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. 10290 Order No. R-3528-A

APPLICATION OF AVON ENERGY CORPORATION FOR AMENDMENT OF DIVISION ORDER NOS. R-3185, R-3185-A AND R-3528 TO EXPAND THE VERTICAL LIMITS AND TO ESTABLISH AN INJECTION PRESSURE LIMITATION FOR THE TURNER "B" LEASE WATERFLOOD PROJECT, EDDY COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

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This cause came on for hearing at 8:15 a.m. on August 8, 1991, at Santa Fe, New Mexico, before Examiner David R. Catanach.

NOW, on this 23rd day of September, 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:

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

(2) By Order No. R-3185, dated February 1, 1967, the Division authorized Sinclair Oil & Gas Company to institute three waterflood projects, the Russel Grayburg-Jackson Waterflood Project, Turner "A" Grayburg-Jackson Waterflood Project, and the Turner "B" Grayburg-Jackson Waterflood Project, said projects comprising all or portions of Sections 17, 18, 19, 20, 29 and 30, Township 17 South, Range 31 East, NMPM, Grayburg-Jackson Pool, Eddy County, New Mexico, by the injection of water into the Grayburg-San Andres formation through two, eight and nine injection wells located within said projects, respectively.

CASE NO. 10290 COLLEM WER TO ETATE Order No. R-3528-A COLLEM UNATURAL CHARTEN MULTICATION Page -2- ALIENIG CLEAVAERNO JIO

CALLER OF THE HEARING

(3) By Nunc Pro Tunc Order No. R-3185-A, dated February 19, 1968, the Division corrected certain injection well locations authorized by said Order No. R-3185.

(4) By Order No. R-3528, dated October 9, 1968, the Division authorized Sinclair Oil Corporation to expand its Turner "B" Grayburg-Jackson Waterflood Project by the injection of water into the Premier Sand member of the Grayburg formation through twelve injection wells located in Sections 20, 29 and 30, Township 17 South, Range 31 East, NMPM, Eddy County, New Mexico, hereinafter referred to as the "Expansion Area".

THE VERTICAL LIMITS AND TO ESTABLISH

(5) The current boundaries of the Russel Grayburg-Jackson Waterflood Project, Turner "A" Grayburg-Jackson Waterflood Project, Turner "B" Grayburg-Jackson Waterflood Project (including the "Expansion Area"), and the Grayburg-Jackson Friess-Fren Waterflood Project (also located in said Sections 19 and 30 and approved by Division Order No. R-4306) are as follows:

Russel Grayburg-Jackson Waterflood Project TOWNSHIP 17 SOUTH, RANGE 31 EAST, NMPM

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Section 18: NW/4, W/2 NE/4

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Turner "A" Grayburg-Jackson-Waterflood Project

2005 Constitution 23rd day of September, 1901 out of Lineardered the testimony, the record, **° 2/2**1.:81 noitoe2 and the many the record, **° 2/2**1.:81 noitoe2 and the premises, **° 2/N** :91 noitoe2

Turner "B" Grayburg-Jackson Waterflood Project TOWNSHIP 17 SOUTH, RANGE 31 EAST, NMPM

Section 17: NW/4 SW/4; S/2.S/2 is all to mithin the Section 20: All

1 P. Order No. R-3185, deallAl :22. notaes into a company into a company to institute/JSC :: 00 notaes into a company to institute/JSC :: 00 notaes into a company to institute/JSC :: 00 Notaethod Project. Torner "A" Gravburg-Jackson - 1.1.1

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TOWNSHIP 17 SOUTH, RANGE 31 EAST, NMPM

Section 19: /E/2 SW/4, SE/4 / mail. and section in the section of the section of

Section 30: NE/4- Hongest straight biss another house

CASE NO. 10290 Order No. R-3528-A Page -3-

Jackson Friess-Fren and portions of the Turner "A" Grayburg-Jackson, Grayburg-Projects are currently owned and operated by Socorro Petroleum Company.

Company, currently operates a portion of the Turner "B" Grayburg-Jackson Waterflood Project comprising the following described acreage:

TOWNSHIP 17 SOUTH, RANGE 31 EAST, NMPM

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Section 29: All

1) The amendment of Division Order No. R-3528 by expanding the block of the list bar out injection interval in the twelve injection wells approved by said state be off if 70 "8" non-order to include the entire Grayburg-San Andres formation; abmed indextop monog of beinger of block inspinges and the notice state and said

to noticative of bial back above the formation fracture pressure as determined from step rate in tests for those twelve injection wells located within the "Expansion

Area".

Trans "B' Ho, 55 . 199 Date Date Section 29, T-175, R-3 E

The establishment of an administrative procedure whereby acreage HI-S 201-T 92 6 currently contained within the Russel Grayburg-Jackson, Turner HI-S 201-T 92 for "A" Grayburg-Jackson; Turner "B" Grayburg-Jackson, and

Grayburg-Jackson Friess-Fren Waterflood Projects may be devine termination of the transferred to: Avon Energy Corporation and operated as a single more for one of gritness. waterflood projection, algorithm because of the black molecular of the termination of termination of the termination of te

(9) According to applicant's evidence, Avon Energy Corporation currently has

a farmout agreement with Socorro Petroleum Company whereby Avon earns acreage from Socorro as said acreage is drilled or otherwise further developed.

waterflood projects is Federal lands to subconcentrations and the subject

CASE NO. 10290 Order No. R-3528-A Page -4-

(11) The transfer and operation of such acreage should result in a more efficient operation, will result in the recovery of additional oil within the projects, and will not violate correlative rights.

(12) According to applicant's evidence and testimony, expansion of the injection interval within those wells located in the "Expansion Area" will result in the recovery of an additional 2.3 million barrels of oil which would not otherwise be recovered, thereby preventing waste.

(13) The proposed expansion of the injection interval within those wells located in the "Expansion Area" should be approved.

(14) The Division has determined, after consultation with the applicant prior to the hearing, that certain "Area of Review" wells located within the "Expansion Area" are not completed in such a manner which will assure that their wellbores will not serve as a conduit for migration of the injected fluid from the proposed injection zone.

(15) Prior to commencing injection operations within one-half mile of any of the following described wells, or prior to injecting into the Turner "B" Well No. 56 located in Unit J of said Section 30, the applicant should be required to perform remedial cement operations or take other action as may be necessary in order to assure that these wellbores will not serve as a conduit for migration of injected fluid to the satisfaction of the supervisor of the Artesia district office of the Division:

Turner "B" No. 55	Unit H, Section 29, T-17S, R-31E
Turner "B" No. 60	Unit K, Section 29, T-17S, R-31E
Turner "B" No. 68	Unit P, Section 29, T-17S, R-31E
Turner "B" No. 71	Unit M, Section 29, T-17S, R-31E

(16) No injection pressure limitation currently exists on any of the injection wells in the subject waterflood projects, however, by virtue of amending the injection interval in those injection wells located within the "Expansion Area", the Division would normally impose a surface injection pressure limitation on those wells equal to 0.2 psi per foot of depth to the uppermost perforations.

(17) The applicant presented the results of step-rate tests conducted on three injection wells within the "Expansion Area". The results of these step rate tests show an average formation fracture pressure of 1208 psi.

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-74:-2 NO. 10230 Inter No: R-3523-A Page -6-

(18) The applicant's engineering study of pressure limits based upon Frac Hite, Frac Migration, and After Frac Logs (submitted as evidence in this case) provides by business substantial evidence to demonstrate that injection at 1650 psi (450 psi above the substantial evidence to demonstrate that injection at 1650 psi (450 psi above the formation parting pressure) will not propagate fractures outside of the vertical limits of visually the Grayburg-Jackson Pool, and Hguoth, ico9 nozact-giudyend, noitemnoi of the Grayburg-Jackson Pool, and Hguoth, ico9 nozact-giudyend, noitemnoi obside the Grayburg-Jackson Pool, and Hguoth, ico9 nozact-giudyend, noitemnoi beddelfs "A" their and novole (8228-9, oN head of head of the vertical boothead W noz (19) The requested increase in surface pressure limitations for the "Expansion agne9. Area" will approximate the surface injection pressure for the original injection wells for

which no pressure limit was imposed to well, New Men and Walking it 2011 Marking Eddy County, New Men and Men Men and Men Men and Me

beggiups solution (20): Engineering studies conducted on behalf of the applicant have demonstrated bise no that the water injected into the original injection wells at pressures up to an average of 1870 psi remained confined to the Grayburg-Jackson Poolsdi mom on or allow

Syonges viewils (21): There is no indication that water injected into the original injection wells at beliate pressures higher than those sought by the applicant in this case has moved water outside allower of the vertical limits of the Grayburg-Jackson Pooletest events that up word

the Division may deem necessary accompany such requests the Division nuay deem necessary accompany such requests the stand of the request previous of the stand (22) (22) the stand of the request previous of the stand of the stand of the stand the stand of the stand the stand of the stand the stand of th

adecuately confined to the Grayburg-Jackson Pool.

(23) Injection into the twelve subject injection wells at a surface injection only to verpressure of approximately, 450 psi above formation, fracture pressure will allow the balabole recovery of additional oil reserves within the Grayburg-Jackson Pool, thereby preventing to another waster, will not endanger any fresh water aquifers, and should therefore be approved. Ion line approved that studies of tables of tables.

10 1021V190102 3dl (24) As the reservoir pressure in the "Expansion Area", increases as a result of the injection of water, it will be necessary to periodically increase the surface pressure limitation for the project which should be authorized administratively.

Turner 1B" No 55 Unit H. Section 29 IT-178, R-31E

11. 9. (25) The applicant should be required to submit a request to the Santa Fe and Artesia offices of the Division and to the United States Bureau of Land Management (BLM) for transfer of acreage from the Socorro Petroleum Company operated Turner "A" Grayburg-Jackson, Turner "B" Grayburg-Jackson, Grayburg-Jackson Friess-Fren and Russel Grayburg-Jackson Waterflood Projects into the Avon operated Turner "B" Grayburg-Jackson Waterflood Project. Such request should be in general letter form along with a plat of the projects showing the requested acreage to be transferred. CASE NO. 10290 Order No. R-3528-A Page -6

IT IS THEREFORE ORDERED THAT:

- ACADA ANT MARK DISCUSSION

(1) Division Order Nos. R-3185, R-3185-A and R-3528 are hereby amended authorizing Avon Energy Corporation to inject water into the Grayburg-San Andres formation, Grayburg-Jackson Pool, through the twelve injection wells (previously approved for injection by Order No. R-3528) shown on Exhibit "A" attached hereto located within the "Expansion Area" of the Turner "B" Grayburg-Jackson Waterflood Project comprising all or portions of Sections 20, 29 and 30, Township 17 South, Range 31 East, NMPM, Eddy County, New Mexico. The Data Andres Section 20, 29 and 30, Township 17 South, Range

(2) The twelve subject injection wells or pressurization system shall be equipped with a pressure limiting device which will limit the surface injection pressure on said wells to no more than 1650 psi.

(3) The Division Director shall have the authority to administratively approve subsequent pressure increases on said wells to 450 psi above fracture pressure, provided, however, that step-rate tests, temperature surveys, tracer surveys or other supporting data the Division may deem necessary accompany such requests.

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(4) 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.

(5) Prior to commencing injection operations within one-half mile of any of the following described wells, or prior to injecting into the Turner "B" Well No. 56 located in Unit J of said Section 30, the applicant shall perform remedial cement operations or take other action as may be necessary in order to assure that these wellbores will not serve as a conduit for migration of injected fluid to the satisfaction of the supervisor of the Artesia district office of the Division:

	•	. · ii				
Turner "B"	No. 55		Unit	H, Section	29, T-17S, 1	R-31E
Turner "B"	No. 60		Unit	K, Section	29, T-17S, I	R-31E
Turner "B"	No. 68	: •	Unit	P; Section 2	29, T-17S, F	₹-3 1E
Turner "B"	No. 71		Unit	M, Section	29, T-17S,	R-31E
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Order No. R-3528-A	
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The Division Director may authorize the transfer of acreage currently contained within the Socorro Petroleum Company operated Turner "A" Grayburg-Jackson, Turner "B" Grayburg-Jackson, Grayburg-Jackson Friess-Fren and Russel Grayburg-Jackson Waterflood Projects into the Avon operated Turner "B" Grayburg-Jackson Waterflood Project provided a request for such transfer of acreage is submitted to the Santa Fe and Artesia offices of the Division and to the United States Bureau of Land Management (BLM) - Such request shall be in general letter form along with a plat of the projects showing the requested acreage to be transferred.

Jurisdiction is hereby 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. 162

STATE OF NEW MEXICO

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Well Number	Location	Unit	S-T-R	Injection Perforations	Packer Depth	Tubing Size	Injection Pressure
Turner "B" No. 44	660' FSL & 2055' FWL	z	20-17S-31E	TBD*	TBD*	2 3/8	1650
Turner "B" No. 46	660' FSL & 760' FEL	Ρ	20-17S-31E	TBD*	TBD*	2 3/8	1650
Turner "B" No. 47	560' FNL & 1980' FEL	В	29-17S-31E	3045' - 3412'	2945'	2 3/8	1650
Turner "B" No. 50	660' FNL & 660' FWL	D	29-17S-31E	2978' - 3330'	2878'	2 3/8	1650
Turner "B" No. 54	1980' FNL & 1980' FWL	Ľ	29-17S-31E	3108' - 3404'	3008'	2 3/8	1650
Turner "B" No. 55	1980' FNL & 660' FEL	Н	29-17S-31E	TBD*	TBD*	2 3/8	1650
Turner "B" No. 56	1980' FSL & 1980' FEL	J	30-17S-31E	TBD*	TBD*	2 3/8	1650
Turner "B" No. 61	1980' FSL & 1980' FEL	J	29-17S-31E	3254' - 3646'	3154'	2 3/8	1650
Turner "B" No. 64	1980' FSL & 660' FWL	ſ	29-17S-31E	3146' - 3557'	3046'	2 3/8	1650
Turner "B" No. 66	660' FSL & 1980' FWL	z	29-17S-31E	3281' - 3678'	3181'	2 3/8	1650
Turner "B" No. 68	660' FSL & 660' FEL	Р	29-17S-31E	TBD*	TBD*	2 3/8	1650
Turner "B" No. 76	660' FSL & 660' FEL	Р	30-17S-31E	TBD*	TBD•	2 3/8	1650
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. 1 BEFORE THE OIL CONSERVATION COMMISSION سر کے میں OF THE STATE OF NEW MEXICO CASE NO. 4705

Order No. R+4306

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF NEW MEXICO FOR MINOLION and demonds noise which THE PURPOSE OF CONSIDERING:

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APPLICATION COMPANY FOR EDDY COUNTY,	WATERFLOC		Friese ?	Richfield Richfield Richfield	odanala. Odanilai
	$\frac{1}{Z}$	ů.	Fren Oil	Richfield	Friendler Atlantic Atlantic

(2) That the subject waterflood pro: MOISSIMMOD THE YALT VE the Atlantic Grayburg-Jackson Friess-Fren Waterricon Fromdat and and This cause came on for hearing at 9 a.m. on May 5, 1972, at Santa Fe, New Mexico, before Examiner Elvis A. Utz. and and

which we want this 19th day of May, 1972, the Commission, a - guorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

(a) ToFINDS: Far al sause shif fo noiselful that (a) actry of such further orders as the Commission may dear necessary

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

That the applicant, Atlantic Richfield Company, seeks (2) permission to institute a waterflood project in the Grayburg-Jackson Pool by the injection of water into the Grayburg formation through five wells located in Sections 19 and 30, Township 17 South, Range 31 East, NMPM, Eddy County, New Mexico.

That the wells in the project area are in an advanced (3) state of depletion and should properly be classified as "stripper" wells. ALEX J. ARMIICO, MORAN

(4) That the proposed waterflood project should result in the recovery of otherwise unrecoverable oil, thereby preventing Waste, sadare , ... Andrey ...

(5) That the subject application should be approved and the projects should be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

IT IS THEREFORE ORDERED:

(1) That the applicant, Atlantic Richfield Company, is hereby authorized to institute a waterflood project in the Grayburg-Jackson Pool by the injection of water into the Grayburg -2-CASE NO. 4705 Order No. R-4306

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formation through the following-described five wells in Township 17 South, Range 31 East, NMPM, Eddy County, New Mexico:

Well Name	Well Numb er	Unit Letter	Section
Atlantic Richfield Friess MA	1	в	30
Atlantic Richfield Friess MA	4.	H	30
Atlantic Richfield Friess			
Federal	2	J	19
Atlantic Richfield Fren Oil Co	. 2	N	19
Atlantic Richfield Fren Oil Co	. 13	P	19

(2) That the subject waterflood project is hereby designated the Atlantic Grayburg-Jackson Friess-Fren Waterflood Project and shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

(3) That monthly progress reports of the waterflood project herein authorized shall be submitted to the Commission in accordance with Rules 704 and 1120 of the Commission Rules and Regulations.

(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.

STATE OF NEW MEXICO OIL CONSERVATION COMMISSION

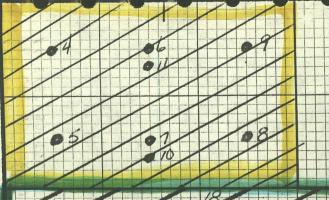
BRUCE KING, Chairman

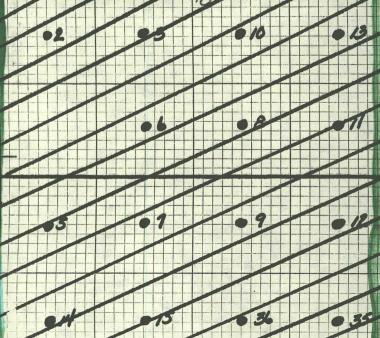
ALEX J. ARMIJO, Member

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

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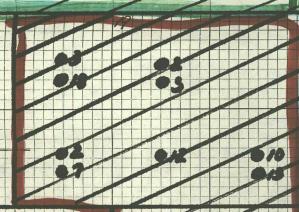




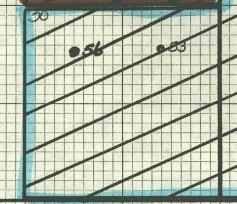
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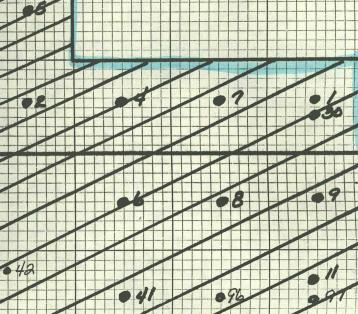


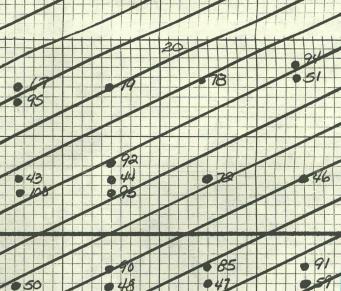


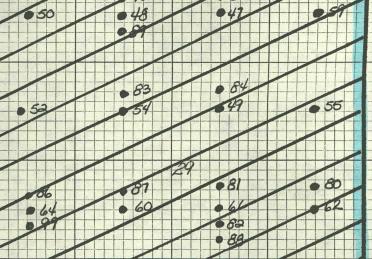


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