

Lara
N.M. Oil Cons. DIV-Dist. 2
 UNITED STATES **1301 W. Grand Avenue**
 DEPARTMENT OF THE INTERIOR
 BUREAU OF LAND MANAGEMENT
 Mesia, NM 88240

FORM APPROVED
 OMB No. 1004-0136
 Expires January 31, 2004

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of Work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NMNM-01165
1b. Type of Well: <input type="checkbox"/> Oil Well <input checked="" type="checkbox"/> Gas Well <input type="checkbox"/> Other <input type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		6. If Indian, Allottee or Tribe Name
2. Name of Operator Mewbourne Oil Company - 14744		7. If Unit or CA Agreement, Name and No.
3a. Address PO Box 5270 Hobbs, NM 88240	3b. Phone No. (include area code) 505-393-5905	8. Lease Name and Well No. Derringer 18 Federal #1 <i>35148</i>
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface 660' FNL & 1980' FWL Unit C At proposed prod. zone Same		9. API Well No. <i>30-015-34362</i>
14. Distance in miles and direction from nearest town or post office* 10 miles NE of Carlsbad		10. Field and Pool, or Exploratory East Burton Flat Morrow <i>73320</i>
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 660'	16. No. of Acres in lease 320	11. Sec., T., R., M., or Blk. and Survey or Area Sec 18-T20S-R29E
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 1935'	19. Proposed Depth 11750'	12. County or Parish Eddy
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3261' GL	22. Approximate date work will start* ASAP	13. State NM
20. BLM/BIA Bond No. on file NM1693, Nationwide		17. Spacing Unit dedicated to this well 320
23. Estimated duration 45		

24. Attachments

CAPITAN CONTROLLED WATER BASIN

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, shall be attached to this form:

- | | |
|---|--|
| 1. Well plat certified by a registered surveyor. | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan. | 5. Operator certification. |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office). | 6. Such other site specific information and/or plans as may be required by the authorized officer. |

25. Signature <i>Kristi Green</i>	Name (Printed/Typed) Kristi Green	Date 08/23/05
Title Hobbs Regulatory		
Approved by (Signature) <i>/s/ Joe G. Lara</i>	Name (Printed/Typed) <i>/s/ Joe G. Lara</i>	Date SEP 26 2005
Title ACTING FIELD MANAGER		Office CARLSBAD FIELD OFFICE

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Conditions of approval, if any, are attached.

APPROVAL FOR 1 YEAR

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

*(Instructions on reverse)

WITNESS Surface,
 1st and 2nd
 Intermediate
 Casings

APPROVAL SUBJECT TO
 GENERAL REQUIREMENTS
 AND SPECIAL STIPULATIONS
 ATTACHED

29.5
 5.11

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
DISTRICT II
811 South First, Artesia, NM 88210
DISTRICT III
1000 Rio Brazos Rd., Artec, NM 87410
DISTRICT IV
2040 South Pacheco, Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-102
Revised March 17, 1999

Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

OIL CONSERVATION DIVISION

2040 South Pacheco
Santa Fe, New Mexico 87504-2088

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code 73320	Pool Name East Burton Flat Morrow
Property Code	Property Name DERRINGER 18 FEDERAL	Well Number 1
OGRID No. 14744	Operator Name MEWBOURNE OIL COMPANY	Elevation 3261

Surface Location

UL or lot No. C	Section 18	Township 20-S	Range 29-E	Lot Idn	Feet from the 660	North/South line NORTH	Feet from the 1980	East/West line WEST	County EDDY
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Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
Dedicated Acres 3.30	Joint or Infill	Consolidation Code	Order No.						

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

	<p>OPERATOR CERTIFICATION</p> <p>I hereby certify the the information contained herein is true and complete to the best of my knowledge and belief.</p> <p><i>Kristi Green</i> Signature Kristi Green Printed Name Hobbs Regulatory Title 8/22/05 Date</p> <p>SURVEYOR CERTIFICATION</p> <p>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.</p> <p>AUGUST 15, 2005 Date Surveyed GARY L. JONES Signature & Seal of Professional Surveyor 7977 Certificate No. 7977 BASIN SURVEYS</p>
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District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

For drilling and production facilities, submit to appropriate NMOCD District Office.
For downstream facilities, submit to Santa Fe office

Form C-144
March 12, 2004

Pit or Below-Grade Tank Registration or Closure

Is pit or below-grade tank covered by a "general plan"? Yes ☐ No ☒

Type of action: Registration of a pit or below-grade tank ☒ Closure of a pit or below-grade tank ☐

RECEIVED

AUG 25 2005

OCD-ARTESIA

Operator: Mewbourne Oil Company Telephone: 505-393-5905 e-mail address:

kgreen@mewbourne.com

Address: PO Box 5270 Hobbs, NM 88240

Facility or well name: Derringer 18 Federal #1 API #: 30-015-34362 U/L or Qtr/Qtr C Sec 18 T20S R29E

County: Eddy Latitude 32-34-44.2N Longitude 104-06-56.4W NAD: 1927 ☐ 1983 ☒

Surface Owner Federal ☒ State ☐ Private ☐ Indian ☐

Pit

Type: Drilling ☒ Production ☐ Disposal ☐

Workover ☐ Emergency ☐

Lined ☒ Unlined ☐

Liner type: Synthetic ☒ Thickness 12 mil Clay ☐ Volume

24,000 bbl

Below-grade tank

Volume: bbl Type of fluid:

Construction material:

Double-walled, with leak detection? Yes ☐ If not, explain why not.

Depth to ground water (vertical distance from bottom of pit to seasonal high water elevation of ground water.)

Less than 50 feet

(20 points)

50 feet or more, but less than 100 feet

(10 points)

100 feet or more X

(0 points) X

Wellhead protection area: (Less than 200 feet from a private domestic water source, or less than 1000 feet from all other water sources.)

Yes

(20 points)

No X

(0 points) X

Distance to surface water: (horizontal distance to all wetlands, playas, irrigation canals, ditches, and perennial and ephemeral watercourses.)

Less than 200 feet

(20 points)

200 feet or more, but less than 1000 feet

(10 points)

1000 feet or more X

(0 points) X

Ranking Score (Total Points)

0 points

If this is a pit closure: (1) attach a diagram of the facility showing the pit's relationship to other equipment and tanks. (2) Indicate disposal location:

onsite ☐ offsite ☐ If offsite, name of facility . (3) Attach a general description of remedial action taken including remediation start date and end date. (4) Groundwater encountered: No ☐ Yes ☐ If yes, show depth below ground surface ft. and attach sample results. (5) Attach soil sample results and a diagram of sample locations and excavations.

I hereby certify that the information above is true and complete to the best of my knowledge and belief. I further certify that the above-described pit or below-grade tank has been/will be constructed or closed according to NMOCD guidelines ☒ a general permit ☐, or an (attached) alternative OCD-approved plan ☐.

Date: 08/22/05

Printed Name/Title Kristi Green / Hobbs Regulatory Asst

Signature Kristi Green

Your certification and NMOCD approval of this application/closure does not relieve the operator of liability should the contents of the pit or tank contaminate ground water or otherwise endanger public health or the environment. Nor does it relieve the operator of its responsibility for compliance with any other federal, state, or local laws and/or regulations.

Approval:

Date: 9-1-05

Printed Name/Title

Signature Benny

As a condition of approval, if during pit construction water is encountered or if water seeps in pits after construction the OCD MUST BE CONTACTED IMMEDIATELY!

MULTI-POINT SURFACE USE AND OPERATIONS PLAN

MEWBOURNE OIL COMPANY

Derringer 18 Federal #1

660' FNL & 1980' FWL

Sec 18-T20S-R29E

Eddy County, New Mexico

This plan is submitted with Form 3160-3, Application for Permit to Drill, Covering the above described well. The purpose of this plan is to describe the location of the proposed well, the proposed construction activities and operations plan, the magnitude of the surface disturbance involved, and the procedures to be followed in restoring the surface so that a complete appraisal can be made of the environmental impact associated with the proposed operations.

1. Existing Roads:

- A. Exhibit #3 is a road map showing the location of the proposed well. Exhibit #3A is a topographic map showing the location of the proposed well and access road. Existing roads are highlighted in red and proposed roads are highlighted in yellow.
- B. Directions to location from Carlsbad, NM: East on Hwy 62/180 to mile marker 44. Turn left (north) on Eddy Co 243 (Magnum Rd). Go north on Magnum Rd approx 8 miles to the junction of CR243 & CR238. Go east on CR238 200' to lease road. Go north 0.9 miles. Go east 0.2 miles to new location.

2. Proposed Access Road:

- A. Will need approx 120' of new road.
- B. The access to the location will be limited to 16' in width and will adequately drain runoff and control erosion as presently constructed.

3. Location of Existing Wells:

There are producing wells within the immediate vicinity of the well site. Exhibit #4 shows the proposed well and existing wells within a one mile radius.

4. Location of Existing and/or Proposed Facilities:

- A. There are no production facilities on this lease at the present time.
- B. In the event that the well is productive, production facilities will be located on the well pad.
- C. All production vessels left on location will be painted to conform with BLM painting stipulations within 180 days of installation.

5. Location and Type of Water Supply

The well will be drilled with a combination of fresh water and brine water based mud systems. The water will be obtained from commercial suppliers in the area and/or hauled to the location by transport trucks over existing and proposed roads as indicated in Exhibit #3.

Drilling Program
Mewbourne Oil Company
Derringer 18 Federal #1
660' FNL & 1980' FWL
Sec 18-T20S-R29E
Eddy County, New Mexico

1. The estimated top of geological markers are as follows:

Yates	980'
Capitan	1229'
Delaware	3160'
Bone Spring	5240'
Wolfcamp	9175'
Strawn	10300'
Atoka	10600'
Morrow	11150'

2. Estimated depths of anticipated fresh water, oil, or gas:

Water	Approximately 200'
Hydrocarbons	All zones below Delaware.

3. Pressure control equipment:

A 2000 psi working pressure annular BOP will be installed on the 13-3/8" surface casing. A 5000 psi WP Double Ram BOP and a 2500 psi WP Annular will be installed after running 9 5/8" casing. Pressure tests will be conducted prior to drilling out under all casing strings. BOP controls will be installed prior to drilling under surface casing and will remain in use until completion of drilling operations. BOP's will be inspected and operated daily to insure mechanical integrity and the inspection will be recorded on the daily drilling report. Kelly cock and a sub equipped with a full opening valve sized to fit the drill pipe and collars will be available on the rig floor in the open position when the kelly is not in use.

4. Proposed casing and cementing program:

A. Casing Program:

<u>Hole Size</u>	<u>Casing</u>	<u>Wt/Ft.</u>	<u>Grade</u>	<u>Depth</u>	
26"	20"	94#	H40	0-300'	WITNESS
17 1/2"	13 3/8"	54.5#	K55	0-1100'	WITNESS
12 1/4"	9 5/8"	40#	K55/N80	0-3100'	WITNESS
8 3/4"	5 1/2"	17#	P110/N80	0-11750'	

Drilling Program

Mewbourne Oil Company

Derringer 18 Federal #1

Page 2

Minimum casing design factors: Collapse 1.125, Burst 1.0, Tensile strength 1.8.

B. Cementing Program

- i. Surface Casing: 300 sacks Class "C" light cement containing ½ #/sk cellophane flakes, 2% CaCl, 5 lbs/sack gilsonite. 200 sacks Class "C" cement containing 2% CaCl
- ii. Deep Surface Casing: 500 sacks Class "C" light cement containing ½ #/sk cellophane flakes, 2% CaCl, 5 lbs/sack gilsonite. 400 sacks Class "C" cement containing 2% CaCl
- iii. Intermediate Casing: 900 sacks 35:65 pozmix cement containing 6% gel, 5 lbs/sack gilsonite. 400 sacks Class "C" cement containing 2% CaCl.
- iv. Production Casing: 600 sacks Class "H" cement containing fluid loss additive, friction reducer additive, compressive strength enhancer, and NaCl. Shallower productive zones may be protected by utilizing a multiple stage cementing tool in the production casing below potentially productive zones and cementing with a light cement slurry.

**Mewbourne Oil Company reserves the right to change cement designs as hole conditions may warrant.*

5. Mud Program:

<u>Interval</u>	<u>Type System</u>	<u>Weight</u>	<u>Viscosity</u>	<u>Fluid Loss</u>
0'-300'	FW spud mud	8.6-9.4	32-34	NA
300'-1100'	Brine water	10.0-10.2	28-30	NA
1100'-3100'	Fresh water	8.4-8.6	28-30	NA
3100'-10300'	Cut brine water	8.8-9.2	28-30	NA
10300'-TD	BW/Starch	9.2-9.8	30-40	8-15

(Note: Any weight above 8.6 ppg would be to hold back Wolfcamp shale, rather than abnormal bottom hole pressure in Morrow formation.)

6. Evaluation Program:

Samples:	10'samples from intermediate casing to TD
Logging:	Compensated density and dual laterlog from intermediate casing to TD
Coring:	As needed for evaluation
Drill Stem Tests:	As needed for evaluation

Drilling Program

Mewbourne Oil Company

Derringer 18 Federal #1

Page 3

7. Downhole Conditions

Zones of abnormal pressure:	None anticipated
Zones of lost circulation:	Anticipated in surface and intermediate holes
Maximum bottom hole temperature:	180 degree F
Maximum bottom hole pressure:	8.6 lbs/gal gradient or less

8. Anticipated Starting Date:

Mewbourne Oil Company intends to drill this well as soon as possible after receiving approval with approximately 35 days involved in drilling operations and an additional 10 days involved in completion operations on the project.

Hydrogen Sulfide Drilling Operations Plan

Mewbourne Oil Company

Derringer 18 Federal #1

660' FNL & 1980' FWL

Sec 18-T20S-R29E

Eddy County, New Mexico

1. General Requirements

Rule 118 does not apply to this well because MOC has researched this area and no high concentrations of H₂S were found. MOC will have on location and working all H₂S safety equipment before the Yates formation @ 980' for purposes of safety and insurance requirements.

2. Hydrogen Sulfide Training

All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will have received training from a qualified instructor in the following areas prior to entering the drilling pad area of the well:

1. The hazards and characteristics of hydrogen sulfide gas.
2. The proper use of personal protective equipment and life support systems.
3. The proper use of hydrogen sulfide detectors, alarms, warning systems, briefing areas, evacuation procedures.
4. The proper techniques for first aid and rescue operations.

Additionally, supervisory personnel will be trained in the following areas:

- 1 The effects of hydrogen sulfide on metal components. If high tensile tubular systems are utilized, supervisory personnel will be trained in their special maintenance requirements.
- 2 Corrective action and shut in procedures, blowout prevention, and well control procedures while drilling a well.
- 3 The contents of the Hydrogen Sulfide Drilling Operations Plan.

There will be an initial training session prior to encountering a known hydrogen sulfide source. The initial training session shall include a review of the site specific Hydrogen Sulfide Drilling Operations Plan.

3. Hydrogen Sulfide Safety Equipment and Systems

All hydrogen sulfide safety equipment and systems will be installed, tested, and operational prior to drilling below the intermediate casing.

1. Well Control Equipment

- A. Flare line with automatic igniter or continuous ignition source.
- B. Choke manifold with minimum of one adjustable choke.
- C. Blowout preventers equipped with blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit
- D. Auxiliary equipment including rotating head and annular type blowout preventer.

2. Protective Equipment for Essential Personnel

Thirty minute self contained work unit located at briefing area as indicated on wellsite diagram.

Notes Regarding Blowout Preventer

Mewbourne Oil Company

Derringer 18 Federal #1

660' FNL & 1980' FWL

Sec 18-T20S-R29E

Eddy County, New Mexico

- I. Drilling nipple (bell nipple) to be constructed so that it can be removed without the use of a welder through the opening of the rotary table, with minimum internal diameter equal to blowout preventer bore.
- II. Blowout preventer and all fittings must be in good condition with a minimum 5000 psi working pressure.
- III. Safety valve must be available on the rig floor at all times with proper connections to install in the drill string. Valve must be full bore with minimum 5000 psi working pressure.
- IV. Equipment through which bit must pass shall be at least as large as internal diameter of the casing.
- V. A kelly cock shall be installed on the kelly at all times.

Blowout preventer closing equipment to include and accumulator of at least 40 gallon capacity, two independent sources of pressure on closing unit, and meet all other API specifications.

Mewbourne Oil Company
BOP Schematic for
12 1/4" Hole

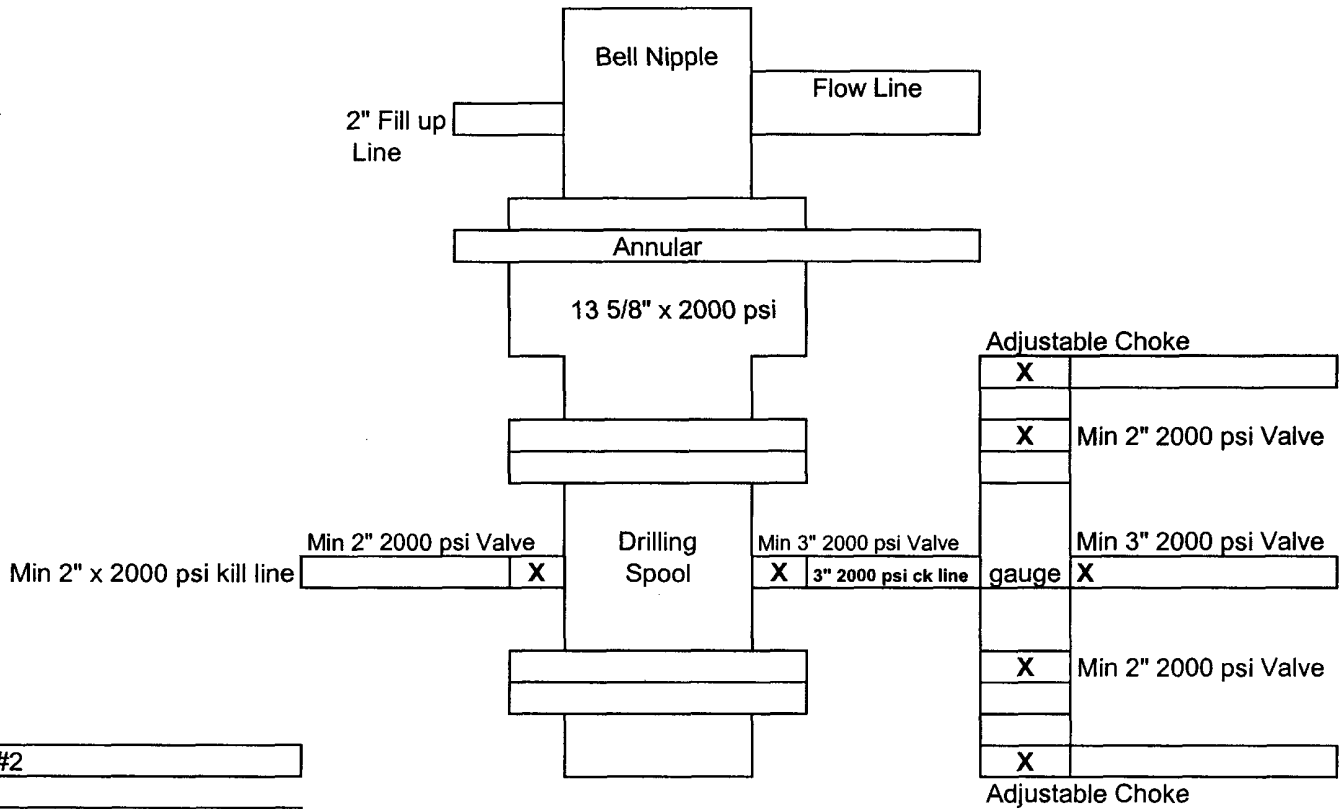


Exhibit #2

Derringer 18 Federal #1
660' FNL & 1980' FWL
Sec 18-T20S-R29E
Eddy, County
New Mexico

8 3/4" or 7 7/8" Hole

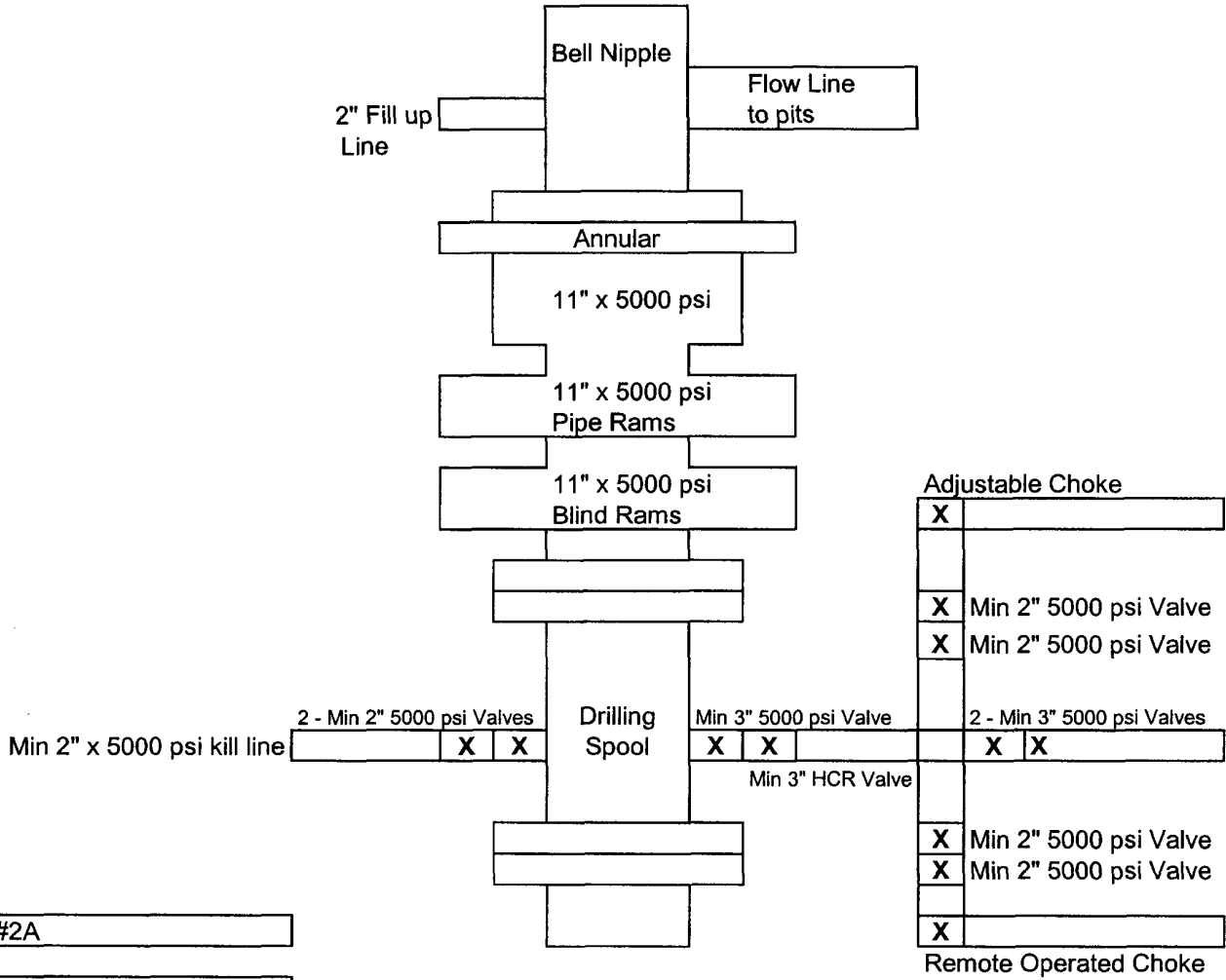
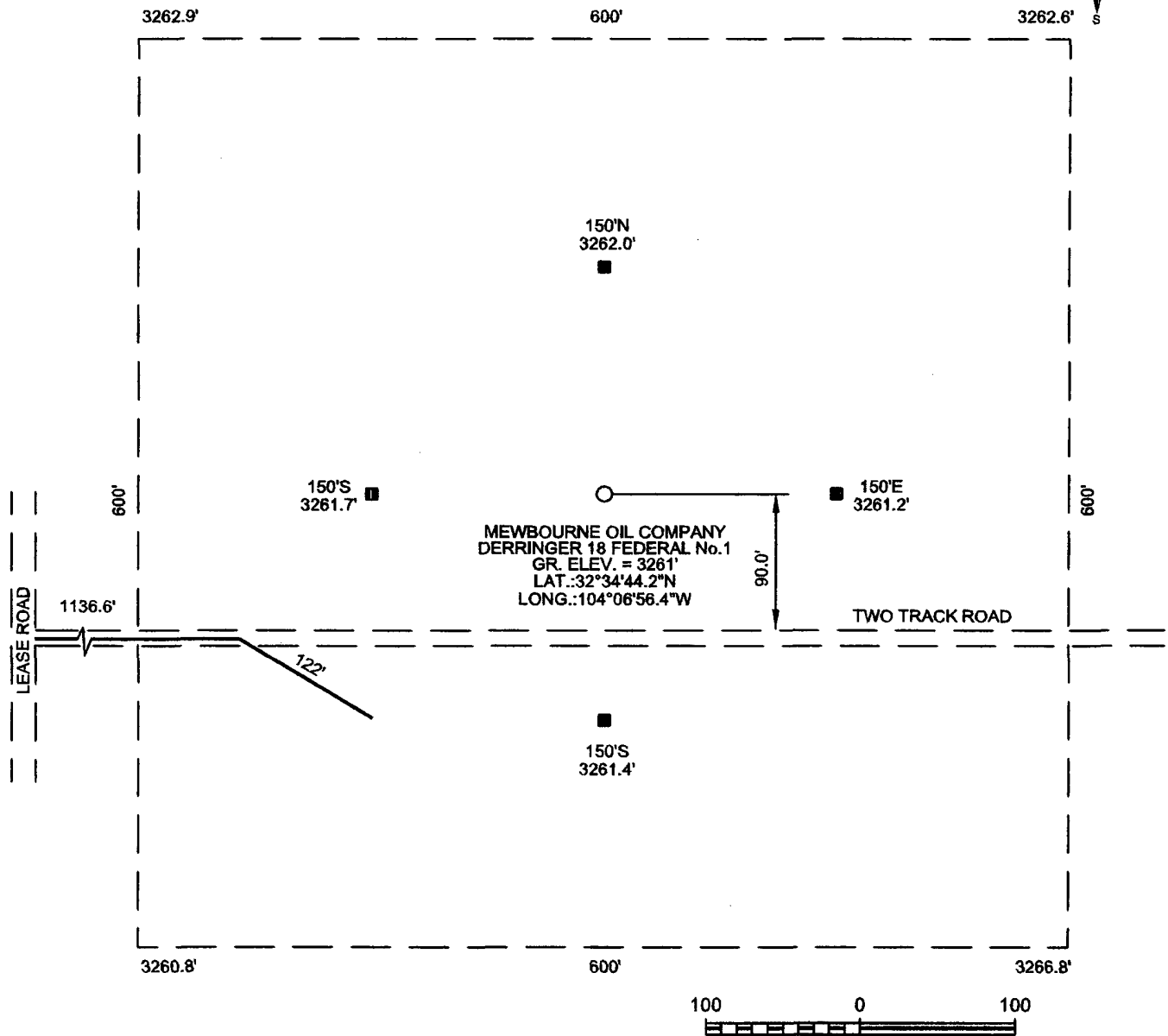


Exhibit #2A

**Derringer 18 Federal #1
660' FNL & 1980' FWL
Sec 18-T20S-R29E
Eddy, County
New Mexico**

**SECTION 18, TOWNSHIP 20 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, NEW MEXICO**



DIRECTIONS TO LOCATION:

FROM THE INTERSECTION OF COUNTY ROAD No. 238 BURTON
FLAT ROAD AND COUNTY ROAD No.243, GO EAST 200 FEET TO
A LEASE ROAD. GO NORTH 0.9 MILES TO TWO TRACK ROAD, GO
EAST 0.2 MILES TO LOCATION.

MEWBOURNE OIL COMPANY

DERRENGER 18 FEDERAL #1 WELL PAD TOPO

**DERRINGER 18 FEDERAL No.1
LOCATED 660' F.N.L. & 1980' F.W.L., SECTION 18,
TOWNSHIP 20 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, NEW MEXICO**

BASIN SURVEYS P.O. BOX 1786 -HOBBS, NEW MEXICO

W.O. Number: 5718

Drawn By: S.STANFIELD

Date: 08-19-2005

Disk:C:\DRAWINGS\MEWBOURNE\MEW5718-1

Survey Date: 08-15-2005

Sheet 1 of 1 Sheets

Exhibit #4
Status of Wells in Immediate Vicinity
Mewbourne Oil Company
Derringer 18 Federal #1
660' FNL & 1980' FWL
Sec 18-T20S-R29E
Eddy County, New Mexico

Section 18-T20S-R29E

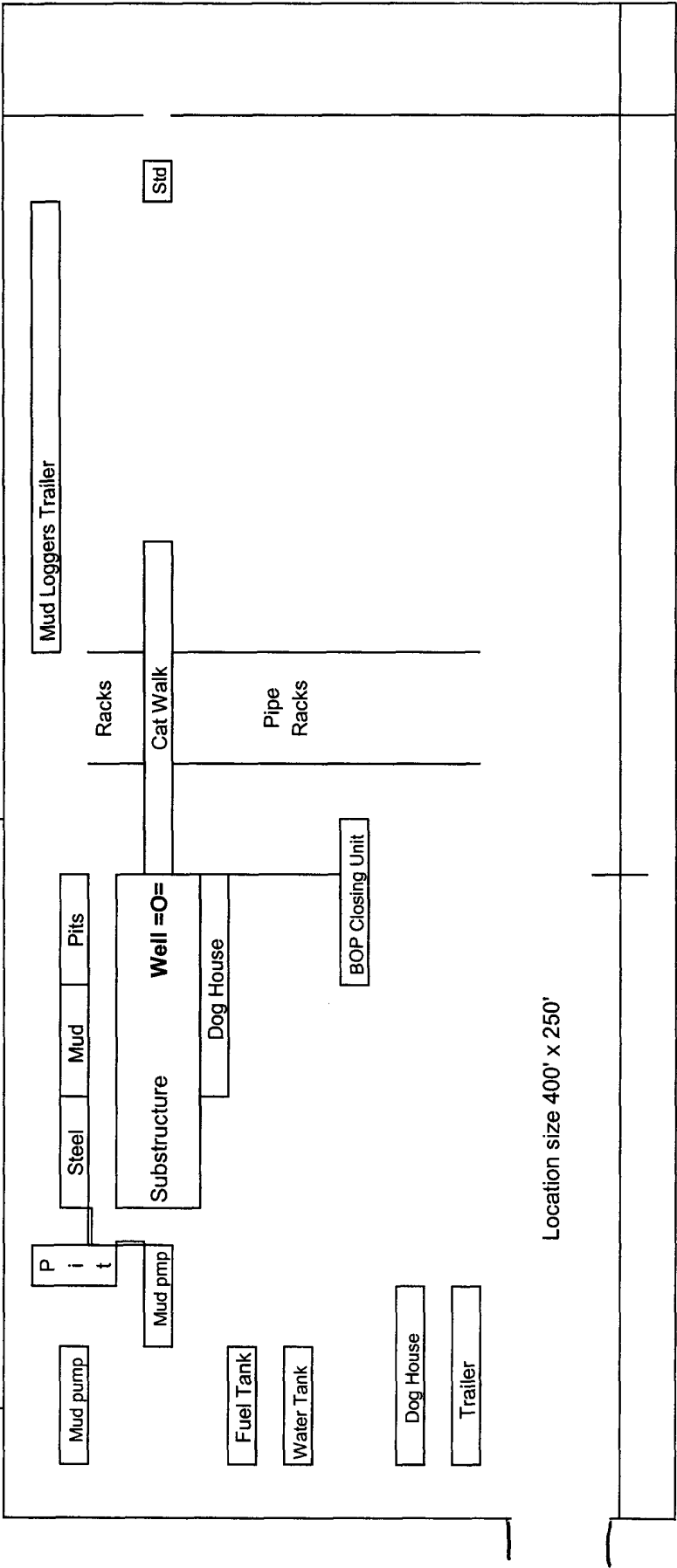
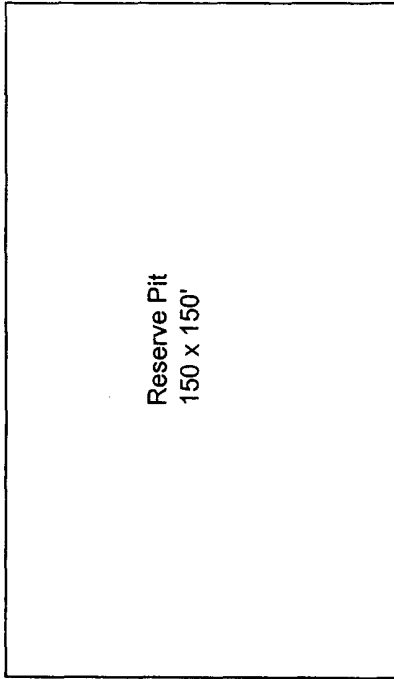
Operator: Marathon Oil Company
Well Name: Yates Federal #2
Unit letter: E
Status: P&A
Field: Burton Flat East

Mewbourne Oil Company

-N-

Well Name	Derringer 18 Federal #1
Footages	660' FNL & 1980' FWL
STR	Sec 18-T20S-R29E
County	Eddy, County
State	New Mexico

Exhibit #5



Rig Location Schematic

CONDITIONS OF APPROVAL - DRILLING

Operator's Name: Mewbourne Oil Company
Well Name & No. Derringer 18 Federal #1
Location: 660' FNL, 1980' FWL, Section 18, T. 20 S., R. 29 E., Eddy County, New Mexico
Lease: NM-01165

I. DRILLING OPERATIONS REQUIREMENTS:

1. The Bureau of Land Management (BLM) is to be notified at the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, (505) 361-2822 for wells in Eddy County in sufficient time for a representative to witness:

A. Well spud

B. Cementing casing: 20 inch 13-3/8 inch 9-5/8 inch 5-1/2 inch

C. BOP tests

2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.

3. Submit a Sundry Notice (Form 3160-5, one original and five copies) for each casing string, describing the casing and cementing operations. Include pertinent information such as; spud date, hole size, casing (size, weight, grade and thread type), cement (type, quantity and top), water zones and problems or hazards encountered. The Sundry shall be submitted within 15 days of completion of each casing string. The reports may be combined into the same Sundry if they fall within the same 15 day time frame.

4. The API No. assigned to the well by NMOCD shall be included on the subsequent report of setting the first casing string.

II. CASING:

1. The 20 inch surface casing shall be set at approximately 300 feet or 25 feet into the top of the Rustler Anhydrite and cement circulated to the surface. If cement does not circulate to the surface the appropriate BLM office shall be notified and a temperature survey or cement bond log shall be run to verify the top of the cement. Remedial cementing shall be completed prior to drilling out that string.

2. The minimum required fill of cement behind the 13-3/8 inch 1st intermediate casing is to be sufficient to circulate to the surface.

3. The minimum required fill of cement behind the 9-5/8 inch 2nd intermediate casing is to be sufficient to circulate to the surface.

4. The minimum required fill of cement behind the 5-1/2 inch production casing is to be sufficient to reach at least 500 feet above the top of the uppermost hydrocarbon productive interval.

III. PRESSURE CONTROL:

1. All BOP systems and related equipment shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2. The BOP and related equipment shall be installed and operational before drilling below the 13-3/8 inch casing shoe and shall be tested as described in Onshore Order No. 2. Any equipment failing to test satisfactorily shall be repaired or replaced.

2. Minimum working pressure of the blowout preventer and related equipment (BOPE) shall be 2000 psi. A variance to test the BOP's with the rig pump to 1000 psi is granted.

3. Minimum working pressure of the blowout preventer and related equipment (BOPE) below the 2nd intermediate casing shall be 5000 psi.

4. The appropriate BLM office shall be notified in sufficient time for a representative to witness the tests.

- The tests shall be done by an independent service company.
- The results of the test shall be reported to the appropriate BLM office.
- Testing fluid must be water or an appropriate clear liquid suitable for sub-freezing temperatures. Use of drilling mud for testing is not permitted since it can mask small leaks.
- Testing must be done in a safe workman-like manner. Hard line connections shall be required.

IV. DRILLING MUD:

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the **Wolfcamp** formation, and shall be used until production casing is run and cemented. Monitoring equipment shall consist of the following:

- Recording pit level indicator to indicate volume gains and losses.
- Mud measuring device for accurately determining the mud volumes necessary to fill the hole during trips.
- Flow-sensor on the flow-line to warn of abnormal mud returns from the well.

acs

8/29/2005