AFS-12-549

OCD-ARTESIA

RECEIVED
JUL 10 2012
NMOCD ARTESIA

Form 3160-3
(April 2004)

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: ☑ DRILL ☐ REENTER	5 Lease Serial No: NM NMLC-100844
1b Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other ☐ Single Zone ☐ Multiple Zone	6 If Indian, Allotee or Tribe Name: N/A
2 Name of Operator: COG Operating LLC < 229137 >	7 If Unit or CA Agreement, Name and No: N/A
3a Address: 550 W. Texas, Suite 100 Midland TX 79701	3b Phone No. (include area code): (432) 685-4384
4 Location of Well (Report location clearly and in accordance with any State requirements *) At surface: SHL: 380' FSL & 2070' FEL, UL O At proposed prod zone: BHL: 380' FSL & 330' FWL, UL M	8 Lease Name and Well No: Reindeer 21 Federal #5H < 36817 >
	9 API Well No. 30-015- 40451
	10 Field and Pool, or Exploratory: Crow Flats; Wolfcamp < 97102 >
	11 Sec., T. R. M. or Blk and Survey or Area: Sec 21, T16S, R28E
14 Distance in miles and direction from nearest town or post office*: 2 miles North of Loco Hills, NM	12 County or Parish: Eddy; 13 State: NM
15 Distance from proposed* location to nearest property or lease line, ft (Also to nearest drig unit line, if any): 380'	16 No of acres in lease: 920; 17 Spacing Unit dedicated to this well: 160
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft: 280'	19 Proposed Depth: TVD: 6568' MD: 9183'; 20 BLM/BIA Bond No. on file: NMB000740; NMB000215
21 Elevations (Show whether DF, KDB, RT, GL, etc.): 3593' GL	22. Approximate date work will start*: 05/31/2012; 23 Estimated duration: 15 days

TQS 7/11/2012

24. Attachments

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

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

25 Signature: Kacie Connally	Name (Printed/Typed): Kacie Connally	Date: 03/14/2012
Title: Permitting Tech		
Approved by (Signature): James A. Amos	Name (Printed/Typed): James A. Amos	Date: JUL 6 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 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction

*(Instructions on page 2)

ROSWELL CONTROLLED WATER BASIN

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

APPROVAL SUBJECT TO
GENERAL REQUIREMENTS
AND SPECIAL STIPULATIONS
ATTACHED

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 make 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 14th day of March, 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@conchoresources.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-102
Revised August 1, 2011
Submit one copy to appropriate District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT (pool expansion)

API Number	Pool Code	Pool Name
30-015 - 40451	97691	Crow Flats; Abo

Property Code	Property Name	Well Number
36817	REINDEER 21 FEDERAL	5H

OGRID No.	Operator Name	Elevation
229137	COG OPERATING, LLC	3593'

Surface Location

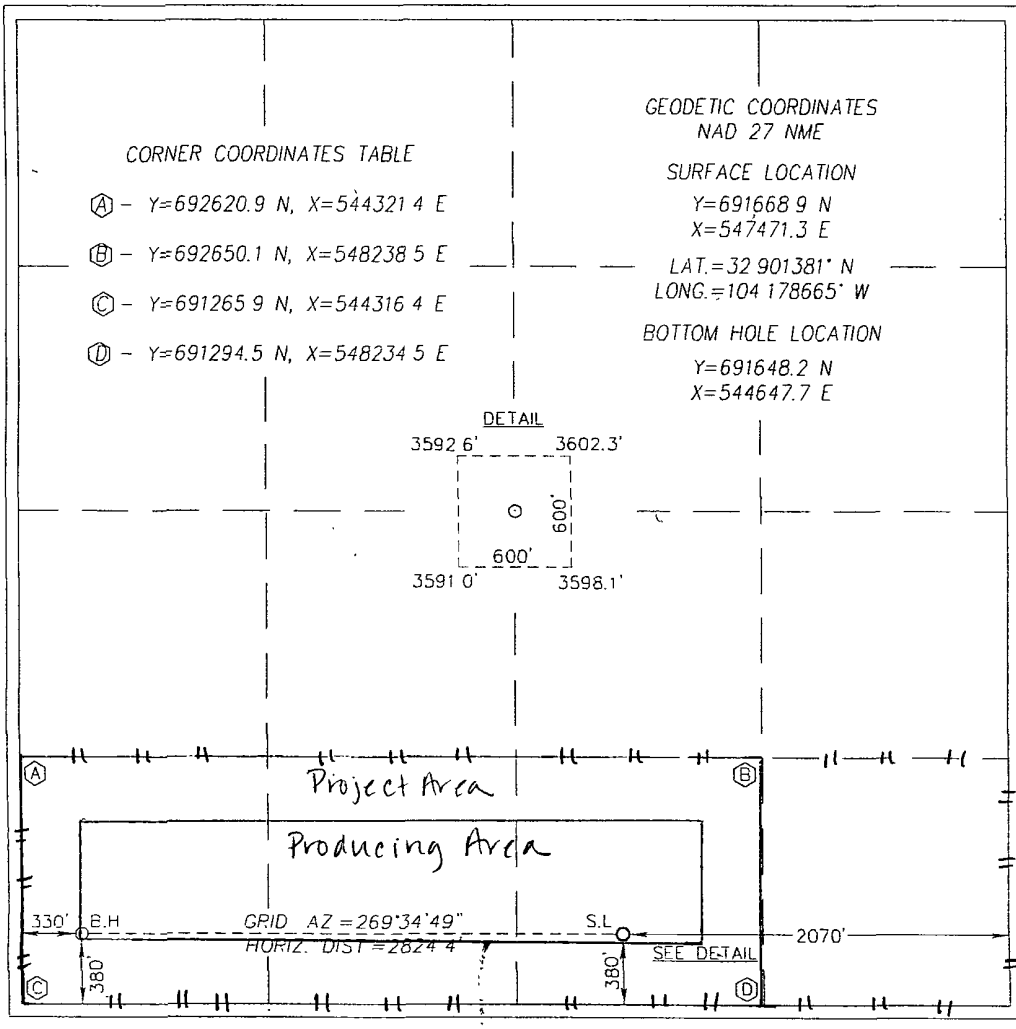
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
O	21	16-S	28-E		380	SOUTH	2070	EAST	EDDY

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
M	21	16-S	28-E		380	SOUTH	330	WEST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
120			9183 7/16

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



OPERATOR CERTIFICATION

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

Signature — Date: 3-20-12

Kelly J. Holly
Printed Name

kholly@concho.com
E-mail Address

SURVEYOR CERTIFICATION

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

FEBRUARY 25, 2012

Date of Survey

Signature & Seal of Professional Surveyor:

RONALD J. EIDSON NEW MEXICO 3239 REGISTERED PROFESSIONAL SURVEYOR

Ronald J. Eidson 03/15/2012

Certificate Number		
	Gary L. Eidson	12641
	Ronald J. Eidson	3239

AF JWSC W.O.: 12.11 0344

ATTACHMENT TO FORM 3160-3
COG Operating, LLC
Reindeer 21 Federal #5H
SL: 380' FSL & 2070' FEL, Unit O
BHL: 1980' FNL & 330' FWL, Unit E
Sec 21, T16S, R28E
Eddy County, NM

1. Proration Unit Spacing: 120 Acres

2. Ground Elevation: 3593'

3. Proposed Depths: Horizontal TVD = 6564', MD = 9183'

4. Estimated tops of geological markers:

Quaternary	Surface
Salado	~~100'~~ Surface Ck 4/18/12
Tansil	255'
Yates	370'
Seven Rivers	580'
Queen	1080'
Grayburg	1500'
San Andres	1925'
Glorieta	3340'
Paddock	3385'
Blinebry	3675'
Tubb	4637'
Drinkard	4741'
Abo Shale	5401'
Base Lower Abo	6645'

5. Possible mineral bearing formations:

Water Sand	150'	Fresh Water
Yates	370'	Oil / Gas
Queen	1080'	Oil / Gas
San Andres	1925'	Oil / Gas
Glorieta	3340'	Oil / Gas
Tubb	4637'	Oil / Gas
Lower Abo	6645'	Oil / Gas

6. Casing Program - Proposed

Hole size	Interval	OD of Casing	Weight	Cond.	Collar	Grade
17-1/2"	0' - +/-350'	13-3/8"	48#	New	STC	H40/J55 Hybrid J-55 at 4/18/12
Collapse sf – 3.87, Burst sf – 8.7, Tension sf – 14.91						
8-3/4"	0' – 5900'MD	7"	26#	New	LTC	P110
Collapse sf - 2.19, Burst sf – 3.51, Tension sf – 4.44						
6-1/8"	5800' – 9183'MD	4-1/2"	11.6#	New	LTC	P110
Collapse sf – 2.31, Burst sf – 3.27, Tension sf – 3.63						

If wellbore integrity cannot be maintained, then the 8-3/4" hole will be reamed out to 12-1/4" and new 9-5/8" casing contingency will be run as follows:

12-1/4"	0' - +/- 1925'	9-5/8"	40#	New	LTC	J/K-55
Collapse sf – 3.02, Burst sf – 4.64, Tension sf – 7.22						

Respectfully request permission for 100' liner overlap to set pump as deep as possible.

7. Cement Program

13 3/8" Surface Casing set at +/- 350', Circ.to Surf with +/- 400 sx Class "C" w/ 2% CaCl2 w/0.25 pps CF, 14.8 ppg, 1.35 cf/sk, 1.35 yd. 138% excess calculated to surface.

7" Production Casing set at +/- 5900', Circ. to Surf with +/- 900 sx Class "C" w/ 4% gel 13.5 ppg, 1.72 cf/sk, 2.45 yd. & 200 sx Class "C" w/ 0.35% R-3 14.8 ppg, 1.33 cf/sk, 1.35 yd. 88% excess calculated to surface.

6566' per directional plan

4 ½" Production Liner set at +/- 9183' MD, 6619' TVD, Uncemented, with packers for isolation, and requesting permission for only 100' liner overlap.

9 5/8" Contingency Intrmd. Csg. Set at +/- 1925'. Lead: 300sx 35:65:6 C:Poz:gel w/ 5pps LCM-1 0.2% sodium metasilicate, 0.3% FL5ZA, 5% NaCl, 2.05 yd. Tail: 200sx Class "C" w/ 2% CaCl2, 1.35 yd. 102% excess, calculated to surface

8. Pressure Control Equipment:

See COA

After setting 13 3/8" casing and installing 3000 psi casing head, NU 13 5/8" 3000 psi annular BOP. Test annular BOP, casing and manifold with clear fluid to 1000 psi w/ ~~rig pump.~~ independent tester last 4/10/12

After setting 7" casing and installing 3000 psi casing spool, NU 3000 psi double ram BOP and 3000 psi annular BOP. Test double ram BOP and manifold to 3000# with clear fluid and annular to 1500 psi using an independent tester, this equipment will be used continuously until TD is reached. Blind rams will be operationally checked on each trip out of hole. Pipe rams will be operationally checked each 24 hour period. These checks will be noted on daily tour sheets. Other accessories to the BOP equipment include a Kelly cock and floor safety valves, choke lines and choke manifold with 3000 psi WP rating.

9. Proposed Mud Circulating System

Interval	Mud Wt.	Visc.	FL	Type Mud System
0' - 350'	8.5	28	NC	Fresh water native mud w/ paper for seepage and sweeps. Lime for PH.
350'- 5900'	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.
5900' – 9183'	9.5	36	10	~~Drill pilot hole~~, curve and horizontal section with ~~XCD polymer~~ / cut brine / starch.

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. Auxiliary Well Control and Monitoring Equipment

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

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

11. Production Hole Drilling Summary:

Set 7" production casing at 5900'. Drill 6-1/8" hole. Kick off 6-1/8" hole at +/- 6086' MD, building curve over +/- 475' to horizontal at +/-6564' TVD. Drill horizontal section in a westerly direction for +/-2,824' lateral to TD @ +/-9183' MD, 6568' TVD. Run 4-1/2" production liner in open hole lateral and set isolation packers and liner top packer @ +/-5800' MD.

* 12. 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 T.D. in vertical pilot hole inside 7" csng shoe.

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 4 ½" production casing has been run to 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 at TD is 120 degrees and estimated maximum bottom hole pressure is 3160 psig. Low levels of Hydrogen sulfide have been monitored in producing wells in the area, so H2S may be present while drilling of the well. 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 November 30, 2011 with drilling and completion operations lasting approximately 45 days.

CONCHO

COG Operating LLC

Eddy County, NM (NAN27 NME)
Raindeer 21 Federal #5H
Raindeer 21 Federal #5H

OH

Plan: Plan #1 - 8-3/4" Hole
SHL = 380' FSL & 2070' FEL
BHL = 380' FSL & 330' FWL

Standard Planning Report

13 March, 2012

Scientific Drilling
Directional Drilling Operations

Database:	EDM 5000 1 Single User Db	**Local Co-ordinate Reference:**	Site Raindeer 21 Federal #5H
Company:	COG Operating LLC	**TVD Reference:**	GL @ 3593 00usft
Project:	Eddy County, NM (NAN27 NME)	**MD Reference:**	GL @ 3593 00usft
Site:	Raindeer 21 Federal #5H	**North Reference:**	Grid
Well:	Raindeer 21 Federal #5H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - 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 Raindeer 21 Federal #5H

Site Position:		**Northing:**	691,668 90 usft	**Latitude:**	32° 54' 4 972 N
From:	Map	**Easting:**	547,471 30 usft	**Longitude:**	104° 10' 43 195 W
Position Uncertainty:	0 00 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0 08 °

Well Raindeer 21 Federal #5H

Well Position	**+N/-S**	0 00 usft	**Northing:**	691,668 90 usft	**Latitude:**	32° 54' 4 972 N
	+E/-W	0 00 usft	**Easting:**	547,471.30 usft	**Longitude:**	104° 10' 43 195 W
Position Uncertainty		0 00 usft	**Wellhead Elevation:**		**Ground Level:**	3,593.00 usft

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	03/13/12	7 83	60 69	48,881

Design Plan #1 - 8-3/4" Hole

Audit Notes:

Version:		**Phase:**	PLAN	**Tie On Depth:**	0 00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0 00	0 00	0 00	269.58

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	
6,086.00	0 00	0 00	6,086 00	0 00	0 00	0.00	0 00	0 00	0 00	
6,836 04	89 90	269 58	6,564 00	-3 50	-477 18	11 99	11 99	0.00	269 58	
9,182.53	89 90	269 58	6,568 00	-20 70	-2,823 60	0 00	0 00	0 00	0 00	PBHL-Raindeer 21 Fe

Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Site Raindeer 21 Federal #5H
Company:	COG Operating LLC	TVD Reference:	GL @ 3593 00usft
Project:	Eddy County NM (NAN27 NME)	MD Reference:	GL @ 3593 00usft
Site:	Raindeer 21 Federal #5H	North Reference:	Grid
Well:	Raindeer 21 Federal #5H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 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
6,086 00	0 00	0 00	6,086 00	0 00	0 00	0 00	0 00	0 00	0 00
KOP Start Build 12.00°/100									
6,100 00	1 68	269 58	6,100 00	0 00	-0 20	0 21	11 99	11 99	0 00
6,200 00	13 66	269 58	6,198 92	-0 10	-13 53	13 53	11 99	11 99	0 00
6,300 00	25 65	269 58	6,292 92	-0.35	-47 11	47.11	11 99	11 99	0 00
6,400 00	37 64	269 58	6,377 90	-0 73	-99 47	99 48	11 99	11 99	0 00
6,500 00	49 62	269 58	6,450 15	-1 23	-168 35	168 35	11 99	11 99	0 00
6,600 00	61 61	269 58	6,506 52	-1 84	-250 72	250.73	11 99	11 99	0 00
6,700 00	73 60	269 58	6,544 55	-2 51	-343 01	343 02	11 99	11 99	0 00
6,800 00	85 58	269 58	6,562 59	-3 23	-441 18	441.19	11 99	11 99	0 00
6,836 04	89 90	269 58	6,564 00	-3 50	-477 18	477 19	11 98	11 98	0 00
Land hold 89.90°									
6,900 00	89 90	269 58	6,564 11	-3 97	-541 14	541 15	0 00	0 00	0 00
7,000 00	89 90	269 58	6,564 28	-4 70	-641 14	641.15	0 00	0 00	0 00
7,100 00	89 90	269 58	6,564 45	-5 43	-741 13	741 15	0 00	0 00	0 00
7,200 00	89 90	269 58	6,564 62	-6 17	-841 13	841 15	0 00	0 00	0 00
7,300 00	89 90	269 58	6,564 79	-6 90	-941 13	941 15	0 00	0 00	0 00
7,400 00	89 90	269 58	6,564 96	-7 63	-1,041 12	1,041 15	0 00	0 00	0 00
7,500 00	89 90	269 58	6,565 13	-8 37	-1,141 12	1,141 15	0 00	0 00	0 00
7,600 00	89 90	269 58	6,565 30	-9 10	-1,241 12	1,241 15	0 00	0 00	0 00
7,700 00	89 90	269 58	6,565 47	-9 83	-1,341 12	1,341 15	0 00	0 00	0 00
7,800 00	89 90	269 58	6,565 64	-10 56	-1,441 11	1,441 15	0 00	0 00	0 00
7,900 00	89 90	269 58	6,565 82	-11 30	-1,541 11	1,541 15	0 00	0 00	0 00
8,000 00	89 90	269 58	6,565 99	-12 03	-1,641 11	1,641 15	0 00	0 00	0 00
8,100 00	89 90	269 58	6,566 16	-12 76	-1,741 10	1,741 15	0 00	0 00	0 00
8,200 00	89 90	269 58	6,566 33	-13 50	-1,841 10	1,841 15	0 00	0 00	0 00
8,300 00	89 90	269 58	6,566 50	-14 23	-1,941 10	1,941 15	0 00	0 00	0 00
8,400 00	89 90	269 58	6,566 67	-14 96	-2,041 10	2,041 15	0 00	0 00	0 00
8,500 00	89 90	269 58	6,566 84	-15.70	-2,141 09	2,141 15	0 00	0 00	0 00
8,600 00	89 90	269 58	6,567 01	-16 43	-2,241 09	2,241 15	0 00	0 00	0 00
8,700 00	89 90	269 58	6,567 18	-17 16	-2,341 09	2,341 15	0 00	0 00	0 00
8,800 00	89 90	269 58	6,567 35	-17 90	-2,441 08	2,441 15	0 00	0 00	0 00
8,900 00	89 90	269 58	6,567 52	-18 63	-2,541 08	2,541 15	0.00	0 00	0 00
9,000 00	89 90	269 58	6,567 69	-19 36	-2,641 08	2,641 15	0 00	0 00	0 00
9,100 00	89 90	269 58	6,567 86	-20 10	-2,741 08	2,741 15	0 00	0 00	0 00
9,182 53	89 90	269 58	6,568 00	-20 70	-2,823 60	2,823 68	0 00	0 00	0 00
PBHL-Raindeer 21 Fed #5H									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PBHL-Raindeer 21 Fed - plan hits target center - Point	0 00	0 01	6,568 00	-20 70	-2,823 60	691,648 20	544,647 70	32° 54' 4 807 N	104° 11' 16 315 W

Database:	EDM 5000 1 Single User Db	**Local Co-ordinate Reference:**	Site Raindeer 21 Federal #5H
Company:	COG Operating LLC	**TVD Reference:**	GL @ 3593 00usft
Project:	Eddy County, NM (NAN27-NME)	**MD Reference:**	GL @ 3593 00usft
Site:	Raindeer 21 Federal #5H	**North Reference:**	Grid
Well:	Raindeer 21 Federal #5H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - 8 3/4" Hole		

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
6,086 00	6,086 00	0 00	0 00	KOP Start Build 12 00°/100'
6,836 04	6,564 00	-3 50	-477 18	Land hold 89 90°

CONCHO

Raindeer 21 Federal #5H
Eddy County, NM (NAN27 NME)
Northing (Y) 691668 90
Easting (X) 547471 30
Plan #1 - 8-3/4" Hole

Scientific Drilling
Directional Drilling Operations

Azimuths to Grid North
True North -0 08°
Magnetic North 7 74°

Magnetic Field
Strength 48880 5nT
Dip Angle 60 69°
Date 03/13/2012
Model IGRF2010

To convert Magnetic North to Grid Add 7 74°
To convert True North to Grid Subtract 0 08°

GL 3593 00

WELL DETAILS: Raindeer 21 Federal #5H

+N/-S	+E/-W	Northing	Ground Level Easting	3593 00 Latitude	Longitude	Slot
0 00	0 00	691668 90	547471 30	32° 54' 4 572" N	104° 10' 43 195" W	

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 Raindeer 21 Federal #5H Grid North

Latitude 32° 54' 4 572" N
Longitude 104° 10' 43 195" W

Grid East 547471 30
Grid North 691668 90
Scale Factor 1 000

Geomagnetic Model IGRF2010
Sample Date 13 Mar-12
Magnetic Declination 7 83°
Dip Angle from Horizontal 60 69°
Magnetic Field Strength 48881

To convert Magnetic North to Grid Add 7 74°
To convert Magnetic North to True North Add 7 83° East
To convert True North to Grid Subtract 0 08°

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	
2	6086 00	0 00	0 00	6086 00	0 00	0 00	0 00	0 00	0 00	
3	6836 04	89 90	269 58	6564 00	-3 50	-477 18	11 99	269 58	477 19	
4	9182 53	89 90	269 58	6588 00	-20 70	-2823 80	0 00	0 00	2823 88	PBHL-Raindeer 21 Fed #5H

SITE DETAILS: Raindeer 21 Federal #5H

Site Centre Northing 691668 90
Easting 547471 30

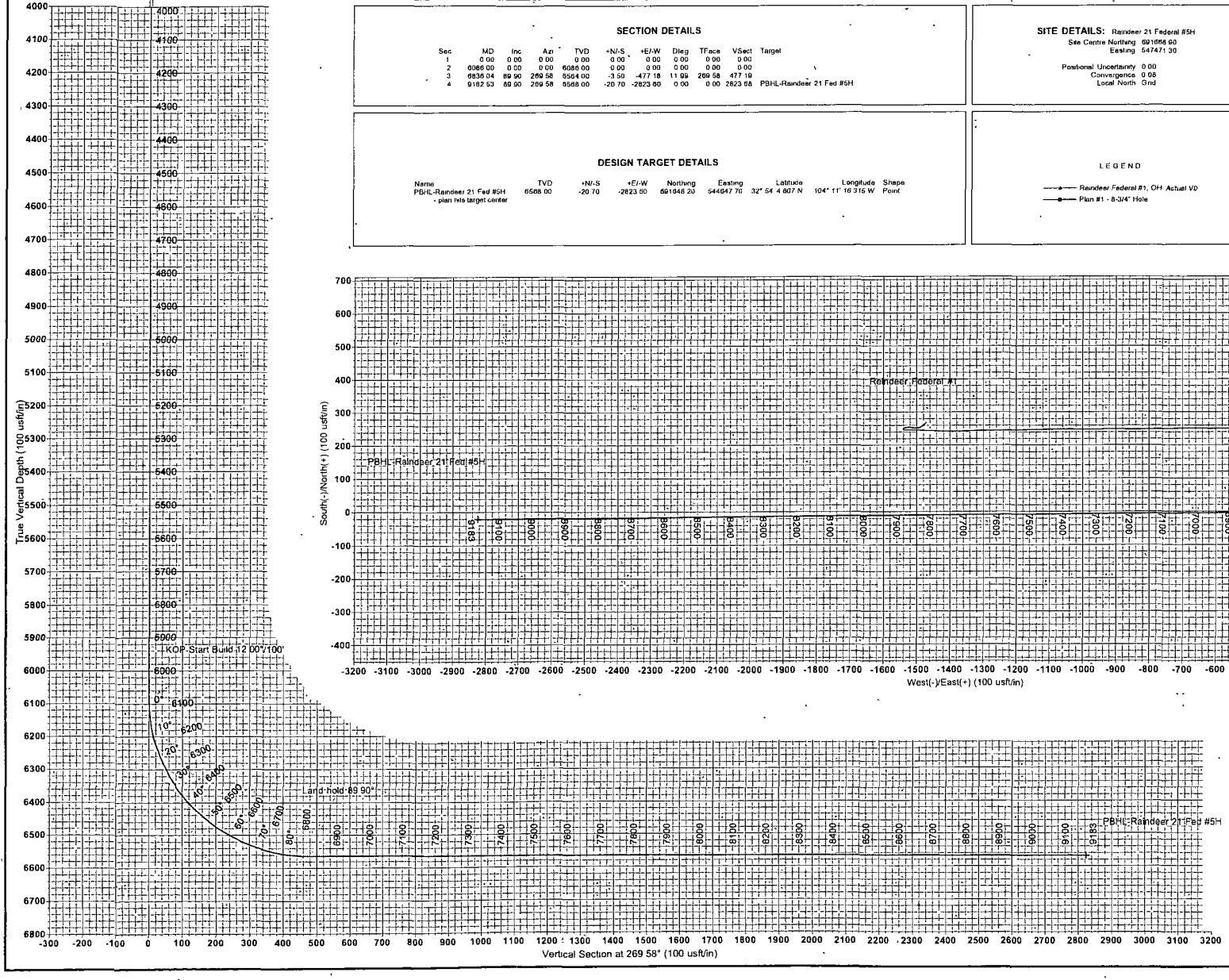
Positional Uncertainty 0 00
Convergence 0 08
Local North Grid

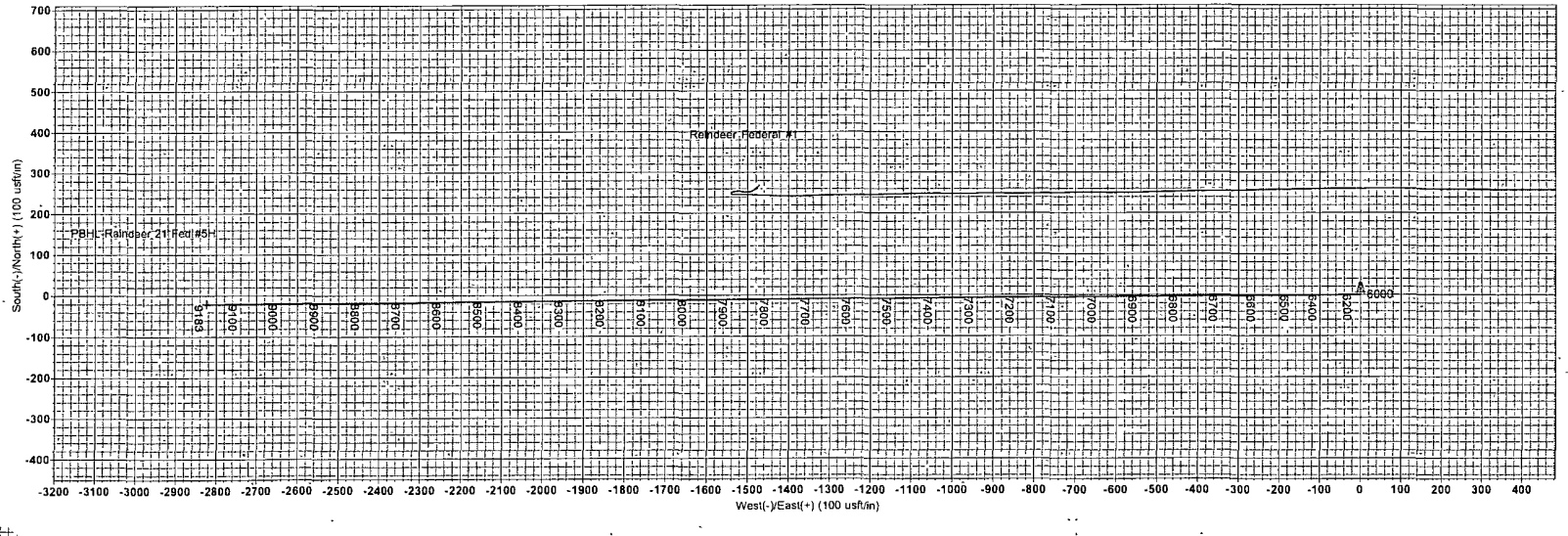
DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
PBHL-Raindeer 21 Fed #5H - plan hits target center	6588 00	-20 70	-2823 80	691648 20	544647 70	32° 54' 4 807" N	104° 11' 16 315" W	Point

LEGEND

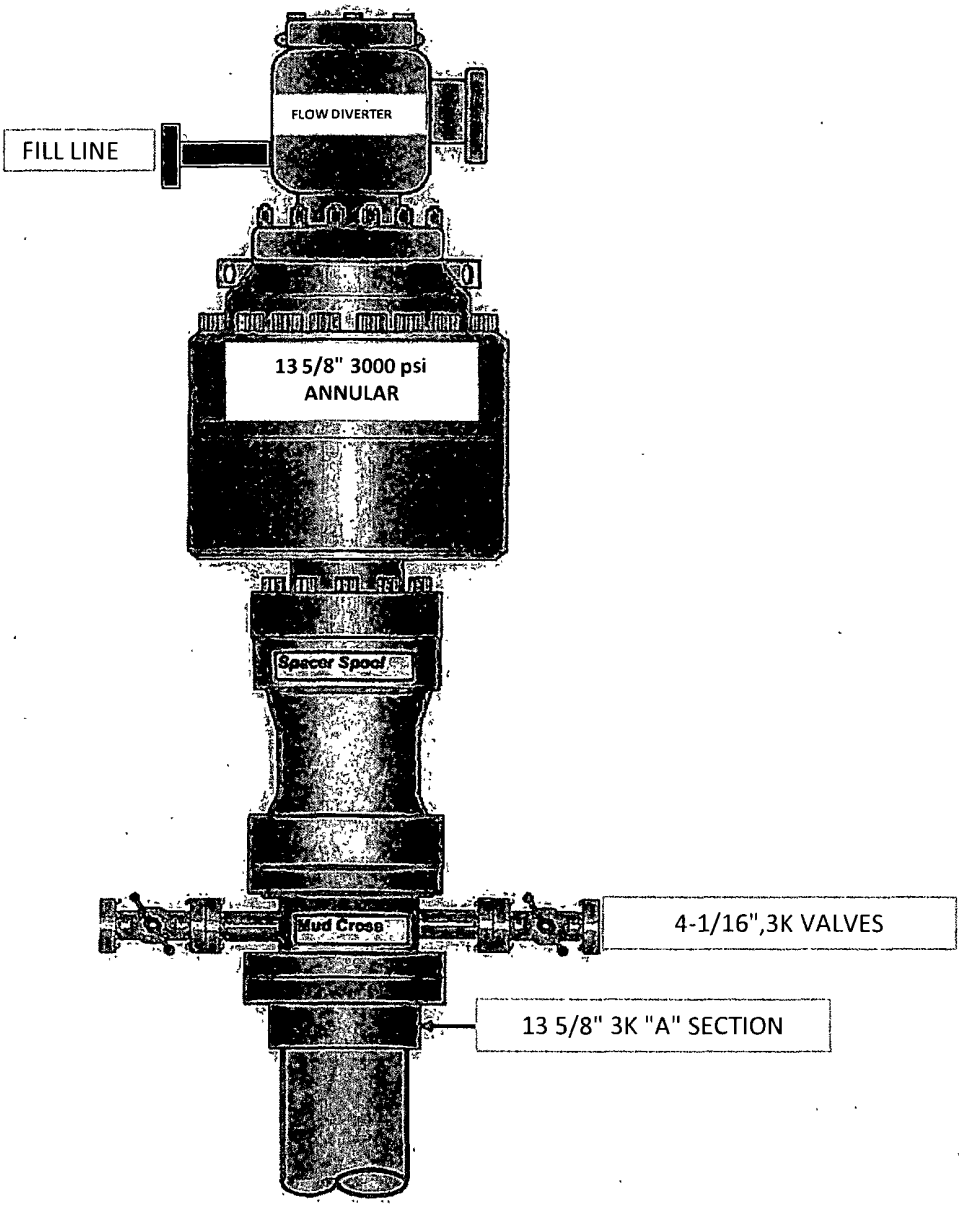
Raindeer Federal #1, OH Actual VD
Plan #1 - 8-3/4" Hole



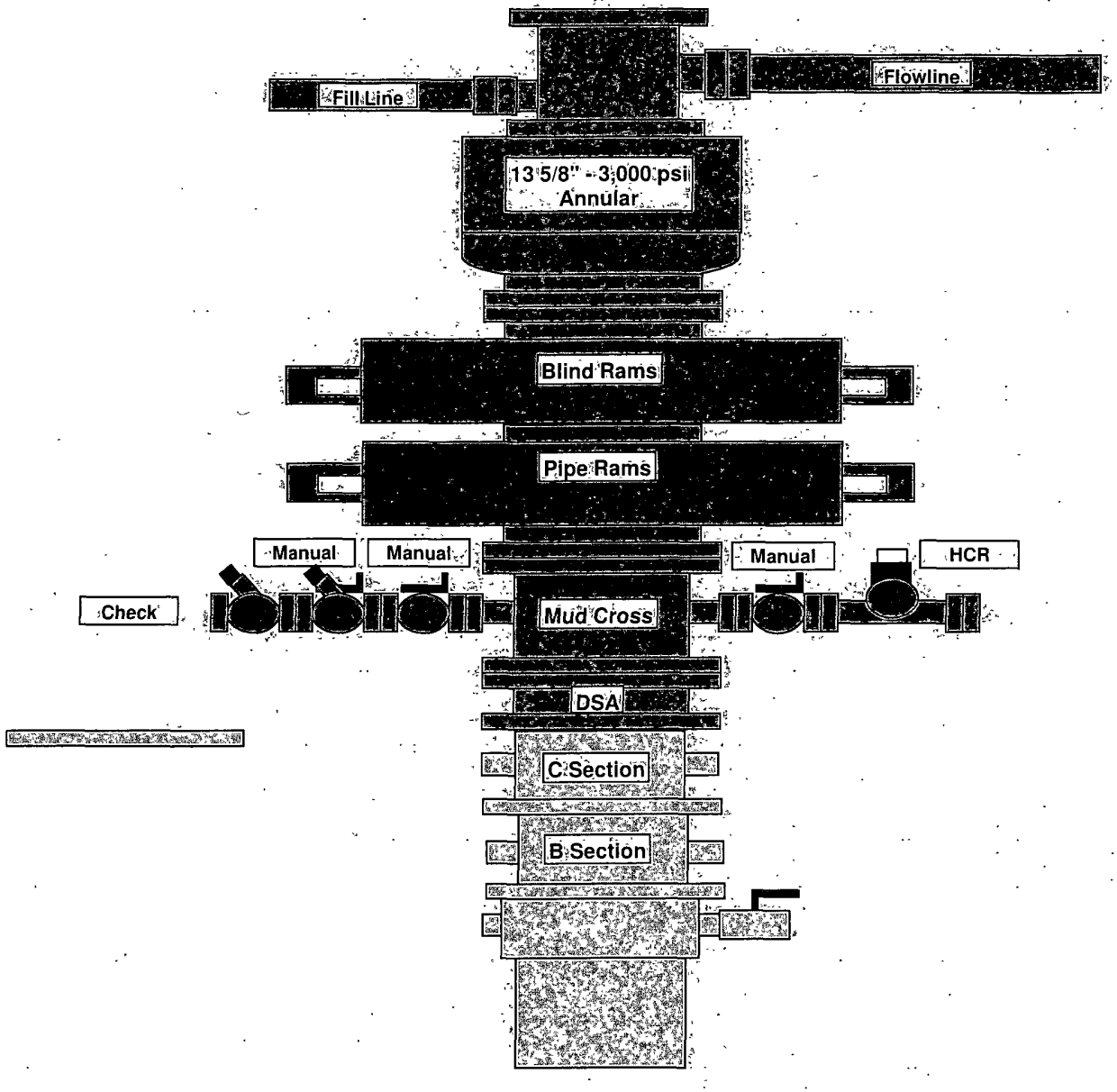


Julio C Piña
Scientific Drilling
2034 Trade Drive
Midland, TX 79703

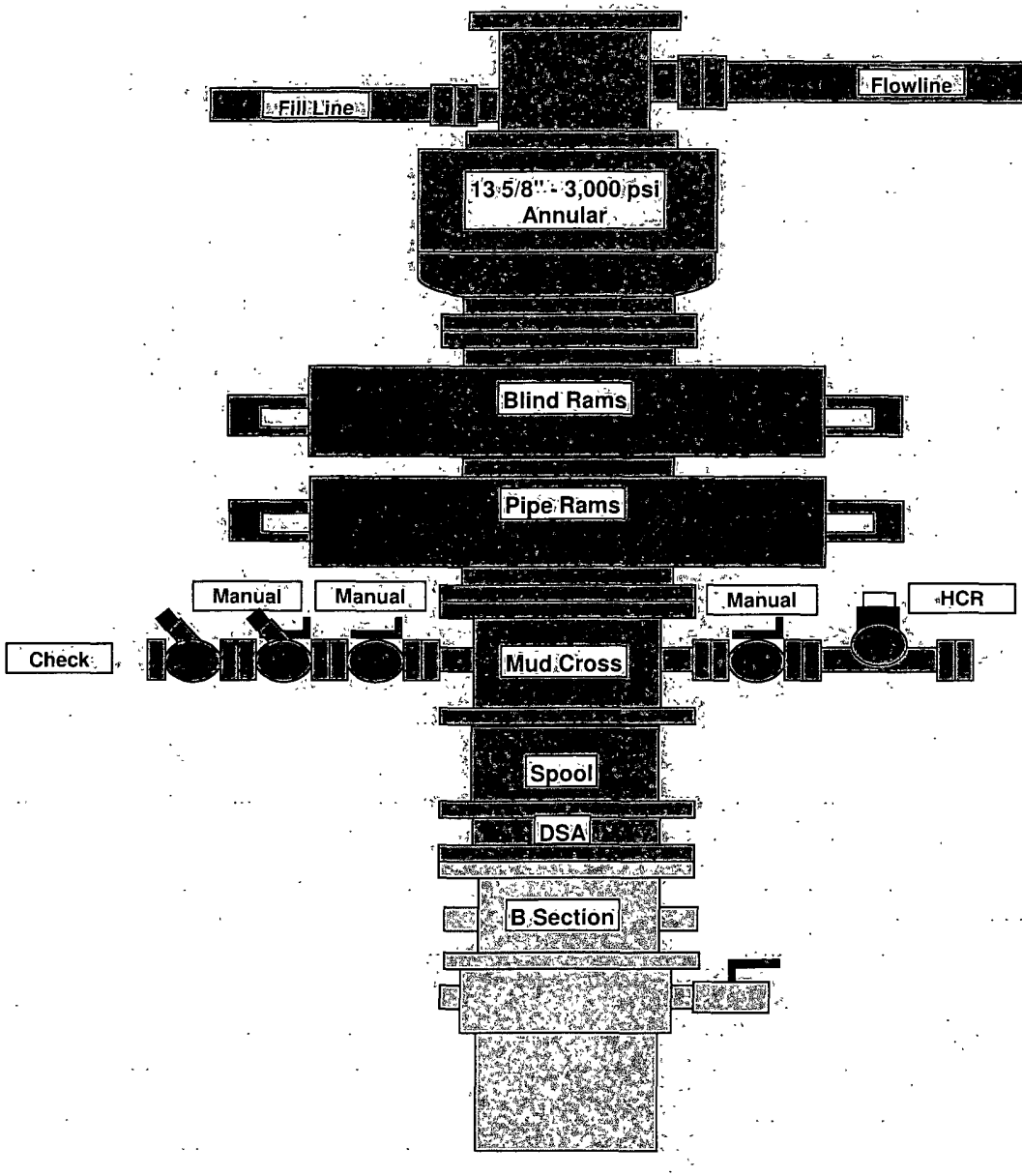
13 5/8" 3K ANNULAR BOP



13 5/8" 3M BOP
FOR 6 1/8" HOLE SECTION

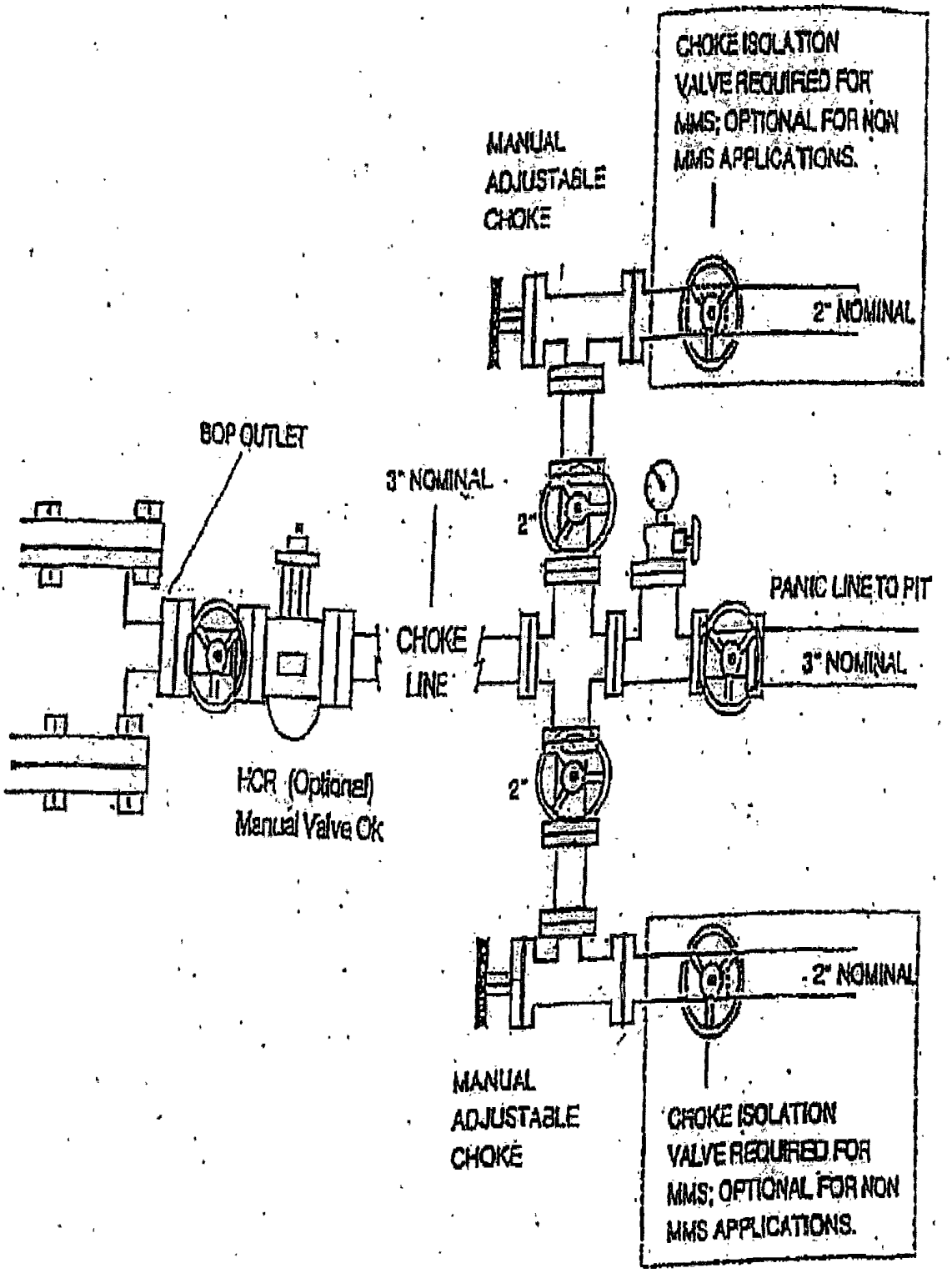


13 5/8" 3M BOP
FOR 8 3/4" HOLE SECTION if 9 5/8" casing installed



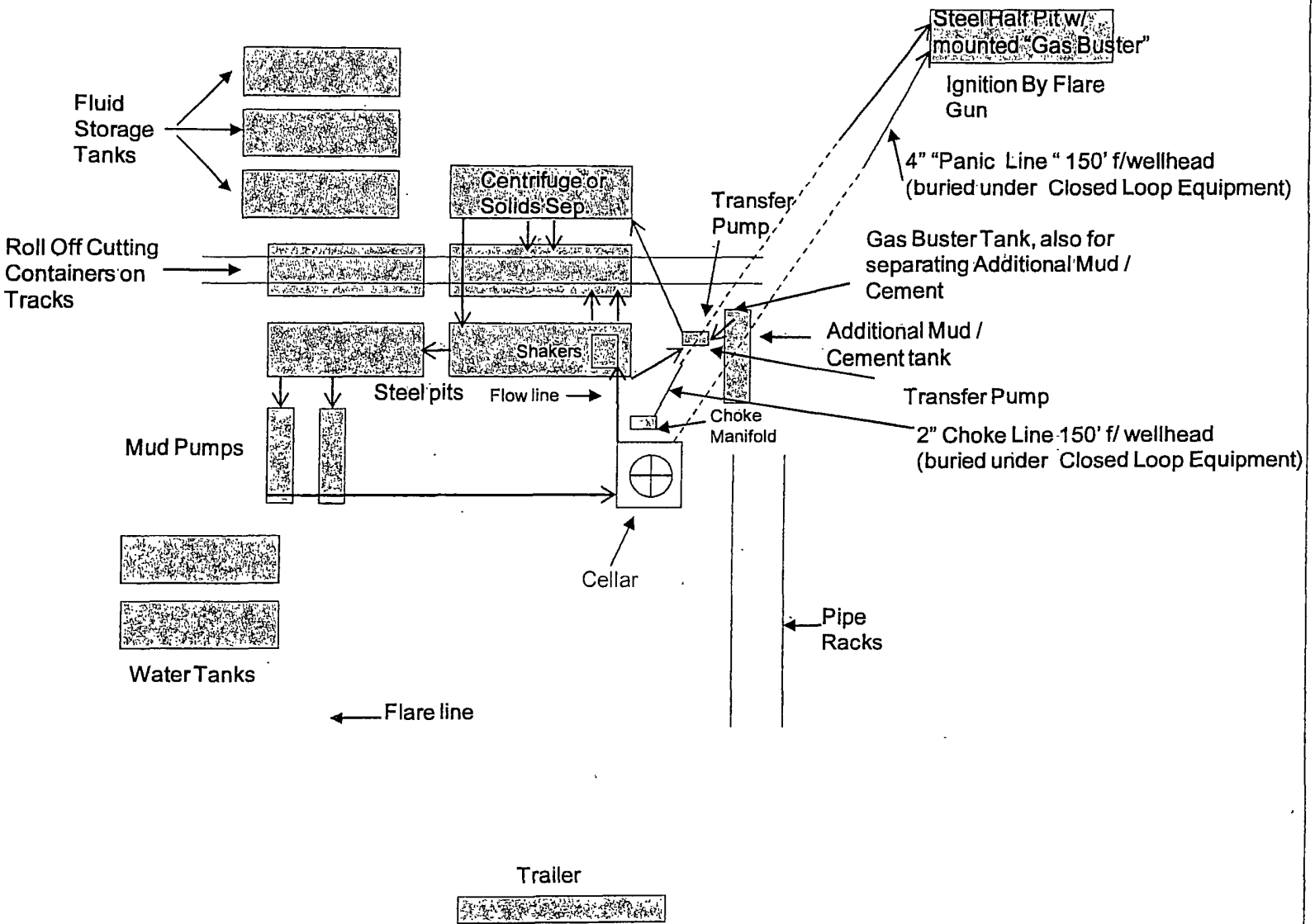
NOTES REGARDING THE BLOWOUT PREVENTERS
Master Drilling Plan
Eddy County, New Mexico

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.


CHOKE ISOLATION VALVE REQUIRED FOR MMS; OPTIONAL FOR NON MMS APPLICATIONS.
MANUAL ADJUSTABLE CHOKE
2" NOMINAL
BOP OUTLET
3" NOMINAL
2"
PANIC LINE TO PIT
CHOKE LINE
3" NOMINAL
2"
HCR (Optional) Manual Valve Ok
2" NOMINAL
MANUAL ADJUSTABLE CHOKE
CHOKE ISOLATION VALVE REQUIRED FOR MMS; OPTIONAL FOR NON MMS APPLICATIONS.

COG Operating LLC

Closed Loop Equipment Diagram



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

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

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

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

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

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

Cuttings will be hauled to either:

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

dependent upon which rig is available to drill this well.

COG Operating LLC

Hydrogen Sulfide Drilling Operation Plan

I. HYDROGEN SULFIDE TRAINING

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

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

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

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

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

II. H2S SAFETY EQUIPMENT AND SYSTEMS

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

1. **Well Control Equipment:**

   A. Flare line.

   B. Choke manifold.

   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

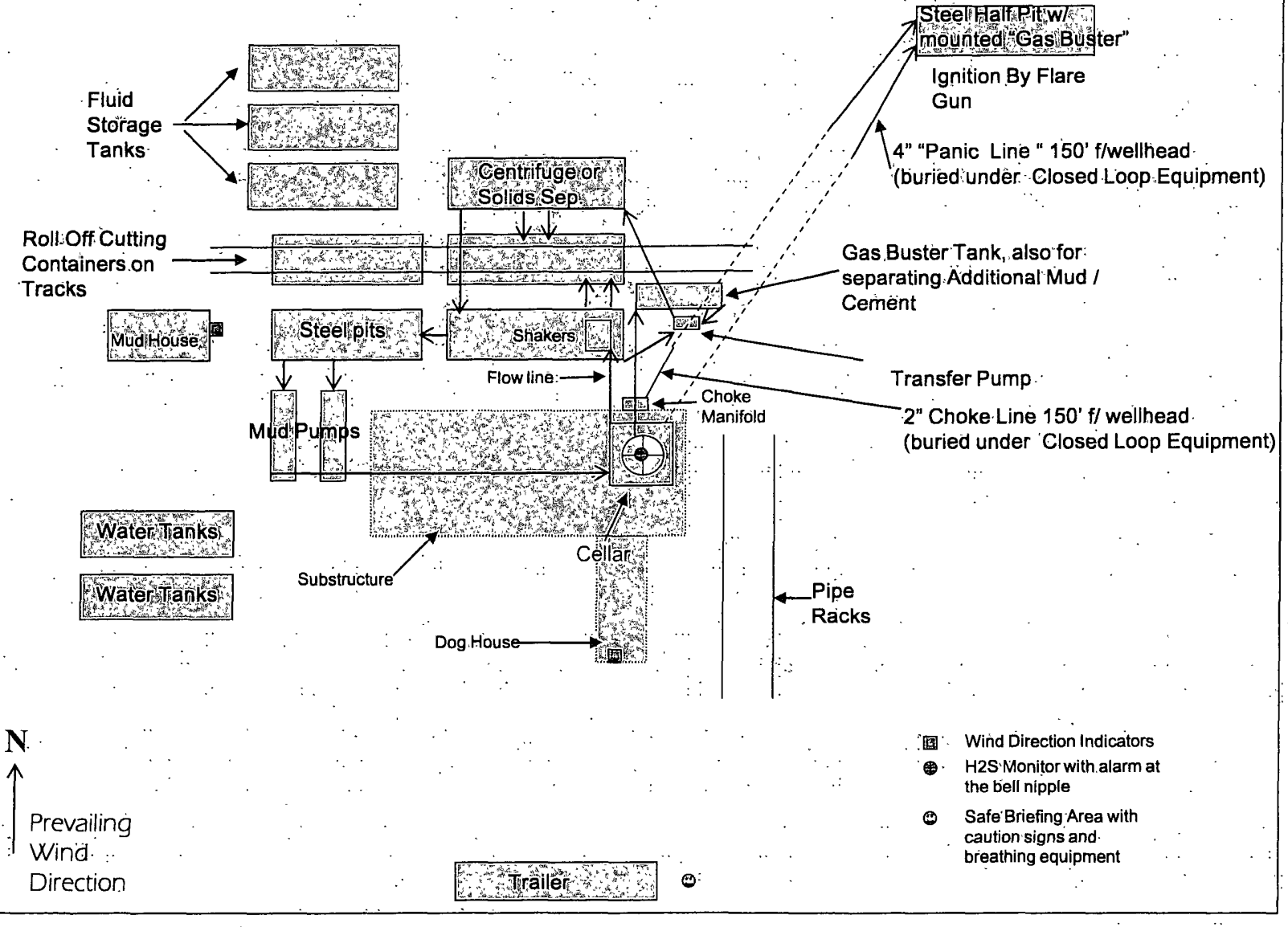
LEA COUNTY EMERGENCY NUMBERS

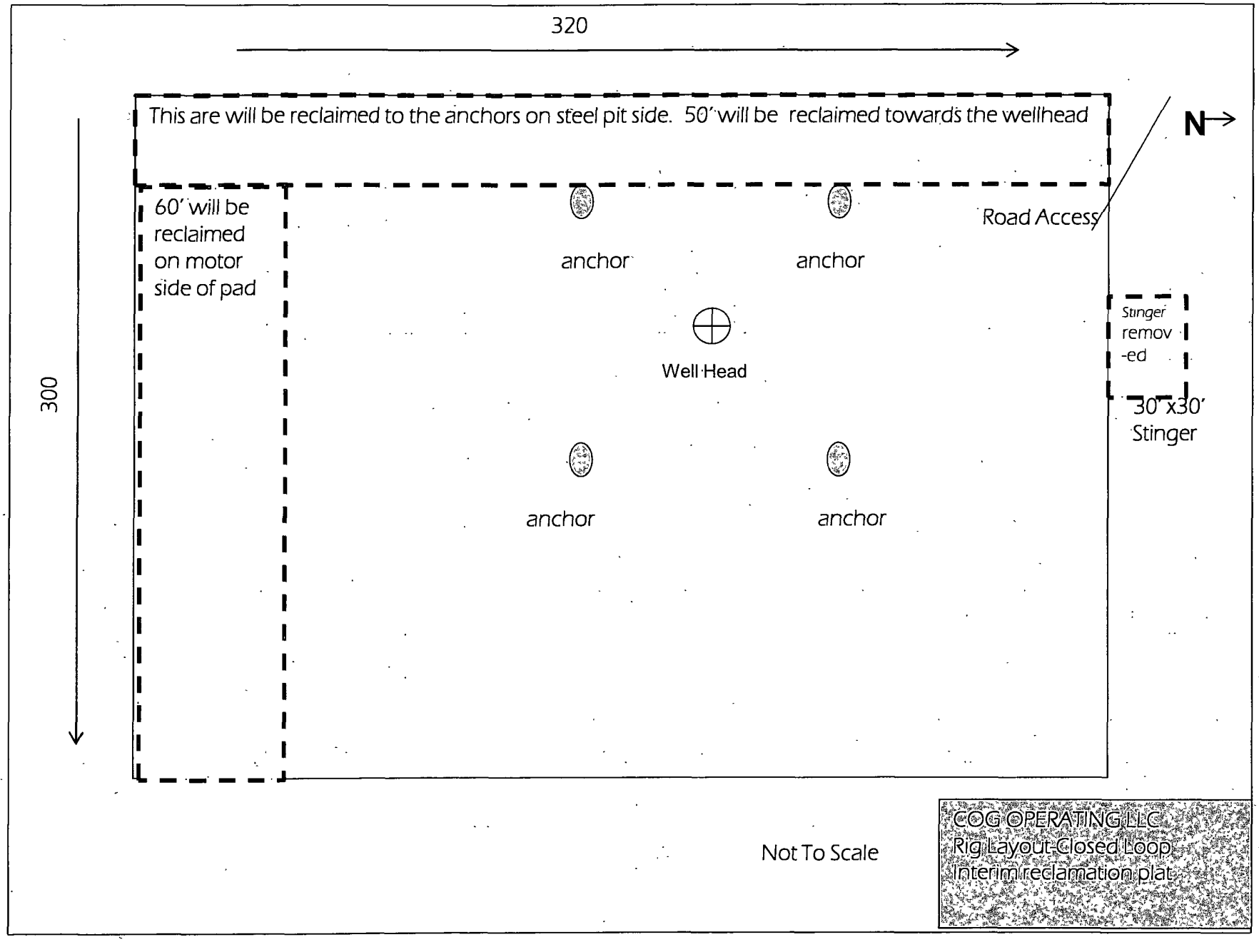
HOBBS FIRE DEPT. 575-397-9308
HOBBS POLICE DEPT. 575-397-9285
LEA CO. SHERIFF DEPT. 575-396-1196

COG Operating LLC

EXHIBIT 8

Drilling Location - H2S Safety Equipment Diagram




320
This are will be reclaimed to the anchors on steel pit side. 50' will be reclaimed towards the wellhead
N
60' will be reclaimed on motor side of pad
Road Access
anchor
anchor
Stinger removed
Well Head
300
30' x30' Stinger
anchor
anchor
Not To Scale
COG OPERATING LLC
Rig Layout Closed Loop
Interim reclamation plat

PECOS DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG Operating
LEASE NO.:	NM-100844
WELL NAME & NO.:	Reindeer 21 Federal #5H
SURFACE HOLE FOOTAGE:	380' FSL & 2070' FEL
BOTTOM HOLE FOOTAGE	380' FSL & 330' FWL
LOCATION:	Section 21, T.16 S., R.28 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.