDESIGNATION OF 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 January 24, 1991, at Santa Fe, New Mexico, before Examiner Jim Morrow.

NOW, on this 15th day of March, 1991, the Division Director, having considered the testimony, the record and the recommendations of the Examiner, and being 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) The applicant, Conoco Inc., seeks to amend Division Order No. R-6906 by expanding, contracting and redesignating its Conoco-Southland Blinebry Cooperative Waterflood Project, extend the vertical limits and to include additional injection wells into said project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks to amend Division Order No. R-6906, which authorized the Conoco-Southland Blinebry Cooperative Waterflood Project by the injection of water into the Blinebry Oil and Gas Pool through nine wells located in Sections 33 and 34, Township 20 South, Range 38 East and in Sections 3 and 4, Township 21 South, Range 38 East, NMPM, Lea County, New Mexico. Applicant proposes to redesignate said project and reestablish its area to include the S/2 S/2 of Section 22, all of Sections 26, 27, 33, and 34, and the N/2 N/2 of Section 35, Township 20 South, Range 38 East. Applicant also seeks to extend the vertical limits of said project to include both the Blinebry and Tubb formations. Further, the addition of 20 injection wells into said project area will be considered.

(3) Two injection wells in Sections 2 and 3, Township 21 South, Range 37 East, NMPM, Lea County, New Mexico, were approved by Order No. R-6906 as a part of the Conoco-Southland Blinebry Cooperative Waterflood Project. These two sections and the two injection wells are now a part of Shell's Northeast Drinkard Unit and should be excluded from Conoco's redesignated waterflood project. After expansion, as set out in Finding (2) above, Conoco proposes to redesignate the project as the "Warren Blinebry-Tubb Waterflood Project."

(4) Conoco began water injection into the cooperative project on January 24, 1983. Through August, 1990, 3,374,000 barrels of water had been injected. Production increased as a result of water injection in approximately one year. By 1985, the six producing wells within the 400-acre area affected by the flood were producing a total of 100 barrels of oil per day - an increase in production of 70 barrels of oil per day. The 400-acre area had produced 938,000 barrels of oil prior to the start of injection, and has produced 207,000 additional barrels since injection began.

(5) The Conoco project is bordered on the South by Shell's Northeast Drinkard Unit Waterflood Project. Shell is flooding the Blinebry, Tubb, and Drinkard simultaneously. Approval to water flood in this manner was obtained by OCD orders R-8541, R-8541-A and R-8541-B.

(6) Conoco's witnesses presented structure maps and cross-sections to show the relationship of the Blinebry and Tubb formations across the Conoco Warren Unit and the Shell Northeast Drinkard Unit.

(7) Wells in the Conoco project produce at relatively high gas-oil ratios. Since the flood started, overall gas-oil ratio has been approximately 6,000 cubic feet per barrel with some wells producing at up to 10,000 cubic feet per barrel, according to Conoco testimony. Conoco requested that no limit be placed on the gas-oil ratio allowed for the project.

(8) Applicant's witness testified that the reservoir qualities of the Blinebry and Tubb (which is immediately below the Blinebry) formations are very similar in this area. Both are composed of dolomite interbedded with anhydride. Porosity for both formations is approximately 8% and permeability is about 4.5 millidarcys. Based on Shell's successful project to the South, applicant believes the formations can be successfully flooded simultaneously.

(9) Conoco expects to recover a total of 4,305,000 barrels of oil from the expansion area. This includes 3,490,000 barrels of secondary oil. The project expansion would begin in 1991. Total life of the project would extend to the year 2017.

(10) The expanded project would utilize a 5-spot pattern with two injection wells and two producing wells per quarter section.

(11) At the hearing, applicant requested approval for 21 additional wells to be used for injection bringing the total in the project to 28. Seven will be newly drilled wells and 14 will be converted producing wells. Average injection rate would be approximately 500 barrels per well per day at an average pressure of 1700 psi. Maximum injection rate would be 700 barrels at maximum pressure of 2000 psi.

(12) Source water for injection will be sewage effluent from the City of Hobbs.

(13) Applicant submitted data on the proposed injection wells, water wells in the area, and all wells (including plugged wells) within 1/2 mile of the proposed injection which penetrate the zone of interest. This data shows that wells in the area are cased and plugged so as to protect fresh water and prevent fluid migration from the injection zone, and includes a statement indicating no evidence of open faults or any other hydrologic connection between the injection zone and the fresh water resources in the area.

(14) The proposed injection interval would be from the top of the Blinebry (75 feet above the Blinebry marker) down to the base of the Tubb formation (top of the Drinkard). These vertical limits are identified in the Conoco-Warren Unit Well No. 37, located in Unit J, Section 27, Township 20 South, Range 38 East, with the Blinebry top at 5,865 feet and the Tubb base at 6,741 feet. This is an overall interval of 876 feet.

(15) Testimony and exhibits submitted by applicant's witness indicates that plastic coated tubing set in packers will be used in all injection wells with packers set within 100 feet of the top perforations. Injection profiles will be run and the annular space will be monitored in each injection well.

(16) 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 the pressure limitation upon a proper showing that a pressure increase would not result in the fracturing of the injection formation or confining strata.

(17) 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.

(18) The operator should give advance notification to the Supervisor of the Hobbs district office of the Division of the date and time of the installation of injection equipment and of the mechanical integrity pressure test in order that the same may be witnessed.

(19) Applicant has applied to the OCD in Case No. 10245 for the creation and designation of the Warren Blinebry-Tubb Oil and Gas Pool. The pool would include the Blinebry and Tubb formations as described in Finding No. (14) above. The horizontal boundaries of the new pool would exactly coincide with the Conoco Warren Unit North Blinebry Waterflood Project (as set out in Findings (2) and (3) above) for which Conoco seeks approval by this order. The order in this case (No. 10220) should be approved concurrently with the order to be issued in Case No. 10245.

(20) No interested party appeared and objected to Conoco's application.

(21) This application should be approved to allow Conoco to recover an additional 4,305,000 barrels of oil; 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 Conoco-Southland Blinebry Cooperative Waterflood Project is hereby redesignated the Conoco Warren Blinebry-Tubb Waterflood Project.

(2) The project shall be governed by the provisions of Rules 701 through 708 of the Division Rules and Regulations.

(3) The project area shall consist of the S/2 S/2 of Section 22, all of Sections 26, 27, 33 and 34 and the N/2 N/2 of Section 35, Township 20 South, Range 38 East, NMPM, Lea County, New Mexico.

(4) The applicant is hereby authorized to expand the waterflood within the project area by drilling seven new injection wells and converting 14 producing wells to injection wells. These 21 injection wells and the seven currently approved injection wells are listed in Exhibit A which is attached to this order. Authorized injection interval for all 28 injection wells shall be from the top of the Blinebry (75 feet above the Blinebry marker) down to the base of the Tubb formation (top of the Drinkard). These vertical limits are identified in the Conoco Warren Unit Well No. 37, located in Unit J, Section 27, Township 20 South, Range 38 East, with the Blinebry top at 5,865 feet and the Tubb base at 6,741 feet.

(5) 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 of the 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.

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(6) 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.

(7) Prior to initiating injection into any of the injection wells herein authorized, 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.

(8) The applicant shall notify the supervisor of the Hobbs district office of the Division prior to conducting any casing pressure-test on any injection well shown on Exhibit "A".

(9) 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.

(10) 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.

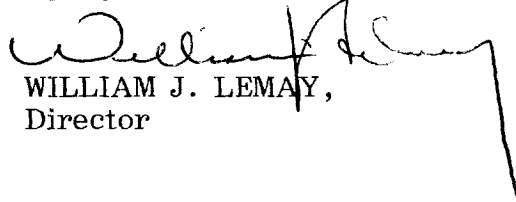
(11) This order is being approved concurrently with Order No. R-9467 in Case No. 10245 which creates and designates the Warren Blinbry-Tubb Oil and Gas Pool.

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

(13) This order shall become effective on March 1, 1991.

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

dr/

EXHIBIT "A"
CASE NO. 10220 - ORDER NO. R-6906-B
Warren Blinebry-Tubb Waterflood Project
Conoco Inc.-Warren Unit Injection Wells,
Township 20 South, Range 38 East, NMPM, Lea County, New Mexico

<u>WELL NO.</u>	<u>LOCATION</u>	<u>SECTION</u>
70	660' FSL and 660' FEL, Unit P	22
56	660' FNL and 1980' FEL, Unit B	26
57	660' FNL and 660' FWL, Unit D	26
48	2030' FNL and 1980' FWL, Unit F	26
103	1980' FNL and 660' FEL, Unit H	26
49	1980' FSL and 1980' FEL, Unit J	26
59	1980' FSL and 660' FWL, Unit L	26
45	660' FSL and 1980' FWL, Unit N	26
104	660' FNL and 1980' FEL, Unit B	27
33	1980' FNL and 1980' FWL, Unit F	27
105	1980' FNL and 660' FEL, Unit H	27
37	1980' FSL and 1980' FEL, Unit J	27
41	660' FSL and 1980' FWL, Unit N	27
32	660' FSL and 660' FEL, Unit P	27
108	Footage Location Unavailable, Unit A	33
84	660' FNL and 1920' FWL, Unit C	33
80	1980' FNL and 1980' FEL, Unit G	33
17	1980' FSL and 660' FEL, Unit I	33
107	1980' FSL and 1980' FWL, Unit K	33
16	660' FSL and 1980' FEL, Unit O	33
39	660' FNL and 1980' FEL, Unit B	34
20	1980' FNL and 660' FWL, Unit E	34
102	1980' FNL and 1980' FEL, Unit G	34
109	1980' FSL and 660' FEL, Unit I	34
75	1980' FSL and 1980' FWL, Unit K	34
14	660' FSL and 660' FWL, Unit M	34
13	660' FSL and 1980' FEL, Unit O	34
79	660' FNL and 660' FWL, Unit D	35