ATS-12-518

TES 3/22/2013

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Form 3160-3
(April 2004)

FORM APPROVED
OMB No. 1004-0137
Expires March 31, 2007

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

# APPLICATION FOR PERMIT TO DRILL OR REENTER

| | |
|---|---|
| 5. Lease Serial No. BHL-NMNM-83591 BHL - NM117554 | |
| 6. If Indian, Allotee or Tribe Name: N/A | |
| 1a. Type of work: ☑ DRILL ☐ REENTER | 7. If Unit or CA Agreement, Name and No.: N/A |
| 1b. Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other ☑ Single Zone ☐ Multiple Zone | 8. Lease Name and Well No.: GISSLER FEDERAL #23H 302499 |
| 2. Name of Operator: COG Operating LLC 229137 | 9. API Well No.: 30-015- 41224 |
| 3a. Address: One Concho Center, 600 W Illinois Ave, Midland TX 79701 | 3b. Phone No. (include area code): (432) 221-0336 |
| | 10. Field and Pool, or Exploratory: Loco Hills; Glorieta Yeso 96718 |
| 4. Location of Well (Report location clearly and in accordance with any State requirements.*) At surface: SHL: 990' FNL & 330' FWL, UL D, Lot 4 At proposed prod. zone: BHL: 971' FNL & 330' FEL, UL A, Lot 1 | 11. Sec., T. R. M. or Blk. and Survey or Area: Sec 5, T17S, R30E |
| 14. Distance in miles and direction from nearest town or post office*: 2.5 miles Northeast of Loco Hills, 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): 330' | 16. No. of acres in lease: 1602 | 17. Spacing Unit dedicated to this well: ~~40~~ 157.76 |
| 18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.: 480' | 19. Proposed Depth: TVD: 5528' MD: 10019' | 20. BLM/BIA Bond No. on file: NMB000740; NMB000215 |
| 21. Elevations (Show whether DF, KDB, RT, GL, etc.): 3701' GL | 22. Approximate date work will start*: 02/28/2013 | 23. Estimated duration: 10 days |

## 24. Attachments

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

1. Well plat certified by a registered surveyor.
2. A Drilling Plan.
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office).
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 authorized officer.

| | | |
|---|---|---|
| 25. Signature: Kacie Connally | Name (Printed/Typed): Kacie Connally | Date: 12/21/2012 |
| Title: Permitting Tech | | |
| Approved by (Signature): /s/ Don Peterson | Name (Printed/Typed): | Date: MAR 20 2013 |
| 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.

*(Instructions on page 2)

Roswell Controlled Water Basin

Approval Subject to General Requirements & Special Stipulations Attached

SEE ATTACHED FOR CONDITIONS OF APPROVAL

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
DISTRICT II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
DISTRICT III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate District Office

☐ AMENDED REPORT

# WELL LOCATION AND ACREAGE DEDICATION PLAT

| API Number | Pool Code | Pool Name |
|---|---|---|
| 30-015- 41224 | 96718 | Loco Hills; Glorieta-Yeso |

| Property Code | Property Name | Well Number |
|---|---|---|
| 302499 | GISSLER FEDERAL | 23H |

| OGRID No. | Operator Name | Elevation |
|---|---|---|
| 229137 | COG OPERATING, LLC | 3701' |

Surface Location

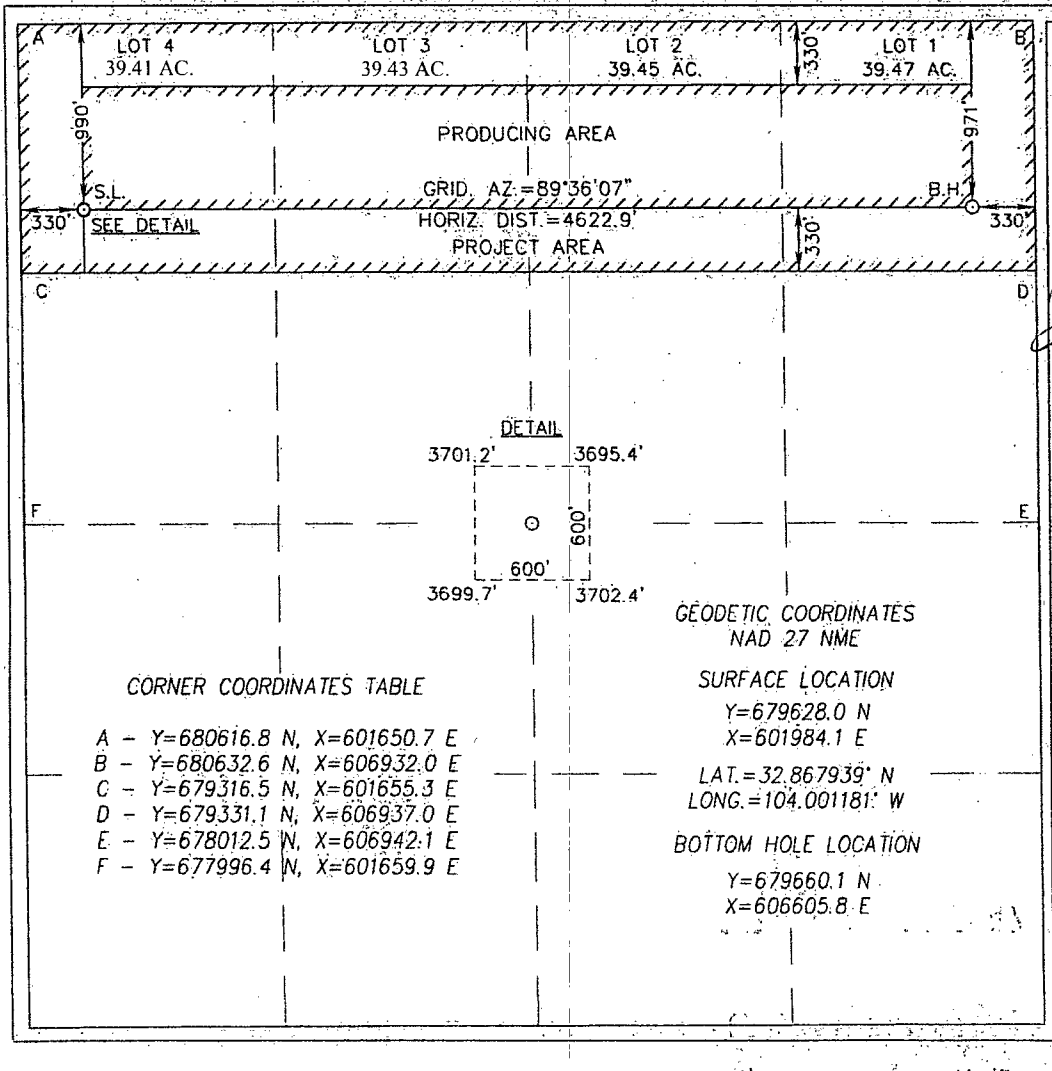
| UL or lot No. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| 4 | 5 | 17-S | 30-E | | 990 | NORTH | 330 | WEST | EDDY |

Bottom Hole Location If Different From Surface

| UL or lot No. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 5 | 17-S | 30-E | | 971 | NORTH | 330 | EAST | EDDY |

| Dedicated Acres | Joint or Infill | Consolidation Code | Order No. |
|---|---|---|---|
| 157.76 | | | |

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




CORNER COORDINATES TABLE

A - Y=680616.8 N, X=601650.7 E
B - Y=680632.6 N, X=606932.0 E
C - Y=679316.5 N, X=601655.3 E
D - Y=679331.1 N, X=606937.0 E
E - Y=678012.5 N, X=606942.1 E
F - Y=677996.4 N, X=601659.9 E

GEODETIC COORDINATES
NAD 27 NME

SURFACE LOCATION
Y=679628.0 N
X=601984.1 E
LAT.=32.867939° N
LONG.=104.001181° W

BOTTOM HOLE LOCATION
Y=679660.1 N
X=606605.8 E

## OPERATOR CERTIFICATION

*I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.*

Signature 1/15/2013 Date

Robyn M. Odom
Printed Name

Rodom@concho.com
E-mail Address

## SURVEYOR CERTIFICATION

*I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.*

FEBRUARY 22, 2012
Date of Survey

Signature & Seal of Professional Surveyor:

GARY G. EIDSON NEW MEXICO 12641

12/07/12

| Certificate Number | | |
|---|---|---|
| | Gary G. Eidson | 12641 |
| | Ronald J. Eidson | 3239 |

AF REL. W.O.: 12.11.0144 JWSC W.O.: 12.13.2006

I hereby certify that I, or persons under my direct supervision, have inspected the drill site and access road proposed herein; that I am familiar with the conditions that presently 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 COG Operating, LLC, 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 3rd day of April, 2012.

Signed: Carl Bird

Printed Name: Carl Bird

Position: Drilling Engineer

Address: One Concho Center, 600 W Illinois Ave, Midland, Texas 79701

Telephone: (432) 683-7443

Field Representative (if not above signatory): Same

E-mail: cbird@concho.com

**ATTACHMENT TO FORM 3160-3**
**COG Operating, LLC**
**GISSLER FEDERAL #23H**
**SHL: 990' FNL & 330' FWL, LOT 4**
**BHL: 990' FNL & 330' FEL, Lot 1**
**Sec 5, T17S, R30E**
**Eddy County, NM**

1. Proration Unit Spacing: 160 Acres

2. Ground Elevation: 3701'

3. Proposed Depths: Horizontal: **EOC (end of curve) TVD=5600' MD=5881'**
**Toe (end of lateral) TVD=5528' MD= 10019'**

4. Estimated tops of geological markers:

| | |
|---|---|
| Rustler | 368' |
| Top of Salt | 618' |
| Base of Salt | 1077' |
| Yates | 1239' |
| Seven Rivers | 1525' |
| Queen | 2125' |
| Grayburg | 2547' |
| San Andres | 2866' |
| Glorieta | 4291' |
| Paddock | 4358' |
| Blinebry | 4786' |
| Tubb | 5736' |

5. Possible mineral bearing formations:

| | | |
|---|---|---|
| Water Sand | 130' | Fresh Water |
| Grayburg | 2547' | |
| San Andres | 2866' | |
| Glorieta | 4291' | |
| Paddock | 4358' | |
| Blinebry | 4786' | |
| Tubb | 5736' | |

No other formations are expected to give up oil, gas or fresh water in measurable quantities. Setting 13 3/8" casing to 393' (25' into Rustler) and circulating cement back to the surface will protect the surface fresh water sand. The Salt Section will be protected by setting 9 5/8" casing to ~~1260'~~ and circulating cement back to surface in a single or multi-stage job and/or with an ECP. Any shallower zones above TD, which contain commercial quantities of oil and/or gas, will have cement circulated across them or be isolated by external casing packers. This will be achieved by cementing 7" casing from the KOP by single or multi-stage job using ECP & DV Tools as necessary. The 7" portion of the tapered 7" x 5 ½" production casing will be cemented back to a minimum of 200' into the intermediate casing (although cement volume is actually calculated to surface). At the KOP the 7" casing will be tapered to 5 ½" casing which will be run thru curve and lateral with external casing packers for zone isolation. If wellbore conditions arise that require immediate action and/or a change to this program, COG Operating LLC personnel will always react to protect the wellbore and/or environment.

See COA

See COA

**6. Proposed Mud System**

The well will be drilled to TD with a combination of fresh water, brine, cut brine and polymer mud systems. The applicable depths and properties of these systems are as follows:

| DEPTH (MD) | TYPE | WEIGHT | VISCOSITY | WATERLOSS |
|---|---|---|---|---|
| 0-393' | Fresh Water | 8.5 | 28 | N.C. |
| 393'-1250'/1200 | Brine | 10 | 30 | N.C. |
| 1250'-5123' | Cut Brine | 8.7-9.2 | 30 | N.C. |
| 5123'-5881' | Cut Brine/polymer mud | 8.7-9.2 | 30 | N.C. |
| 5881'-10019' | Cut Brine/polymer mud | 8.7-9.2 | 30 | N.C. |

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

Visual or electronic mud monitoring equipment shall be in place to detect volume changes indicating loss or gain of circulating fluid volume.

The mud program has been designed to minimize the volume of H2S circulated to surface. Proper mud weights, safe drilling practices and the use of H2S scavengers will minimize hazards when penetrating H2S bearing zones.

**6. Proposed Casing Program**

| Hole Size | Interval MD | OD Casing | Weight | Grade | Condition | Jt. | brst/clps/ten |
|---|---|---|---|---|---|---|---|
| 17 ½" | 0-393' | 13 3/8" 0'-393' | 48# | H-40/J-55 Hybrid | New | ST&C | 4.40/4.42/19.62 |
| 12 ¼" | 393'-1250'/1200 | 9 5/8" 0'-1250'/1200 | 40# | J/K-55 | New | LT&C | 3.95/3.16/12.24 |
| 8 ¾" | 1250'-5123' | 7" 0'-5123' | 26# | L-80 | New | LT&C | 1.45/2.74/5.54 |
| 8 ¾" | 5123'-5881' | 5 ½" 5123'-5881' | 17# | L-80 | New | LT&C | 1.55/2.86/5.03 |
| 7 7/8" | 5881'-10019' | 5½" 5881'-10019' | 17# | L-80 | New | LT&C | 1.55/2.86/5.03 |

See COA

Production string will be a tapered string with 7" 26# L-80 LTC run from surface to kick off point (5123') and then crossed over to 5 ½" 17# L-80 LTC.

## 7. Proposed Cement Program

**13 3/8" SURFACE**: **(Circulate to Surface)**

| | | | | |
|---|---|---|---|---|
| Lead: 0'-393'<br>Excess 93% | 455 sks | Class "C" w/2% CaCl2<br>+ 0.25 pps CF | 1.32 cf/sk | 14.8 ppg |

**9 5/8" INTERMEDIATE**:

**Option #1: Single Stage (Circulate to Surface)**

| | | | | |
|---|---|---|---|---|
| Lead:<br>0'-750'<br>Excess 183% | 300 sks | 50:50:10 C:Poz:Gel<br>w/ 5% Salt+ 0.25% CF<br>+5 pps LCM | 2.45 cf/sk | 11.8 ppg |
| Tail:<br>750'-1250'<br>Excess 52% | 200 sks | Class C w/2% CaCl2 | 1.32 cf/sk | 14.8 ppg |

**Option #2: Multi-stage w/ DV Tool @ +/-443'(DV Tool 50' below 13 3/8" csg. Shoe) (Circulate to Surface)**

**Stage #1:**

| | | | | |
|---|---|---|---|---|
| Lead:<br>443'-750'<br>Excess 282% | 150 sks | 50:50:10 C:Poz:Gel w/5%<br>Salt+0.25% CF+5 pps LCM | 2.45 cf/sk | 11.8 ppg |
| Tail:<br>750'-1250'<br>Excess 52% | 200 sks | Class "C" w/2% CaCl2 | 1.32 cf/sk | 14.8 ppg |

**Stage #2**

| | | | | |
|---|---|---|---|---|
| 0'-443'<br>Excess 125% | 150 sks | 50:50:10 C:Poz:Gel w/5%<br>salt+ 0.25% CF | 2.45 cf/sk | 11.8 ppg |

Note: Multi-stage tool to be set depending on hole conditions at approximately 443' (50' below the surface casing shoe). Cement volumes will be adjusted proportionately for depth changes of multi-stage tool.

**7" X 5 ½" TAPERED PRODUCTION CASING**:

Cement details for 7" portion of tapered casing string as follows:.

**Option #1: Single Stage (Cement cal to Surface)**
**DV Tool & ECP (external csg. Packer ) @ 5123' KOP**:

| | | | | |
|---|---|---|---|---|
| Lead: 0'-3400' (min. tie back 200' above 9 5/8"shoe) Excess 93% | 500 sks | 35:65:6 C:Poz Gel w/5% salt+ 5 pps LCM+ 0.2 % SMS+ 0.3% FL-52A+ 0.125 pps CF+1 % BA-58+ 1% FL-25 | 2.05 cf/sk | 12.5 ppg |
| Tail: 3400'-5123' Excess 105% | 400 sks | 50:50:2 C:Poz Gel w/5% salt+ 3 pps LCM+ 0.6 % SMS+ 0.3% FL-52A+ 0.125 pps CF+1% FL-25+ 1% BA-58 | 1.37 cf/sk | 14.0 ppg |

**Option #2:Multi-stage (2 Stages)**

**Stage #1: DV Tool & ECP @ +/- 5123'**

| | | | | |
|---|---|---|---|---|
| Lead: 1300'-3400' Excess 127% | 350 sks | 35:65:2 C:Poz Gel w/5% salt+ 5 pps LCM+ 0.2 % SMS+ 0.3% FL-52A+ 0.125 pps CF+1% FL-25+ 1% BA-58 | 2.05 cf/sk | 14.0 ppg |
| Tail: 3400'-5123' Excess 105% | 400 sks | 50:50:2 C:P)oz Gel w/5% salt+ 3 pps LCM + 0.6% SMS + 0.3% FL-52A+ 0.125 pps CF + 1% FL-25+ 1% BA-58 | 1.37 cf/sk | 14.0 ppg |

**Stage #2:**
**2nd DV Tool @ 1300' (50' below 9 5/8" csg shoe) (Cement cal to Surface)**

| | | | | |
|---|---|---|---|---|
| Lead: 0'-1300' (min. tie back 200' above 9 5/8" shoe) Excess 50% | 150 sks | 35:65:2 C:Poz Gel w/5% salt+ 5 pps LCM+ 0.2 % SMS+ 0.3% FL-52A+ 0.125 pps CF+1% FL-25+ 1% BA-58 | 2.05 cf/sk | 12.5 ppg |

Note: 5 ½" casing will be run from KOP at 5123' thru curve and lateral to TD of 10019' MD. Productive intervals will be isolated by a Peak Packer system or similar.

Note: Assumption for 2nd DV tool is water flow. Cement volumes will be adjusted proportionately for depth changes of multi-stage tool.

Note: FL-52A is fluid loss additive, R-3 is retarder.

Note: Multi-stage tool to be set depending on hole conditions at approximately 1300' Cement volumes will be adjusted proportionately for depth changes of multi-stage tool.

8. Pressure Control Equipment:

The blowout preventer equipment (BOP) shown in Exhibit #9 will consist of a double ram-type (2000 psi WP) preventer, and in some cases possibly a 2000 psi Hydril type annular preventer as provided for in Onshore Order #2. This unit will be hydraulically operated and the ram type preventer will be equipped with blind rams on top and 4 1/2" drill pipe rams on the bottom. A 13-5/8" BOP will be used during the drilling of the well. A 13 5/8" permanent casing head will be installed on the 13 3/8" casing. The BOP will be nipped up on the 13 5/8" permanent casing head and tested to 2000 psig. After setting 9-5/8", permanent "B section" well head will be installed and the BOP will then be nipped up on the permanent B . BOP and well head will be tested by a third party to 2000 psig and used continuously until total depth is reached. 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, choke lines and a choke manifold with a 2000 psi WP rating all of which will also be tested to working pressure by independent tester also. See COA

9. Production Hole Drilling Summary:

***Drill 8 ¾" hole and kick off at +/- 5123', building curve at 12°/100' over +/- 758' to horizontal at 5881' MD/ 5600' TVD Az 87.00°. At EOC reduce hole size to 7 7/8", turn lateral at 3°/100' to Azmith of 89.94°. Continue 7 7/8" lateral section in a easterly direction for +/4137' lateral to TD at +/- 10019' MD, 5528' TVD. Run 7" x 5-1/2" production casing. 7" to be run from surface to kickoff point and then changed over to 5 ½" with DV Tool and ECP at kickoff point. 5 ½" casing will be run from kickoff point to td and isolation packers set throughout lateral. 7" to be cemented from kickoff point to surface.***

10. Auxiliary Well Control and Monitoring Equipment

A. Kelly cock will be kept in the drill string at all times.

B. A full opening drill pipe-stabbing valve with proper drill pipe connections will be on the rig floor at all times.

11. Logging, Testing and Coring Program:

A. The following logs will be run in the vertical portion of the hole to KOP: SLB-PEX/HRLA,HNGS.

B. The mud logging program will consist of lagged 10' samples from KOP to TD in Horizontal hole.

C. Drill Stem test is not anticipated.

D. No conventional coring is anticipated.

E. Further testing procedures will be determined after the 7" x 5 ½" production casing has been cemented at TD based on drill shows and log evaluation.

12. Abnormal Conditions, Pressures, Temperatures and Potential Hazards:

No abnormal pressures or temperatures are anticipated. The estimated bottom hole temperature at TD is 93° Fahrenheit and estimated maximum bottom hole pressure is 2464 psi. Wells in the Loco Hills area will penetrate formations that are known or could reasonably be expected to contain Hydrogen Sulfide. Measurable gas volumes or Hydrogen Sulfide levels have not been encountered during drilling operations in this area, However a H2S drilling operations plan is included with this APD. If H2S concentrations exceed 100 ppm a remote operated choke will be installed (see diagram #8 & #9) and COG will comply with the specifics of Onshore Order #6. No major loss circulation zones have been reported in offsetting wells.

See COA

13. Anticipated Starting Date

Drilling operations will commence approximately on **February *28, 2013*** with drilling and completion operations lasting approximately ***90*** days.

CONCHO

# COG Operating LLC

**Eddy County, NM (NAN27 NME)**
**Gissler Federal #23H**

**OH**

**Plan #3 8-3/4" Hole**
**Surface: 990' FNL, 330' FWL, Sec 5, T17S, R30E, Unit D (Lot #4)**
**PP: 990' FNL, 721' FWL, Sec 5, T17S, R30E, Unit D (Lot #4)**
**BHL: 971' FNL, 330' FEL, Sec 5, T17S, R30E, Unit A (Lot #1)**

# Standard Planning Report

**19 December, 2012**

Scientific Drilling

| | | | |
|---|---|---|---|
| **Database:** | EDM 5000.1 Single User Db | **Local Co-ordinate Reference:** | Well #23H |
| **Company:** | COG Operating LLC | **TVD Reference:** | GL @ 3701.00usft |
| **Project:** | Eddy County, NM (NAN27 NME) | **MD Reference:** | GL @ 3701.00usft |
| **Site:** | Gissler Federal | **North Reference:** | Grid |
| **Well:** | #23H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | OH | | |
| **Design:** | Plan #3 8-3/4" Hole | | |

**Project** Eddy County, NM (NAN27 NME)

| | | | |
|---|---|---|---|
| **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 | | Using geodetic scale factor |

**Site** Gissler Federal

| | | | | | |
|---|---|---|---|---|---|
| **Site Position:** | | **Northing:** | 677,007.70 usft | **Latitude:** | 32° 51' 38.652 N |
| **From:** | Map | **Easting:** | 601,994.40 usft | **Longitude:** | 104° 0' 4.226 W |
| **Position Uncertainty:** | 0.00 usft | **Slot Radius:** | 13-3/16 " | **Grid Convergence:** | 0.18 ° |

**Well** #23H

| | | | | | | |
|---|---|---|---|---|---|---|
| **Well Position** | **+N/-S** | 2,620.51 usft | **Northing:** | 679,628.00 usft | **Latitude:** | 32° 52' 4.581 N |
| | **+E/-W** | -10.30 usft | **Easting:** | 601,984.10 usft | **Longitude:** | 104° 0' 4.251 W |
| **Position Uncertainty** | | 0.00 usft | **Wellhead Elevation:** | | **Ground Level:** | 3,701.00 usft |

**Wellbore** OH

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|---|---|---|---|---|---|
| | BGGM2012 | 12/19/2012 | 7.76 | 60.64 | 48,785 |

**Design** Plan #3 8-3/4" Hole

**Audit Notes:**

| | | | | | |
|---|---|---|---|---|---|
| **Version:** | | **Phase:** | PLAN | **Tie On Depth:** | 0.00 |

| Vertical Section: | Depth From (TVD) (usft) | +N/-S (usft) | +E/-W (usft) | Direction (°) |
|---|---|---|---|---|
| | 0.00 | 0.00 | 0.00 | 89.60 |

**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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5,122.61 | 0.00 | 0.00 | 5,122.61 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5,880.94 | 91.00 | 87.00 | 5,600.00 | 25.42 | 485.13 | 12.00 | 12.00 | 0.00 | 87.00 | |
| 5,979.00 | 91.00 | 89.94 | 5,598.29 | 28.04 | 583.13 | 3.00 | 0.00 | 3.00 | 89.98 | |
| 10,018.55 | 91.00 | 89.94 | 5,527.80 | 32.10 | 4,622.07 | 0.00 | 0.00 | 0.00 | 0.00 | PBHL |

| | | | |
|---|---|---|---|
| **Database:** | EDM 5000.1 Single User Db | **Local Co-ordinate Reference:** | Well #23H |
| **Company:** | COG Operating LLC | **TVD Reference:** | GL @ 3701.00usft |
| **Project:** | Eddy County, NM (NAN27-NME) | **MD Reference:** | GL @ 3701.00usft |
| **Site:** | Gissler Federal | **North Reference:** | Grid |
| **Well:** | #23H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | OH | | |
| **Design:** | Plan #3 8-3/4" Hole | | |

**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) |
|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,122.61 | 0.00 | 0.00 | 5,122.61 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **KOP Start Build 12.00** | | | | | | | | | |
| 5,200.00 | 9.29 | 87.00 | 5,199.66 | 0.33 | 6.25 | 6.25 | 12.00 | 12.00 | 0.00 |
| 5,300.00 | 21.29 | 87.00 | 5,295.95 | 1.70 | 32.53 | 32.54 | 12.00 | 12.00 | 0.00 |
| 5,400.00 | 33.29 | 87.00 | 5,384.66 | 4.10 | 78.23 | 78.26 | 12.00 | 12.00 | 0.00 |
| 5,500.00 | 45.29 | 87.00 | 5,461.91 | 7.41 | 141.35 | 141.40 | 12.00 | 12.00 | 0.00 |
| 5,600.00 | 57.29 | 87.00 | 5,524.34 | 11.48 | 219.13 | 219.20 | 12.00 | 12.00 | 0.00 |
| 5,700.00 | 69.29 | 87.00 | 5,569.21 | 16.15 | 308.17 | 308.27 | 12.00 | 12.00 | 0.00 |
| 5,786.24 | 79.64 | 87.00 | 5,592.28 | 20.49 | 391.03 | 391.16 | 12.00 | 12.00 | 0.00 |
| **PP Gissler Federal #23H** | | | | | | | | | |
| 5,800.00 | 81.29 | 87.00 | 5,594.56 | 21.20 | 404.58 | 404.72 | 12.00 | 12.00 | 0.00 |
| 5,880.94 | 91.00 | 87.00 | 5,600.00 | 25.42 | 485.13 | 485.29 | 12.00 | 12.00 | 0.00 |
| **EOC Start DLS 3.00 TFO 89.98** | | | | | | | | | |
| 5,900.00 | 91.00 | 87.57 | 5,599.67 | 26.33 | 504.17 | 504.34 | 3.00 | 0.00 | 3.00 |
| 5,979.00 | 91.00 | 89.94 | 5,598.29 | 28.04 | 583.13 | 583.31 | 3.00 | 0.00 | 3.00 |
| **Start 4039.55 hold at 5979.00 MD** | | | | | | | | | |
| 6,000.00 | 91.00 | 89.94 | 5,597.92 | 28.06 | 604.13 | 604.31 | 0.00 | 0.00 | 0.00 |
| 6,100.00 | 91.00 | 89.94 | 5,596.18 | 28.16 | 704.11 | 704.29 | 0.00 | 0.00 | 0.00 |
| 6,200.00 | 91.00 | 89.94 | 5,594.43 | 28.26 | 804.10 | 804.27 | 0.00 | 0.00 | 0.00 |
| 6,300.00 | 91.00 | 89.94 | 5,592.69 | 28.36 | 904.08 | 904.26 | 0.00 | 0.00 | 0.00 |
| 6,400.00 | 91.00 | 89.94 | 5,590.94 | 28.46 | 1,004.06 | 1,004.24 | 0.00 | 0.00 | 0.00 |
| 6,500.00 | 91.00 | 89.94 | 5,589.20 | 28.56 | 1,104.05 | 1,104.22 | 0.00 | 0.00 | 0.00 |
| 6,600.00 | 91.00 | 89.94 | 5,587.45 | 28.66 | 1,204.03 | 1,204.20 | 0.00 | 0.00 | 0.00 |
| 6,700.00 | 91.00 | 89.94 | 5,585.71 | 28.77 | 1,304.02 | 1,304.19 | 0.00 | 0.00 | 0.00 |
| 6,800.00 | 91.00 | 89.94 | 5,583.96 | 28.87 | 1,404.00 | 1,404.17 | 0.00 | 0.00 | 0.00 |
| 6,900.00 | 91.00 | 89.94 | 5,582.22 | 28.97 | 1,503.99 | 1,504.15 | 0.00 | 0.00 | 0.00 |
| 7,000.00 | 91.00 | 89.94 | 5,580.47 | 29.07 | 1,603.97 | 1,604.14 | 0.00 | 0.00 | 0.00 |
| 7,100.00 | 91.00 | 89.94 | 5,578.73 | 29.17 | 1,703.96 | 1,704.12 | 0.00 | 0.00 | 0.00 |
| 7,200.00 | 91.00 | 89.94 | 5,576.98 | 29.27 | 1,803.94 | 1,804.10 | 0.00 | 0.00 | 0.00 |
| 7,300.00 | 91.00 | 89.94 | 5,575.24 | 29.37 | 1,903.93 | 1,904.09 | 0.00 | 0.00 | 0.00 |
| 7,400.00 | 91.00 | 89.94 | 5,573.49 | 29.47 | 2,003.91 | 2,004.07 | 0.00 | 0.00 | 0.00 |
| 7,500.00 | 91.00 | 89.94 | 5,571.75 | 29.57 | 2,103.90 | 2,104.05 | 0.00 | 0.00 | 0.00 |
| 7,600.00 | 91.00 | 89.94 | 5,570.00 | 29.67 | 2,203.88 | 2,204.03 | 0.00 | 0.00 | 0.00 |
| 7,700.00 | 91.00 | 89.94 | 5,568.26 | 29.77 | 2,303.87 | 2,304.02 | 0.00 | 0.00 | 0.00 |
| 7,800.00 | 91.00 | 89.94 | 5,566.51 | 29.87 | 2,403.85 | 2,404.00 | 0.00 | 0.00 | 0.00 |
| 7,900.00 | 91.00 | 89.94 | 5,564.77 | 29.97 | 2,503.84 | 2,503.98 | 0.00 | 0.00 | 0.00 |
| 8,000.00 | 91.00 | 89.94 | 5,563.02 | 30.07 | 2,603.82 | 2,603.97 | 0.00 | 0.00 | 0.00 |
| 8,100.00 | 91.00 | 89.94 | 5,561.28 | 30.17 | 2,703.81 | 2,703.95 | 0.00 | 0.00 | 0.00 |
| 8,200.00 | 91.00 | 89.94 | 5,559.53 | 30.27 | 2,803.79 | 2,803.93 | 0.00 | 0.00 | 0.00 |
| 8,300.00 | 91.00 | 89.94 | 5,557.79 | 30.37 | 2,903.77 | 2,903.92 | 0.00 | 0.00 | 0.00 |
| 8,400.00 | 91.00 | 89.94 | 5,556.04 | 30.47 | 3,003.76 | 3,003.90 | 0.00 | 0.00 | 0.00 |
| 8,500.00 | 91.00 | 89.94 | 5,554.30 | 30.58 | 3,103.74 | 3,103.88 | 0.00 | 0.00 | 0.00 |
| 8,600.00 | 91.00 | 89.94 | 5,552.55 | 30.68 | 3,203.73 | 3,203.86 | 0.00 | 0.00 | 0.00 |
| 8,700.00 | 91.00 | 89.94 | 5,550.81 | 30.78 | 3,303.71 | 3,303.85 | 0.00 | 0.00 | 0.00 |
| 8,800.00 | 91.00 | 89.94 | 5,549.06 | 30.88 | 3,403.70 | 3,403.83 | 0.00 | 0.00 | 0.00 |
| 8,900.00 | 91.00 | 89.94 | 5,547.32 | 30.98 | 3,503.68 | 3,503.81 | 0.00 | 0.00 | 0.00 |
| 9,000.00 | 91.00 | 89.94 | 5,545.57 | 31.08 | 3,603.67 | 3,603.80 | 0.00 | 0.00 | 0.00 |
| 9,100.00 | 91.00 | 89.94 | 5,543.83 | 31.18 | 3,703.65 | 3,703.78 | 0.00 | 0.00 | 0.00 |
| 9,200.00 | 91.00 | 89.94 | 5,542.08 | 31.28 | 3,803.64 | 3,803.76 | 0.00 | 0.00 | 0.00 |
| 9,300.00 | 91.00 | 89.94 | 5,540.34 | 31.38 | 3,903.62 | 3,903.75 | 0.00 | 0.00 | 0.00 |
| 9,400.00 | 91.00 | 89.94 | 5,538.59 | 31.48 | 4,003.61 | 4,003.73 | 0.00 | 0.00 | 0.00 |
| 9,500.00 | 91.00 | 89.94 | 5,536.85 | 31.58 | 4,103.59 | 4,103.71 | 0.00 | 0.00 | 0.00 |
| 9,600.00 | 91.00 | 89.94 | 5,535.10 | 31.68 | 4,203.58 | 4,203.69 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Database:** | EDM 5000.1 Single User Db | **Local Co-ordinate Reference:** | Well #23H |
| **Company:** | COG Operating LLC | **TVD Reference:** | GL @ 3701.00usft |
| **Project:** | Eddy County, NM (NAN27-NME) | **MD Reference:** | GL @ 3701.00usft |
| **Site:** | Gissler Federal | **North Reference:** | Grid |
| **Well:** | #23H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | OH | | |
| **Design:** | Plan #3: 8-3/4" Hole | | |

**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) |
|---|---|---|---|---|---|---|---|---|---|
| 9,700.00 | 91.00 | 89.94 | 5,533.36 | 31.78 | 4,303.56 | 4,303.68 | 0.00 | 0.00 | 0.00 |
| 9,800.00 | 91.00 | 89.94 | 5,531.61 | 31.88 | 4,403.55 | 4,403.66 | 0.00 | 0.00 | 0.00 |
| 9,900.00 | 91.00 | 89.94 | 5,529.87 | 31.98 | 4,503.53 | 4,503.64 | 0.00 | 0.00 | 0.00 |
| 10,000.00 | 91.00 | 89.94 | 5,528.12 | 32.08 | 4,603.52 | 4,603.63 | 0.00 | 0.00 | 0.00 |
| 10,018.55 | 91.00 | 89.94 | 5,527.80 | 32.10 | 4,622.07 | 4,622.18 | 0.00 | 0.00 | 0.00 |
| PBHL | | | | | | | | | |

**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 |
|---|---|---|---|---|---|---|---|---|---|
| PBHL<br>- plan hits target center<br>- Point | 0.00 | 0.00 | 5,527.80 | 32.10 | 4,622.07 | 679,660.10 | 606,605.80 | 32° 52' 4.751 N | 103° 59' 10.061 W |
| PP<br>- plan hits target center<br>- Point | 0.00 | 0.00 | 5,592.28 | 20.49 | 391.00 | 679,648.49 | 602,375.07 | 32° 52' 4.771 N | 103° 59' 59.666 W |

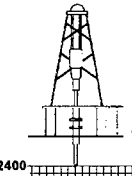
**Plan Annotations**

| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates +N/-S (usft) | Local Coordinates +E/-W (usft) | Comment |
|---|---|---|---|---|
| 5,122.61 | 5,122.61 | 0.00 | 0.00 | KOP Start Build 12.00 |
| 5,880.94 | 5,600.00 | 25.42 | 485.13 | EOC Start DLS 3.00 TFO 89.98 |
| 5,979.00 | 5,598.29 | 28.04 | 583.13 | Start 4039.55 hold at 5979.00 MD |

CONCHO

Scientific Drilling

# Gissler Federal #23H
## Eddy County, NM (NAN27 NME)
**Northing: (Y) 679628.00**
**Easting: (X) 601984.10**
**Plan #3 8-3/4" Hole**




Azimuths to Grid North
True North: -0.18°
Magnetic North: 7.58°

Magnetic Field
Strength: 48784.8snT
Dip Angle: 60.64°
Date: 12/19/2012
Model: BGGM2012

*To convert a Magnetic Direction to a Grid Direction, Add 7.58°*
*To convert a True Direction to a Grid Direction, Subtract 0.18°*

**WELL DETAILS:**

Ground Level: 3701.00

| +N/-S | +E/-W | Northing | Easting | Latitude | Longitude |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 679628.00 | 601984.10 | 32° 52' 4.581 N | 104° 0' 4.251 W |

**SECTION DETAILS**

| MD | Inc | Azi | TVD | +N/-S | +E/-W | Dleg | TFace | VSect | Target |
|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5122.61 | 0.00 | 0.00 | 5122.61 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5880.94 | 91.00 | 87.00 | 5600.00 | 25.42 | 485.13 | 12.00 | 87.00 | 485.29 | |
| 5979.00 | 91.00 | 89.94 | 5598.29 | 28.04 | 583.13 | 3.00 | 89.98 | 583.31 | |
| 10018.55 | 91.00 | 89.94 | 5527.80 | 32.10 | 4622.07 | 0.00 | 0.00 | 4622.18 | PBHL |

**DESIGN TARGET DETAILS**

| Name | TVD | +N/-S | +E/-W | Northing | Easting |
|---|---|---|---|---|---|
| PBHL | 5527.80 | 32.10 | 4622.07 | 679660.10 | 606605.80 |
| PP-Gissler Federal #23H | 5592.28 | 20.49 | 391.00 | 679648.49 | 602375.07 |

**SITE DETAILS:** Gissler Federal
Site Centre Northing: 677007.70
Easting: 601994.40

Positional Uncertainity: 0.00
Convergence: 0.18
Local North: Grid

**PROJECT DETAILS:** Eddy County, NM (NAN27 NME)
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001

System Datum: Mean Sea Level

Map System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone Name: New Mexico East 3001

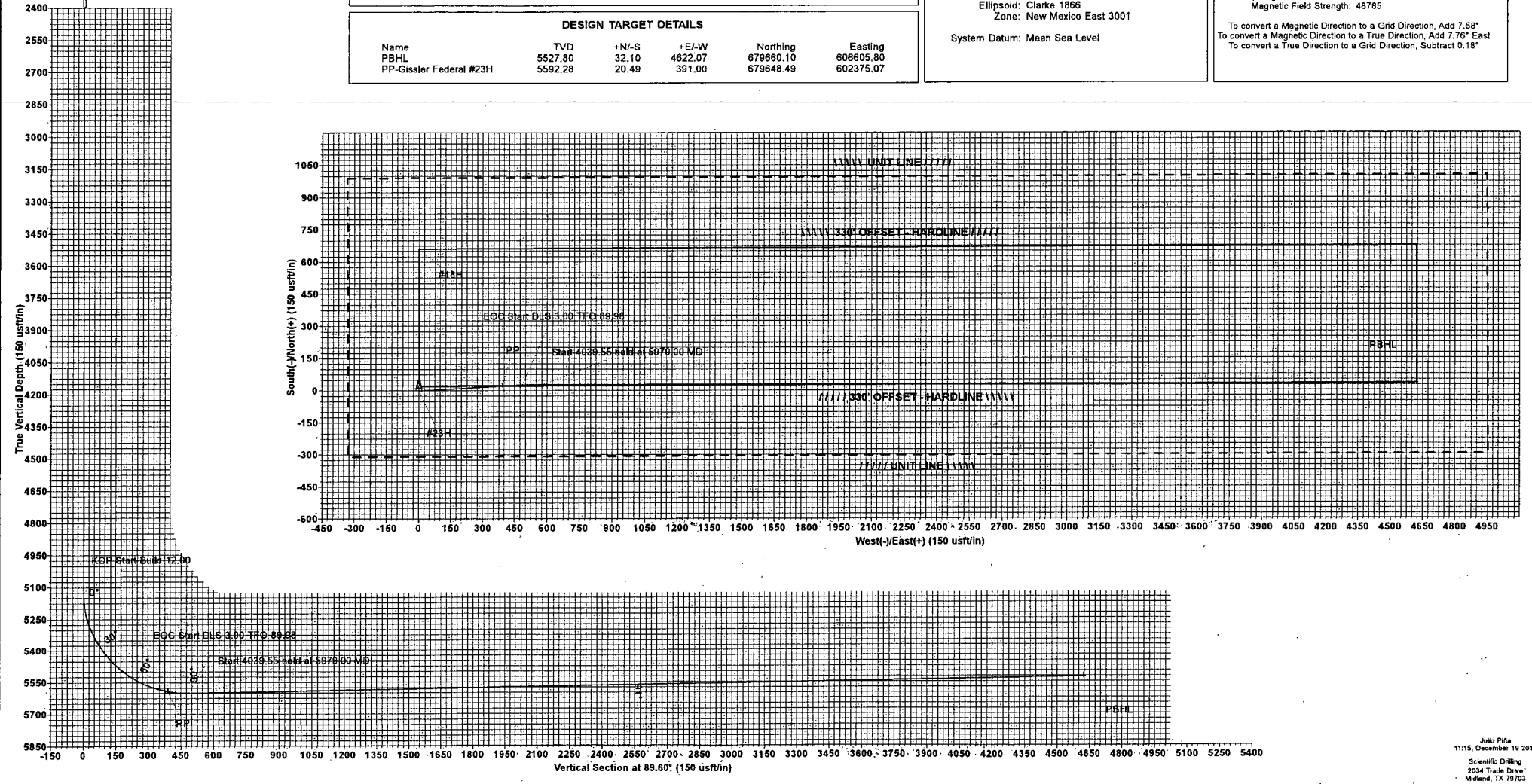
Local Origin: Well #23H, Grid North

Latitude: 32° 52' 4.581 N
Longitude: 104° 0' 4.251 W

Grid East: 601984.10
Grid North: 679628.00
Scale Factor: 1.000

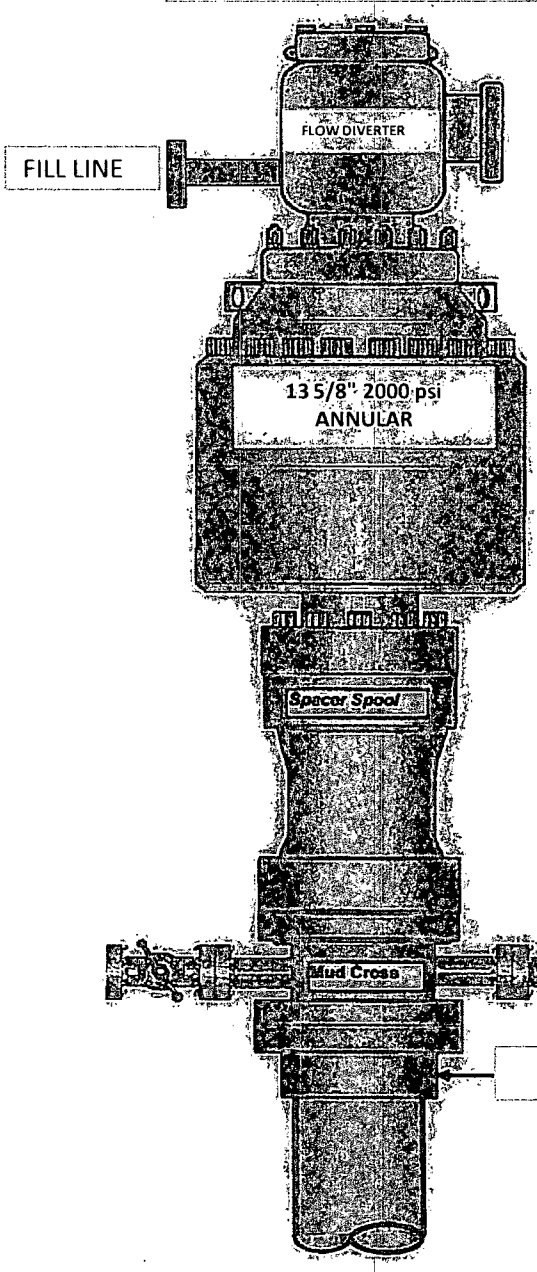
Geomagnetic Model: BGGM2012
Sample Date: 19-Dec-12
Magnetic Declination: 7.76°
Dip Angle from Horizontal: 60.64°
Magnetic Field Strength: 48785

To convert a Magnetic Direction to a Grid Direction, Add 7.58°
To convert a Magnetic Direction to a True Direction, Add 7.76° East
To convert a True Direction to a Grid Direction, Subtract 0.18°




Julio Pina
11:15, December 19 2012
Scientific Drilling
2034 Trade Drive
Midland, TX 79703

# 13 5/8" 2K ANNULAR




FILL LINE

See COA

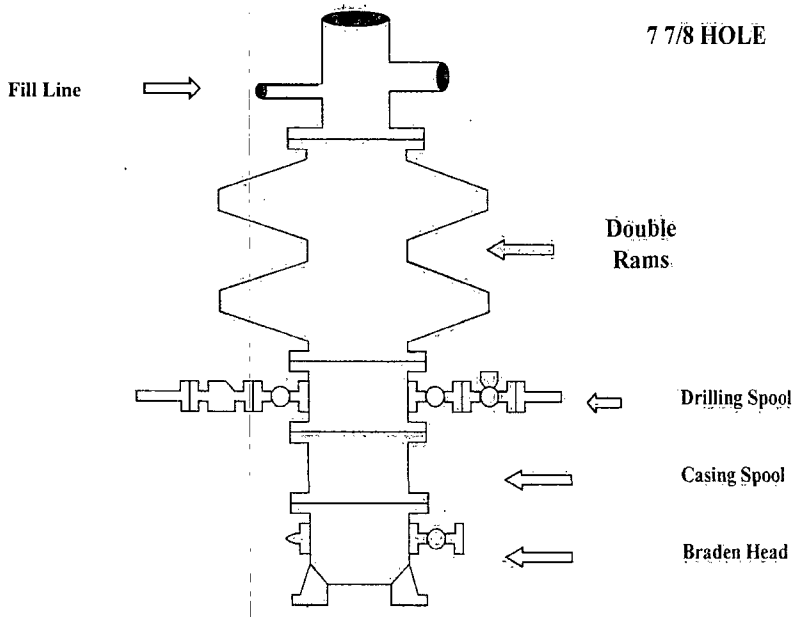
4-1/16",2K VALVES

13 5/8" 3K "A" SECTION

# COG Operating LLC

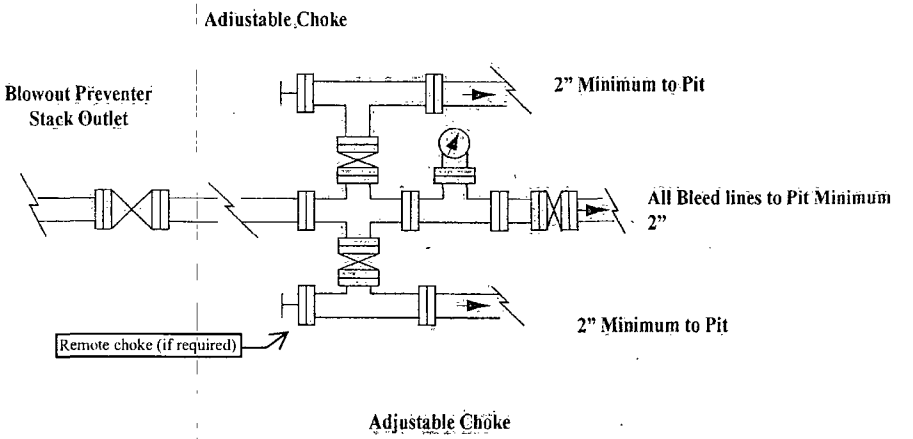
## Exhibit #9

## BOPE and Choke Schematic




Minimum 4" Nominal choke and kill lines

Choke Manifold Requirement (2000 psi WP)
No Annular Required

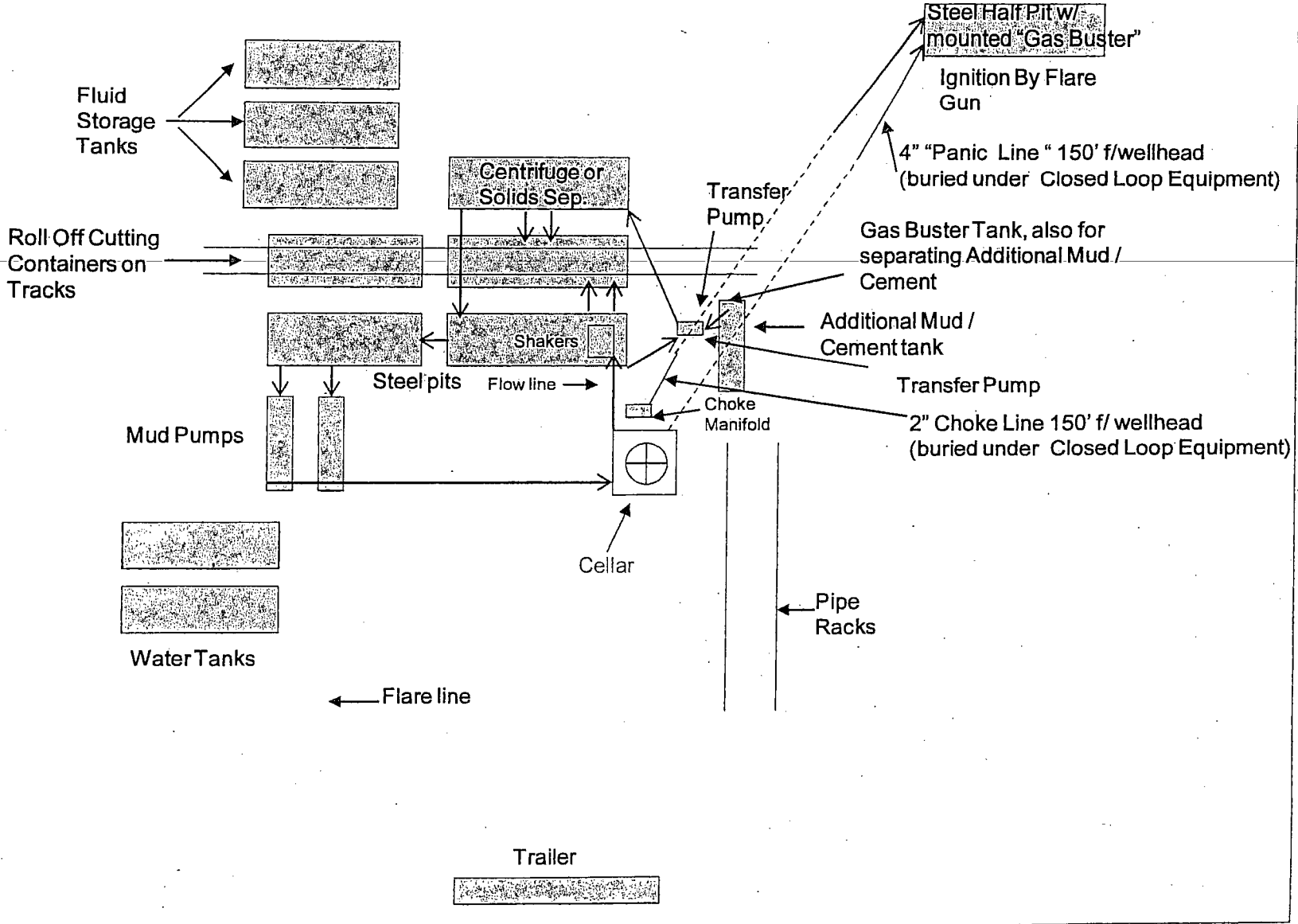


## NOTES REGARDING THE BLOWOUT PREVENTERS
### Master Drilling Plan
### Eddy County, New Mexico

1. Drilling nipple to be so constructed that it can be removed without use of a welder through rotary table opening, with minimum I.D. equal to preventer bore.
2. Wear ring to be properly installed in head.
3. Blow out preventer and all fittings must be in good condition, 2000 psi WP minimum.
4. All fittings to be flanged.
5. Safety valve must be available on rig floor at all times with proper connections, valve to be full 2000 psi WP minimum.
6. All choke and fill lines to be securely anchored especially ends of choke lines.
7. Equipment through which bit must pass shall be at least as large as the diameter of the casing being drilled through.
8. Kelly cock on Kelly.
9. Extension wrenches and hands wheels to be properly installed.
10. Blow out preventer control to be located as close to driller's position as feasible.
11. Blow out preventer closing equipment to include minimum 40-gallon accumulator, two independent sources of pump power on each closing unit installation all API specifications.

COG Operating LLC

Closed Loop Equipment Diagram



All drilling fluid circulated over shaker(s) with cuttings discharged into roll off container.

Fluid and fines below shaker(s) are circulated with transfer pump through centrifuge(s) or solids separator with cuttings and fines discharged into roll off container.

Fluid is continuously re-circulated through equipment with polymer added to aid separation of cutting fines.

Roll off containers are lined and de-watered with fluids re-circulated into system.

Additional tank is used to capture unused drilling fluid or cement returns from casing jobs.

This equipment will be maintained 24 hrs./day by solids control personnel and or rig crews that stay on location.

Cuttings will be hauled to either:

CRI (permit number R9166)
or
GMI (permit number 711-019-001)

dependent upon which rig is available to drill this well.

# COG Operating LLC

## Hydrogen Sulfide Drilling Operation Plan

## I. HYDROGEN SULFIDE TRAINING

All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will receive training from a qualified instructor in the following areas prior to commencing drilling operations on this well:

1. The hazards an characteristics of hydrogen sulfide (H2S)
2. The proper use and maintenance of personal protective equipment and life support systems.
3. The proper use of H2S detectors alarms warning systems, briefing areas, evacuation procedures, and prevailing winds.
4. The proper techniques for first aid and rescue procedures.

In addition, supervisory personnel will be trained in the following areas:

1. The effects of H2S on metal components. If high tensile tubular are to be used, personnel well be trained in their special maintenance requirements.
2. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
3. The contents and requirements of the H2S Drilling Operations Plan and Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H2S zone (within 3 days or 500 feet) and weekly H2S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H2S Drilling Operations Plan and the Public Protection Plan. **The concentrations of H2S of wells in this area from surface to TD are low enough that a contingency plan is not required.**

# II. H2S SAFETY EQUIPMENT AND SYSTEMS

Note: All H2S safety equipment and systems will be installed, tested, and operational when drilling reaches a depth of 500 feet above, or three days prior to penetrating the first zone containing or reasonable expected to contain H2S.

1. **Well Control Equipment:**

   A. Flare line.

   B. Choke manifold with minimum of one remotely operated choke.

   C. Closed Loop Blow Down Tank

   D. Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit.

   E. Auxiliary equipment may include if applicable: annular preventer & rotating head.

2. **Protective equipment for essential personnel:**

   A. SCBA (Self contained breathing apparatus) 30-minute units located in the doghouse and at briefing areas, as indicated on well site diagram.

3. **H2S detection and monitoring equipment:**

   A. Portable H2S monitors positioned on location for best coverage and response. These units have warning lights and audible sirens when H2S levels of 20 PPM are reached.

4. **Visual warning systems:**

   A. Wind direction indicators as shown on well site diagram.

   B. Caution/Danger signs (Exhibit #7) shall be posted on roads providing direct access to location. Signs will be painted a high visibility yellow with black lettering of sufficient size to be readable at a reasonable distance from the immediate location. Bilingual signs will be used, when appropriate. See example attached.

5. **Mud program:**

   A. The mud program has been designed to minimize the volume of H2S circulated to surface. Proper mud weight, safe drilling practices, and the use of H2S scavengers will minimize hazards when penetrating H2S bearing zones.

# PECOS DISTRICT
# CONDITIONS OF APPROVAL

| | |
|---|---|
| OPERATOR'S NAME: | COG Operating |
| LEASE NO.: | NM117554 |
| WELL NAME & NO.: | 23H Gissler Federal |
| SURFACE HOLE FOOTAGE: | 990' FNL & 330' FWL |
| BOTTOM HOLE FOOTAGE | 971' FNL & 330' FEL |
| LOCATION: | Section5 , T.17 S., R.30 E., NMPM |
| COUNTY: | Eddy County, New Mexico |

## TABLE OF CONTENTS

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.

## 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)

**Timing Limitation Stipulation / Condition of Approval for lesser prairie-chicken**: Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 feet from the source of the noise.

**Ground-level Abandoned Well Marker to avoid raptor perching**: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well. For more installation details, contact the Carlsbad Field Office at 575-234-5972.

**Communitization Agreement**

A Communitization Agreement covering the acreage dedicated to this well must be filed for approval with the BLM. The effective date of the agreement shall be prior to any sales. In addition, the well sign shall include the surface and bottom hole lease numbers. If the Communitization Agreement number is known, it shall also be on the sign. If not, it shall be placed on the sign when the sign is replaced. **The name of the well should be change to reflect the Communitization Agreement.**

# 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 stockpile the topsoil in a low profile manner in order to prevent wind/water erosion of the topsoil. The topsoil to be stripped is approximately 6 inches in depth. The topsoil will be used 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. 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.

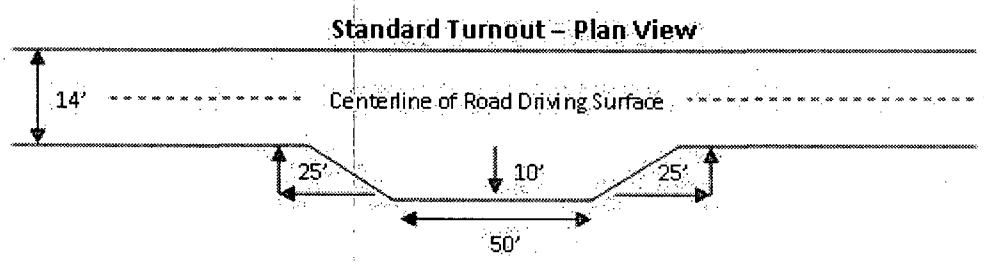
Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

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.

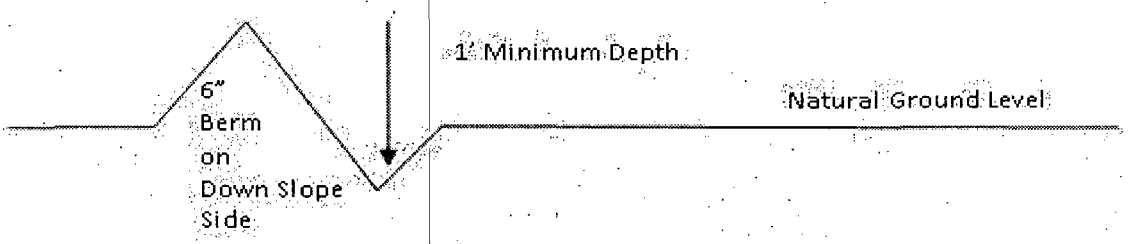
**Turnouts**
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall be constructed on all blind curves. Turnouts shall conform to the following diagram:




**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:

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

**Culvert Installations**
Appropriately sized culvert(s) shall be installed at the deep waterway channel flow crossing.

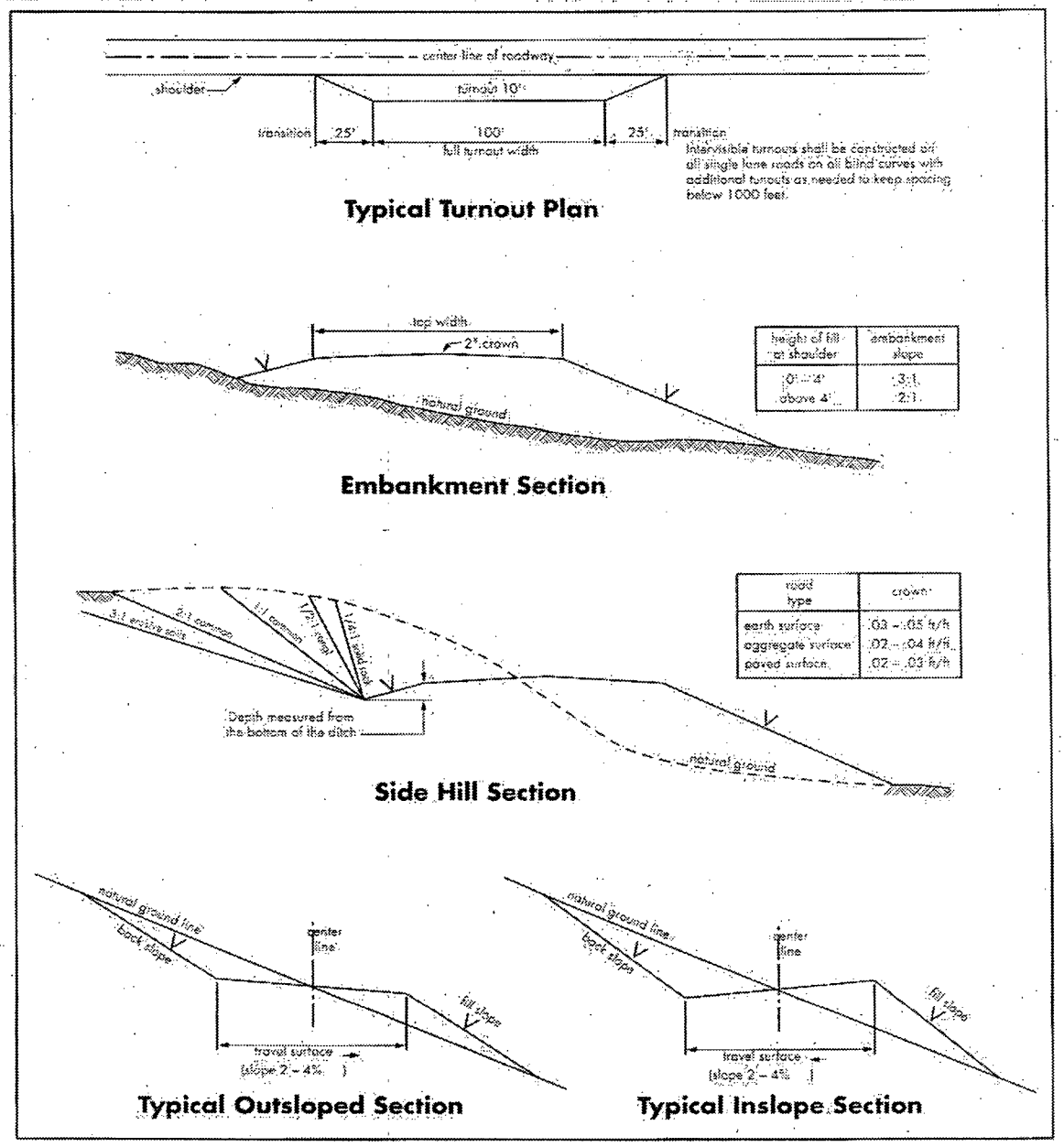
**Cattleguards**
An appropriately sized cattleguard(s) sufficient to carry out the project shall be installed and maintained at fence crossing(s).

Any existing cattleguard(s) on the access road 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 cattleguard(s) that are in place and are utilized during lease operations.

A gate shall be constructed and fastened securely to H-braces.

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

**Figure 1 – Cross Sections and Plans For Typical Road Sections**



# VII. DRILLING

## A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified a minimum of 4 hours in advance for a representative to witness:

a. Spudding well
b. Setting and/or Cementing of all casing strings
c. BOPE tests

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

1. A Hydrogen Sulfide (H2S) Drilling Plan should be activated 500 feet prior to drilling into the **Grayburg** formation. **As a result, the Hydrogen Sulfide area must meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, please provide measured values 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. **The record of the drilling rate along with the GR/N well log run from TD to surface will 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. 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.).**

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

**Wait on cement (WOC) time prior to drilling out for a primary cement job will be a minimum 18 hours for a water basin, 24 hours in the potash area, or 500 pounds compressive strength, whichever is greater for all casing strings. DURING THIS WOC TIME, NO DRILL PIPE, ETC. SHALL BE RUN IN THE HOLE. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. See individual casing strings for details regarding lead cement slurry requirements.**

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

**Possible water and brine flows in the Salado and Artesia Group.**
**Possible lost circulation in the Grayburg and San Andres formations.**

1. The **13-3/8** inch surface casing shall be set at **approximately 393 feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt)** and cemented to the surface.

    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.

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is: (Set casing in the Tansill at approximately 1200')

    ☒ As proposed. If cement does not circulate see B.1.a, c-d above.

**Operator has proposed DV tool at depth of 443', but will adjust cement proportionately if moved. DV tool SHALL be set a minimum of 50' below previous shoe and a minimum of 200' above current shoe. Operator shall submit sundry if DV tool depth cannot be set in this range. If an ECP is used, it is to be set a minimum of 50' below the shoe to provide cement across the shoe. If it cannot be set below the shoe, a CBL shall be run to verify cement coverage.**

a. First stage to DV tool:

☒ Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with second stage cement job. Operator should have plans as to how they will achieve circulation on the next stage.

b. Second stage above DV tool:

☒ Cement to surface. If cement does not circulate, contact the appropriate BLM office.

3. The minimum required fill of cement behind the **7 X 5-1/2** inch production casing is:

☒ Cement from Kick off point to 200 feet inside previous casing. If cement does not circulate, contact the appropriate BLM office.

**Operator has proposed DV tool at depth of 5123', but will adjust cement proportionately if moved. DV tool shall be set a minimum of 50' below previous shoe and a minimum of 200' above current shoe. Operator shall submit sundry if DV tool depth cannot be set in this range.**

a. First stage from KOP to DV tool:

☒ Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with second stage cement job. Operator should have plans as to how they will achieve tie-back on the next stage.

b. Second stage above DV tool:

☒ Cement should tie-back at least 200 feet into previous casing string. Operator shall provide method of verification.

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.

## C. PRESSURE CONTROL

1. 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. **Operator approved for either 13-5/8" or 11" BOP stack.**

2. **In the case where the only BOP installed is an annular preventer, it shall be tested to full working pressure or a minimum of 2000 psi.**

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.

    a. **For surface casing only:** If the BOP/BOPE is to be tested against casing, the wait on cement (WOC) time for that casing is to be met (see WOC statement at start of casing section). Independent service company required.

4. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

    a. In a water basin, 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. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

    b. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (18 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).

    c. The results of the test shall be reported to the appropriate BLM office.

    d. 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.**

    e. 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.

## 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.

**CRW 031913**

# 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.

**Containment Structures**
The containment structure shall be constructed to hold the capacity of the entire contents of the largest tank, plus 24 hour production, unless more stringent protective requirements are deemed necessary by the Authorized Officer.

**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 APD and attachments, including stipulations, survey plat and/or map, will be on location during construction. BLM personnel may request to you 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. The 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. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards 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 especially, 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. The 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 agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. The holder shall be liable for damage or injury to the United States to the extent provided by 43 CFR Sec. 2883.1-4. The 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 the 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 the holder, regardless of fault. Upon failure of the 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 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 the holder. Such action by the Authorized Officer shall not relieve the holder

of any responsibility as provided herein.

6. The pipeline shall be routed no farther than 6 feet from and parallel to existing roads. The authorized right-of-way width will be **20** feet. 14 feet of the right-of-way width will consist of existing disturbance (existing lease roads) and the remaining 6 feet will consist of area adjacent to the disturbance. All construction and maintenance activity will be confined to existing roads.

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

8. The 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 will be "snaked" around hummocks and dunes rather then 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.

## 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).

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well.

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