ATS-16-41

# SECRETARY'S POTASH

OCD Artesia

Form 3160-3
(March 2012)

FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

## APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
~~NM70951X~~ NM 05312977

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☑ DRILL ☐ REENTER

7. If Unit or CA Agreement, Name and No.
Forty Niner Ridge Unit NM 70951X

1b. Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other ☑ Single Zone ☐ Multiple Zone

8. Lease Name and Well No.
Forty Niner Ridge Unit #105H

2. Name of Operator Mewbourne Oil Company

9. API Well No.
30-015-44219

3a. Address PO Box 5270
Hobbs, NM 88241

3b. Phone No. *(include area code)*
575-393-5905

10. Field and Pool, or Exploratory
Forty Niner Ridge Bone Spring 24720

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface 525' FSL & 666' FEL, Sec 22 T23S R30E
At proposed prod. zone 100 FNL & 660 FEL, Sec 15 T23S R30E

11. Sec., T. R. M. or Blk. and Survey or Area
Sec 22 T23S R30E

14. Distance in miles and direction from nearest town or post office*
14 miles East of Loving, NM

12. County or Parish
Eddy

13. State
NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)
100'

16. No. of acres in lease
3,840

17. Spacing Unit dedicated to this well
320

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.
164' - Forty Niner Ridge Unit #106H

19. Proposed Depth
9795' - TVD
19,550' - MD

20. BLM/BIA Bond No. on file
NM-1693 Nationwide, NMB-000919

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
3263' - GL

22. Approximate date work will start*
12/09/2015

23. Estimated duration
60 Days

## 24. Attachments

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

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

25. Signature
Name *(Printed/Typed)* Bradley Bishop
Date 09/09/2015

Title

Approved by *(Signature)* /s/Cody Layton
Name *(Printed/Typed)*
Date MAY 18 2017

Title 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 TWO YEARS

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.

(Continued on page 2)

*(Instructions on page 2)

Carlsbad Controlled Water Basin

NM OIL CONSERVATION
ARTESIA DISTRICT
MAY 30 2017

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

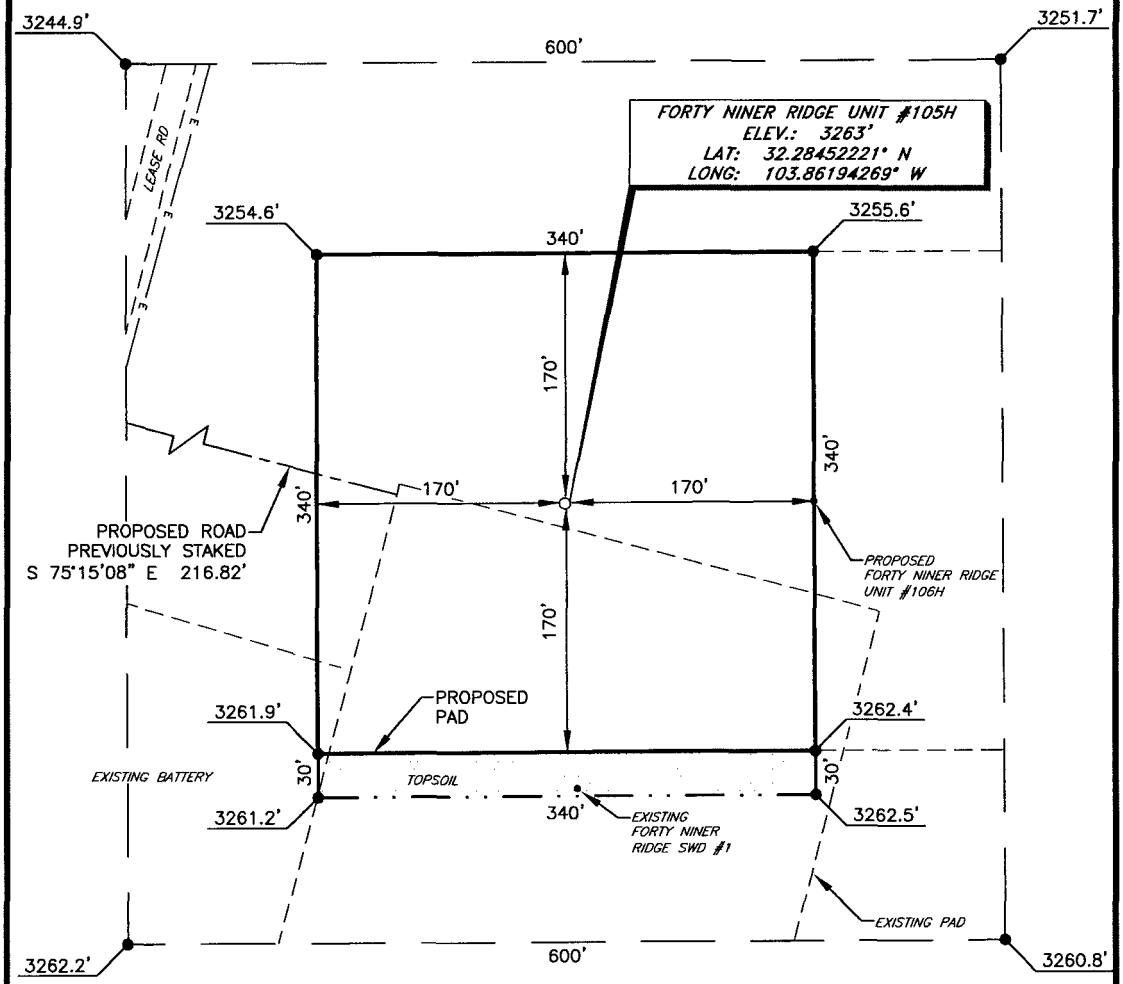
RECEIVED

Approval Subject to General Requirements
& Special Stipulations Attached

RJP 5-31-17

# MEWBOURNE OIL COMPANY

## FORTY NINER RIDGE UNIT #105H
## (525' FSL & 666' FEL)
### SECTION 22, T23S, R30E
### N. M. P. M., EDDY COUNTY, NEW MEXICO




*DIRECTIONS TO LOCATION*

*From the intersection of NM Hwy. 128 and CR-795 (Mobley Ranch Rd.)*

*Go South on CR-795 approx. 0.6 miles to a "Y";*

*Keep left at "Y" and go South approx. 2.9 miles to a proposed road on the left;*

*Turn left and go West approx. 332 feet to location.*

SCALE: 1" = 100'
0 50 100

*BEARINGS ARE*
*NAD 27 GRID - NM EAST*
*DISTANCES ARE GROUND*

*Firm No.: TX 10193838 NM 4655451*



| NO. | REVISION | DATE |
|---|---|---|
| | | |
| | | |
| | | |

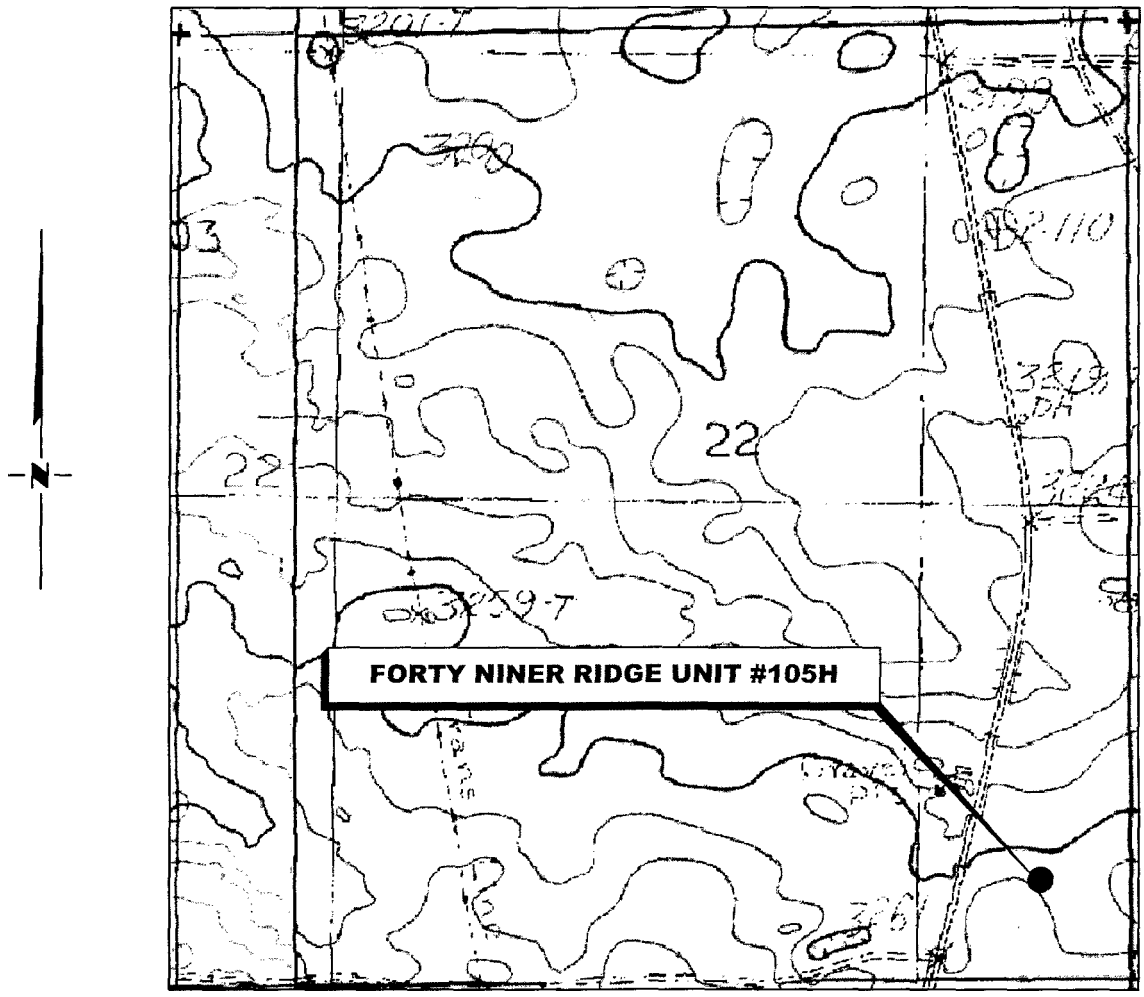
JOB NO.: LS1505254
DWG. NO.: 1505254PAD

RRC

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

SCALE: 1" = 100'
DATE: 7-24-2015
SURVEYED BY: BK/ML
DRAWN BY: CMJ
APPROVED BY: RMH
SHEET : 1 OF 1

# LOCATION VERIFICATION MAP




*SECTION 22, TWP. 23 SOUTH, RGE. 30 EAST,*
*N. M. P. M., EDDY CO., NEW MEXICO*

OPERATOR: Mewbourne Oil Company
LEASE: Forty Niner Ridge Unit
WELL NO.: 105H
ELEVATION: 3263'

LOCATION: 525' FSL & 666' FEL
CONTOUR INTERVAL: 10'
USGS TOPO. SOURCE MAP:
Los Medanos, NM (P. E. 1985)



| NO. | REVISION | DATE |
|---|---|---|
| | | |
| | | |
| | | |

JOB NO.: LS1505254
DWG. NO.: 1505254LVM

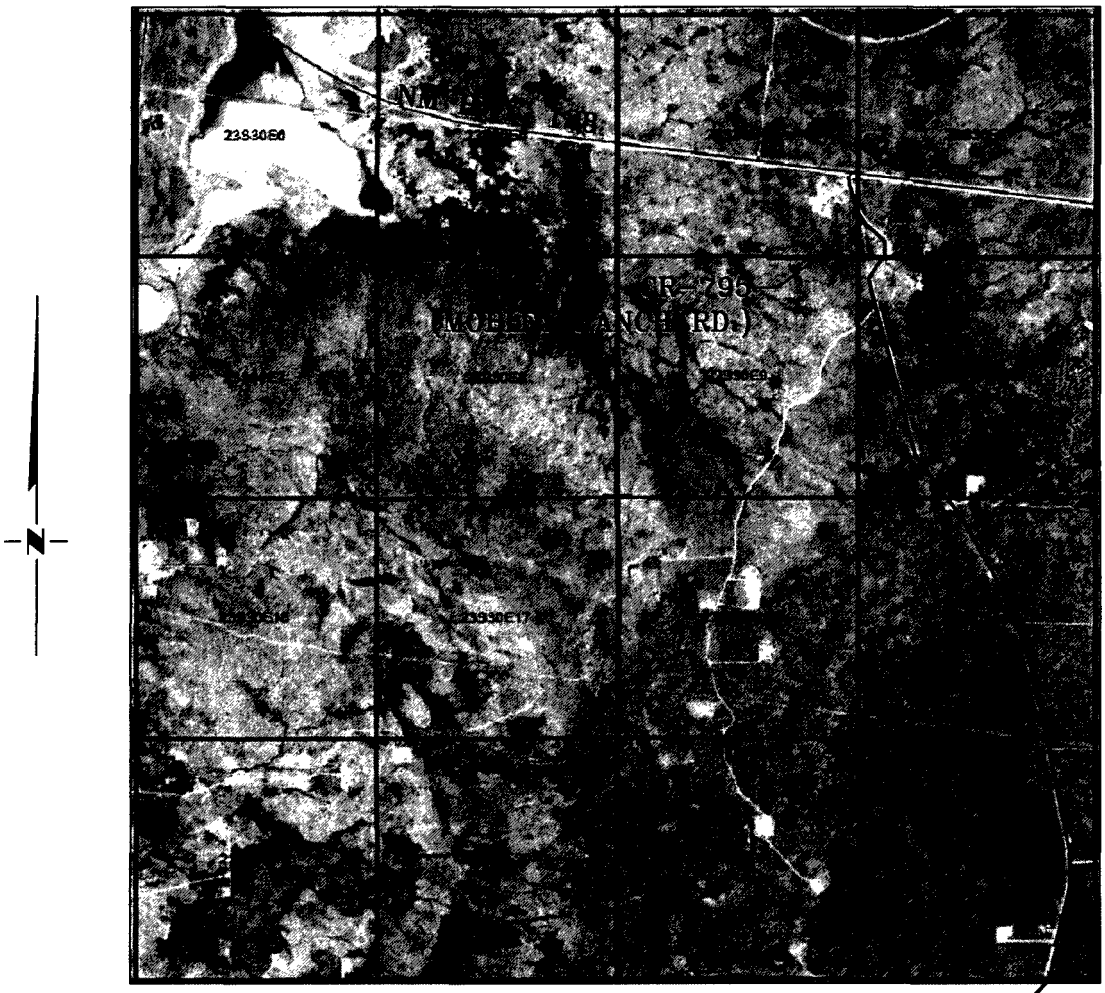
RRC

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

SCALE: 1000'
DATE: 7-24-2015
SURVEYED BY: BK/ML
DRAWN BY: CMJ
APPROVED BY: RMH
SHEET : 1 OF 1

# VICINITY MAP

NOT TO SCALE




**FORTY NINER RIDGE UNIT #105H**

*SECTION 22, TWP. 23 SOUTH, RGE. 30 EAST,*
*N. M. P. M., EDDY CO., NEW MEXICO*

OPERATOR: Mewbourne Oil Company
LEASE: Forty Niner Ridge Unit
WELL NO.: 105H

LOCATION: 525' FSL & 666' FEL
ELEVATION: 3263'



| NO. | REVISION | DATE |
|---|---|---|
| | | |
| | | |
| | | |

JOB NO.: LS1505254
DWG. NO.: 1505254VM

RRC

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

SCALE: NTS
DATE: 7-24-2015
SURVEYED BY: BK/ML
DRAWN BY: CMJ
APPROVED BY: RMH
SHEET : 1 OF 1

Exhibit "4" - SL - Forty Niner Ridge Unit #105H

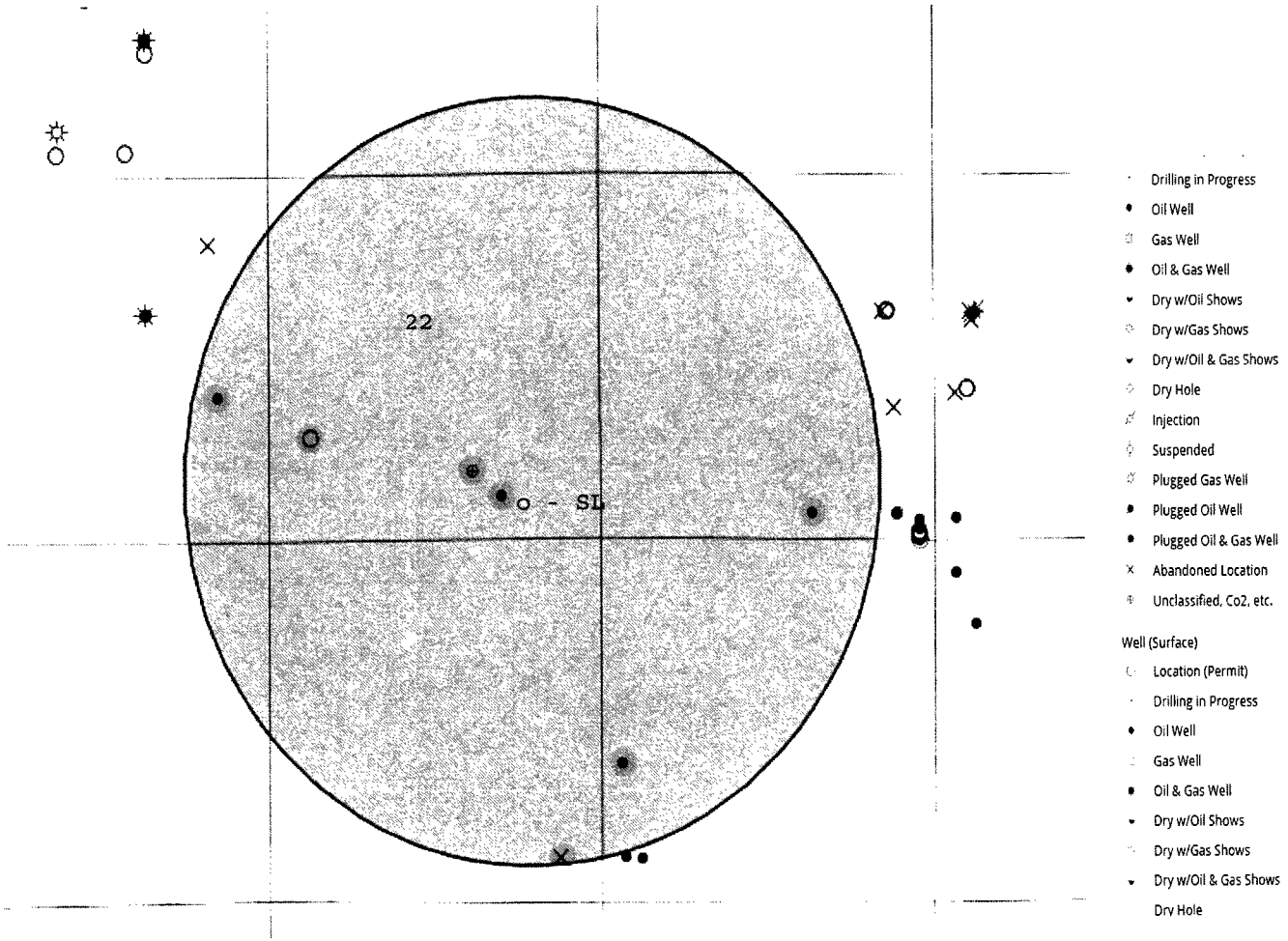
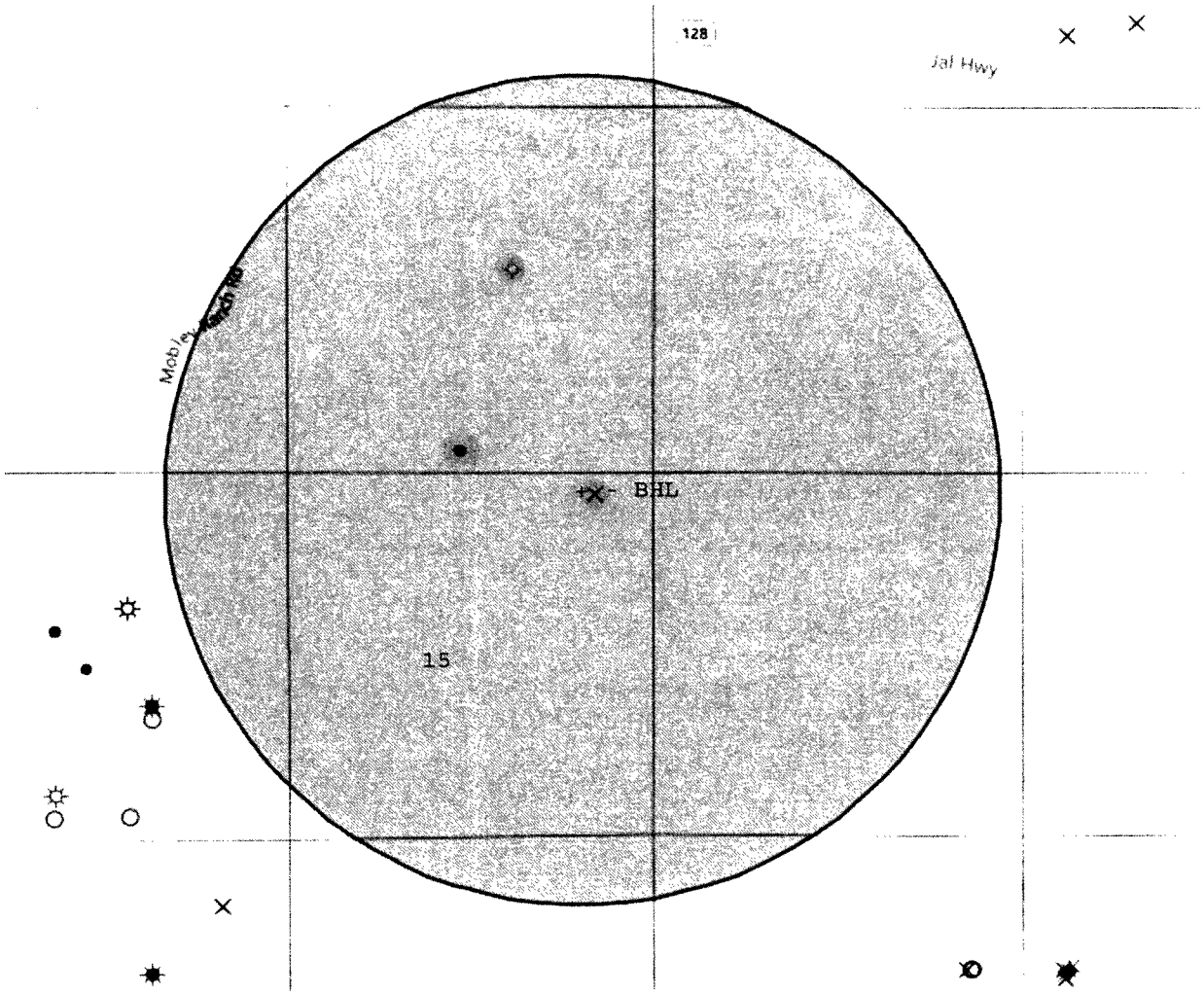


Exhibit "4A" - BHL - Forty Niner Ridge Unit #105H




- Drilling in Progress
- Oil Well
- Gas Well
- Oil & Gas Well
- Dry w/Oil Shows
- Dry w/Gas Shows
- Dry w/Oil & Gas Shows
- Dry Hole
- Injection
- Suspended
- Plugged Gas Well
- Plugged Oil Well
- Plugged Oil & Gas Well
- Abandoned Location
- Unclassified, Co2, etc.

Well (Surface)

- Location (Permit)
- Drilling in Progress
- Oil Well
- Gas Well
- Oil & Gas Well
- Dry w/Oil Shows
- Dry w/Gas Shows
- Dry w/Oil & Gas Shows
- Dry Hole

**Mewbourne Oil Company, Forty Niner Ridge Unit #105H**
**Sec 22, T23S, R30E**
**SL: 525' FSL & 666' FEL, Sec 22**
**BHL: 100' FNL & 330' FEL, Sec 15**

## 1. Geologic Formations

| | | | |
|---|---|---|---|
| TVD of target | 9795' | Pilot hole depth | NA |
| MD at TD: | 19550' | Deepest expected fresh water: | 300' |

**Basin**

| Formation | Depth (TVD) from KB | Water/Mineral Bearing/ Target Zone? | Hazards* |
|---|---|---|---|
| Quaternary Fill | Surface | | |
| Rustler | | | |
| Top of Salt | 472 | Salt | |
| Castile | 2291 | | |
| Base of Salt | 3549 | | |
| Yates | | Oil | |
| Lamar | 3776 | | |
| Cherry Canyon | 4704 | | |
| Manzanita Marker | 4874 | | |
| Brushy Canyon | 5994 | | |
| Bone Spring | 7649 | Oil/Gas | |
| 1st Bone Spring Sand | 8649 | | |
| 2nd Bone Spring Sand | 9504 | Target Zone | |
| 3rd Bone Spring Sand | | | |
| Abo | | | |
| Wolfcamp | | Will Not Penetrate | |
| Devonian | | | |
| Fusselman | | | |
| Ellenburger | | | |
| Granite Wash | | | |

*H2S, water flows, loss of circulation, abnormal pressures, etc.

**Mewbourne Oil Company, Forty Niner Ridge Unit #105H**
**Sec 22, T23S, R30E**
**SL: 525' FSL & 666' FEL, Sec 22**
**BHL: 100' FNL & 330' FEL, Sec 15**

## 2. Casing Program

| Hole Size | Casing Interval From | Casing Interval To | Csg. Size | Weight (lbs) | Grade | Conn. | SF Collapse | SF Burst | SF Tension |
|---|---|---|---|---|---|---|---|---|---|
| 17.5" | 0' | 425' | 13.375" | 48 | H40 | STC | 3.35 | 7.83 | 15.78 |
| 12.25" | 0' | 3453' | 9.625" | 36 | J55 | LTC | 1.13 | 1.96 | 3.38 |
| 12.25" | 3453' | 3700' | 9.625" | 40 | J55 | LTC | 1.34 | 2.05 | 52.63 |
| 8.75" | 0' | 1199' | 7" | 26 | HCP110 | BTC | 12.51 | 15.98 | 1.99 |
| 8.75" | 1199' | 9313' | 7" | 26 | HCP110 | LTC | 1.61 | 2.06 | 1.80 |
| 8.75 | 9313' | 10063' | 5.5" | 17 | P110 | BTC | 1.47 | 2.09 | 3.14 |
| 8.75" | 10063' | 19550' | 5.5" | 17 | P110 | LTC | 1.47 | 2.09 | 2.75 |
| | | | | BLM Minimum Safety Factor | | | 1.125 | 1 | 1.6 Dry<br>1.8 Wet |

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

Must have table for contingency casing

| | Y or N |
|---|---|
| Is casing new? If used, attach certification as required in Onshore Order #1 | Y |
| Is casing API approved? If no, attach casing specification sheet. | Y |
| Is premium or uncommon casing planned? If yes attach casing specification sheet. | N |
| Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria). | Y |
| Will the pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing? | Y |
| | |
| Is well located within Capitan Reef? | N |
| If yes, does production casing cement tie back a minimum of 50' above the Reef? | |
| Is well within the designated 4 string boundary. | |
| | |
| Is well located in SOPA but not in R-111-P? | Y |
| If yes, are the first 2 strings cemented to surface and 3rd string cement tied back 500' into previous casing? | Y |
| | |
| Is well located in R-111-P and SOPA? | N |
| If yes, are the first three strings cemented to surface? | |
| Is 2nd string set 100' to 600' below the base of salt? | |
| | |
| Is well located in high Cave/Karst? | Y |
| If yes, are there two strings cemented to surface? | Y |
| (For 2 string wells) If yes, is there a contingency casing if lost circulation occurs? | |
| | |
| Is well located in critical Cave/Karst? | N |
| If yes, are there three strings cemented to surface? | |

**Mewbourne Oil Company, Forty Niner Ridge Unit #105H**
**Sec 22, T23S, R30E**
**SL: 525' FSL & 666' FEL, Sec 22**
**BHL: 100' FNL & 330' FEL, Sec 15**

**3. Cementing Program**

| Casing | # Sks | Wt. lb/ gal | Yld ft3/ sack | $H_20$ gal/ sk | 500# Comp. Strength (hours) | Slurry Description |
|---|---|---|---|---|---|---|
| Surf. | 160 | 14.8 | 2.12 | 6.3 | 8 | Class C + 0.005pps Static Free + 1% CaCl2 + 0.25 pps CelloFlake + 0.005 gps FP-6L |
| | 200 | 14.8 | 1.34 | 6.3 | 8 | Tail: Class C + 0.25 lb/sk Cello Flake + 0.005 lb/sk Static Free |
| Inter. | 560 | 12.5 | 2.12 | 11 | 10 | Lead: Class C (35:65:4) + 5% Sodium Chloride +5#/sk LCM +0.25lb/sk Cello-Flake |
| | 200 | 14.8 | 1.34 | 6.3 | 8 | Tail: Class C + 0.25 lb/sk Cello Flake + 0.005 lb/sk Static Free |
| Prod | 1480 | 11.2 | 2.97 | 18 | 16 | Class C (60:40:0)+4% MPA5+1.2% BA10A+10#/sk BA90+5%A10+0.65%ASA301+1.5%SMS+1.2%R21 |

A copy of cement test will be available on location at time of cement job providing pump times & compressive strengths.

| Casing String | TOC | % Excess |
|---|---|---|
| Surface | 0' | 100% |
| Intermediate | 0' | 25% |
| Production | ~~3200'~~ 0' | 25% |

**Mewbourne Oil Company, Forty Niner Ridge Unit #105H**
**Sec 22, T23S, R30E**
**SL: 525' FSL & 666' FEL, Sec 22**
**BHL: 100' FNL & 330' FEL, Sec 15**

**4. Pressure Control Equipment**

| | Variance: None | | | | |
|---|---|---|---|---|---|
| **BOP installed and tested before drilling which hole?** | **Size?** | **System Rated WP** | **Type** | **✓** | **Tested to:** |
| 12-1/4" | 13-5/8" | ~~3M~~ 2M | Annular | X | 1500# |
| | | | Blind Ram | | |
| | | | Pipe Ram | | |
| | | | Double Ram | | |
| | | | Other* | | |
| 8-3/4" | 13 5/8" | 5M | Annular | X | 2500# |
| | | | Blind Ram | X | 5000# |
| | | | Pipe Ram | X | |
| | | | Double Ram | | |
| | | | Other* | | |

Not w/a 3M Rams

*Specify if additional ram is utilized.
BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.
Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. See attached schematics.

| | |
|---|---|
| X | Formation integrity test will be performed per Onshore Order #2.<br>On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i. |
| Y | A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart. |
| | N Are anchors required by manufacturer? |
| N | A multibowl wellhead is being used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested.<br>• Provide description here<br>See attached schematic. |

| | |
|---|---|
| N | A multibowl wellhead is being used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested.<br><br>• Provide description here<br><br>See attached schematic. |

**5. Mud Program**

| Depth | | Type | Weight (ppg) | Viscosity | Water Loss |
|---|---|---|---|---|---|
| From | To | | | | |
| 0 | 425 | FW Gel | 8.6-8.8 | 28-34 | N/C |
| 425 | 3700 | Saturated Brine | 10.0 | 28-34 | N/C |
| 3700 | 9313 | Cut Brine | 8.6-9.5 | 28-34 | N/C |
| 9313 | 19550 | FW w/Polymer | 8.6-9.5 | 30-40 | <20cc |

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

| | |
|---|---|
| What will be used to monitor the loss or gain of fluid? | Visual Monitoring |

**6. Logging and Testing Procedures**

| **Logging, Coring and Testing.** | |
|---|---|
| X | Will run GR/CNL from KOP(9313') to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM. |
| | No Logs are planned based on well control or offset log information. |
| | Drill stem test? If yes, explain |
| | Coring? If yes, explain |

| **Additional logs planned** | | **Interval** |
|---|---|---|
| X | Gamma Ray | 9313'(KOP) to TD |
| | Density | |
| | CBL | |
| | Mud log | |
| | PEX | |

**Mewbourne Oil Company, Forty Niner Ridge Unit #105H**
**Sec 22, T23S, R30E**
**SL: 525' FSL & 666' FEL, Sec 22**
**BHL: 100' FNL & 330' FEL, Sec 15**

## 7. Drilling Conditions

| Condition | Specify what type and where? |
|---|---|
| BH Pressure at deepest TVD | 4242 psi |
| Abnormal Temperature | No |

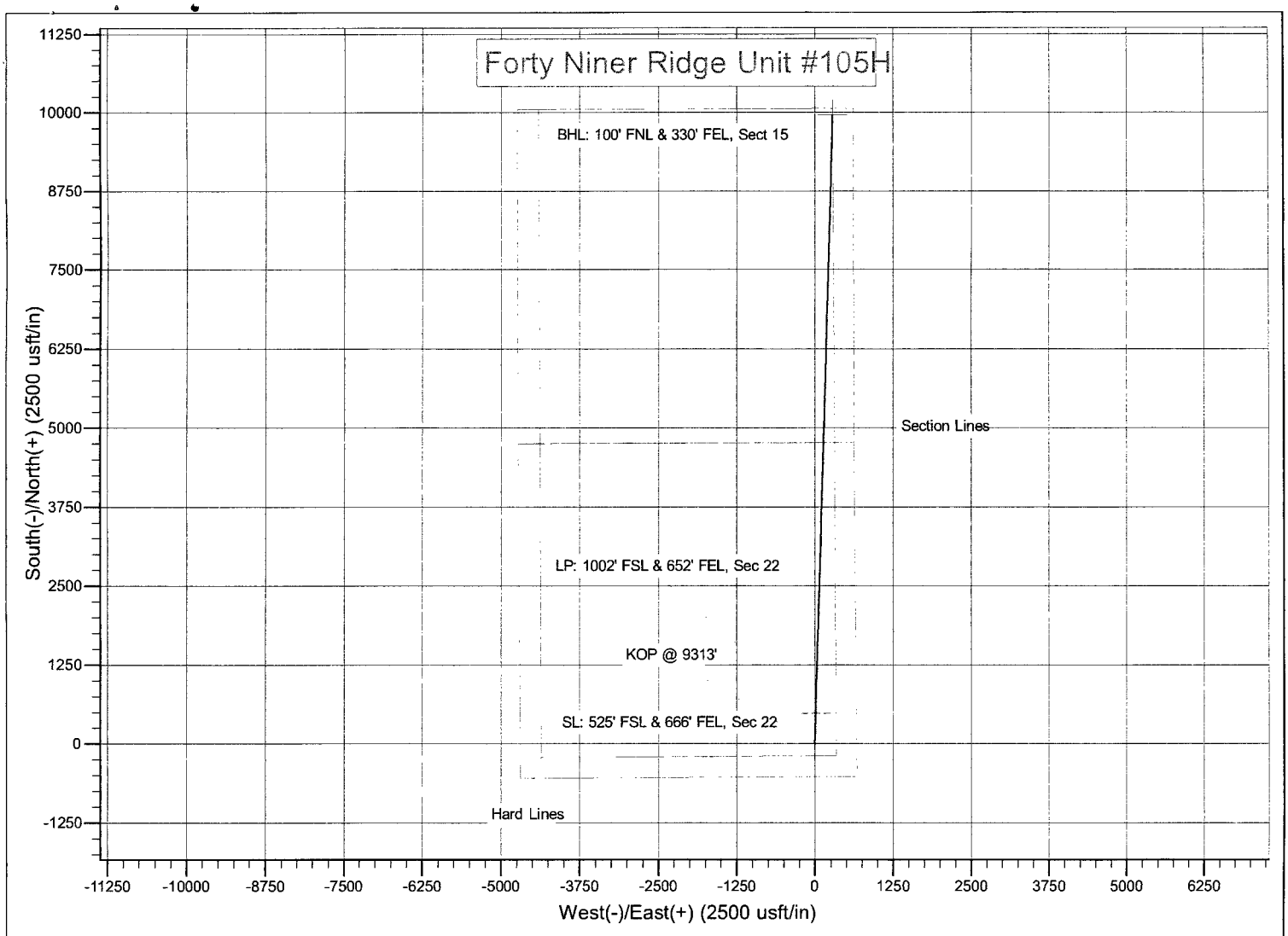
Mitigation measure for abnormal conditions. Describe. Lost circulation material/sweeps/mud scavengers in surface hole.

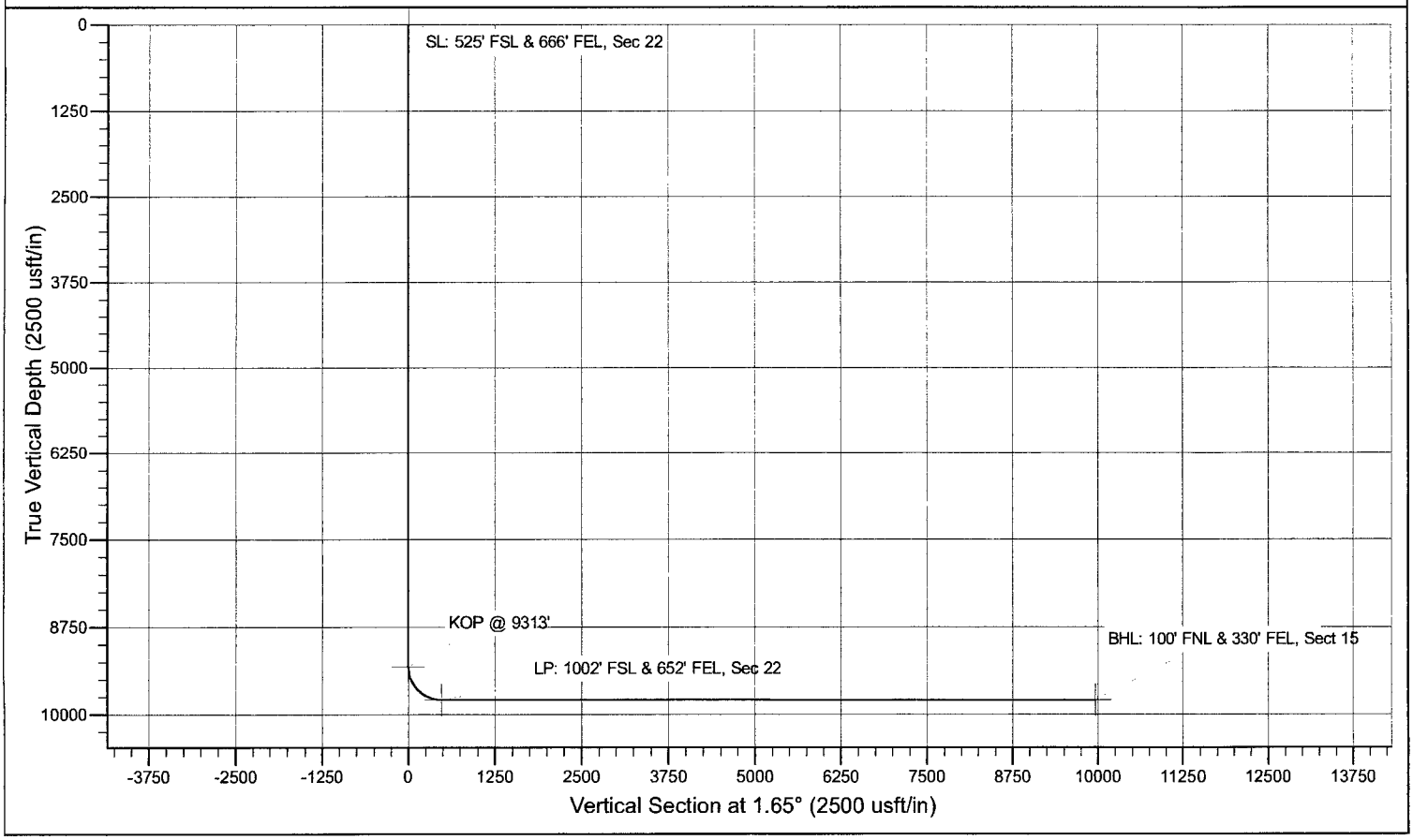
| | |
|---|---|
| Hydrogen Sulfide (H2S) monitors will be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM. | |
| | H2S is present |
| X | H2S Plan attached |

## 8. Other facets of operation

Is this a walking operation? If yes, describe.
Will be pre-setting casing? If yes, describe.

Attachments
___ Directional Plan
___ Other, describe


Forty Niner Ridge Unit #105H
BHL: 100' FNL & 330' FEL, Sect 15
Section Lines
LP: 1002' FSL & 652' FEL, Sec 22
KOP @ 9313'
SL: 525' FSL & 666' FEL, Sec 22
Hard Lines
South(-)/North(+) (2500 usft/in)
West(-)/East(+) (2500 usft/in)
11250
10000
8750
7500
6250
5000
3750
2500
1250
0
-1250
-11250
-10000
-8750
-7500
-6250
-5000
-3750
-2500
-1250
0
1250
2500
3750
5000
6250


SL: 525' FSL & 666' FEL, Sec 22
KOP @ 9313'
BHL: 100' FNL & 330' FEL, Sect 15
LP: 1002' FSL & 652' FEL, Sec 22
True Vertical Depth (2500 usft/in)
Vertical Section at 1.65° (2500 usft/in)
0
1250
2500
3750
5000
6250
7500
8750
10000
-3750
-2500
-1250
0
1250
2500
3750
5000
6250
7500
8750
10000
11250
12500
13750

# Mewbourne Oil Company

**Eddy County, New Mexico**
**Forty Niner Ridge Unit #105H**
**Sec 22, T23S, R30E**
**SL: 525' FSL & 666' FEL, Sec 22**
**BHL: 100' FNL & 330' FEL, Sec 15**

**Plan: Design #1**

# Standard Planning Report

**24 September, 2015**

| | | | |
|---|---|---|---|
| **Database:** | Hobbs | **Local Co-ordinate Reference:** | Site Forty Niner Ridge Unit #105H |
| **Company:** | Mewbourne Oil Company | **TVD Reference:** | WELL @ 3290.0usft (Original Well Elev) |
| **Project:** | Eddy County, New Mexico | **MD Reference:** | WELL @ 3290.0usft (Original Well Elev) |
| **Site:** | Forty Niner Ridge Unit #105H | **North Reference:** | Grid |
| **Well:** | Sec 22, T23S, R30E | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | BHL: 100' FNL & 330' FEL, Sec 15 | | |
| **Design:** | Design #1 | | |

| | | | |
|---|---|---|---|
| **Project** | Eddy County, New Mexico | | |
| **Map System:** | US State Plane 1927 (Exact solution) | **System Datum:** | Mean Sea Level |
| **Geo Datum:** | NAD 1927 (NADCON CONUS) | | |
| **Map Zone:** | New Mexico East 3001 | | |

| | | | | | |
|---|---|---|---|---|---|
| **Site** | Forty Niner Ridge Unit #105H | | | | |
| **Site Position:** | | **Northing:** | 467,547.00 usft | **Latitude:** | 32° 17' 4.285 N |
| **From:** | Map | **Easting:** | 645,676.00 usft | **Longitude:** | 103° 51' 42.997 W |
| **Position Uncertainty:** | 0.0 usft | **Slot Radius:** | 13-3/16 " | **Grid Convergence:** | 0.25 ° |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Well** | Sec 22, T23S, R30E | | | | | |
| **Well Position** | **+N/-S** | 0.0 usft | **Northing:** | 467,547.00 usft | **Latitude:** | 32° 17' 4.285 N |
| | **+E/-W** | 0.0 usft | **Easting:** | 645,676.00 usft | **Longitude:** | 103° 51' 42.997 W |
| **Position Uncertainty** | | 0.0 usft | **Wellhead Elevation:** | 3,290.0 usft | **Ground Level:** | 3,263.0 usft |

| | | | | | |
|---|---|---|---|---|---|
| **Wellbore** | BHL: 100' FNL & 330' FEL, Sec 15 | | | | |
| **Magnetics** | **Model Name** | **Sample Date** | **Declination (°)** | **Dip Angle (°)** | **Field Strength (nT)** |
| | IGRF200510 | 12/31/2009 | 7.89 | 60.25 | 48,798 |

| | | | | | |
|---|---|---|---|---|---|
| **Design** | Design #1 | | | | |
| **Audit Notes:** | | | | | |
| **Version:** | | **Phase:** | PROTOTYPE | **Tie On Depth:** | 0.0 |
| **Vertical Section:** | **Depth From (TVD) (usft)** | **+N/-S (usft)** | **+E/-W (usft)** | **Direction (°)** | |
| | 0.0 | 0.0 | 0.0 | 1.65 | |

**Plan Sections**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) | TFO (°) | Target |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 9,312.5 | 0.00 | 0.00 | 9,312.5 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 10,062.3 | 89.97 | 1.65 | 9,790.0 | 477.0 | 13.7 | 12.00 | 12.00 | 0.00 | 1.65 | |
| 19,550.2 | 89.97 | 1.65 | 9,795.0 | 9,961.0 | 287.0 | 0.00 | 0.00 | 0.00 | 0.00 | BHL: 100' FNL & 330' |

| | | | |
|---|---|---|---|
| **Database:** | Hobbs | **Local Co-ordinate Reference:** | Site Forty Niner Ridge Unit #105H |
| **Company:** | Mewbourne Oil Company | **TVD Reference:** | WELL @ 3290.0usft (Original Well Elev) |
| **Project:** | Eddy County, New Mexico | **MD Reference:** | WELL @ 3290.0usft (Original Well Elev) |
| **Site:** | Forty Niner Ridge Unit #105H | **North Reference:** | Grid |
| **Well:** | Sec 22, T23S, R30E | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | BHL: 100' FNL & 330' FEL, Sec 15 | | |
| **Design:** | Design #1 | | |

**Planned Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| **SL: 525' FSL & 666' FEL, Sec 22** | | | | | | | | | |
| 100.0 | 0.00 | 0.00 | 100.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 200.0 | 0.00 | 0.00 | 200.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 300.0 | 0.00 | 0.00 | 300.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 400.0 | 0.00 | 0.00 | 400.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 500.0 | 0.00 | 0.00 | 500.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 600.0 | 0.00 | 0.00 | 600.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 700.0 | 0.00 | 0.00 | 700.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 800.0 | 0.00 | 0.00 | 800.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 900.0 | 0.00 | 0.00 | 900.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,000.0 | 0.00 | 0.00 | 1,000.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,100.0 | 0.00 | 0.00 | 1,100.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,200.0 | 0.00 | 0.00 | 1,200.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,300.0 | 0.00 | 0.00 | 1,300.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,400.0 | 0.00 | 0.00 | 1,400.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,500.0 | 0.00 | 0.00 | 1,500.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,600.0 | 0.00 | 0.00 | 1,600.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,700.0 | 0.00 | 0.00 | 1,700.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,800.0 | 0.00 | 0.00 | 1,800.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,900.0 | 0.00 | 0.00 | 1,900.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,000.0 | 0.00 | 0.00 | 2,000.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,100.0 | 0.00 | 0.00 | 2,100.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,200.0 | 0.00 | 0.00 | 2,200.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,300.0 | 0.00 | 0.00 | 2,300.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,400.0 | 0.00 | 0.00 | 2,400.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,500.0 | 0.00 | 0.00 | 2,500.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,600.0 | 0.00 | 0.00 | 2,600.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,700.0 | 0.00 | 0.00 | 2,700.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,800.0 | 0.00 | 0.00 | 2,800.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,900.0 | 0.00 | 0.00 | 2,900.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 3,000.0 | 0.00 | 0.00 | 3,000.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 3,100.0 | 0.00 | 0.00 | 3,100.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 3,200.0 | 0.00 | 0.00 | 3,200.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 3,300.0 | 0.00 | 0.00 | 3,300.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 3,400.0 | 0.00 | 0.00 | 3,400.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 3,500.0 | 0.00 | 0.00 | 3,500.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 3,600.0 | 0.00 | 0.00 | 3,600.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 3,700.0 | 0.00 | 0.00 | 3,700.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 3,800.0 | 0.00 | 0.00 | 3,800.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 3,900.0 | 0.00 | 0.00 | 3,900.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 4,000.0 | 0.00 | 0.00 | 4,000.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 4,100.0 | 0.00 | 0.00 | 4,100.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 4,200.0 | 0.00 | 0.00 | 4,200.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 4,300.0 | 0.00 | 0.00 | 4,300.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 4,400.0 | 0.00 | 0.00 | 4,400.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 4,500.0 | 0.00 | 0.00 | 4,500.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 4,600.0 | 0.00 | 0.00 | 4,600.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 4,700.0 | 0.00 | 0.00 | 4,700.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 4,800.0 | 0.00 | 0.00 | 4,800.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 4,900.0 | 0.00 | 0.00 | 4,900.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 5,000.0 | 0.00 | 0.00 | 5,000.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 5,100.0 | 0.00 | 0.00 | 5,100.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 5,200.0 | 0.00 | 0.00 | 5,200.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Database:** | Hobbs | **Local Co-ordinate Reference:** | Site Forty Niner Ridge Unit #105H |
| **Company:** | Mewbourne Oil Company | **TVD Reference:** | WELL @ 3290.0usft (Original Well Elev) |
| **Project:** | Eddy County, New Mexico | **MD Reference:** | WELL @ 3290.0usft (Original Well Elev) |
| **Site:** | Forty Niner Ridge Unit #105H | **North Reference:** | Grid |
| **Well:** | Sec 22, T23S, R30E | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | BHL: 100' FNL & 330' FEL, Sec 15 | | |
| **Design:** | Design #1 | | |

**Planned Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 5,300.0 | 0.00 | 0.00 | 5,300.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 5,400.0 | 0.00 | 0.00 | 5,400.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 5,500.0 | 0.00 | 0.00 | 5,500.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 5,600.0 | 0.00 | 0.00 | 5,600.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 5,700.0 | 0.00 | 0.00 | 5,700.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 5,800.0 | 0.00 | 0.00 | 5,800.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 5,900.0 | 0.00 | 0.00 | 5,900.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 6,000.0 | 0.00 | 0.00 | 6,000.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 6,100.0 | 0.00 | 0.00 | 6,100.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 6,200.0 | 0.00 | 0.00 | 6,200.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 6,300.0 | 0.00 | 0.00 | 6,300.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 6,400.0 | 0.00 | 0.00 | 6,400.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 6,500.0 | 0.00 | 0.00 | 6,500.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 6,600.0 | 0.00 | 0.00 | 6,600.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 6,700.0 | 0.00 | 0.00 | 6,700.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 6,800.0 | 0.00 | 0.00 | 6,800.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 6,900.0 | 0.00 | 0.00 | 6,900.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 7,000.0 | 0.00 | 0.00 | 7,000.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 7,100.0 | 0.00 | 0.00 | 7,100.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 7,200.0 | 0.00 | 0.00 | 7,200.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 7,300.0 | 0.00 | 0.00 | 7,300.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 7,400.0 | 0.00 | 0.00 | 7,400.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 7,500.0 | 0.00 | 0.00 | 7,500.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 7,600.0 | 0.00 | 0.00 | 7,600.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 7,700.0 | 0.00 | 0.00 | 7,700.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 7,800.0 | 0.00 | 0.00 | 7,800.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 7,900.0 | 0.00 | 0.00 | 7,900.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 8,000.0 | 0.00 | 0.00 | 8,000.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 8,100.0 | 0.00 | 0.00 | 8,100.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 8,200.0 | 0.00 | 0.00 | 8,200.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 8,300.0 | 0.00 | 0.00 | 8,300.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 8,400.0 | 0.00 | 0.00 | 8,400.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 8,500.0 | 0.00 | 0.00 | 8,500.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 8,600.0 | 0.00 | 0.00 | 8,600.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 8,700.0 | 0.00 | 0.00 | 8,700.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 8,800.0 | 0.00 | 0.00 | 8,800.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 8,900.0 | 0.00 | 0.00 | 8,900.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 9,000.0 | 0.00 | 0.00 | 9,000.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 9,100.0 | 0.00 | 0.00 | 9,100.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 9,200.0 | 0.00 | 0.00 | 9,200.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 9,300.0 | 0.00 | 0.00 | 9,300.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 9,312.5 | 0.00 | 0.00 | 9,312.5 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| **KOP @ 9313'** | | | | | | | | | |
| 9,400.0 | 10.50 | 1.65 | 9,399.5 | 8.0 | 0.2 | 8.0 | 12.00 | 12.00 | 0.00 |
| 9,500.0 | 22.50 | 1.65 | 9,495.2 | 36.3 | 1.0 | 36.3 | 12.00 | 12.00 | 0.00 |
| 9,600.0 | 34.50 | 1.65 | 9,582.9 | 83.9 | 2.4 | 84.0 | 12.00 | 12.00 | 0.00 |
| 9,700.0 | 46.50 | 1.65 | 9,658.9 | 148.7 | 4.3 | 148.8 | 12.00 | 12.00 | 0.00 |
| 9,800.0 | 58.50 | 1.65 | 9,719.6 | 227.9 | 6.6 | 228.0 | 12.00 | 12.00 | 0.00 |
| 9,900.0 | 70.50 | 1.65 | 9,762.6 | 317.9 | 9.2 | 318.0 | 12.00 | 12.00 | 0.00 |
| 10,000.0 | 82.50 | 1.65 | 9,785.9 | 414.9 | 12.0 | 415.1 | 12.00 | 12.00 | 0.00 |
| 10,062.3 | 89.97 | 1.65 | 9,790.0 | 477.0 | 13.7 | 477.2 | 12.00 | 12.00 | 0.00 |
| **LP: 1002' FSL & 652' FEL, Sec 22** | | | | | | | | | |
| 10,100.0 | 89.97 | 1.65 | 9,790.0 | 514.7 | 14.8 | 514.9 | 0.00 | 0.00 | 0.00 |
| 10,200.0 | 89.97 | 1.65 | 9,790.1 | 614.7 | 17.7 | 614.9 | 0.00 | 0.00 | 0.00 |

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|---|---|---|---|
| **Database:** | Hobbs | **Local Co-ordinate Reference:** | Site Forty Niner Ridge Unit #105H |
| **Company:** | Mewbourne Oil Company | **TVD Reference:** | WELL @ 3290.0usft (Original Well Elev) |
| **Project:** | Eddy County, New Mexico | **MD Reference:** | WELL @ 3290.0usft (Original Well Elev) |
| **Site:** | Forty Niner Ridge Unit #105H | **North Reference:** | Grid |
| **Well:** | Sec 22, T23S, R30E | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | BHL: 100' FNL & 330' FEL, Sec 15 | | |
| **Design:** | Design #1 | | |

**Planned Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 10,300.0 | 89.97 | 1.65 | 9,790.1 | 714.6 | 20.6 | 714.9 | 0.00 | 0.00 | 0.00 |
| 10,400.0 | 89.97 | 1.65 | 9,790.2 | 814.6 | 23.5 | 814.9 | 0.00 | 0.00 | 0.00 |
| 10,500.0 | 89.97 | 1.65 | 9,790.2 | 914.5 | 26.4 | 914.9 | 0.00 | 0.00 | 0.00 |
| 10,600.0 | 89.97 | 1.65 | 9,790.3 | 1,014.5 | 29.2 | 1,014.9 | 0.00 | 0.00 | 0.00 |
| 10,700.0 | 89.97 | 1.65 | 9,790.3 | 1,114.5 | 32.1 | 1,114.9 | 0.00 | 0.00 | 0.00 |
| 10,800.0 | 89.97 | 1.65 | 9,790.4 | 1,214.4 | 35.0 | 1,214.9 | 0.00 | 0.00 | 0.00 |
| 10,900.0 | 89.97 | 1.65 | 9,790.4 | 1,314.4 | 37.9 | 1,314.9 | 0.00 | 0.00 | 0.00 |
| 11,000.0 | 89.97 | 1.65 | 9,790.5 | 1,414.3 | 40.8 | 1,414.9 | 0.00 | 0.00 | 0.00 |
| 11,100.0 | 89.97 | 1.65 | 9,790.5 | 1,514.3 | 43.6 | 1,514.9 | 0.00 | 0.00 | 0.00 |
| 11,200.0 | 89.97 | 1.65 | 9,790.6 | 1,614.3 | 46.5 | 1,614.9 | 0.00 | 0.00 | 0.00 |
| 11,300.0 | 89.97 | 1.65 | 9,790.7 | 1,714.2 | 49.4 | 1,714.9 | 0.00 | 0.00 | 0.00 |
| 11,400.0 | 89.97 | 1.65 | 9,790.7 | 1,814.2 | 52.3 | 1,814.9 | 0.00 | 0.00 | 0.00 |
| 11,500.0 | 89.97 | 1.65 | 9,790.8 | 1,914.1 | 55.2 | 1,914.9 | 0.00 | 0.00 | 0.00 |
| 11,600.0 | 89.97 | 1.65 | 9,790.8 | 2,014.1 | 58.0 | 2,014.9 | 0.00 | 0.00 | 0.00 |
| 11,700.0 | 89.97 | 1.65 | 9,790.9 | 2,114.0 | 60.9 | 2,114.9 | 0.00 | 0.00 | 0.00 |
| 11,800.0 | 89.97 | 1.65 | 9,790.9 | 2,214.0 | 63.8 | 2,214.9 | 0.00 | 0.00 | 0.00 |
| 11,900.0 | 89.97 | 1.65 | 9,791.0 | 2,314.0 | 66.7 | 2,314.9 | 0.00 | 0.00 | 0.00 |
| 12,000.0 | 89.97 | 1.65 | 9,791.0 | 2,413.9 | 69.6 | 2,414.9 | 0.00 | 0.00 | 0.00 |
| 12,100.0 | 89.97 | 1.65 | 9,791.1 | 2,513.9 | 72.4 | 2,514.9 | 0.00 | 0.00 | 0.00 |
| 12,200.0 | 89.97 | 1.65 | 9,791.1 | 2,613.8 | 75.3 | 2,614.9 | 0.00 | 0.00 | 0.00 |
| 12,300.0 | 89.97 | 1.65 | 9,791.2 | 2,713.8 | 78.2 | 2,714.9 | 0.00 | 0.00 | 0.00 |
| 12,400.0 | 89.97 | 1.65 | 9,791.2 | 2,813.8 | 81.1 | 2,814.9 | 0.00 | 0.00 | 0.00 |
| 12,500.0 | 89.97 | 1.65 | 9,791.3 | 2,913.7 | 84.0 | 2,914.9 | 0.00 | 0.00 | 0.00 |
| 12,600.0 | 89.97 | 1.65 | 9,791.3 | 3,013.7 | 86.8 | 3,014.9 | 0.00 | 0.00 | 0.00 |
| 12,700.0 | 89.97 | 1.65 | 9,791.4 | 3,113.6 | 89.7 | 3,114.9 | 0.00 | 0.00 | 0.00 |
| 12,800.0 | 89.97 | 1.65 | 9,791.4 | 3,213.6 | 92.6 | 3,214.9 | 0.00 | 0.00 | 0.00 |
| 12,900.0 | 89.97 | 1.65 | 9,791.5 | 3,313.6 | 95.5 | 3,314.9 | 0.00 | 0.00 | 0.00 |
| 13,000.0 | 89.97 | 1.65 | 9,791.5 | 3,413.5 | 98.4 | 3,414.9 | 0.00 | 0.00 | 0.00 |
| 13,100.0 | 89.97 | 1.65 | 9,791.6 | 3,513.5 | 101.2 | 3,514.9 | 0.00 | 0.00 | 0.00 |
| 13,200.0 | 89.97 | 1.65 | 9,791.7 | 3,613.4 | 104.1 | 3,614.9 | 0.00 | 0.00 | 0.00 |
| 13,300.0 | 89.97 | 1.65 | 9,791.7 | 3,713.4 | 107.0 | 3,714.9 | 0.00 | 0.00 | 0.00 |
| 13,400.0 | 89.97 | 1.65 | 9,791.8 | 3,813.3 | 109.9 | 3,814.9 | 0.00 | 0.00 | 0.00 |
| 13,500.0 | 89.97 | 1.65 | 9,791.8 | 3,913.3 | 112.8 | 3,914.9 | 0.00 | 0.00 | 0.00 |
| 13,600.0 | 89.97 | 1.65 | 9,791.9 | 4,013.3 | 115.6 | 4,014.9 | 0.00 | 0.00 | 0.00 |
| 13,700.0 | 89.97 | 1.65 | 9,791.9 | 4,113.2 | 118.5 | 4,114.9 | 0.00 | 0.00 | 0.00 |
| 13,800.0 | 89.97 | 1.65 | 9,792.0 | 4,213.2 | 121.4 | 4,214.9 | 0.00 | 0.00 | 0.00 |
| 13,900.0 | 89.97 | 1.65 | 9,792.0 | 4,313.1 | 124.3 | 4,314.9 | 0.00 | 0.00 | 0.00 |
| 14,000.0 | 89.97 | 1.65 | 9,792.1 | 4,413.1 | 127.2 | 4,414.9 | 0.00 | 0.00 | 0.00 |
| 14,100.0 | 89.97 | 1.65 | 9,792.1 | 4,513.1 | 130.0 | 4,514.9 | 0.00 | 0.00 | 0.00 |
| 14,200.0 | 89.97 | 1.65 | 9,792.2 | 4,613.0 | 132.9 | 4,614.9 | 0.00 | 0.00 | 0.00 |
| 14,300.0 | 89.97 | 1.65 | 9,792.2 | 4,713.0 | 135.8 | 4,714.9 | 0.00 | 0.00 | 0.00 |
| 14,400.0 | 89.97 | 1.65 | 9,792.3 | 4,812.9 | 138.7 | 4,814.9 | 0.00 | 0.00 | 0.00 |
| 14,500.0 | 89.97 | 1.65 | 9,792.3 | 4,912.9 | 141.6 | 4,914.9 | 0.00 | 0.00 | 0.00 |
| 14,600.0 | 89.97 | 1.65 | 9,792.4 | 5,012.8 | 144.4 | 5,014.9 | 0.00 | 0.00 | 0.00 |
| 14,700.0 | 89.97 | 1.65 | 9,792.4 | 5,112.8 | 147.3 | 5,114.9 | 0.00 | 0.00 | 0.00 |
| 14,800.0 | 89.97 | 1.65 | 9,792.5 | 5,212.8 | 150.2 | 5,214.9 | 0.00 | 0.00 | 0.00 |
| 14,900.0 | 89.97 | 1.65 | 9,792.5 | 5,312.7 | 153.1 | 5,314.9 | 0.00 | 0.00 | 0.00 |
| 15,000.0 | 89.97 | 1.65 | 9,792.6 | 5,412.7 | 156.0 | 5,414.9 | 0.00 | 0.00 | 0.00 |
| 15,100.0 | 89.97 | 1.65 | 9,792.7 | 5,512.6 | 158.8 | 5,514.9 | 0.00 | 0.00 | 0.00 |
| 15,200.0 | 89.97 | 1.65 | 9,792.7 | 5,612.6 | 161.7 | 5,614.9 | 0.00 | 0.00 | 0.00 |
| 15,300.0 | 89.97 | 1.65 | 9,792.8 | 5,712.6 | 164.6 | 5,714.9 | 0.00 | 0.00 | 0.00 |
| 15,400.0 | 89.97 | 1.65 | 9,792.8 | 5,812.5 | 167.5 | 5,814.9 | 0.00 | 0.00 | 0.00 |
| 15,500.0 | 89.97 | 1.65 | 9,792.9 | 5,912.5 | 170.4 | 5,914.9 | 0.00 | 0.00 | 0.00 |
| 15,600.0 | 89.97 | 1.65 | 9,792.9 | 6,012.4 | 173.2 | 6,014.9 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Database:** | Hobbs | **Local Co-ordinate Reference:** | Site Forty Niner Ridge Unit #105H |
| **Company:** | Mewbourne Oil Company | **TVD Reference:** | WELL @ 3290.0usft (Original Well Elev) |
| **Project:** | Eddy County, New Mexico | **MD Reference:** | WELL @ 3290.0usft (Original Well Elev) |
| **Site:** | Forty Niner Ridge Unit #105H | **North Reference:** | Grid |
| **Well:** | Sec 22, T23S, R30E | ***Survey Calculation Method:*** | *Minimum Curvature* |
| **Wellbore:** | BHL: 100' FNL & 330' FEL, Sec 15 | | |
| **Design:** | Design #1 | | |

**Planned Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 15,700.0 | 89.97 | 1.65 | 9,793.0 | 6,112.4 | 176.1 | 6,114.9 | 0.00 | 0.00 | 0.00 |
| 15,800.0 | 89.97 | 1.65 | 9,793.0 | 6,212.3 | 179.0 | 6,214.9 | 0.00 | 0.00 | 0.00 |
| 15,900.0 | 89.97 | 1.65 | 9,793.1 | 6,312.3 | 181.9 | 6,314.9 | 0.00 | 0.00 | 0.00 |
| 16,000.0 | 89.97 | 1.65 | 9,793.1 | 6,412.3 | 184.8 | 6,414.9 | 0.00 | 0.00 | 0.00 |
| 16,100.0 | 89.97 | 1.65 | 9,793.2 | 6,512.2 | 187.6 | 6,514.9 | 0.00 | 0.00 | 0.00 |
| 16,200.0 | 89.97 | 1.65 | 9,793.2 | 6,612.2 | 190.5 | 6,614.9 | 0.00 | 0.00 | 0.00 |
| 16,300.0 | 89.97 | 1.65 | 9,793.3 | 6,712.1 | 193.4 | 6,714.9 | 0.00 | 0.00 | 0.00 |
| 16,400.0 | 89.97 | 1.65 | 9,793.3 | 6,812.1 | 196.3 | 6,814.9 | 0.00 | 0.00 | 0.00 |
| 16,500.0 | 89.97 | 1.65 | 9,793.4 | 6,912.1 | 199.2 | 6,914.9 | 0.00 | 0.00 | 0.00 |
| 16,600.0 | 89.97 | 1.65 | 9,793.4 | 7,012.0 | 202.0 | 7,014.9 | 0.00 | 0.00 | 0.00 |
| 16,700.0 | 89.97 | 1.65 | 9,793.5 | 7,112.0 | 204.9 | 7,114.9 | 0.00 | 0.00 | 0.00 |
| 16,800.0 | 89.97 | 1.65 | 9,793.6 | 7,211.9 | 207.8 | 7,214.9 | 0.00 | 0.00 | 0.00 |
| 16,900.0 | 89.97 | 1.65 | 9,793.6 | 7,311.9 | 210.7 | 7,314.9 | 0.00 | 0.00 | 0.00 |
| 17,000.0 | 89.97 | 1.65 | 9,793.7 | 7,411.9 | 213.6 | 7,414.9 | 0.00 | 0.00 | 0.00 |
| 17,100.0 | 89.97 | 1.65 | 9,793.7 | 7,511.8 | 216.4 | 7,514.9 | 0.00 | 0.00 | 0.00 |
| 17,200.0 | 89.97 | 1.65 | 9,793.8 | 7,611.8 | 219.3 | 7,614.9 | 0.00 | 0.00 | 0.00 |
| 17,300.0 | 89.97 | 1.65 | 9,793.8 | 7,711.7 | 222.2 | 7,714.9 | 0.00 | 0.00 | 0.00 |
| 17,400.0 | 89.97 | 1.65 | 9,793.9 | 7,811.7 | 225.1 | 7,814.9 | 0.00 | 0.00 | 0.00 |
| 17,500.0 | 89.97 | 1.65 | 9,793.9 | 7,911.6 | 228.0 | 7,914.9 | 0.00 | 0.00 | 0.00 |
| 17,600.0 | 89.97 | 1.65 | 9,794.0 | 8,011.6 | 230.8 | 8,014.9 | 0.00 | 0.00 | 0.00 |
| 17,700.0 | 89.97 | 1.65 | 9,794.0 | 8,111.6 | 233.7 | 8,114.9 | 0.00 | 0.00 | 0.00 |
| 17,800.0 | 89.97 | 1.65 | 9,794.1 | 8,211.5 | 236.6 | 8,214.9 | 0.00 | 0.00 | 0.00 |
| 17,900.0 | 89.97 | 1.65 | 9,794.1 | 8,311.5 | 239.5 | 8,314.9 | 0.00 | 0.00 | 0.00 |
| 18,000.0 | 89.97 | 1.65 | 9,794.2 | 8,411.4 | 242.4 | 8,414.9 | 0.00 | 0.00 | 0.00 |
| 18,100.0 | 89.97 | 1.65 | 9,794.2 | 8,511.4 | 245.2 | 8,514.9 | 0.00 | 0.00 | 0.00 |
| 18,200.0 | 89.97 | 1.65 | 9,794.3 | 8,611.4 | 248.1 | 8,614.9 | 0.00 | 0.00 | 0.00 |
| 18,300.0 | 89.97 | 1.65 | 9,794.3 | 8,711.3 | 251.0 | 8,714.9 | 0.00 | 0.00 | 0.00 |
| 18,400.0 | 89.97 | 1.65 | 9,794.4 | 8,811.3 | 253.9 | 8,814.9 | 0.00 | 0.00 | 0.00 |
| 18,500.0 | 89.97 | 1.65 | 9,794.4 | 8,911.2 | 256.8 | 8,914.9 | 0.00 | 0.00 | 0.00 |
| 18,600.0 | 89.97 | 1.65 | 9,794.5 | 9,011.2 | 259.6 | 9,014.9 | 0.00 | 0.00 | 0.00 |
| 18,700.0 | 89.97 | 1.65 | 9,794.6 | 9,111.1 | 262.5 | 9,114.9 | 0.00 | 0.00 | 0.00 |
| 18,800.0 | 89.97 | 1.65 | 9,794.6 | 9,211.1 | 265.4 | 9,214.9 | 0.00 | 0.00 | 0.00 |
| 18,900.0 | 89.97 | 1.65 | 9,794.7 | 9,311.1 | 268.3 | 9,314.9 | 0.00 | 0.00 | 0.00 |
| 19,000.0 | 89.97 | 1.65 | 9,794.7 | 9,411.0 | 271.2 | 9,414.9 | 0.00 | 0.00 | 0.00 |
| 19,100.0 | 89.97 | 1.65 | 9,794.8 | 9,511.0 | 274.0 | 9,514.9 | 0.00 | 0.00 | 0.00 |
| 19,200.0 | 89.97 | 1.65 | 9,794.8 | 9,610.9 | 276.9 | 9,614.9 | 0.00 | 0.00 | 0.00 |
| 19,300.0 | 89.97 | 1.65 | 9,794.9 | 9,710.9 | 279.8 | 9,714.9 | 0.00 | 0.00 | 0.00 |
| 19,400.0 | 89.97 | 1.65 | 9,794.9 | 9,810.9 | 282.7 | 9,814.9 | 0.00 | 0.00 | 0.00 |
| 19,500.0 | 89.97 | 1.65 | 9,795.0 | 9,910.8 | 285.6 | 9,914.9 | 0.00 | 0.00 | 0.00 |
| 19,550.2 | 89.97 | 1.65 | 9,795.0 | 9,961.0 | 287.0 | 9,965.1 | 0.00 | 0.00 | 0.00 |
| **BHL: 100' FNL & 330' FEL, Sect 15** | | | | | | | | | |

| | | | |
|---|---|---|---|
| **Database:** | Hobbs | **Local Co-ordinate Reference:** | Site Forty Niner Ridge Unit #105H |
| **Company:** | Mewbourne Oil Company | **TVD Reference:** | WELL @ 3290.0usft (Original Well Elev) |
| **Project:** | Eddy County, New Mexico | **MD Reference:** | WELL @ 3290.0usft (Original Well Elev) |
| **Site:** | Forty Niner Ridge Unit #105H | **North Reference:** | Grid |
| **Well:** | Sec 22, T23S, R30E | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | BHL: 100' FNL & 330' FEL, Sec 15 | | |
| **Design:** | Design #1 | | |

**Design Targets**

| Target Name - hit/miss target - Shape | Dip Angle (°) | Dip Dir. (°) | TVD (usft) | +N/-S (usft) | +E/-W (usft) | Northing (usft) | Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| SL: 525' FSL & 666' FEL<br>- plan hits target center<br>- Point | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 467,547.00 | 645,676.00 | 32° 17' 4.285 N | 103° 51' 42.997 W |
| KOP @ 9313'<br>- plan hits target center<br>- Point | 0.00 | 0.00 | 9,312.5 | 0.0 | 0.0 | 467,547.00 | 645,676.00 | 32° 17' 4.285 N | 103° 51' 42.997 W |
| LP: 1002' FSL & 652' FE<br>- plan hits target center<br>- Point | 0.00 | 0.00 | 9,790.0 | 477.0 | 13.7 | 468,024.00 | 645,689.70 | 32° 17' 9.004 N | 103° 51' 42.813 W |
| BHL: 100' FNL & 330' FE<br>- plan hits target center<br>- Point | 0.00 | 0.00 | 9,795.0 | 9,961.0 | 287.0 | 477,508.00 | 645,963.00 | 32° 18' 42.845 N | 103° 51' 39.142 W |

**Notes Regarding Blowout Preventer**
**Mewbourne Oil Company**
Forty Niner Ridge Unit 105H
525' FSL & 666' FEL (SHL)
Sec 22-T23S-R30E
Eddy County

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.

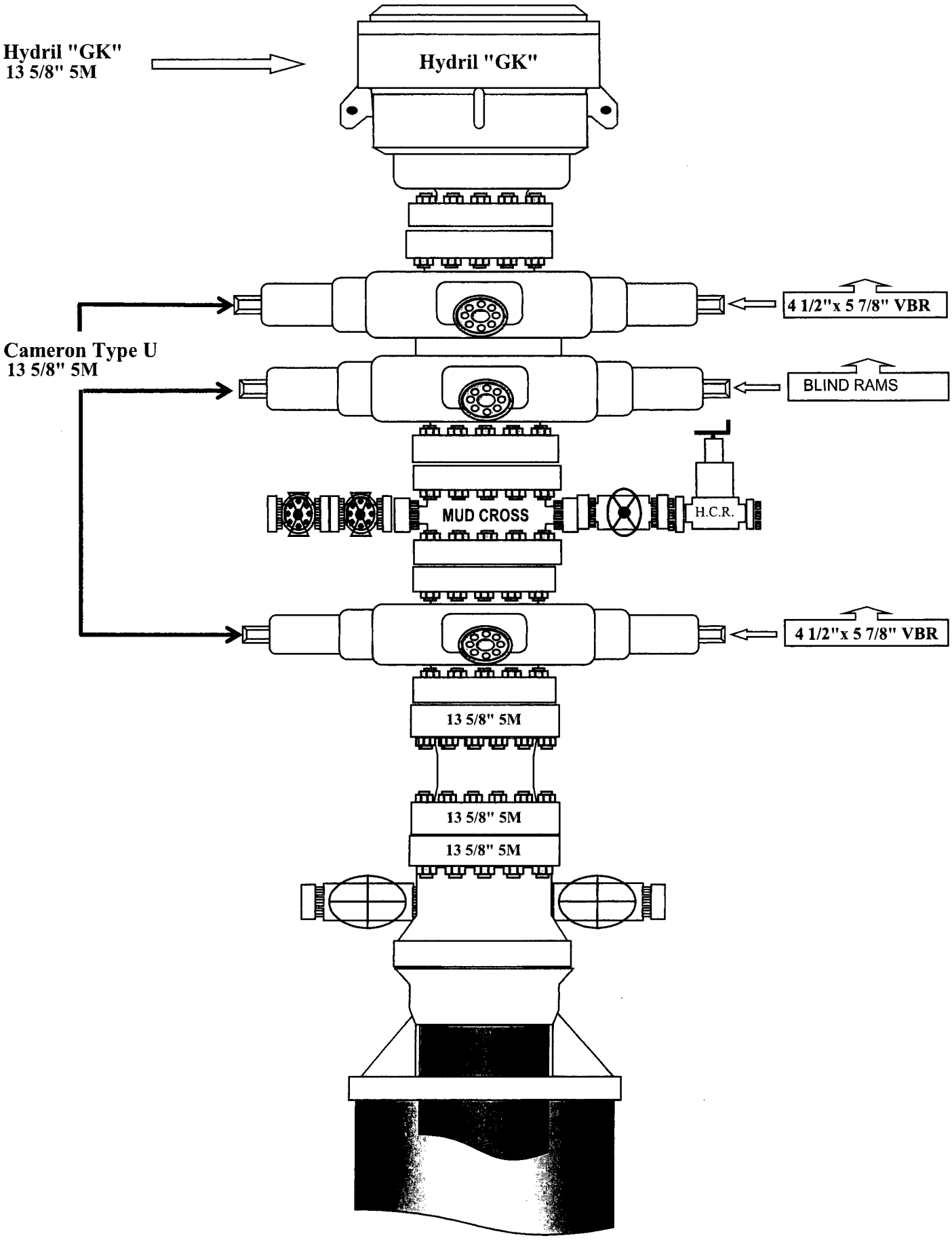
II. Blowout preventer and all fittings must be in good condition with a minimum ~~3000~~ 5000 psi working pressure on 9 5/8" and 7" casing.

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 ~~3000~~ 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.


Hydril "GK"
13 5/8" 5M
Hydril "GK"
4 1/2"x 5 7/8" VBR
Cameron Type U
13 5/8" 5M
BLIND RAMS
MUD CROSS
H.C.R.
4 1/2"x 5 7/8" VBR
13 5/8" 5M
13 5/8" 5M
13 5/8" 5M

# 5M BOPE & Closed Loop Equipment Schematic

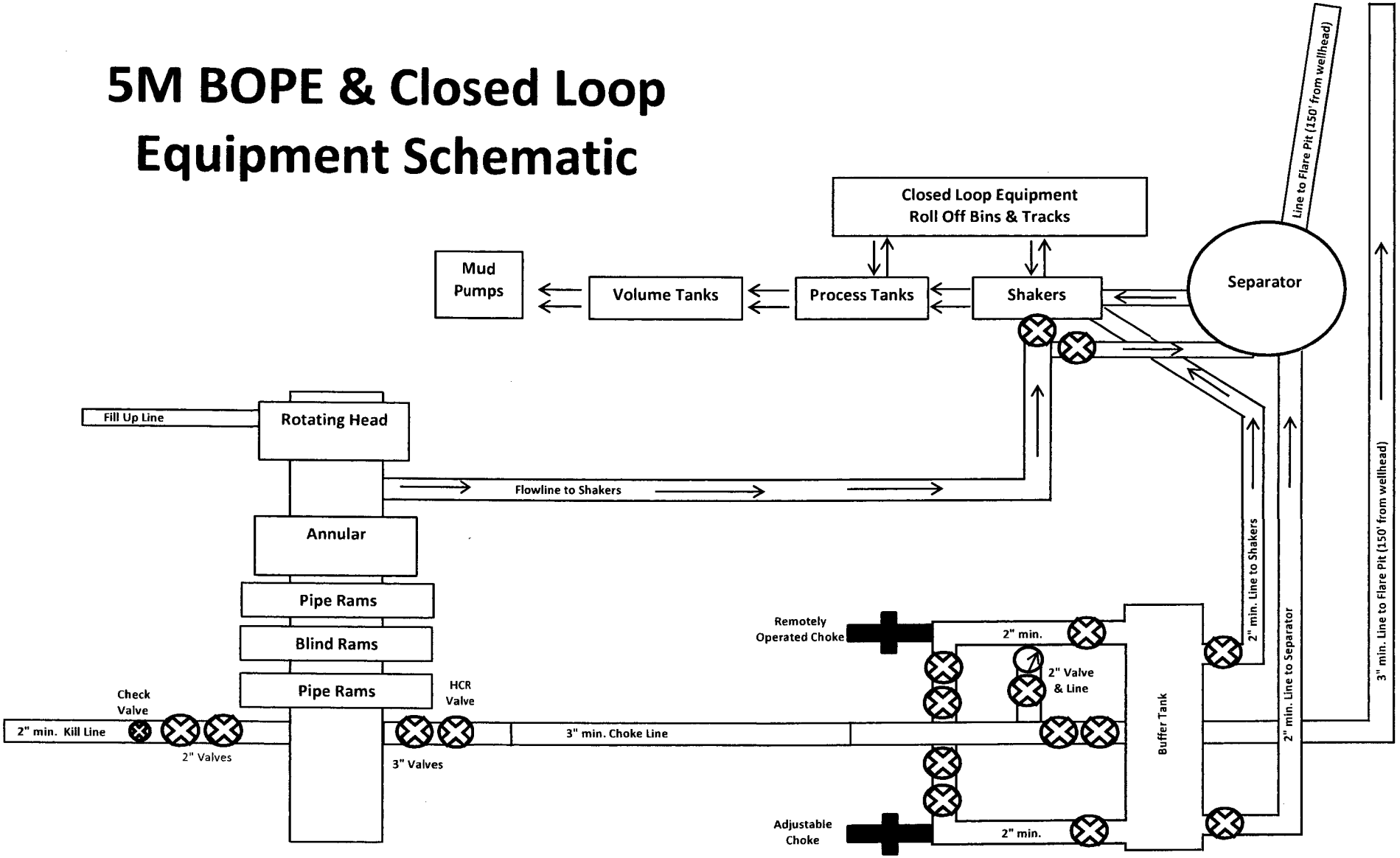
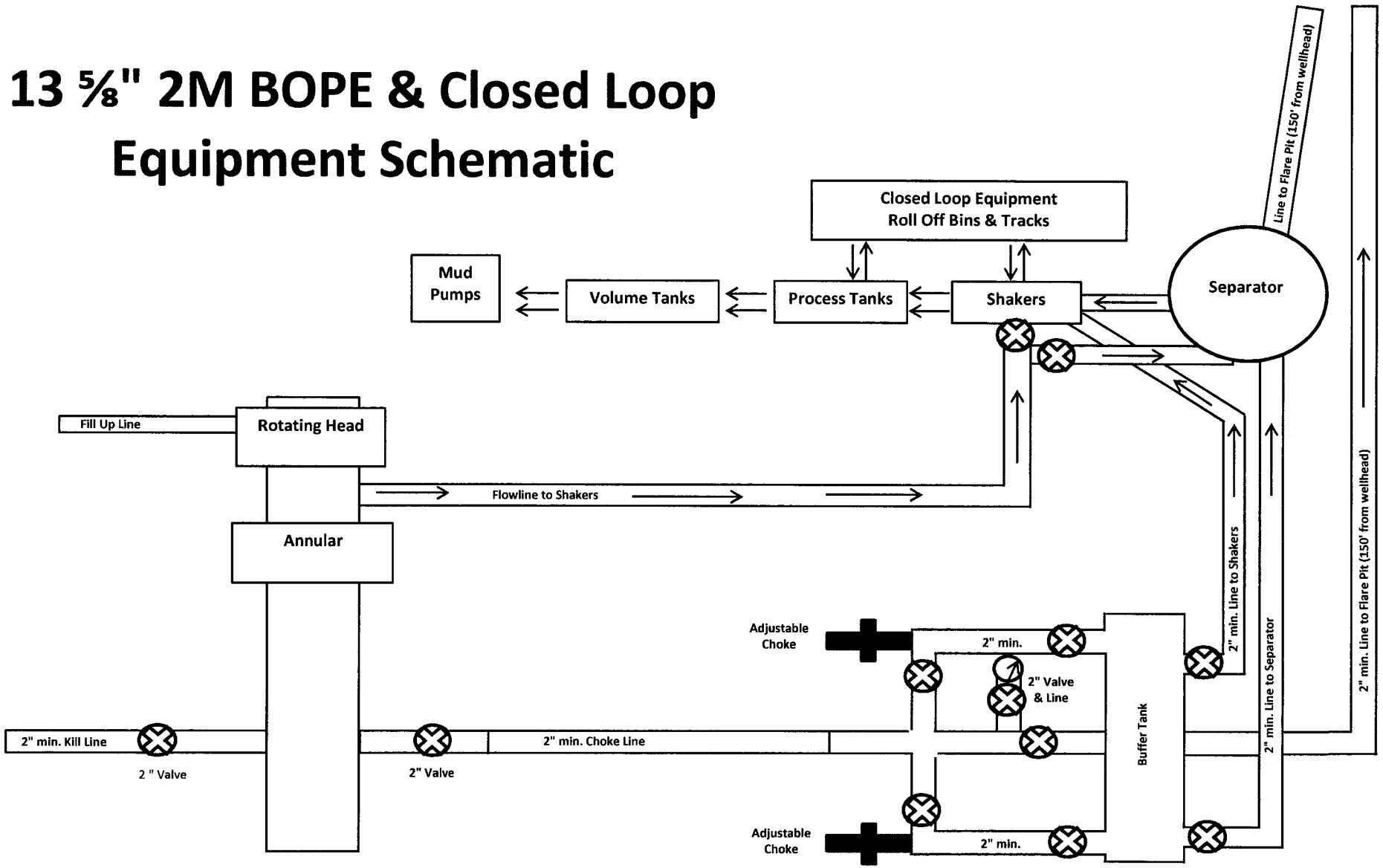



Exhibit 2

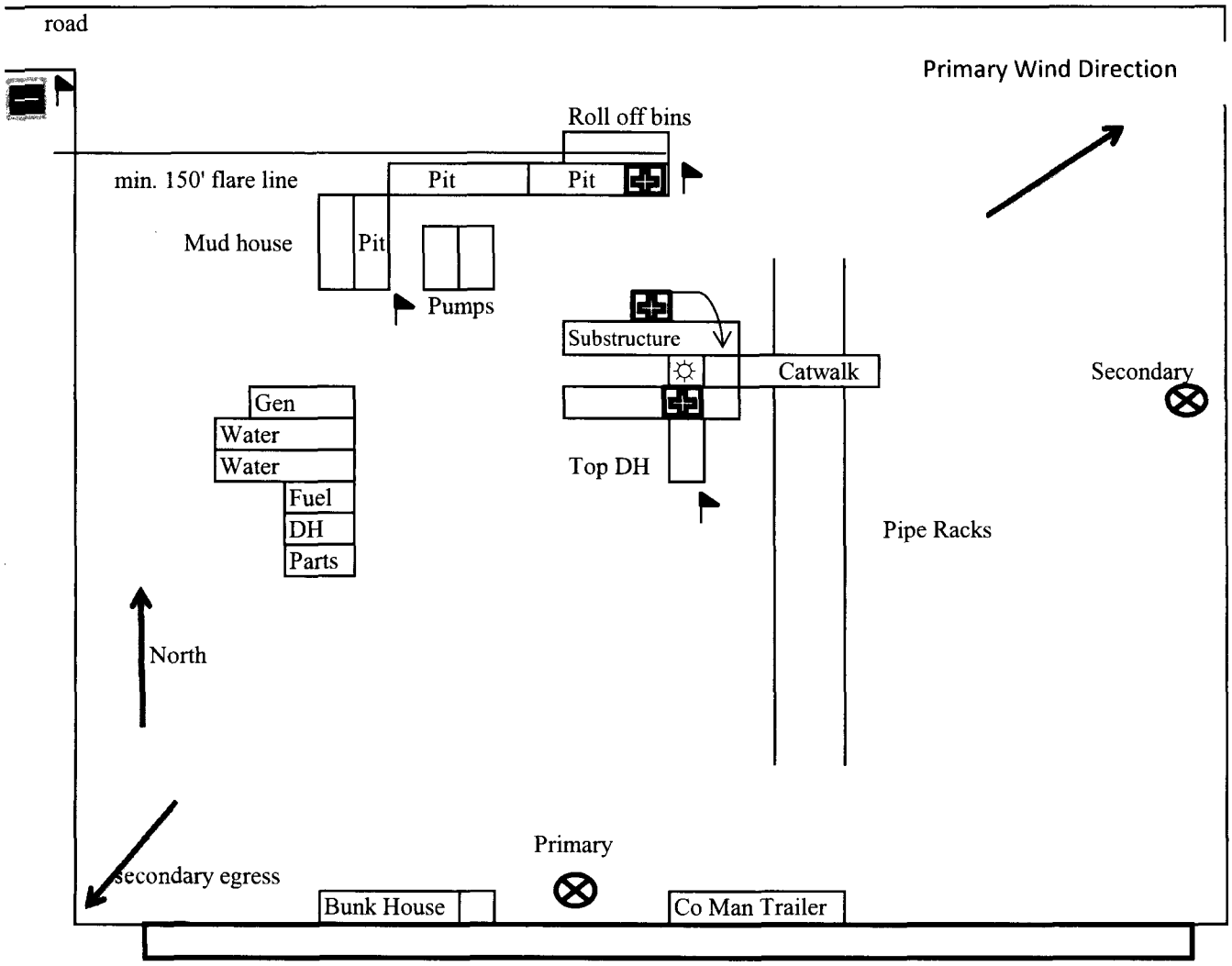
Note: All valves & lines on choke manifold are 3" unless otherwise noted. Exact manifold configuration may vary.

# 13 ⅝" 2M BOPE & Closed Loop Equipment Schematic




| Exhibit 2A |
| --- |
| Forty Niner Ridge Unit 105H |

H2S Diagram
Closed Loop Pad Dimensions 340' x 340' Exhibit 5




= Warning Signs = Wind Markers

= H2S Monitors

= Safety Stations

Mewbourne Oil Company
Forty Niner Ridge Unit #105H
525' FSL & 666' FEL
Sec. 22 T23S R30E
Eddy County, NM

Hydrogen Sulfide Drilling Operations Plan

**Mewbourne Oil Company**

Forty Niner Ridge Unit 105H

525' FSL & 666' FEL (SHL)

Sec 22-T23S-R30E

Eddy County, NM

## 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 Delaware formation 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 know 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 9 5/8" intermediate casing.

1. Well Control Equipment
   - A. Choke manifold with minimum of one adjustable choke/remote choke.
   - B. Blowout preventers equipped with blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit
   - C. Auxiliary equipment including annular type blowout preventer.
2. Protective Equipment for Essential Personnel

   Thirty minute self contained work unit located in the dog house and at briefing areas.

Additionally: If H2S is encountered in concentrations less than 10 ppm, fans will be placed in work areas to prevent the accumulation of hazardous amounts of poisonous gas. If higher concentrations of H2S are detected the well will be shut in MOC will follow Onshore Order 6 and install a rotating head, mud/gas separator, remote choke and flare line with igniter will be installed.

3. Hydrogen Sulfide Protection and Monitoring Equipment
Two portable hydrogen sulfide monitors positioned on location for optimum coverage and detection. The units shall have audible sirens to notify personnel when hydrogen sulfide levels exceed 20 PPM.

4. Visual Warning Systems
A. Wind direction indicators as indicated on the wellsite diagram.
B. Caution signs shall be posted on roads providing access to location. Signs shall be painted a high visibility color with lettering of sufficient size to be readable at reasonable distances from potentially contaminated areas.

## 4. Mud Program

The mud program has been designed to minimize the amount of hydrogen sulfide entrained in the mud system. Proper mud weight, safe drilling practices, and the use of hydrogen sulfide scavengers will minimize hazards while drilling the well.

## 5. Metallurgy

All tubular systems, wellheads, blowout preventers, drilling spools, kill lines, choke manifolds, and valves shall be suitable for service in a hydrogen sulfide environment when chemically treated.

## 6. Communications

State & County Officials phone numbers are posted on rig floor and supervisors trailer. Communications in company vehicles and toolpushers are either two way radios or cellular phones.

## 7. Well Testing

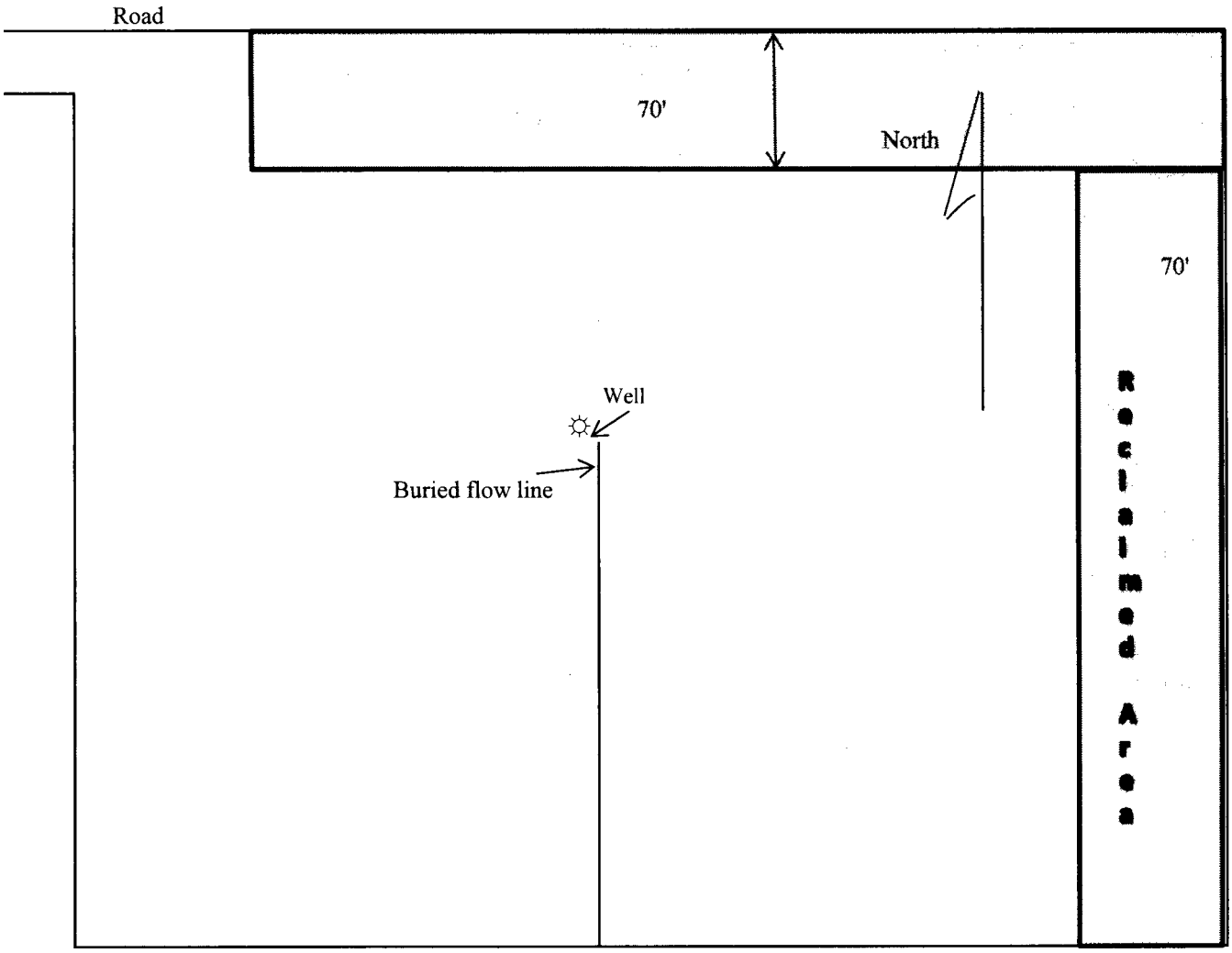
Drill stem testing is not an anticipated requirement for evaluation of this well. A drill stem test is required, it will be conducted with a minimum number of personnel in the immediate vicinity. The test will be conducted during daylight hours only.

## 8. Emergency Phone Numbers

| | |
|---|---|
| **Lea County Sheriff's Office** | **911 or 575-396-3611** |
| **Ambulance Service** | **911 or 575-885-2111** |
| **Carlsbad Fire Dept** | **911 or 575-885-2111** |
| **Closest Medical Facility - Columbia Medical Center of Carlsbad** | **575-492-5000** |

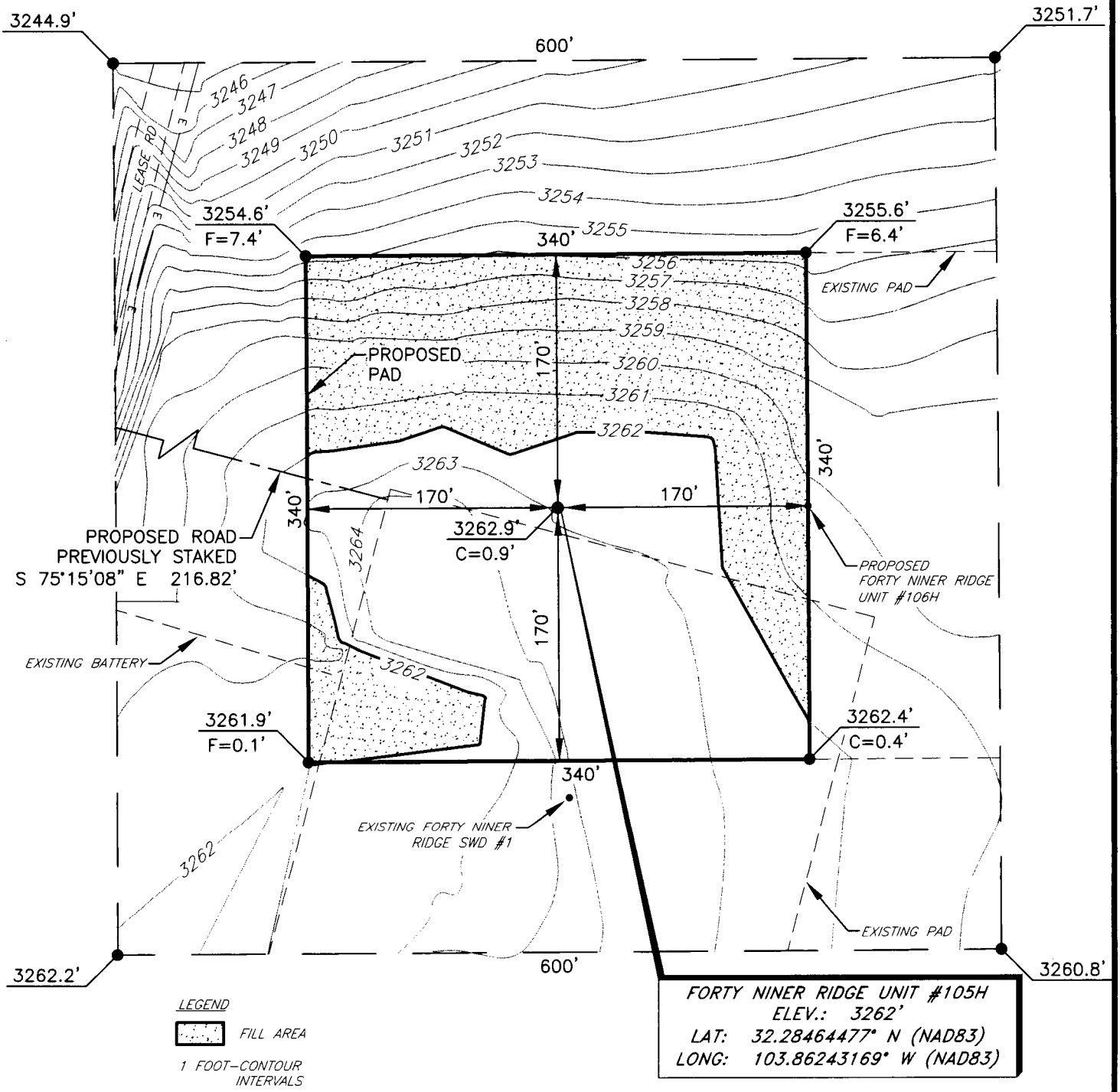
| | | |
|---|---|---|
| **Mewbourne Oil Company** | **Hobbs District Office** | **575-393-5905** |
| | **Fax** | **575-397-6252** |
| | **2nd Fax** | **575-393-7259** |
| **District Manager** | **Robin Terrell** | **575-390-4816** |
| **Drilling Superintendent** | **Frosty Lathan** | **575-390-4103** |
| | **Bradley Bishop** | **575-390-6838** |
| **Drilling Foreman** | **Wesley Noseff** | **575-441-0729** |

Exhibit 6 - reclaimed area




Mewbourne Oil Company
Forty Niner Ridge Unit #105H
525' FSL & 666' FEL
Sec. 22 T23S R30E
Eddy County, NM

# MEWBOURNE OIL COMPANY
## FORTY NINER RIDGE UNIT #105H
## (525' FSL & 666' FEL)
### SECTION 22, T23S, R30E
### N. M. P. M., EDDY COUNTY, NEW MEXICO




LEGEND

FILL AREA

1 FOOT-CONTOUR INTERVALS

FORTY NINER RIDGE UNIT #105H
ELEV.: 3262'
LAT: 32.28464477° N (NAD83)
LONG: 103.86243169° W (NAD83)

### DIRECTIONS TO LOCATION

From the intersection of NM Hwy. 128 and CR-795 (Mobley Ranch Rd.)

Go South on CR-795 approx. 0.6 miles to a "Y";

Keep left at "Y" and go South approx. 2.9 miles to a proposed road on the left;

Turn left and go West approx. 332 feet to location.

# SURFACE USE PLAN OF OPERATIONS
# MEWBOURNE OIL COMPANY

Forty-Niner Ridge Unit #105H
525 FSL & 666 FEL (SHL)
Sec. 22 – T23S-R30E
Eddy County, New Mexico

## Introduction

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. The existing access road route to the proposed project is depicted on **Exhibit 3E**. Improvements to the driving surface will be done where necessary. No new surface disturbance will be done, unless otherwise noted in the New or Reconstructed Access Roads section of this surface use plan.
b. The existing oil and gas roads utilized to access the proposed project will be maintained by crowning, clearing ditches, and fixing potholes. All existing structures on the entire access route such as cattleguards, other range improvement projects, culverts, etc. will be properly repaired or replaced if they are damaged or have deteriorated beyond practical use.
c. Mewbourne Oil Co. will cooperate with other operators in the maintenance of lease roads twice annually in dry conditions & three times annually in wet conditions.

## 2. New or Reconstructed Access Roads

a. An access road will be needed for this proposed project. See the survey plat(s) for the location of the access road.
b. The length of access road needed to be constructed for this proposed project is about 216.82 **feet**.
c. The access road will be 14 feet wide and will be constructed with 6 inches of compacted caliche. A 25 foot wide area would be needed to construct the road.
d. When the road travels on fairly level ground, the road will be crowned and ditched with a 2% slope from the tip of the road crown to the edge of the driving surface. The ditches will be 3 feet wide with 3:1 slopes.
e. The access road will be constructed with a ditch on each side of the road.
f. The maximum grade for the access road will be 5 percent.
g. If the road is longer than 1,000 feet, turnouts will be constructed with an interval of 1,000 feet. Turnouts will be intervisible and will be 10 feet wide and 100 feet long.
h. Low water crossings will be constructed where drainages cross the access road.

i. Construction of new or reconstructed roads, on surface under the jurisdiction of the Bureau of Land Management will include ditching, draining, crowning and capping or sloping and dipping the roadbed as necessary to provide a well-drained and safe road.
j. An appropriately sized cattle guard will be installed where the proposed access road crosses a fence line.
k. A BLM right-of-way grant is needed for the construction of this access road and one will be acquired prior to construction.
l. Lead-off ditches will be constructed for the proposed access road, but will not extend more than 15 feet outside the road edge.

## 3. Location of Existing Wells

a. **Exhibit 4, 4A** of the APD depicts all known wells within a one mile radius of the proposed well.

## 4. Location of Existing and/or Proposed Production Facilities

a. All permanent, lasting more than 6 months, above ground structures including but not limited to pumpjacks, storage tanks, pipeline risers, meter housing, etc. that are not subject to safety requirements will be painted a non-reflective paint color that blends in with the surrounding landscape. The paint color will be one of the colors from the BLM Standard Environmental Colors chart selected by the BLM authorized officer.
b. All proposed production facilities that are located on the well pad will be strategically placed to allow for maximum interim reclamation, recontouring, and revegetation of the well location.
c. Production from the proposed well will be transported to the production main facility for the drill island.
d. A surface 2 7/8" steel low pressure pipeline to transport production will be installed from the proposed well to the existing production facility following the existing route that was approved under Forty-Niner Ridge Unit #103H.
    i. **Exhibit 3** depicts the proposed production pipeline route from the well to the production facility.
e. If any plans change regarding the production facility or other infrastructure (pipeline, electric line, etc.), we will submit a sundry notice or right of way (if applicable) prior to installation of construction.
f. An electric line will be applied for through a sundry notice or BLM right of way at a later date.

## 5. Location and Types of Water

a. 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 identified above in this surface use plan.

## 6. Construction Materials

a. Construction material that will be used to build the well pad and road will be caliche.
b. The construction contractor will be solely responsible for securing construction materials required for this operation and paying any royalties that may be required on those materials.
c. Obtaining caliche: One way of obtaining caliche to build locations and roads will be by "turning over" the location. This means, caliche will be obtained from the actual well site. A caliche permit will be obtained from BLM prior to obtaining caliche. Amount of caliche will vary for each pad. The procedure below has been approved by BLM personnel:
    i. The top 6 inches of topsoil is pushed off and stockpiled along the side of the location.
    ii. An approximate 160' X 160' area is used within the proposed well site to remove caliche.
    iii. Subsoil is removed and stockpiled within the surveyed well pad.
    iv. When caliche is found, material will be stock piled within the pad site to build the location and road.
    v. Then subsoil is pushed back in the hole and caliche is spread accordingly across entire location and road.
    vi. Once well is drilled, the stock piled top soil will be used for interim reclamation and spread along areas where caliche is picked up and the location size is reduced.
    vii. Neither caliche, nor subsoil will be stock piled outside of the well pad. Topsoil will be stockpiled along the edge of the pad as depicted in the Well Site Layout or survey plat.

In the event that no caliche is found onsite, caliche will be hauled in from a BLM, state, or private mineral pit. A BLM mineral material permit will be acquired prior to obtaining any mineral material from BLM pits or land. Caliche will be purchased from one of the following sites: State of NM caliche pit in Sec 16 T23S R30E, 32.307840, -103.883353. or Sec 18 T23S R30E, 32.308933, -103.928780. Water will be purchased from the following: private owner in Sec

16 T23S R30E, 32.308931, -103.891533 or a frac pond in Sec 16 T23S R30E, 32.302008, -103.887441.

## 7. Methods of Handling Waste

a. The well will be drilled utilizing a closed loop system. Drill cuttings will be properly contained in steel tanks and taken to an NMOCD approved disposal facility.
b. Drilling fluids and produced oil and water from the well during completion operations will be stored safely in closed containers and disposed of properly in an NMOCD approved disposal facility.
c. Garbage and trash produced during drilling and completion operations will be collected in trash containers and disposed of properly at a state approved site. All trash on and around the well site will be collected for disposal.
d. All human waste and grey water from drilling and completion operations will be properly contained and disposed of properly at a disposal facility.
e. After drilling and completion operations, trash, chemicals, salts, frac sand and other waste material will be removed and disposed of properly at a disposal site.

## 8. Ancillary Facilities

a. No ancillary facilities will be needed for this proposed project.

## 9. Well Site Layout

a. The proposed drilling pad to be built was staked and surveyed by a professional surveyor. The attached survey plat of the well site depicts the drilling pad layout as staked.
b. A title of a well site diagram is **Exhibit 5**. This diagram depicts the rig layout.
c. In areas to be heavily disturbed, the top 6 inches of soil material, will be stripped and stockpiled on the perimeter of the well location to keep topsoil viable, and to make redistribution of topsoil more efficient during interim reclamation. Stockpiled topsoil should include vegetative material. Topsoil will be clearly segregated and stored separately from subsoils. Contaminated soil will not be stockpiled, but properly treated and handled prior to topsoil salvaging.

## 10. Plans for Surface Reclamation

Within 90 days of cessation of drilling and completion operations, all equipment not necessary for production operations will be removed. The location will be cleaned of all trash and junk to assure the well site is left as aesthetically pleasing as reasonably possible.

**a. Interim Reclamation (well pad)**

i. Interim reclamation will be performed on the well site after the well is drilled and completed. **Exhibit 6** depicts the location and dimensions of the planned interim reclamation for the well site.

ii. The well location and surrounding areas will be cleared of, and maintained free of, all materials, trash, and equipment not required for production.

iii. In areas planned for interim reclamation, all the surfacing material will be removed and returned to the original mineral pit or recycled to repair or build roads and well pads.

iv. The areas planned for interim reclamation will then be recontoured to the original contour if feasible, or if not feasible, to an interim contour that blends with the surrounding topography as much as possible. Where applicable, the fill material of the well pad will be backfilled into the cut to bring the area back to the original contour. The interim cut and fill slopes prior to re-seeding will not be steeper than a 3:1 ratio, unless the adjacent native topography is steeper. Note: Constructed slopes may be much steeper during drilling, but will be recontoured to the above ratios during interim reclamation.

v. Topsoil will be evenly respread and aggressively revegetated over the entire disturbed area not needed for all-weather operations including cuts & fills. To seed the area, the proper BLM seed mixture, free of noxious weeds, will be used. Final seedbed preparation will consist of contour cultivating to a depth of 4 to 6 inches within 24 hours prior to seeding, dozer tracking, or other imprinting in order to break the soil crust and create seed germination micro-sites.

vi. Proper erosion control methods will be used on the area to control erosion, runoff and siltation of the surrounding area.

vii. The interim reclamation will be monitored periodically to ensure that vegetation has reestablished and that erosion and invasive/noxious weeds are controlled.

**b. Final Reclamation (well pad, buried pipelines, etc.)**

i. Prior to final reclamation procedures, the well pad, road, and surrounding area will be cleared of material, trash, and equipment.

ii. All surfacing material will be removed and returned to the original mineral pit or recycled to repair or build roads and well pads.

iii. All disturbed areas, including roads, pipelines, pads, production facilities, and interim reclaimed areas will be recontoured to the contour existing prior to initial construction or a contour that blends indistinguishably with the surrounding landscape. Topsoil that was spread over the interim reclamation areas will be stockpiled prior to recontouring. The topsoil will be redistributed evenly over the entire disturbed site to ensure successful revegetation.

iv. After all the disturbed areas have been properly prepared, the areas will be seeded with the proper BLM seed mixture, free of noxious weeds. Final seedbed preparation will consist of contour cultivating to a depth of 4 to 6 inches within 24 hours prior to seeding, dozer tracking, or other imprinting in order to break the soil crust and create seed germination micro-sites.

v. Proper erosion control methods will be used on the entire area to control erosion, runoff and siltation of the surrounding area.

vi. All unused equipment and structures including pipelines, electric line poles, tanks, etc. that serviced the well will be removed.

vii. All reclaimed areas will be monitored periodically to ensure that revegetation occurs, that the area is not redisturbed, and that erosion and invasive/noxious weeds are controlled.

## 11. Surface Ownership

a. The surface ownership of the proposed project is State of New Mexico.
b. An oil and gas lease is held with the NMSLO.

## 12. Other Information

a. No other information is needed at this time.

## 13. Operator's Representative

a. Through APD approval, drilling, completion and production operations:

**Robin Terrell, District Manager**
Mewbourne Oil Company
PO Box 5270
Hobbs, NM 88241
575-393-5905

# Mewbourne Oil Company

PO Box 5270
Hobbs, NM 88241
(575) 393-5905

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of State and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.

Executed this 9 day of Sept, 2015.

Name: Robin Terrell

Signature: [signature] for RT

Position Title: Hobbs District Manager

Address: PO Box 5270, Hobbs NM 88241

Telephone: 575-393-5905

E-mail: rterrell@mewbourne.com

# PECOS DISTRICT
# CONDITIONS OF APPROVAL

| | |
|---|---|
| OPERATOR'S NAME: | Mewbourne Oil Company |
| LEASE NO.: | NM0531277 |
| WELL NAME & NO.: | 105H-Forty Niner Ridge Unit |
| SURFACE HOLE FOOTAGE: | 525'/S & 666'/E |
| BOTTOM HOLE FOOTAGE | 100'/N & 660'/E |
| LOCATION: | Section 22, T.23 S., R.30 E., NMPM |
| COUNTY: | Eddy County, New Mexico |

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Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

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## I. GENERAL PROVISIONS

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

## II. PERMIT EXPIRATION

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

## III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

## IV. NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

## V. SPECIAL REQUIREMENT(S)

**Unit Wells**
The well sign for a unit well shall include the unit number in addition to the surface and bottom hole lease numbers. This also applies to participating area numbers. If a participating area has not been established, the operator can use the general unit designation, but will replace the unit number with the participating area number when the sign is replaced.

**Cave Karst**
## Cave and Karst

** Depending on location, additional Drilling, Casing, and Cementing procedures may be required by engineering to protect critical karst groundwater recharge areas.

### Cave/Karst Surface Mitigation
The following stipulations will be applied to minimize impacts during construction, drilling and production.

**Construction:**
In the advent that any underground voids are opened up during construction activities, construction activities will be halted and the BLM will be notified immediately.

**No Blasting:**
No blasting will be utilized for pad construction. The pad will be constructed and leveled by adding the necessary fill and caliche.

**Pad Berming:**
The entire perimeter of the well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad.

- The compacted berm shall be constructed at a minimum of 12 inches high with impermeable mineral material (e.g. caliche).
- No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad.
- The topsoil stockpile shall be located outside the bermed well pad.
- Topsoil, either from the well pad or surrounding area, shall not be used to construct the berm.
- No storm drains, tubing or openings shall be placed in the berm.
- If fluid collects within the bermed area, the fluid must be vacuumed into a safe container and disposed of properly at a state approved facility.
- The integrity of the berm shall be maintained around the surfaced pad throughout the life of the well and around the downsized pad after interim reclamation has been completed.

- Any access road entering the well pad shall be constructed so that the integrity of the berm height surrounding the well pad is not compromised. (Any access road crossing the berm cannot be lower than the berm height.)

**Tank Battery Liners and Berms:**
Tank battery locations and all facilities will be lined and bermed. A 20 mil permanent liner will be installed with a 4 oz. felt backing to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank.

**Leak Detection System:**
A method of detecting leaks is required. The method could incorporate gauges to measure loss, situating values and lines so they can be visually inspected, or installing electronic sensors to alarm when a leak is present. Leak detection plan will be submitted to BLM for approval.

**Automatic Shut-off Systems**:
Automatic shut off, check values, or similar systems will be installed for pipelines and tanks to minimize the effects of catastrophic line failures used in production or drilling.

## Cave/Karst Subsurface Mitigation

The following stipulations will be applied to protect cave/karst and ground water concerns:

**Rotary Drilling with Fresh Water:**
Fresh water will be used as a circulating medium in zones where caves or karst features are expected. SEE ALSO: Drilling COAs for this well.

**Directional Drilling:**
Kick off for directional drilling will occur at least 100 feet below the bottom of the cave occurrence zone. SEE ALSO: Drilling COAs for this well.

**Lost Circulation:**
ALL lost circulation zones from the surface to the base of the cave occurrence zone will be logged and reported in the drilling report.

Regardless of the type of drilling machinery used, if a void of four feet or more and circulation losses greater than 70 percent occur simultaneously while drilling in any cave-bearing zone, the BLM will be notified immediately by the operator. The BLM will assess the situation and work with the operator on corrective actions to resolve the problem.

**Abandonment Cementing:**
Upon well abandonment in high cave karst areas additional plugging conditions of approval may be required. The BLM will assess the situation and work with the operator to ensure proper plugging of the wellbore.

**Pressure Testing:**
Annual pressure monitoring will be performed by the operator on all casing annuli and reported in a sundry notice. If the test results indicated a casing failure has occurred, remedial action will be undertaken to correct the problem to the BLM's approval.

## Watershed

The entire well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad. Topsoil shall not be used to construct the berm. No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad. The berm shall be maintained through the life of the well and after interim reclamation has been completed.

Any water erosion that may occur due to the construction of the well pad during the life of the well will be quickly corrected and proper measures will be taken to prevent future erosion.

## Potash

1. Drilling within the Designated Potash Area. It is the intent of the Department of the Interior to administer oil and gas operations throughout the Designated Potash Area in a manner which promotes safe, orderly co-development of oil, gas, and potash resources. It is the policy of the Department of the Interior to deny approval of most applications for permits to drill oil and gas wells from surface locations within the Designated Potash Area. Three exceptions to this policy will be permitted if the drilling will occur under the following conditions from:

    a. A Drilling Island associated with a Development Area established under this Order or a Drilling Island established under a prior Order;

    b. A Barren Area and the Authorized Officer determines that such operations will not adversely affect active or planned potash mining operations in the immediate vicinity of the proposed drill-site; or

    c. A Drilling Island, not covered by (a) above or single well site established under this Order by the approval and in the sole discretion of the Authorized Officer, provided that such site was jointly recommended to the Authorized Officer by the oil and gas lessee(s) and the nearest potash lessee(s).

2. Development Areas
    a. When processing an application for permit to drill (APD) an oil or gas well in the Designated Potash Area that complies with regulatory requirements, the Authorized Officer will determine whether to establish a Development Area in connection with the application, and if so, will determine the boundaries of the Development Area and the location within the Development Area of one or more Drilling Islands from which drilling will be permitted. The BLM may also designate a Development Area

outside of the APD process based on information in its possession, and may modify the boundaries of a Development Area. Existing wells may be included within the boundaries of a Development Area. A Development Area may include Federal oil and gas leases and other Federal and non-Federal lands.

b. After designating or modifying a Development Area, the BLM will issue a Notice to Lessees, consistent with its authorities under 43 CFR Subpart 3105 and part 3180, information lessees that future drilling on lands under an oil and gas lease within that Development Area will:
    i. occur, under most circumstances, from a Barren Area or A Drilling Island within the Development Area; and
    ii. be managed under a unit or communitization agreement, generally by a single operator, consistent with BLM regulations and this Order. Unit and communitization agreements will be negotiated among lessees. The BLM will consider whether a specific plan of development is necessary or advisable for a particular Drilling Island.

c. The Authorized Officer reserves the right to approve an operator or successor operator of a Development Area and/or a Drilling Island, if applicable, to ensure that the operator has the resources to operate and extract the oil and gas resources consistent with the requirements of this Order and all applicable laws and regulations, and has provided financial assurance in the amount required by the Authorized Officer.

d. The Authorized Officer will determine the appropriate designation of a Development Area in terms of location, shape and size. In most cases, a single Drilling Island will be established for each Development Area. In establishing the location, shape and size of a Development Area and an associated Drilling Island, the Authorized Officer will consider:
    i. the appropriate location, shape, and size of a Development Area and associated Drillings Island to allow effective extraction of oil and gas resources while managing the impact on potash resources;
    ii. the application of available oil and gas drilling and production technology in the Permian Basin;
    iii. the applicable geology of the Designated Potash Area and optimal locations to minimize loss of potash ore while considering co-development of both resources;
    iv. any long term exploration and/or mining plans provided by the potash industry;
    v. whether a Barren Area may be the most appropriate area for a Drilling Island;
    vi. the requirements of this Order; and
    vii. any other relevant factors

e. As the Authorized Officer establishes a Development Area, the Authorized Officer will more strictly apply the factors listed in Section 6.e.(2)(d), especially the appropriate application of the available oil and gas drilling and production technology in the Permian Basin, when closer to current traditional (non-solution) potash mining operations. Greater flexibility in the application of the factors listed in Section 6.e(2)(d) will be applied further from current and near-term traditional (non-solution)potash mining operations. No Drilling Islands will be established within one mile of any area where approved potash mining operations will be conducted within 3 years consistent with the 3-year mine plan referenced above (Section 6.d.(8)) without the consent of the affected potash lessee(s).

f. The Authorized Officer may establish a Development Area associated with a well or wells drilled from a Barren Area as appropriate and necessary.

g. As part of the consideration for establishing Development Areas and Drilling Islands, the BLM will consider input from the potash lessees and the oil and gas lessees or mineral right owner who would be potentially subject to a unitization agreement supporting the Development Are, provided that the input is given timely.

3. Buffer Zones. Buffer Zones of ¼ mile for oil wells and ½ mile for gas wells are hereby established. These Buffer Zones will stay in effect until such time as revised distances are adopted by the BLM Director or other BLM official, as delegated. However, the Authorized Officer may adjust the Buffer Zones in an individual case, when the facts and circumstances demonstrate that such adjustment would enhance conservation and would not compromise safety. The Director will base revised Buffer Zones on science, engineering, and new technology and will consider comments and reports from the Joint Industry Technical Committee and other interested parties in adopting any revisions.

4. Unitization and Communitization. To more properly conserve the potash, oil and gas resources in the Designated Potash Area and to adequately protect the rights of all parties in interest, including the United States, it is the policy of the Department of the Interior that all Federal oil and gas leases within a Development Area should be unitized or subject to an approved communitization agreement unless there is a compelling reason for another operating system. The Authorized Officer will make full use of his/her authorities wherever necessary or advisable to require unitization and/or communitization pursuant to the regulations in 43 CFR Subparts 3105 and 3180. The Authorized Officer will use his/her discretion to the fullest extent possible to assure that any communitization agreement and any unit plan of operations hereafter approved or prescribed within the Designated Potash Area will adhere to the provisions of this Order. The Authorized Officer will work with Federal lessees, and with the State Of New Mexico as provided below, to include non-Federal mineral rights owners in unit or communitization agreements to the extent possible.

5. Coordination with the State of New Mexico.
    a. If the effective operation of any Development Area requires that the New Mexico Oil Conservation Division (NMOCD) revise the State's mandatory well spacing requirements, the BLM will participate as needed in such a process. The BLM may adopt the NMOCD spacing requirements and require lessees to enter into communitization agreements based on those requirements.
    b. The BLM will cooperate with the NMOCD in the implementation of that agency's rules and regulations.
    c. In taking any action under Section 6.e. of this Order, the Authorized Officer will take into consideration the applicable rules and regulations of the NMOCD.

To minimize impacts to potash resources, the proposed well is confined within the boundaries of the established Olive Branch Drill Island (See Potash Memo and Map in attached file for Drill Island description).

# VI. CONSTRUCTION

## A. NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (575) 234-5909 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and Conditions of Approval (COA) on the well site and they shall be made available upon request by the Authorized Officer.

## B. TOPSOIL

The operator shall strip the top portion of the soil (root zone) from the entire well pad area and stockpile the topsoil along the edge of the well pad as depicted in the APD. The root zone is typically six (6) inches in depth. All the stockpiled topsoil will be redistributed over the interim reclamation areas. Topsoil shall not be used for berming the pad or facilities. For final reclamation, the topsoil shall be spread over the entire pad area for seeding preparation.

Other subsoil (below six inches) stockpiles must be completely segregated from the topsoil stockpile. Large rocks or subsoil clods (not evident in the surrounding terrain) must be buried within the approved area for interim and final reclamation.

## C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.
The operator shall properly dispose of drilling contents at an authorized disposal site.

## D. FEDERAL MINERAL MATERIALS PIT

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the Carlsbad Field Office at (575) 234-5972.

## E. WELL PAD SURFACING

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation.The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

## F. EXCLOSURE FENCING (CELLARS & PITS)

**Exclosure Fencing**
The operator will install and maintain exclosure fencing for all open well cellars to prevent access to public, livestock, and large forms of wildlife before and after drilling operations until the pit is free of fluids and the operator initiates backfilling. (For examples of exclosure fencing design, refer to BLM's Oil and Gas Gold Book, Exclosure Fence Illustrations, Figure 1, Page 18.)

## G. ON LEASE ACCESS ROADS

**Road Width**
The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed twenty-five (25) feet.

**Surfacing**
Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

**Crowning**
Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

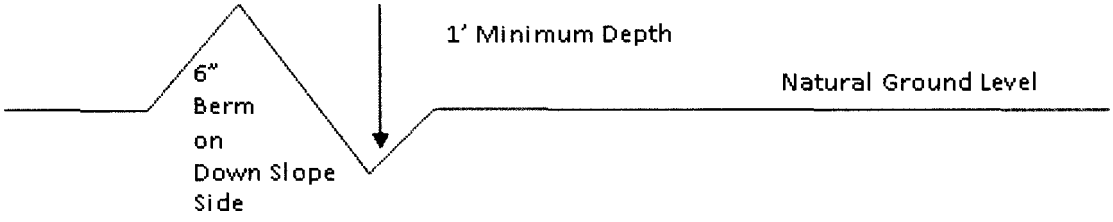
**Ditching**
Ditching shall be required on both sides of the road.

**Turnouts**
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

**Drainage**
Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping and insloping, lead-off ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.

**Cross Section of a Typical Lead-off Ditch**




All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

**Formula for Spacing Interval of Lead-off Ditches**

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

$$\text{400 foot road with 4\% road slope: } \frac{400'}{4\%} + 100' = 200' \text{ lead-off ditch interval}$$

**Cattleguards**

An appropriately sized cattleguard sufficient to carry out the project shall be installed and maintained at fence/road crossings. Any existing cattleguards on the access road route shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattleguards that are in place and are utilized during lease operations.

**Fence Requirement**
Where entry is granted across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences.

**Public Access**
Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

**Construction Steps**

1. Salvage topsoil
2. Construct road
3. Redistribute topsoil
4. Revegetate slopes

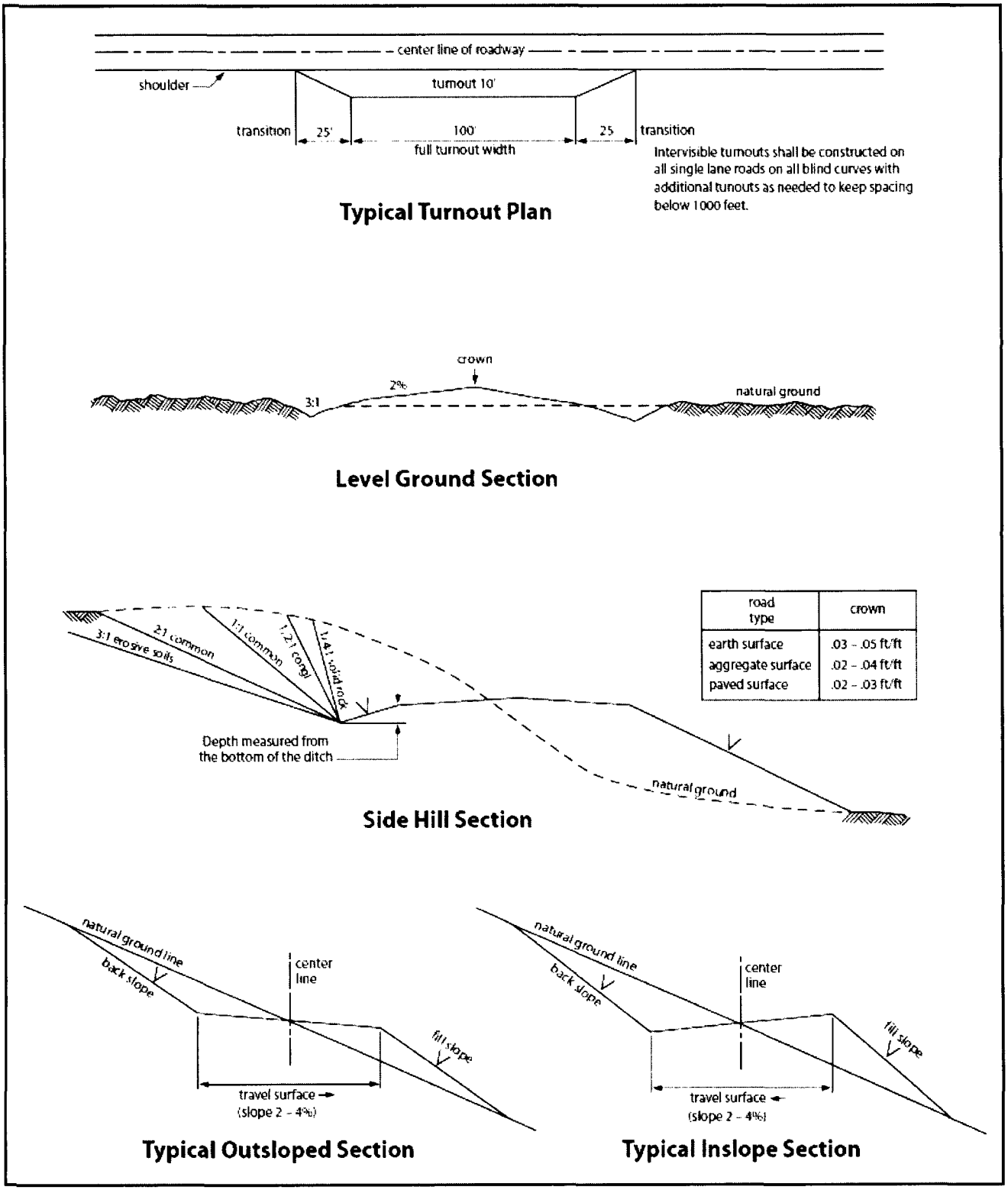



**Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.**

# VII. DRILLING

## A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

a. Spudding well (minimum of 24 hours)
b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
c. BOPE tests (minimum of 4 hours)

☒ **Eddy County**

Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, (575) 361-2822

1. **Although there are no measured amounts of Hydrogen Sulfide reported, it is always a potential hazard. It is recommended that monitoring equipment be onsite for potential Hydrogen Sulfide. If H2S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, report measured amounts and formations to the BLM.**

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. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a "Major" violation.**

3. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works is located, this does not include the dog house or stairway area.

4. **The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.**

## B. CASING

**Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.**

**Centralizers required on surface casing per Onshore Order 2.III.B.1.f.**

**Wait on cement (WOC) for Potash Areas:**
**After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log.**

**No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.**

**R-111-P- Potash**
**Medium Cave/Karst**
**Possibility of water flows in the Salado and Castile.**
**Possibility of lost circulation in the Rustler and Delaware.**

1. The **13-3/8** inch surface casing shall be set at approximately **425** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface. **If salt is encountered, set casing at least 25 feet above the salt.**
    a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
    **b. Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.**
    c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
    d. If cement falls back, remedial cementing will be done prior to drilling out that string.

**The 9-5/8" casing must be kept liquid filled while running into hole to meet minimum BLM requirements for collapse.**

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:

    ☒ Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst and potash. Excess calculates to 21% - Additional cement may be required.**

**Centralizers required on horizontal leg, must be type for horizontal service and a minimum of one every other joint.**

**Formation below the 9 5/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe (not the mud weight required to prevent dissolving the salt formation) and the mud weight for the bottom of the hole. Report results to BLM office.**

3. The minimum required fill of cement behind the **7** and **5-1/2** inch production casing is:
   ☒ Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst and potash.**

4. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

5. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

## C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. **Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.** If the BLM inspector questions the straightness of the hose, a BLM engineer will be contacted and will review in the field or via picture supplied by inspector to determine if changes are required (operator shall expect delays if this occurs).

2. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.

3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M)** psi.

4. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8** intermediate casing shoe shall be **5000 (5M)** psi. **5M system requires an HCR valve, remote kill line and annular to**

**match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.**

5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
    a. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time.
    b. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**.
    c. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
    d. The results of the test shall be reported to the appropriate BLM office.
    e. All tests are required to be recorded on a calibrated test chart. **A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.**
    f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

### D. DRILL STEM TEST

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

### E. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

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## VIII. PRODUCTION (POST DRILLING)

### A. WELL STRUCTURES & FACILITIES

**Placement of Production Facilities**

Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

**Exclosure Netting (Open-top Tanks)**
Immediately following active drilling or completion operations, the operator will take actions necessary to prevent wildlife and livestock access, including avian wildlife, to all open-topped tanks that contain or have the potential to contain salinity sufficient to cause harm to wildlife or livestock, hydrocarbons, or Resource Conservation and Recovery Act of 1976-exempt hazardous substances. At a minimum, the operator will net, screen, or cover open-topped tanks to exclude wildlife and livestock and prevent mortality. If the operator uses netting, the operator will cover and secure the open portion of the tank to prevent wildlife entry. The operator will net, screen, or cover the tanks until the operator removes the tanks from the location or the tanks no longer contain substances that could be harmful to wildlife or livestock. Use a maximum netting mesh size of 1 ½ inches. The netting must not be in contact with fluids and must not have holes or gaps.

**Chemical and Fuel Secondary Containment and Exclosure Screening**
The operator will prevent all hazardous, poisonous, flammable, and toxic substances from coming into contact with soil and water. At a minimum, the operator will install and maintain an impervious secondary containment system for any tank or barrel containing hazardous, poisonous, flammable, or toxic substances sufficient to contain the contents of the tank or barrel and any drips, leaks, and anticipated precipitation. The operator will dispose of fluids within the containment system that do not meet applicable state or U. S. Environmental Protection Agency livestock water standards in accordance with state law; the operator must not drain the fluids to the soil or ground. The operator will design, construct, and maintain all secondary containment systems to prevent wildlife and livestock exposure to harmful substances. At a minimum, the operator will install effective wildlife and livestock exclosure systems such as fencing, netting, expanded metal mesh, lids, and grate covers. Use a maximum netting mesh size of 1 ½ inches.

**Open-Vent Exhaust Stack Exclosures**
The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. (*Recommended exclosure structures on open-vent exhaust stacks are in the shape of a cone.*) Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers.

**Containment Structures**
Proposed production facilities such as storage tanks and other vessels will have a secondary containment structure that is constructed to hold the capacity of 1.5 times the largest tank, plus freeboard to account for precipitation, unless more stringent protective requirements are deemed necessary.

**Painting Requirement**
All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color, **Shale Green** from the BLM Standard Environmental Color Chart (CC-001: June 2008).

## B. PIPELINES

STANDARD STIPULATIONS FOR SURFACE INSTALLED PIPELINES

**A copy of the Grant and attachments, including stipulations, survey plat(s) and/or map(s), shall be on location during construction. BLM personnel may request to review a copy of your permit during construction to ensure compliance with all stipulations.**

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. Holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.

2. Holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, Holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC § 2601 *et seq.* (1982) with regard to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant (*see* 40 CFR, Part 702-799 and in particular, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193). Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the Authorized Officer concurrent with the filing of the reports to the involved Federal agency or State government.

3. Holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. § 9601, *et seq.* or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, *et seq.*) on the Right-of-Way (unless the release or threatened release is wholly unrelated to activity of the Right-of-Way Holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way Holder on the Right-of-Way. This provision applies without regard to whether a release is caused by Holder, its agent, or unrelated third parties.

4. Holder shall be liable for damage or injury to the United States to the extent provided by 43 CFR Sec. 2883.1-4. Holder shall be held to a standard of strict liability for damage or injury to the United States resulting from pipe rupture, fire, or spills caused or substantially aggravated by any of the following within the right-of-way or permit area:

a. Activities of Holder including, but not limited to: construction, operation, maintenance, and termination of the facility;
b. Activities of other parties including, but not limited to:
    (1) Land clearing
    (2) Earth-disturbing and earth-moving work
    (3) Blasting
    (4) Vandalism and sabotage;
c. Acts of God.

The maximum limitation for such strict liability damages shall not exceed one million dollars ($1,000,000) for any one event, and any liability in excess of such amount shall be determined by the ordinary rules of negligence of the jurisdiction in which the damage or injury occurred.

This section shall not impose strict liability for damage or injury resulting primarily from an act of war or from the negligent acts or omissions of the United States.

5. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil, salt water, or other pollutant should be discharged from the pipeline system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil, salt water, or other pollutant, wherever found, shall be the responsibility of Holder, regardless of fault. Upon failure of Holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages resulting therefrom, on the Federal lands, the Authorized Officer may take such measures as he/she deems necessary to control and clean up the discharge and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of Holder. Such action by the Authorized Officer shall not relieve Holder of any responsibility as provided herein.

6. All construction and maintenance activity shall be confined to the authorized right-of-way width of **20** feet. If the pipeline route follows an existing road or buried pipeline right-of-way, the surface pipeline shall be installed no farther than 10 feet from the edge of the road or buried pipeline right-of-way. If existing surface pipelines prevent this distance, the proposed surface pipeline shall be installed immediately adjacent to the outer surface pipeline. All construction and maintenance activity shall be confined to existing roads or right-of-ways.

7. No blading or clearing of any vegetation shall be allowed unless approved in writing by the Authorized Officer.

8. Holder shall install the pipeline on the surface in such a manner that will minimize suspension of the pipeline across low areas in the terrain. In hummocky of duney areas, the pipeline shall be "snaked" around hummocks and dunes rather than suspended across these features.

9. The pipeline shall be buried with a minimum of **24** inches under all roads, "two-tracks," and trails. Burial of the pipe will continue for 20 feet on each side of each

crossing. The condition of the road, upon completion of construction, shall be returned to at least its former state with no bumps or dips remaining in the road surface.

10. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

12. Excluding the pipe, all above-ground structures not subject to safety requirement shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be a color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2; designated by the Rocky Mountain Five State Interagency Committee.

13. The pipeline will be identified by signs at the point of origin and completion of the right-of-way and at all road crossings. At a minimum, signs will state the holder's name, BLM serial number, and the product being transported. Signs will be maintained in a legible condition for the life of the pipeline.

14. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway.

15. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the authorized officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the authorized officer. An evaluation of the discovery will be made by the authorized officer to determine appropriate cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the authorized officer after consulting with the holder.

16. The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, powerline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following

EPA and BLM requirements and policies.

17. Surface pipelines shall be less than or equal to 4 inches and a working pressure below 125 psi.

## IX. INTERIM RECLAMATION

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

Within six (6) months of well completion, operators should work with BLM surface management specialists (Jim Amos: 575-234-5909) to devise the best strategies to reduce the size of the location. Interim reclamation should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche that is free of contaminants may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

All disturbed areas after they have been satisfactorily prepared need to be reseeded with the seed mixture provided below.

Upon completion of interim reclamation, the operator shall submit a Sundry Notices and Reports on Wells, Subsequent Report of Reclamation (Form 3160-5).

## X. FINAL ABANDONMENT & RECLAMATION

At final abandonment, well locations, production facilities, and access roads must undergo "final" reclamation so that the character and productivity of the land are restored.

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

After all disturbed areas have been satisfactorily prepared, these areas need to be revegetated with the seed mixture provided below. Seeding should be accomplished by drilling on the contour whenever practical or by other approved methods. Seeding may need to be repeated until revegetation is successful, as determined by the BLM.

Operators shall contact a BLM surface protection specialist prior to surface abandonment operations for site specific objectives (Jim Amos: 575-234-5909).

Seed Mixture 2, for Sandy Sites

The holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed will be done in accordance with State law (s) and within nine (9) months prior to purchase. Commercial seed will be either certified or registered seed. The seed container will be tagged in accordance with State law(s) and available for inspection by the authorized officer.

Seed will be planted using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (smaller/heavier seeds have a tendency to drop the bottom of the drill and are planted first). The holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed* per acre:

| Species | lb/acre |
|---|---|
| Sand dropseed (Sporobolus cryptandrus) | 1.0 |
| Sand love grass (Eragrostis trichodes) | 1.0 |
| Plains bristlegrass (Setaria macrostachya) | 2.0 |

*Pounds of pure live seed:

Pounds of seed **x** percent purity **x** percent germination = pounds pure live seed