

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. 9929  
Order No. R-2268-C

APPLICATION OF SOCORRO PETROLEUM  
COMPANY FOR WATERFLOOD EXPANSION  
AND TO AMEND DIVISION ORDER NO.  
R-2268 AND ADMINISTRATIVE ORDERS  
WFX-585 AND WFX-587, EDDY COUNTY,  
NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on May 2, 1990, at Santa Fe, New Mexico, before Examiner David R. Catanach.

NOW, on this 14th day of June, 1990, 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, Socorro Petroleum Company, is the current operator of the Keel-West Waterflood Project which was originally approved by Division Order Nos. R-2268, R-2268-A and R-2268-B, and which encompasses, in part, Sections 3, 4, 9 and 10, Township 17 South, Range 31 East, NMPM, Grayburg-Jackson Pool, Eddy County, New Mexico.

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(3) The applicant seeks authority to expand said Keel-West Waterflood Project by converting its H. E. West "B" Well No. 24, located 660 feet from the North and East lines (Unit A) of Section 10, Township 17 South, Range 31 East, NMPM, Eddy County, New Mexico, from a producing oil well to a water injection well.

(4) By Order Nos. R-2268 (supplemental), WFX-585 and WFX-587, entered, respectively, October 7, 1989, August 31, 1989, and September 26, 1989, the Division authorized the expansion of said Keel-West Waterflood Project by the conversion of fifteen wells located in said Sections 3, 4, 9 and 10 to water injection wells. These orders further limited the surface injection pressure on said wells to 0.2 psi per foot of depth to the uppermost perforations or approximately 670 psi.

(5) The applicant also seeks authority, in the immediate case, to increase the surface injection pressure on said fifteen injection wells to approximately 450 psi above formation parting pressure as determined from step rate tests conducted on certain injection wells located within the project area. The applicant further seeks to increase the surface injection pressure on its proposed H. E. West "B" Well No. 24, as described above, to 450 psi above formation parting pressure.

(6) At the time of the hearing, the applicant requested that the portion of this case requesting the authority to convert its H. E. West "B" Well No. 24 to an injection well be dismissed inasmuch as a formal application to convert said well has been filed with the Division for administrative approval.

(7) The subject waterflood project was initiated in June, 1962, at which time the Division did not restrict the surface injection pressure on injection wells.

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(8) From inception to August, 1986, the former operator of the Keel-West Waterflood Project utilized some ten injection wells previously approved by said Order Nos. R-2268, R-2268-A, and R-2268-B, and located within said Sections 3, 4, 9 and 10, to inject water into the Grayburg and San Andres formations at surface injection pressures as high as 2500 psi.

(9) Decline curve analysis indicates that if sufficient volumes of water are injected into the Grayburg-Jackson Pool in this area, an estimated additional 1.48 million barrels of oil will be recovered.

(10) The evidence presented by the applicant indicates that sufficient volumes of water cannot be injected into the Grayburg-Jackson Pool by those fifteen subsequently approved injection wells at their currently authorized injection pressures.

(11) The applicant presented test data obtained from step rate injection tests conducted on nine of the fifteen subject injection wells which indicates that the average fracture pressure is approximately 1711 psi.

(12) The evidence presented further indicates that injection volumes limited to the formation fracture pressure as established by said step rate tests are not sufficient to recover the additional 1.48 million barrels of oil.

(13) The applicant, through its engineering evidence and testimony, has satisfactorily demonstrated that injection through the fifteen subject injection wells at a pressure of approximately 450 psi above formation fracture pressure is necessary in order to efficiently and effectively waterflood the area and will enable the applicant to recover the additional oil reserves within the Grayburg-Jackson Pool, thereby preventing waste.

(14) The applicant has further demonstrated that injection into the Grayburg and San Andres formations at said injection pressures should not result in the migration of injected water from the Grayburg-Jackson Pool.

(15) According to the evidence presented, there are no fresh water aquifers located above or below the Grayburg-Jackson Pool in this area.

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(16) Injection into the fifteen subject injection wells at a surface injection pressure of approximately 450 psi above formation fracture pressure will allow the recovery of additional oil reserves within the Grayburg-Jackson Pool, thereby preventing waste, will not endanger any fresh water aquifers, and should therefore be approved.

(17) The Division Director should have the authority to reduce or rescind said injection pressures should it become apparent that the injected fluid is not being adequately confined to the Grayburg-Jackson Pool.

(18) Inasmuch as the injection pressures authorized by this order are based upon the current formation fracture pressure, which, through continued injection, may increase, the Division Director should also have the authority to administratively increase the surface injection pressures on the fifteen subject injection wells, provided, however, that current step rate tests are accompanied by such request.

(19) Prior to authorizing the requested surface injection pressure for the proposed H. E. West "B" Well No. 24, the applicant should be required to demonstrate that said well has been approved for injection, and should further be required to conduct and submit a step rate test on said well.

IT IS THEREFORE ORDERED THAT:

(1) Division Order Nos. R-2268 (supplemental), WFX-585 and WFX-587 are hereby amended authorizing Socorro Petroleum Company to inject water into fifteen previously approved injection wells located within the Keel-West Waterflood Project in Sections 3, 4, 9 and 10, Township 17 South, Range 31 East, NMPM, Grayburg-Jackson Pool, Eddy County, New Mexico, at a surface injection pressure of approximately 450 psi above formation fracture pressure as shown on Exhibit "A" attached hereto.

(2) The Division Director shall have the authority to administratively approve subsequent pressure increases on said wells provided, however, that current step rate tests are accompanied by such requests.

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(3) The Division Director shall also have the authority to reduce or rescind said injection pressures should it become apparent that the injected fluid is not being adequately confined to the Grayburg-Jackson Pool.

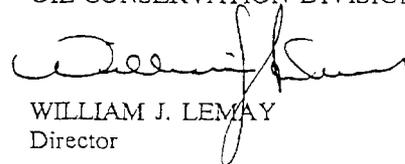
(4) The portion of this case requesting the expansion of the Keel West Waterflood Project by the conversion of the H. E. West "B" Well No. 24 located 660 feet from the North and East lines (Unit A) of Section 10, Township 17 South, Range 31 East, NMPM, Eddy County, New Mexico, to a water injection well is hereby dismissed.

(5) Prior to authorizing the requested surface injection pressure for said H. E. West "B" Well No. 24, the applicant shall be required to demonstrate that said well has been approved for injection, and shall further be required to conduct and submit a step rate injection test on said well.

(6) 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

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EXHIBIT "A"  
DIVISION ORDER NO. R-2268-C

<u>WELL &amp; LOCATION</u>	<u>MAXIMUM SURFACE INJECTION PRESSURE</u>
H.E. West "A" No. 8 Unit E, Section 3, T-17S, R-31E	2407 PSIG
H.E. West "A" No. 9 Unit I, Section 4, T-17S, R-31E	2250 PSIG
H.E. West "A" No. 11 Unit G, Section 3, T-17S, R-31E	2160 PSIG
H.E. West "A" No. 14 Unit O, Section 4, T-17S, R-31E	2160 PSIG
H.E. West "A" No. 15 Unit A, Section 3, T-17S, R-31E	2160 PSIG
H.E. West "B" No. 12 Unit G, Section 9, T-17S, R-31E	1872 PSIG
H.E. West "B" No. 13 Unit E, Section 10, T-17S, R-31E	2027 PSIG
H.E. West "B" No. 15 Unit G, Section 10, T-17S, R-31E	2236 PSIG
H.E. West "B" No. 16 Unit M, Section 3, T-17S, R-31E	2160 PSIG
H.E. West "B" No. 18 Unit O, Section 3, T-17S, R-31E	2000 PSIG

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<u>WELL &amp; LOCATION</u>	<u>MAXIMUM SURFACE INJECTION PRESSURE</u>
H.E. West "B" No. 20 Unit O, Section 10, T-17S, R-31E	2160 PSIG
H.E. West "B" No. 21 Unit M, Section 10, T-17S, R-31E	2075 PSIG
H.E. West "B" No. 22Y Unit O, Section 9, T-17S, R-31E	2118 PSIG
H.E. West "B" No. 34 Unit I, Section 10, T-17S, R-31E	2160 PSIG
H.E. West "B" No. 43 Unit M, Section 9, T-17S, R-31E	2470 PSIG