

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION 2040 S. PACHECO SANTA FE, NEW MEXICO 87505 (505) 827-7131

August 18, 1995

Merrion Oil & Gas Corporation P. O. Box 840 Farmington, New Mexico 87499

**Attention: George Sharpe** 

### Administrative Order DD-111(H) High Angle/Horizontal

Dear Mr. Sharpe:

Reference is made to your application dated May 31, 1995 for authorization to initiate a high angle/horizontal directionally drilling project in the designated and Undesignated Snake Eyes-Entrada Oil Pool on Merrion Oil & Gas Corporation's Santa Fe fee lease in Sections 19, 20, and 21, Township 21 North, Range 8 West, NMPM, San Juan County, New Mexico.

#### The Division Director Finds That:

- (1) The application by Merrion Oil & Gas Corporation ("Merrion") has been duly filed under the provisions of Rule 111.D and E of the General Rules and Regulations of the New Mexico Oil Conservation Division ("Division"), revised by Division Order No. R-10388, issued by the Oil Conservation Commission in Case 11,274 on June 13, 1995;
- (2) The Snake Eyes-Entrada Oil Pool currently comprises the N/2 of Section 20, Township 21 North, Range 8 West, NMPM, San Juan County, New Mexico and is subject to the statewide rules and regulations for oil wells, as promulgated by Rule 104.C(1)(a), which provides for 40-acre oil spacing and proration units, or drilling units, and requires that wells be located no closer than 330 feet to the outer boundary of a single 40-acre oil spacing and proration unit;
- (3) A special depth bracket oil allowable of 750 barrels of oil per day per 40-acre unit was established for said pool by Division Order No. R-5421, dated April 26, 1977;
- (4) The Entrada formation in this area was deposited as an eolian sand overlain by lacustrine limestones and anhydrites of the Todilto formation. The resulting "dune-

Administrative Order DD-111(H) August 18, 1995 Page No. 2

> like" structures, having porosity and permeability, act as the reservoir for trapping the accumulation of oil in the Entrada formation. The Eagle Mesa-Entrada Pool is in contact with a large aquifer and hydrodynamically active fresh ground water flowing to the southwest beneath the oil accumulation. This strong drive acts to tilt the oil-water contact in the direction of flow; conventionally drilled (vertical) wells in this pool experience significant "water coning", whereby the water below the oil moves upward to the wellbore, a process that has left a significant amount of "attic" oil sidetracked or by-passed between wells; by drilling horizontally across the top of the structure, the applicant is attempting to drain this otherwise unrecoverable attic oil by alleviating this coning action; such horizonal drainhole will act to create a small pressure drop along the large area found in a long horizontal drainhole instead of a large pressure drop through a small area available to a vertical wellbore;

(5) The "project area" proposed by Merrion would consist of a single fee lease which comprises 1040 acres, or 26 40-acre units, underlying the following described area in San Juan County, New Mexico:

#### TOWNSHIP 21 NORTH, RANGE 8 WEST, NMPM

Section 19: E/2 NE/4 and NE/4 SE/4 Section 20: All Section 21: NW/4, N/2 SW/4, and SW/4 SW/4;

(6) Within this project area Merrion seeks:

a) the ability to traverse section, quarter section and quarter-quarter section lines within the project area in order to form non-standard oversized and irregular sized spacing and proration units to accommodate such wellbores;

b) drill the proposed horizontal wellbores to within 330 feet of the outer boundary of the project area; and,

c) the assignment of an allowable for a horizontally drilled well based upon the number of standard 40acre proration units which are developed or traversed by a horizontal wellbore; Administrative Order DD-111(H) August 18, 1995 Page No. 3

- (7) Initially, it is Merrion's intent to utilize the existing wellbores on its Santa Fe "20" Well No. 1 (API No. 30-045-22291), located 1800 feet from the North line and 2110 feet from the East line (Unit G), of said Section 20 and its Santa Fe "20" Well No. 3 (API No. 30-045-22568), located 2220 feet from the North line and 990 feet from the East line (Unit H), of said Section 20 to drill short radius horizontal drainholes a lateral distance of 800 to 1,000 feet; and,
- (8) It appears the applicant has satisfied all of the appropriate requirements prescribed in said Rule 111.D and E, the subject application should be approved and the well should be governed by the provisions contained within this order and all other applicable provisions of Division General Rule 111.

#### **IT IS THEREFORE ORDERED THAT:**

(1) The application of Merrion Oil and Gas Corporation ("Merrion") for high angle/horizontal directional drilling within a "project area", in the designated and Undesignated Snake Eyes-Entrada Oil Pool on its Santa Fe fee lease comprising the following described 1040 acres in San Juan County, New Mexico, is hereby approved:

### TOWNSHIP 21 NORTH, RANGE 8 WEST, NMPM

Section 19: E/2 NE/4 and NE/4 SE/4 Section 20: All Section 21: NW/4, N/2 SW/4, and SW/4 SW/4.

(2) Merrion is further authorized to proceed with their initial plans to recomplete its existing Santa Fe "20" Well No. 1 (API No. 30-045-22291), located 1800 feet from the North line and 2110 feet from the East line (Unit G), of said Section 20 and its Santa Fe "20" Well No. 3 (API No. 30-045-22568), located 2220 feet from the North line and 990 feet from the East line (Unit H), of said Section 20 by plugging-back, milling a window in the existing production casing, kick-off from the vertical by drilling a short radius curve hole to approximately 90 degrees so as to encounter the upper portion of the oil bearing Entrada sand, and continue drilling horizontally a distance of 800 to 1,000 feet.

<u>PROVIDED HOWEVER THAT</u> any drainhole drilled from either of said wellbores may traverse section, quarter section and quarter-quarter section lines within the project area provided that the horizonal or producing portion of any drainhole shall be located no closer than 330 feet from the outer boundary of the above-described "project area".

Administrative Order DD-111(H) August 18, 1995 Page No. 4

<u>PROVIDED FURTHER THAT</u> the applicant shall determine the actual location of the kick-off points in each well prior to commencing directional drilling operations. Also, the applicant shall conduct a directional survey on the lateral portion of any horizontal wellbore during or after completion of drilling operations.

(3) The applicant shall notify the supervisor of the Aztec District office of the Division of the date and time said wellbore surveys are to be conducted so that they may be witnessed. The applicant shall further provide a copy of said wellbore surveys to the Santa Fe and Aztec offices of the Division upon completion.

(4) The allowable assigned to the proration units designated to each well in the Snake Eyes-Entrada Oil Pool shall be assigned by the supervisor of the Division's Aztec district office and shall be equal to 750 barrels of oil per day times the number of standard 40-acre tracts within each designated proration unit that are developed/traversed by a horizontal drainhole.

(5) The operator shall comply with all requirements and conditions set forth in Division General Rule 111.E(2) and any applicable requirements in 111.D and F.

(6) Form C-105 shall be filed in accordance with Division Rule 1105 and the operator shall indicate thereon true vertical depth (TVD) in addition to measured depths (MVD).

(7) 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. LÉN Director

SEAL

cc: Oil Conservation Division - Aztec
 U. S. Bureau of Land Management - Farmington
 File: Case 11327

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Received i 6/6/95 Effective Rec Bok and 6/13/95 IN Suspence Date : 7/3/95

# **OIL CONSERVATION DIVISION**

Released : 8/18/85

August 18, 1995

Merrion Oil & Gas Corporation P. O. Box 840 Farmington, New Mexico 87499

Attention: George Sharpe

Administrative Order DD-\*\*\*(H) High Angle/Horizontal

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- (2) The Snake Eyes-Entrada Oil Pool currently comprises the N/2 of Section 20, Township 21 North, Range 8 West, NMPM, San Juan County, New Mexico and is subject to the statewide rules and regulations for oil wells, as promulgated by Rule 104.C(1)(a), which provides for 40-acre oil spacing and proration units, or drilling units, and requires that wells be located no closer than 330 feet to the outer boundary of a single 40-acre oil spacing and proration unit;
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### Administrative Order DD-\*\*\*\*\*(H) August \*\*\*\*\*\*\*\* Page No. 2

(5) The "project area" proposed by Merrion would consist of a single fee lease which comprises 1040 acres, or 26 40-acre units, underlying the following described area in San Juan County, New Mexico:

**TOWNSHIP 21 NORTH, RANGE 8 WEST, NMPM** 

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- (8) It appears the applicant has satisfied all of the appropriate requirements prescribed in said Rule 111.D and E, the subject application should be approved and the well should be governed by the provisions contained within this order and all other applicable provisions of Division General Rule 111.

#### IT IS THEREFORE ORDERED THAT:

(1) The application of Merrion Oil and Gas Corporation ("Merrion") for high angle/horizontal directional drilling within a "project area", in the designated and Undesignated Snake Eyes-Entrada Oil Pool on its Santa Fe fee lease comprising the following described 1040 acres in San Juan County, New Mexico, is hereby approved:

TOWNSHIP 21 NORTH, RANGE 8 WEST, NMPM

Section 19: E/2 NE/4 and NE/4 SE/4 Section 20: All Section 21: NW/4, N/2 SW/4, and SW/4 SW/4. Administrative Order DD-\*\*\*\*\*(H) August \*\*\*\*\*\*\*\* Page No. 3

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<u>PROVIDED FURTHER THAT</u> the applicant shall determine the actual location of the kick-off points in each well prior to commencing directional drilling operations. Also, the applicant shall conduct a directional survey on the lateral portion of any horizontal wellbore during or after completion of drilling operations.

(3) The applicant shall notify the supervisor of the Aztec District office of the Division of the date and time said wellbore surveys are to be conducted so that they may be witnessed. The applicant shall further provide a copy of said wellbore surveys to the Santa Fe and Aztec offices of the Division upon completion.

(4) The allowable assigned to the proration units designated to each well in the Snake Eyes-Entrada Oil Pool shall be assigned by the supervisor of the Division's Aztec district office and shall be equal to 750 barrels of oil per day times the number of standard 40-acre tracts within each designated proration unit that are developed/traversed by a horizontal drainhole.

(5) The operator shall comply with all requirements and conditions set forth in Division General Rule 111.E(2) and any applicable requirements in 111.D and F.

(6) Form C-105 shall be filed in accordance with Division Rule 1105 and the operator shall indicate thereon true vertical depth (TVD) in addition to measured depths (MVD).

(7) 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

SEAL

# Administrative Order DD-\*\*\*\*(H) August \*\*\*\*\*\*\* Page No. 4

cc: Oil Conservation Division - Aztec U. S. Bureau of Land Management - Farmington File: Case 11327 Case 11,274

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# **OIL CONSERVATION DIVISION**

Docketed

June 27, 1995

Merrion Oil & Gas Corporation P. O. Box 840 Farmington, New Mexico 87499

Attention: George Sharpe

. **RE**:

Division Case Nos. 11327, 11328, and 11329 Applications for high angle/horizontal directional drilling projects in the San Juan Basin of Northwest New Mexico.

Dear Mr. Sharpe:

Per our telephone conversation yesterday concerning the subject applications, all three will now be considered under the provisions of revised Division General Rule 111, as promulgated by Division Order No. R-10388, see copy attached. The three cases already docketed for hearing on June 29, 1995 will be continued to the hearing scheduled for July 13, 1995, this will assure that these matters will be handled in a quick and prompt manner should a protest be filed or a glitch arise so that an administrative order could not be issued.

Should you have any questions or comments concerning this matter, please call me in Santa Fe at (505) 827-8185.

Sincerely

Michael E. Stogner Chief Hearing Officer/Engineer

cc:

OCD - Aztec Files: Case No. 11327 Case No. 11328 Case No. 11329

VILLAGRA BUILDING - 408 Gelisteo Forestry and Resources Conservation Division P.O. Box 1948 87504-1948 827-5830 Park and Recreation Division

Park and Recreation Division P.O. Box 1147 87504-1147 827-7465 Office of the Secretary 827-5950 Administrative Services 827-5925 Energy Conservation & Management 827-5900 Mining and Minerais 827-5970 Oil Conservation 827-7131

2040 South Pachaco

# STATE OF NEW MEXICO ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION DIVISION

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

CASE NO. 11274 Order No. R-10388

# APPLICATION OF MERIDIAN OIL INC. TO ESTABLISH A STATEWIDE ADMINISTRATIVE PROCEDURE FOR APPROVAL OF DIRECTIONAL DRILLING PROJECTS IN THE STATE OF NEW MEXICO.

#### **ORDER OF THE COMMISSION**

#### **BY THE COMMISSION:**

This cause came on for hearing at 9 o'clock a.m. on April 27, 1995, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 13th day of June, 1995, the Commission, a quorum being present, having considered the record and being fully advised in the premises,

#### FINDS THAT:

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

(2) There was a consensus among industry and government that there is a need for revision of Rule 111 to provide for administrative approval for directionally drilled wells under certain circumstances, in particular intentionally deviated directional wells which have been approved only after notice and hearing or in certain pools with special provision contained therein.

(3) Although Meridian Oil Inc. was the applicant and all present agreed to the concept of administrative approval for directionally drilled wells, additional testimony was provided by Amoco Production Company, Marathon Oil Company, Mobil Exploration and Production, Phillips Petroleum Company, Permian Basin Petroleum Association, New Mexico Oil and Gas Association, and New Mexico Oil Conservation Division. Differences of opinion centered around an expanded version of the proposed rule change incorporating more definitions and greater reporting requirements for applicants and a shorter version with condensed definitions and reduced reporting requirements.

# CASE 11274 Order No. R-10388 Page -2-

(4) The more condensed rule changes provide for greater efficiencies without sacrificing clarity or important documentation.

(5) Meridian Oil Inc. recommended rule provisions which would address correlative rights within affected proration units. Marathon Oil Company and Amoco Production Company supported a simplified rule which allows for operator decisions concerning the need for additional wells.

(6) Operational decisions and equity issues should be addressed under provisions of the operating agreement that deal with "operations by less than all parties" and not by regulations.

(7) The rule changes incorporated in Exhibit "A", attached hereto and made a part hereof, will not affect wells deviated intentionally for mechanical and/or operational reasons and will make the process for application and approval of directionally drilled wells more efficient and less costly without causing waste or impairing correlative rights.

#### IT IS THEREFORE ORDERED THAT:

(1) Division Rule 111 be amended to read as shown on Exhibit "A" attached to and made part of this Order.

(2) Revised Rule 111 shall be effective on the date of this Order.

(3) 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 hereinafter designated.

STATE OF NEW MEXICO OIL CONSERVATION COMMISSION

Bill Weiss WILLIAM R. WEISS, Member

Harlow

GARY CARLSON, Member WILLIAM J. LÉMAY, Chairman

SEAL

### EXHIBIT "A" CASE NO. 11274 ORDER NO. R-10388

### **RULE 111-Deviation Tests/Deviated Wells and Directional Wells:**

A. <u>Definitions</u>: The following definitions shall apply to this Rule:

(1) <u>Deviated Well</u> - means any wellbore which is intentionally deviated from vertical but <u>not</u> with an intentional azimuth. Any deviated well is subject to Rule 111-B and C.

(2) <u>Directional Well</u> - means a wellbore which is intentionally deviated from vertical with an intentional azimuth. Any directional well is subject to Rule 111-D.

(3) <u>Vertical Well</u> - means a well that does not have an intentional departure or course deviation from the vertical.

(4) <u>Drilling Unit</u> - means the surface acreage assigned to a vertical wellbore in accordance with NMOCD Rule 104. Included in this definition is a "unit of proration for oil or gas" as defined by the Division and all non-standard such units previously approved by the Division.

(5) <u>Wellbore</u> - means the interior surface of a cased or open hole through which drilling, production, or injection operations are conducted.

(6) <u>Project Well</u> - means any well drilled, completed, produced or injected into as either a deviated well or as a directional well.

(7) <u>Project Area</u> - means one or more drilling units which are to be dedicated to the project well.

(8) <u>Producing Area</u> - means all points that lie along a rectangular or square window formed by plotting the measured distance from the North, South, East and West boundaries of a project area inside of which a vertical wellbore can be drilled and produced in conformity with the setback requirements from the outer boundary of a standard spacing and proration unit for the applicable pool(s).

(9) <u>Penetration Point</u> - means the point where the wellbore penetrates the top of the pool from which it is intended to produce.

(10) <u>Azimuth</u> - means the deviation in the horizontal plane of a wellbore expressed in terms of compass degrees.

(11) <u>Kick-off Point</u> - means the point at which the wellbore is intentionally deviated from vertical.

(12) <u>Terminus</u> - means the farthest point attained along the wellbore.

(13) <u>Producing Interval</u> - means that portion of the wellbore drilled inside the vertical limits of a pool, between its penetration point and its terminus and within the producing area.

(14) <u>Lateral</u> - means any portion of a wellbore past the point where the wellbore has been intentionally departed from the vertical.

#### B. <u>Deviation Tests</u>:

Any well which is drilled or deepened shall be tested at reasonably frequent intervals to determine the deviation from the vertical. Such tests shall be made at least once each 500 feet or at the first bit change succeeding 500 feet. A tabulation of all deviation tests run, sworn to and notarized, shall be filed with Form C-104, Request for Allowable and Authorization to Transport Oil and Natural Gas. When the deviation averages more than five degrees in any 500-foot interval, the operator shall include the calculations of the maximum possible horizontal displacement of the hole and the Division Director may require that a directional survey be run to establish the location of the producing interval(s). Upon request from the Division Director, any well which was deviated in an indeterminate direction or toward the vertical shall be directionally surveyed.

#### C. <u>Deviated Wellbores</u>:

(1) The Supervisor of the appropriate Division District may approve the written request of an operator to drill a deviated wellbore or to deviate an existing wellbore to:

- (a) straighten a crooked hole by deviating towards the vertical;
- (b) side track junk in the hole by deviating in an indeterminate direction (no intentional azimuth);
- (c) side track an existing wellbore by deviating in an indeterminate direction (no intentional azimuth) for the purpose of recompleting into an existing producing formation or plugging the originally completed formation and recompleting into a different formation.

(2) The Supervisor of the appropriate Division District may require any request for a deviated well to be submitted for administrative approval by the Division Director.

(3) Applications for administrative approval for a deviated well shall:

- (a) be filed in duplicate and shall be accompanied by plats showing both the surface location of the subject well, its spacing unit and all adjoining spacing units;
- (b) state the reason(s) for deviating the subject well; and
- (c) shall include a statement or plat showing the names and addresses of all operators of spacing units, or working interest owners of undrilled spacing units offsetting the unit in which the project is located and attesting that applicant, on or before the same date the application was submitted to the Division, has sent notification to all those parties by submitting a copy of the application to them by certified mail return receipt requested and advising them that if they have an objection, it must be filed in writing within twenty (20) days of the date notice was sent.

(4) The bottomhole location of any deviated well shall be at an orthodox well location or an unorthodox location previously approved pursuant to Rule 104 and shall be considered acceptable if the actual subsurface location in the formation to be produced is orthodox or is no more than 50 feet from the approved subsurface location.

(5) The Division Director may approve the application for a deviated well upon receipt of waivers from all offset operators or owners of undrilled tracts or if no offset operator or owner has entered an objection to the project within 20 days after the application was received by the Director.

#### D. <u>Directional Wellbore</u>:

(1) The Division Director, shall have the authority without notice and hearing to administratively approve a directional wellbore project when:

- (a) the surface location of the proposed or existing project well is within the boundaries of the project area, consisting of a single or multiple drilling unit(s), substantially in the form of either a square or a rectangle, as applicable, being a legal subdivision of the U.S. Public Land Survey;
- (b) the producing interval of the wellbore(s) is totally confined to a producing area. The wellbore(s) may be re-oriented to any azimuth based upon a change in conditions either geologic or mechanical, which is encountered either before or after the commencement of a project, but only insofar as the producing interval(s) remains totally confined to the producing area;
  - ) the project area includes either a single drilling unit or multiple contiguous drilling units; and,

(C)

(d) the project well includes either a single lateral or multiple laterals which conform to conditions (a) and (b) above.

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(2) To obtain administrative approval to drill a directional well, the applicant shall file a written application in duplicate with the Division Director, copy to the appropriate OCD District Supervisor, which shall include:

- (a) a statement addressing the reason(s) for directionally drilling the subject well;
- (b) a plat indicating the section, township and range in which the well is to be drilled, the project area, the proposed surface location, the producing area for the project well, any existing wells in the applicable pool(s) in the proposed project area, all offsetting drilling units in the applicable pool(s) and their associated operator, and any wells in those units;
- (c) a vertically oriented plan view (cross-sectional view) for the subject well including the true vertical depth of the top and bottom of the subject pool, degree of angle to be built in the project wellbore(s), the true vertical and the measured depth of the estimated kickoff point, the estimated penetration point and the lateral length;
- (d) a horizontal plan view for the subject well and its spacing unit showing the drilling unit and drilling-producing window, including the estimated azimuth and maximum length of the lateral(s) to be drilled;
- (e) a type log section on which is identified the top and bottom of the subject pool; and,
- (f) a statement or plat showing the names and addresses of all operators of spacing units, or working interest owners of undrilled spacing units offsetting the unit in the applicable pool(s) in which the project is located and attesting that applicant, on or before the same date the application was submitted to the Division, has sent notification to all those parties by submitting a copy of the application to them by certified mail return receipt requested and advising them that if they have an objection, it must be filed in writing within twenty (20) days of the date notice was sent.

(3) The maximum allowable assigned to the project area when dealing with prorated pools shall be based upon of the number of standard proration units (or approved non-standard proration and spacing units) for that pool any portion of which is within a distance of the producing lateral of the directional wellbore not greater than the footage setback distance for locating a vertical well from the outer boundary of a spacing unit for that pool.

### E. <u>Requirements/Conditions of Administrative Approval:</u>

(1) The Division Director may approve the application upon receipt of waivers from all offset operators or owners of undrilled tracts or if no offset operator or owner has entered an objection to the project within 20 days after the application was received by the Director.

(2) Any order issued by the Director approving an application for a directional wellbore shall require that:

- (a) the applicant shall conduct a directional survey on the wellbore after directional drilling operations in order that the direction, extent and terminus of said wellbore may be determined to be in compliance with the provision of any order with copies submitted to the Santa Fe NMOCD and to the NMOCD-district office in which the well is located; and,
- (b) the Supervisor of the appropriate Division District shall be notified of the approximate time all directional surveys are to be conducted. All directional surveys run on any well in any manner for any reason must be filed with the Division upon completion of the well. The Division shall not assign an allowable to a well until the operator has submitted an affidavit that all such directional surveys have been filed.

#### F. Additional Matters:

(1) The Division Director, at the request of an offset operator, may require any operator to make a directional survey of any well. The directional survey and all associated costs shall be at the expense of the requesting party and shall be secured in advance by a \$5,000 indemnity bond posted with and approved by the Division. The requesting party may designate the well survey company and the survey may be witnessed by the Division and the operator.

(2) The Division Director, may, at his discretion, set any application for administrative approval for public hearing.

(3) Permission to deviate or directionally drill any wellbore for any reason or in any manner not provided for in this rule shall be granted only after notice and hearing.

# MERRION

OIL & GAS

May 31, 1995

Mr. William Lemay New Mexico Oil Conservation Division P. O. Box 2088 Santa Fe, New Mexico 87503

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O'L CONSERVICION DIVISION RECEIVED

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Re: Application for Administrative Approval - Special Pool Rules For Unorthodox Locations, Non-Standard Spacing Units, and Special Allowables To Facilitate Horizontal Drilling Snake Eyes Entrada Oil Pool Sandoval County, New Mexico

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Dear Mr. Lemay:

Merrion Oil & Gas requests administrative approval of special pool rules for the Snake Eyes Entrada Oil Pool (see Exhibit 1 for land plat) to allow for horizontal drilling within the fee lease which encompasses the productive area. This application reviews the justification for horizontal drilling in the Entrada and outlines the pool rules we are requesting.

#### JUSTIFICATION FOR HORIZONTAL DRILLING

In the Entrada, oil trapped in the top of preserved dunes is underlain by a large aquifer. The strong water drive results in severe water coning around vertical wells, leaving significant "attic" oil undrained between wells at the top of the dune. The use of horizontal wells to tap into that attic oil has proven effective at the Papers Wash Entrada Oil Pool, and again recently at Eagle Mesa Entrada Oil Pool. We feel this technology could also be successfully applied at the Snake Eyes Entrada Oil Pool (see Exhibit 2 for remaining net pay map).

### **REQUESTED SPECIAL POOL RULES**

Merrion requests that provisions similar to those approved for the Eagle Mesa Entrada Secondary Unit (Order R-10213 attached as Exhibit 3) be approved for the Snake Eyes Entrada Oil Pool. In summary, those provisions state the following:

1.) Merrion is authorized to institute a short radius drilling pilot project, hereinafter referred to as the "project area", in the Snake Eyes Entrada Oil Pool comprising a single fee lease with the following described 1040 acres in San Juan County, New Mexico:

### TOWNSHIP 21N, RANGE 8W, NMPM

Section 19: E/2 NE/4 and NE/4 SE/4 Section 20: All Section 21: NW/4 and N/2 SW/4 and SW/4 SW/4 Page 2 May 31, 1995

- 2.) Special operating provisions for additional horizontal or vertical wells within this lease will be promulgated that allow for:
  - a.) No vertical well or any portion of a horizontal well shall be closer than 330 feet to the outer boundary of the project area;
  - b.) No surface well location shall be closer than 10 feet to an interior quarter quarter section line;
  - c.) The allowable assigned to the project area, shall be 750 barrels of oil per day times the number of 40 acre tracts that are either developed by conventionally drilled wells or traversed by a horizontal drain hole.

# SUPPORTING INFORMATION

The following information is provided in support of this request:

- 1.) The entire productive feature is within the boundary of this lease. Ownership within the lease is common, so all interest owners will benefit proportionately from any well drilled.
- 2.) The proposed rules will protect correlative rights by providing additional drilling, which will benefit the royalty owners.
- 3.) Copies of this application were sent certified mail to the following offset lease owners (see Exhibit 1):

Parker & Parsley P. O. Box 3178 Midland, Texas 97902

Bureau of Land Management Attn: Duane Spencer 1235 La Plata Highway Farmington, New Mexico 87401

Yates Petroleum 105 S. 4th Street Artesia, New Mexico 88210

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Page 3 May 31, 1995

# **SUMMARY**

These proposed rules are needed to allow horizontal wells to be drilled in the Snake Eyes Entrada Oil Pool. This will protect correlative rights through increased royalty payments. Therefore, we request your prompt attention to this matter.

Please call me at (505) 327-9801 with questions or comments.

Sincerely,

George F. Sharpe Manager - Oil & Gas Investments

xc: Unit File Jim Johnson

# EXHIBITS

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- 1 Land Plat
- 2 Remaining Net Pay Map
- 3 Order R-10213 Special Operating Rules for the Eagle Mesa Secondary Unit



EXHIBIT 1 SNAKE EYES ENTRADA FIELD LAND PLAT

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**MERRION OIL & GAS** SNAKE EYES ENTRADA FIELD T 21 N R 8 W SAN JUAN COUNTY, NEW MEXICO HORIZ RESERVES REMAINING NET PAY

OOIP = 1,361,732 BO

FIELD CUM = 273,762 BO

= 159,900 BO

# EXHIBIT 3

# 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. 10971 ORDER NO. R-10213

# APPLICATION OF MERRION OIL & GAS CORPORATION FOR A HIGH ANCLE/HORIZONTAL DIRECTIONAL DRILLING PILOT PROJECT AND THE PROMULGATION OF SPECIAL OPERATING RULES THEREFOR, SANDOVAL COUNTY, NEW MEXICO

#### ORDER OF THE DIVISION

#### **BY THE DIVISION:**

This cause came on for hearing at 8:15 a.m. on May 12, 1994, at Santa Fe, New Mexico, before Examiner Michael E. Stogner.

NOW, on this <u>30th</u> day of September, 1994 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 in this matter, Merrion Oil and Gas Corporation ("Merrion"), seeks authority to institute a short radius high angle/horizontal directional drilling pilot project, hereinafter referred to as the "project area", in the designated and Undesignated Eagle Mesa-Entrada Oil Pool on its Eagle Mesa Entrada Secondary (Federal) Unit comprising the following described 280 acres in Sandoval County, New Mexico:

# TOWNSHIP 19 NORTH, RANGE 4 WEST, NMPM

Section 11:	SE/4 SE/4
Section 12:	SW/4 SW/4
Section 13:	W/2 NW/4
Section 14:	N/2 NE/4 and SE/4 NE/4.

# Case No. 10971 Order No. R-10213 Page No. 2

- (3) Within the project area the applicant seeks authority to:
  - (a) utilize the existing wellbores on its Federal "12" Well No. 1 (API No. 30-043-20175), located 460 feet from the South line and 330 feet from the West line (Unit M), of said Section 12 and its Navajo 13 "C" Well No. 1 (API No. 30-043-20181), located 430 feet from the North line and 330 feet from the West line (Unit D), of said Section 13 to drill short radius horizontal drainholes a lateral distance of 800 to 1.000 feet;
  - (b) the ability to traverse section, quarter section and quarter-quarter section lines within the project area in order to form non-standard oversized and irregular sized spacing and proration units to accommodate such wellbores;
  - (c) drill the proposed horizontal wellbores to within 330 feet of the outer boundary of the project area; and,
  - (d) the assignment of an allowable for a horizontally drilled well based upon the number of standard 40-acre proration units which are developed or traversed by a horizontal wellbore.

(4) The applicant further seeks the promulgation of special operating rules and procedures within the project area including provisions for administrative authorization of further horizontal wellbores, and the assignment of a special oil allowable or formula for the project area.

(5) The proposed project area is located within the governing limits of the Eagle Mesa-Entrada Oil Pool which is currently administered under the Statewide Rules and Regulations which require standard 40-acre spacing and proration units with wells to be located no closer than 330 feet from the outer boundary of the spacing unit. A special oil allowable of 750 barrels of oil per day and a limiting gas-oil ratio of 2,000 cubic feet of gas per barrel of oil exists for said pool, as promulgated by Division Order No. R-5118, as amended.

(6) The Entrada formation in this area was deposited as an eolian sand overlain by lacustrine limestones and anhydrites of the Todilto formation. The resulting "dune-like" structures, having porosity and permeability, act as the reservoir for trapping the accumulation of oil in the Entrada formation. The Eagle Mesa-Entrada Pool is in contact with a large aquifer and hydrodynamically active fresh ground water flowing to the southwest beneath the oil accumulation. This strong drive acts to tilt the oil-water contact in the direction of flow.

# Case No. 10971 Order No. R-10213 Page No. 3

(7) According to the testimony presented by the applicant conventionally drilled (vertical) wells in this pool experience significant "water coning", whereby the water below the oil moves upward to the wellbore, a process that has left a significant amount of "attic" oil sidetracked or by-passed between wells. By drilling horizontally across the top of the structure, the applicant is attempting to drain this otherwise unrecoverable attic oil by alleviating this coning action. Such horizonal drainhole will act to create a small pressure drop along the large area found in a long horizontal drainhole instead of a large pressure drop through a small area available to a vertical wellbore.

(8) Evidence further indicates that once water breakthrough has occurred in a conventionally drilled vertical wellbore, water volume increases dramatically and oil production decreases substantially, resulting in high operating costs. With horizontal drainholes, the poolwide volume of produced water should decrease, thereby lowering operating costs.

(9) Approval of this application is in the best interest of conservation. exhibits sound engineering practices, will serve to prevent the waste of otherwise unrecoverable reserves, and with the formation of a Unit will further serve to protect correlative rights.

(10) Adoption of special procedures allowing for administrative approval of additional horizontal drainholes in the Entrada formation within the Eagle Mesa Entrada Secondary (Federal) Unit will serve to promote such supplemental drilling activity in fields nearing depletion and should aid in expediting any further request to drill drainholes in this Unit without the necessity for additional hearings.

(11) The allowable assigned to either a single proration unit or the project area should be assigned by the supervisor of the Aztec district office of the Division and should be based upon the number of standard 40-acre proration units within the project area which are developed or traversed by a horizontal wellbore.

(12) No offset operator and/or interest owner appeared at the hearing in opposition to the subject application.

(13) The applicant initially proposes to recomplete its Federal "12" Well No. 1 and Navajo 13 "C" Well No. 1 by plugging-back, milling a window in the existing production casing, kick-off from the vertical by milling a window in the existing production casing, drill a short radius curve hole to approximately 90 degrees so as to encounter the upper portion of the oil bearing Entrada sand and continue drilling horizontally a distance of 800 to 1,000 feet.

# Cuse No. 10971 Order No. R-10213 Page No. 4

(14) Certain provisions should be included within this approval to assure orderly development and depletion of this reservoir with horizontal drainholes and the continued protection of correlative rights within the area of this Unit:

- (a) no portion of a wellbore, either vertical or horizontal should be closer than 330 feet to the outer boundary of the Eagle Mesa Entrada Secondary (Federal) Unit;
- (b) the applicant should be required to conduct a directional survey on the vertical portion of a wellbore prior to commencing directional drilling operations, and on the horizontal portion of the wellbore during or subsequent to completion of directional drilling operations in order that direction, extent and terminus of said wellbore may be determined to be in compliance with the terms of this order;
- (c) the applicant should further be required to submit copies of said directional surveys to the Santa Fe and Aztec offices of the Division; and,
- (d) the applicant should notify the supervisor of the Aztec District Office of the Division of the date and time of commencement of directional drilling operations and of the conductance of any directional surveys on the proposed well in order that these operations may be witnessed.

#### **IT IS THEREFORE ORDERED THAT:**

(1) The application of Merrion Oil and Gas Corporation ("Merrion") to institute a short radius high angle/horizontal directional drilling pilot project, hereinafter referred to as the "project area", in the designated and Undesignated Eagle Mesa-Entrada Oil Pool on its Eagle Mesa Entrada Secondary (Federal) Unit comprising the following described 280 acres in Sandoval County, New Mexico, is hereby approved:

#### TOWNSHIP 19 NORTH. RANGE 4 WEST. NMPM

Section 11:	SE/4 SE/4
Section 12:	SW/4 SW/4
Section 13:	W/2 NW/4
Section 14:	N/2 NE/4 and SE/4 NE/4.

(2) Merrion is further authorized to proceed with their initial plans to recomplete its existing Federal "12" Well No. 1 (API No. 30-043-20175), located 460 feet from the South line and 330 feet from the West line (Unit M), of said Section 12 and its Navajo 13 "C" Well No. 1 (API No. 30-043-20181), located 430 feet from the North line and 330 feet Case No. 10971 Order No. R-10213 Page No. 5

from the West line (Unit D), of said Section 13 by plugging-back. milling a window in the existing production casing, kick-off from the vertical by milling a window in the existing production casing, drill a short radius curve hole to approximately 90 degrees so as to encounter the upper portion of the oil bearing Entrada sand and continue drilling horizontally a distance of 800 to 1,000 feet. Provided however that;

- (a) any drainhole drilled from either of said wellbores may traverse section, quarter section and quarter-quarter section lines within the project area provided that the horizonal or producing portion of any drainhole shall be located no closer than 330 feet from the outer boundary of the project area;
- (b) \* 2500 GYRD, 5208
- the applicant shall determine the actual location of the kick-off points in each well prior to commencing directional drilling operations. Also, the applicant shall conduct a directional survey on the lateral portion of any horizontal wellbore during or after completion of drilling operations;
- (c) the applicant shall notify the supervisor of the Aztec district office of the Division of the date and time of conductance of any directional surveys in order that the same may be witnessed;
- (d) the applicant shall submit copies of all directional surveys conducted on the subject well to both the Santa Fe and Aztec offices of the Division; and,
- (e) the allowable assigned to the proration units designated to each well in the Eagle Mesa-Entrada Oil Pool shall be assigned by the supervisor of the Division's Aztec district office and shall be equal to 750 barrels of oil per day times the number of standard 40-acre tracts within each designated proration unit that are developed/traversed by a horizontal drainhole.

(3) Special operating provisions for additional horizontal/high angle wellbores within said Eagle Mesa Entrada Secondary (Federal) Unit are hereby promulgated as follows:

# SPECIAL OPERATING RULES AND REGULATIONS FOR THE EAGLE MESA ENTRADA SECONDARY (FEDERAL) UNIT

<u>**RULE 1.</u>** The surface location of any well within said Unit Area shall be located no closer than 330 feet to the outer boundary of the unitized area, nor closer than 10 feet to any section, quarter section, or quarter-quarter section lines or subdivision inner boundary.</u>

<u>RULE 2</u>. The Director of the Division may grant an exception to the surface well location requirements of Rule 2 without notice and hearing when an application has been filed for an unorthodox surface well location necessitated by topographic conditions or the recompletion of a well previously drilled to a deeper horizon. All operators and/or owners of undrilled tracts or unleased mineral interests offsetting the proposed location shall be notified of the application by registered or certified mail, and the application shall state that such notice has been furnished. The Director may approve the application upon receipt of written waivers from all operators and/or owners of undrilled tracts or unleased mineral interests offsetting the proposed surface location or if no objection to the unorthodox surface location has been entered within twenty days after the Director has received the application.

<u>RULE 3</u>.

- (A). The Director of the Division is hereby authorized to administratively approve intentionally deviated wells in the Eagle Mesa Entrada Secondary (Federal) Unit for the purpose of penetrating the Entrada formation by means of a wellbore drilled horizontally, provided the following conditions are complied with:
  - (1) the surface location of the proposed well is a standard location or the applicant has obtained approval of an unorthodox surface oil well location as provided for in Rule (2), above: and,
  - (2) no producing portion of a horizontal wellbore shall enter or exit the Entrada formation outside of a "drilling window" which is not in accordance with the setback requirements of Rule (1), above, provided however, that the aforementioned 10 foot setback distance requirement from any internal subdivision boundary within said Unit Area shall not apply to horizontal drainholes.

Case No. 10971 Order No. R-10213 Page No. 7

- (B). To obtain administrative approval for additional deviated horizontal drainholes within the Unit, the applicant shall file such request in writing with the Aztec and Santa Fe offices of the Division and shall further provide a copy of such application to all operators and/or owners of undrilled tracts or unleased mineral interests offsetting the proposed proration unit for said well by registered or certified mail, and the application shall state that such notice has been furnished. The application shall include the following information:
  - (1) a copy of Division Form C-102 identifying the proposed proration unit to be dedicated to the well and any other wells within this proposed unit;
  - (2) a land plat that identifies the ownership of all offsetting tracts to the proposed proration unit: and.
  - (3) schematic drawings of the proposed well completion or recompletion which fully describe the casing, tubing, perforated or openhole interval, kick-off point, and proposed trajectory of the drainhole section.
- (C). The Division Director may approve the application upon receipt of written waivers from all parties described above or if no objection to the intentionally deviated horizontal wellbore has been entered within twenty days after the Director has received the application. If any objection to the proposed intentionally deviated horizontal well is received within the prescribed time limit as described above, the Director shall, at the applicant's request, set said application for public hearing before a Division Hearing Examiner.
- (D). During or upon completion of drilling operations the operator shall further be required to conduct an acceptable directional survey on the vertical and lateral portions of the wellbore and shall submit a copy of said survey to the Santa Fe and Aztec offices of the Division.
- (E). The operator shall notify the supervisor of the Aztec District Office of the Division of the date and time of commencement of directional drilling operations and of the conductance of any directional surveys on the proposed well in order that these operations may be witnessed.

- (F). The Director, at his discretion, may set any application for intentionally deviated horizontal wellbores for public hearing before a Division Hearing Examiner.
- <u>RULE 4.</u> Allowables shall be assigned in the following manner
  - (A). The allowable assigned to the proration units designated to the Eagle Mesa-Entrada Oil Pool within the Unit Area shall be assigned by the supervisor of the Division's Aztec district office and shall be equal to 750 barrels of oil per day times the number of standard 40-acre tracts within each designated proration unit that are developed/traversed by a horizontal drainhole; or,
  - (B). The supervisor of the Division's Aztec district office may assign a "project allowable" based on the number of 40-acre tracts that are either developed by conventionally drilled wells or traversed by a horizontal drainhole. The operator may produce the assigned project allowable from the wells within the project area in any proportion.

<u>**RULE 5.**</u> The Director of the Division may rescind the authority for any horizontal drainhole if the perforated or openhole portion of such wellbore is located closer to the Unit Area boundary than permitted by these rules or if it should appear that such rescission is necessary to prevent waste or protect correlative rights.

(4) 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. LE**M**AY Director

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#### CASE 11323: Application of Stevens & Tull, Inc. for an exception to the casing requirements of Division Order No. R-111-P, Lea County, New Mexico. Applicant, in the above styled-cause, seeks authority to delete the salt protection string requirements of Division Order No. R-111-P in the "Oil-Potash Area" from its proposed Federal "9" Well No. 7 to be drilled 2310 feet from the South line and 990 feet from the East line (Unit I) of Section 9, Township 20 South, Range 33 East, to test the West Teas-Yates Seven Rivers Pool. Said well site is located approximately one mile north of U. S. Highway 62/180 at mile post No. 72.

#### CASE 11324: (This Case will be Continued to July 13, 1995, Examiner Hearing.)

Application of Texaco Exploration and Production Inc. for a high angle/horizontal directional drilling pilot project, special operating rules therefor, a non-standard oil proration unit, and a special project allowable, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks to initiate a high angle/horizontal directional drilling pilot project in the West Lindrith Gallup-Dakota Oil Pool underlying Lots 3 and 4, the E/2 SW/4, and the SE/4 (S/2 equivalent) of irregular Section 31, Township 25 North, Range 3 West, to form a non-standard 335.93-acre oil spacing and proration unit for said pool. The applicant proposes to re-complete the existing L. L. McConnell Well No. 13, located at a standard surface location 970 feet from the South line and 1800 feet from the West line (Unit N) of said Section 31, by kicking-off from vertical in an easterly direction commencing to build angle at an appropriate rate to horizontally traverse the proposed producing area. Further, the applicant seeks the promulgation of special operating rules and procedures therefor including the designation of a target window such that the horizontal or producing portion of the wellbore shall be no closer than 790 feet to the outer boundary of the project area, and for a special project allowable. Said area is located approximately 8.5 miles west-northwest of Lindrith, New Mexico.

#### CASE 11325: (This Case will be Continued to July 13, 1995, Examiner Hearing.)

Application of Texaco Exploration and Production Inc. for a high angle/horizontal directional drilling pilot project, special operating rules therefor, a non-standard oil proration unit, and a special project allowable, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks to initiate a high angle/horizontal directional drilling pilot project in the West Lindrith Gallup-Dakota Oil Pool underlying the S/2 of Section 17, Township 25 North, Range 3 West, to form a non-standard 320-acre oil spacing and proration unit for said pool. The applicant proposes to re-complete the existing C. W. Roberts Well No. 4, located at a previously approved unorthodox surface oil well location (Division Administrative Order NSL-626) 660 feet from the South and West lines (Unit M) of said Section 17, by kicking-off from vertical in an easterly direction commencing to build angle at an appropriate rate to horizontally traverse the proposed producing area. Further, the applicant seeks the promulgation of special operating rules and procedures therefor including the designation of a target window such that the horizontal or producing portion of the wellbore shall be no closer than 660 feet to the outer boundary of the project area, and for a special project allowable. Said area is located approximately 9 miles northwest of Lindrith, New Mexico.

#### CASE 11326: (This Case will be Continued to July 13, 1995, Examiner Hearing.)

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Application of Texaco Exploration and Production Inc. for a high angle/horizontal directional drilling pilot project, special operating rules therefor, a non-standard oil proration unit, simultaneous dedication, and a special project allowable, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks to initiate a high angle/horizontal directional drilling pilot project in the West Lindrith Gallup-Dakota Oil Pool underlying the S/2 of Section 21, Township 25 North, Range 3 West, to form a non-standard 320-acre oil spacing and proration unit for said pool. The applicant proposes to re-complete the existing Jicarilla "C" Well No. 35, located at a standard surface location 1850 feet from the South line and 1190 feet from the West line (Unit L) of said Section 21, by kicking-off from vertical in an easterly direction commencing to build angle at an appropriate rate to horizontally traverse the proposed producing area. Further, the applicant seeks the promulgation of special operating rules and procedures therefor including the designation of a target window such that the horizontal or producing portion of the wellbore shall be no closer than 790 feet to the outer boundary of the project area. The applicant also requests the assignment of a special project allowable for the proposed oversized oil spacing and proration unit to be simultaneously dedicated to both the Jicarilla "C" Well No. 35 and to the Jicarilla "C" Well No. 26, located at a standard oil well location 1850 feet from the South line and 790 feet from the East line (Unit I) of said Section 21. Said area is located approximately 7.5 miles northwest of Lindrith, New Mexico.

SE 11327: Application of Merrion Oil & Gas Corporation for a high angle/horizontal directional drilling pilot project and for the promulgation of special operating rules therefor, Sandoval County, New Mexico. Applicant, in the above-styled cause, seeks to initiate a high angle/horizontal directional drilling pilot project in the designated and Undesignated Snake Eyes-Entrada Oil Pool underlying a single fee lease comprising all or portions of Sections 19, 20, and 21, Township 21 North, Range 8 West. Further, the applicant seeks the promulgation of special operating rules and procedures for wells within said project area including provisions for administrative authorization for horizontal wells, the formation of oversized and irregular shaped spacing and proration units to accommodate such wellbores, the assignment of a special oil allowable or formula for the project area and the designation of a target window such that horizontal or producing portions of such a wellbore shall be no closer than 330 feet to the outer boundary of the project area. Said area is located approximately 16 miles south by east of Nageesi, New Mexico.

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Submit-3 Copies to Appropriate Energy District Office	State of New Mexico y, Minerals and Natural Resource	es Department	- Form C-103 Revised 1-1-89
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DISTRICT III 1000 Rio Brazos Rd., Azzec, NM 8741052		ment	6. State Oil & Gas Lease No.
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2. Name of Operator Merrion Oil & Gas Corpo	oration		8. Well No. 20-112
3. Address of Operator			9. Pool name or Wildcat
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Subre 3 3 Copies to Appropriate District Office	State of New M Energy, Minerals, and Natural R	Lesources Department	Form C-103 Revised 1-1-89
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