

ATS-07-22

OCD-ARTESIA

SUBMIT IN TRIPLICATE\* (Other Instructions on reverse side)

Form approved. Budget Bureau No. 1004-0136 Expires: December 31, 1991

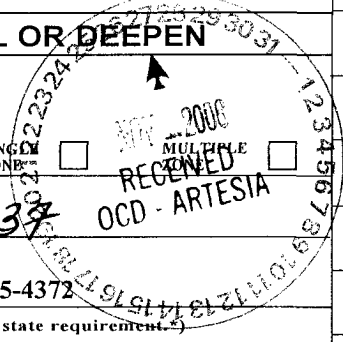
Form 3160-3 (Dec 2000)

S

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR DEEPEN

0093



1a. TYPE OF WORK: DRILL [X] DEEPEN [ ]
b. TYPE OF WELL: OIL WELL [X] Gas Well [ ] OTHER [ ]
2. NAME OF OPERATOR: COG Operating LLC
3. ADDRESS AND TELEPHONE NO.: 550 W. Texas Suite 1300 Midland, TX 79701 (432) 685-4372
4. LOCATION OF WELL: 330 FNL & 2310 FEL ROSWELL CONTROLLED WATER BASIN
14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE\*: 1 1/2 miles north of Loco Hills
15. DISTANCE FROM PROPOSED\* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT.: 330
16. NO. OF ACRES IN LEASE: 80
17. NO. OF ACRES IN LEASE TO THIS WELL: 40
18. DISTANCE FROM PROPOSED LOCATION\* TO NEAREST WELL, DRILLING, COMPLETED OR APPLIED FOR, ON THIS LEASE, FT.: 660
19. PROPOSED DEPTH: 6000
20. ROTARY OR CABLE TOOLS: Rotary
21. ELEVATIONS (Show whether DF, RT, GR, etc.): 3677' GR
22. APPROX. DATE WORK WILL START\*: 11/6/2006

5. LEASE DESIGNATION AND SERIAL NO.: NM-2933
6. IF INDIAN, ALLOTTEE OR TRIBE NAME
7. UNIT AGREEMENT NAME
8. FARM OR LEASE NAME, WELL NO.: Caddo Federal #2 36176
9. API WELL NO.: 30-015-35245
10. FIELD AND POOL, OR WILDCAT, AND SURVEY OR AREA: Loco Hills G1011212-Yes
11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec 17 T17S R30E
12. COUNTY OR PARISH: Eddy
13. STATE: NM

Table with 5 columns: SIZE OF HOLE, GRADE, SIZE OF CASING, WEIGHT PER FOOT, SETTING DEPTH, QUANTITY OF CEMENT. Rows include 17 1/2, 12 1/4, and 7 7/8 casing sizes.

COG proposes to drill to a depth sufficient to test the Paddock formation for oil. If productive, 5 1/2" casing will be cemented. If non-productive, the well will be plugged and abandoned in a manor consistent with federal regulation. Specific programs as per Onshore Oil and Gas Order #1 are outlined in the following attachments:

- 1. Surveys: Exhibit #1- Well Location Plat, Exhibit #2- Vicinity Map, Exhibit #3- Location Verification Map
2. Drilling Program
3. Surface Use & Operating Plan: Exhibit #4- One Mile Radius Map, Exhibit #5- Production Facilities Layout, Exhibit #6- Location Layout
4. Certification
5. Hydrogen Sulfide Drilling Operations: Exhibit #7- H2S Warning Sign, Exhibit #8- H2S Safety Equipment
6. Blowout Preventers: Exhibit #9- BOPE Schematic, Exhibit #10- Blowout Preventer Riser, Exhibit #11- Choke Manifold

APPROVAL SUBJECT TO GENERAL REQUIREMENTS AND SPECIAL STIPULATIONS ATTACHED
SEE ATTACHED FOR CONDITIONS OF APPROVAL

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

24. SIGNED: [Signature] TITLE: Production Clerk DATE: 10/9/06

(This space for Federal or State office use)
PERMIT NO. APPROVAL DATE
Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject.
CONDITIONS OF APPROVAL, IF ANY:

If earthen pits are used in association with the drilling of this well, an OCD pit permit must be obtained prior to pit construction.

APPROVED BY: /s/ James Stovall TITLE: ACTING FIELD MANAGER DATE: NOV 21 2006

\*See Instructions On Reverse Side

APPROVAL FOR 1 YEAR

State of New Mexico

Energy, Minerals and Natural Resources Department

DISTRICT I  
1625 N. FRENCH DR., HOBBS, NM 88240

DISTRICT II  
1301 W. GRAND AVENUE, ARTESIA, NM 88210

DISTRICT III  
1000 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV  
1220 S. ST. FRANCIS DR., SANTA FE, NM 87505

OIL CONSERVATION DIVISION  
1220 SOUTH ST. FRANCIS DR.  
Santa Fe, New Mexico 87505

Form C-102  
Revised October 12, 2005  
Submit to Appropriate District Office  
State Lease - 4 Copies  
Fee Lease - 3 Copies

WELL LOCATION AND ACREAGE DEDICATION PLAT

AMENDED REPORT

|                     |                                    |                                                  |
|---------------------|------------------------------------|--------------------------------------------------|
| API Number          | Pool Code<br>96718                 | Pool Name<br>Loco Hills I <b>Glorieta - Geso</b> |
| Property Code       | Property Name<br>CADDO FEDERAL     | Well Number<br>2                                 |
| OGRID No.<br>229137 | Operator Name<br>COG OPERATING LLC | Elevation<br>3677'                               |

Surface Location

| UL or lot No. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---------------|---------|----------|-------|---------|---------------|------------------|---------------|----------------|--------|
| B             | 17      | 17-S     | 30-E  |         | 330           | NORTH            | 2310          | 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 |
|---------------|---------|----------|-------|---------|---------------|------------------|---------------|----------------|--------|
|               |         |          |       |         |               |                  |               |                |        |

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

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><b>OPERATOR CERTIFICATION</b></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><i>Jerry W. Sherrell</i> 10/9/06<br/>Signature Date</p> <p>Jerry W. Sherrell<br/>Printed Name</p> |
|  | <p><b>SURVEYOR CERTIFICATION</b></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>SEPTEMBER 22, 2006</p> <p>Date Surveyed JR</p> <p>Signature &amp; Seal of Professional Surveyor</p> <p><i>Ronald J. Eidson</i> 9/26/06<br/>06.11.1434</p>                                                                                                                                                                                                                       |
|  | <p>GEODETIC COORDINATES<br/>NAD 27 NME</p> <p>Y=669755.6 N<br/>X=604658.9 E</p> <p>LAT.=32.840780° N<br/>LONG.=103.992573° W</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|  | <p>Certificate No. GARY EIDSON 12641<br/>RONALD J. EIDSON 3239</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

United State Department of the Interior

BUREAU OF LAND MANAGEMENT

Roswell Resource Area

P.O. Drawer 1857

Roswell, New Mexico 88202-1857

Statement Accepting Responsibility for Operations

Operator name: COG Operating LLC  
Street or box : 550 W. Texas Suite 1300  
City, State : Midland, TX  
Zip Code, : 79701

The undersigned accepts all applicable terms, conditions, stipulations, and restrictions concerning operations conducted on the leased land or portion thereof, as described below:

Lease No.: NM-2933 Caddo Federal #2

Legal Description of land: Sec 17 T17S R30E NW/4 NE/4

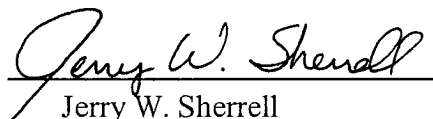
Formation(s) (if applicable): Paddock

Bond Coverage: (State if individually bonded or another's bond)

Statewide Bond

BLM Bond File No.: NM000215

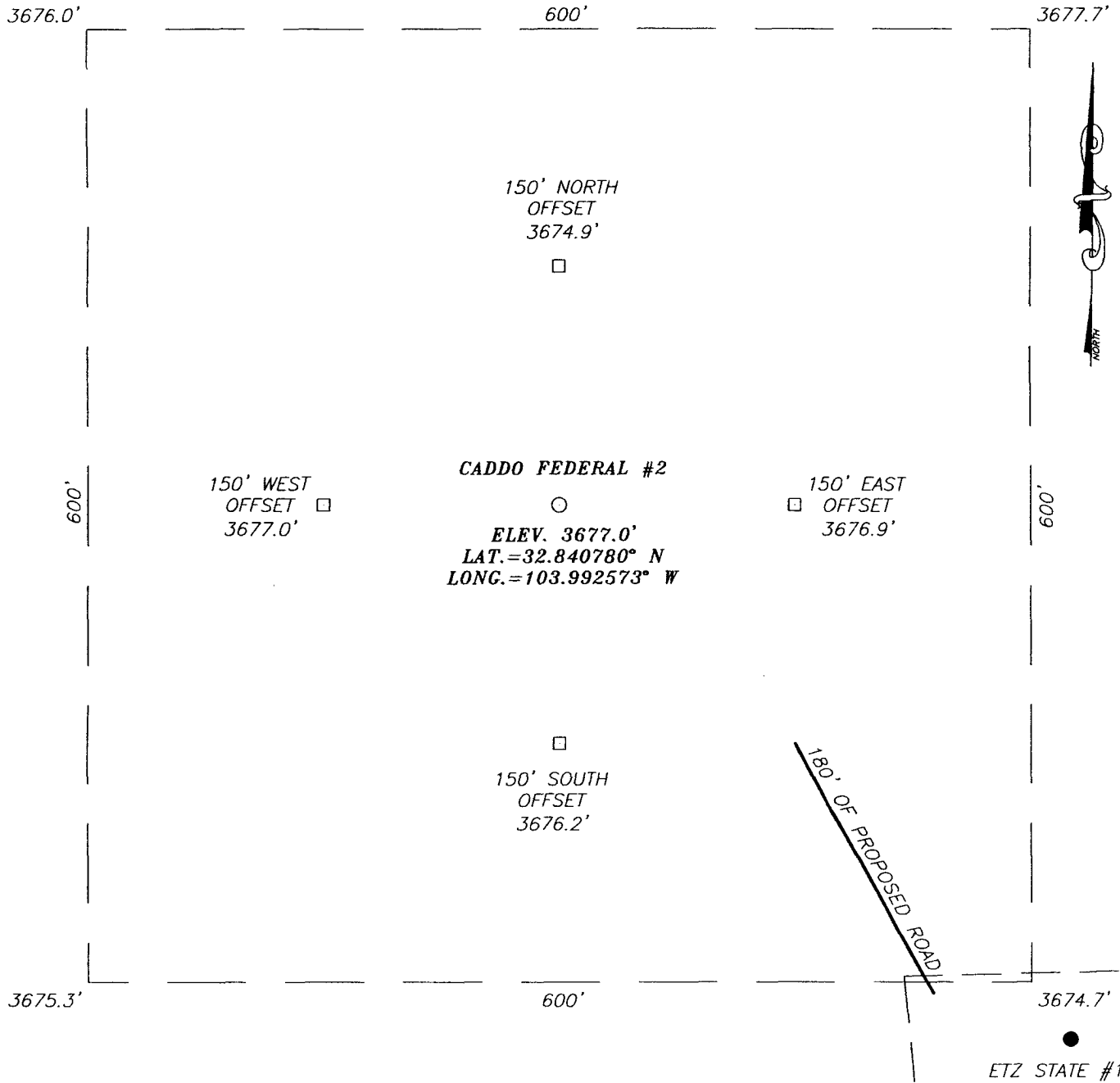
Authorized Signature:

  
Jerry W. Sherrell

Title: Production Clerk

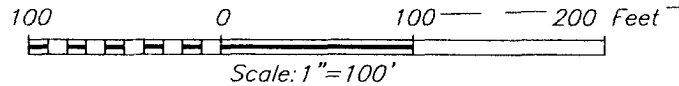
Date: 10/9/06

SECTION 17, TOWNSHIP 17 SOUTH, RANGE 30 EAST, N.M.P.M.,  
 EDDY COUNTY, NEW MEXICO



**DIRECTIONS TO LOCATION**

FROM THE INTERSECTION OF U.S. HWY. #82 AND CO. RD. #217 (HAGERMAN CUTOFF) GO NORTH ON CO. RD. #217 FOR APPROX. 1.4 MILES. TURN LEFT AND GO WEST APPROX. 0.4 MILES TO THE MACK ENERGY ETZ STATE #100 WELL. THIS LOCATION IS APPROX. 465 FEET NORTHWEST.



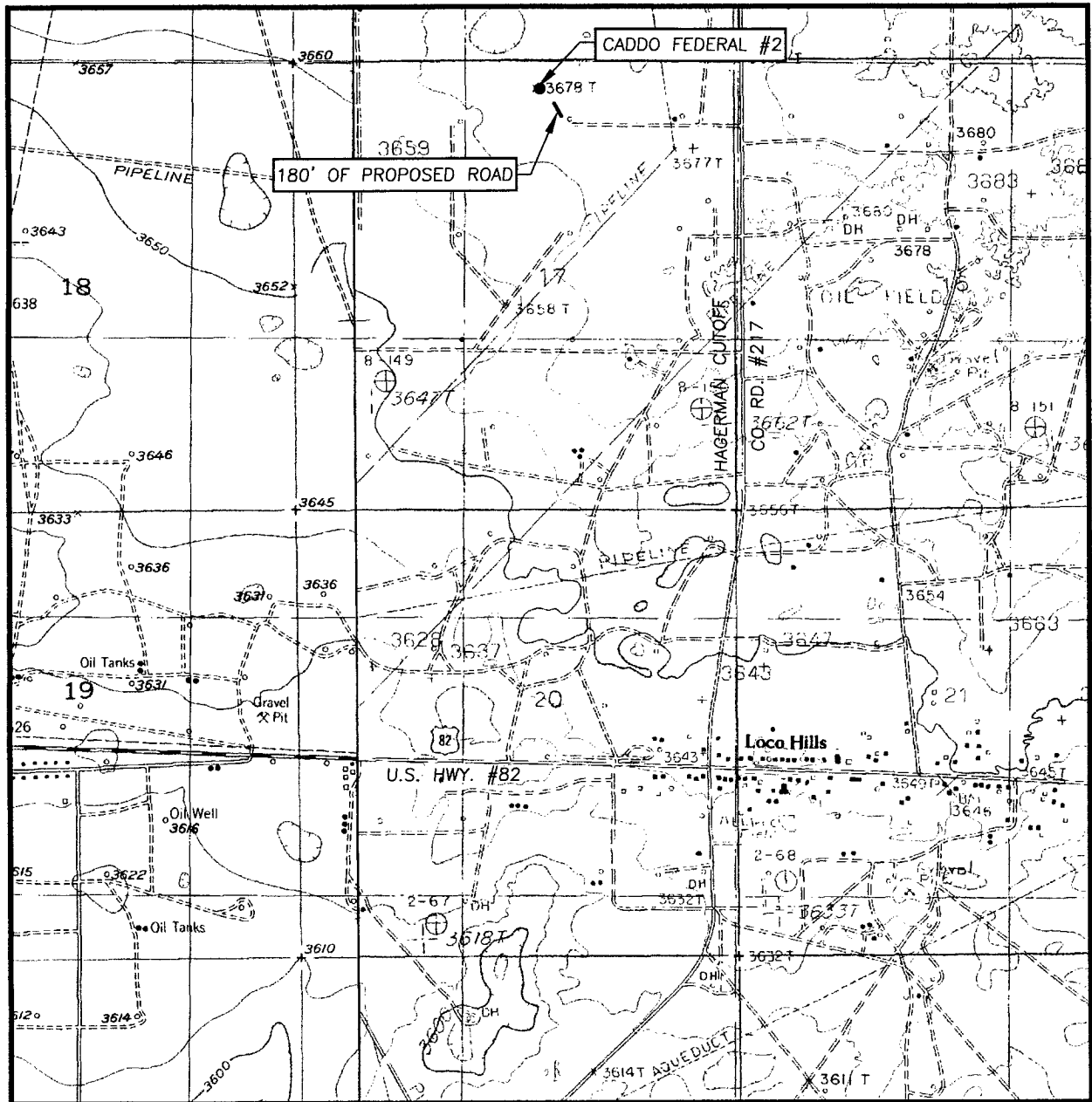
PROVIDING SURVEYING SERVICES  
 SINCE 1946  
**JOHN WEST SURVEYING COMPANY**  
 412 N. DAL PASO  
 HOBBS, N.M. 88240  
 (505) 393-3117

**MACK ENERGY CORPORATION**

CADDO FEDERAL #2 WELL  
 LOCATED 330 FEET FROM THE NORTH LINE  
 AND 2310 FEET FROM THE EAST LINE OF SECTION 17,  
 TOWNSHIP 17 SOUTH, RANGE 30 EAST, N.M.P.M.,  
 EDDY COUNTY, NEW MEXICO.

|                         |                                    |
|-------------------------|------------------------------------|
| Survey Date: 09/22/06   | Sheet 1 of 1 Sheets                |
| W.O. Number: 06.11.1434 | Dr By: J.R. Rev 1: N/A             |
| Date: 09/26/06          | Disk: CD#6 06111434 Scale: 1"=100' |

# LOCATION VERIFICATION MAP



SCALE: 1" = 2000'

CONTOUR INTERVAL:  
 LOCO HILLS, N.M. - 10'  
 RED LAKE SE, N.M. - 10'

SEC. 17 TWP. 17-S RGE. 30-E

SURVEY \_\_\_\_\_ N.M.P.M.

COUNTY EDDY STATE NEW MEXICO


DESCRIPTION 330' FNL & 2310' FEL

ELEVATION 3677'

OPERATOR MACK ENERGY CORPORATION

LEASE CADDO FEDERAL

U.S.G.S. TOPOGRAPHIC MAP  
LOCO HILLS, N.M.



**PROVIDING SURVEYING SERVICES**  
 SINCE 1946  
**JOHN WEST SURVEYING COMPANY**  
 412 N. DAL PASO  
 HOBBS, N.M. 88240  
 (505) 393-3117

Attached to Form 3160-3  
 COG Operating LLC  
 Caddo Federal #2  
 330 FNL & 2310 FEL  
 NW/4 NE/4, Sec 17 T17S R30E  
 Eddy County, NM

## DRILLING PROGRAM

### 1. Geologic Name of Surface Formation

Quaternary

### 2. Estimated Tops of Important Geologic Markers:

|              |         |
|--------------|---------|
| Quaternary   | Surface |
| Top of Salt  | 505'    |
| Base of Salt | 105025' |
| Yates        | 1600'   |
| Queen        | 2130'   |
| San Andres   | 3050'   |
| Glorietta    | 4320'   |

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

|            |       |             |
|------------|-------|-------------|
| Water Sand | 150'  | Fresh Water |
| Grayburg   | 2580' | Oil/Gas     |
| San Andres | 3050' | Oil/Gas     |
| Paddock    | 3950' | Oil/Gas     |

No other formations are expected to give up oil, gas or fresh water in measurable quantities. Setting 13 3/8" casing to 425' and circulating cement back to surface will protect the surface fresh water sand. Salt Section will be protected by setting 8 5/8" casing to 1100' and circulating cement back to surface. Any shallower zones above TD, which contain commercial quantities of oil and/or gas, will have cement circulated across them by cementing 5 1/2" production casing, which will be run at TD.

### 4. Casing Program:

| Hole Size | Interval | OD Casing | Weight, Grade, Jt, Cond., Type |
|-----------|----------|-----------|--------------------------------|
| 17 1/2"   | 0-425'   | 13 3/8"   | 48#, H-40, ST&C, New, R-3      |
| 12 1/4"   | 0-1100'  | 8 5/8"    | 24#, J-55, ST&C, New, R-3      |
| 7 7/8"    | 0-TD     | 5 1/2"    | 17#, J-55, LT&C, New, R-3      |

Attached to Form 3160-3  
COG Operating LLC  
Caddo Federal #2  
330 FNL & 2310 FEL  
NW/4 NE/4, Sec 17 T17S R30E  
Eddy County, NM

**5. Cement Program:**

13 3/8" Surface Casing: Circulate to Surface with Class C w/2% CaCl<sub>2</sub>.

8 5/8 Intermediate Casing: Circulate to Surface with Class C W/2% CaCl<sub>2</sub>.

5 1/2" Production Casing: Cement Casing with Class C w/6# Salt & 2/10 of 1% CFR-3 per sack. We will run a hole caliper and run sufficient cement to circulate to surface.

**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. 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 bottom. The BOP will be nipped up on the 13 3/8" surface casing and tested to 1500 psi by a 3<sup>rd</sup> party. The BOP will then be nipped up on the 8 5/8" intermediate casing and tested by a 3<sup>rd</sup> party to 2000 psi and used continuously until TD is reached. All BOP's and accessory equipment will be tested to 2000 psi before drilling out of intermediate casing. 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 and choke lines and choke manifold (Exhibit #11) with 2000 psi WP rating.

**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 |
|-----------|-------------|--------|-----------|-----------|
| 0-425'    | Fresh Water | 8.5    | 28        | N.C.      |
| 425-1100' | Brine       | 10     | 30        | N.C.      |
| 1100'-TD  | Cut Brine   | 9.1    | 29        | N.C.      |

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

Attached to Form 3160-3  
COG Operating LLC  
Caddo Federal #2  
330 FNL & 2310 FEL  
NW/4 NE/4, Sec 17 T17S R30E  
Eddy County, NM

- A. The electric logging program will consist of GR-Dual Laterolog, Spectral Density, Dual Spaced Neutron, CSNG Log and will be ran from T.D. to 8 5/8 casing shoe.
- 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, Pressures, Temperatures and Potential Hazards:**

No abnormal pressures or temperatures are anticipated. The estimated bottom hole at TD is 110 degrees and estimated maximum bottom hole pressure is 2300 psig. Low levels of Hydrogen sulfide have been monitors in producing wells in the area, so H2S may be present while drilling of the well a plan is attached to the Drilling 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. The anticipated spud date is November 6, 2006. Once commenced, the drilling operation 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.



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COG Operating LLC  
Caddo Federal #2  
330 FNL & 2310 FEL  
NW/4 NE/4, Sec 17 T17S R30E  
Eddy County, NM

## SURFACE USE AND OPERATING PLAN

### 1. Existing & Proposed Access Roads

- A. The well site and elevation plat for the proposed well is shown in Exhibit #1. It was staked by John West Engineering, Hobbs, NM.
- B. All roads to the location are shown in Exhibit below. The existing lease roads are illustrated in Blue and are adequate for travel during drilling and production operations. Upgrading existing roads prior to drilling well will be done where necessary.
- C. Directions to Location: From Loco Hills, go north 1.4 miles on CR 217, turn west .4 mile, location is 465' northwest from this point.
- D. Routine grading and maintenance of existing roads will be conducted as necessary to maintain their condition as long as any operations continue on this lease.

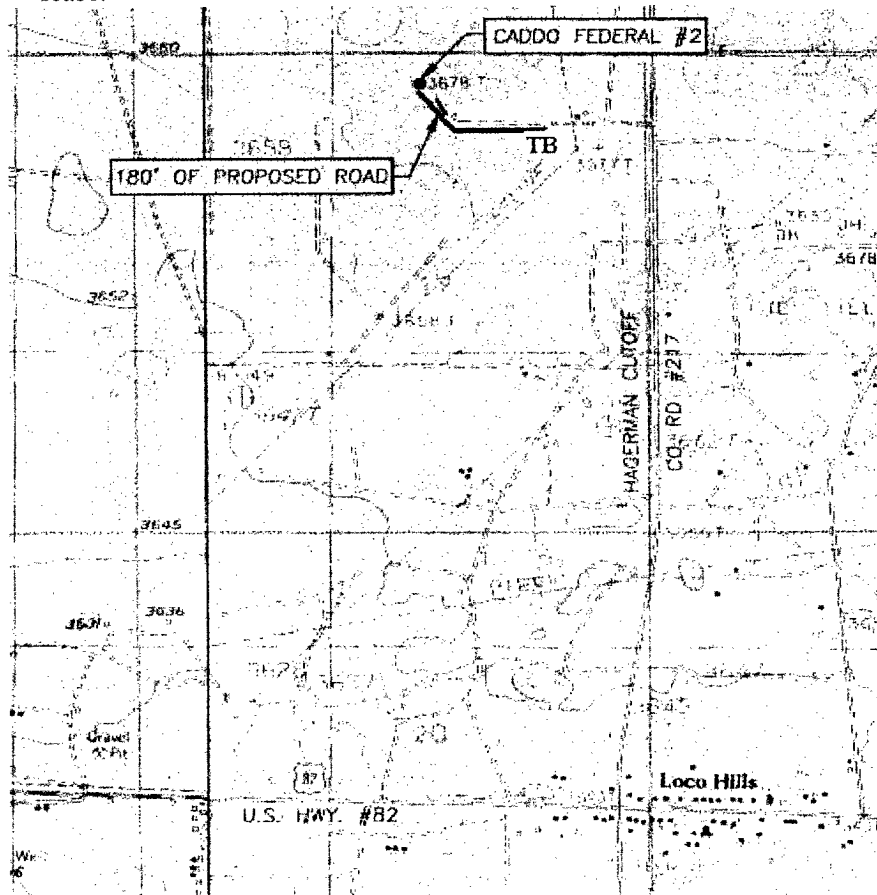


Exhibit #4

Attached to Form 3160-3  
COG Operating LLC  
Caddo Federal #2  
330 FNL & 2310 FEL  
NW/4 NE/4, Sec 17 T17S R30E  
Eddy County, NM

**2. Proposed Access Road:**

Exhibit #3 shows the 180' of new access road to be constructed. The road will be constructed as follows:

- A. The Maximum width of the running surface will be 14'. The road will be crowned and ditched and constructed of 6" rolled and compacted caliche. Ditches will be at 3:1 slope and 4 feet wide. Water will be diverted where necessary to avoid ponding, prevent erosion, maintain good drainage, and to be consistent with local drainage patterns.
- B. The average grade will be less than 1%.
- C. No turnouts are planned.
- D. No culverts, cattleguard, gates, low water crossings or fence cuts are necessary.
- E. Surfacing material will consist of native caliche. Caliche will be obtained from the nearest BLM approved caliche pit or reserve pit area.
- F. The proposed access road as shown in Exhibit #3 has been centerline flagged by John West Engineering, Hobbs, New Mexico.

**3. Location of Existing Wells & Proposed flow lines for New Wells:**

Exhibit #4 shows all existing wells within a one-mile radius of this well. As shown on this plat there are numerous wells producing from the San Andres and Paddock formations. Proposed flow lines will follow an archaeologically approved route to the proposed tank battery, located at the Caddo Federal #1.

**4. Location of Existing and/or Proposed Facilities:**

- A. COG Operating LLC does not operate a production facility on this lease.
- B. If the well is productive, contemplated facilities will be as follows:
  - 1) Paddock Completion: Will be sent to the Caddo Federal tank battery. The Facility is shown in Exhibit #5.
  - 2) The tank battery and facilities including all flow lines and piping will be installed according to API specifications.
  - 3) Any additional caliche will be obtained from a BLM approved caliche pit. Any additional construction materials will be purchased from contractors.

Attached to Form 3160-3  
COG Operating LLC  
Caddo Federal #2  
330 FNL & 2310 FEL  
NW/4 NE/4, Sec 17 T17S R30E  
Eddy County, NM

- 4) It will be necessary to run electric power if this well is productive. Power will be run by CVE and they will send in a separate plan for power.

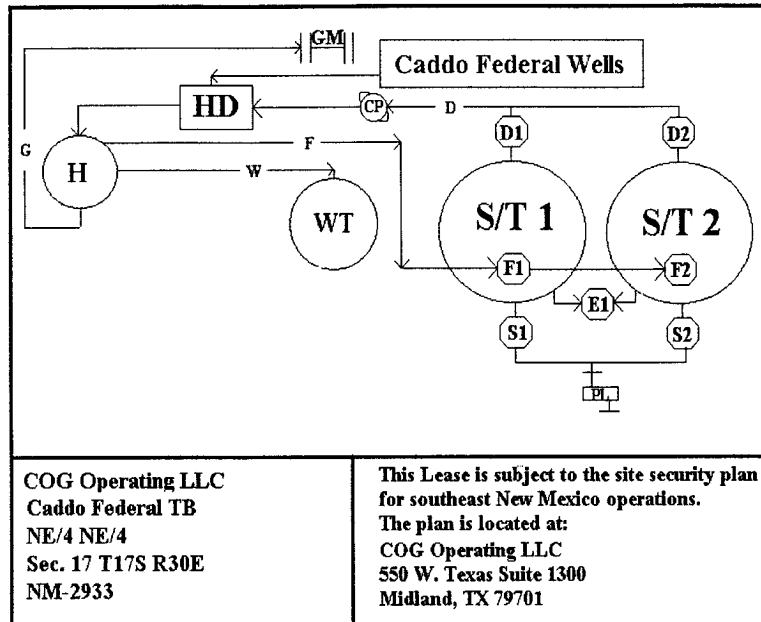


Exhibit #5

- A. If the well is productive, rehabilitation plans are as follows:
- 1) The reserve pit will be back filled after the contents of the pit are dry (within 120 days after the well is completed).
  - 2) Topsoil removed from the drill site will be used to recontour the pit area to the original natural level, as nearly as possible, and reseeded as per BLM specifications.

**5. Location and Type of Water Supply:**

The well will be drilled with combination brine and fresh water mud system as outlined in the drilling program. The water will be obtained from commercial water stations in the area and hauled to location by transport truck over the existing and proposed access roads shown in Exhibit #4. If a commercial fresh water source is nearby, fasline may be laid along existing road ROW's and fresh water pumped to the well. No water well will be drilled on the location.

**6. Source of Construction Materials:**

All caliche required for construction of the drill pad and proposed new access road (approximately 2500 cubic yards) will be obtained from a BLM approved caliche pit or the reserve pit.

Attached to Form 3160-3  
COG Operating LLC  
Caddo Federal #2  
330 FNL & 2310 FEL  
NW/4 NE/4, Sec 17 T17S R30E  
Eddy County, NM

**7. Methods of Handling Water Disposal:**

- A. Drill cuttings not retained for evaluation purposes will be disposed into the reserve pit.
- B. Drilling fluids will be contained in a lined working pit. The reserve pit will contain any excess drilling fluid or flow from the well during drilling, cementing and completion operations. The reserve pit will be an earthen pit, approximately 125' X 125' X 10' deep with a dividing wall dividing it into two horseshoe style pits and fenced on three sides prior to drilling. It will be fenced on the fourth side immediately following rig removal. The reserve pit will be lined 125' X 125' X 10'. The reserve pit will be lined (12-mil thickness) to minimize loss of drilling fluids and saturation of the ground with brine water.
- C. Water produced from the well during completion may be disposed into the reserve pit or a steel tank (depending on the rates). After the well is permanently placed on production, produced water will be collected in tanks (fiberglass) until pumped to an approved disposal system; produced oil will be collected in steel tanks until sold.
- D. Garbage and trash produced during drilling or completion operations will be collected in a trash bin and hauled to an approved landfill. All water and fluids will be disposed of into the reserve pit. Salts and other chemicals produced during drilling or testing will be disposed into the reserve pit. No toxic waste or hazardous chemicals will be produced by this operation.
- E. After the rig is moved out and the well is either completed or abandoned, all waste materials will be cleaned up within 30 days. The reserve pit will be completely fenced and kept closed until it has dried. When the reserve pit is dry enough to breakout and backfill and reseeded as per BLM specifications as weather permits. In the event of a dry hole only a dry hole marker will remain.

**8. Ancillary Facilities:**

No airstrip, campsite or other facilities will be built as a result of the operation on this well.

Attached to Form 3160-3  
COG Operating LLC  
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330 FNL & 2310 FEL  
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Eddy County, NM

**9. Well Site Layout:**

- A. The drill pad layout, with elevations staked by John West Engineering, is shown in Exhibit #6. Dimensions of the pad and pits are shown. Topsoil, if available, will be stockpiled per BLM specifications. Because the pad is almost level no major cuts will be required.
- B. Diagram below shows the proposed orientation of reserve pit, working pit and access road. There is a possibility that the pits will be moved around depending on Caliche in the area. No permanent living facilities are planned, but a temporary foreman/toolpusher's trailer will be on location during the drilling operations.
- C. The reserve pit will be lined with high quality plastic sheeting (12 mil thickness).

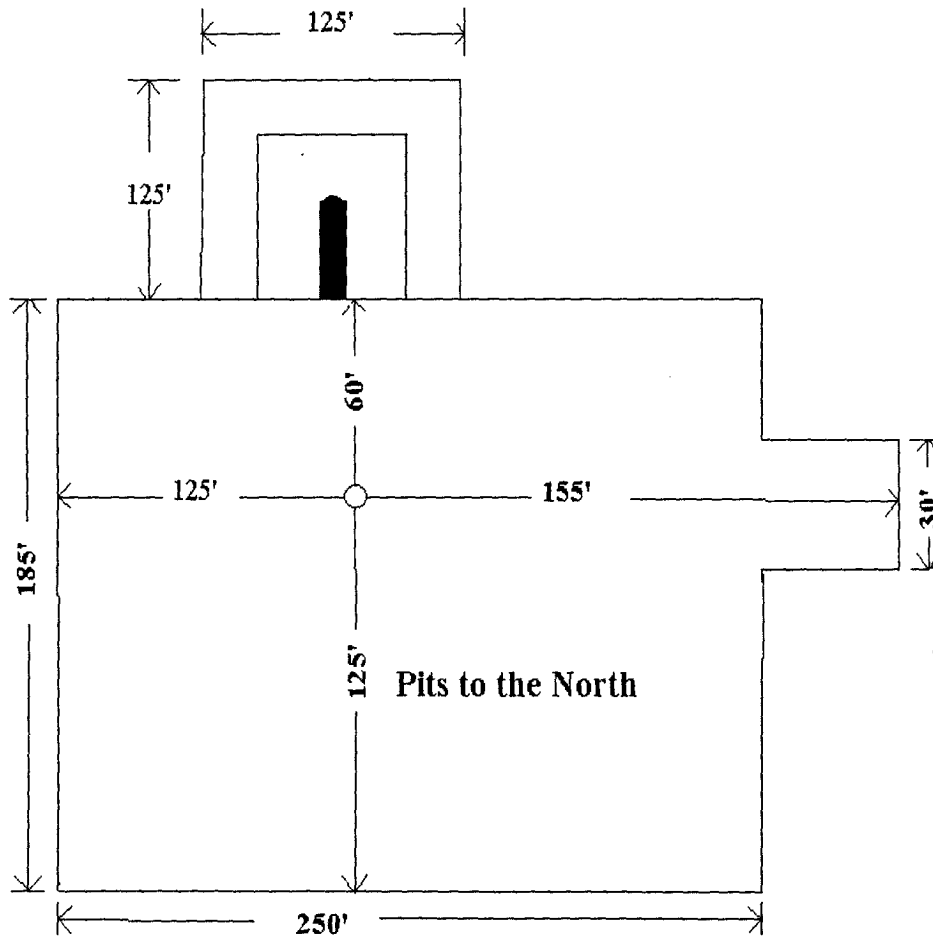


Exhibit #6

Attached to Form 3160-3  
COG Operating LLC  
Caddo Federal #2  
330 FNL & 2310 FEL  
NW/4 NE/4, Sec 17 T17S R30E  
Eddy County, NM

**10. Plans for Restoration of the Surface:**

- A. Upon completion of the proposed operations, the pit area, after allowing drying, will be broken out and leveled. The original topsoil will be returned to the pit area, which will be leveled and contoured to as nearly the original topography as possible.
- B. The disturbed area will be revegetated by reseeding during the proper growing season with a seed mixture of native grasses as recommended by the BLM.
- C. Three sides of the reserve pit will be fenced prior to and during drilling operations. At the time that the rig is removed, the reserve pit will be fenced on the rig (fourth) side to prevent livestock from being entrapped. The fencing will remain in place until the pit area is cleaned up and leveled. No oil will be left on the surface of the fluid in the pit.
- D. Upon completion of proposed operations, if the well is completed, the reserve pit area will be treated as outlined above within the same prescribed time. Any additional caliche required for facilities will be obtained from a BLM approved caliche pit. Topsoil removed from the drill site will be used to recontour the pit area to its original natural level and reseeded as per BLM specifications.

**11. Surface Ownership:**

The well site and lease is located entirely on Federal surface. We have notified the surface lessee of the impending operations. According to BLM the lessee is Bogel Farms, Lewis Derrick, P.O. Box 441 Artesia, NM 88210.

**12. Other Information:**

- A. The area around the well site is grassland and the topsoil is sandy. The vegetation is native scrub grass with sagebrush.
- B. There is no permanent or live water in the immediate area.
- C. A Cultural Resources Examination has been requested and will be forwarded to your office in the near future.

**13. Lessee's and Operator's Representative:**

The COG Operating LLC representative responsible for assuring compliance with the surface use plan is as follows:

Jerry W. Sherrell  
COG Operating LLC  
P.O. Box 960  
Artesia, NM 88211-0960  
Phone (505) 748-1288 (office)

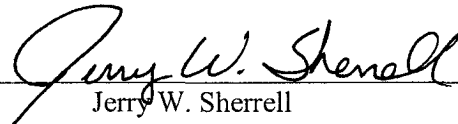
Attached to Form 3160-3  
COG Operating LLC  
Caddo Federal #2  
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NW/4 NE/4, Sec 17 T17S R30E  
Eddy County, NM

### CERTIFICATION

I hereby certify that I, or person under my direct supervision, have inspected the proposed drill site and access route; that I am familiar with the conditions which currently exist; that the statements made in this plan are to the best of my knowledge, true and correct; and the work associated with the operations proposed herein will be performed by COG Operating LLC and its contractors and subcontractors in conformity with this plan and the terms and conditions which it is approved. This statement is subject to the provisions of 18 U.S.C. 1001 for the filing of a false statement.

Date: 10-9-06

Signed: \_\_\_\_\_

  
Jerry W. Sherrell

## 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 (H<sub>2</sub>S)
2. The proper use and maintenance of personal protective equipment and life support systems.
3. The proper use of H<sub>2</sub>S 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 H<sub>2</sub>S 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 H<sub>2</sub>S Drilling Operations Plan and Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H<sub>2</sub>S zone (within 3 days or 500 feet) and weekly H<sub>2</sub>S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H<sub>2</sub>S Drilling Operations Plan and the Public Protection Plan. **The concentrations of H<sub>2</sub>S 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 H<sub>2</sub>S service.
- B. All elastomers used for packing and seals shall be H<sub>2</sub>S 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 H<sub>2</sub>S environment will use the closed chamber method of testing.
- B. There will be no drill stem testing.

**EXHIBIT #7**

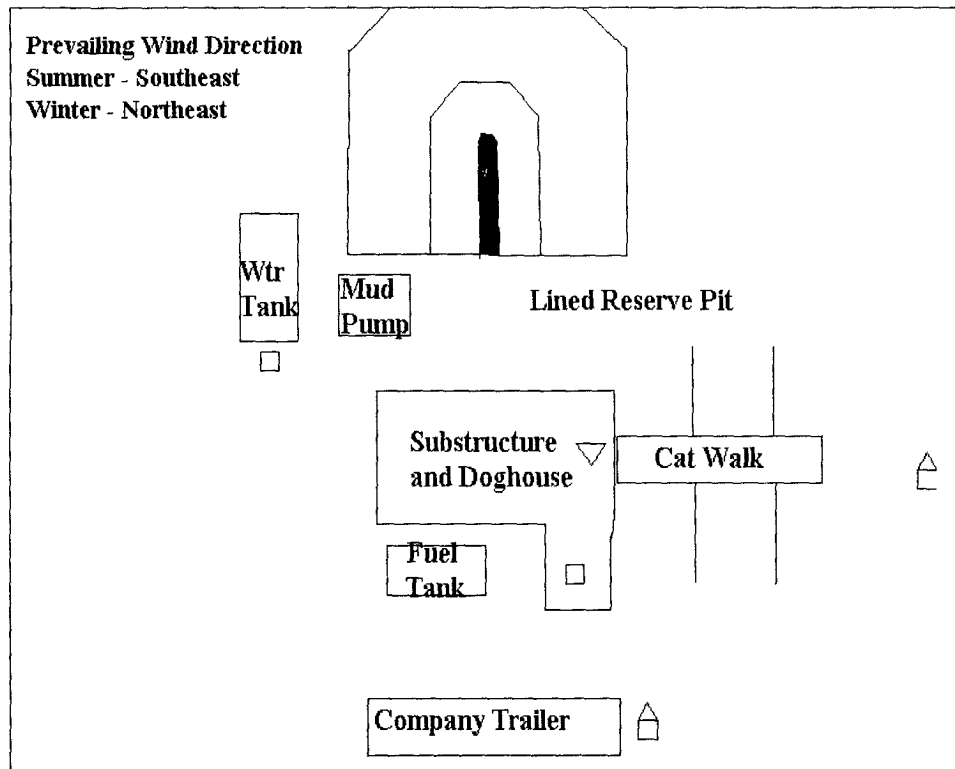
**WARNING**  
**YOU ARE ENTERING AN H<sub>2</sub>S**  
**AUTHORIZED PERSONNEL ONLY**

- 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 MACK ENERGY FOREMAN AT OFFICE**

**MACK ENERGY CORPORATION**

**1-505-748-1288**

**DRILLING LOCATION H2S SAFTY EQUIPMENT**  
**Exhibit # 8**



- ▽ H2S Monitors with alarms at the bell nipple
- Wind Direction Indicators
- ⌠ Safe Briefing areas with caution signs and breathing equipment min 150 feet from

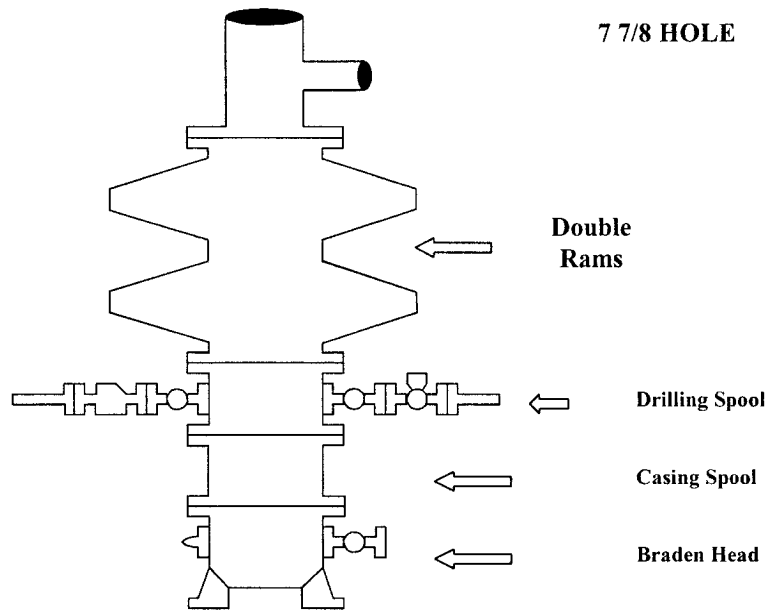
**Attachment to Exhibit #9**  
**NOTES REGARDING THE BLOWOUT PREVENTERS**  
**Caddo Federal #2**  
**Eddy County, New Mexico**

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.

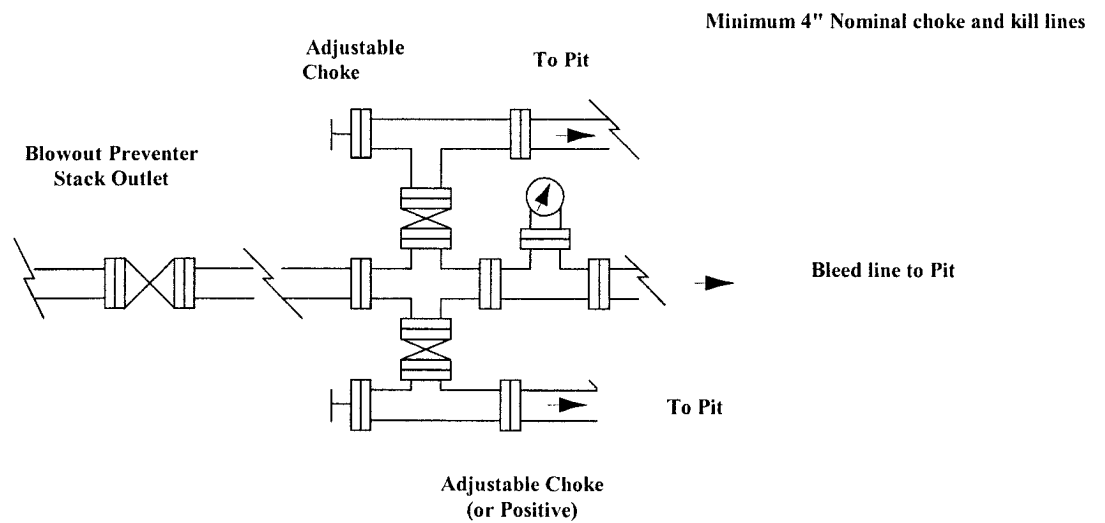
# COG Operating LLC

## Exhibit #9

### BOPE Schematic



#### Choke Manifold Requirement (2000 psi WP) No Annular Required



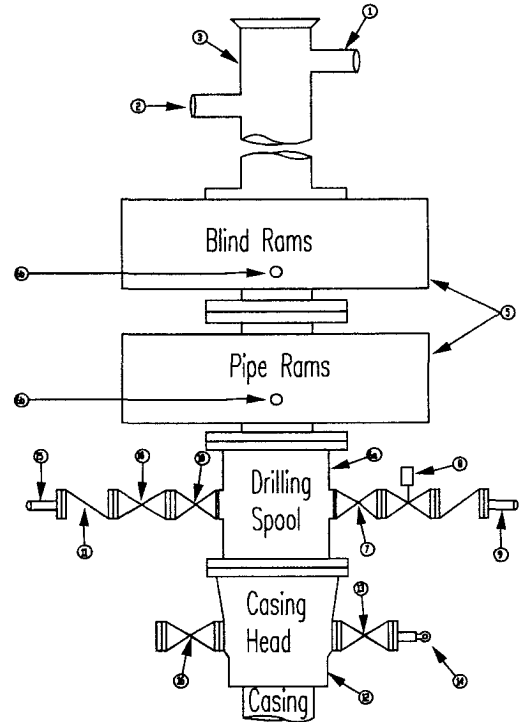
**COG Operating LLC**  
**Minimum Blowout Preventer Requirements**  
 2000 psi Working Pressure  
 2 MWP  
**EXHIBIT #10**

**Stack Requirements**

| NO. | Items                                                                            | Min. I.D. | Min. Nominal |
|-----|----------------------------------------------------------------------------------|-----------|--------------|
| 1   | Flowline                                                                         |           | 2"           |
| 2   | Fill up line                                                                     |           | 2"           |
| 3   | Drilling nipple                                                                  |           |              |
| 4   | Annular preventer                                                                |           |              |
| 5   | Two single or one dual hydraulically operated rams                               |           |              |
| 6a  | Drilling spool with 2" min. kill line and 3" min choke line outlets              |           | 2" Choke     |
| 6b  | 2" min. kill line and 3" min. choke line outlets in ram. (Alternate to 6a above) |           |              |
| 7   | Valve Gate Plug                                                                  | 3 1/8     |              |
| 8   | Gate valve-power operated                                                        | 3 1/8     |              |
| 9   | Line to choke manifold                                                           |           | 3"           |
| 10  | Valve Gate Plug                                                                  | 2 1/16    |              |
| 11  | Check valve                                                                      | 2 1/16    |              |
| 12  | Casing head                                                                      |           |              |
| 13  | Valve Gate Plug                                                                  | 1 13/16   |              |
| 14  | Pressure gauge with needle valve                                                 |           |              |
| 15  | Kill line to rig mud pump manifold                                               |           | 2"           |

**OPTIONAL**

|    |               |         |  |
|----|---------------|---------|--|
| 16 | Flanged Valve | 1 13/16 |  |
|----|---------------|---------|--|



**CONTRACTOR'S OPTION TO FURNISH:**

- All equipment and connections above bradenhead or casinghead. Working pressure of preventers to be 2000 psi minimum.
- Automatic accumulator (80 gallon, minimum) capable of closing BOP in 30 seconds or less and, holding them closed against full rated working pressure.
- BOP controls, to be located near drillers' position.
- Kelly equipped with Kelly cock.
- Inside blowout preventer or its equivalent on derrick floor at all times with proper threads to fit pipe being used.
- Kelly saver-sub equipped with rubber casing protector at all times.
- Plug type blowout preventer tester.
- Extra set pipe rams to fit drill pipe in use on location at all times.
- Type RX ring gaskets in place of Type R.

**COG TO FURNISH:**

- Bradenhead or casing head and side valves.
- Wear bushing. If required.

**GENERAL NOTES:**

- Deviations from this drawing may be made only with the express permission of COG's Drilling Manager.
- All connections, valves, fittings, piping, etc., subject to well or pump pressure must be flanged (suitable clamp connections acceptable) and have minimum working pressure equal to rated working pressure of preventers up through choke valves must be full opening and suitable for high pressure mud service.
- Controls to be of standard design and each marked, showing opening and closing position
- Chokes will be positioned so as not to hamper or delay changing of choke beans. Replaceable parts for adjustable choke, or bean

- sizes, retainers, and choke wrenches to be conveniently located for immediate use.
- All valves to be equipped with hand-wheels or handles ready for immediate use.
- Choke lines must be suitably anchored.
- Handwheels and extensions to be connected and ready for use.
- Valves adjacent to drilling spool to be kept open. Use outside valves except for emergency.
- All seamless steel control piping (2000 psi working pressure) to have flexible joints to avoid stress. Hoses will be permitted.
- Casinghead connections shall not be used except in case of emergency.
- Do not use kill line for routine fill up operations.

# COG Operating LLC

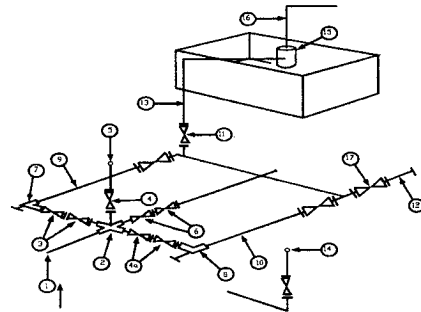
Exhibit #11

## MIMUMUM CHOKE MANIFOLD

3,000, 5,000, and 10,000 PSI Working Pressure

2 M will be used or greater

3 MWP - 5 MWP - 10 MWP



Mud Pit

Reserve Pit

\* Location of separator optional

Below Substructure

### Minimum requirements

| No. |                                                  | 3,000 MWP |         |        | 5,000 MWP |         |        | 10,000 MWP |         |        |
|-----|--------------------------------------------------|-----------|---------|--------|-----------|---------|--------|------------|---------|--------|
|     |                                                  | I.D.      | NOMINAL | Rating | I.D.      | Nominal | Rating | I.D.       | Nominal | Rating |
| 1   | Line from drilling Spool                         |           | 3"      | 3,000  |           | 3"      | 5,000  |            | 3"      | 10,000 |
| 2   | Cross 3" x 3" x 3" x 2"                          |           |         | 3,000  |           |         | 5,000  |            |         |        |
| 2   | Cross 3" x 3" x 3" x 2"                          |           |         |        |           |         |        |            |         | 10,000 |
| 3   | Valve Gate Plug                                  | 3 1/8     |         | 3,000  | 3 1/8     |         | 5,000  | 3 1/8      |         | 10,000 |
| 4   | Valve Gate Plug                                  | 1 13/16   |         | 3,000  | 1 13/16   |         | 5,000  | 1 13/16    |         | 10,000 |
| 4a  | Valves (1)                                       | 2 1/16    |         | 3,000  | 2 1/16    |         | 5,000  | 2 1/16     |         | 10,000 |
| 5   | Pressure Gauge                                   |           |         | 3,000  |           |         | 5,000  |            |         | 10,000 |
| 6   | Valve Gate Plug                                  | 3 1/8     |         | 3,000  | 3 1/8     |         | 5,000  | 3 1/8      |         | 10,000 |
| 7   | Adjustable Choke (3)                             | 2"        |         | 3,000  | 2"        |         | 5,000  | 2"         |         | 10,000 |
| 8   | Adjustable Choke                                 | 1"        |         | 3,000  | 1"        |         | 5,000  | 2"         |         | 10,000 |
| 9   | Line                                             |           | 3"      | 3,000  |           | 3"      | 5,000  |            | 3"      | 10,000 |
| 10  | Line                                             |           | 2"      | 3,000  |           | 2"      | 5,000  |            | 2"      | 10,000 |
| 11  | Valve Gate Plug                                  | 3 1/8     |         | 3,000  | 3 1/8     |         | 5,000  | 3 1/8      |         | 10,000 |
| 12  | Line                                             |           | 3"      | 1,000  |           | 3"      | 1,000  |            | 3"      | 2,000  |
| 13  | Line                                             |           | 3"      | 1,000  |           | 3"      | 1,000  |            | 3"      | 2,000  |
| 14  | Remote reading compound Standpipe pressure gauge |           |         | 3,000  |           |         | 5,000  |            |         | 10,000 |
| 15  | Gas Separator                                    |           | 2' x 5' |        |           | 2' x 5' |        |            | 2' x 5' |        |
| 16  | Line                                             |           | 4"      | 1,000  |           | 4"      | 1,000  |            | 4"      | 2,000  |
| 17  | Valve Gate Plug                                  | 3 1/8     |         | 3,000  | 3 1/8     |         | 5,000  | 3 1/8      |         | 10,000 |

- (1) Only one required in Class 3M
- (2) Gate valves only shall be used for Class 10 M
- (3) Remote operated hydraulic choke required on 5,000 psi and 10,000 psi for drilling.

### EQUIPMENT SPECIFICATIONS AND INSTALLATION INSTRUCTION

- 1. All connections in choke manifold shall be welded, studded, flanged or Cameron clamp of comparable rating.
- 2. All flanges shall be API 6B or 6BX and ring gaskets shall be API RX or BX. Use only BX for 10 MWP.
- 3. All lines shall be securely anchored.
- 4. Chokes shall be equipped with tungsten carbide seats and needles, and replacements shall be available.
- 5. Choke manifold pressure and standpipe pressure gauges shall be available at the choke manifold to assist in regulating chokes. As an alternate with automatic chokes, a choke manifold pressure gauge shall be located on the rig floor in conjunction with the standpipe pressure gauge.
- 6. Line from drilling spool to choke manifold should be as straight as possible. Lines downstream from chokes shall make turns by large bends or 90 degree bends using bull plugged tees.

## CONDITIONS OF APPROVAL - DRILLING

Well Name & No.      2-Caddo Federal  
Operator's Name:      COG Operating LLC  
Location:              330FNL, 2310FEL, Section 17, T-17-S, R-30-E  
Lease:                  NM-2933

### I. DRILLING OPERATIONS REQUIREMENTS:

1. The Bureau of Land Management (BLM) is to be notified at the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, (505) 234-5972 or (505) 361-2822 - for wells in Eddy County; and the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (505) 393-3612 for wells in Lea County, in sufficient time for a representative to witness:

A. Spudding

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

C. BOP tests

2. A Hydrogen Sulfide (H<sub>2</sub>S) Drilling Plan should be activated prior to drilling into the **Grayburg** Formation. A copy of the plan shall be posted at the drilling site. **H<sub>2</sub>S has been reported in sections 12 and 15 from the Grayburg Jackson pool measuring 500-1800 ppm.**

3 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.

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

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

6. 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.

7. Gamma-Ray/Neutron logs shall be run from the base of the Salado Formation to the surface; cable speed not to exceed 30 feet per minute.

### II. CASING:

1. The 13-3/8 inch surface casing shall be set at approximately 425 feet or 25 feet into the Rustler Anhydrite or in the case that salt occurs at a shallower depth above the top of the salt, below usable water and cement circulated to the surface. The surface casing shoe shall be set in the anhydrite to ensure adequate sealing. If cement does not circulate to the surface, the operator may then use ready-mix cement to fill the remaining annulus. The operator is required to use an excess of 100% cement volume to fill the annulus.

**Possible loss of circulation in the Grayburg and San Andres formations.**

**Possible water flows in the Salado and Artesia Groups.**

2. The minimum required fill of cement behind the 8-5/8 inch salt protection casing is circulate cement to the surface. Set intermediate into basal anhydrite beneath the salt section.

3. The minimum required fill of cement behind the 5-1/2 inch production casing is cement shall circulate to surface.



### **III. PRESSURE CONTROL:**

1. All BOP systems and related equipment shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2. The BOP and related equipment shall be installed and operational before drilling below the **13-3/8** inch casing shoe and shall be tested as described in Onshore Order No. 2. Any equipment failing to test satisfactorily shall be repaired or replaced. **The BOP, BOPE, and 13-3/8 inch surface casing will be tested to stack working pressure if isolated by plug or to 70% of internal yield pressure by a 3<sup>rd</sup> party. The BOP and all associated equipment will be tested to 2M prior to drilling below the 8-5/8 inch casing.**
2. Minimum working pressure of the blowout preventer and related equipment (BOPE) is **2M** psi.
3. The appropriate BLM office shall be notified in sufficient time for a representative to witness the tests.
  - The tests shall be done by an independent service company.
  - The results of the test shall be reported to the appropriate BLM office.
  - Testing fluid must be water or an appropriate clear liquid suitable for sub-freezing temperatures. Use of drilling mud for testing is not permitted since it can mask small leaks.
  - Testing must be done in a safe workman-like manner. Hard line connections shall be required.

**Engineer on call phone: 505-706-2779**

**WWI 112006**