Entered January 12, 1983

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

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

CASE NO. 7759
Order No. R-7182

APPLICATION OF CONOCO, INC. FOR A
PRESSURE MAINTENANCE PROJECT,
LEA COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 9 a.m. on December 16, 1982, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this 12th day of January, 1983, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

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

(2) That the applicant, Conoco Inc., seeks the classification of its State H-35 Lease comprising the E/2 NW/4 and NE/4 of Section 35, Township 17 South, Range 34 East, Vacuum Grayburg-San Andres Pool, as a pressure maintenance project area based on water injection wells cooperatively drilled and operated by applicant and offsetting operators along the lease boundary of said State H-35 Lease.

(3) That the applicant further seeks the promulgation of special rules for said project, including the assignment of a basic pressure maintenance project allowable to said lease and the assignment of a share of the water injection credit allowable earned by the cooperative lease line injection wells.

(4) That the applicant additionally seeks approval for the drilling of two wells at the following unorthodox locations: 1345 feet from the North line and 1210 feet from the East line and 1295 feet from the North line and 1615 feet from the West line of said Section 35, said wells to be initially completed as

producing wells with approval to be later converted to water injection in the pressure maintenance project.

(5) That the applicant (Conoco, Inc.), Texaco Inc., Mobil Oil Corporation, and Phillips Petroleum Company have entered into a cooperative water injection agreement providing for lease-line injection wells surrounding said H-35 lease.

(6) That said lease-line injection wells and the percentage of injected water to be credited to the various operators and projects involved in said cooperative agreement are shown on Exhibit "A" attached to this order.

(7) That injection into those lease-line wells described in said Exhibit "A" which immediately offset applicant's State H-35 Lease, and later injection into the two wells described in Finding No. 3 above, will provide a thorough and efficient sweep of the hydrocarbons underlying the entire project and will result in the recovery of otherwise unrecoverable oil and gas, thereby preventing waste.

(8) That the above described injection wells, some of which will be at unorthodox locations along the outer boundaries of the State H-35 Lease in accordance with the aforementioned lease-line agreement, will not impair but will protect correlative rights.

(9) That the applicant seeks to have the entire State H-35 Lease designated as the Conoco State H-35 Vacuum Pressure Maintenance Project.

(10) That the project area should comprise all of the State H-35 Lease provided that no allowable in excess of a normal unit allowable shall be assigned to any and all wells on any 40-acre proration unit unless such proration unit contains or is directly or diagonally offset by one of the offset lease-line injection wells noted on Exhibit "A" attached to this order or a State H-35 lease injection well.

(11) That the total project area allowable should be equal to the sum of the basic project area allowable plus the water injection credit allowable.

(12) That the basic project area allowable should be equal to 80 barrels of oil per day times the number of developed 40-acre proration units in the project area.

(13) That the water injection credit allowable should be based on the following formula:

$$\text{Water Injection Credit Allowable} = \left[\frac{\text{net water injected}}{\text{basic project area allowable voidage}} - 1x \right] \text{basic project area allowable}$$

and should be calculated in accordance with Exhibits "B" and "C" attached hereto and by reference made a part hereof.

(14) That a weighted average project area reservoir pressure should be determined prior to commencement of water injection and at least annually thereafter.

(15) That except as provided in Finding No. (9) above, the project area allowable should be produced from wells within the project area in any proportion.

(16) That the application to drill, at unorthodox locations, to produce for a time, and to ultimately convert to injection those wells described in Finding No. (4) above, should be approved.

(17) That any newly drilled production or injection well in the project should be equipped with surface casing set at approximately 350 feet and cemented to the surface and with "production" casing set at total depth, approximately 4800 feet.

(18) That the "production" casing on each of said newly drilled wells should be cemented to the surface, except that in any well in which an intermediate casing string has been run to below the top of the Yates formation and cemented to the surface, the "production" casing may be cemented back into the base of the intermediate casing string.

(19) Injection should be accomplished through tubing installed in a packer set within 100 feet of the uppermost perforation. The injection tubing should be corrosion protected by a non-reactive internal lining or coating and the casing-tubing annulus in each injection well should be filled with an inert fluid and a surface pressure gauge or approved leak detection device shall be attached to the annulus.

(20) The injection wells or system should be equipped with a pressure control device or other acceptable device which will limit the surface injection pressure to no more than 0.2 psi per foot of depth to the uppermost perforation. The Division Director should be authorized to administratively authorize a pressure limitation in excess of the above upon showing by the project operator that such higher pressure will not result in fracturing of the confining strata.

(21) All wells within the project area should be equipped with risers or in some other acceptable manner as to facilitate the periodic testing of the bradenhead for pressure or fluid production.

(22) The project operator should immediately notify the Supervisor of the Hobbs District Office of the Division of the failure of the tubing or packer in any of said injection wells, the leakage of water or oil from or around any producing well, the leakage of water or oil from or around any plugged and abandoned well within the individual lease project area, or any other evidence of fluid migration from the injection zone, and should take such timely steps as may be necessary or required to correct such failure or leakage.

(23) Each month the project operator should submit to the Division a Pressure Maintenance Project Operator's Report, on a form prescribed by the Division, outlining thereon the data required and requesting allowables for each of the several wells in the Project as well as the total individual lease project area allowable.

(24) The Division should, upon review of the report and after any adjustments deemed necessary, calculate the allowable for the wells in the Project for the next succeeding month in accordance with these rules.

(25) That prior to conversion to injection of either of the wells described in Finding No. 3 above, the applicant should replug its State H-35 Well No. 11, located 660 feet from the North line and 2180 feet from the West line of Section 35, Township 17 South, Range 34 East, NMPM, in a manner approved by the Division's district supervisor at Hobbs or otherwise demonstrate that said well cannot serve as an avenue for escape of the injected water from the injection interval.

(26) That an order embodying the above findings and authorizing the proposed pressure maintenance project is in the interest of conservation, will prevent waste and protect correlative rights, and should be approved.

IT IS THEREFORE ORDERED:

(1) That the applicant, Conoco Inc., is hereby authorized to institute a Vacuum Grayburg-San Andres pressure maintenance project on its State H-35 Lease, comprising the E/2 NW/4 and NE/4 of Section 35, Township 17 South, Range 34 East, NMPM, Lea County, New Mexico, by the injection of water into the Grayburg and San Andres formations through nine offset lease-line injection wells owned and operated as described on

Exhibit "A" attached to this order and by injection into applicant's following described wells to be drilled at unorthodox locations (also hereby approved) as follows:

Lease	Well No.	Unit	Location
State H-35	14	H	1345' FNL and 1210' FEL
State H-35	15	C	1295' FNL and 2615' FWL

all in Section 35, Township 17 South, Range 34 East, NMPM.

(2) That the applicant is authorized to produce said State H-35 Wells No. 14 and No. 15 prior to their conversion to injection.

(3) That the project herein authorized shall be known as Conoco State H-35 Vacuum Pressure Maintenance Project and shall be governed by special rules and regulations hereby promulgated as follows:

SPECIAL RULES AND REGULATIONS
FOR THE
CONOCO STATE H-35 VACUUM
PRESSURE MAINTENANCE PROJECT

RULE 1. That the project area for the Conoco State H-35 Vacuum Pressure Maintenance Project shall comprise all of the E/2 NW/4 and NE/4 of Section 35, Township 17 South, Range 34 East, NMPM, Vacuum Grayburg-San Andres Pool.

RULE 2. The project area shall receive a project area allowable, and said project area allowable shall be the sum of the basic project area allowable plus the water injection credit allowable.

RULE 3. The basic project area allowable shall be equal to 80 barrels of oil per day times the number of developed 40-acre proration units in the project area.

RULE 4. The water injection credit allowable shall be contingent upon full reservoir voidage replacement of all produced fluids and shall be based upon the following formula:

$$\text{Water Injection Credit Allowable} = \left[\frac{\text{Net Water Injected}}{\text{Basic Project Area Allowable}} \times \frac{1}{\text{Reservoir Voidage}} \right] \text{Basic Project Area Allowable}$$

The water injection credit allowable shall be calculated in accordance with the procedures and parameters depicted on Exhibits "B" and "C" attached to this order.

In no event shall the water injection credit allowable be less than zero, i.e., negative numbers derived from application of the above formula shall be ignored.

RULE 5. The weighted average project area reservoir pressure shall be determined prior to commencement of injection of water into the reservoir and at least annually thereafter. The weighted average project area pressure shall be determined from the pressures in a representative sample well selected by the operator and the Supervisor of the Hobbs District Office of the Division.

RULE 6. The project area allowable may be produced from the wells within the project area in any proportion provided, however, that any proration unit not containing nor offset by an injection well (State H-35 Lease Wells No. 14 or No. 15 or an offset lease-line injection well) shall not be permitted to produce in excess of 80 barrels of oil per day.

RULE 7. Each newly drilled injection or producing well shall be equipped with a minimum of 350 feet of surface casing and "production" casing run to total depth (approximately 4800 feet). All casing strings shall be cemented to the surface except that in any well in which an intermediate casing string has been run to below the top of the Yates formation and cemented to the surface, the "production" string may be cemented back into the base of the intermediate casing.

RULE 8. Injection shall be accomplished through tubing installed in a packer set within 100 feet of the uppermost perforation. The injection tubing shall be corrosion protected by a non-reactive internal lining or coating. The casing-tubing annulus in each injection well shall be filled with an inert fluid and a surface pressure gauge or approved leak detection device shall be attached to the annulus.

RULE 9. The injection wells or system shall be equipped with a pressure control device or acceptable substitute which will limit the surface injection pressure to no more than 0.2 psi per foot of depth to the uppermost perforation. The Division Director may administratively authorize a pressure limitation in excess of the above upon showing by the operator that such higher pressure will not result in fracturing of the confining strata.

RULE 10. All wells within the project area shall be equipped with risers or in some other acceptable manner as to facilitate the periodic testing of the bradenhead for pressure or fluid production.

RULE 11. The operator shall immediately notify the Supervisor of the Hobbs District Office of the Division of the failure of the tubing or packer in any of said injection wells, the leakage of water or oil from or around any producing well, the leakage of water or oil from or around any plugged and abandoned well within the project area, or any other evidence of fluid migration from the injection zone, and shall take such timely steps as may be necessary or required to correct such failure or leakage.

RULE 12. Each month the project operator shall submit to the Division a Pressure Maintenance Project Operator's Report, on a form prescribed by the Division, outlining thereon the data required and requesting allowables for each of the several wells in the Project as well as the total project area allowable. The data shall include total injection into each offset lease-line injection well and the calculated water injection credit based upon the percentages shown on Exhibit "A" attached to this order.

RULE 13. The Division shall, upon review of the report and after any adjustments deemed necessary, calculate the allowable for the wells in the Project for the next succeeding month in accordance with these rules. The sum of the allowables so calculated shall be assigned to the Project and, except as provided under Rule 6 above, may be produced from the wells in the Project in any proportion.

IT IS FURTHER ORDERED:

(1) That prior to conversion to injection of either said State H-35 Well No. 14 or No. 15, the applicant shall replug its State H-35 Well No. 11, located 660 feet from the North line and 2180 feet from the West line of Section 35, Township 17 South, Range 34 East, NMPM, in a manner approved by the Supervisor of the Division's District Office at Hobbs or otherwise demonstrate that said well cannot serve as an avenue of escape of the injected water from the injection zone.

(2) That 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

JOE D. RAMEY,
Director

S E A L

OWNERSHIP AND WATER INJECTION CREDIT PERCENTAGE FOR LEASELINE WELLS IN THE VACUUM G-SA FIELD

Operator and Lease or Unit Name Well No. - Approximate Location		Approximate Lease Line Injection Well Locations and Numbers	Leaseline Well Water Injection Credit Percentage					
			Central Vacuum Unit	West Vacuum Unit	Mobil	Conoco	Phillips	Vacuum Grayburg San Andres Unit (Texaco Inc.)
TEXACO INC., Central Vacuum Unit								
155 - 2630' FSL & 1310' FEL	Sec. 25, T-17-S, R-34-E		75		25			
156 - 2340' FSL & 1330' FWL	Sec. 25, T-17-S, R-34-E		50		50			
157 - 1150' FSL & 150' FWL	Sec. 25, T-17-S, R-34-E		50		50			
158 - 100' FNL & 150' FWL	Sec. 36, T-17-S, R-34-E		50		25	25		
159 - 1330' FNL & 10' FWL	Sec. 36, T-17-S, R-34-E		50			50		
160 - 2630' FNL & 10' FWL	Sec. 36, T-17-S, R-34-E		50			25	25	
161 - 10' FSL & 10' FWL	Sec. 36, T-17-S, R-34-E		25				25	50
TEXACO INC., West Vacuum Unit								
55 - 180' FNL & 40' FEL	Sec. 3, T-18-S, R-34-E			50				50
62 - 10' FNL & 1330' FWL	Sec. 2, T-18-S, R-34-E						25	75
63 - 10' FNL & 2630' FEL	Sec. 2, T-18-S, R-34-E						50	50
65 - 1310' FSL & 10' FWL	Sec. 35, T-17-S, R-34-E			50				50
67 - 2630' FSL & 10' FWL	Sec. 35, T-17-S, R-34-E			50			25	25
MOBIL PRODUCING, Bridges State Lease								
C - 10' FSL & 1250' FEL	Sec. 26, T-17-S, R-34-E				50	50		
A - 2340' FNL & 2630' FWL	Sec. 25, T-17-S, R-34-E		50		50			
B - 2630' FNL & 10' FEL	Sec. 26, T-17-S, R-34-E		25		75			
D - 10' FSL & 2630' FEL	Sec. 26, T-17-S, R-34-E				50	50		
PHILLIPS PETROLEUM CO., M. E. Hale Lease								
14 - 2630' FSL & 1330' FWL	Sec. 35, T-17-S, R-34-E					25	50	25
15 - 2630' FSL & 2630' FWL	Sec. 35, T-17-S, R-34-E					50	50	
16 - 2630' FSL & 1330' FEL	Sec. 35, T-17-S, R-34-E					50	50	
17 - 1310' FSL & 1330' FWL	Sec. 35, T-17-S, R-34-E						50	50
18 - 1310' FSL & 10' FEL	Sec. 35, T-17-S, R-34-E		50				50	
19 - 10' FSL & 1310' FEL	Sec. 35, T-17-S, R-34-E						50	50
PHILLIPS PETROLEUM CO., Mable Lease								
4 - 1330' FNL & 1310' FWL	Sec. 35, T-17-S, R-34-E					50	50	
5 - 13[illegible] FNL & 10' FWL	Sec. 35, T-17-S, R-34-E			50			50	

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Order No. R-7182
Exhibit "A"

_____ LEASE

WATER INJECTION CREDIT ALLOWABLE CALCULATION DATA

ATTACHMENT TO_____, 19__, REPORT

$$\text{Water Injection Credit Allowable} = \frac{W_i - W_p}{BPAA} - 1 \qquad BPAA$$

$$BPAA \quad B_o + \frac{(R_p - R_s)B_g}{(1{,}000)}$$

W_i = _____ = Average daily water injection, barrels per day, project area injection wells plus Conoco's percent water injection volume from the offset lease-line injection wells

W_p = _____ = Average daily water produced, barrels per day, project area only.

BPAA = _____ = Basic project area allowable, 80 bopd x ___ (number of developed 40-acre tracts in project area).

_____ = Weighted average project area reservoir pressure, psig, from _____, 19___, survey data.

B_o _____ = Oil formation volume factor, reservoir barrels per stock tank barrel (Exhibit B).

R_p _____ = Producing gas-oil ratio, cubic feet per barrel, project area only.

R_s _____ = Solution gas-oil ratio, cubic feet per barrel, (Exhibit B).

B_g _____ = Gas formation volume factor, reservoir barrels per Mcf (Exhibit B).

Water injection credit allowable for _____, 19___ = _____ barrels of oil per day.

EXHIBIT "B"
ORDER NO. R-7182

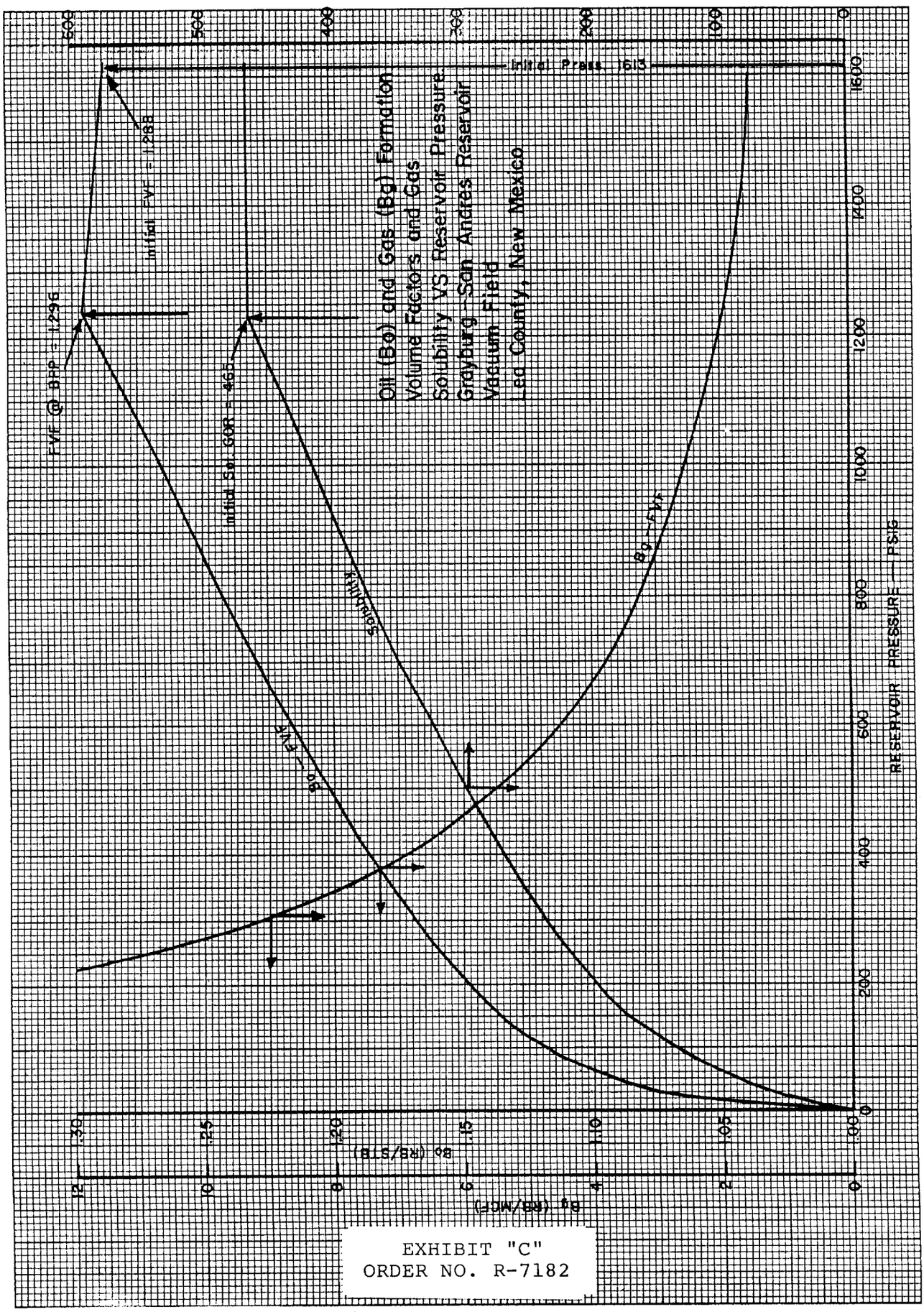

EXHIBIT "C"
ORDER NO. R-7182