

**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. 12208
Order No. R-11254*

**APPLICATION OF ST. MARY LAND & EXPLORATION COMPANY FOR
APPROVAL OF A WATERFLOOD PROJECT AND TO QUALIFY THE
PROJECT FOR THE RECOVERED OIL TAX RATE PURSUANT TO THE
ENHANCED OIL RECOVERY ACT, EDDY AND LEA COUNTIES, NEW
MEXICO.**

ORDER OF THE DIVISION

BY THE DIVISION:

This case came on for hearing at 8:15 a.m. on August 5, 1999, at Santa Fe, New Mexico, before Examiner David R. Catanach.

NOW, on this 14th day of October, 1999, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner,

FINDS THAT:

- (1) Due public notice has been given and the Division has jurisdiction of this case and its subject matter.
- (2) Division Cases No. 12207 and 12208 were consolidated at the time of the hearing for the purpose of testimony.
- (3) The applicant, St. Mary Land & Exploration Company, seeks authority to institute a waterflood project within its proposed East Shugart Delaware Unit (the subject of companion Case No. 12207) by the injection of water into the Delaware formation, East Shugart-Delaware Pool, Eddy and Lea Counties, New Mexico, through the gross interval from approximately 5,015 feet to 5,420 feet in nine proposed injection wells shown on the attached Exhibit "A".
- (4) Intoil, Inc., an interest owner in the proposed East Shugart Delaware Unit, appeared at the hearing but did not object to the proposed waterflood project.
- (5) The East Shugart Delaware Unit is proposed to comprise the following described acreage in Eddy and Lea Counties, New Mexico:

Eddy County
Township 18 South, Range 31 East, NMPM

Section 13: S/2 SE/4
Section 24: NE/4, N/2 SE/4

Lea County
Township 18 South, Range 32 East, NMPM

Section 18: Lot 4
Section 19: Lots 1 through 3, E/2 NW/4, NE/4 SW/4

(6) The East Shugart-Delaware Pool was created by Division Order No. R-8179 dated March 14, 1986. The pool, which was discovered by the Siete Oil and Gas Corporation Geronimo Federal Well No. 3 located in Unit A of Section 24, Township 18 South, Range 31 East, NMPM, currently comprises portions of Sections 13 and 24, Township 18 South, Range 31 East, Eddy County, and portions of Sections 18 and 19, Township 18 South, Range 32 East, Lea County.

(7) The applicant presented geologic evidence indicating that:

- a) the Unitized Formation comprises that interval from the “top of the Brushy Canyon formation of the Delaware Mountain Group to the stratigraphic equivalent of 5,600 feet within the Delaware Brushy Canyon formation as determined by the Geronimo Federal Well No. 3 well log”;
- b) within the Unitized Formation, there are ten separate pay sands that are generally continuous across the East Shugart Delaware Unit; however, there can be significant variations in porosity from one well location to the next;
- c) the applicant has determined the approximate location of the oil-water contact within each of the pay sands of the Unitized Formation. Each of the pay sands is productive across some portion of the East Shugart Delaware Unit, the amount of such productive area being dictated by the location of the oil-water contact;
- d) producing wells within the East Shugart-Delaware Pool are completed in an average of three to five pay sands of the Unitized Formation, and

- e) the applicant proposes to conduct waterflood operations within each of the ten pay sands of the Unitized Formation.

(8) The applicant presented engineering evidence indicating that:

- a) there are currently 15 active and 1 inactive producing wells within the East Shugart Delaware Unit. These wells are in an advanced state of depletion and produce at an average rate of approximately 12 barrels of oil and 21 barrels of water per day from the East Shugart-Delaware Pool;
- b) cumulative oil production within the proposed unit area is approximately 2.2 million barrels of oil and 5.0 BCF of gas. Remaining primary reserves, in the absence of workover and waterflood operations, is estimated at 600,000 barrels of oil;
- c) an estimated 822,000 barrels of additional primary oil will be recovered from the unit area as a result of perforating behind-pipe zones and performing re-fracture stimulations on existing producing zones. Secondary reserves from waterflood operations are estimated to be approximately 2.9 million barrels of oil; and
- d) an inverted five spot injection pattern will be utilized within the East Shugart Delaware Unit. Ultimately, nine injection wells and 15 producing wells will be utilized for the proposed secondary recovery operations.

(9) The proposed waterflood project will result in the recovery of an additional 3.7 million barrels of oil from the East Shugart Delaware Unit which would otherwise not be recovered, thereby preventing waste.

(10) The applicant estimates that \$5.6 million in capital costs will be required to conduct waterflood operations within the East Shugart Delaware Unit.

(11) The proposed waterflood project should be approved.

(12) The applicant should 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.

(13) The injection of water into each of the wells shown on Exhibit "A" should be accomplished through 2 3/8 inch internally plastic-lined tubing installed in a packer set within 100 feet of the uppermost injection perforations. The casing-tubing annulus should be filled with an inert fluid and a gauge or approved leak-detection device should be attached to the annulus in order to detect leakage in the casing, tubing or packer.

(14) Prior to commencing injection operations into the wells shown on Exhibit "A", the casing in each well should be pressure tested throughout the interval from the surface down to the proposed packer setting depth to assure the integrity of such casing.

(15) The injection wells or pressurization system should be initially equipped with a pressure control device or acceptable substitute that will limit the surface injection pressure to no more than 1,003 psi.

(16) The Division Director should have the authority to administratively authorize an increase in injection pressure upon a showing by the operator that such higher pressure will not result in fracturing of the injection formation or confining strata.

(17) The operator should give advance notice to the supervisor of the Division's Artesia District Office of the date and time i) injection equipment will be installed on each of the proposed injection wells, and ii) the mechanical integrity pressure tests will be conducted on each of the proposed injection wells, so these operations may be witnessed.

(18) The waterflood project should be governed by Division Rules No. 701 through 708.

(19) The injection authority granted herein for the wells shown on Exhibit "A" should terminate one year after the effective date of this order if the operator has not commenced injection operations into these wells; provided however the Division, upon written request by the operator, may grant an extension for good cause.

(20) The applicant seeks to qualify the waterflood project as an Enhanced Oil Recovery Project pursuant to the Enhanced Oil Recovery Act (Sections 7-29A-1 through 7-29A-5, NMSA 1978).

(21) The evidence presented indicates that the waterflood project meets all the criteria for certification.

(22) The certified project area should initially comprise that area contained within the East Shugart Delaware Unit, as described in Finding No. 5 above, provided however the project area and/or the producing wells eligible for the enhanced oil recovery (EOR) tax rate may be contracted and reduced based upon the evidence presented by the applicant in its demonstration of a positive production response.

(23) To be eligible for the EOR tax rate, the operator should advise the Division of the date and time water injection commences within the waterflood project. At such time, the Division will certify the project to the New Mexico Taxation and Revenue Department.

(24) At such time as a positive production response occurs and within five years from the date the project was certified to the New Mexico Taxation and Revenue Department, the applicant must apply to the Division for certification of a positive production response. This application shall identify the area benefiting from enhanced oil recovery operations and the specific wells eligible for the tax credit. The Division may review the application administratively or set it for hearing. Based upon the evidence presented, the Division will certify to the New Mexico Taxation and Revenue Department those wells that are eligible for the EOR tax rate.

IT IS THEREFORE ORDERED THAT:

(1) The applicant, St. Mary Land & Exploration Company, is hereby authorized to institute a waterflood project within its East Shugart Delaware Unit (further described in Finding No. 5 above and in companion Case No. 12207) by the injection of water into the Delaware formation, East Shugart-Delaware Pool, Eddy and Lea Counties, New Mexico, through the gross interval from approximately 5,015 feet to 5,420 feet in nine proposed injection wells shown on the attached Exhibit "A".

(2) The applicant shall take all steps necessary to ensure that the injected fluid 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.

(3) The injection of water into each of the wells shown on Exhibit "A" shall be accomplished through 2 3/8 inch internally plastic-lined tubing installed in a packer set within 100 feet of the uppermost injection perforations. The casing-tubing annulus shall be filled with an inert fluid and a gauge or approved leak-detection device shall be attached to the annulus in order to detect leakage in the casing, tubing or packer.

(4) Prior to commencing injection operations into the wells shown on Exhibit "A", the casing in each well shall be pressure tested throughout the interval from the surface down to the proposed packer setting depth to assure the integrity of such casing.

(5) The injection wells or pressurization system shall be initially equipped with a pressure control device or acceptable substitute that will limit the surface injection pressure to no more than 1,003 psi.

(6) The Division Director shall have the authority to administratively authorize an increase in injection pressure upon a showing by the operator that such higher pressure will not result in fracturing of the injection formation or confining strata.

(7) The operator shall give advance notice to the supervisor of the Division's Artesia District Office of the date and time i) injection equipment will be installed on each of the proposed injection wells, and ii) the mechanical integrity pressure tests will be conducted on each of the proposed injection wells, so these operations may be witnessed.

(8) The applicant shall immediately notify the supervisor of the Division's Artesia District Office of the failure of the tubing, casing or packer in any of the injection wells or the leakage of water or oil from or around any producing or plugged and abandoned well within the project area, and shall take such steps as may be necessary and timely to correct the failure or leakage.

(9) The waterflood project is hereby designated the East Shugart Delaware Unit Waterflood Project, and the applicant shall conduct injection operations in accordance with Division Rules No. 701 through 708, and shall submit monthly progress reports in accordance with Division Rules No. 706 and 1115.

(10) The injection authority granted herein for the wells shown on Exhibit "A" shall terminate one year after the effective date of this order if the operator has not commenced injection operations into these wells; provided however the Division, upon written request by the operator, may grant an extension for good cause.

(11) The East Shugart Delaware Unit Waterflood Project is hereby qualified as an "Enhanced Oil Recovery Project." The project area shall initially comprise that area contained within the East Shugart Delaware Unit, as described in Finding No. 5 above, provided however the project area and/or the producing wells eligible for the enhanced oil recovery (EOR) tax rate may be contracted and reduced based upon the evidence presented by the applicant in its demonstration of a positive production response.

(12) To be eligible for the EOR tax rate, the operator shall advise the Division of the date and time water injection commences within the waterflood project. At such time, the Division will certify the project to the New Mexico Taxation and Revenue Department.

(13) At such time as a positive production response occurs and within five years from the date the project was certified to the New Mexico Taxation and Revenue Department, the applicant must apply to the Division for certification of a positive production response. This application shall identify the area actually benefiting from enhanced oil recovery operations and shall identify the specific wells eligible for the tax credit. The Division may review the application administratively or set it for hearing. Based upon the evidence presented, the Division will certify to the New Mexico Taxation and Revenue Department those wells that are eligible for the EOR tax rate.

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

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



S E A L

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION



LORI WROTENBERY
Director

Exhibit "A"
Division Order No. R-11254
East Shugart Delaware Unit Waterflood Project
Approved Injection Wells

<i>Well Name & Number</i>	<i>Well Location</i>	<i>Injection Interval</i>	<i>Packer Setting Depth</i>	<i>Tbg. Size</i>	<i>Maximum Surface Injection Pressure</i>
ESDU No. 1	430' FSL & 1650' FEL (Unit O) Section 13, T-18S, R-31E	5,090'-5,420'	5,000'	2 3/8"	1,003 PSIG
ESDU No. 17	248' FNL & 302' FEL (Unit A) Section 24, T-18S, R-31E	5,030'-5,310'	5,000'	2 3/8"	1,003 PSIG
ESDU No. 18	190' FNL & 1045' FWL (Unit D) Section 19, T-18S, R-32E	5,065'-5,320'	5,000'	2 3/8"	1,003 PSIG
ESDU No. 19	1288' FNL & 1361' FEL (Unit B) Section 24, T-18S, R-31E	5,020'-5,310'	5,000'	2 3/8"	1,003 PSIG
ESDU No. 20	1250' FNL & 303' FEL (Unit A) Section 24, T-18S, R-31E	5,020'-5,310'	5,000'	2 3/8"	1,003 PSIG
ESDU No. 21	1193' FNL & 1018' FWL (Unit D) Section 19, T-18S, R-32E	5,015'-5,330'	5,000'	2 3/8"	1,003 PSIG
ESDU No. 22	2330' FNL & 1320 FEL Section 24, T-18S, R-31E	5,030'-5,340'	5,000'	2 3/8"	1,003 PSIG
ESDU No. 23	2322' FNL & 248' FEL (Unit H) Section 24, T-18S, R-31E	5,025'-5,345'	5,000'	2 3/8"	1,003 PSIG
ESDU No. 24	2322' FNL & 1073' FWL (Unit E) Section 19, T-18S, R-32E	5,030'-5,360'	5,000'	2 3/8"	1,003 PSIG