

OCD-ARTESIA

Form 3160-3
(April 2004)UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

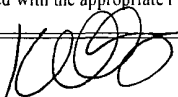
FORM APPROVED
OMB No. 1004-0137
Expires March 31, 2007

1a Type of work ☒ DRILL ☐ REENTER		5 Lease Serial No SHL-NMLC-028731B BHL-LC 068722
1b Type of Well ☒ Oil Well ☐ Gas Well ☐ Other ☐ Single Zone ☐ 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 N/A
3a Address 550 W. Texas Ave., Suite 100 Midland, TX 79701	3b Phone No (include area code) 432-685-4384	8 Lease Name and Well No SUBMARINE 10 FED COM #4H
4 Location of Well (Report location clearly and in accordance with any State requirements *) At surface SHL: 2285' FNL & 40' FEL, Unit H At proposed prod zone BHL: 2310' FNL & 330' FWL, Unit E		9 API Well No 30-015- 40545
14 Distance in miles and direction from nearest town or post office* 2 miles from Loco Hills, NM		10 Field and Pool, or Exploratory Dodd; Glorieta-Upper Yeso
15 Distance from proposed* location to nearest property or lease line, ft (Also to nearest drig unit line, if any) 40'		11 Sec, T R M or Blk and Survey or Area Sec 10 T17S R29E
16 No of acres in lease 1480		12 County or Parish EDDY
17 Spacing Unit dedicated to this well 160		13 State NM
18 Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft 170'		19 Proposed Depth TVD. 5200' MD: 9914'
20 BLM/BIA Bond No on file NMB000740; NMB000215		21 Elevations (Show whether DF, KDB, RT, GL, etc) 3626' GL
22 Approximate date work will start* 06/30/2012		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 04/04/2012
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Title

Permitting Tech

Approved by (Signature) /s/ Don Peterson	Name (Printed/Typed) /s/ Don Peterson	Date JUL 26 2012
Title FIELD MANAGER	Office CARLSBAD FIELD OFFICE	

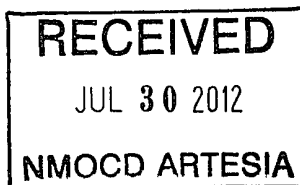
Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon

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

Approval Subject to General Requirements
& Special Stipulations AttachedSEE ATTACHED FOR
CONDITIONS OF APPROVAL

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

John H. Bemis
Cabinet Secretary

Brett F. Woods, Ph.D.
Deputy Cabinet Secretary

JAMI BAILEY
Division Director
Oil Conservation Division



Administrative Order DHC-4567

Order Date: 5/9/2012

Application Reference Number: pWVJ1213036736

COG OPERATING LLC
550 W TEXAS, SUITE 100
MIDLAND, TX 79701

Attention: Kanicia Castillo

Submarine 10 Federal Com Well No. 4H
API No: 30-015-NA
Unit H, Section 10, Township 17 South, Range 29 East, NMPM
Eddy County, New Mexico

Pool: DODD, GLORIETA-UPPER YESO Oil 97917
Names: UNDES. EMPIRE, GLORIETA-YESO, EAST Oil 96610

Reference is made to your recent application for an exception to 19.15.12.9A NMAC of the Division Rules and Regulations to permit the above-described well to commingle production from the subject pools in the wellbore.

It appearing that the subject well qualifies for approval for such exception pursuant to the provisions of 19.15.12.11A NMAC, and that reservoir damage or waste will not result from such downhole commingling, and correlative rights will not be violated thereby, you are hereby authorized to commingle the production as described above and any Division Order which authorized the dual completion or otherwise required separation of the zones is hereby placed in abeyance.

In accordance with 19.15.12.11A.(6) NMAC, the production attributed to any commingled pool within the well shall not exceed the allowable applicable to that pool.

Assignment of allowable and allocation of production from the well shall be as follows:

DODD; GLORIETA-UPPER YESO Pool	Pct Gas: 75	Pct Oil: 75
UNDES. EMPIRE; GLORIETA-YESO, EAST Pool	Pct Gas: 25	Pct Oil: 25

REMARKS: The operator shall notify the Division's district office upon implementation of commingling operations.

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

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

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

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015- 40545	Pool Code 97917	Pool Name Dodd; Glorieta-Upper Yeso
Property Code 39252	Property Name SUBMARINE 10 FEDERAL COM	Well Number 4H
Survey No. 229137	Operator Name COG OPERATING, LLC	Elevation 3621'

Surface Location

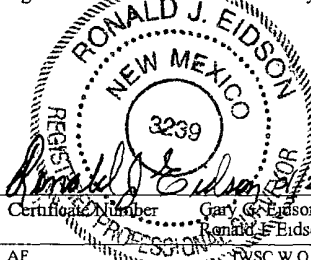
UL or lot No	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	10	17-S	29-E		2285	NORTH	40	EAST	EDDY

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
E	10	17-S	29-E		2310	NORTH	330	WEST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
160			

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

CORNER COORDINATES TABLE Ⓐ - Y=6740018 N, X=5806292 E Ⓑ - Y=6740093 N, X=5859162 E Ⓒ - Y=6726817 N, X=5806299 E Ⓓ - Y=6726887 N, X=5859199 E Producing Area GRID AZ = 269°37'11" HORIZ DIST = 4920.5' Project Area SEE DETAIL 40		OPERATOR CERTIFICATION I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division  1-31-12 Signature Date Kelly J. Holly Printed Name kholly@concho.com E-mail Address
GEODETIC COORDINATES NAD 27 NME SURFACE LOCATION Y=6730453 N X=5858788 E LAT = 32 849974" N LONG = 104 053690" W BOTTOM HOLE LOCATION Y=6730127 N X=5809596 E DETAIL 3614.9' 3630.1' 3618.0' 3627.0'		SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief JANUARY 4, 2012 Date of Survey Signature & Seal of Professional Surveyor  Certificate Number Gary G. Eidson 12641 Ronald J. Eidson 3239 AF WSC W O 11 11.2693

ATTACHMENT TO FORM 3160-3
COG Operating, LLC
SUBMARINE 10 FEDERAL COM #4H
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6. Casing Program - Proposed

<u>Hole size</u>	<u>Interval</u>	<u>OD of Casing</u>	<u>Weight</u>	<u>Cond</u>	<u>Collar</u>	<u>Grade</u>
See COA 17-1/2"	0' - +/- 400' ²⁵⁰	13-3/8"	48#	New	STC	H-40 or Hybrid J-55
Collapse sf - 4.36, Burst sf - 9.79, Tension sf - 16.77						
12-1/4"	0' - +/- 1350'	9-5/8"	36#	New	STC	J/K-55
Collapse sf - 3.16, Burst sf - 5.51, Tension sf - 9.32						
8-3/4" x 7 7/8"	0' - 9914'	7" x 5-1/2"	26#/17#	New	LTC	L-80
7" Csg - Collapse sf - 2.42, Burst sf - 1.94, Tension sf - 4.23						
5 1/2" Csg - Collapse sf - 2.55, Burst sf - 1.95, Tension sf - 3.94						

Production string will be a tapered string with 7" 26# L-80 LTC ran from surface to kick off point and then crossed over to 5 1/2" 17# L-80 LTC.

7. Cement Program See
COA

13 3/8" Surface Csg: Set at +/- 400' MD, Lead Slurry: 400sx Class "C" w/ 2% CaCl₂ & 25 pps CF, 1.32 yield. 190% excess, calculated to surface

9 5/8" Intrmd. Csg: Set at +/- 1350' MD. Single Stage: Lead Slurry: 300 sx 50:50:10:C:Poz:Gel w/ 5% salt, 5 pps LCM-1 .25 pps CF, 2.45 yield. Tail Slurry: 200 sx Class "C" w/ 2% CaCl₂, 1.32 yield 185% excess, calculated to surface.

Multi Stage: Stage 1: 200 sx Class "C" w/ 2% CaCl₂, 1.32 yield. 45% excess Stage 2: 300 sx 50:50:10:C:Poz:Gel w/ 5% salt, 5 pps LCM-1 .25 pps CF, 2.45 yield, back to surface, 185% excess; assumption for tool is lost circulation. Multi stage tool to be set at approximately, depending on hole conditions, 450' (50' below the surface casing). Cement volumes will be adjusted proportionately for depth changes of multi stage tool.

7 x 5 1/2" Production Csg: Set at +/- 9914' MD Single Stage: Lead Slurry: 400 sx 35:65:6:C:Poz:Gel w/ 5% salt, 5 pps LCM, .2% SMS, 3% FL-52A, .125 pps CF, 2.01 yd. Tail Slurry: 300 sx 50:50:2:C:Poz:Gel w/ 5% salt, 3 pps LCM, .6% SMS, 1% FL-25, 1% BA-58, .125 pps CF, .3% FL-52A; 1.37 yield. DV Tool and ECP to be set at kick off point with 7" cemented to surface and 5 1/2" run with +/- 18 isolation packers and sliding sleeves in uncemented lateral. 95% excess in open hole, from kick off point, calculated to surface. **This is a minimum volume and will be adjusted up after caliper is run.**

Multi Stage: Stage 1: (From assumed KOP of 4723' MD to DV at 3000') Lead Slurry: 200 sx 50:50:2:C:Poz:Gel w/ 5% salt, 3 pps LCM, .6% SMS, 1% FL-25, 1% BA-58, .125 pps CF, 3% FL-52A, 1.37 yield. 6% excess. **This is a minimum volume and will be adjusted up after caliper is run.** Stage 2: Lead Slurry: 400 sx 50:50:2:C:Poz:Gel w/ 5% salt, 3 pps LCM, .6% SMS, 1% FL-25, 1% BA-58, .125 pps CF, .3% FL-52A; 1.37 yield Tail Slurry: 300 sx Class C w/ 0.3% R-3 + 1.5% CD-32, 1.02 yield. 154% excess calculated back to surface (no need for excess in casing overlap). DV tool to be set at 3000' DV Tool depth will be adjusted depending on hole conditions Stage packer to be set at kick off point at 4723', with 7" casing cemented from kick off point to surface and 5 1/2" casing run from kick off point to TD with +/- 18 isolation packers and sliding sleeves in uncemented lateral. **This is a minimum volume and will be adjusted up after caliper is run.**

Multi stage tool to be set at approximately 3000', depending on hole conditions. Cement volumes will be adjusted proportionately for depth changes of multi stage tool; assumption for use of tool is water flow

ATTACHMENT TO FORM 3160-3
COG Operating, LLC
SUBMARINE 10 FEDERAL COM #4H
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8 Pressure Control Equipment:

The blowout preventer equipment (BOP) shown in Exhibit #9 will consist of a double ram-type (2000 psi WP) preventer, and in some cases possibly a 2000 psi Hydril type annular preventer as provided for in Onshore Order #2. This unit will be hydraulically operated and the ram type preventer will be equipped with blind rams on top of 4 1/2" drill pipe rams on the bottom. A 13-5/8" BOP will be used during the drilling of the well. A 13 5/8" permanent casing head will be installed on the 13 3/8" casing. The BOP will be nipped up on the 13 5/8" permanent casing head and tested to 2000 psi. After setting 9-5/8", permanent "B section" well head will be installed and the BOP will then be nipped up on the permanent B section well head 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

9 Proposed Mud Circulating System

Interval	Mud Wt.	Visc.	FL	Type Mud System
0' - 400' ²⁵⁰	8.5	28	NC	Fresh water native mud w/ paper for seepage and sweeps. Lime for PH.
400' - 1350'	10	30	NC	Brine mud, lime for PH and paper for seepage and sweeps.
1350' - 9914'	9.1	29	NC	Drill section with fresh water/cut brine circulating the reserve utilizing periodic sweeps of paper as needed for seepage control and solids removal.

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

10 Production Hole Drilling Summary.

Drill 8 3/4" hole and kick off at +/- 4723', building curve over +/- 750' to horizontal at 5200' TVD. Drill 7 7/8" lateral section in a westerly direction for +/-4442' lateral to TD at +/-9914' MD, 5200' TVD. Run 7" x 5-1/2" production casing. 7" to be ran from surface to kickoff point and changed over to 5 1/2" with DV Tool and ECP at kickoff point. 5 1/2" casing will be ran from kickoff point to td and isolation packers set throughout lateral. 7" to be cemented from kickoff point to surface.

11 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

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COG Operating, LLC
SUBMARINE 10 FEDERAL COM #4H
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12 Logging, Testing and Coring Program: *See COA*

- A. No electric logs to be run.
- B. The mud logging program will consist of lagged 10' samples from intermediate casing point to T.D. in vertical pilot hole and from Kick off point to TD in Horizontal hole.
- C. Drill Stem test is not anticipated.
- D. No conventional coring is anticipated.
- E. Further testing procedures will be determined after the 7" x 5 1/2" production casing has been cemented at TD based on drill shows and log evaluation.

13 Abnormal Conditions, Pressures, Temperatures and Potential Hazards:

No abnormal pressures or temperatures are anticipated. The estimated bottom hole temperature at TD of pilot hole is 90 degrees and estimated maximum bottom hole pressure is 2200 psig. Measurable gas volumes or Hydrogen Sulfide levels have not been encountered during drilling operations in this area, however an H2S plan is attached to the Drilling Program. No major loss of circulation zones has been reported in offsetting wells.

14 Anticipated Starting Date

Drilling operations will commence approximately on *June 30,* ~~May 15,~~ **2012** with drilling and completion operations lasting approximately **90** days



COG Operating LLC

Eddy County, NM (NAN27 NME)

Submarine 10 Federal Com #4H

Submarine 10 Federal Com #4H

OH

Plan: Plan #3 8-3/4" Hole

SHL = 2285' FNL & 40' FEL

PP = 2285' FNL & 330' FEL

BHL = 2310' FNL & 330' FWL

Standard Planning Report

09 February, 2012



Scientific Drilling
Directional Drilling Operations

Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Site Submarine 10 Federal Com #4H
Company:	COG Operating LLC	TVD Reference:	GL Elev @ 3626 00usft
Project:	Eddy County, NM (NAN27 NME)	MD Reference:	GL Elev @ 3626 00usft
Site:	Submarine 10 Federal Com #4H	North Reference:	Gnd
Well:	Submarine 10 Federal Com #4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3 8-3/4" Hole		

Project:	Eddy County, NM (NAN27 NME)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site:	Submarine 10 Federal Com #4H		
Site Position		Northing	673,045 30 usft
From:	Map	Easting:	585,878 80 usft
Position Uncertainty:	0 00 usft	Slot Radius:	13-3/16 "
		Latitude	32° 50' 59 905 N
		Longitude	104° 3' 13 285 W
		Grid Convergence:	0 15 °

Well	Submarine 10 Federal Com #4H					
Well Position	+N/-S	0 00 usft	Northing:	673,045 30 usft	Latitude	32° 50' 59 905 N
	+E/-W	0 00 usft	Easting:	585,878 80 usft	Longitude	104° 3' 13 285 W
Position Uncertainty		0 00 usft	Wellhead Elevation.		Ground Level.	3,626 00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	01/23/12	7 78	60 67	48,877

Design:	Plan #3 8-3/4" Hole			
Audit Notes:				
Version:	Phase	PLAN	Tie On Depth.	0 00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(usft)	(usft)	(usft)	(°)
	0 00	0 00	0 00	269 62

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	
4,722 54	0 00	0 00	4,722 54	0 00	0 00	0 00	0 00	0 00	0 00	
5,472 54	90 00	269 62	5,200 00	-3 16	-477 45	12 00	12 00	0 00	269 62	
9,914 38	90 00	269 62	5,200 00	-32 60	-4,919 20	0 00	0 00	0 00	0 00	PBHL-Submarine 10



SDI
Planning Report



Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference	Site Submarine 10 Federal Com #4H
Company:	COG Operating LLC	TVD Reference:	GL Elev @ 3626 00usft
Project:	Eddy County, NM (NAN27 NME)	MD Reference:	GL Elev @ 3626 00usft
Site:	Submarine 10 Federal Com #4H	North Reference:	Grid
Well:	Submarine 10 Federal Com #4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3 8-3/4" Hole		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	
100 00	0 00	0 00	100 00	0 00	0 00	0 00	0 00	0 00	0 00	
200 00	0 00	0 00	200 00	0 00	0 00	0 00	0 00	0 00	0 00	
300 00	0 00	0 00	300 00	0 00	0 00	0 00	0 00	0 00	0 00	
400 00	0 00	0 00	400 00	0 00	0 00	0 00	0 00	0 00	0 00	
500 00	0 00	0 00	500 00	0 00	0 00	0 00	0 00	0 00	0 00	
600 00	0 00	0 00	600 00	0 00	0 00	0 00	0 00	0 00	0 00	
700 00	0 00	0 00	700 00	0 00	0 00	0 00	0 00	0 00	0 00	
800 00	0 00	0 00	800 00	0 00	0 00	0 00	0 00	0 00	0 00	
900 00	0 00	0 00	900 00	0 00	0 00	0 00	0 00	0 00	0 00	
1,000 00	0 00	0 00	1,000 00	0 00	0 00	0 00	0 00	0 00	0 00	
1,100 00	0 00	0 00	1,100 00	0 00	0 00	0 00	0 00	0 00	0 00	
1,200 00	0 00	0 00	1,200 00	0 00	0 00	0 00	0 00	0 00	0 00	
1,300 00	0 00	0 00	1,300 00	0 00	0 00	0 00	0 00	0 00	0 00	
1,400 00	0 00	0 00	1,400 00	0 00	0 00	0 00	0 00	0 00	0 00	
1,500 00	0 00	0 00	1,500 00	0 00	0 00	0 00	0 00	0 00	0 00	
1,600 00	0 00	0 00	1,600 00	0 00	0 00	0 00	0 00	0 00	0 00	
1,700 00	0 00	0 00	1,700 00	0 00	0 00	0 00	0 00	0 00	0 00	
1,800 00	0 00	0 00	1,800 00	0 00	0 00	0 00	0 00	0 00	0 00	
1,900 00	0 00	0 00	1,900 00	0 00	0 00	0 00	0 00	0 00	0 00	
2,000 00	0 00	0 00	2,000 00	0 00	0 00	0 00	0 00	0 00	0 00	
2,100 00	0 00	0 00	2,100 00	0 00	0 00	0 00	0 00	0 00	0 00	
2,200 00	0 00	0 00	2,200 00	0 00	0 00	0 00	0 00	0 00	0 00	
2,300 00	0 00	0 00	2,300 00	0 00	0 00	0 00	0 00	0 00	0 00	
2,400 00	0 00	0 00	2,400 00	0 00	0 00	0 00	0 00	0 00	0 00	
2,500 00	0 00	0 00	2,500 00	0 00	0 00	0 00	0 00	0 00	0 00	
2,600 00	0 00	0 00	2,600 00	0 00	0 00	0 00	0 00	0 00	0 00	
2,700 00	0 00	0 00	2,700 00	0 00	0 00	0 00	0 00	0 00	0 00	
2,800 00	0 00	0 00	2,800 00	0 00	0 00	0 00	0 00	0 00	0 00	
2,900 00	0 00	0 00	2,900 00	0 00	0 00	0 00	0 00	0 00	0 00	
3,000 00	0 00	0 00	3,000 00	0 00	0 00	0 00	0 00	0 00	0 00	
3,100 00	0 00	0 00	3,100 00	0 00	0 00	0 00	0 00	0 00	0 00	
3,200 00	0 00	0 00	3,200 00	0 00	0 00	0 00	0 00	0 00	0 00	
3,300 00	0 00	0 00	3,300 00	0 00	0 00	0 00	0 00	0 00	0 00	
3,400 00	0 00	0 00	3,400 00	0 00	0 00	0 00	0 00	0 00	0 00	
3,500 00	0 00	0 00	3,500 00	0 00	0 00	0 00	0 00	0 00	0 00	
3,600 00	0 00	0 00	3,600 00	0 00	0 00	0 00	0 00	0 00	0 00	
3,700 00	0 00	0 00	3,700 00	0 00	0 00	0 00	0 00	0 00	0 00	
3,800 00	0 00	0 00	3,800 00	0 00	0 00	0 00	0 00	0 00	0 00	
3,900 00	0 00	0 00	3,900 00	0 00	0 00	0 00	0 00	0 00	0 00	
4,000 00	0 00	0 00	4,000 00	0 00	0 00	0 00	0 00	0 00	0 00	
4,100 00	0 00	0 00	4,100 00	0 00	0 00	0 00	0 00	0 00	0 00	
4,200 00	0 00	0 00	4,200 00	0 00	0 00	0 00	0 00	0 00	0 00	
4,300 00	0 00	0 00	4,300 00	0 00	0 00	0 00	0 00	0 00	0 00	
4,400 00	0 00	0 00	4,400 00	0 00	0 00	0 00	0 00	0 00	0 00	
4,500 00	0 00	0 00	4,500 00	0 00	0 00	0 00	0 00	0 00	0 00	
4,600 00	0 00	0 00	4,600 00	0 00	0 00	0 00	0 00	0 00	0 00	
4,700 00	0 00	0 00	4,700 00	0 00	0 00	0 00	0 00	0 00	0 00	
4,722 54	0 00	0 00	4,722 54	0 00	0 00	0 00	0 00	0 00	0 00	
Start Build 12.00°/100'										
4,800 00	9 30	269 62	4,799 66	-0 04	-6 27	6 27	12 00	12 00	0 00	
4,900 00	21 30	269 62	4,895 94	-0 22	-32 60	32 60	12 00	12 00	0 00	
5,000 00	33 30	269 62	4,984 64	-0 52	-78 38	78 38	12 00	12 00	0 00	
5,100 00	45 30	269 62	5,061 89	-0 94	-141 59	141 59	12 00	12 00	0 00	



SDI
Planning Report



Database:	EDM 5000-1 Single User Db	Local Co-ordinate Reference:	Site Submarine 10 Federal Com #4H
Company:	COG Operating LLC	TVD Reference:	GL Elev @ 3626 00usft
Project:	Eddy County, NM (NAN27 NME)	MD Reference:	GL Elev @ 3626 00usft
Site:	Submarine 10 Federal Com #4H	North Reference:	Grid
Well:	Submarine 10 Federal Com #4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3 8-3/4" Hole		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,200 00	57 30	269 62	5,124 31	-1 45	-219 48	219 49	12 00	12 00	0 00
5,279 93	66 89	269 62	5,161 67	-1 92	-290 03	290 04	12 00	12 00	0 00
PP-330' FEL Submarine 10 #4H									
5,300 00	69 30	269 62	5,169 16	-2 05	-308 65	308 66	12 00	12 00	0 00
5,400 00	81 30	269 62	5,194 50	-2 69	-405 20	405 21	12 00	12 00	0 00
5,472 54	90 00	269 62	5,200 00	-3 16	-477 46	477 47	12 00	12 00	0 00
Land hold 90.00°									
5,500 00	90 00	269 62	5,200 00	-3 35	-504 92	504 93	0 00	0 00	0 00
5,600 00	90 00	269 62	5,200 00	-4 01	-604 92	604 93	0 00	0 00	0 00
5,700 00	90 00	269 62	5,200 00	-4 67	-704 91	704 93	0 00	0 00	0 00
5,800 00	90 00	269 62	5,200 00	-5 33	-804 91	804 93	0 00	0 00	0 00
5,900 00	90 00	269 62	5,200 00	-6 00	-904 91	904 93	0 00	0 00	0 00
6,000 00	90 00	269 62	5,200 00	-6 66	-1,004 91	1,004 93	0 00	0 00	0 00
6,100 00	90 00	269 62	5,200 00	-7 32	-1,104 91	1,104 93	0 00	0 00	0 00
6,200 00	90 00	269 62	5,200 00	-7 99	-1,204 90	1,204 93	0 00	0 00	0 00
6,300 00	90 00	269 62	5,200 00	-8 65	-1,304 90	1,304 93	0 00	0 00	0 00
6,400 00	90 00	269 62	5,200 00	-9 31	-1,404 90	1,404 93	0 00	0 00	0 00
6,500 00	90 00	269 62	5,200 00	-9 97	-1,504 90	1,504 93	0 00	0 00	0 00
6,600 00	90 00	269 62	5,200 00	-10 64	-1,604 89	1,604 93	0 00	0 00	0 00
6,700 00	90 00	269 62	5,200 00	-11 30	-1,704 89	1,704 93	0 00	0 00	0 00
6,800 00	90 00	269 62	5,200 00	-11 96	-1,804 89	1,804 93	0 00	0 00	0 00
6,900 00	90 00	269 62	5,200 00	-12 62	-1,904 89	1,904 93	0 00	0 00	0 00
7,000 00	90 00	269 62	5,200 00	-13 29	-2,004 89	2,004 93	0 00	0 00	0 00
7,100 00	90 00	269 62	5,200 00	-13 95	-2,104 88	2,104 93	0 00	0 00	0 00
7,200 00	90 00	269 62	5,200 00	-14 61	-2,204 88	2,204 93	0 00	0 00	0 00
7,300 00	90 00	269 62	5,200 00	-15 27	-2,304 88	2,304 93	0 00	0 00	0 00
7,400 00	90 00	269 62	5,200 00	-15 94	-2,404 88	2,404 93	0 00	0 00	0 00
7,500 00	90 00	269 62	5,200 00	-16 60	-2,504 87	2,504 93	0 00	0 00	0 00
7,600 00	90 00	269 62	5,200 00	-17 26	-2,604 87	2,604 93	0 00	0 00	0 00
7,700 00	90 00	269 62	5,200 00	-17 93	-2,704 87	2,704 93	0 00	0 00	0 00
7,800 00	90 00	269 62	5,200 00	-18 59	-2,804 87	2,804 93	0 00	0 00	0 00
7,900 00	90 00	269 62	5,200 00	-19 25	-2,904 87	2,904 93	0 00	0 00	0 00
8,000 00	90 00	269 62	5,200 00	-19 91	-3,004 86	3,004 93	0 00	0 00	0 00
8,100 00	90 00	269 62	5,200 00	-20 58	-3,104 86	3,104 93	0 00	0 00	0 00
8,200 00	90 00	269 62	5,200 00	-21 24	-3,204 86	3,204 93	0 00	0 00	0 00
8,300 00	90 00	269 62	5,200 00	-21 90	-3,304 86	3,304 93	0 00	0 00	0 00
8,400 00	90 00	269 62	5,200 00	-22 56	-3,404 85	3,404 93	0 00	0 00	0 00
8,500 00	90 00	269 62	5,200 00	-23 23	-3,504 85	3,504 93	0 00	0 00	0 00
8,600 00	90 00	269 62	5,200 00	-23 89	-3,604 85	3,604 93	0 00	0 00	0 00
8,700 00	90 00	269 62	5,200 00	-24 55	-3,704 85	3,704 93	0 00	0 00	0 00
8,800 00	90 00	269 62	5,200 00	-25 22	-3,804 85	3,804 93	0 00	0 00	0 00
8,900 00	90 00	269 62	5,200 00	-25 88	-3,904 84	3,904 93	0 00	0 00	0 00
9,000 00	90 00	269 62	5,200 00	-26 54	-4,004 84	4,004 93	0 00	0 00	0 00
9,100 00	90 00	269 62	5,200 00	-27 20	-4,104 84	4,104 93	0 00	0 00	0 00
9,200 00	90 00	269 62	5,200 00	-27 87	-4,204 84	4,204 93	0 00	0 00	0 00
9,300 00	90 00	269 62	5,200 00	-28 53	-4,304 84	4,304 93	0 00	0 00	0 00
9,400 00	90 00	269 62	5,200 00	-29 19	-4,404 83	4,404 93	0 00	0 00	0 00
9,500 00	90 00	269 62	5,200 00	-29 85	-4,504 83	4,504 93	0 00	0 00	0 00
9,600 00	90 00	269 62	5,200 00	-30 52	-4,604 83	4,604 93	0 00	0 00	0 00
9,700 00	90 00	269 62	5,200 00	-31 18	-4,704 83	4,704 93	0 00	0 00	0 00
9,800 00	90 00	269 62	5,200 00	-31 84	-4,804 82	4,804 93	0 00	0 00	0 00
9,900 00	90 00	269 62	5,200 00	-32 50	-4,904 82	4,904 93	0 00	0 00	0 00
9,914 38	90 00	269 62	5,200 00	-32 60	-4,919 20	4,919 31	0 00	0 00	0 00



Database	EDM 5000 1 Single User Db	Local Co-ordinate Reference	Site Submarine 10 Federal Com #4H
Company	COG Operating LLC	TVD Reference	GL Elev @ 3626 00usft
Project	Eddy County, NM (NAN27 NME)	MD Reference	GL Elev @ 3626 00usft
Site	Submarine 10 Federal Com #4H	North Reference	Grid
Well	Submarine 10 Federal Com #4H	Survey Calculation Method	Minimum Curvature
Wellbore	OH		
Design	Plan #3, 8-3/4" Hole		

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)
PBHL-Submarine 10 #4H									

Design Targets									
Target Name	hit/miss target	Dip Angle (°)	Dip Dir (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	
Shape									Latitude Longitude
PP-330' FEL Submarine	- plan hits target center	0 00	0 00	5,161 66	-1 92	-290 00	673,043 37	585,588 81	32° 50' 59 893 N 104° 3' 16 685 W
	- Point								
PBHL-Submarine 10 #4H	- plan hits target center	0 00	0 00	5,200 00	-32 60	-4,919 20	673,012 70	580,959 60	32° 50' 59 707 N 104° 4' 10 951 W
	- Point								

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
4,722 54	4,722 54	0 00	0 00	Start Build 12 00°/100'	
5,472 54	5,200 00	-3 16	-477 46	Land hold 90 00°	



Azimuth to Grid North
True North -0 15
Magnetic North 7 63
Magnetic Field
Strength 48877 nT
Dip Angle 66 67°
Date 01/23/2012
Model IGRF2010

To convert a Magnetic Direction to a Grid Direction Add 7 63
To convert a True Direction to a Grid Direction Subtract 0 15

Submarine 10 Federal Com #4H
Eddy County, NM (NAN27 NME)
Northing (Y) 673045'30
Easting (X) 585878 80
Plan #3 8-3/4" Hole

WELL DETAILS Submarine 10 Federal Com #4H

	-N/S	-E/W	Northing	Ground Level	3626 00	Latitude	Longitude	Spot
	0 00	0 00	673045 30	585878 80	32 50 59 905 N	104 3 13 285 W		

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	-N/S	-E/W	Dleg	TFace	VSecl	Target
1	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	
2	4721 54	0 00	0 00	4723 54	0 00	0 00	0 00	0 00	0 00	
3	5472 54	90 00	269 62	5200 00	3 16	-477 45	12 00	269 62	477 46	
4	9914 38	90 00	269 62	5200 00	-32 60	-4919 20	0 00	0 00	4919 31	PBHL-Submarine 10 #4H

DESIGN TARGET DETAILS

Name	TVD	-N/S	-E/W	Northing	Easting	Latitude	Longitude	Shape
PP-330 FEL Submarine 10 #4H161 56	1 92	-290 00	673043 38	585588 8032 50	59 853 N	104 3 16 685 W	Point	
plan hole target center								
PBHL-Submarine 10 #4H	5200 00	-32 60	-4919 20	673012 70	580959 6032 50	59 707 N	104 4 10 951 W	Point
- plan hole target center								

PROJECT DETAILS Eddy County NM (NAN27 NME)

Geodetic System US State Plane 1927 (Exact solution)
Datum NAD 1927 (NADCON CONUS)
Ellipsoid Clarke 1866
Zone New Mexico East 3001
System Datum Mean Sea Level

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

Local Origin Site Submarine 10 Federal Com #4H Grid North
Latitude 32 50 59 905 N
Longitude 104 3 13 285 W

Grid East 585878 80
Grid North 673045 30
Scale Factor 1 000

Geomagnetic Model IGRF2010

Sample Date 23-Jan-12

Magnetic Declination 7 78

Dip Angle from Horizontal 66 67°

Magnetic Field Strength 48877

To convert a Magnetic Direction to a Grid Direction Add 7 63
To convert a Magnetic Direction to a True Direction Add 7 78 East
To convert a True Direction to a Grid Direction Subtract 0 15

SITE DETAILS Submarine 10 Federal Com #4H

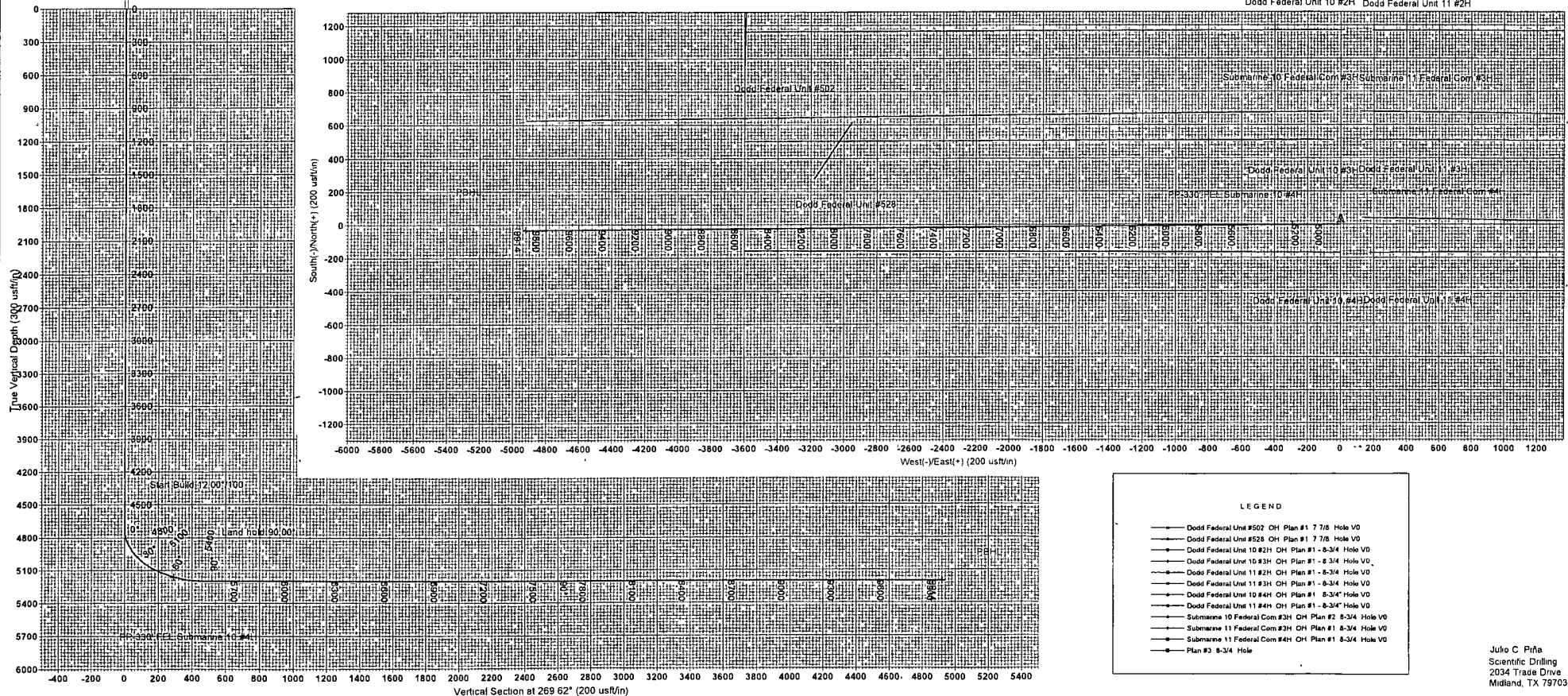
Site Centre Northing 673045 30
Easting 585878 80

Positional Uncertainty 0 00

Convergence 0 15

Local North Grid

Dodd Federal Unit 10 #2H Dodd Federal Unit 11 #2H

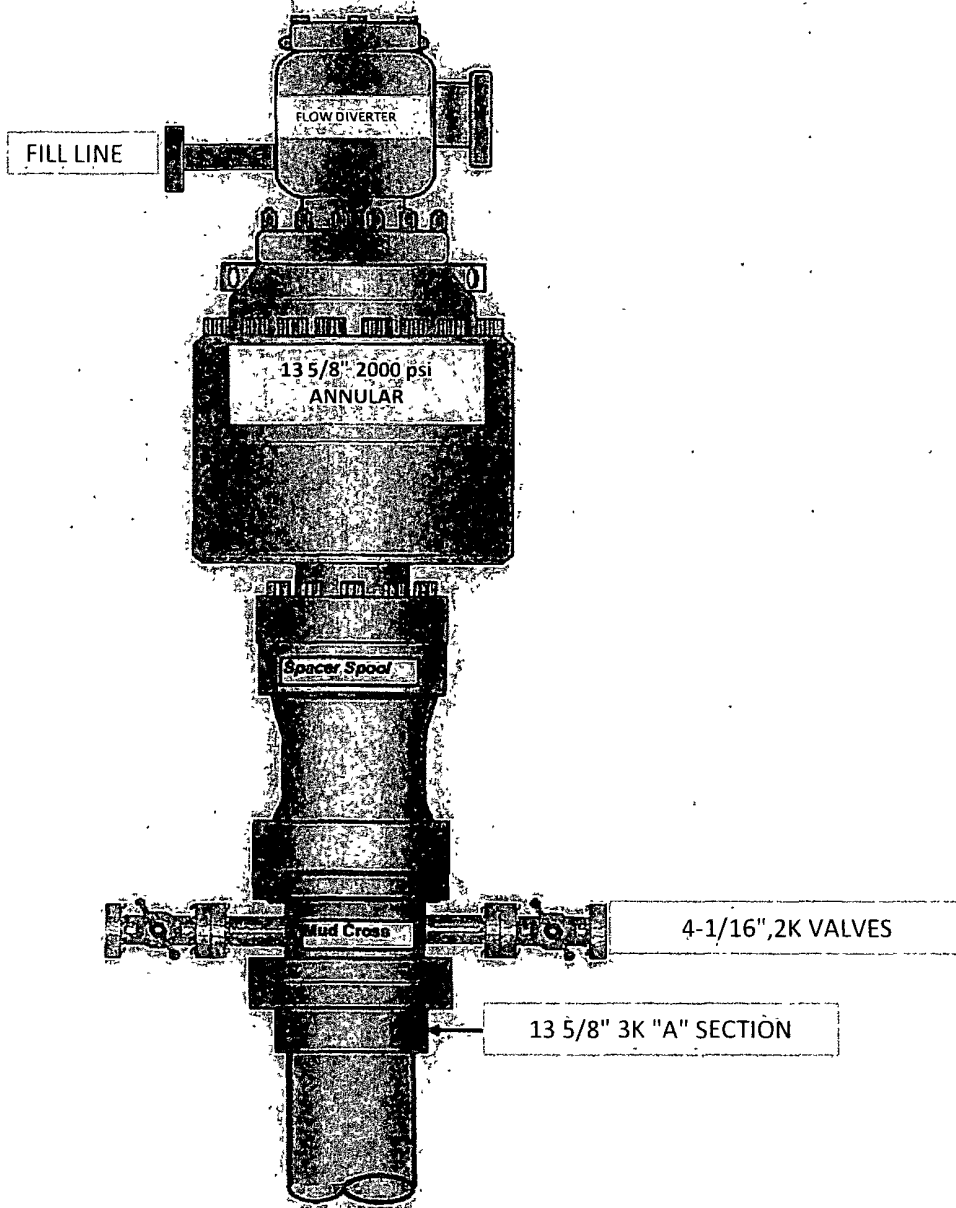


LEGEND

- Dodd Federal Unit #502 OH Plan #1 7 78 Hole V0
- Dodd Federal Unit #528 OH Plan #1 7 78 Hole V0
- Dodd Federal Unit 10 #2H OH Plan #1 - 8-3/4 Hole V0
- Dodd Federal Unit 10 #3H OH Plan #1 - 8-3/4 Hole V0
- Dodd Federal Unit 11 #2H OH Plan #1 - 8-3/4 Hole V0
- Dodd Federal Unit 11 #3H OH Plan #1 - 8-3/4 Hole V0
- Dodd Federal Unit 10 #4H OH Plan #1 - 8-3/4 Hole V0
- Dodd Federal Unit 11 #4H OH Plan #1 - 8-3/4 Hole V0
- Submarine 10 Federal Com #3H OH Plan #2 8-3/4 Hole V0
- Submarine 11 Federal Com #3H OH Plan #1 8-3/4 Hole V0
- Submarine 11 Federal Com #4H OH Plan #1 8-3/4 Hole V0
- Plan #3 8-3/4 Hole

Jufo C. Peña
Scientific Drilling
2034 Trade Drive
Midland, TX 79703

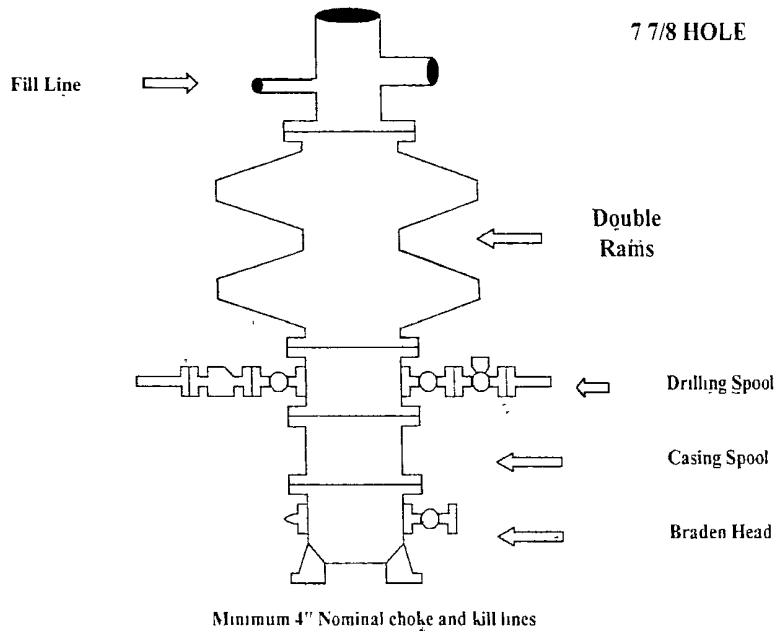
13 5/8" 2K ANNULAR



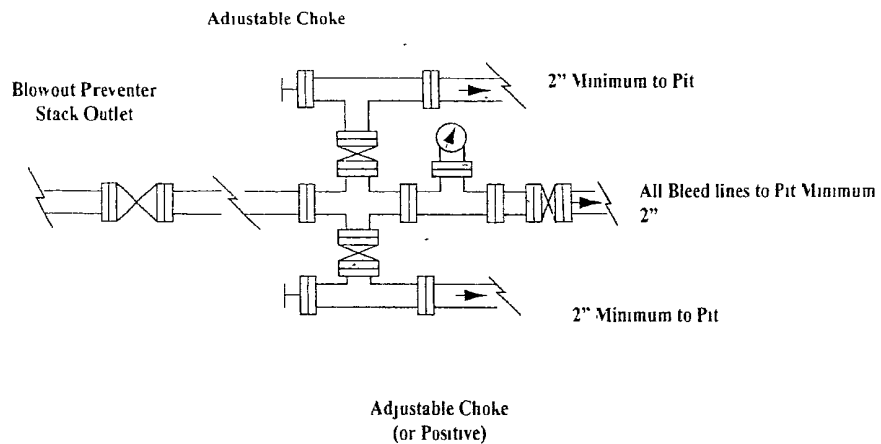
COG Operating LLC

Exhibit #9

BOPE and Choke Schematic



Choke Manifold Requirement (2000 psi WP)
No Annular Required

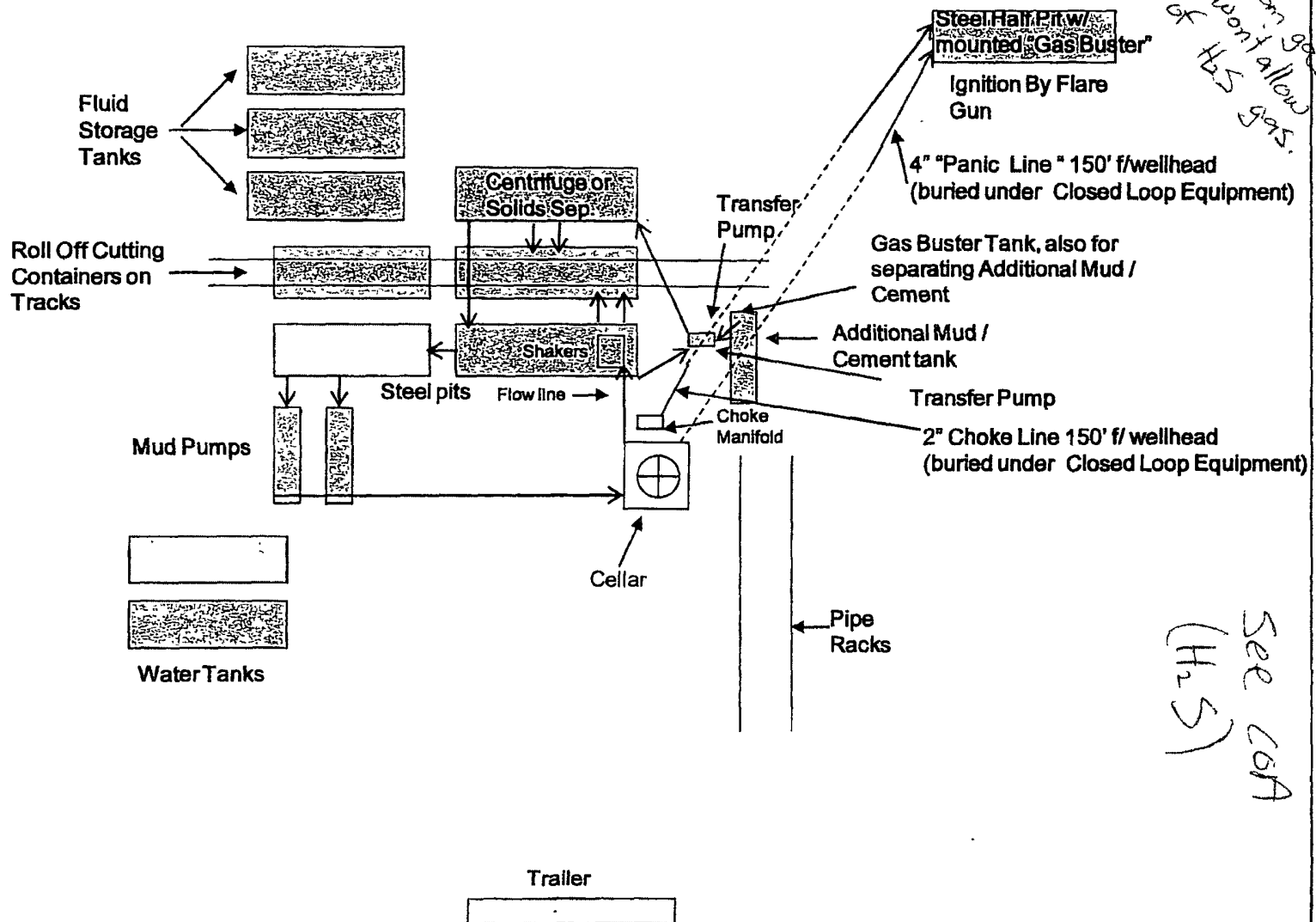


NOTES REGARDING THE BLOWOUT PREVENTERS

**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

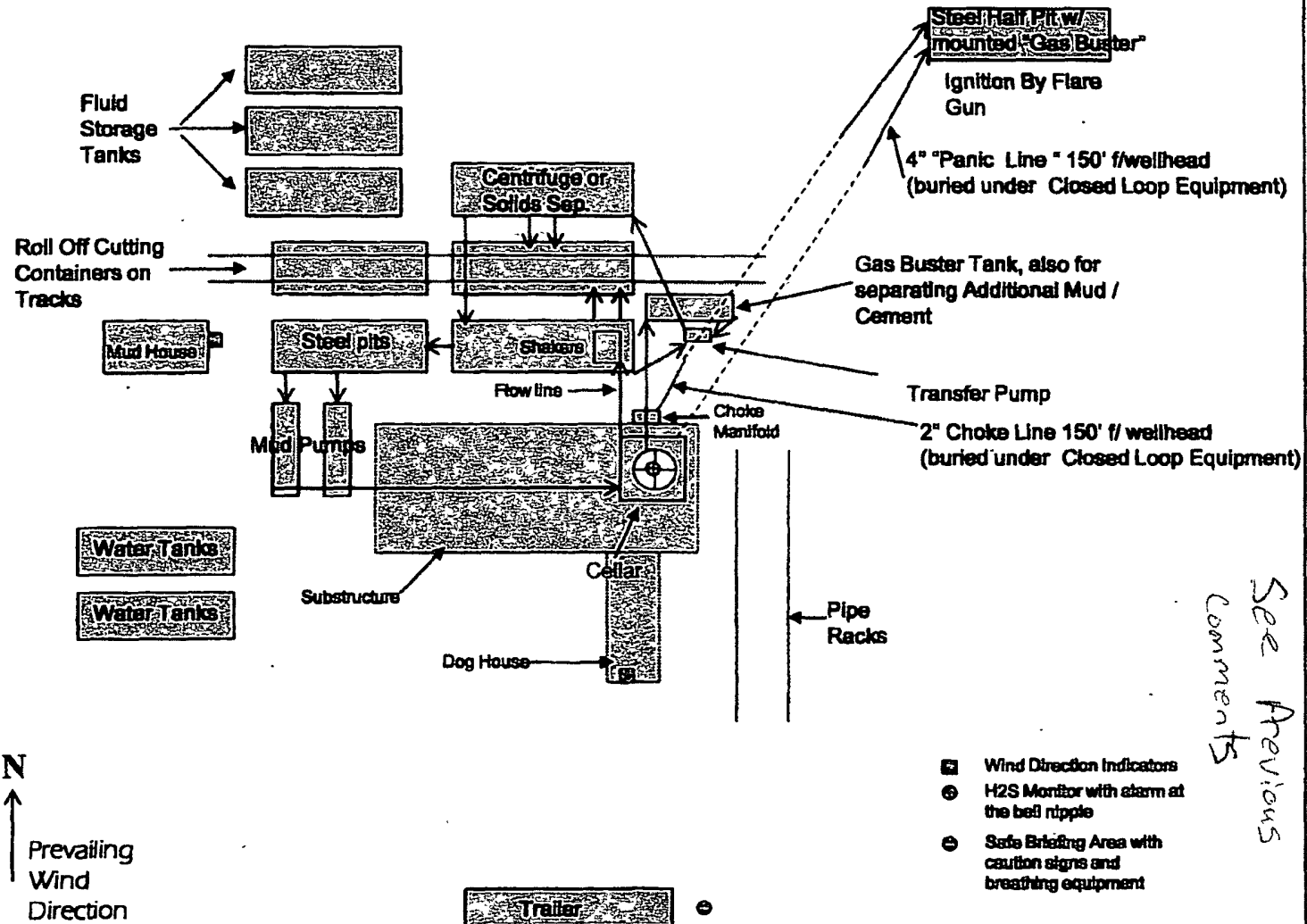
LEA COUNTY EMERGENCY NUMBERS

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

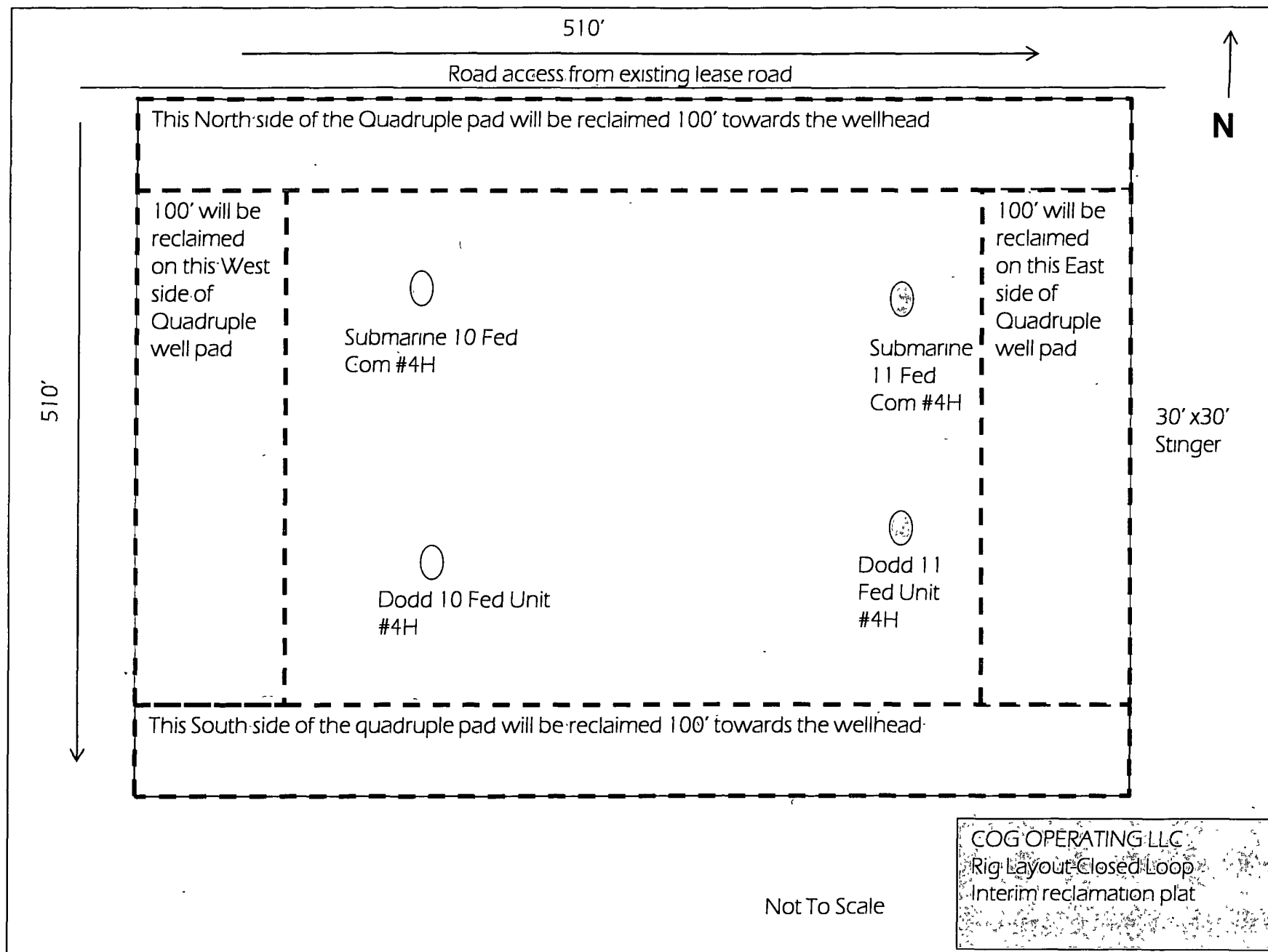
COG Operating LLC

EXHIBIT 8

Drilling Location - H2S Safety Equipment Diagram



See Previous comments



PECOS DISTRICT CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG Operating
LEASE NO.:	LC068722
WELL NAME & NO.:	4H Submarine 10 Fed Com
SURFACE HOLE FOOTAGE:	2285' FNL & 40' FEL
BOTTOM HOLE FOOTAGE:	2310' FNL & 330' FWL
LOCATION:	Section 10, T.17 S., R.29 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**
 - Lesser Prairie-Chicken Timing Stipulations
 - Ground-level Abandoned Well Marker
 - Communitization Agreement
- ☐ **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**