

Form 3160-3
(April 2004)

OCD Artesia

FORM APPROVED
OMB No 1004-0137
Expires March 31, 2007UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

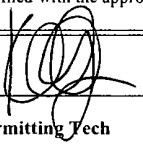
APPLICATION FOR PERMIT TO DRILL OR REENTER

| | | | |
|--|--|---|--|
| 1a. Type of work <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER | | 5 Lease Serial No. NMLC-028731A | |
| 1b. Type of Well <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other <input type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone | | 6 If Indian, Allottee or Tribe Name N/A | |
| 2 Name of Operator COG Operating LLC | | 7 If Unit or CA Agreement, Name and No NMNM-111789X; Dodd Federal Unit | |
| 3a Address 550 W. Texas Ave., Suite 100 Midland, TX 79701 | | 8 Lease Name and Well No. DODD FEDERAL UNIT #620 | |
| 3b Phone No. (include area code) 432-685-4384 | | 9 API Well No. 30-015- 40602 | |
| 4 Location of Well (Report location clearly and in accordance with any State requirements *) At surface SHL: 1600' FSL & 690' FEL, Unit I At proposed prod zone BHL: 1550' FSL & 330' FEL, Unit I | | 10 Field and Pool, or Exploratory Dodd; Glorieta-Upper Yeso | |
| 11 Sec, T R M or Blk and Survey or Area Sec 15 T17S R29E | | 12 County or Parish EDDY | |
| 13 State NM | | 14 Distance in miles and direction from nearest town or post office* 2 miles from Loco Hills, NM | |
| 15 Distance from proposed* location to nearest property or lease line, ft (Also to nearest drg unit line, if any) 690' | 16 No. of acres in lease 600 | 17 Spacing Unit dedicated to this well 40 | |
| 18 Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft 317' | 19 Proposed Depth TVD: 4550' MD: 4569' | 20 BLM/BIA Bond No on file NMB000740; NMB000215 | |
| 21 Elevations (Show whether DF, KDB, RT, GL, etc.) 3594' GL | 22 Approximate date work will start* 08/31/2012 | 23 Estimated duration 15 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 | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above) |
| 2. A Drilling Plan | 5. Operator certification |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office) | 6. Such other site specific information and/or plans as may be required by the authorized officer |

| | | |
|---|--|--------------------|
| 25. Signature  | Name (Printed/Typed) Kelly J. Holly | Date 06/05/2012 |
| Title Permitting Tech | | |

| | | |
|--|---------------------------------------|---------------------------------|
| Approved by (Signature) /s/ Don Peterson | Name (Printed/Typed) /s/ Don Peterson | Date AUG - 8 2012 |
| Title FIELD MANAGER | | Office CARLSBAD FIELD OFFICE |

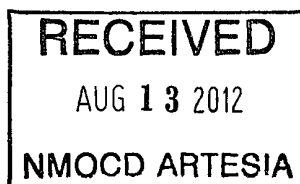
Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon
Conditions of approval, if any, are attached.

APPROVAL FOR TWO YEARS

Title 18 USC Section 1001 and Title 43 USC 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

SEE ATTACHED FOR
CONDITIONS OF APPROVALApproval Subject to General Requirements
& Special Stipulations Attached

Surface Use Plan
COG Operating, LLC
Dodd Federal Unit #620
SL: 1600' FSL & 690' FEL UL I
BHL: 1550' FSL & 330' FEL UL I
Section 15, T-17-S, R-29-E
Eddy County, New Mexico

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 13th day of June, 2012.

Signed: Carl Bird

Printed Name: Carl Bird

Position: Drilling Engineer

Address: 550 W. Texas, Suite 1300, Midland, Texas 79701

Telephone: (432) 683-7443

Field Representative (if not above signatory): Same

E-mail: cbird@concho.com

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-10:
Revised August 1, 201
Submit one copy to appropriate
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

| | | |
|------------------------------------|-------------------------------------|--|
| API Number 30-015- 40602 | Pool Code 97917 | Pool Name Dodd; Glorieta Upper Yeso |
| Property Code 308195 | Property Name DODD FEDERAL UNIT | Well Number 620 |
| OGRID No. 229137 | Operator Name COG OPERATING, LLC | Elevation 3594' |

Surface Location


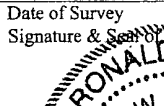
| UL or lot No. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---------------|---------|----------|-------|---------|---------------|------------------|---------------|----------------|--------|
| I | 15 | 17-S | 29-E | | 1600 | SOUTH | 690 | EAST | 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 |
|---------------|---------|----------|-------|---------|---------------|------------------|---------------|----------------|--------|
| I | 15 | 17-S | 29-E | | 1550 | SOUTH | 330 | EAST | EDDY |

| | | | |
|-----------------------|-----------------|--------------------|-----------------------|
| Dedicated Acres 40 | Joint or Infill | Consolidation Code | Order No. 4569 8/8 |
|-----------------------|-----------------|--------------------|-----------------------|

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

| | | | | | | | | | |
|---|----------------------------|----------------------------|---|----------------------------|---|----------------------------|---|----------------------------|---|
| <p>GEODETIC COORDINATES NAD 27 NME</p> <p>SURFACE LOCATION Y=666359.6 N X=585251.5 E</p> <p>BOTTOM HOLE LOCATION Y=666309.8 N X=585611.6 E</p> <p>CORNER COORDINATES TABLE</p> <table border="1"> <tr> <td>Ⓐ</td> <td>Y=667403.0 N, X=584616.0 E</td> </tr> <tr> <td>Ⓑ</td> <td>Y=667404.9 N, X=585938.7 E</td> </tr> <tr> <td>Ⓒ</td> <td>Y=666081.1 N, X=584618.9 E</td> </tr> <tr> <td>Ⓓ</td> <td>Y=666082.7 N, X=585942.0 E</td> </tr> </table> <p>DETAIL</p> <p>3601.1' 3593.7' 600' 3596.5' 3593.4'</p> <p>Estimated Completed Interval: 1559 FSL + 399 FES</p> <p>GRID: AZ = 97°52'28" HORIZ DIST = 363.6'</p> <p>690' 330' 1600' 1550'</p> | Ⓐ | Y=667403.0 N, X=584616.0 E | Ⓑ | Y=667404.9 N, X=585938.7 E | Ⓒ | Y=666081.1 N, X=584618.9 E | Ⓓ | Y=666082.7 N, X=585942.0 E | <p>OPERATOR CERTIFICATION</p> <p>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.</p> <p> 5-30-12 Signature Date</p> <p>Kelly J. Holly Printed Name</p> <p>kholly@concho.com E-mail Address</p> <p>SURVEYOR CERTIFICATION</p> <p>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief</p> <p>APRIL 27, 2012 Date of Survey</p> <p> Professional Surveyor</p> <p>RONALD J. EIDSON NEW MEXICO 3239</p> <p>Certificate Number Gary Eidson 12641 Ronald J. Eidson 3239</p> <p>AF WSC.W.O 12.11.0416</p> |
| Ⓐ | Y=667403.0 N, X=584616.0 E | | | | | | | | |
| Ⓑ | Y=667404.9 N, X=585938.7 E | | | | | | | | |
| Ⓒ | Y=666081.1 N, X=584618.9 E | | | | | | | | |
| Ⓓ | Y=666082.7 N, X=585942.0 E | | | | | | | | |

MASTER DRILLING PROGRAM

1. Geologic Name of Surface Formation

Quaternary

2. Estimated Tops of Important Geologic Markers:

| | |
|--------------|---------|
| Quaternary | Surface |
| Rustler | 220' |
| Salt | 360' |
| Base of Salt | 780' |
| Yates | 950' |
| Seven Rivers | 1235' |
| Queen | 1845' |
| Grayburg | 2220' |
| San Andres | 2540' |
| Glorieta | 4000' |
| Paddock | 4075' |
| Blaine | 4620' |
| Tubb | 5520' |

3. Estimated Depths of Anticipated Fresh Water, Oil and Gas

| | | |
|------------|-------|-------------|
| Water Sand | 150' | Fresh Water |
| Grayburg | 2220' | Oil/Gas |
| San Andres | 2540' | Oil/Gas |
| Glorieta | 4000' | Oil/Gas |
| Paddock | 4075' | Oil/Gas |
| Blaine | 4620' | Oil/Gas |
| Tubb | 5520' | Oil/Gas |

No other formations are expected to give up oil, gas or fresh water in measurable quantities. Setting 13 3/8" casing to 300' and circulating cement back to the surface will protect the surface fresh water sand. The Salt Section will be protected by setting 8 5/8" casing to 850' and circulating cement, in a single or multi-stage job and/or with an ECP, back to the surface. Any shallower zones above TD, which contain commercial quantities of oil and/or gas, will have cement circulated across them. This will be achieved by cementing, with a single or multi-stage job, the 5 1/2" production casing back 200' into the intermediate casing, (but calculated to surface) to be run at TD. 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

COG Operating LLC
Master Drilling Plan
Dodd; Glorieta- Upper Yeso
Use for Sections 6-30, T17S, R29E
Eddy County, NM

4. Casing Program

| Hole Size | Interval | OD Casing | Weight | Grade | Jt., Condition | Jt. | brst/clps/ten |
|-----------|-----------|-----------|-----------|------------------|----------------|------|-----------------|
| 17 1/2" | 0-300.25' | 13 3/8" | 48# | H-40/J-55 hybrid | ST&C/New | ST&C | 9.22/3.943/15.8 |
| 11" | 0-850.97' | 8 5/8" | 24or32# | J-55 | ST&C/New | ST&C | 3.03/2.029/7.82 |
| 7 7/8" | 0-TD | 5 1/2" | 15.5or17# | J-55orL-80 | LT&C/New | LT&C | 1.88/1.731/2.42 |

5. Cement Program *See COA*

13 3/8" Surface Casing:

Class C w/ 2% CaCl₂ + 0.25 pps CF, 400 sx, yield 1.32 cuft/sk, 14.8 ppg, back to surface. 154% excess

8 5/8" Intermediate Casing:

11" Hole:

Single Stage: 50:50:10 C:Poz:Gel w/ 5% Salt +0.25% CF, 300 sx lead, yield-2.45 cuft/sk, 11.8 ppg + Class C w/2% CaCl₂, 200 sx tail, yield-1.32 cuft/sk, 14.8 ppg, back to surface. 363% excess

Multi-Stage: Stage 1: Class C w/2% CaCl₂, 200 sx, yield - 1.32 cuft/sk, 14.8 ppg; 108% excess Stage 2: 50:50:10 C:Poz:Gel w/ 5% Salt +0.25% CF, 300 sx, yield - 2.45 cuft/sk, 11.8 ppg, back to surface, 726% excess; assumption for tool is lost circulation. Multi stage tool to be set at approximately, depending on hole conditions, 350' (50' below the surface casing). Cement volumes will be adjusted proportionately for depth changes of multi stage tool.

5 1/2" Production Casing:

Single Stage: LEAD 500 sx 35:65:6 C:Poz:Gel w/ 5% Salt + 5 pps LCM + 0.2% SMS + 0.3% FL-52A + 0.125 pps CF, yield-2.05 cuft/sk, 12.5 ppg; + TAIL 400 sx 50:50:2 C:Poz:Gel w/ 5% Salt + 3 pps LCM + 0.6% SMS + 1% FL-25 + 1% BA-58 + 0.3% FL-52A + 0.125 pps CF, yield-1.37 cuft/sk, 14.0 ppg, to 200' minimum tie back to intermediate casing. 76.8% open hole excess, cement calculated back to surface.

Multi-Stage: Stage 1: (Assumed TD of 4550') 500 sx 50:50:2 C:Poz:Gel w/ 5% Salt + 3 pps LCM + 0.6% SMS + 1% FL-25 + 1% BA-58 + 0.3% FL-52A + 0.125 pps CF, yield - 1.37 cuft/sk, 14.0 ppg, 34% excess; Stage 2: LEAD 450 sx 50:50:2 C:Poz:Gel w/ 5% Salt + 3 pps LCM + 0.6% SMS + 1% FL-25 + 1% BA-58 + 0.3% FL-52A + 0.125 pps CF, yield - 1.37 cuft/sk, 14.0 ppg, + TAIL 250 sx Class C w/ 0.3% R-3 + 1.5% CD-32, yield - 1.02 cuft/sk, 16.8 ppg, 148% open hole excess, cement calculated back to surface. Multi stage tool to be set at approximately, depending on hole conditions, 2500'. Cement volumes will be adjusted proportionately for depth changes of multi stage tool, assumption for tool is water flow.

6. Minimum Specifications for Pressure Control

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 of 4 1/2" drill pipe rams on the bottom. A 13-5/8" or 11" BOP will be used, depending on the rig selected, during the drilling of the well. The BOP will be nipped up on the 13 3/8" surface casing with BOP equipment and tested to 2000 psi. When 11" BOP is used the special drilling flange will be utilized on the 13-3/8" head to allow testing the BOP with a retrievable test plug. After setting 8-5/8" the BOP will then be nipped up on the 8 5/8" intermediate casing and tested by a third party to 2000 psi 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 (Exhibit #10) will include a Kelly cock and floor safety valve, choke lines and a choke manifold (Exhibit #11) with a 2000 psi WP rating.

The majority of the rigs currently in use have a 13-5/8" BOP, so no special provision is needed for most wells in the area for conventionally testing the BOP with a test plug. However, due to the vagaries of rig scheduling, it might be that one of the few rigs with 11" BOP's might be called upon to drill any specific well in the area. Note that intermediate hole size is always 11". Therefore, COG Operating LLC respectfully requests a variance to the requirement of 13-5/8" *see 107*

BOP on 13-3/8" casing. When that circumstance is encountered the special flange will be utilized to allow testing the entire BOP with a test plug, without subjecting the casing to test pressure. The special flange also allows the return to full-open capability if desired.

7. Types and Characteristics of the Proposed Mud System

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

| DEPTH | TYPE | WEIGHT | VISCOSITY | WATERLOSS |
|---------------------|-------------|---------|-----------|-----------|
| 0-300' <i>255</i> | Fresh Water | 8.5 | 28 | N.C. |
| 300-850' <i>430</i> | Brine | 10 | 30 | N.C. |
| 850'-TD' | Cut Brine | 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.

8. 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.

9. Logging, Testing and Coring Program *See COA*

- A. The electric logging program will consist of GR-Dual Laterolog, Spectral Density, Dual Spaced Neutron, CSNG Log and will be run from TD to Surface.
- B. Drill Stem test is not anticipated.
- C. No conventional coring is anticipated.
- D. Further testing procedures will be determined after the 5 1/2" production casing has been cemented at TD, based on drill shows and log evaluation.

10. Abnormal Conditions, Pressure, Temperatures and Potential Hazards

No abnormal pressures or temperatures are anticipated. The estimated bottom hole at TD is 110 degrees and the estimated maximum bottom hole pressure is 2300 psig. Measurable gas volumes or Hydrogen Sulfide levels have not been encountered during drilling operations in this area, although a Hydrogen Sulfide

*COG Operating LLC
Master Drilling Plan
Dodd; Glorieta- Upper Yeso
Use for Sections 6-30, T17S, R29E
Eddy County, NM*

Drilling Operation Plan is attached to this program. No major loss of circulation zones has been reported in offsetting wells.

11. Anticipated Starting Date and Duration of Operations

Road and location work will not begin until approval has been received from the BLM. As this is a Master Drilling plan, please refer to the Form 3160-3 for the anticipated start date. Once commenced, drilling operations should be finished in approximately 10 days. If the well is productive, an additional 30 days will be required for completion and testing before a decision is made to install permanent facilities. Completion is planned in the Paddock formation.



COG Operating LLC

Eddy County, NM (NAN27 NME)

Dodd Federal Unit #620

OH

Plan: Pan #1 - 7-7/8" Hole

Surface: 1600' FSL, 690' FEL, Sec 15, T17S, R29E, Unit I

BHL: 1550' FSL, 340' FEL, Sec 15, T17S, R29E, Unit I

Top of Paddock = 41' South of Surface & 291' East of Surface @ 4000' TVD

Standard Planning Report

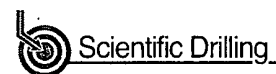
01 June, 2012





Scientific Drilling International, Inc.

Planning Report



| | | | |
|-----------|-----------------------------|------------------------------|-----------------------------|
| Database: | EDM 5000 1 Single User Db | Local Co-ordinate Reference: | Site Dodd Federal Unit #620 |
| Company: | COG Operating LLC | TVD Reference: | GL @ 3594.00usft |
| Project: | Eddy County, NM (NAN27-NME) | MD Reference: | GL @ 3594.00usft |
| Site: | Dodd Federal Unit #620 | North Reference: | Grid |
| Well: | Dodd Federal Unit #620 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | OH | | |
| Design: | Pan #1 7-7/8" 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 | | |

| | | | |
|-----------------------|------------------------|-------------------|-----------------|
| Site | Dodd Federal Unit #620 | | |
| Site Position: | | Northing: | 666,359.60 usft |
| From: | Map | Easting: | 585,251.50 usft |
| Position Uncertainty: | 0.00 usft | Slot Radius: | 13-3/16" |
| | | Grid Convergence: | 0.15° |

| | | | |
|----------------------|------------------------|---------------------|---------------|
| Well | Dodd Federal Unit #620 | | |
| Well Position | +N/-S | 0.00 usft | Northing: |
| | +E/-W | 0.00 usft | Easting: |
| Position Uncertainty | 0.00 usft | Wellhead Elevation: | Ground Level: |

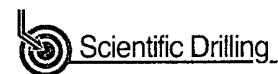
| | | | |
|-----------|------------|-------------|----------------|
| Wellbore | OH | | |
| Magnetics | Model Name | Sample Date | Declination |
| | IGRF2010 | 06/01/12 | 7.74 |
| | | | Dip Angle |
| | | | 60.64 |
| | | | Field Strength |
| | | | 48,831 |

| | | | |
|-------------------|--------------------|--------|---------------|
| Design | Pan #1 7-7/8" Hole | | |
| Audit Notes: | | | |
| Version: | Phase: | PLAN | Tie On Depth: |
| | | | 0.00 |
| Vertical Section: | Depth From (TVD) | +N/-S | +E/-W |
| | (usft) | (usft) | (usft) |
| | 0.00 | 0.00 | 0.00 |
| | | | Direction |
| | | | 98.10 |

| | | | | | | | | | | |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|------------------------|-----------------------|---------|----------------|
| 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 | |
| 1,150.00 | 0.00 | 0.00 | 1,150.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1,461.03 | 6.22 | 98.10 | 1,460.42 | -2.38 | 16.70 | 2.00 | 2.00 | 31.54 | 98.10 | |
| 4,568.91 | 6.22 | 98.10 | 4,550.00 | -49.80 | 350.10 | 0.00 | 0.00 | 0.00 | 0.00 | PBHL-Dodd #620 |



Scientific Drilling International, Inc.
Planning Report



| | | | |
|-----------|-----------------------------|------------------------------|-----------------------------|
| Database: | EDM 5000 1- Single User Db | Local Co-ordinate Reference: | Site Dodd Federal Unit #620 |
| Company: | COG Operating LLC | TVD Reference: | GL @ 3594.00usft |
| Project: | Eddy County, NM (NAN27-NME) | MD Reference: | GL @ 3594.00usft |
| Site: | Dodd Federal Unit #620 | North Reference: | Grid |
| Well: | Dodd Federal Unit #620 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | OH | | |
| Design: | Pan #1 - 7-7/8" 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 |
| 1,050.00 | 0.00 | 0.00 | 1,050.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8-5/8" Casing | | | | | | | | | |
| 1,150.00 | 0.00 | 0.00 | 1,150.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| KOP Start DLS 2.00°/100' | | | | | | | | | |
| 1,200.00 | 1.00 | 98.10 | 1,200.00 | -0.06 | 0.43 | 0.44 | 2.00 | 2.00 | 0.00 |
| 1,300.00 | 3.00 | 98.10 | 1,299.93 | -0.55 | 3.89 | 3.93 | 2.00 | 2.00 | 0.00 |
| 1,400.00 | 5.00 | 98.10 | 1,399.68 | -1.54 | 10.79 | 10.90 | 2.00 | 2.00 | 0.00 |
| 1,461.03 | 6.22 | 98.10 | 1,460.42 | -2.38 | 16.70 | 16.87 | 2.00 | 2.00 | 0.00 |
| EOC hold 6.22° | | | | | | | | | |
| 1,500.00 | 6.22 | 98.10 | 1,499.16 | -2.97 | 20.88 | 21.09 | 0.00 | 0.00 | 0.00 |
| 1,600.00 | 6.22 | 98.10 | 1,598.57 | -4.50 | 31.61 | 31.93 | 0.00 | 0.00 | 0.00 |
| 1,700.00 | 6.22 | 98.10 | 1,697.98 | -6.02 | 42.34 | 42.76 | 0.00 | 0.00 | 0.00 |
| 1,800.00 | 6.22 | 98.10 | 1,797.39 | -7.55 | 53.06 | 53.60 | 0.00 | 0.00 | 0.00 |
| 1,900.00 | 6.22 | 98.10 | 1,896.80 | -9.07 | 63.79 | 64.43 | 0.00 | 0.00 | 0.00 |
| 2,000.00 | 6.22 | 98.10 | 1,996.22 | -10.60 | 74.52 | 75.27 | 0.00 | 0.00 | 0.00 |
| 2,100.00 | 6.22 | 98.10 | 2,095.63 | -12.13 | 85.25 | 86.10 | 0.00 | 0.00 | 0.00 |
| 2,200.00 | 6.22 | 98.10 | 2,195.04 | -13.65 | 95.97 | 96.94 | 0.00 | 0.00 | 0.00 |
| 2,300.00 | 6.22 | 98.10 | 2,294.45 | -15.18 | 106.70 | 107.77 | 0.00 | 0.00 | 0.00 |
| 2,400.00 | 6.22 | 98.10 | 2,393.86 | -16.70 | 117.43 | 118.61 | 0.00 | 0.00 | 0.00 |
| 2,500.00 | 6.22 | 98.10 | 2,493.27 | -18.23 | 128.16 | 129.45 | 0.00 | 0.00 | 0.00 |
| 2,600.00 | 6.22 | 98.10 | 2,592.68 | -19.76 | 138.88 | 140.28 | 0.00 | 0.00 | 0.00 |
| 2,700.00 | 6.22 | 98.10 | 2,692.09 | -21.28 | 149.61 | 151.12 | 0.00 | 0.00 | 0.00 |
| 2,800.00 | 6.22 | 98.10 | 2,791.51 | -22.81 | 160.34 | 161.95 | 0.00 | 0.00 | 0.00 |
| 2,900.00 | 6.22 | 98.10 | 2,890.92 | -24.33 | 171.07 | 172.79 | 0.00 | 0.00 | 0.00 |
| 3,000.00 | 6.22 | 98.10 | 2,990.33 | -25.86 | 181.79 | 183.62 | 0.00 | 0.00 | 0.00 |
| 3,100.00 | 6.22 | 98.10 | 3,089.74 | -27.39 | 192.52 | 194.46 | 0.00 | 0.00 | 0.00 |
| 3,200.00 | 6.22 | 98.10 | 3,189.15 | -28.91 | 203.25 | 205.30 | 0.00 | 0.00 | 0.00 |
| 3,300.00 | 6.22 | 98.10 | 3,288.56 | -30.44 | 213.98 | 216.13 | 0.00 | 0.00 | 0.00 |
| 3,400.00 | 6.22 | 98.10 | 3,387.97 | -31.96 | 224.70 | 226.97 | 0.00 | 0.00 | 0.00 |
| 3,500.00 | 6.22 | 98.10 | 3,487.38 | -33.49 | 235.43 | 237.80 | 0.00 | 0.00 | 0.00 |
| 3,600.00 | 6.22 | 98.10 | 3,586.80 | -35.01 | 246.16 | 248.64 | 0.00 | 0.00 | 0.00 |
| 3,700.00 | 6.22 | 98.10 | 3,686.21 | -36.54 | 256.89 | 259.47 | 0.00 | 0.00 | 0.00 |
| 3,800.00 | 6.22 | 98.10 | 3,785.62 | -38.07 | 267.61 | 270.31 | 0.00 | 0.00 | 0.00 |
| 3,900.00 | 6.22 | 98.10 | 3,885.03 | -39.59 | 278.34 | 281.14 | 0.00 | 0.00 | 0.00 |
| 4,000.00 | 6.22 | 98.10 | 3,984.44 | -41.12 | 289.07 | 291.98 | 0.00 | 0.00 | 0.00 |
| 4,015.65 | 6.22 | 98.10 | 4,000.00 | -41.36 | 290.75 | 293.68 | 0.00 | 0.00 | 0.00 |
| Top of Paddock | | | | | | | | | |
| 4,100.00 | 6.22 | 98.10 | 4,083.85 | -42.64 | 299.80 | 302.82 | 0.00 | 0.00 | 0.00 |
| 4,200.00 | 6.22 | 98.10 | 4,183.26 | -44.17 | 310.52 | 313.65 | 0.00 | 0.00 | 0.00 |
| 4,300.00 | 6.22 | 98.10 | 4,282.67 | -45.70 | 321.25 | 324.49 | 0.00 | 0.00 | 0.00 |
| 4,400.00 | 6.22 | 98.10 | 4,382.09 | -47.22 | 331.98 | 335.32 | 0.00 | 0.00 | 0.00 |
| 4,500.00 | 6.22 | 98.10 | 4,481.50 | -48.75 | 342.71 | 346.16 | 0.00 | 0.00 | 0.00 |
| 4,568.91 | 6.22 | 98.10 | 4,550.00 | -49.80 | 350.10 | 353.62 | 0.00 | 0.00 | 0.00 |
| PBHL Dodd #620 | | | | | | | | | |



Scientific Drilling International, Inc.
Planning Report



| | | | |
|-----------|-----------------------------|------------------------------|-----------------------------|
| Database: | EDM 5000.1 Single User Db | Local Co-ordinate Reference: | Site Dodd Federal Unit #620 |
| Company: | COG Operating LLC | TVD Reference: | GL @ 3594 00usft |
| Project: | Eddy County, NM (NAN27 NME) | MD Reference: | GL @ 3594 00usft |
| Site: | Dodd Federal Unit #620 | North Reference: | Grid |
| Well: | Dodd Federal Unit #620 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | OH | | |
| Design: | Pan #1 - 7-7/8" Hole | | |

| Design Targets | | | | | | | | | |
|---------------------------|-----------|----------|----------|--------|--------|------------|------------|------------------|------------------|
| Target Name | Dip Angle | Dip Dir. | TVD | +N/-S | +E/-W | Northing | Easting | Latitude | Longitude |
| - hit/miss target | (°) | (°) | (usft) | (usft) | (usft) | (usft) | (usft) | | |
| - Shape | | | | | | | | | |
| PBHL-Dodd #620 | 0 00 | 0 01 | 4,550 00 | -49 80 | 350 10 | 666,309 80 | 585,601 60 | 32° 49' 53 262 N | 104° 3' 16 743 W |
| - plan hits target center | | | | | | | | | |
| - Circle (radius 10 00) | | | | | | | | | |

| Casing Points | | | | |
|----------------|----------------|---------------|-----------------|---------------|
| Measured Depth | Vertical Depth | Name | Casing Diameter | Hole Diameter |
| (usft) | (usft) | | (") | (") |
| 1,050 00 | 1,050 00 | 8-5/8" Casing | 8-5/8 | 12-1/4 |

| Formations | | | | |
|----------------|----------------|----------------|-----------|---------------|
| Measured Depth | Vertical Depth | Name | Lithology | Dip Direction |
| (usft) | (usft) | | | (°) |
| 4,015 65 | 4,000 00 | Top of Paddock | | 0.00 |

| Plan Annotations | | | | |
|------------------|----------------|-------------------|--------------|--------------------------|
| Measured Depth | Vertical Depth | Local Coordinates | | Comment |
| (usft) | (usft) | +N/-S (usft) | +E/-W (usft) | |
| 1,150 00 | 1,150 00 | 0 00 | 0 00 | KOP Start DLS 2 00"/100' |
| 1,461 03 | 1,460 42 | -2 38 | 16.70 | EOC hold 6 22° |

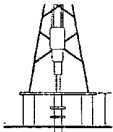


Dodd Federal Unit #620
Eddy County, NM (NAN27 NME)
Northing (Y) 666359.60
Easting (X) 585251.50
Pan #1 - 7-7/8" Hole



Admutive to Grid Nor
True North -0 1
Magnetic North -7 5
Magnetic Field
Strength 48830 G
Dip Angle 80.6
Date 05/01/2010
Model IGRF20

To convert Magnetic North to Grid Add 7.59°
To convert True North to Grid Subtract 0.15°



GL 3594.00

WELL DETAILS

| | | | | | | |
|------------------------|-------|--------------|-----------|------------------|------------------|------|
| Dodd Federal Unit #620 | | | | | | |
| | | Ground Level | 3594.00 | | | |
| +N/-S | +E/-W | Northing | Easting | Latitude | Longitude | Spot |
| 0.00 | 0.00 | 666359.60 | 585251.50 | 32° 49' 53.764 N | 104° 3' 20.845 W | |

SECTION DETAILS

| Sec | MD | Inc | Azi | TVD | +N/-S | +E/-W | Diag | TFace | VSecl | Target |
|-----|---------|------|-------|---------|--------|--------|------|-------|--------|----------------|
| 1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 1150.00 | 0.00 | 0.00 | 1150.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1461.03 | 0.22 | 98.10 | 1460.42 | -2.38 | 16.70 | 2.00 | 98.10 | 16.87 | 0.00 |
| 4 | 4568.91 | 0.22 | 98.10 | 4558.00 | -49.80 | 350.10 | 0.00 | 0.00 | 353.62 | PBHL-Dodd #620 |

DESIGN TARGET DETAILS

| Name | TVD | +N/-S | +E/-W | Northing | Easting | Latitude | Longitude | Shape |
|------------------------|---------|--------|--------|-----------|-----------|------------------|------------------|-----------------------|
| PBHL-Dodd #620 | 4550.00 | -49.80 | 350.10 | 666309.80 | 585001.80 | 32° 49' 53.262 N | 104° 3' 16.743 W | Circle (Radius 10.00) |
| plan hit target center | | | | | | | | |

FORMATION TOP DETAILS

| TVDPath | MDPath | Formation | DipAngle | DipDir |
|---------|---------|----------------|----------|--------|
| 4000.00 | 4015.95 | Top of Paddock | 0.00 | |

CASING DETAILS

| TVD | MD | Name | Size |
|---------|---------|---------------|--------|
| 1050.00 | 1050.00 | 8-5/8" Casing | 8-5/8" |

SITE DETAILS

Dodd Federal Unit #620
Site Centre Northing 666359.60
Easting 585251.50
Positional Uncertainty 0.00
Convergence 0.15
Local North Grid

Map System US State Plane 1927 (Exact solution)
Datum NAD 1927 (NADCON CONUS)
Ellipsoid Clarke 1866
Zone Name New Mexico East 3001
Local Origin Site Dodd Federal Unit #620 Grid North

Latitude 32° 49' 53.764 N
Longitude 104° 3' 20.845 W

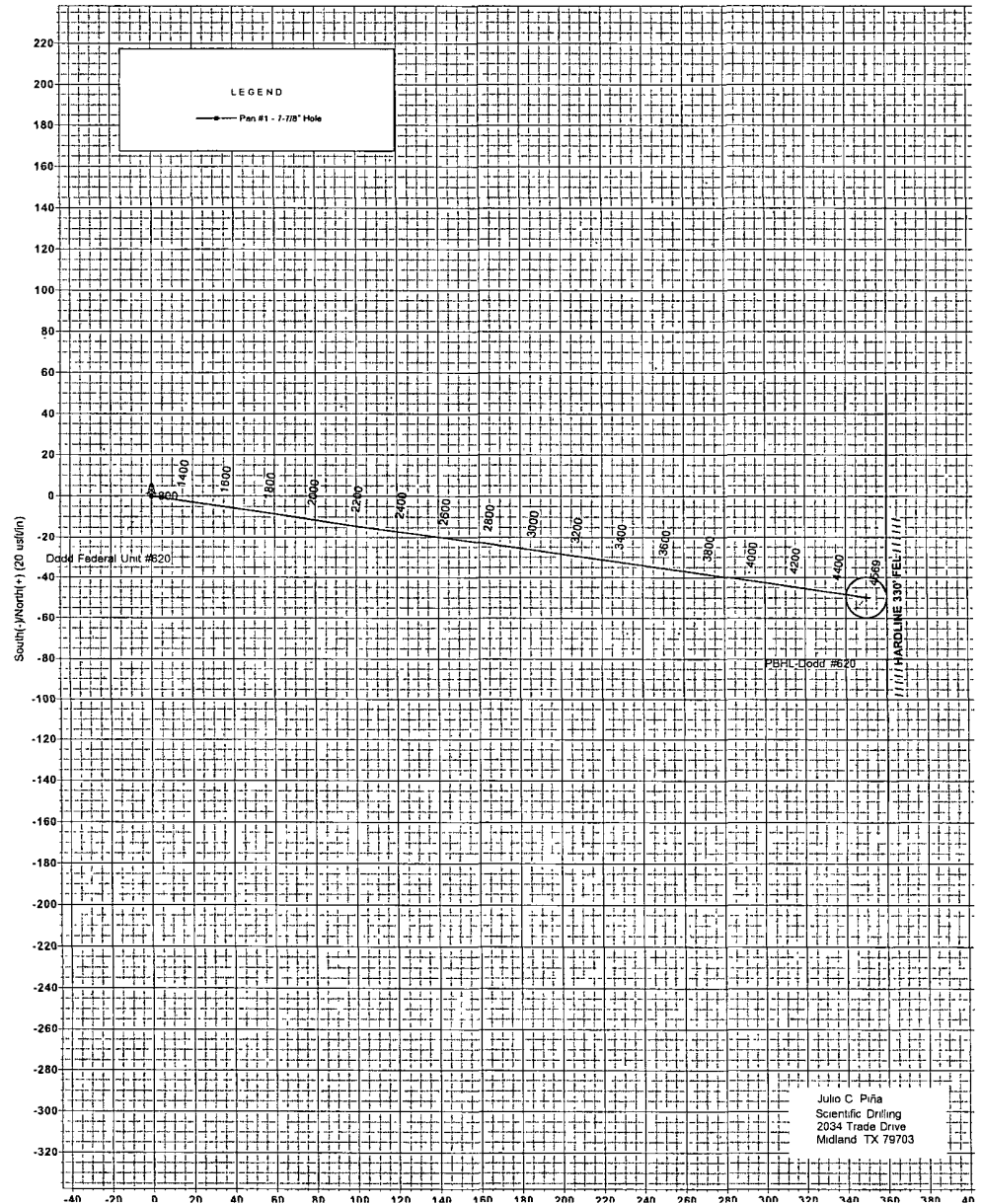
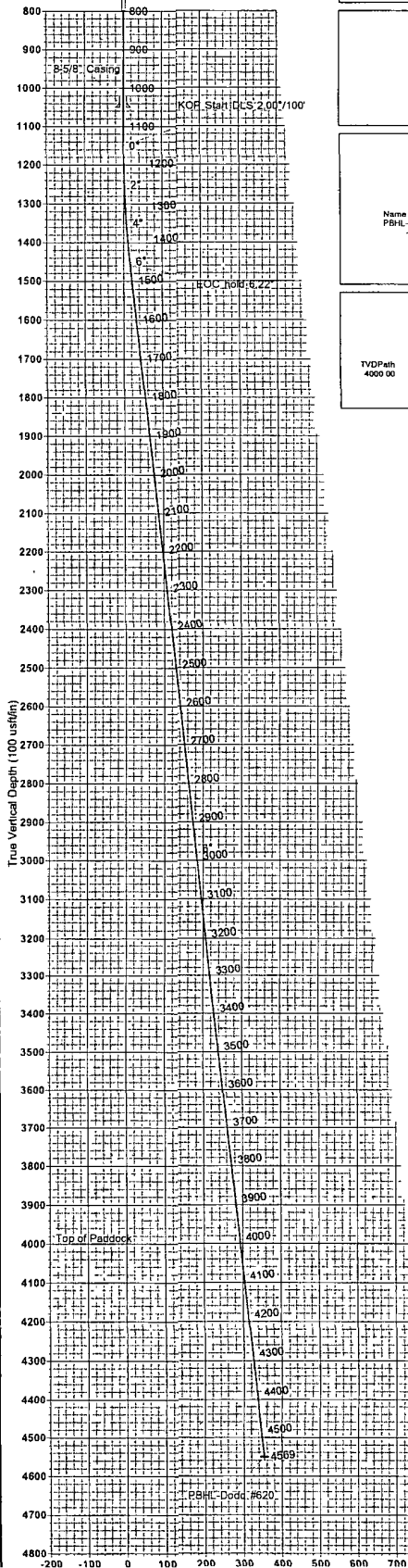
Grid East 585251.50
Grid North 666359.60
Scale Factor 1.000

Geographic Model IGRF2010
Sample Date 01-Jun-12
Magnetic Declination 7.74°
Dip Angle from Horizontal 80.64°
Magnetic Field Strength 48831

To convert Magnetic North to Grid Add 7.59°
To convert Magnetic North to True North Add 7.74° East
To convert True North to Grid Subtract 0.15°

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



Julio C. Pina
Scientific Drilling
2034 Trade Drive
Midland, TX 79703

COG OPERATING LLC

550 West Texas, Suite 100
Midland, TX 79701

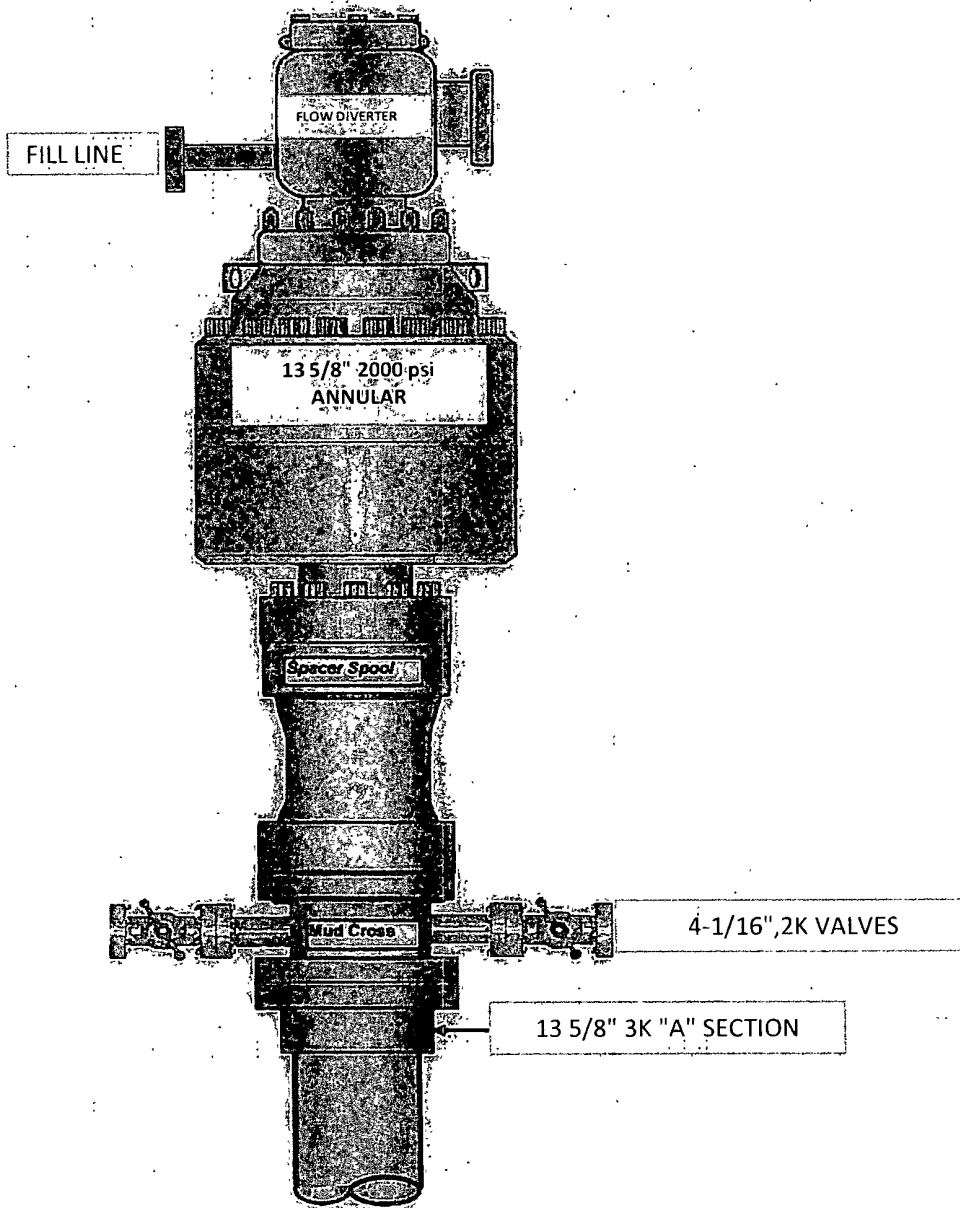
DIRECTIONAL PLAN VARIANCE REQUEST

**Dodd Federal Unit #620
EDDY, NM**

| | | |
|-----|-------------------|----------------------------|
| SHL | 1600 FSL, 690 FEL | Sec 15, T17S, R29E, Unit I |
| BHL | 1550 FSL, 330 FEL | Sec 15, T17S, R29E, Unit I |

COG Operating LLC, as Operator, desires that the APD reflect the footages as stated on the surveyor's plat. However, Operator also desires to avoid inadvertently drilling the well to a non-standard location. Therefore, due to the proximity of the plat bottom hole location to the pro-ration unit hard line(s), the attached directional plan is designed to avoid the hard lines by as much as fifty feet; said fifty feet being in either (or both) the north-south and/or east-west directions as applicable.

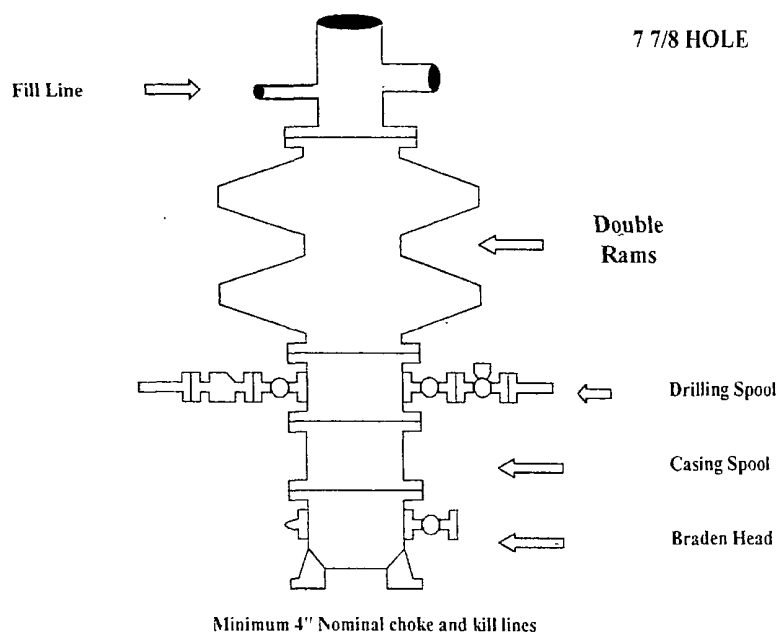
13 5/8" 2K ANNULAR



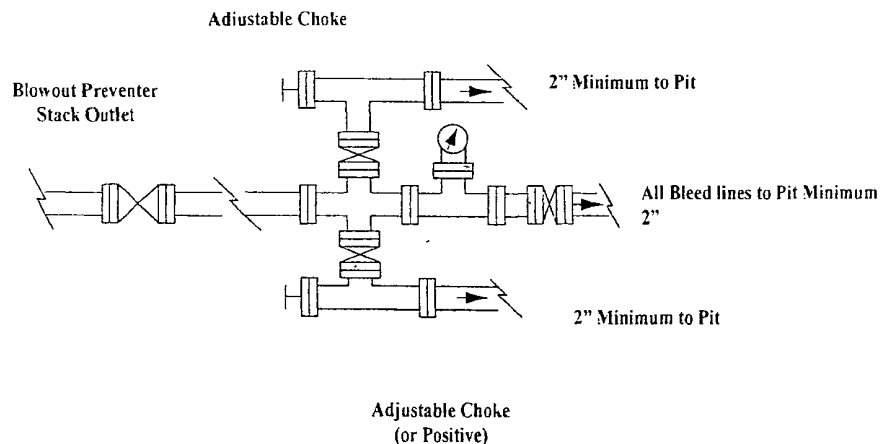
COG Operating LLC

Exhibit #9

BOPE and Choke Schematic



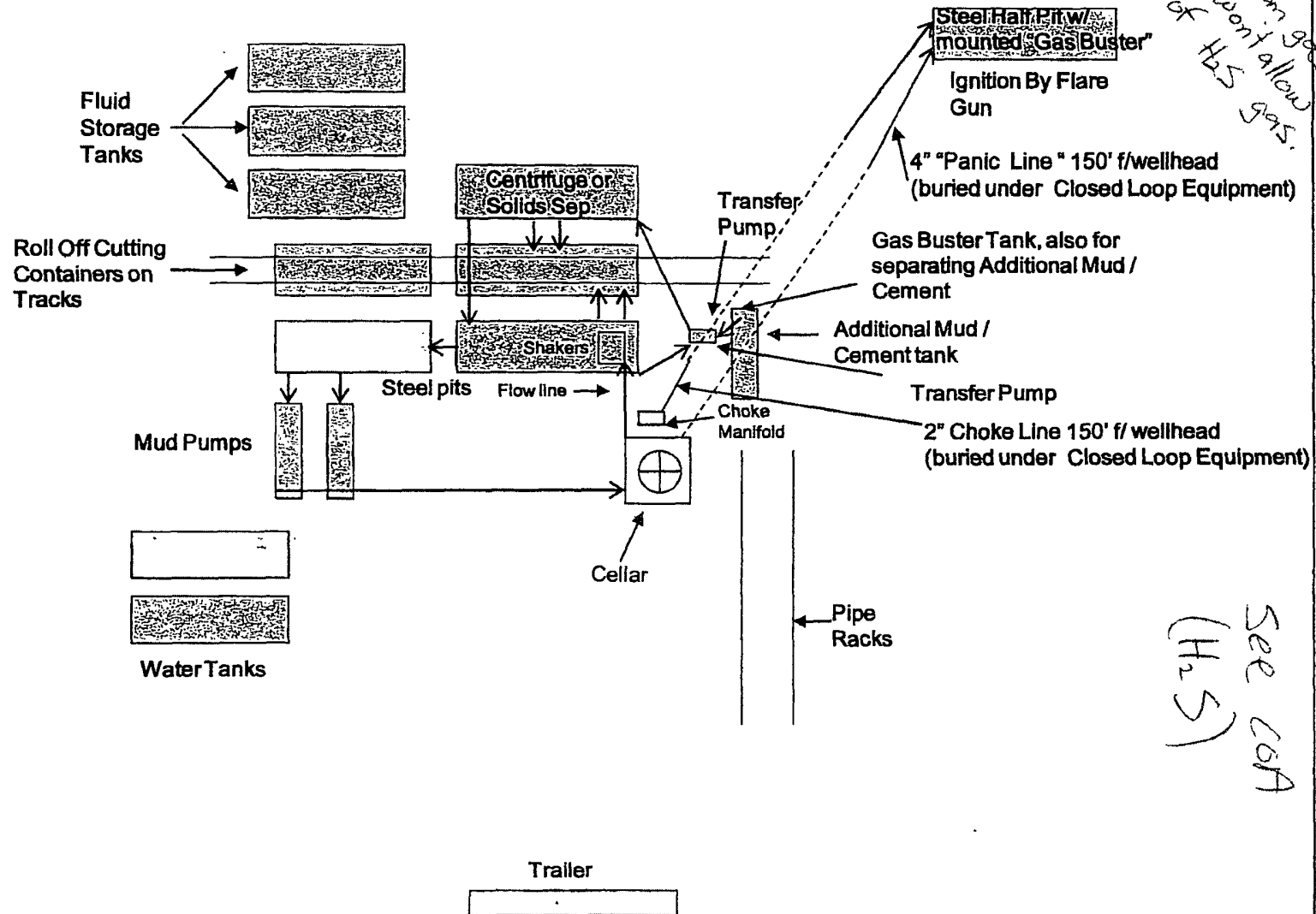
Choke Manifold Requirement (2000 psi WP)
No Annular Required



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



Closed Loop Operation & Maintenance Procedure

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 and 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 will 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.
- C. Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit.
- D. Auxiliary equipment may include if applicable: annular preventer & rotating head.

2. Protective equipment for essential personnel:

- A. Mark II Survive air 30-minute units located in the doghouse and at briefing areas, as indicated on well site diagram.

3. H2S detection and monitoring equipment:

- A. 1 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 (Exhibit #8).
- 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.

6. Metallurgy:

- A. All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H₂S service.
- B. All elastomers used for packing and seals shall be H₂S trim.

7. Communication:

- A. Radio communications in company vehicles including cellular telephone and 2-way radio.
- B. Land line (telephone) communication at Office.

8. Well testing:

- A. Drill stem testing will be performed with a minimum number of personnel in the immediate vicinity, which are necessary to safely and adequately conduct the test. The drill stem testing will be conducted during daylight hours and formation fluids will not be flowed to the surface. All drill-stem-testing operations conducted in an H₂S environment will use the closed chamber method of testing.
- B. There will be no drill stem testing.

EXHIBIT #7

WARNING
YOU ARE ENTERING AN H₂S
AUTHORIZED PERSONNEL ONLY

- 1. BEARDS OR CONTACT LENSES NOT ALLOWED
- 2. HARD HATS REQUIRED
- 3. SMOKING IN DESIGNATED AREAS ONLY
- 4. BE WIND CONSCIOUS AT ALL TIMES
- 5. CHECK WITH COG OPERATING FOREMAN AT

COG OPERATING LLC

1-432-683-7443

1-575-746-2010

EDDY COUNTY EMERGENCY NUMBERS

ARTESIA FIRE DEPT. 575-746-5050
ARTESIA POLICE DEPT. 575-746-5000
EDDY CO. SHERIFF DEPT. 575-746-9888

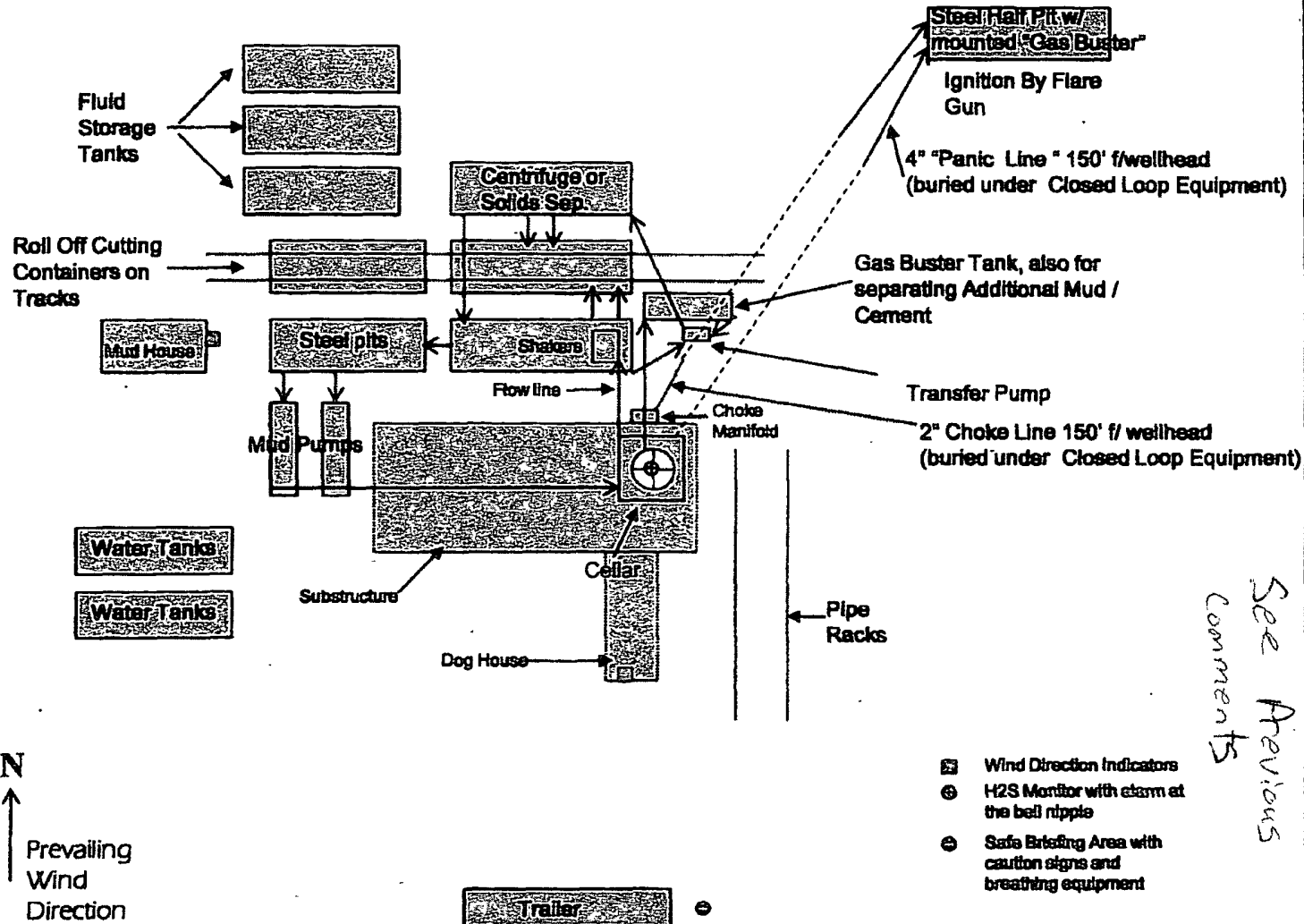
LEA COUNTY EMERGENCY NUMBERS

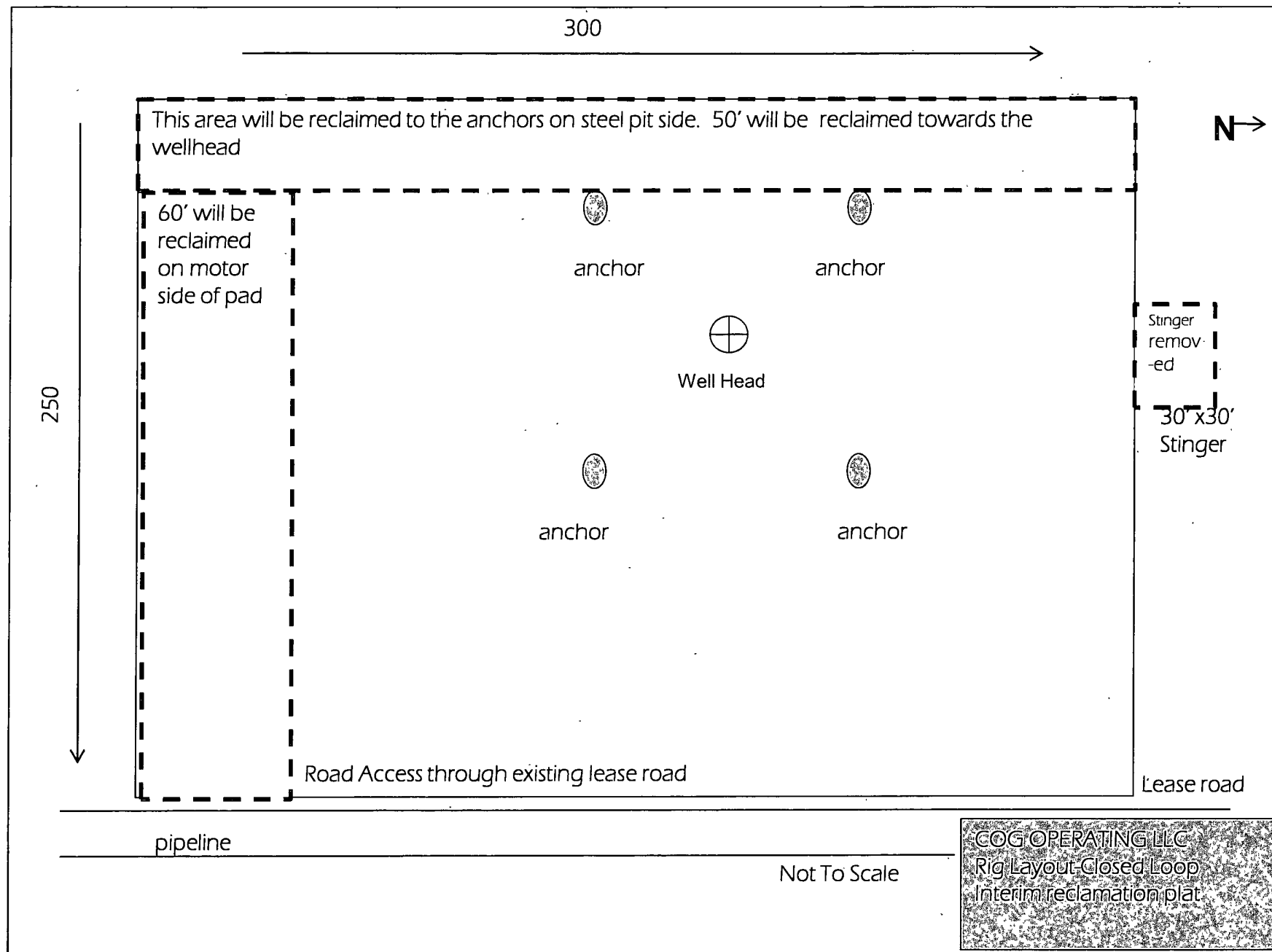
HOBBS FIRE DEPT. 575-397-9308
HOBBS POLICE DEPT. 575-397-9285
LEA CO. SHERIFF DEPT. 575-396-1196

COG Operating LLC

EXHIBIT 8

Drilling Location - H2S Safety Equipment Diagram





PECOS DISTRICT CONDITIONS OF APPROVAL

| | |
|-----------------------|-------------------------------------|
| OPERATOR'S NAME: | COG OPERATING, LLC |
| LEASE NO.: | NMLC028731A |
| WELL NAME & NO.: | 620-DODD FEDERAL UNIT |
| SURFACE HOLE FOOTAGE: | 1600'/S. & 0690'/E. |
| BOTTOM HOLE FOOTAGE: | 1550'/S. & 0330'/E. |
| LOCATION: | Section 15, T. 17 S., R. 9 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.

- ☐ **General Provisions**
- ☐ **Permit Expiration**
- ☐ **Archaeology, Paleontology, and Historical Sites**
- ☐ **Noxious Weeds**
- ☐ **Special Requirements**
- ☐ **Construction**
 - Notification
 - Topsoil
 - Closed Loop System
 - Federal Mineral Material Pits
 - Well Pads
 - Roads
- ☐ **Road Section Diagram**
- ☒ **Drilling**
 - H2S requirement
 - Logging requirement
 - Waste Material and Fluids
- ☐ **Production (Post Drilling)**
 - Well Structures & Facilities
 - Pipelines
 - Electric Lines
- ☐ **Interim Reclamation**
- ☐ **Final Abandonment & Reclamation**