NM OIL CONSERVATION
ARTESIA DISTRICT

JAN 04 2019

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Form 3160-3
(June 2015)

FORM APPROVED
OMB No. 1004-0137
Expires: January 31, 2018

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
NMNM123925

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☑ DRILL ☐ REENTER

1b. Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other

1c. Type of Completion: ☐ Hydraulic Fracturing ☑ Single Zone ☐ Multiple Zone

7. If Unit or CA Agreement, Name and No.

8. Lease Name and Well No.
HAMBONE FEDERAL COM
25H 323072

2. Name of Operator
COG OPERATING LLC 229137

9. API Well No.
30-015-45581

3a. Address	3b. Phone No. (include area code)	10. Field and Pool, or Exploratory
600 West Illinois Ave Midland TX 79701	(432)683-7443	WILDCAT / PURPLE SAGE WOLFCAMP

4. Location of Well (Report location clearly and in accordance with any State requirements. *)

At surface SESW / 330 FSL / 2410 FWL / LAT 32.0505753 / LONG -104.0071445

At proposed prod. zone NENW / 200 FNL / 2310 FWL / LAT 32.078395 / LONG -104.0075836

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 8 / T26S / R29E / NMP

14. Distance in miles and direction from nearest town or post office*	12. County or Parish	13. State
15 miles	EDDY	NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drlg. unit line, if any)	16. No of acres in lease	17. Spacing Unit dedicated to this well
200 feet	240	640

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	19. Proposed Depth	20. BLM/BIA Bond No. in file
3711 feet	11045 feet / 21243 feet	FED: NMB000215

21. Elevations (Show whether DF, KDB, RT, GL, etc.)	22. Approximate date work will start*	23. Estimated duration
2894 feet	06/01/2018	30 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)

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 must 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 requested by the BLM.

25. Signature	Name (Printed/Typed)	Date
(Electronic Submission)	Mayte Reyes / Ph: (575)748-6945	04/02/2018

Title
Regulatory Analyst

Approved by (Signature)	Name (Printed/Typed)	Date
(Electronic Submission)	Cody Layton / Ph: (575)234-5959	12/14/2018

Title	Office
Assistant Field Manager Lands & Minerals	CARLSBAD

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.

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.

APPROVED WITH CONDITIONS

(Continued on page 2)

*(Instructions on page 2)

Approval Date: 12/14/2018

RWP 1-4-19

INSTRUCTIONS

GENERAL: This form is designed for submitting proposals to perform certain well operations, as indicated on Federal and Indian lands and leases for action by appropriate Federal agencies, pursuant to applicable Federal laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from local Federal offices.

ITEM 1: If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable Federal regulations concerning subsequent work proposals or reports on the well.

ITEM 4: Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local Federal offices for specific instructions.

ITEM 14: Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on the reverse side, showing the roads to, and the surveyed location of, the well, and any other required information, should be furnished when required by Federal agency offices.

ITEMS 15 AND 18: If well is to be, or has been directionany drilled, give distances for subsurface location of hole in any present or objective productive zone.

ITEM 22: Consult applicable Federal regulations, or appropriate officials, concerning approval of the proposal before operations are started.

ITEM 24: If the proposal will involve hydraulic fracturing operations, you must comply with 43 CFR 3162.3-3, including providing information about the protection of usable water. Operators should provide the best available information about all formations containing water and their depths. This information could include data and interpretation of resistivity logs run on nearby wells. Information may also be obtained from state or tribal regulatory agencies and from local BLM offices.

NOTICES

The Privacy Act of 1974 and regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.
AUTHORITY: 30 U.S.C. 181 et seq., 25 U.S.G. 396; 43 CFR 3160
PRINCIPAL PURPOSES: The information will be used to: (1) process and evaluate your application for a permit to drill a new oil, gas, or service wen or to reenter a plugged and abandoned well; and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered; (b) reviewing procedures and equipment and the projected impact on the land involved; and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impacts.
ROUTINE USE: Information from the record and/or the record win be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities.
EFFECT OF NOT PROVIDING INFORMATION: Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease.

The Paperwork Reduction Act of 1995 requires us to inform you that:
The BLM conects this information to anow evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases. This information will be used to analyze and approve applications. Response to this request is mandatory only if the operator elects to initiate drilling or reentry operations on an oil and gas lease. The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

BURDEN HOURS STATEMENT: Public reporting burden for this form is estimated to average 8 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0137), Bureau Information Conection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

(Continued on page 3)

Additional Operator Remarks

Location of Well

1. SHL: SESW / 330 FSL / 2410 FWL / TWSP: 26S / RANGE: 29E / SECTION: 8 / LAT: 32.0505753 / LONG: -104.0071445 (TVD: 0 feet, MD: 0 feet)
   PPP: NENW / 1320 FNL / 2310 FWL / TWSP: 26S / RANGE: 29E / SECTION: 8 / LAT: 32.0607026 / LONG: -104.0062717 (TVD: 11037 feet, MD: 14800 feet)
   PPP: SESW / 330 FSL / 2310 FWL / TWSP: 26S / RANGE: 29E / SECTION: 8 / LAT: 32.0505827 / LONG: -104.0074674 (TVD: 11044 feet, MD: 11450 feet)
   BHL: NENW / 200 FNL / 2310 FWL / TWSP: 26S / RANGE: 29E / SECTION: 5 / LAT: 32.078395 / LONG: -104.0075836 (TVD: 11045 feet, MD: 21243 feet)

BLM Point of Contact

Name: Priscilla Perez
Title: Legal Instruments Examiner
Phone: 5752345934
Email: pperez@blm.gov

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Review and Appeal Rights

A person contesting a decision shall request a State Director review. This request must be filed within 20 working days of receipt of the Notice with the appropriate State Director (see 43 CFR 3165.3). The State Director review decision may be appealed to the Interior Board of Land Appeals, 801 North Quincy Street, Suite 300, Arlington, VA 22203 (see 43 CFR 3165.4). Contact the above listed Bureau of Land Management office for further information.

CONFIDENTIAL

AFMSS

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

APD Print Report

12/18/2018

APD ID: 10400028957 | **Submission Date:** 04/02/2018

Operator Name: COG OPERATING LLC | **Federal/Indian APD:** FED

Well Name: HAMBONE FEDERAL COM | **Well Number:** 25H

Well Type: OIL WELL | **Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

Application

Section 1 - General

APD ID: 10400028957 | **Tie to previous NOS?** | **Submission Date:** 04/02/2018

BLM Office: CARLSBAD | **User:** Mayte Reyes | **Title:** Regulatory Analyst

Federal/Indian APD: FED | **Is the first lease penetrated for production Federal or Indian?** FED

Lease number: NMNM123925 | **Lease Acres:** 240

Surface access agreement in place? | **Allotted?** | **Reservation:**

Agreement in place? NO | **Federal or Indian agreement:**

Agreement number:

Agreement name:

Keep application confidential? YES

Permitting Agent? NO | **APD Operator:** COG OPERATING LLC

Operator letter of designation:

Operator Info

Operator Organization Name: COG OPERATING LLC

Operator Address: 600 West Illinois Ave

Zip: 79701

Operator PO Box:

Operator City: Midland | **State:** TX

Operator Phone: (432)683-7443

Operator Internet Address: RODOM@CONCHO.COM

Section 2 - Well Information

Well in Master Development Plan? NO | **Mater Development Plan name:**

Well in Master SUPO? NO | **Master SUPO name:**

Well in Master Drilling Plan? NO | **Master Drilling Plan name:**

Operator Name: COG OPERATING LLC

Well Name: HAMBONE FEDERAL COM **Well Number:** 25H

Well Name: HAMBONE FEDERAL COM **Well Number:** 25H **Well API Number:**

Field/Pool or Exploratory? Field and Pool **Field Name:** WILDCAT **Pool Name:** PURPLE SAGE WOLFCAMP GAS

Is the proposed well in an area containing other mineral resources? USEABLE WATER

Describe other minerals:

Is the proposed well in a Helium production area? N **Use Existing Well Pad?** NO **New surface disturbance?**

Type of Well Pad: MULTIPLE WELL **Multiple Well Pad Name:** HAMBONE FEDERAL COM **Number:** 25H AND 26H

Well Class: HORIZONTAL **Number of Legs:**

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: EXPLORATORY (WILDCAT)

Describe sub-type:

Distance to town: 15 Miles **Distance to nearest well:** 3711 FT **Distance to lease line:** 200 FT

Reservoir well spacing assigned acres Measurement: 640 Acres

Well plat: COG_Hambone_25H_C102_20180403154116.pdf

Well work start Date: 06/01/2018 **Duration:** 30 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NAVD88

Survey number:

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
SHL Leg #1	330	FSL	2410	FWL	26S	29E	8	Aliquot SESW	32.0505753	-104.007144 5	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 123925	2894	0	0
KOP Leg #1	330	FSL	2410	FWL	26S	29E	8	Aliquot SESW	32.0505753	-104.007144 5	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 123925	2894	0	0

Operator Name: COG OPERATING LLC

Well Name: HAMBONE FEDERAL COM **Well Number:** 25H

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
PPP Leg #1	330	FSL	2310	FWL	26S	29E	8	Aliquot SESW	32.0505827	-104.0074674	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 123925	-8150	11450	11044
PPP Leg #1	1320	FNL	2310	FWL	26S	29E	8	Aliquot NENW	32.0607026	-104.0062717	EDDY	NEW MEXICO	NEW MEXICO	F	FEE	-8143	14800	11037
EXIT Leg #1	330	FNL	2310	FWL	26S	29E	5	Aliquot NENW	32.0780376	-104.0075824	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 118113	-8129	21000	11023
BHL Leg #1	200	FNL	2310	FWL	26S	29E	5	Aliquot NENW	32.078395	-104.0075836	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 118113	-8151	21243	11045

Drilling Plan

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1	QUATERNARY	2894	0	0		NONE	No
2	RUSTLER	2035	859	859		NONE	No
3	TOP SALT	1853	1041	1041	SALT	NONE	No
4	BASE OF SALT	208	2688	2688	ANHYDRITE	NONE	No
5	LAMAR	105	2789	2789	LIMESTONE	OTHER : Salt Water	No
6	BELL CANYON	66	2828	2828		OTHER : Salt Water	No
7	CHERRY CANYON	-785	3679	3679		NATURAL GAS,OIL	No
8	BRUSHY CANYON	-2065	4959	4959		NATURAL GAS,OIL	No
9	BONE SPRING LIME	-3630	6524	6524		NATURAL GAS,OIL	No
10	UPPER AVALON SHALE	-3954	6848	6848		NATURAL GAS,OIL	No

Operator Name: COG OPERATING LLC

Well Name: HAMBONE FEDERAL COM **Well Number:** 25H

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
11	---	-4215	7109	7109		NATURAL GAS,OIL	No
12	BONE SPRING 1ST	-4551	7445	7445		NATURAL GAS,OIL	No
13	BONE SPRING 2ND	-5397	8291	8291	SANDSTONE	NATURAL GAS,OIL	No
14	BONE SPRING 3RD	-6454	9348	9348		NATURAL GAS,OIL	No
15	WOLFCAMP	-8151	11045	11045		NATURAL GAS,OIL	Yes

Section 2 - Blowout Prevention

Pressure Rating (PSI): 3M **Rating Depth:** 10418

Equipment: Annular. Accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold.
Requesting Variance? YES

Variance request: A variance is requested for the use of a flexible choke line from the BOP to the choke manifold. See attached for specs and hydrostatic test chart.
Testing Procedure: BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested. 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.

Choke Diagram Attachment:

COG_Hambone_25H_3M_Choke_20180330142725.pdf

BOP Diagram Attachment:

COG_Hambone_25H_3M_BOP_20180330142730.pdf

COG_Hambone_25H_Flex_Hose_20180817085122.pdf

Pressure Rating (PSI): 5M **Rating Depth:** 11045

Equipment: Annular, Blind Ram, Pipe Ram. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold
Requesting Variance? YES

Variance request: A variance is requested for the use of a flexible choke line from the BOP to the choke manifold. See attached for specs and hydrostatic test chart.
Testing Procedure: BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested. 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.

Operator Name: COG OPERATING LLC

Well Name: HAMBONE FEDERAL COM **Well Number:** 25H

Choke Diagram Attachment:

COG_Hambone_25H_5M_Choke_20180330142756.pdf

BOP Diagram Attachment:

COG_Hambone_25H_5M_BOP_20180330142803.pdf

COG_Hambone_25H_Flex_Hose_20180817085131.pdf

Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	
1	SURFACE	17.5	13.375	NEW	API	N	0	930	0	930	-6999	-7974	930	J-55	54.5	STC	2.72	7.58	DRY	10.14	DRY	10 4
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	10418	0	10418	-6999	-18749	10418	HCL-80	47	OTHER - BTC	1.69	1.2	DRY	2.29	DRY	2.
3	PRODUCTION	8.5	5.5	NEW	API	N	0	21243	0	21243	-6999	-24211	21243	P-110	23	OTHER - BTC	2.03	2.39	DRY	2.85	DRY	2.

Casing Attachments

Casing ID: 1 **String Type:** SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

COG_Hambone_25H_Casing_Prog_20180330142928.pdf

Operator Name: COG OPERATING LLC

Well Name: HAMBONE FEDERAL COM **Well Number:** 25H

Casing Attachments

Casing ID: 2 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

COG_Hambone_25H_Casing_Prog_20180330143024.pdf

Casing ID: 3 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

COG_Hambone_25H_Casing_Prog_20180330143138.pdf

Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	930	370	1.75	13.5	647	50	Class C	4% Gel
SURFACE	Tail		0	930	250	1.34	14.8	335	50	Class C	2% CaCl2
INTERMEDIATE	Lead		0	10418	540	2.8	11	1512	50	NeoCem	As needed
INTERMEDIATE	Tail		0	10418	300	1.1	16.4	330	50	Tail: Class H	As needed

Operator Name: COG OPERATING LLC

Well Name: HAMBONE FEDERAL COM **Well Number:** 25H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
PRODUCTION	Lead		0	21243	400	2	12.7	800	35	35:65:6 H Blend	As needed
PRODUCTION	Tail		0	21243	2980	1.24	14.4	3695	35	50:50:2 Class H Blend	As needed

Section 5 - Circulating Medium

Mud System Type: Closed

an air or gas system be Used? NO

Description of the equipment for the circulating system in accordance with Onshore Order #2:

Diagram of the equipment for the circulating system in accordance with Onshore Order #2:

Describe what will be on location to control well or mitigate other conditions: Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

Describe the mud monitoring system utilized: PVT/Pason/Visual Monitoring

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
930	10418	OTHER : Brine Diesel Emulsion	8.6	9.4							Brine Diesel Emulsion
0	930	OTHER : FW Gel	8.6	8.8							FW Gel
10418	21243	OIL-BASED MUD	10.5	12.5							OBM

Operator Name: COG OPERATING LLC

Well Name: HAMBONE FEDERAL COM **Well Number:** 25H

Section 6 - Test, Logging, Coring

List of production tests including testing procedures, equipment and safety measures:

None planned

List of open and cased hole logs run in the well:

CNL,GR

Coring operation description for the well:

None planned

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 7180 **Anticipated Surface Pressure:** 4750.1

Anticipated Bottom Hole Temperature(F): 165

Anticipated abnormal pressures, temperatures, or potential geologic hazards? NO

Describe:

Contingency Plans geoharzards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

COG_Hambone_25H_H2SSchem_20180402110529.pdf

COG_Hambone_25H_H2S_SUP_20180402110536.pdf

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

COG_Hambone_25H_Direct_Rpt_20180330144249.pdf

COG_Hambone_25H_AC_Report_20180330144255.pdf

Other proposed operations facets description:

GCP Attached

Other proposed operations facets attachment:

COG_Hambone_25H_Drilling_Prog_20180330144306.pdf

COG_Hambone_26H_GCP_20181203095112.pdf

Other Variance attachment:

SUPO

Operator Name: COG OPERATING LLC

Well Name: HAMBONE FEDERAL COM **Well Number:** 25H

Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map:

COG_Hambone_25H_Ex_Road_20181203095634.pdf

Existing Road Purpose: ACCESS **Row(s) Exist?** NO

ROW ID(s)

ID:

Do the existing roads need to be improved? NO

Existing Road Improvement Description:

Existing Road Improvement Attachment:

Section 2 - New or Reconstructed Access Roads

Will new roads be needed? YES

New Road Map:

COG_Hambone_25H_Plat_Maps_20181203095702.pdf

New road type: TWO-TRACK

Length: 6113.14 Feet **Width (ft.):** 30

Max slope (%): 33 **Max grade (%):** 1

Army Corp of Engineers (ACOE) permit required? NO

ACOE Permit Number(s):

New road travel width: 14

New road access erosion control: Water will be diverted where necessary to avoid ponding, prevent erosion, maintain good drainage, and to be consistent with local drainage patterns.

New road access plan or profile prepared? NO

New road access plan attachment:

Access road engineering design? NO

Access road engineering design attachment:

Access surfacing type: OTHER

Access topsoil source: ONSITE

Operator Name: COG OPERATING LLC

Well Name: HAMBONE FEDERAL COM **Well Number:** 25H

Access surfacing type description: Caliche

Access onsite topsoil source depth: 6

Offsite topsoil source description:

Onsite topsoil removal process: Blading

Access other construction information: No turnouts are planned. Re-routing access road around proposed well location.

Access miscellaneous information:

Number of access turnouts: **Access turnout map:**

Drainage Control

road drainage crossing: OTHER

Drainage Control comments: None necessary.

Road Drainage Control Structures (DCS) description: None needed.

Road Drainage Control Structures (DCS) attachment:

Access Additional Attachments

Additional Attachment(s):

Section 3 - Location of Existing Wells

Existing Wells Map? YES

Attach Well map:

COG_Hambone_25H_1Mile_Data_20180402133721.pdf

Existing Wells description:

Section 4 - Location of Existing and/or Proposed Production Facilities

Submit or defer a Proposed Production Facilities plan? SUBMIT

Production Facilities description: A Central Tank Battery and facilities will be permitted and constructed at a later date. (Once onsite is completed) The battery and facilities will be installed according to API specifications.
Production Facilities map:

COG_Hambone_25H_ProdFacility_20180402111056.pdf
COG_Hambone_25H_Layout_20181203095948.pdf

Section 5 - Location and Types of Water Supply

Water Source Table

Operator Name: COG OPERATING LLC

Well Name: HAMBONE FEDERAL COM **Well Number:** 25H

Water source use type: INTERMEDIATE/PRODUCTION CASING **Water source type:** OTHER

Describe type: Brine

Source latitude: **Source longitude:**

Source datum:

Water source permit type: PRIVATE CONTRACT

Source land ownership: COMMERCIAL

Water source transport method: TRUCKING

Source transportation land ownership: COMMERCIAL

Water source volume (barrels): 30000 **Source volume (acre-feet):** 3.866793

Source volume (gal): 1260000

Water source use type: STIMULATION, SURFACE CASING **Water source type:** OTHER

Describe type: Fresh H2O

Source latitude: **Source longitude:**

Source datum:

Water source permit type: PRIVATE CONTRACT

Source land ownership: PRIVATE

Water source transport method: PIPELINE

Source transportation land ownership: PRIVATE

Water source volume (barrels): 450000 **Source volume (acre-feet):** 58.001892

Source volume (gal): 18900000

Water source and transportation map:

COG_Hambone_25H_Brine_H2O_20180402131720.pdf

COG_Hambone_25H_Fresh_H2O_20180402131730.pdf

Water source comments: Fresh water will be obtained from El Paso Natural Gas Co., water well located in Section 5. T26S, R30E. Brine water will be obtained from the Malaga I Brine station in Section 2. T21S. R25E., and will be provided by Malaga Brine Station.

New water well? NO

New Water Well Info

Well latitude: **Well Longitude:** **Well datum:**

Well target aquifer:

Est. depth to top of aquifer(ft): **Est thickness of aquifer:**

Aquifer comments:

Aquifer documentation:

Operator Name: COG OPERATING LLC

Well Name: HAMBONE FEDERAL COM **Well Number:** 25H

Well depth (ft): **Well casing type:**

Well casing outside diameter (in.): **Well casing inside diameter (in.):**

water well casing? **Used casing source:**

Drilling method: **Drill material:**

out material: **Grout depth:**

Casing length (ft.): **Casing top depth (ft.):**

Well Production type: **Completion Method:**

Water well additional information:

State appropriation permit:

Additional information attachment:

Section 6 - Construction Materials

Construction Materials description: Caliche will be obtained from the actual well site if available. If not available onsite, caliche will be obtained from Brantley caliche pit located in Section 14, T26S, R28E.
Construction Materials source location attachment:

Section 7 - Methods for Handling Waste

Waste type: DRILLING

Waste content description: Drilling fluids and produced oil and water during drilling and completion operations

Amount of waste: 6000 barrels

Waste disposal frequency : One Time Only

Safe containment description: All drilling waste will be stored safely and disposed of properly

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL
Disposal type description:

Disposal location description: Trucked to an approved disposal facility

Waste type: SEWAGE

Waste content description: Human waste and gray water

Amount of waste: 250 gallons

Waste disposal frequency : Weekly

Safe containment description: Waste will be properly contained and disposed of properly at a state approved disposal facility

containmant attachment:

Operator Name: COG OPERATING LLC

Well Name: HAMBONE FEDERAL COM **Well Number:** 25H

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL

Disposal type description:

Disposal location description: Trucked to an approved disposal facility

W te type: GARBAGE

Waste content description: Garbage and trash produced during drilling and completion operations

A unt of waste: 125 pounds

Waste disposal frequency : Weekly

Safe containment description: Garbage and trash produced during drilling and completion operations will be collected in a t i container and disposed of properly at a state approved disposal facility

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL

Disposal type description:

Disposal location description: Trucked to an approved disposal facility

Reserve Pit

Reserve Pit being used? NO

T porary disposal of produced water into reserve pit?

R erve pit length (ft.) **Reserve pit width (ft.)**

R erve pit depth (ft.) **Reserve pit volume (cu. yd.)**

Is at least 50% of the reserve pit in cut?

F rve pit liner

R rve pit liner specifications and installation description

Cuttings Area

Cuttings Area being used? NO

Are you storing cuttings on location? YES

D ription of cuttings location Roll off cuttings containers on tracks

Cuttings area length (ft.) **Cuttings area width (ft.)**

Cuttings area depth (ft.) **Cuttings area volume (cu. yd.)**

Is at least 50% of the cuttings area in cut?

WCuttings area liner

Operator Name: COG OPERATING LLC

Well Name: HAMBONE FEDERAL COM **Well Number:** 25H

Cuttings area liner specifications and installation description

Section 8 - Ancillary Facilities

Are you requesting any Ancillary Facilities?: NO

Ancillary Facilities attachment:

Comments:

Section 9 - Well Site Layout

Well Site Layout Diagram:

COG_Hambone_25H_ProdFacility_20180402132144.pdf

COG_Hambone_25H_Layout_20181203100034.pdf

Comments: A Central Tank Battery and facilities will be permitted and constructed at a later date. (Once onsite is completed) The battery and facilities will be installed according to API specifications.

Section 10 - Plans for Surface Reclamation

Type of disturbance: New Surface Disturbance **Multiple Well Pad Name:** HAMBONE FEDERAL COM

Multiple Well Pad Number: 25H AND 26H

Recontouring attachment:

Drainage/Erosion control construction: Approximately 400' of straw waddles will be placed on the West side and 400' on the South side to reduce sediment impacts to fragile/sensitive soils. We will be putting 12" lined berms on all four sides of the well pad, we will be putting natural erosion control in drainage's on the west of the pad, we will be putting as many needed low water crossings on the access road.

Drainage/Erosion control reclamation: Reclaim north side 80' and northwest side 80'

Well pad proposed disturbance (acres): 3.95
Road proposed disturbance (acres): 0.25
Powerline proposed disturbance (acres): 0
Pipeline proposed disturbance (acres): 0
Other proposed disturbance (acres): 0
Total proposed disturbance: 4.2

Well pad interim reclamation (acres): 0.15
Road interim reclamation (acres): 0.25
Powerline interim reclamation (acres): 0
Pipeline interim reclamation (acres): 0
Other interim reclamation (acres): 0
Total interim reclamation: 0.4

Well pad long term disturbance (acres): 2.57
Road long term disturbance (acres): 0.25
Powerline long term disturbance (acres): 0
Pipeline long term disturbance (acres): 0
Other long term disturbance (acres): 0
Total long term disturbance: 2.82

Disturbance Comments:

Reconstruction method: New construction of pad.

Topsoil redistribution: Reclaim north side 80' and northwest side 80'

Operator Name: COG OPERATING LLC

Well Name: HAMBONE FEDERAL COM **Well Number:** 25H

Soil treatment: None

Existing Vegetation at the well pad: Shinnery Oak/Mesquite grassland

Existing Vegetation at the well pad attachment:

Existing Vegetation Community at the road: Shinnery Oak/Mesquite grassland

Existing Vegetation Community at the road attachment:

Existing Vegetation Community at the pipeline: Shinnery Oak/Mesquite grassland

Existing Vegetation Community at the pipeline attachment:

Existing Vegetation Community at other disturbances: N/A

Existing Vegetation Community at other disturbances attachment:

Non native seed used? NO

Non native seed description:

Seedling transplant description:

Will seedlings be transplanted for this project? NO

Seedling transplant description attachment:

Will seed be harvested for use in site reclamation? NO

Seed harvest description:

Seed harvest description attachment:

Seed Management

Seed Table

Seed type:

Seed source:

Seed name:

Source name:

Source address:

Source phone:

Seed cultivar:

Seed use location:

PLS pounds per acre:

Proposed seeding season:

Operator Name: COG OPERATING LLC

Well Name: HAMBONE FEDERAL COM Well Number: 25H

Seed Summary	
Seed Type	Pounds/Acre

Total pounds/Acre:

reclamation attachment:

Operator Contact/Responsible Official Contact Info

First Name: Gerald Last Name: Herrera

Phone: (432)260-7399 Email: gherrera@concho.com

Seedbed prep:

Seed BMP:

Seed method:

Existing invasive species? NO

Existing invasive species treatment description:

Existing invasive species treatment attachment:

Weed treatment plan description: N/A

Weed treatment plan attachment:

Monitoring plan description: N/A

Monitoring plan attachment:

Success standards: N/A

Pit closure description: N/A

Pit closure attachment:

COG_Hambone_25H_ClosedLoop_20180402132325.pdf

Section 11 - Surface Ownership

Disturbance type: WELL PAD

[cribe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

Operator Name: COG OPERATING LLC

Well Name: HAMBONE FEDERAL COM **Well Number:** 25H

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland: **USFS Ranger District:**

Section 12 - Other Information

Right of Way needed? NO **Use APD as ROW?**

ROW Type(s):

ROW Applications

SUPO Additional Information:

Use a previously conducted onsite? YES

Previous Onsite Information: Onsite completed on 1/17/2017 by Rand French (COG) and Jeff Robertson (BLM).

Other SUPO Attachment

COG_Hambone_25H_Certification_20180402112210.pdf
COG_Hambone_25H_SUP_20181203100255.pdf
COG_Hambone_25H_Layout_20181203100304.pdf
COG_Hambone_25H_Plat_Maps_20181203100326.pdf
COG_Hambone_25H_Ex_Road_20181203100334.pdf
COG_Hambone_25H_1Mile_Data_20181203100351.pdf
COG_Hambone_25H_ProdFacility_20181203100357.pdf
COG_Hambone_25H_ProdFacility_20181203100404.pdf
COG_Hambone_25H_ClosedLoop_20181203100413.pdf
COG_Hambone_25H_Fresh_H2O_20181203100428.pdf
COG_Hambone_25H_Brine_H2O_20181203100438.pdf

Operator Name: COG OPERATING LLC

Well Name: HAMBONE FEDERAL COM **Well Number:** 25H

Section 1 - General

Would you like to address long-term produced water disposal? NO

Section 2 - Lined Pits

Would you like to utilize Lined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit specifications:

Pit liner description:

Pit liner manufacturers information:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule attachment:

Lined pit reclamation description:

Lined pit reclamation attachment:

Leak detection system description:

Leak detection system attachment:

Lined pit Monitor description:

Lined pit Monitor attachment:

Lined pit: do you have a reclamation bond for the pit?

the reclamation bond a rider under the BLM bond?

Operator Name: COG OPERATING LLC

Well Name: HAMBONE FEDERAL COM Well Number: 25H

Lined pit bond number:

Lined pit bond amount:

Additional bond information attachment:

Section 3 - Unlined Pits

Would you like to utilize Unlined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: PWD disturbance (acres):

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit specifications:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

Unlined pit Monitor attachment:

Do you propose to put the produced water to beneficial use?

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

Does the produced water have an annual average Total Dissolved Solids (TDS) concentration equal to or less than that of the existing water to be protected?

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

Unlined Produced Water Pit Estimated percolation:

Unlined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Additional bond information attachment:

Operator Name: COG OPERATING LLC

Well Name: HAMBONE FEDERAL COM Well Number: 25H

Section 4 - Injection

Would you like to utilize Injection PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: PWD disturbance (acres):

Injection PWD discharge volume (bbl/day):

Injection well mineral owner:

Injection well type:

Injection well number: Injection well name:

Assigned injection well API number? Injection well API number:

Injection well new surface disturbance (acres):

Minerals protection information:

Mineral protection attachment:

Underground Injection Control (UIC) Permit?

UIC Permit attachment:

Section 5 - Surface Discharge

Would you like to utilize Surface Discharge PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: PWD disturbance (acres):

Surface discharge PWD discharge volume (bbl/day):

Surface Discharge NPDES Permit?

Surface Discharge NPDES Permit attachment:

Surface Discharge site facilities information:

Surface discharge site facilities map:

Section 6 - Other

Would you like to utilize Other PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: PWD disturbance (acres):

Other PWD discharge volume (bbl/day):

Other PWD type description:

Operator Name: COG OPERATING LLC

Well Name: HAMBONE FEDERAL COM **Well Number:** 25H

Other PWD type attachment:

Have other regulatory requirements been met?

Other regulatory requirements attachment:

Bond Info

Bond Information

Federal/Indian APD: FED

BLM Bond number: NMB000215

BIA Bond number:

Do you have a reclamation bond? NO

Is the reclamation bond a rider under the BLM bond?

Is the reclamation bond BLM or Forest Service?

BLM reclamation bond number:

Forest Service reclamation bond number:

Forest Service reclamation bond attachment:

Reclamation bond number:

Reclamation bond amount:

Reclamation bond rider amount:

Additional reclamation bond information attachment:

Operator Certification

Operator Certification

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, 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.

NAME: Mayte Reyes **Signed on:** 03/30/2018

Title: Regulatory Analyst

Street Address: 2208 W Main Street

City: Artesia **State:** NM **Zip:** 88210

Phone: (575)748-6945

Email address: Mreyes1@concho.com

Operator Name: COG OPERATING LLC

Well Name: HAMBONE FEDERAL COM **Well Number:** 25H

Field Representative

Representative Name: Gerald Herrera

Street Address: 2208 West Main Street

City: Artesia **State:** NM **Zip:** 88210

Phone: (575)748-6940

Email address: gherrera@concho.com

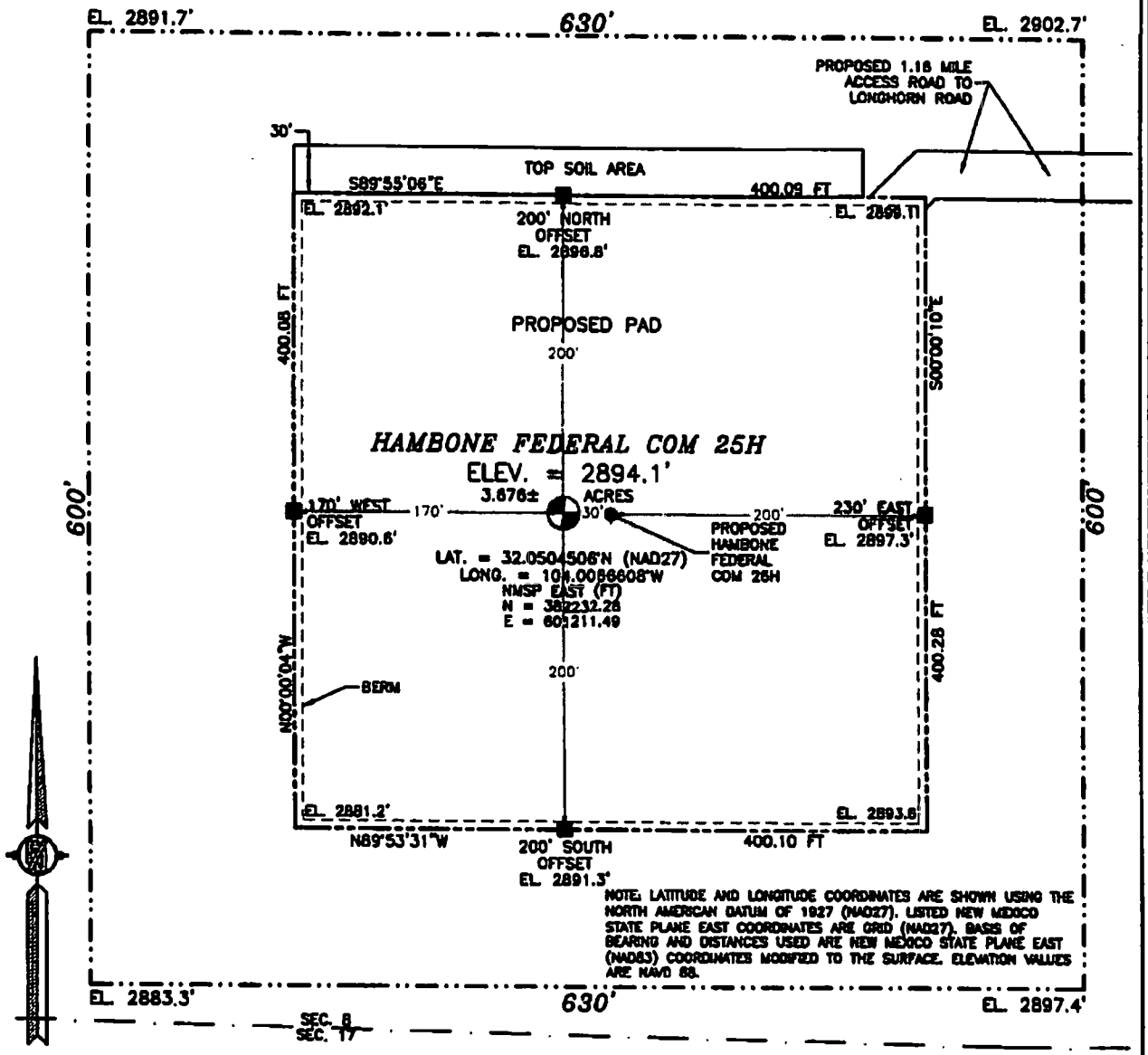
Payment Info

Payment

APD Fee Payment Method: PAY.GOV

pay.gov Tracking ID: 268NSTAP

SITE MAP



DIRECTIONS TO LOCATION
FROM THE INTERSECTION OF HWY. 285 (PECOS HWY.) AND CR. 275 (LONGHORN RD.), GO EAST ON LONGHORN RD. APPROX 4.5 MILES TO A ROAD LATH ON RIGHT (SOUTH). FOLLOW ROAD LATHS APPROX 0.95 MILE SOUTHWEST AND SOUTH, CONTINUE FOLLOWING ROAD LATHS WEST 1135' TO THE NORTHEAST PAD CORNER FOR THIS LOCATION.

I, FILIMON F. JARAMILLO, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO.

FILIMON F. JARAMILLO, PLS 12797 DATE 11/30/18

COG OPERATING, LLC
HAMBONE FEDERAL COM 25H
LOCATED 330 FT. FROM THE SOUTH LINE AND 2410 FT. FROM THE WEST LINE OF SECTION 8, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M. EDDY COUNTY, STATE OF NEW MEXICO

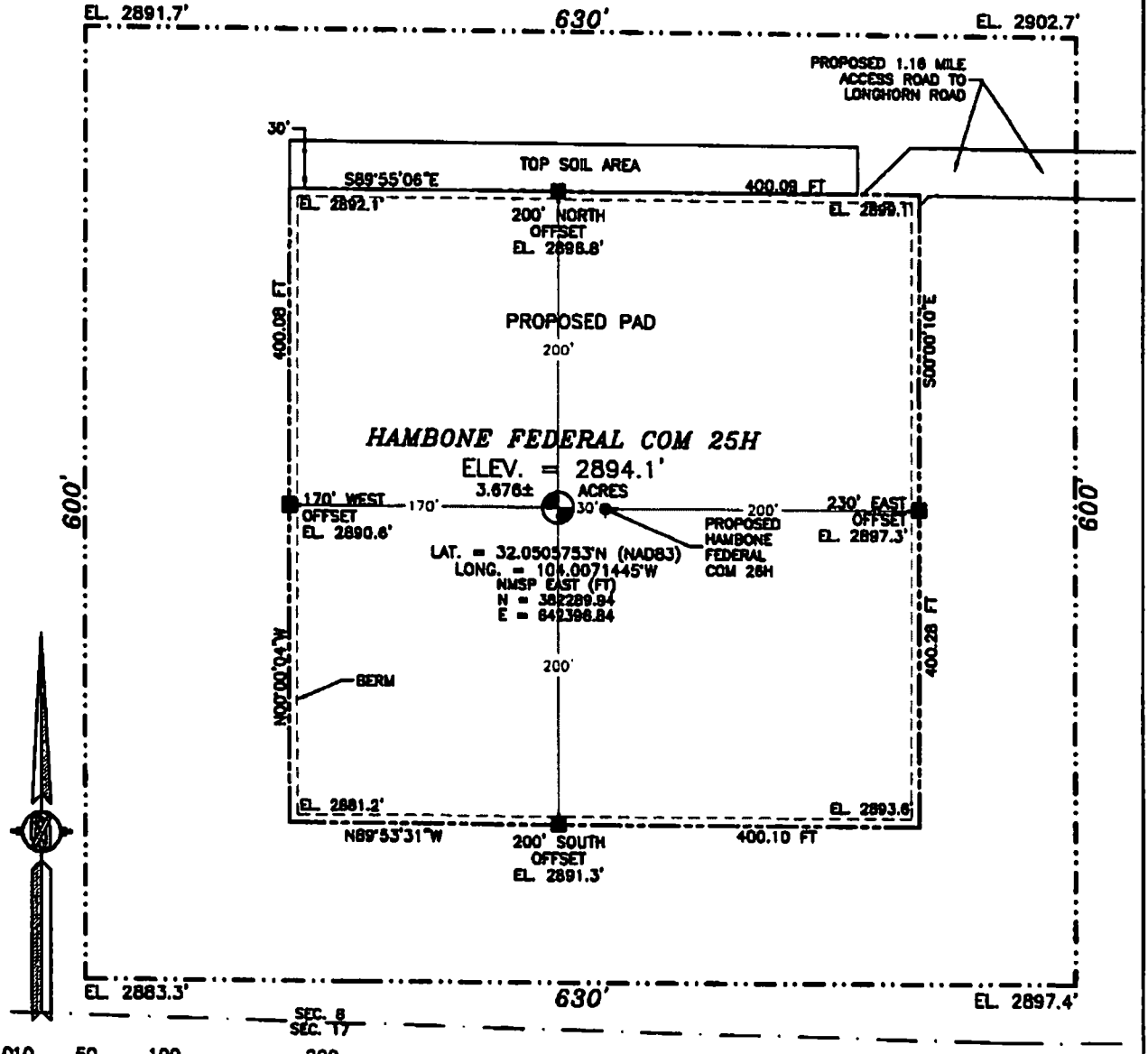
NOVEMBER 30, 2018

SURVEY NO. 4926F

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SITE MAP

NOTE: LATITUDE AND LONGITUDE COORDINATES ARE SHOWN USING THE NORTH AMERICAN DATUM OF 1983 (NAD83) IN DECIMAL DEGREE FORMAT. LISTED NEW MEXICO STATE PLANE EAST COORDINATES ARE GRID (NAD83). ELEVATION VALUES ARE NAVD88. BASIS OF BEARING AND DISTANCES USED ARE NEW MEXICO STATE PLANE EAST COORDINATES MODIFIED TO THE SURFACE.



0 10 50 100 200

SCALE 1" = 100'

DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF HWY. 285 (PECOS HWY.) AND CR. 275 (LONGHORN RD.), GO EAST ON LONGHORN RD. APPROX. 4.5 MILES TO A ROAD LATH ON RIGHT (SOUTH). FOLLOW ROAD LATHS APPROX. 0.95 MILE SOUTHWEST AND SOUTH, CONTINUE FOLLOWING ROAD LATHS WEST 1135' TO THE NORTHEAST PAD CORNER FOR THIS LOCATION.

I, FILIMON F. JARAMILLO, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND/OR WAS RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO.

FILIMON F. JARAMILLO PLS 12797 DATE

COG OPERATING, LLC

HAMBONE FEDERAL COM 25H

LOCATED 330 FT. FROM THE SOUTH LINE AND 2410 FT. FROM THE WEST LINE OF SECTION 8, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M. EDDY COUNTY, STATE OF NEW MEXICO

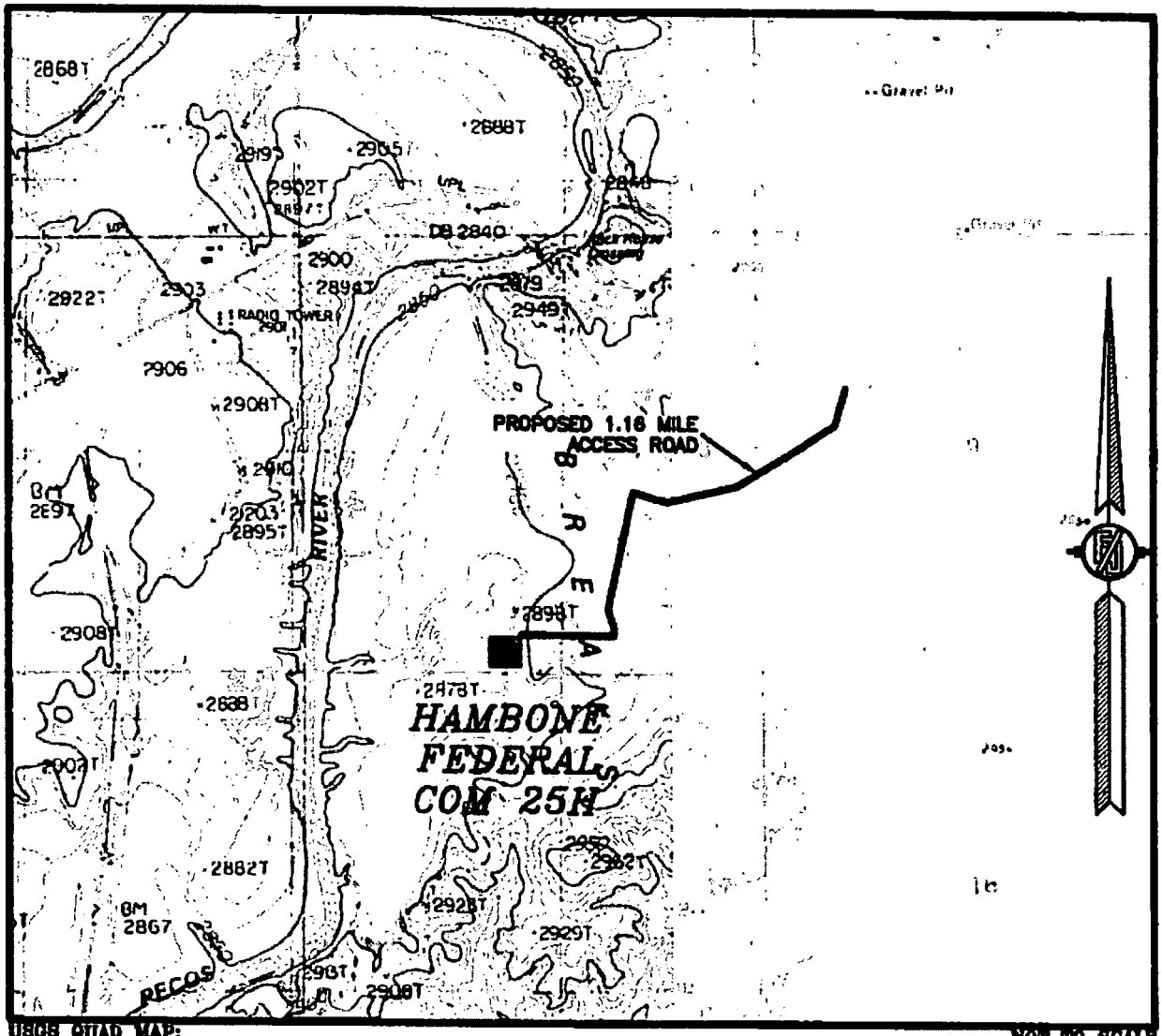
NOVEMBER 30, 2018

SURVEY NO. 4926F

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SECTION 8, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

LOCATION VERIFICATION MAP



USGS QUAD MAP:
ROSS RANCH
RED BLUFF

NOT TO SCALE

COG OPERATING, LLC
HAMBONE FEDERAL COM 25H
LOCATED 330 FT. FROM THE SOUTH LINE
AND 2410 FT. FROM THE WEST LINE OF
SECTION 8, TOWNSHIP 26 SOUTH,
RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

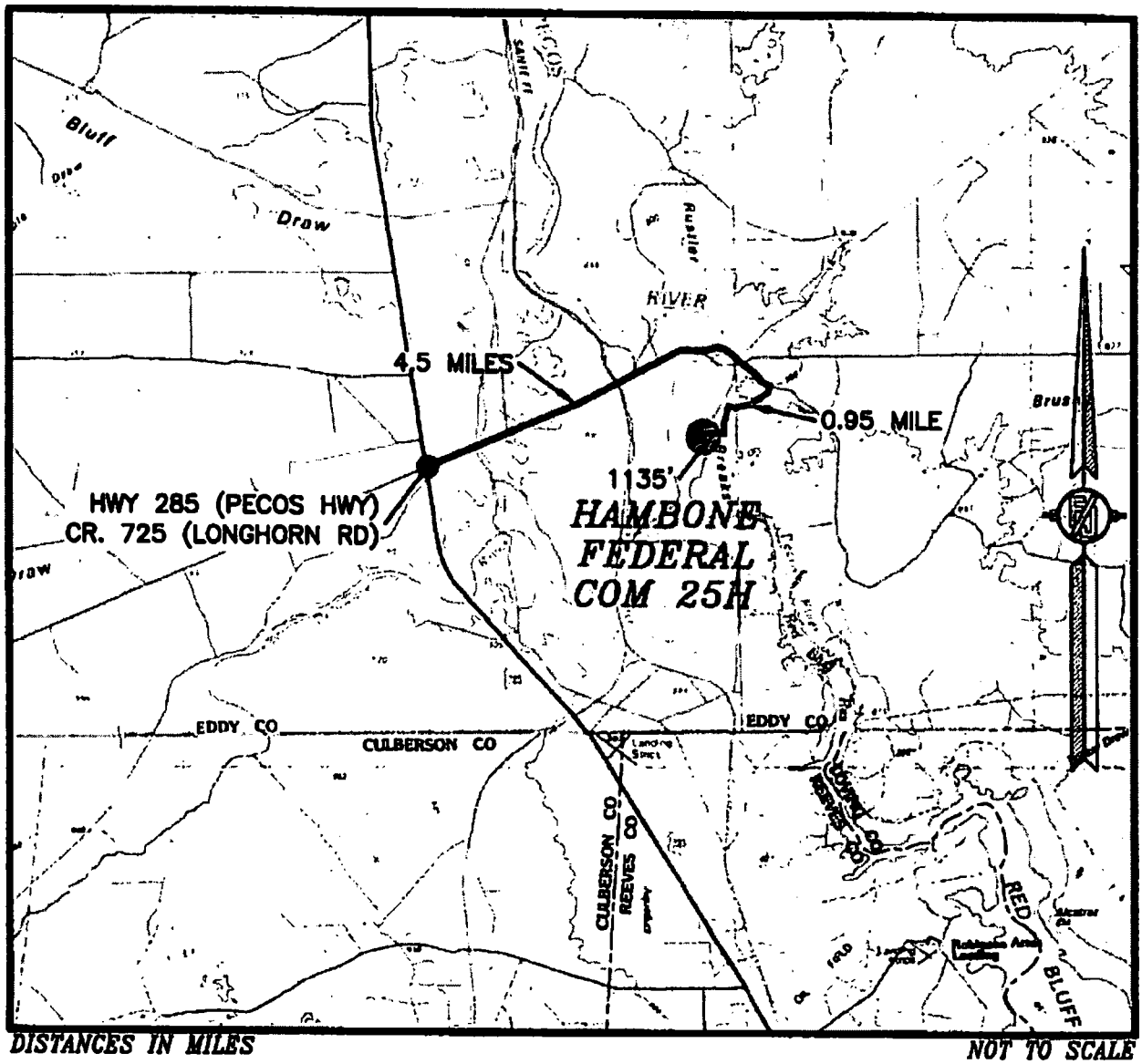
NOVEMBER 30, 2018

SURVEY NO. 4925F

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SECTION 8, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

VICINITY MAP



DISTANCES IN MILES

NOT TO SCALE

DIRECTIONS TO LOCATION
FROM THE INTERSECTION OF HWY. 285 (PECOS HWY.) AND CR. 275 (LONGHORN RD.), GO EAST ON LONGHORN RD. APPROX 4 5 MILES TO A ROAD LATH ON RIGHT (SOUTH), FOLLOW ROAD LATHS APPROX. 0 95 MILE SOUTHWEST AND SOUTH. CONTINUE FOLLOWING ROAD LATHS WEST 1135' TO THE NORTHEAST PAD CORNER FOR THIS LOCATION.

COG OPERATING, LLC
HAMBONE FEDERAL COM 25H
LOCATED 330 FT. FROM THE SOUTH LINE AND 2410 FT. FROM THE WEST LINE OF SECTION 8, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

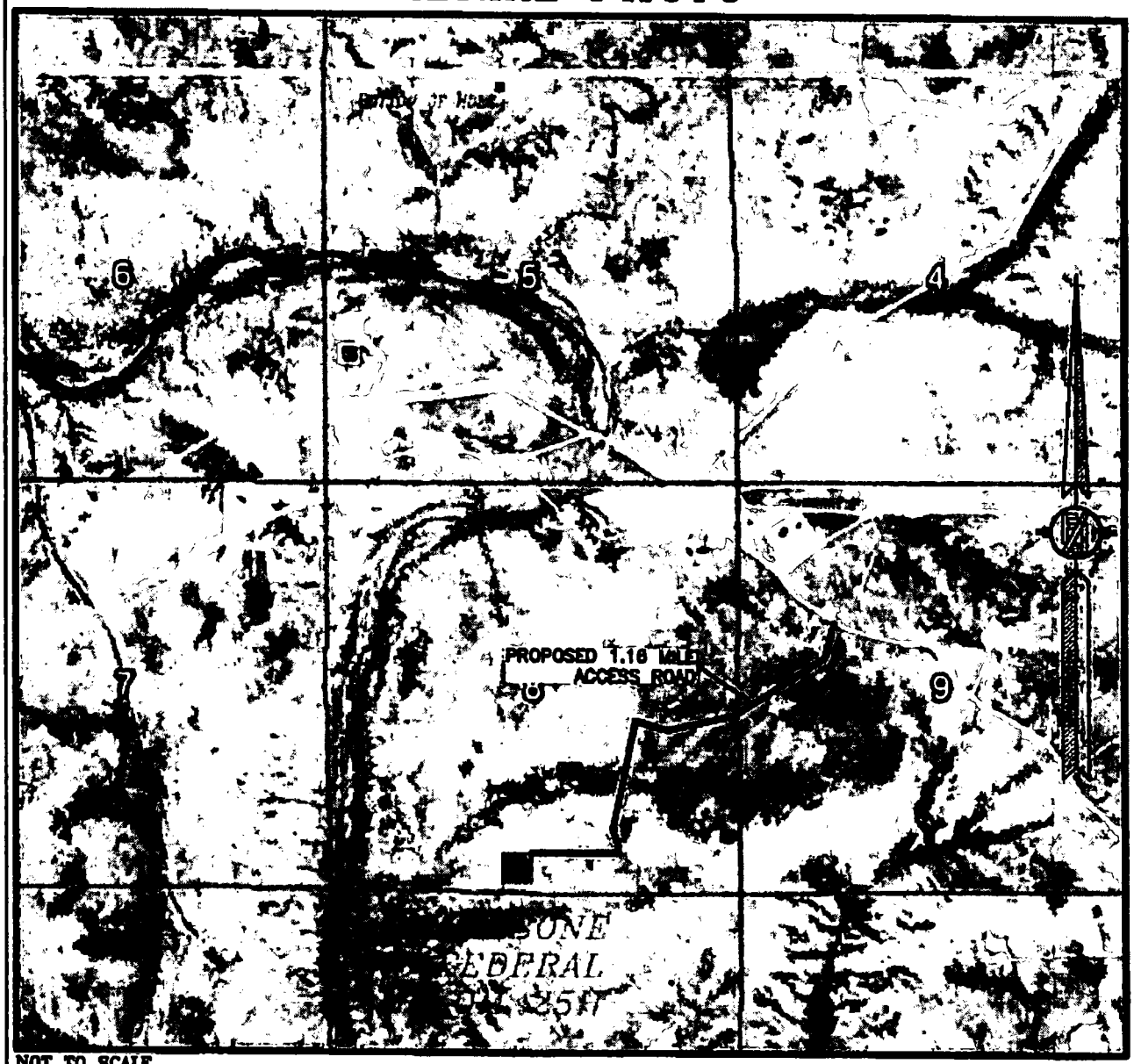
NOVEMBER 30, 2018

SURVEY NO. 4925F

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SECTION 8, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

AERIAL PHOTO



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
NOV. 2015

COG OPERATING, LLC
HAMBONE FEDERAL COM 25H
LOCATED 330 FT. FROM THE SOUTH LINE
AND 2410 FT. FROM THE WEST LINE OF
SECTION 8, TOWNSHIP 26 SOUTH,
RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

NOVEMBER 30, 2018

SURVEY NO. 4925F

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SECTION 8, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

AERIAL ACCESS ROUTE MAP

NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
NOV. 2015

COG OPERATING, LLC
HAMBONE FEDERAL COM 25H
LOCATED 330 FT. FROM THE SOUTH LINE
AND 2410 FT. FROM THE WEST LINE OF
SECTION 8, TOWNSHIP 26 SOUTH,
RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

NOVEMBER 30, 2018

SURVEY NO. 4925F

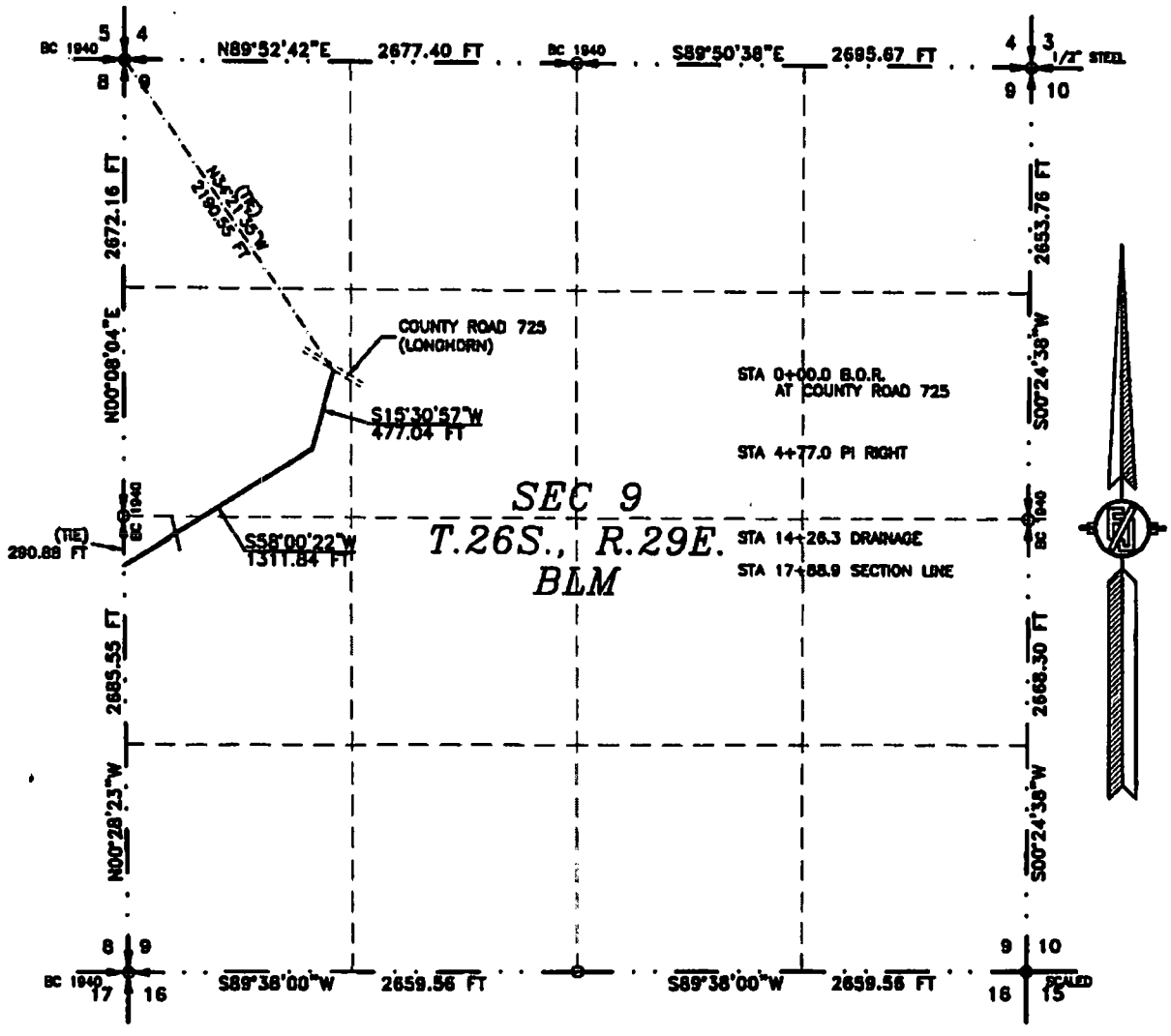
MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

ACCESS ROAD PLAT

ACCESS ROAD FROM COUNTY ROAD 725 (LONGHORN) TO HAMBONE FEDERAL COM 25H & 26H

COG OPERATING, LLC

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 9, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
NOVEMBER 30, 2018



SEE NEXT SHEET (2-7) FOR DESCRIPTION

1000 0 1000

Scale: 1" = 1000'

GENERAL NOTES

1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.

2.) BASIS OF BEARING AND DISTANCE IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY.

SURVEYOR CERTIFICATE

I, FILIMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO.

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 12TH DAY OF NOVEMBER, 2018

FILIMON F. JARAMILLO NM 12797

MADRON SURVEYING, INC.
301 SOUTH CANAL
CARLSBAD, NEW MEXICO 88220
Phone (575) 234-3341

SHEET: 1-7

SURVEY NO. 5129B

MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO

ACCESS ROAD PLAT

ACCESS ROAD FROM COUNTY ROAD 725 (LONGHORN) TO HAMBONE FEDERAL COM 25H & 26H

COG OPERATING, LLC

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 9, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
NOVEMBER 30, 2018

DESCRIPTION

A STRIP OF LAND 20 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 9, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M., EDDY COUNTY, STATE OF NEW MEXICO AND BEING 10 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY:

BEGINNING AT A POINT WITHIN THE SW/4 NW/4 OF SAID SECTION 9, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M., WHENCE THE NORTHWEST CORNER OF SAID SECTION 9, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M. BEARS N34°21'35"W, A DISTANCE OF 2190.55 FEET;
THENCE S15°30'57"W A DISTANCE OF 477.04 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE S58°00'22"W A DISTANCE OF 1311.84 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE WEST QUARTER CORNER OF SAID SECTION 9, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M. BEARS N00°28'23"W, A DISTANCE OF 290.88 FEET;

SAID STRIP OF LAND BEING 1788.88 FEET OR 108.42 RODS IN LENGTH, CONTAINING 0.821 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

SW/4 NW/4	1237.10 L.F.	74.98 RODS	0.568 ACRES
NW/4 SW/4	551.78 L.F.	33.44 RODS	0.253 ACRES

GENERAL NOTES

1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.

2.) BASIS OF BEARING AND DISTANCE IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY.

SURVEYOR CERTIFICATE

I, FILIMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO.

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 30 DAY OF NOVEMBER 2018

FILIMON F. JARAMILLO, PLS 12797

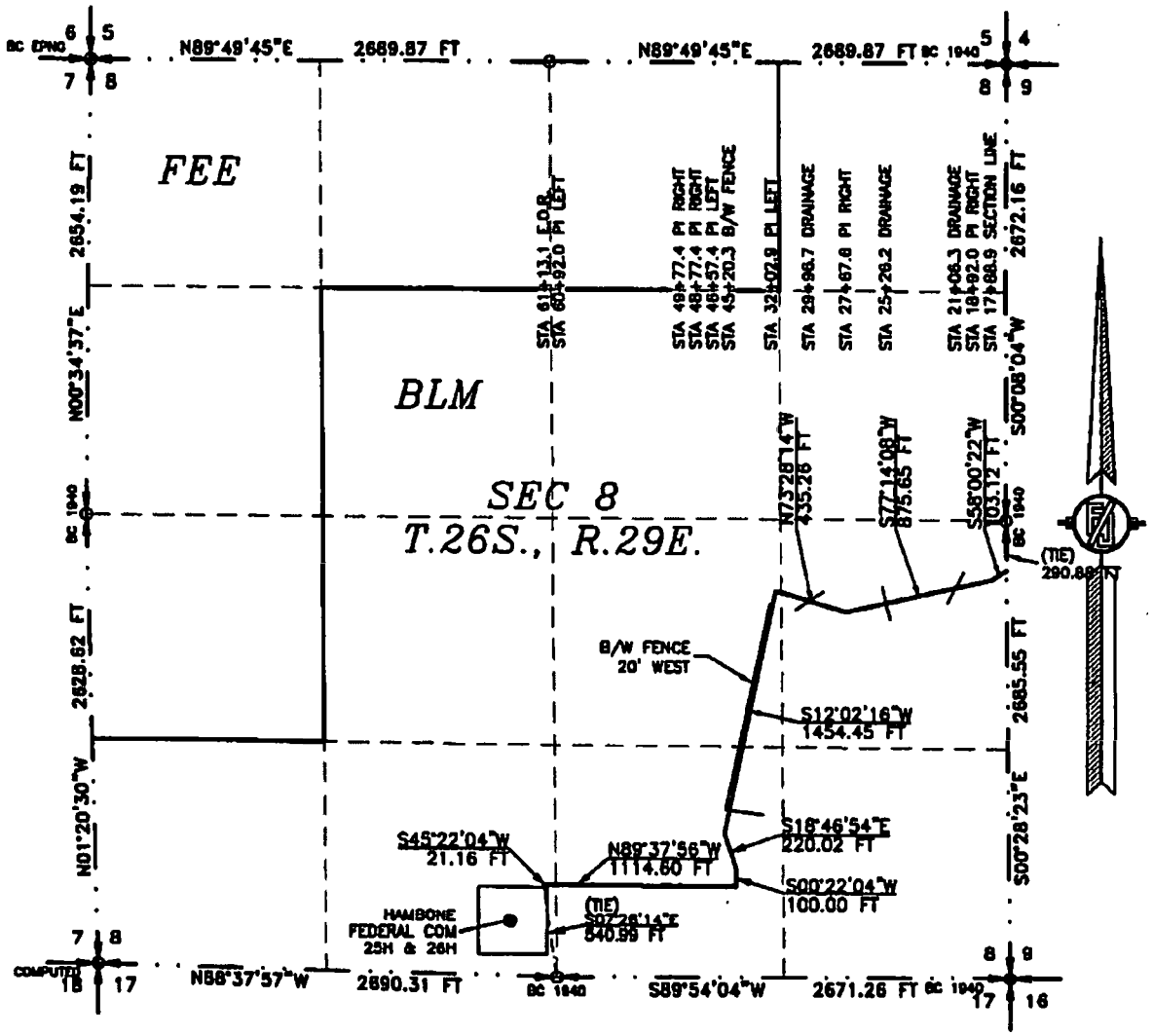
MADRON SURVEYING, INC.
301 SOUTH CANAL
CARLSBAD, NEW MEXICO 88220
Phone (575) 234-3341

ACCESS ROAD PLAT

ACCESS ROAD FROM COUNTY ROAD 725 (LONGHORN) TO HAMBONE FEDERAL COM 26H & 26H

COG OPERATING, LLC

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 8, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
NOVEMBER 30, 2018



SEE NEXT SHEET (4-7) FOR DESCRIPTION

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Scale: 1" = 1000'

GENERAL NOTES

1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.

2.) BASIS OF BEARING AND DISTANCE IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY.

SURVEYOR CERTIFICATE

I, FILIMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO.

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 30th DAY OF NOVEMBER 2018

FILIMON F. JARAMILLO PLS 12797
301 SOUTH CANAL
(575) 234-3341

MADRON SURVEYING, INC.
301 SOUTH CANAL
CARLSBAD, NEW MEXICO 88220
Phone (575) 234-3341

SHEET: 3-7

SURVEY NO. 5129B

MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO

ACCESS ROAD PLAT

ACCESS ROAD FROM COUNTY ROAD 725 (LONGHORN) TO HAMBONE FEDERAL COM 25H & 26H

COG OPERATING, LLC

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 8, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
NOVEMBER 30, 2018

DESCRIPTION

A STRIP OF LAND 20 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 8, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M., EDDY COUNTY, STATE OF NEW MEXICO AND BEING 10 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY:

BEGINNING AT A POINT WITHIN THE NE/4 SE/4 OF SAID SECTION 8, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M., WHENCE THE EAST QUARTER CORNER OF SAID SECTION 8, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M. BEARS N00°28'23"W, A DISTANCE OF 290.88 FEET;
THENCE S58°00'22"W A DISTANCE OF 103.12 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE S77°14'08"W A DISTANCE OF 875.65 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE N73°28'14"W A DISTANCE OF 435.26 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE S12°02'16"W A DISTANCE OF 1454.45 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE S16°46'54"E A DISTANCE OF 220.02 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE S00°22'04"W A DISTANCE OF 100.00 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE N89°37'56"W A DISTANCE OF 1114.60 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE S45°22'04"W A DISTANCE OF 21.16 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE SOUTH QUARTER CORNER OF SAID SECTION 8, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M. BEARS S07°26'14"E, A DISTANCE OF 540.99 FEET;

SAID STRIP OF LAND BEING 4324.26 FEET OR 262.08 RODS IN LENGTH, CONTAINING 1.985 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

NE/4 SE/4	1380.40 L.F.	83.66 RODS	0.634 ACRES
NW/4 SE/4	972.90 L.F.	58.96 RODS	0.447 ACRES
SW/4 SE/4	1898.38 L.F.	115.05 RODS	0.872 ACRES
SE/4 SW/4	72.58 L.F.	4.40 RODS	0.033 ACRES

GENERAL NOTES

1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.

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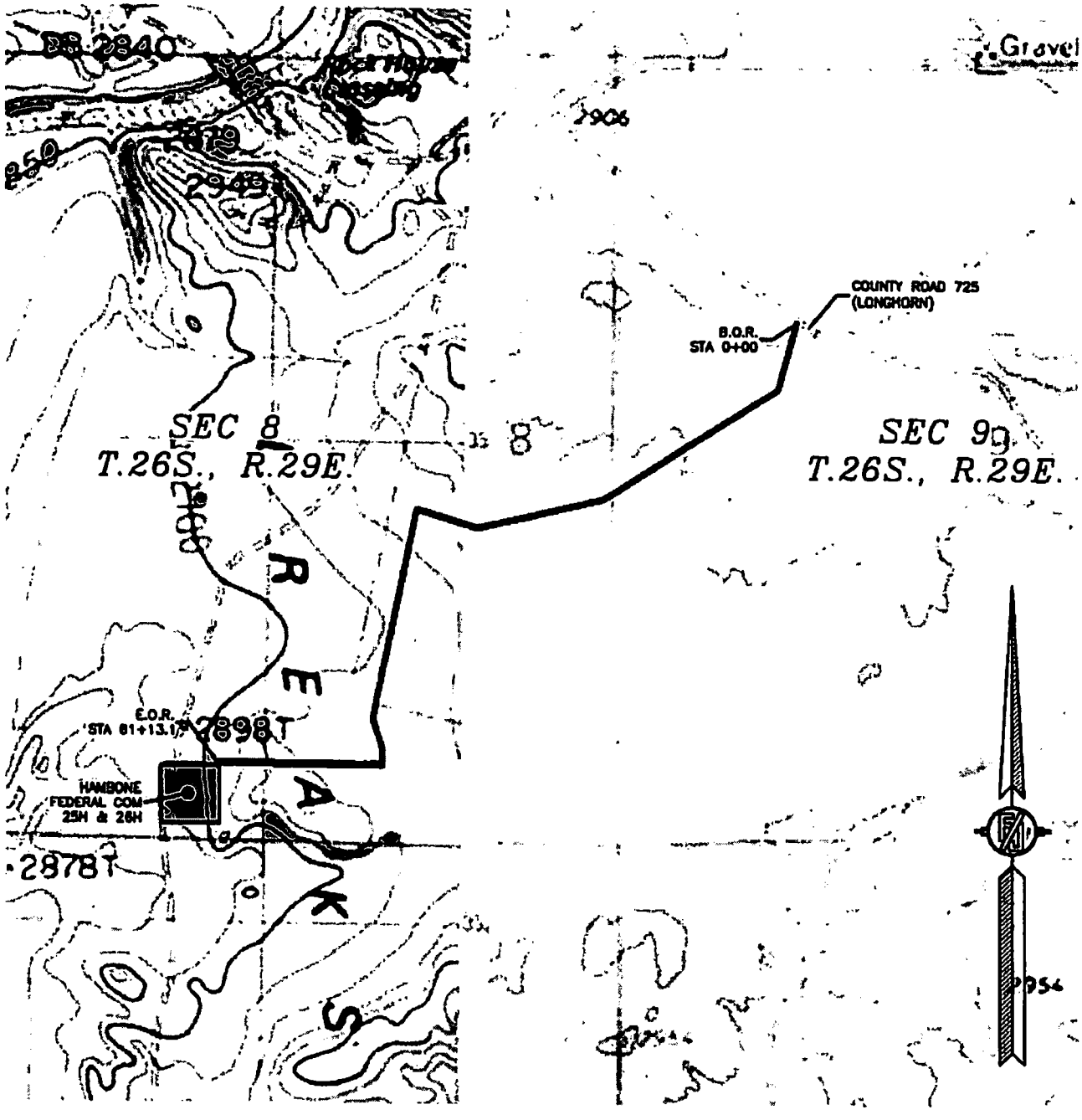
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTIONS 9 & 8, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
NOVEMBER 30, 2018



SHEET: 5-7

SURVEY NO. 5129B

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

ACCESS ROAD PLAT

ACCESS ROAD FROM COUNTY ROAD 725 (LONGHORN) TO HAMBONE FEDERAL COM 25H & 26H

COG OPERATING, LLC

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTIONS 9 & 8, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
NOVEMBER 30, 2018

SHEET: 6-7

SURVEY NO. 5129B

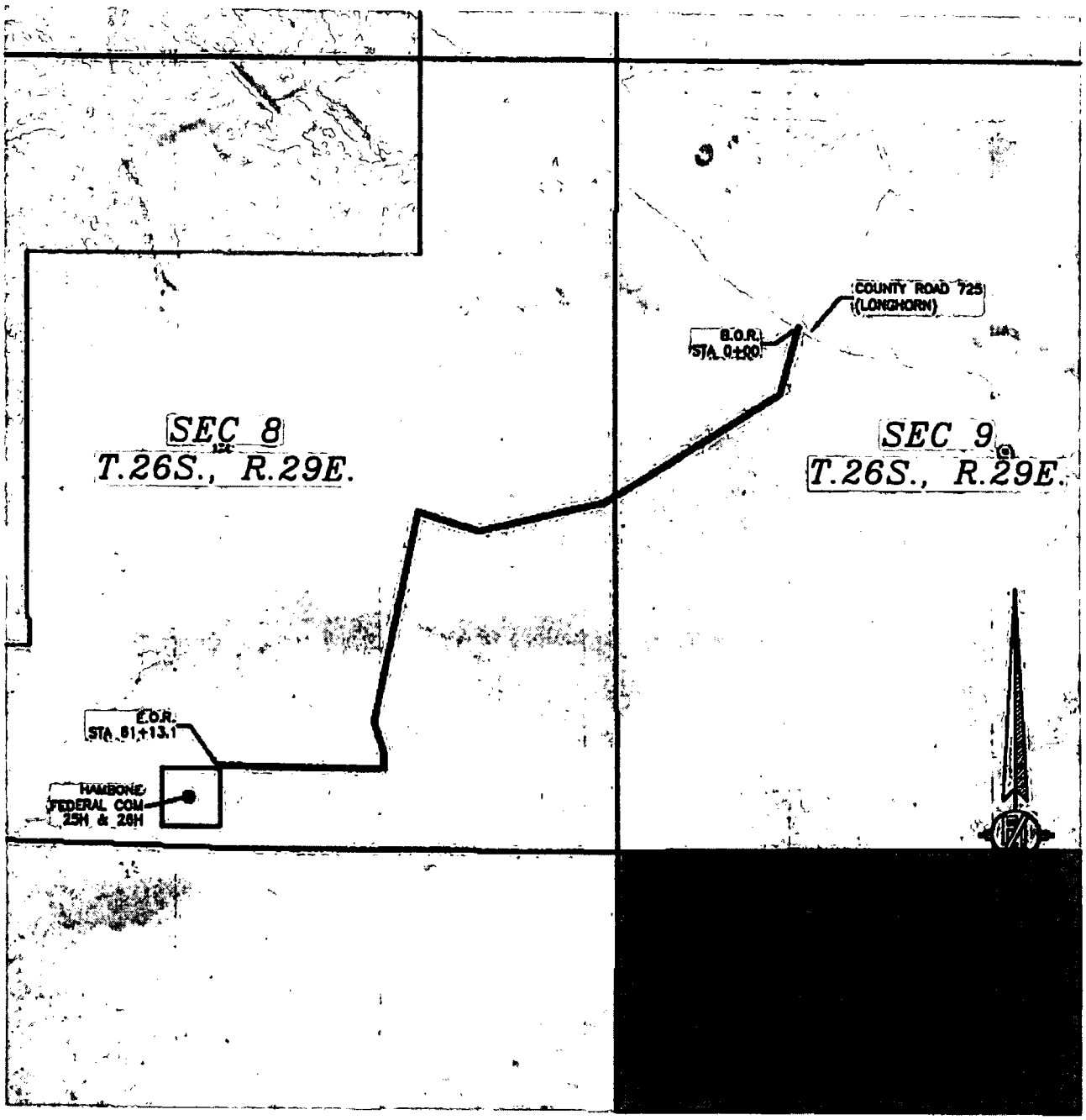
MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

ACCESS ROAD PLAT

ACCESS ROAD FROM COUNTY ROAD 725 (LONGHORN) TO HAMBONE FEDERAL COM 25H & 26H

COG OPERATING, LLC

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTIONS 9 & 8, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
NOVEMBER 30, 2018

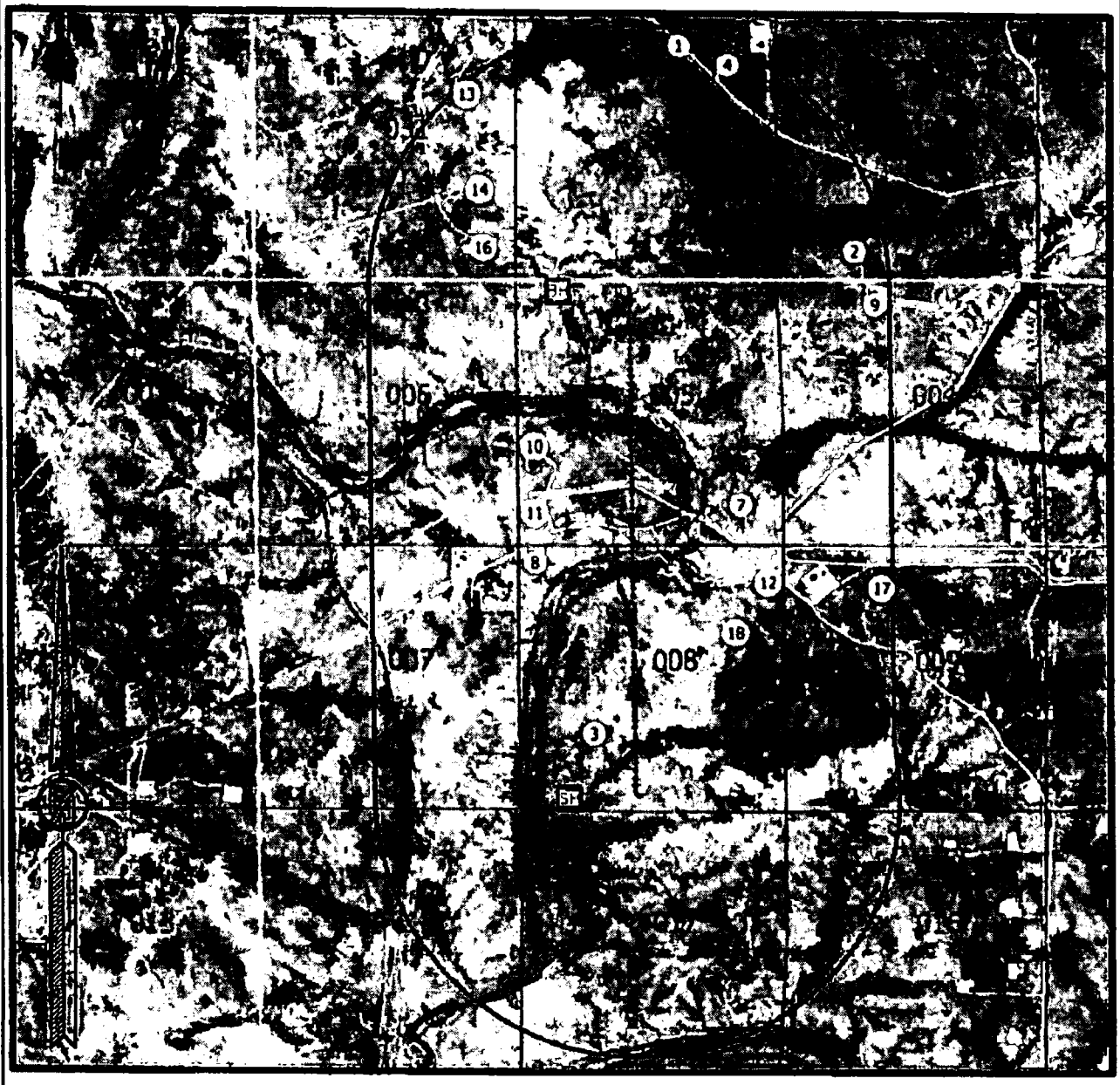


SHEET: 7-7

SURVEY NO. 5129B

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

1 – MILE MAP



SH SURFACE LOCATION
BH BOTTOM OF HOLE
XX WELLS WITHIN 1 MILE

COG OPERATING, LLC
HAMBONE FEDERAL COM 25H
LOCATED 330 FT. FROM THE SOUTH LINE AND 2410 FT. FROM THE WEST LINE OF SECTION 8, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M. EDDY COUNTY, STATE OF NEW MEXICO

NOVEMBER 30, 2018

SURVEY NO. 4925F

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

ID	API	wellname	well_type	ulstr	surface location	ogrid_name	status	dir_status	elevation	meas_depth	tot_depth	latitude	longitude	pool_id_lb
1	30-015-23882	NORTHERN NATURAL GAS #001	O	B-32-25S-29E	660 FNL 1980 FEL	DINERO OPERATING CO	P	V	29989	7850	7850	32.0917397	-104.0042648	[44152] EDDY UNDESIGNATED, GROUP 4
2	30-015-36971	WEST BRUSHY FEDERAL 33 #001	O	H-33-25S-29E	660 FSL 1560 FWL	XTO ENERGY, INC	A	V	2990	9	9	32.0805206	-103.9928131	[8080] BRUSHY DRAW, DELAWARE
4	30-015-29470	SHOCKER SWD #001	S	A-32-25S-29E	1040 FNL 980 FEL	EOG Y RESOURCES, INC.	A	V	2990	15700	15700	32.0908734	-104.0010681	[96101] SWD, DEVONIAN; [97864] WILDCAT, DEVONIAN
6	30-015-31675	WEST BRUSHY 8 FEDERAL SWD #001	S	A-08-26S-29E	660 FNL 330 FEL	COG OPERATING LLC	A	V	2918	5475	5475	32.0615267	-103.9986572	[8080] BRUSHY DRAW, DELAWARE; [96100] SWD, DELAWARE
6	30-015-37614	OCHO CINCO FEDERAL COM #001H	O	A-08-26S-29E	760 FNL 330 FEL	COG OPERATING LLC	P	O	2920	11645	11645	32.062252	-103.9986572	[97801] WILDCAT G-04 S262908A, BONE SPRING
7	30-015-31869	WEST BRUSHY 5 FEDERAL SWD #005	S	P-05-26S-29E	800 FSL 650 FEL	COG OPERATING LLC	A	V	2881	6050	6050	32.0845398	-104.0001891	[8080] BRUSHY DRAW, DELAWARE; [96100] SWD, DELAWARE
8	30-015-37294	BOYLES FEE COM #001	O	D-08-26S-29E	330 FNL 330 FWL	COG OPERATING LLC	P	D	2885	6655	3450	32.0634232	-104.013918	[8080] BRUSHY DRAW, DELAWARE
9	30-015-37833	BIG PAPI FEDERAL COM #002H	O	C-04-26S-29E	330 FNL 1980 FWL	COG OPERATING LLC	A	H	2975	12985	8637	32.0780182	-103.9915085	[13354] CORRAL CANYON, BONE SPRING, SOUTH
9	30-015-32196	PAPPYS PREFERENCE FEDERAL #001	O	C-04-26S-29E	495 FNL 1980 FWL	COG OPERATING LLC	A	V	2983	5913	5913	32.0775642	-103.9915009	[8080] BRUSHY DRAW, DELAWARE
10	30-015-38318	HAMBONE FEE COM #002H	O	L-05-26S-29E	1980 FSL 330 FWL	COG OPERATING LLC	P	V	2895	11594	7176	32.069783	-104.0139122	[97801] WILDCAT G-04 S262908A, BONE SPRING
11	30-015-38980	HAMBONE FEE COM #001H	O	M-05-26S-29E	660 FSL 330 FWL	COG OPERATING LLC	P	O	2906	11715	7261	32.066143	-104.0139236	[97801] WILDCAT G-04 S262908A, BONE SPRING
13	30-015-37749	COOPER 31 FEDERAL #003H	O	H-31-25S-29E	1850 FNL 990 FEL	COG PRODUCTION, LLC	A	O	2975	10860	7061	32.0890656	-104.018158	[8080] BRUSHY DRAW, DELAWARE
14	30-015-39343	COOPER 31 FEDERAL #004H	O	I-31-25S-29E	1830 FSL 730 FEL	COG PRODUCTION, LLC	A	O	2959	11071	6910	32.0839386	-104.0173492	[8085] BRUSHY DRAW, DELAWARE, NORTH; [53775] ROCK SPUR, BONE SPRING
16	30-015-36755	COOPER 31 FEDERAL #002H	G	P-31-25S-29E	660 FSL 660 FEL	COG PRODUCTION, LLC	P	O	2934	11300	6834	32.0807228	-104.0171509	[53775] ROCK SPUR, BONE SPRING
17	30-015-27013	MARIS FEDERAL #001	O	C-09-26S-29E	670 FNL 1980 FWL	OXY USA INC	A	V	2930	6700	6700	32.0619354	-103.9911357	[8085] BRUSHY DRAW, DELAWARE
18	30-015-31866	WEST BRUSHY 8 FEDERAL 2 SWD #002	S	H-08-26S-29E	1750 FNL 990 FEL	MARBOB ENERGY CORP	P	V	2927	5575	5575	32.0595284	-104.0007858	[8080] BRUSHY DRAW, DELAWARE

COG Operating, LLC - Hambone Federal Com 25H

1. Geologic Formations

TVD of target	11,045' EOL	Pilot hole depth	NA
MD at TD:	21,243'	Deepest expected fresh water:	207'

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Quaternary Fill	Surface	Water	
Rustler	859	Water	
Top of Salt	1041	Salt	
Base of Salt	2688	Salt	
Lamar	2789	Salt Water	
Bell Canyon	2828	Salt Water	
Cherry Canyon	3679	Oil/Gas	
Brushy Canyon	4959	Oil/Gas	
Bone Spring Lime	6524	Oil/Gas	
U. Avalon Shale	6848	Oil/Gas	
L. Avalon Shale	7109	Oil/Gas	
1st Bone Spring Sand	7445	Oil/Gas	
2nd Bone Spring Sand	8291	Oil/Gas	
3rd Bone Spring Sand	9348	Oil/Gas	
Wolfcamp	11045	Target Oil/Gas	

2. Casing Program

Hole Size	Casing From	Casing To	Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17.5"	0	930	13.375"	54.5	J55	STC	2.72	7.58	10.14
12.25"	0	10418	9.625"	47	HCL80	BTC	1.69	1.20	2.29
8.5	0	21,243	5.5"	23	P110	BTC	2.03	2.39	2.85
			BLM Minimum Safety Factor				1.125	1	1.6 Dry 1.8 Wet

Intermediate casing will be kept at least 1/3 full while running casing.to mitigate collapse. Intermediate burst based on 0.7 frac gradient at the shoe with Gas Gradient 0.1 psi/ft to surface.
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

COG Operating, LLC - Hambone Federal Com 25H

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	N
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	
Is well within the designated 4 string boundary?	
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3rd string cement tied back 500' into previous casing?	
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	
Is 2nd string set 100' to 600' below the base of salt?	
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

3. Cementing Program

Casing	# Sks	Wt. lb/ gal	Yld ft3/ sack	H_2O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surf.	370	13.5	1.75	9	12	Lead: Class C + 4% Gel
	250	14.8	1.34	6.34	8	Tail: Class C + 2% CaCl2
Inter. Stage1	540	11	2.8	19	48	Lead: NeoCem
	300	16.4	1.1	5	8	Tail: Class H
DV Tool @ 6524'						
Inter. Stage2	940	11	2.8	19	48	Lead: NeoCem
	100	14.8	1.35	6.34	8	Tail: Class C + 2% Cacl
5.5 Prod	400	12.7	2	10.6	16	Lead: 35:65:6 H Blend
	2980	14.4	1.24	5.7	19	Tail: 50:50:2 Class H Blend

Volumes Subject to Observed Hole Conditions and/or Fluid Caliper Results
Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.

Casing String	TOC	% Excess
Surface	0'	50%
1st Intermediate	0'	50%
Production	9,418'	35%

4. Pressure Control Equipment

N	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	x	Tested to:
12-1/4"	13-5/8"	3M	Annular	x	2500 psi
			Blind Ram		3M
			Pipe Ram	x	
			Double Ram	x	
			Other*		
8-3/4"	13-5/8"	5M	5M Annular	x	2500 psi
			Blind Ram		5M
			Pipe Ram	x	
			Double Ram	x	
			Other*		

BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. See attached schematics.

Y	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.
Y	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.
	N Are anchors required by manufacturer?
N	A multibowl wellhead is being used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested.

5. Mud Program

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From	To				
0	Surf. Shoe	FW Gel	8.4 - 8.6	28-29	N/C
Surf csg	Int shoe	Diesel Brine Emul	8.6 - 9.4	30-40	N/C
Int shoe	Lateral TD	OBM	10.5 - 12.5	30-40	20

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

What will be used to monitor the loss or gain of fluid?	PVT/Pason/Visual Monitoring

6. Logging and Testing Procedures

Logging, Coring and Testing.	
Y	Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
N	Are Logs are planned based on well control or offset log information.
N	Drill stem test? If yes, explain.
N	Coring? If yes, explain.

Additional logs planned		Interval
N	Resistivity	Pilot Hole TD to ICP
N	Density	Pilot Hole TD to ICP
Y	CBL	Production casing (If cement not circulated to surface)
Y	Mud log	Intermediate shoe to TD
N	PEX	

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	7180 psi at 11045' TVD
Abnormal Temperature	NO 165 Deg. F.

No abnormal pressure or temperature conditions are anticipated. Sufficient mud materials to maintain mud properties and weight increase requirements will be kept on location at all times.

Sufficient supplies of Paper/LCM for periodic sweeps to control seepage and losses will be maintained on location.

Hydrogen Sulfide (H2S) monitors will be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.	
N	H2S is present
Y	H2S Plan attached

8. Other Facets of Operation

Y	Is it a walking operation?
N	Is casing pre-set?

x	H2S Plan.
x	BOP & Choke Schematics.
x	Directional Plan

CONCHO

COG Operating LLC

Eddy County, NM (NAD27 NME)
Hambone Federal Com
25H

OH

Plan: Plan 1 03-28-18

Standard Planning Report

28 March, 2018

PHOENIX
TECHNOLOGY SERVICES

Database:	USA Compass	**Local Co-ordinate Reference:**	Well 25H
Company:	COG Operating LLC	**TVD Reference:**	RKB @ 2918.10usft (Ensign 155)
Project:	Eddy County, NM (NAD27 NME)	**MD Reference:**	RKB @ 2918.10usft (Ensign 155)
Site:	Hambone Federal Com	**North Reference:**	Grid
Well:	25H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1 03-28-18		

Project	Eddy County, NM (NAD27 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 Hambone Federal Com

Site Position:		**Northing:**	382,232.28 usft	**Latitude:**	32° 3' 1.62215 N
From:	Map	**Easting:**	601,211.49 usft	**Longitude:**	104° 0' 23.97902 W
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.17 °

Well 25H

Well Position	**+N/-S**	0.00 usft	**Northing:**	382,232.28 usft	**Latitude:**	32° 3' 1.62215 N
	+E/-W	0.00 usft	**Easting:**	601,211.49 usft	**Longitude:**	104° 0' 23.97902 W
Position Uncertainty		0.00 usft	**Wellhead Elevation:**		**Ground Level:**	2,894.10 usft

Wellbore OH

Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	MVHD	3/28/2018	6.96	59.73	47,935.07000985

Design Plan 1 03-28-18

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	357.53

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	
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,604.53	2.09	197.53	2,604.51	-1.82	-0.57	2.00	2.00	0.00	197.53	
10,556.31	2.09	197.53	10,550.99	-278.43	-87.93	0.00	0.00	0.00	0.00	
11,323.94	90.13	359.60	11,045.00	199.76	-96.84	12.00	11.47	21.11	162.06	
21,243.94	90.13	359.60	11,023.00	10,119.49	-166.32	0.00	0.00	0.00	0.00	BHL - Hambone Fe

Database:	USA Compass	**Local Co-ordinate Reference:**	Well 25H
Company:	COG Operating LLC	**TVD Reference:**	RKB @ 2918.10usft (Ensign 155)
Project:	Eddy County, NM (NAD27 NME)	**MD Reference:**	RKB @ 2918.10usft (Ensign 155)
Site:	Hambone Federal Com	**North Reference:**	Grid
Well:	25H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1 03-28-18		

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
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP, Begin 2.00°/100' Build									
2,600.00	2.00	197.53	2,599.98	-1.66	-0.53	-1.64	2.00	2.00	0.00
2,604.53	2.09	197.53	2,604.51	-1.82	-0.57	-1.79	2.00	2.00	0.00
Hold 2.09° Inc at 197.53° Azm									
2,700.00	2.09	197.53	2,699.91	-5.14	-1.62	-5.06	0.00	0.00	0.00
2,800.00	2.09	197.53	2,799.85	-8.62	-2.72	-8.49	0.00	0.00	0.00
2,900.00	2.09	197.53	2,899.78	-12.10	-3.82	-11.92	0.00	0.00	0.00
3,000.00	2.09	197.53	2,999.71	-15.58	-4.92	-15.35	0.00	0.00	0.00
3,100.00	2.09	197.53	3,099.65	-19.05	-6.02	-18.78	0.00	0.00	0.00
3,200.00	2.09	197.53	3,199.58	-22.53	-7.12	-22.20	0.00	0.00	0.00
3,300.00	2.09	197.53	3,299.51	-26.01	-8.21	-25.63	0.00	0.00	0.00
3,400.00	2.09	197.53	3,399.45	-29.49	-9.31	-29.06	0.00	0.00	0.00
3,500.00	2.09	197.53	3,499.38	-32.97	-10.41	-32.49	0.00	0.00	0.00
3,600.00	2.09	197.53	3,599.31	-36.45	-11.51	-35.92	0.00	0.00	0.00
3,700.00	2.09	197.53	3,699.25	-39.93	-12.61	-39.34	0.00	0.00	0.00
3,800.00	2.09	197.53	3,799.18	-43.40	-13.71	-42.77	0.00	0.00	0.00
3,900.00	2.09	197.53	3,899.11	-46.88	-14.81	-46.20	0.00	0.00	0.00
4,000.00	2.09	197.53	3,999.05	-50.36	-15.90	-49.63	0.00	0.00	0.00
4,100.00	2.09	197.53	4,098.98	-53.84	-17.00	-53.06	0.00	0.00	0.00
4,200.00	2.09	197.53	4,198.91	-57.32	-18.10	-56.48	0.00	0.00	0.00
4,300.00	2.09	197.53	4,298.85	-60.80	-19.20	-59.91	0.00	0.00	0.00
4,400.00	2.09	197.53	4,398.78	-64.28	-20.30	-63.34	0.00	0.00	0.00
4,500.00	2.09	197.53	4,498.72	-67.75	-21.40	-66.77	0.00	0.00	0.00
4,600.00	2.09	197.53	4,598.65	-71.23	-22.50	-70.20	0.00	0.00	0.00
4,700.00	2.09	197.53	4,698.58	-74.71	-23.59	-73.62	0.00	0.00	0.00
4,800.00	2.09	197.53	4,798.52	-78.19	-24.69	-77.05	0.00	0.00	0.00
4,900.00	2.09	197.53	4,898.45	-81.67	-25.79	-80.48	0.00	0.00	0.00
5,000.00	2.09	197.53	4,998.38	-85.15	-26.89	-83.91	0.00	0.00	0.00
5,100.00	2.09	197.53	5,098.32	-88.63	-27.99	-87.34	0.00	0.00	0.00
5,200.00	2.09	197.53	5,198.25	-92.10	-29.09	-90.76	0.00	0.00	0.00
5,300.00	2.09	197.53	5,298.18	-95.58	-30.18	-94.19	0.00	0.00	0.00
5,400.00	2.09	197.53	5,398.12	-99.06	-31.28	-97.62	0.00	0.00	0.00
5,500.00	2.09	197.53	5,498.05	-102.54	-32.38	-101.05	0.00	0.00	0.00
5,600.00	2.09	197.53	5,597.98	-106.02	-33.48	-104.48	0.00	0.00	0.00
5,700.00	2.09	197.53	5,697.92	-109.50	-34.58	-107.90	0.00	0.00	0.00
5,800.00	2.09	197.53	5,797.85	-112.98	-35.68	-111.33	0.00	0.00	0.00
5,900.00	2.09	197.53	5,897.78	-116.45	-36.78	-114.76	0.00	0.00	0.00
6,000.00	2.09	197.53	5,997.72	-119.93	-37.87	-118.19	0.00	0.00	0.00
6,100.00	2.09	197.53	6,097.65	-123.41	-38.97	-121.62	0.00	0.00	0.00
6,200.00	2.09	197.53	6,197.58	-126.89	-40.07	-125.04	0.00	0.00	0.00
6,300.00	2.09	197.53	6,297.52	-130.37	-41.17	-128.47	0.00	0.00	0.00
6,400.00	2.09	197.53	6,397.45	-133.85	-42.27	-131.90	0.00	0.00	0.00
6,500.00	2.09	197.53	6,497.38	-137.33	-43.37	-135.33	0.00	0.00	0.00
6,600.00	2.09	197.53	6,597.32	-140.80	-44.47	-138.76	0.00	0.00	0.00
6,700.00	2.09	197.53	6,697.25	-144.28	-45.58	-142.18	0.00	0.00	0.00
6,800.00	2.09	197.53	6,797.18	-147.76	-46.68	-145.61	0.00	0.00	0.00
6,900.00	2.09	197.53	6,897.12	-151.24	-47.76	-149.04	0.00	0.00	0.00
7,000.00	2.09	197.53	6,997.05	-154.72	-48.86	-152.47	0.00	0.00	0.00
7,100.00	2.09	197.53	7,096.98	-158.20	-49.96	-155.90	0.00	0.00	0.00
7,200.00	2.09	197.53	7,196.92	-161.68	-51.06	-159.32	0.00	0.00	0.00
7,300.00	2.09	197.53	7,296.85	-165.15	-52.16	-162.75	0.00	0.00	0.00
7,400.00	2.09	197.53	7,396.79	-168.63	-53.25	-166.18	0.00	0.00	0.00

Database:	USA Compass	**Local Co-ordinate Reference:**	Well 25H
Company:	COG Operating LLC	**TVD Reference:**	RKB @ 2918.10usft (Ensign 155)
Project:	Eddy County, NM (NAD27 NME)	**MD Reference:**	RKB @ 2918.10usft (Ensign 155)
Site:	Hambone Federal Com	**North Reference:**	Grid
Well:	25H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1 03-28-18		

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)
7,500.00	2.09	197.53	7,496.72	-172.11	-54.35	-169.61	0.00	0.00	0.00
7,600.00	2.09	197.53	7,596.65	-175.59	-55.45	-173.04	0.00	0.00	0.00
7,700.00	2.09	197.53	7,696.59	-179.07	-56.55	-176.46	0.00	0.00	0.00
7,800.00	2.09	197.53	7,796.52	-182.55	-57.65	-179.89	0.00	0.00	0.00
7,900.00	2.09	197.53	7,896.45	-186.03	-58.75	-183.32	0.00	0.00	0.00
8,000.00	2.09	197.53	7,996.39	-189.50	-59.85	-186.75	0.00	0.00	0.00
8,100.00	2.09	197.53	8,096.32	-192.98	-60.94	-190.18	0.00	0.00	0.00
8,200.00	2.09	197.53	8,196.25	-196.46	-62.04	-193.60	0.00	0.00	0.00
8,300.00	2.09	197.53	8,296.19	-199.94	-63.14	-197.03	0.00	0.00	0.00
8,400.00	2.09	197.53	8,396.12	-203.42	-64.24	-200.46	0.00	0.00	0.00
8,500.00	2.09	197.53	8,496.05	-206.90	-65.34	-203.89	0.00	0.00	0.00
8,600.00	2.09	197.53	8,595.99	-210.38	-66.44	-207.32	0.00	0.00	0.00
8,700.00	2.09	197.53	8,695.92	-213.85	-67.53	-210.75	0.00	0.00	0.00
8,800.00	2.09	197.53	8,795.85	-217.33	-68.63	-214.17	0.00	0.00	0.00
8,900.00	2.09	197.53	8,895.79	-220.81	-69.73	-217.60	0.00	0.00	0.00
9,000.00	2.09	197.53	8,995.72	-224.29	-70.83	-221.03	0.00	0.00	0.00
9,100.00	2.09	197.53	9,095.65	-227.77	-71.93	-224.46	0.00	0.00	0.00
9,200.00	2.09	197.53	9,195.59	-231.25	-73.03	-227.89	0.00	0.00	0.00
9,300.00	2.09	197.53	9,295.52	-234.73	-74.13	-231.31	0.00	0.00	0.00
9,400.00	2.09	197.53	9,395.45	-238.20	-75.22	-234.74	0.00	0.00	0.00
9,500.00	2.09	197.53	9,495.39	-241.68	-76.32	-238.17	0.00	0.00	0.00
9,600.00	2.09	197.53	9,595.32	-245.16	-77.42	-241.60	0.00	0.00	0.00
9,700.00	2.09	197.53	9,695.25	-248.64	-78.52	-245.03	0.00	0.00	0.00
9,800.00	2.09	197.53	9,795.19	-252.12	-79.62	-248.45	0.00	0.00	0.00
9,900.00	2.09	197.53	9,895.12	-255.60	-80.72	-251.88	0.00	0.00	0.00
10,000.00	2.09	197.53	9,995.05	-259.08	-81.82	-255.31	0.00	0.00	0.00
10,100.00	2.09	197.53	10,094.99	-262.55	-82.91	-258.74	0.00	0.00	0.00
10,200.00	2.09	197.53	10,194.92	-266.03	-84.01	-262.17	0.00	0.00	0.00
10,300.00	2.09	197.53	10,294.86	-269.51	-85.11	-265.59	0.00	0.00	0.00
10,400.00	2.09	197.53	10,394.79	-272.99	-86.21	-269.02	0.00	0.00	0.00
10,500.00	2.09	197.53	10,494.72	-276.47	-87.31	-272.45	0.00	0.00	0.00
10,556.31	2.09	197.53	10,550.99	-278.43	-87.93	-274.38	0.00	0.00	0.00
KOP2, Begin 12.00°/100' Build & Turn									
10,600.00	3.32	348.42	10,594.66	-277.95	-88.42	-273.88	12.00	2.81	345.36
10,700.00	15.27	357.24	10,693.18	-281.91	-89.64	-257.80	12.00	11.95	8.82
10,800.00	27.26	358.35	10,788.20	-225.73	-90.94	-221.60	12.00	11.99	1.11
10,900.00	39.26	358.81	10,869.66	-171.00	-92.26	-166.87	12.00	12.00	0.46
11,000.00	51.26	359.08	10,939.93	-100.12	-93.55	-95.99	12.00	12.00	0.27
11,100.00	63.26	359.27	10,993.92	-16.17	-94.75	-12.07	12.00	12.00	0.19
11,200.00	75.25	359.43	11,029.27	77.17	-95.80	81.23	12.00	12.00	0.15
11,300.00	87.25	359.57	11,044.45	175.82	-96.67	179.83	12.00	12.00	0.14
11,323.94	90.13	359.60	11,045.00	199.76	-96.84	203.75	12.00	12.00	0.13
LP, Hold 90.13° Inc at 359.60° Azm									
11,400.00	90.13	359.60	11,044.83	275.81	-97.37	279.75	0.00	0.00	0.00
11,500.00	90.13	359.60	11,044.61	375.81	-98.07	379.69	0.00	0.00	0.00
11,600.00	90.13	359.60	11,044.39	475.81	-98.77	479.62	0.00	0.00	0.00
11,700.00	90.13	359.60	11,044.16	575.81	-99.47	579.56	0.00	0.00	0.00
11,800.00	90.13	359.60	11,043.94	675.80	-100.17	679.49	0.00	0.00	0.00
11,900.00	90.13	359.60	11,043.72	775.80	-100.87	779.43	0.00	0.00	0.00
12,000.00	90.13	359.60	11,043.50	875.80	-101.57	879.36	0.00	0.00	0.00
12,100.00	90.13	359.60	11,043.28	975.79	-102.28	979.30	0.00	0.00	0.00
12,200.00	90.13	359.60	11,043.05	1,075.79	-102.98	1,079.23	0.00	0.00	0.00
12,300.00	90.13	359.60	11,042.83	1,175.79	-103.68	1,179.16	0.00	0.00	0.00
12,400.00	90.13	359.60	11,042.61	1,275.79	-104.38	1,279.10	0.00	0.00	0.00

Database:	USA Compass	**Local Co-ordinate Reference:**	Well 25H
Company:	COG Operating LLC	**TVD Reference:**	RKB @ 2918.10usft (Ensign 155)
Project:	Eddy County, NM (NAD27 NME)	**MD Reference:**	RKB @ 2918.10usft (Ensign 155)
Site:	Hambone Federal Com	**North Reference:**	Grid
Well:	25H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1 03-28-18		

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)
12,500.00	90.13	359.60	11,042.39	1,375.78	-105.08	1,379.03	0.00	0.00	0.00
12,600.00	90.13	359.60	11,042.17	1,475.78	-105.78	1,478.97	0.00	0.00	0.00
12,700.00	90.13	359.60	11,041.95	1,575.78	-106.48	1,578.90	0.00	0.00	0.00
12,800.00	90.13	359.60	11,041.72	1,675.78	-107.18	1,678.84	0.00	0.00	0.00
12,900.00	90.13	359.60	11,041.50	1,775.77	-107.88	1,778.77	0.00	0.00	0.00
13,000.00	90.13	359.60	11,041.28	1,875.77	-108.58	1,878.71	0.00	0.00	0.00
13,100.00	90.13	359.60	11,041.06	1,975.77	-109.28	1,978.64	0.00	0.00	0.00
13,200.00	90.13	359.60	11,040.84	2,075.76	-109.98	2,078.58	0.00	0.00	0.00
13,300.00	90.13	359.60	11,040.62	2,175.76	-110.68	2,178.51	0.00	0.00	0.00
13,400.00	90.13	359.60	11,040.39	2,275.76	-111.38	2,278.44	0.00	0.00	0.00
13,500.00	90.13	359.60	11,040.17	2,375.76	-112.08	2,378.38	0.00	0.00	0.00
13,600.00	90.13	359.60	11,039.95	2,475.75	-112.78	2,478.31	0.00	0.00	0.00
13,700.00	90.13	359.60	11,039.73	2,575.75	-113.48	2,578.25	0.00	0.00	0.00
13,800.00	90.13	359.60	11,039.51	2,675.75	-114.18	2,678.18	0.00	0.00	0.00
13,900.00	90.13	359.60	11,039.28	2,775.75	-114.88	2,778.12	0.00	0.00	0.00
14,000.00	90.13	359.60	11,039.06	2,875.74	-115.58	2,878.05	0.00	0.00	0.00
14,100.00	90.13	359.60	11,038.84	2,975.74	-116.28	2,977.99	0.00	0.00	0.00
14,200.00	90.13	359.60	11,038.62	3,075.74	-116.98	3,077.92	0.00	0.00	0.00
14,300.00	90.13	359.60	11,038.40	3,175.73	-117.68	3,177.86	0.00	0.00	0.00
14,400.00	90.13	359.60	11,038.18	3,275.73	-118.38	3,277.79	0.00	0.00	0.00
14,500.00	90.13	359.60	11,037.95	3,375.73	-119.08	3,377.73	0.00	0.00	0.00
14,600.00	90.13	359.60	11,037.73	3,475.73	-119.79	3,477.66	0.00	0.00	0.00
14,700.00	90.13	359.60	11,037.51	3,575.72	-120.49	3,577.59	0.00	0.00	0.00
14,800.00	90.13	359.60	11,037.29	3,675.72	-121.19	3,677.53	0.00	0.00	0.00
14,900.00	90.13	359.60	11,037.07	3,775.72	-121.89	3,777.46	0.00	0.00	0.00
15,000.00	90.13	359.60	11,036.85	3,875.72	-122.59	3,877.40	0.00	0.00	0.00
15,100.00	90.13	359.60	11,036.62	3,975.71	-123.29	3,977.33	0.00	0.00	0.00
15,200.00	90.13	359.60	11,036.40	4,075.71	-123.99	4,077.27	0.00	0.00	0.00
15,300.00	90.13	359.60	11,036.18	4,175.71	-124.69	4,177.20	0.00	0.00	0.00
15,400.00	90.13	359.60	11,035.96	4,275.71	-125.39	4,277.14	0.00	0.00	0.00
15,500.00	90.13	359.60	11,035.74	4,375.70	-126.09	4,377.07	0.00	0.00	0.00
15,600.00	90.13	359.60	11,035.52	4,475.70	-126.79	4,477.01	0.00	0.00	0.00
15,700.00	90.13	359.60	11,035.29	4,575.70	-127.49	4,576.94	0.00	0.00	0.00
15,800.00	90.13	359.60	11,035.07	4,675.69	-128.19	4,676.87	0.00	0.00	0.00
15,900.00	90.13	359.60	11,034.85	4,775.69	-128.89	4,776.81	0.00	0.00	0.00
16,000.00	90.13	359.60	11,034.63	4,875.69	-129.59	4,876.74	0.00	0.00	0.00
16,100.00	90.13	359.60	11,034.41	4,975.69	-130.29	4,976.68	0.00	0.00	0.00
16,200.00	90.13	359.60	11,034.18	5,075.68	-130.99	5,076.61	0.00	0.00	0.00
16,300.00	90.13	359.60	11,033.96	5,175.68	-131.69	5,176.55	0.00	0.00	0.00
16,400.00	90.13	359.60	11,033.74	5,275.68	-132.39	5,276.48	0.00	0.00	0.00
16,500.00	90.13	359.60	11,033.52	5,375.68	-133.09	5,376.42	0.00	0.00	0.00
16,600.00	90.13	359.60	11,033.30	5,475.67	-133.79	5,476.35	0.00	0.00	0.00
16,700.00	90.13	359.60	11,033.08	5,575.67	-134.49	5,576.29	0.00	0.00	0.00
16,800.00	90.13	359.60	11,032.85	5,675.67	-135.19	5,676.22	0.00	0.00	0.00
16,900.00	90.13	359.60	11,032.63	5,775.66	-135.89	5,776.16	0.00	0.00	0.00
17,000.00	90.13	359.60	11,032.41	5,875.66	-136.60	5,876.09	0.00	0.00	0.00
17,100.00	90.13	359.60	11,032.19	5,975.66	-137.30	5,976.02	0.00	0.00	0.00
17,200.00	90.13	359.60	11,031.97	6,075.66	-138.00	6,075.96	0.00	0.00	0.00
17,300.00	90.13	359.60	11,031.75	6,175.65	-138.70	6,175.89	0.00	0.00	0.00
17,400.00	90.13	359.60	11,031.52	6,275.65	-139.40	6,275.83	0.00	0.00	0.00
17,500.00	90.13	359.60	11,031.30	6,375.65	-140.10	6,375.76	0.00	0.00	0.00
17,600.00	90.13	359.60	11,031.08	6,475.65	-140.80	6,475.70	0.00	0.00	0.00
17,700.00	90.13	359.60	11,030.86	6,575.64	-141.50	6,575.63	0.00	0.00	0.00
17,800.00	90.13	359.60	11,030.64	6,675.64	-142.20	6,675.57	0.00	0.00	0.00

Database:	USA Compass	**Local Co-ordinate Reference:**	Well 25H
Company:	COG Operating LLC	**TVD Reference:**	RKB @ 2918.10usft (Ensign 155)
Project:	Eddy County, NM (NAD27 NME)	**MD Reference:**	RKB @ 2918.10usft (Ensign 155)
Site:	Hambone Federal Com	**North Reference:**	Grid
Well:	25H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1 03-28-18		

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)
17,900.00	90.13	359.60	11,030.42	6,775.64	-142.90	6,775.50	0.00	0.00	0.00
18,000.00	90.13	359.60	11,030.19	6,875.64	-143.60	6,875.44	0.00	0.00	0.00
18,100.00	90.13	359.60	11,029.97	6,975.63	-144.30	6,975.37	0.00	0.00	0.00
18,200.00	90.13	359.60	11,029.75	7,075.63	-145.00	7,075.30	0.00	0.00	0.00
18,300.00	90.13	359.60	11,029.53	7,175.63	-145.70	7,175.24	0.00	0.00	0.00
18,400.00	90.13	359.60	11,029.31	7,275.62	-146.40	7,275.17	0.00	0.00	0.00
18,500.00	90.13	359.60	11,029.08	7,375.62	-147.10	7,375.11	0.00	0.00	0.00
18,600.00	90.13	359.60	11,028.86	7,475.62	-147.80	7,475.04	0.00	0.00	0.00
18,700.00	90.13	359.60	11,028.64	7,575.62	-148.50	7,574.98	0.00	0.00	0.00
18,800.00	90.13	359.60	11,028.42	7,675.61	-149.20	7,674.91	0.00	0.00	0.00
18,900.00	90.13	359.60	11,028.20	7,775.61	-149.90	7,774.85	0.00	0.00	0.00
19,000.00	90.13	359.60	11,027.98	7,875.61	-150.60	7,874.78	0.00	0.00	0.00
19,100.00	90.13	359.60	11,027.75	7,975.61	-151.30	7,974.72	0.00	0.00	0.00
19,200.00	90.13	359.60	11,027.53	8,075.60	-152.00	8,074.65	0.00	0.00	0.00
19,300.00	90.13	359.60	11,027.31	8,175.60	-152.70	8,174.59	0.00	0.00	0.00
19,400.00	90.13	359.60	11,027.09	8,275.60	-153.40	8,274.52	0.00	0.00	0.00
19,500.00	90.13	359.60	11,026.87	8,375.59	-154.11	8,374.45	0.00	0.00	0.00
19,600.00	90.13	359.60	11,026.65	8,475.59	-154.81	8,474.39	0.00	0.00	0.00
19,700.00	90.13	359.60	11,026.42	8,575.59	-155.51	8,574.32	0.00	0.00	0.00
19,800.00	90.13	359.60	11,026.20	8,675.59	-156.21	8,674.26	0.00	0.00	0.00
19,900.00	90.13	359.60	11,025.98	8,775.58	-156.91	8,774.19	0.00	0.00	0.00
20,000.00	90.13	359.60	11,025.76	8,875.58	-157.61	8,874.13	0.00	0.00	0.00
20,100.00	90.13	359.60	11,025.54	8,975.58	-158.31	8,974.06	0.00	0.00	0.00
20,200.00	90.13	359.60	11,025.32	9,075.58	-159.01	9,074.00	0.00	0.00	0.00
20,300.00	90.13	359.60	11,025.09	9,175.57	-159.71	9,173.93	0.00	0.00	0.00
20,400.00	90.13	359.60	11,024.87	9,275.57	-160.41	9,273.87	0.00	0.00	0.00
20,500.00	90.13	359.60	11,024.65	9,375.57	-161.11	9,373.80	0.00	0.00	0.00
20,600.00	90.13	359.60	11,024.43	9,475.57	-161.81	9,473.73	0.00	0.00	0.00
20,700.00	90.13	359.60	11,024.21	9,575.56	-162.51	9,573.67	0.00	0.00	0.00
20,800.00	90.13	359.60	11,023.98	9,675.56	-163.21	9,673.60	0.00	0.00	0.00
20,900.00	90.13	359.60	11,023.76	9,775.56	-163.91	9,773.54	0.00	0.00	0.00
21,000.00	90.13	359.60	11,023.54	9,875.55	-164.61	9,873.47	0.00	0.00	0.00
21,100.00	90.13	359.60	11,023.32	9,975.55	-165.31	9,973.41	0.00	0.00	0.00
21,200.00	90.13	359.60	11,023.10	10,075.55	-166.01	10,073.34	0.00	0.00	0.00
21,243.94	90.13	359.60	11,023.00	10,119.49	-166.32	10,117.26	0.00	0.00	0.00
TD at 21243.94									

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
BHL - Hambone Fede - plan hits target center - Point	0.00	0.00	11,023.00	10,119.49	-166.32	392,351.77	601,045.17	32° 4' 41.77441 N	104° 0' 25.55612 W
LTP - Hambone Fede - plan misses target center by 0.29usft at 21113.94usft MD (11023.29 TVD, 9989.49 N, -165.41 E) - Point	0.00	0.00	11,023.00	9,989.49	-165.41	392,221.77	601,046.08	32° 4' 40.48784 N	104° 0' 25.55011 W
FTP - Hambone Fede - plan misses target center by 38.84usft at 11135.43usft MD (11008.67 TVD, 16.03 N, -95.14 E) - Point	0.00	0.00	11,045.00	2.29	-95.46	382,234.57	601,116.04	32° 3' 1.84772 N	104° 0' 25.08808 W

Database:	USA Compass	**Local Co-ordinate Reference:**	Well 25H
Company:	COG Operating LLC	**TVD Reference:**	RKB @ 2918.10usft (Ensign 155)
Project:	Eddy County, NM (NAD27 NME)	**MD Reference:**	RKB @ 2918.10usft (Ensign 155)
Site:	Hambone Federal Com	**North Reference:**	Grid
Well:	25H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1 03-28-18		

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
2,500.00	2,500.00	0.00	0.00	KOP, Begin 2.00°/100' Build
2,604.53	2,604.51	-1.82	-0.57	Hold 2.09° Inc at 197.53° Azm
10,556.31	10,550.99	-278.43	-87.93	KOP2, Begin 12.00°/100' Build & Turn
11,323.94	11,045.00	199.76	-96.84	LP, Hold 90.13° Inc at 359.60° Azm
21,243.94	11,023.00	10,119.49	-166.32	TD at 21243.94

CONCHO

P Eddy ((NAD27
Site: Hambone Federal Com
Well: 25H
Wellbore: OH
Design: Plan 1 03-28-18
Rig: Ensign 155

PHOENIX TECHNOLOGY SERVICES

Azimuths to Grid North
True North: -0.17°
Magnetic North: 6.78°

Magnetic Field
Strength: 47935.1nsT
Dip Angle: 59.73°
Date: 3/28/2018
Model: MVHD

RKB @ 2916.19usft (Ensign 155)

WELL DETAILS

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	382732.28	601211.49	32° 3' 1.82215 N	104° 0' 23.97902 W

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
BHL - Hambone Federal Com 25H	11023.00	10119.49	-186.32	392351.77	601845.17	32° 4' 41.77441 N	104° 0' 25.55812 W
LTP - Hambone Federal Com 25H	11023.00	9968.49	-185.41	392221.77	601845.08	32° 4' 43.48784 N	104° 0' 25.55811 W
FTP - Hambone Federal Com 25H	11045.00	2.29	-85.48	382234.57	601115.83	32° 3' 1.84772 N	104° 0' 25.46869 W

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

Local Origin: Well 25H, Grid North

Latitude: 32° 3' 1.82215 N
Longitude: 104° 0' 23.97902 W

Grid East: 601211.49
Grid North: 382732.28
Scale Factor: 1.000

Geomagnetic Model: MVHD
Sample Date: 28-Mar-18
Magnetic Declination: 6.95°
Dip Angle from Horizontal: 59.73°
Magnetic Field Strength: 47935.07000984nT

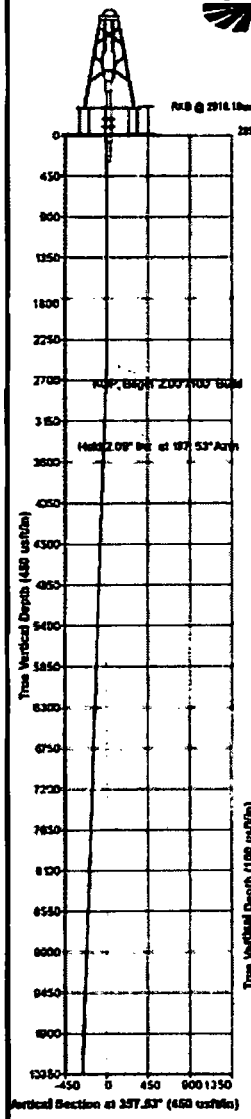
To convert a Magnetic Direction to a Grid Direction, Add 6.78°
To convert a Magnetic Direction to a True Direction, Add 6.95° East
To convert a True Direction to a Grid Direction, Subtract 0.17°

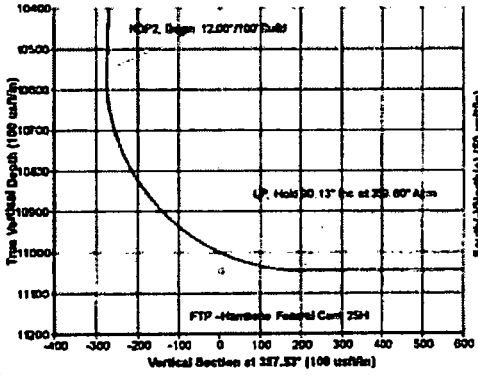
SECTION DETAILS

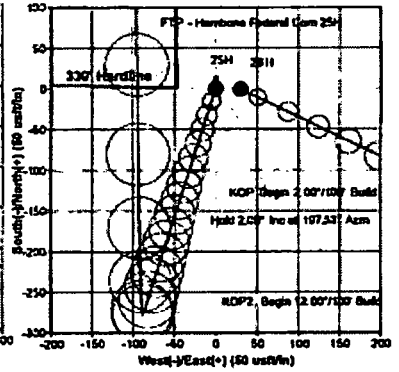
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSect	Target	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
2	2300.00	0.00	0.00	2300.00	0.00	0.00	0.00	0.00	0.00		KOP, Begin 2.00°/100' Build
3	2984.53	2.09	197.53	2984.51	-1.82	-0.57	2.00	197.53	-1.79		Hold 2.09° Inc at 197.53° Azm
4	10556.31	2.09	197.53	10552.99	-171.63	-47.85	0.00	0.00	-174.33		KOP2, Begin 12.00°/100' Build
5	11323.64	90.13	358.60	11045.00	109.76	-46.84	12.00	152.06	253.75		LP, Hold 90.13° Inc at 359.60° Azm
6	21243.94	90.13	358.60	11023.00	10119.49	-186.32	0.00	0.00	10117.26	BHL - Hambone Federal Com 25H	TD at 21243.94

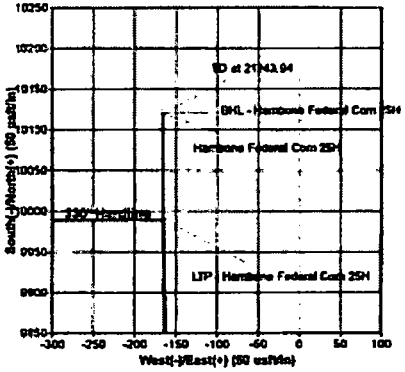
LEGEND

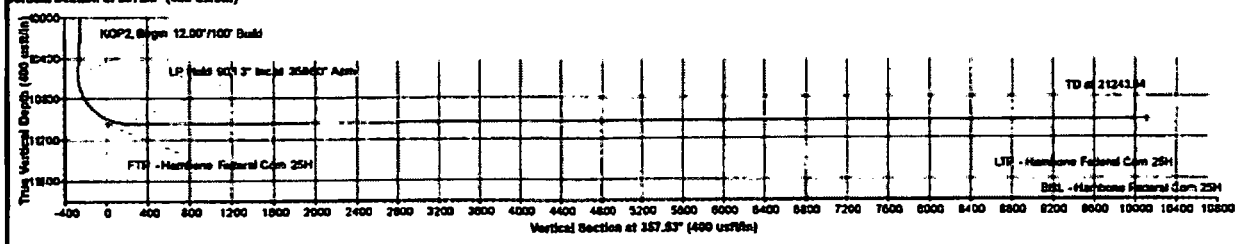
25H, OH, Plan 1 03-28-18 V0
Plan 1 03-28-18

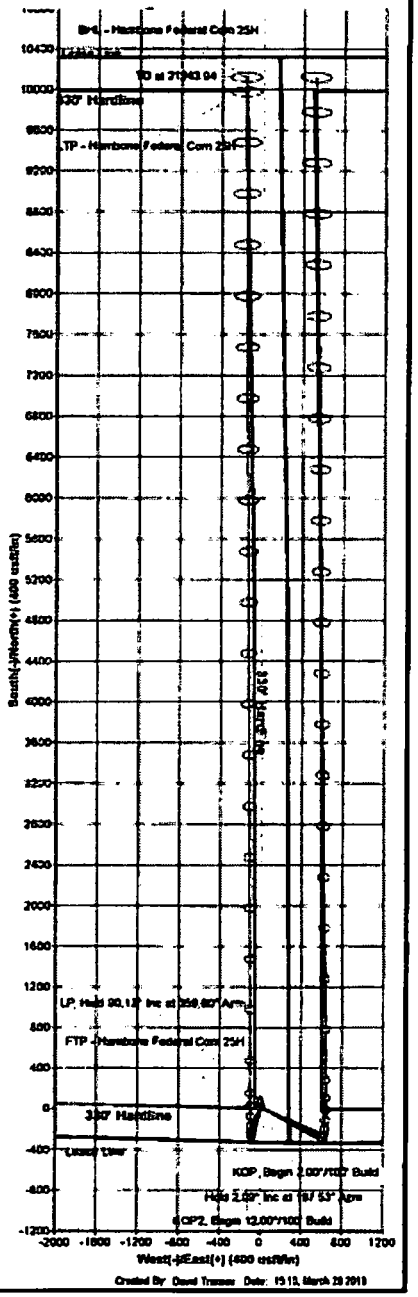












Created By: David Trosper Date: 15:13, March 29 2018

CONCHO

COG Operating LLC

Eddy County, NM (NAD27 NME)
Hambone Federal Com
25H

OH
Plan 1 03-28-18

Anticollision Report

28 March, 2018

PHOENIX
TECHNOLOGY SERVICES

CONCHO

Anticollision Report

PHOENIX TECHNOLOGY SERVICES

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well 25H
Project:	Eddy County, NM (NAD27 NME)	**TVD Reference:**	RKB @ 2918.10usft (Ensign 155)
Reference Site:	Hambone Federal Com	**MD Reference:**	RKB @ 2918.10usft (Ensign 155)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	25H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	USA Compass
Reference Design:	Plan 1 03-28-18	**Offset TVD Reference:**	Offset Datum

Reference	Plan 1 03-28-18		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.00usft	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 50,000.00 u	**Error Surface:**	Major Axis
Warning Levels Evaluated at:	2.00 Sigma	**Casing Method:**	Not applied

Survey Tool Program **Date** 3/28/2018

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	21,243.21	Plan 1 03-28-18 (OH)	MWD+HDGM	OWSG Rev.2 MWD + HDGM

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Hambone Federal Com						
26H - OH - Plan 1 03-28-18	2,416.53	2,416.93	30.06	13.18	1.780	CC
26H - OH - Plan 1 03-28-18	2,500.00	2,500.00	30.06	12.58	1.720	ES, SF

Offset Design Hambone Federal Com - 26H - OH - Plan 1 03-28-18 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD+HDGM — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.40	0.40	0.00	0.00	91.35	-0.71	30.05	30.06				
100.00	100.00	100.40	100.40	0.14	0.14	91.35	-0.71	30.05	30.06	29.78	0.27	109.753	
200.00	200.00	200.40	200.40	0.49	0.50	91.35	-0.71	30.05	30.06	29.07	0.99	30.337	
300.00	300.00	300.40	300.40	0.85	0.85	91.35	-0.71	30.05	30.06	28.35	1.71	17.601	
400.00	400.00	400.40	400.40	1.21	1.21	91.35	-0.71	30.05	30.06	27.63	2.42	12.397	
500.00	500.00	500.40	500.40	1.57	1.57	91.35	-0.71	30.05	30.06	26.92	3.14	9.566	
600.00	600.00	600.40	600.40	1.93	1.93	91.35	-0.71	30.05	30.06	26.20	3.86	7.790	
700.00	700.00	700.40	700.40	2.29	2.29	91.35	-0.71	30.05	30.06	25.48	4.58	6.569	
800.00	800.00	800.40	800.40	2.65	2.65	91.35	-0.71	30.05	30.06	24.77	5.29	5.679	
900.00	900.00	900.40	900.40	3.00	3.01	91.35	-0.71	30.05	30.06	24.05	6.01	5.002	
1,000.00	1,000.00	1,000.40	1,000.40	3.36	3.36	91.35	-0.71	30.05	30.06	23.33	6.73	4.469	
1,100.00	1,100.00	1,100.40	1,100.40	3.72	3.72	91.35	-0.71	30.05	30.06	22.62	7.44	4.038	
1,200.00	1,200.00	1,200.40	1,200.40	4.08	4.08	91.35	-0.71	30.05	30.06	21.90	8.16	3.684	
1,300.00	1,300.00	1,300.40	1,300.40	4.44	4.44	91.35	-0.71	30.05	30.06	21.18	8.88	3.386	
1,400.00	1,400.00	1,400.40	1,400.40	4.80	4.80	91.35	-0.71	30.05	30.06	20.46	9.59	3.133	
1,500.00	1,500.00	1,500.40	1,500.40	5.16	5.16	91.35	-0.71	30.05	30.06	19.75	10.31	2.915	
1,600.00	1,600.00	1,600.40	1,600.40	5.51	5.51	91.35	-0.71	30.05	30.06	19.03	11.03	2.726	
1,700.00	1,700.00	1,700.40	1,700.40	5.87	5.87	91.35	-0.71	30.05	30.06	18.31	11.74	2.559	
1,800.00	1,800.00	1,800.40	1,800.40	6.23	6.23	91.35	-0.71	30.05	30.06	17.60	12.46	2.412	
1,900.00	1,900.00	1,900.40	1,900.40	6.59	6.59	91.35	-0.71	30.05	30.06	16.88	13.18	2.281	
2,000.00	2,000.00	2,000.40	2,000.40	6.95	6.95	91.35	-0.71	30.05	30.06	16.16	13.90	2.163	
2,100.00	2,100.00	2,100.40	2,100.40	7.31	7.31	91.35	-0.71	30.05	30.06	15.45	14.61	2.057	
2,200.00	2,200.00	2,200.40	2,200.40	7.66	7.67	91.35	-0.71	30.05	30.06	14.73	15.33	1.961	
2,300.00	2,300.00	2,300.40	2,300.40	8.02	8.02	91.35	-0.71	30.05	30.06	14.01	16.05	1.873	
2,400.00	2,400.00	2,400.40	2,400.40	8.38	8.38	91.35	-0.71	30.05	30.06	13.29	16.76	1.793	

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well 25H
Project:	Eddy County, NM (NAD27 NME)	**TVD Reference:**	RKB @ 2918.10usft (Ensign 155)
Reference Site:	Hambone Federal Com	**MD Reference:**	RKB @ 2918.10usft (Ensign 155)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	25H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	USA Compass
Reference Design:	Plan 1 03-28-18	**Offset TVD Reference:**	Offset Datum

Offset Design Hambone Federal Com - 25H - OH - Plan 1 03-28-18 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD+HDGM — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
2,416.53	2,416.53	2,416.93	2,416.93	8.44	8.44	91.35	-0.71	30.05	30.06	13.18	16.88	1.780	CC
2,500.00	2,500.00	2,500.00	2,500.00	8.74	8.74	91.35	-0.71	30.05	30.06	12.58	17.48	1.720	ES, SF
2,600.00	2,599.98	2,599.40	2,599.38	9.08	9.08	-107.81	-1.47	31.60	32.14	13.98	18.16	1.769	
2,700.00	2,699.91	2,698.16	2,698.00	9.41	9.41	-109.54	-3.72	36.20	37.92	19.10	18.82	2.015	
2,800.00	2,799.85	2,797.38	2,796.91	9.73	9.75	-109.15	-7.19	43.26	46.15	26.66	19.48	2.369	
2,900.00	2,899.78	2,897.03	2,896.22	10.06	10.09	-108.78	-10.78	50.60	54.58	34.43	20.15	2.708	
3,000.00	2,999.71	2,996.67	2,995.53	10.39	10.43	-108.48	-14.36	57.91	63.01	42.19	20.82	3.026	
3,100.00	3,099.65	3,096.31	3,094.84	10.73	10.77	-108.28	-17.94	65.23	71.44	49.94	21.50	3.323	
3,200.00	3,199.58	3,195.96	3,194.15	11.06	11.12	-108.09	-21.53	72.54	79.88	57.70	22.18	3.601	
3,300.00	3,299.51	3,295.60	3,293.46	11.40	11.47	-107.95	-25.11	79.86	88.31	65.45	22.87	3.862	
3,400.00	3,399.45	3,395.24	3,392.77	11.74	11.82	-107.84	-28.69	87.18	96.75	73.20	23.55	4.108	
3,500.00	3,499.38	3,494.89	3,492.08	12.08	12.17	-107.75	-32.28	94.49	105.19	80.94	24.25	4.338	
3,600.00	3,599.31	3,594.53	3,591.39	12.42	12.52	-107.66	-35.86	101.81	113.62	88.68	24.94	4.556	
3,700.00	3,699.25	3,694.17	3,690.70	12.76	12.87	-107.59	-39.45	109.12	122.06	96.43	25.63	4.762	
3,800.00	3,799.18	3,793.82	3,790.01	13.10	13.23	-107.53	-43.03	116.44	130.50	104.16	26.33	4.956	
3,900.00	3,899.11	3,893.46	3,889.32	13.45	13.58	-107.48	-46.61	123.75	138.93	111.90	27.03	5.139	
4,000.00	3,999.05	3,993.10	3,988.63	13.79	13.94	-107.43	-50.20	131.07	147.37	119.64	27.74	5.313	
4,100.00	4,098.98	4,092.75	4,087.94	14.14	14.30	-107.39	-53.78	138.39	155.81	127.37	28.44	5.479	
4,200.00	4,198.91	4,192.39	4,187.25	14.49	14.66	-107.35	-57.37	145.70	164.25	135.10	29.15	5.635	
4,300.00	4,298.85	4,292.03	4,286.56	14.84	15.02	-107.32	-60.95	153.02	172.68	142.83	29.85	5.784	
4,400.00	4,398.78	4,391.68	4,385.87	15.18	15.38	-107.29	-64.53	160.33	181.12	150.56	30.56	5.926	
4,500.00	4,498.72	4,491.32	4,485.18	15.53	15.74	-107.26	-68.12	167.65	189.56	158.29	31.27	6.062	
4,600.00	4,598.65	4,590.96	4,584.49	15.88	16.10	-107.23	-71.70	174.96	198.00	166.01	31.98	6.191	
4,700.00	4,698.58	4,690.61	4,683.80	16.23	16.46	-107.21	-75.28	182.28	206.43	173.74	32.70	6.314	
4,800.00	4,798.52	4,790.25	4,783.11	16.58	16.82	-107.19	-78.87	189.60	214.87	181.48	33.41	6.431	
4,900.00	4,898.45	4,889.89	4,882.42	16.94	17.19	-107.17	-82.45	196.91	223.31	189.18	34.12	6.544	
5,000.00	4,998.38	4,989.54	4,981.73	17.29	17.55	-107.15	-86.04	204.23	231.75	196.91	34.84	6.652	
5,100.00	5,098.32	5,089.18	5,081.03	17.64	17.92	-107.13	-89.62	211.54	240.18	204.63	35.56	6.755	
5,200.00	5,198.25	5,188.82	5,180.34	17.99	18.28	-107.11	-93.20	218.86	248.62	212.35	36.27	6.854	
5,300.00	5,298.18	5,288.47	5,279.65	18.35	18.64	-107.10	-96.79	226.17	257.06	220.07	36.99	6.949	
5,400.00	5,398.12	5,388.11	5,378.96	18.70	19.01	-107.08	-100.37	233.49	265.50	227.79	37.71	7.040	
5,500.00	5,498.05	5,487.75	5,478.27	19.06	19.38	-107.07	-103.96	240.81	273.94	235.50	38.43	7.128	
5,600.00	5,597.98	5,587.40	5,577.58	19.41	19.74	-107.06	-107.54	248.12	282.37	243.22	39.15	7.212	
5,700.00	5,697.92	5,687.04	5,676.89	19.76	20.11	-107.05	-111.12	255.44	290.81	250.94	39.87	7.293	
5,800.00	5,797.85	5,786.68	5,776.20	20.12	20.48	-107.04	-114.71	262.75	299.25	258.65	40.59	7.372	
5,900.00	5,897.78	5,886.33	5,875.51	20.47	20.84	-107.02	-118.29	270.07	307.69	266.37	41.32	7.447	
6,000.00	5,997.72	5,985.97	5,974.82	20.83	21.21	-107.01	-121.87	277.38	316.12	274.09	42.04	7.520	
6,100.00	6,097.65	6,085.61	6,074.13	21.19	21.58	-107.01	-125.46	284.70	324.56	281.80	42.76	7.590	
6,200.00	6,197.58	6,185.26	6,173.44	21.54	21.94	-107.00	-129.04	292.02	333.00	289.51	43.49	7.659	
6,300.00	6,297.52	6,284.90	6,272.75	21.90	22.31	-106.99	-132.63	299.33	341.44	297.23	44.21	7.723	
6,400.00	6,397.45	6,384.54	6,372.06	22.25	22.68	-106.98	-136.21	306.65	349.88	304.94	44.94	7.788	
6,500.00	6,497.38	6,484.19	6,471.37	22.61	23.05	-106.97	-139.79	313.96	358.31	312.65	45.66	7.847	
6,600.00	6,597.32	6,583.83	6,570.68	22.97	23.42	-106.96	-143.38	321.28	366.75	320.37	46.39	7.906	
6,700.00	6,697.25	6,683.47	6,669.99	23.33	23.79	-106.96	-146.96	328.59	375.19	328.08	47.11	7.964	
6,800.00	6,797.18	6,783.12	6,769.30	23.68	24.16	-106.95	-150.54	335.91	383.63	335.79	47.84	8.019	
6,900.00	6,897.12	6,882.76	6,868.61	24.04	24.53	-106.94	-154.13	343.23	392.07	343.50	48.56	8.073	
7,000.00	6,997.05	6,982.40	6,967.92	24.40	24.89	-106.94	-157.71	350.54	400.50	351.21	49.29	8.125	
7,100.00	7,096.98	7,082.05	7,067.23	24.76	25.26	-106.93	-161.30	357.86	408.94	358.92	50.02	8.176	
7,200.00	7,196.92	7,181.69	7,166.54	25.11	25.63	-106.93	-164.88	365.17	417.38	366.63	50.75	8.225	
7,300.00	7,296.85	7,281.33	7,265.85	25.47	26.00	-106.92	-168.46	372.49	425.82	374.34	51.47	8.272	
7,400.00	7,396.79	7,380.98	7,365.16	25.83	26.37	-106.92	-172.05	379.81	434.25	382.05	52.20	8.319	
7,500.00	7,496.72	7,480.62	7,464.47	26.19	26.74	-106.91	-175.63	387.12	442.69	389.76	52.93	8.364	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well 25H
Project:	Eddy County, NM (NAD27 NME)	**TVD Reference:**	RKB @ 2918.10usft (Ensign 155)
Reference Site:	Hambone Federal Com	**MD Reference:**	RKB @ 2918.10usft (Ensign 155)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	25H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	USA Compass
Reference Design:	Plan 1 03-28-18	**Offset TVD Reference:**	Offset Datum

Offset Design Hambone Federal Com - 28H - OH - Plan 1 03-28-18 — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD+HDGM — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
7,600.00	7,596.65	7,580.26	7,563.78	26.55	27.11	-106.91	-179.22	394.44	451.13	397.47	53.66	8.407	
7,700.00	7,696.59	7,679.91	7,663.09	26.90	27.48	-106.90	-182.80	401.75	459.57	405.18	54.39	8.450	
7,800.00	7,796.52	7,779.55	7,762.40	27.26	27.86	-106.90	-186.38	409.07	468.01	412.89	55.12	8.491	
7,900.00	7,896.45	7,879.19	7,861.71	27.62	28.23	-106.89	-189.97	416.38	476.44	420.60	55.85	8.531	
8,000.00	7,996.39	7,978.84	7,961.02	27.98	28.60	-106.89	-193.55	423.70	484.88	428.31	56.58	8.570	
8,100.00	8,096.32	8,078.48	8,060.33	28.34	28.97	-106.88	-197.13	431.02	493.32	436.01	57.31	8.608	
8,200.00	8,196.25	8,178.12	8,159.64	28.70	29.34	-106.88	-200.72	438.33	501.76	443.72	58.04	8.645	
8,300.00	8,296.19	8,277.77	8,258.95	29.06	29.71	-106.88	-204.30	445.65	510.20	451.43	58.77	8.682	
8,400.00	8,396.12	8,377.41	8,358.26	29.42	30.08	-106.87	-207.89	452.96	518.63	459.14	59.50	8.717	
8,500.00	8,496.05	8,477.05	8,457.57	29.78	30.45	-106.87	-211.47	460.28	527.07	466.84	60.23	8.751	
8,600.00	8,595.99	8,576.70	8,556.88	30.14	30.82	-106.87	-215.05	467.59	535.51	474.55	60.96	8.785	
8,700.00	8,695.92	8,676.34	8,656.19	30.50	31.19	-106.86	-218.64	474.91	543.95	482.26	61.69	8.817	
8,800.00	8,795.85	8,775.98	8,755.50	30.86	31.57	-106.86	-222.22	482.23	552.39	489.96	62.42	8.849	
8,900.00	8,895.79	8,875.63	8,854.81	31.21	31.94	-106.86	-225.81	489.54	560.82	497.67	63.15	8.880	
9,000.00	8,995.72	8,975.27	8,954.12	31.57	32.31	-106.85	-229.39	496.86	569.26	505.38	63.88	8.911	
9,100.00	9,095.65	9,074.91	9,053.43	31.93	32.68	-106.85	-232.97	504.17	577.70	513.08	64.62	8.941	
9,200.00	9,195.59	9,174.56	9,152.74	32.29	33.05	-106.85	-236.56	511.49	586.14	520.79	65.35	8.970	
9,300.00	9,295.52	9,274.20	9,252.05	32.65	33.42	-106.84	-240.14	518.80	594.58	528.50	66.08	8.998	
9,400.00	9,395.45	9,373.84	9,351.36	33.01	33.80	-106.84	-243.72	526.12	603.01	536.20	66.81	9.026	
9,500.00	9,495.39	9,473.49	9,450.67	33.37	34.17	-106.84	-247.31	533.44	611.45	543.91	67.54	9.053	
9,600.00	9,595.32	9,573.13	9,549.98	33.73	34.54	-106.84	-250.89	540.75	619.89	551.61	68.28	9.079	
9,700.00	9,695.25	9,672.77	9,649.29	34.09	34.91	-106.83	-254.48	548.07	628.33	559.32	69.01	9.105	
9,800.00	9,795.19	9,772.42	9,748.60	34.46	35.29	-106.83	-258.06	555.38	636.77	567.03	69.74	9.131	
9,900.00	9,895.12	9,872.06	9,847.91	34.82	35.66	-106.83	-261.64	562.70	645.20	574.73	70.47	9.155	
10,000.00	9,995.05	9,971.70	9,947.22	35.18	36.03	-106.83	-265.23	570.01	653.64	582.44	71.21	9.180	
10,100.00	10,094.99	10,071.35	10,046.52	35.54	36.40	-106.82	-268.81	577.33	662.08	590.14	71.94	9.203	
10,200.00	10,194.92	10,170.99	10,145.83	35.90	36.77	-106.82	-272.40	584.65	670.52	597.85	72.67	9.227	
10,300.00	10,294.86	10,270.63	10,245.14	36.26	37.15	-106.82	-275.98	591.96	678.96	605.55	73.40	9.250	
10,400.00	10,394.79	10,370.28	10,344.45	36.62	37.52	-106.82	-279.56	599.28	687.39	613.26	74.14	9.272	
10,500.00	10,494.72	10,469.92	10,443.76	36.98	37.89	-106.82	-283.15	606.58	695.83	620.96	74.87	9.294	
10,600.00	10,594.66	10,570.42	10,543.94	37.33	38.27	101.99	-286.07	613.96	704.29	628.69	75.60	9.316	
10,700.00	10,693.18	10,674.07	10,648.30	37.65	38.62	92.53	-273.01	621.30	712.60	636.33	76.27	9.343	
10,800.00	10,786.20	10,778.54	10,744.20	37.94	38.91	90.78	-237.61	626.03	720.32	643.47	76.85	9.373	
10,900.00	10,869.66	10,883.65	10,832.67	38.20	39.15	89.71	-181.74	633.82	727.12	649.78	77.34	9.402	
11,000.00	10,939.93	10,989.17	10,907.07	38.42	39.30	88.90	-107.35	638.35	732.69	654.96	77.72	9.427	
11,100.00	10,993.92	11,094.81	10,963.46	38.63	39.38	88.26	-16.33	641.37	736.77	658.76	78.01	9.444	
11,200.00	11,029.27	11,200.26	10,998.85	38.83	39.39	87.77	80.73	642.75	739.20	660.98	78.22	9.451	
11,300.00	11,044.45	11,305.19	11,011.95	39.02	39.35	87.44	184.64	642.42	739.87	661.50	78.37	9.440	
11,400.00	11,044.83	11,405.54	11,011.80	39.21	39.49	87.41	284.98	641.17	739.35	660.84	78.71	9.393	
11,500.00	11,044.61	11,505.54	11,011.59	39.46	39.74	87.41	384.97	639.92	738.80	659.60	79.20	9.328	
11,600.00	11,044.39	11,605.53	11,011.38	39.75	40.04	87.41	484.96	638.67	738.25	658.46	79.79	9.252	
11,700.00	11,044.18	11,705.53	11,011.17	40.10	40.38	87.41	584.95	637.42	737.70	657.23	80.48	9.167	
11,800.00	11,043.94	11,805.53	11,010.96	40.49	40.76	87.40	684.94	636.17	737.15	655.90	81.26	9.072	
11,900.00	11,043.72	11,905.53	11,010.74	40.93	41.18	87.40	784.93	634.92	736.60	654.48	82.12	8.969	
12,000.00	11,043.50	12,005.53	11,010.53	41.42	41.66	87.40	884.92	633.66	736.05	652.97	83.08	8.860	
12,100.00	11,043.28	12,105.53	11,010.32	41.95	42.17	87.40	984.91	632.41	735.50	651.38	84.12	8.743	
12,200.00	11,043.05	12,205.52	11,010.11	42.52	42.73	87.40	1,084.90	631.16	734.95	649.71	85.25	8.622	
12,300.00	11,042.83	12,305.52	11,009.90	43.13	43.32	87.40	1,184.89	629.91	734.40	647.95	86.45	8.495	
12,400.00	11,042.61	12,405.52	11,009.69	43.78	43.95	87.40	1,284.88	628.66	733.85	646.12	87.73	8.365	
12,500.00	11,042.39	12,505.52	11,009.48	44.47	44.62	87.40	1,384.87	627.41	733.30	644.22	89.08	8.232	
12,600.00	11,042.17	12,605.52	11,009.26	45.19	45.32	87.40	1,484.86	626.16	732.75	642.24	90.51	8.096	
12,700.00	11,041.95	12,705.52	11,009.05	45.94	46.06	87.39	1,584.85	624.91	732.20	640.20	92.00	7.959	

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well 25H
Project:	Eddy County, NM (NAD27 NME)	**TVD Reference:**	RKB @ 2918.10usft (Ensign 155)
Reference Site:	Hambone Federal Com	**MD Reference:**	RKB @ 2918.10usft (Ensign 155)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	25H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	USA Compass
Reference Design:	Plan 1 03-28-18	**Offset TVD Reference:**	Offset Datum

Offset Design Hambone Federal Com - 25H - OH - Plan 1 03-28-18 — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD+HDGM — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
12,800.00	11,041.72	12,805.52	11,008.64	46.73	46.82	87.39	1,684.85	623.66	731.65	638.10	93.55	7.821	
12,900.00	11,041.50	12,905.51	11,008.63	47.55	47.62	87.39	1,784.84	622.41	731.10	635.93	95.17	7.682	
13,000.00	11,041.28	13,005.51	11,008.42	48.40	48.45	87.39	1,884.83	621.16	730.55	633.71	96.84	7.544	
13,100.00	11,041.06	13,105.51	11,008.21	49.27	49.30	87.39	1,984.82	619.91	730.00	631.43	98.57	7.406	
13,200.00	11,040.84	13,205.51	11,008.00	50.17	50.19	87.39	2,084.81	618.66	729.45	629.10	100.36	7.269	
13,300.00	11,040.62	13,305.51	11,007.78	51.09	51.09	87.39	2,184.80	617.41	728.90	626.72	102.19	7.133	
13,400.00	11,040.39	13,405.51	11,007.57	52.04	52.02	87.39	2,284.79	616.16	728.35	624.29	104.06	6.999	
13,500.00	11,040.17	13,505.50	11,007.36	53.01	52.98	87.39	2,384.78	614.91	727.80	621.81	105.99	6.867	
13,600.00	11,039.95	13,605.50	11,007.15	54.00	53.95	87.38	2,484.77	613.66	727.25	619.30	107.95	6.737	
13,700.00	11,039.73	13,705.50	11,006.94	55.01	54.94	87.38	2,584.76	612.41	726.70	616.75	109.96	6.609	
13,800.00	11,039.51	13,805.50	11,006.73	56.04	55.96	87.38	2,684.75	611.16	726.15	614.15	112.00	6.484	
13,900.00	11,039.28	13,905.50	11,006.52	57.09	56.99	87.38	2,784.74	609.90	725.60	611.52	114.08	6.361	
14,000.00	11,039.06	14,005.50	11,006.30	58.15	58.04	87.38	2,884.73	608.65	725.05	608.86	116.19	6.240	
14,100.00	11,038.84	14,105.50	11,006.09	59.23	59.10	87.38	2,984.72	607.40	724.50	606.17	118.33	6.123	
14,200.00	11,038.62	14,205.49	11,005.88	60.32	60.18	87.38	3,084.71	606.15	723.95	603.44	120.51	6.008	
14,300.00	11,038.40	14,305.49	11,005.67	61.43	61.28	87.38	3,184.70	604.90	723.40	600.69	122.71	5.895	
14,400.00	11,038.18	14,405.49	11,005.46	62.55	62.39	87.37	3,284.69	603.65	722.85	597.91	124.94	5.786	
14,500.00	11,037.95	14,505.49	11,005.25	63.69	63.51	87.37	3,384.68	602.40	722.30	595.10	127.20	5.679	
14,600.00	11,037.73	14,605.49	11,005.04	64.83	64.65	87.37	3,484.67	601.15	721.75	592.27	129.48	5.574	
14,700.00	11,037.51	14,705.49	11,004.82	65.99	65.79	87.37	3,584.66	599.90	721.20	589.42	131.78	5.473	
14,800.00	11,037.29	14,805.49	11,004.61	67.16	66.95	87.37	3,684.65	598.65	720.65	586.54	134.11	5.374	
14,900.00	11,037.07	14,905.48	11,004.40	68.34	68.12	87.37	3,784.64	597.40	720.10	583.65	136.45	5.277	
15,000.00	11,036.85	15,005.48	11,004.19	69.52	69.30	87.37	3,884.63	596.15	719.55	580.73	138.82	5.183	
15,100.00	11,036.62	15,105.48	11,003.98	70.72	70.48	87.37	3,984.63	594.90	719.00	577.80	141.21	5.092	
15,200.00	11,036.40	15,205.48	11,003.77	71.93	71.68	87.37	4,084.62	593.65	718.45	574.84	143.61	5.003	
15,300.00	11,036.18	15,305.48	11,003.56	73.14	72.89	87.36	4,184.61	592.40	717.90	571.87	146.03	4.916	
15,400.00	11,035.96	15,405.48	11,003.34	74.36	74.10	87.36	4,284.60	591.15	717.35	568.89	148.47	4.832	
15,500.00	11,035.74	15,505.47	11,003.13	75.59	75.32	87.36	4,384.59	589.90	716.80	565.88	150.92	4.750	
15,600.00	11,035.52	15,605.47	11,002.92	76.83	76.55	87.36	4,484.58	588.65	716.25	562.87	153.38	4.670	
15,700.00	11,035.29	15,705.47	11,002.71	78.07	77.79	87.36	4,584.57	587.40	715.70	559.84	155.86	4.592	
15,800.00	11,035.07	15,805.47	11,002.50	79.32	79.03	87.36	4,684.56	586.14	715.15	556.79	158.36	4.516	
15,900.00	11,034.85	15,905.47	11,002.29	80.58	80.28	87.36	4,784.55	584.89	714.60	553.74	160.86	4.442	
16,000.00	11,034.63	16,005.47	11,002.08	81.84	81.54	87.36	4,884.54	583.64	714.05	550.67	163.38	4.370	
16,100.00	11,034.41	16,105.47	11,001.86	83.11	82.80	87.35	4,984.53	582.39	713.50	547.59	165.91	4.300	
16,200.00	11,034.18	16,205.46	11,001.65	84.38	84.07	87.35	5,084.52	581.14	712.95	544.50	168.45	4.232	
16,300.00	11,033.96	16,305.46	11,001.44	85.66	85.34	87.35	5,184.51	579.89	712.40	541.39	171.01	4.166	
16,400.00	11,033.74	16,405.46	11,001.23	86.95	86.62	87.35	5,284.50	578.64	711.85	538.28	173.57	4.101	
16,500.00	11,033.52	16,505.46	11,001.02	88.24	87.90	87.35	5,384.49	577.39	711.30	535.16	176.14	4.039	
16,600.00	11,033.30	16,605.46	11,000.81	89.53	89.19	87.35	5,484.48	576.14	710.75	532.03	178.72	3.977	
16,700.00	11,033.08	16,705.46	11,000.60	90.82	90.48	87.35	5,584.47	574.89	710.20	528.89	181.31	3.917	
16,800.00	11,032.85	16,805.46	11,000.38	92.13	91.78	87.35	5,684.46	573.64	709.65	525.74	183.91	3.859	
16,900.00	11,032.63	16,905.45	11,000.17	93.43	93.08	87.34	5,784.45	572.39	709.10	522.59	186.51	3.802	
17,000.00	11,032.41	17,005.45	10,999.96	94.74	94.39	87.34	5,884.44	571.14	708.55	519.42	189.13	3.746	
17,100.00	11,032.19	17,105.45	10,999.75	96.05	95.69	87.34	5,984.43	569.89	708.00	516.25	191.75	3.692	
17,200.00	11,031.97	17,205.45	10,999.54	97.37	97.01	87.34	6,084.42	568.64	707.45	513.07	194.38	3.640	
17,300.00	11,031.75	17,305.45	10,999.33	98.69	98.32	87.34	6,184.42	567.39	706.90	509.89	197.01	3.588	
17,400.00	11,031.52	17,405.45	10,999.12	100.01	99.64	87.34	6,284.41	566.14	706.35	506.70	199.65	3.538	
17,500.00	11,031.30	17,505.44	10,998.90	101.34	100.96	87.34	6,384.40	564.89	705.80	503.50	202.30	3.489	
17,600.00	11,031.08	17,605.44	10,998.69	102.67	102.29	87.34	6,484.39	563.64	705.25	500.29	204.96	3.441	
17,700.00	11,030.86	17,705.44	10,998.48	104.00	103.62	87.33	6,584.38	562.38	704.70	497.08	207.62	3.394	
17,800.00	11,030.64	17,805.44	10,998.27	105.33	104.95	87.33	6,684.37	561.13	704.15	493.87	210.28	3.349	
17,900.00	11,030.42	17,905.44	10,998.06	106.67	106.28	87.33	6,784.36	559.88	703.60	490.65	212.95	3.304	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well 25H
Project:	Eddy County, NM (NAD27 NME)	**TVD Reference:**	RKB @ 2918.10usft (Ensign 155)
Reference Site:	Hambone Federal Com	**MD Reference:**	RKB @ 2918.10usft (Ensign 155)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	25H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	USA Compass
Reference Design:	Plan 1 03-28-18	**Offset TVD Reference:**	Offset Datum

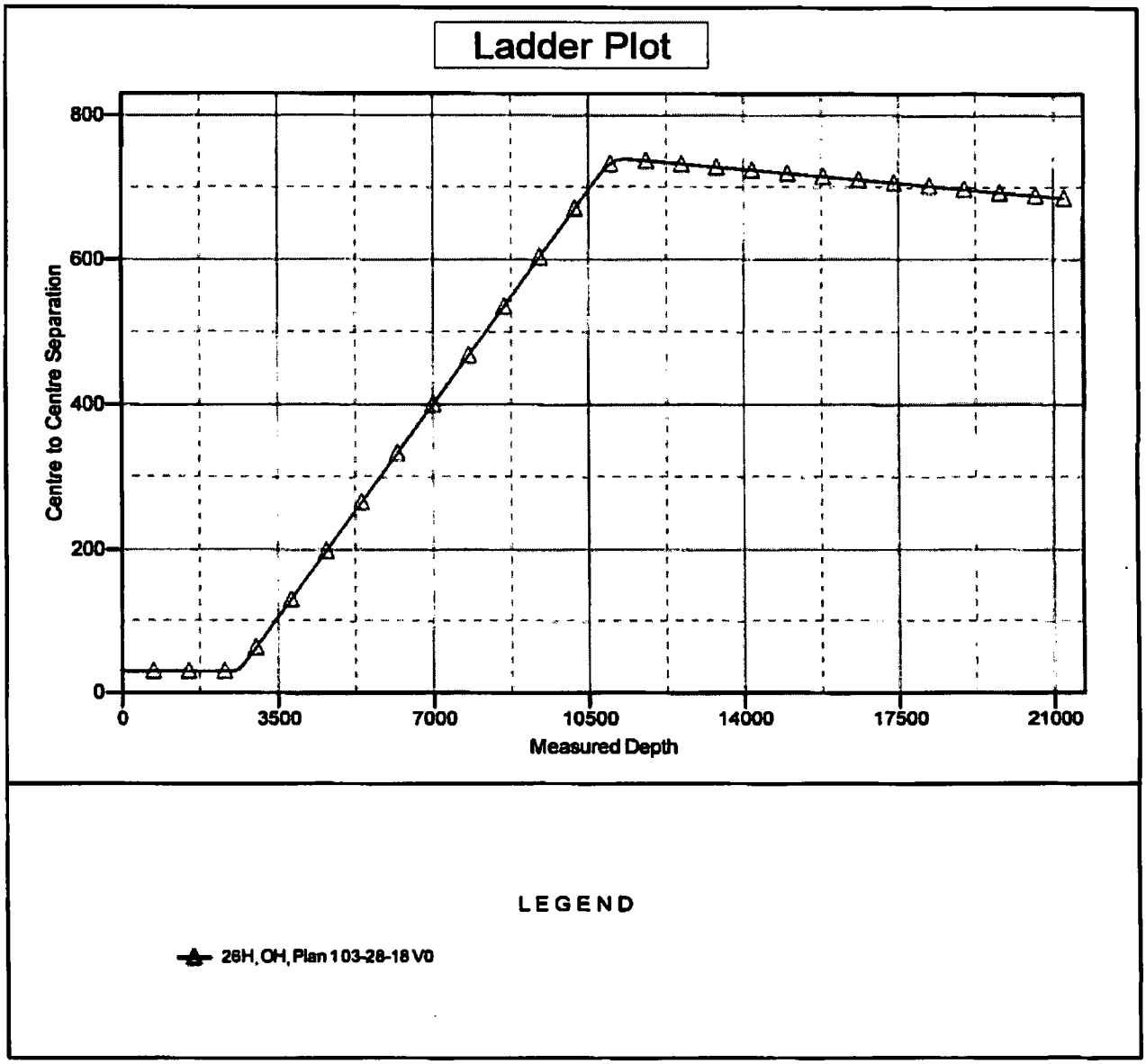
Offset Design Hambone Federal Com - 25H - OH - Plan 1 03-28-18 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD+HDGM — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
18,000.00	11,030.19	18,005.44	10,997.85	108.01	107.62	87.33	6,884.35	558.63	703.05	487.42	215.63	3.260	
18,100.00	11,029.97	18,105.44	10,997.64	109.35	108.96	87.33	6,984.34	557.38	702.50	484.19	218.31	3.218	
18,200.00	11,029.75	18,205.43	10,997.42	110.70	110.30	87.33	7,084.33	556.13	701.95	480.95	221.00	3.176	
18,300.00	11,029.53	18,305.43	10,997.21	112.04	111.65	87.33	7,184.32	554.88	701.40	477.71	223.69	3.136	
18,400.00	11,029.31	18,405.43	10,997.00	113.39	112.99	87.33	7,284.31	553.63	700.85	474.46	226.38	3.096	
18,500.00	11,029.08	18,505.43	10,996.79	114.74	114.34	87.32	7,384.30	552.38	700.30	471.21	229.08	3.057	
18,600.00	11,028.86	18,605.43	10,996.58	116.10	115.69	87.32	7,484.29	551.13	699.75	467.96	231.79	3.019	
18,700.00	11,028.64	18,705.43	10,996.37	117.45	117.05	87.32	7,584.28	549.88	699.20	464.70	234.50	2.982	
18,800.00	11,028.42	18,805.42	10,996.16	118.81	118.40	87.32	7,684.27	548.63	698.65	461.44	237.21	2.945	
18,900.00	11,028.20	18,905.42	10,995.94	120.17	119.76	87.32	7,784.26	547.38	698.10	458.17	239.93	2.910	
19,000.00	11,027.98	19,005.42	10,995.73	121.53	121.12	87.32	7,884.25	546.13	697.55	454.90	242.64	2.875	
19,100.00	11,027.76	19,105.42	10,995.52	122.89	122.48	87.32	7 984.24	544.88	697.00	451.63	245.37	2.841	
19,200.00	11,027.53	19,205.42	10,995.31	124.25	123.84	87.32	8,084.23	543.63	696.45	448.36	248.09	2.807	
19,300.00	11,027.31	19,305.42	10,995.10	125.62	125.20	87.31	8,184.22	542.38	695.90	445.08	250.82	2.774	
19,400.00	11,027.09	19,405.42	10,994.89	126.99	126.57	87.31	8,284.21	541.13	695.35	441 79	253.56	2 742	
19,500.00	11,026.87	19,505.41	10,994.67	128.36	127.94	87.31	8,384.20	539.88	694.80	438.51	256.29	2.711	
19,600.00	11,026.65	19,605.41	10,994.46	129.73	129.31	87.31	8,484.20	538.63	694.25	435.22	259.03	2.680	
19,700.00	11,026.42	19,705.41	10,994.25	131.10	130.68	87.31	8,584.19	537.37	693.70	431.92	261.77	2.650	
19,800.00	11,026.20	19,805.41	10,994.04	132.47	132.05	87.31	8,684.18	536.12	693.15	428.63	264.52	2.620	
19,900.00	11,025.98	19,905.41	10,993.83	133.84	133.42	87.31	8,784.17	534.87	692.60	425.33	267.27	2.591	
20,000.00	11,025.76	20,005.41	10,993.62	135.22	134.80	87.31	8,884.16	533.62	692.05	422.03	270.02	2.563	
20,100.00	11,025.54	20,105.41	10,993.41	136.60	136.17	87.30	8,984.15	532.37	691.50	418.73	272 77	2 535	
20,200.00	11,025.32	20,205.40	10,993.19	137.97	137.55	87.30	9,084.14	531.12	690.95	415.42	275.52	2.508	
20,300.00	11,025.09	20,305.40	10,992.98	139.35	138.93	87.30	9,184.13	529.87	690.40	412.12	278.28	2.481	
20,400.00	11,024.87	20,405.40	10,992.77	140.73	140.31	87.30	9,284.12	528.62	689.85	408.81	281.04	2.455	
20,500.00	11,024.65	20,505.40	10,992.56	142.12	141.69	87.30	9,384.11	527.37	689.30	405.49	283.80	2.429	
20,600.00	11,024.43	20,605.40	10,992.35	143.50	143.07	87.30	9,484.10	526.12	688.75	402.18	286.57	2.403	
20,700.00	11,024.21	20,705.40	10,992.14	144.88	144.45	87.30	9,584.09	524.87	688.20	398.86	289.34	2.379	
20,800.00	11,023.98	20,805.39	10,991.93	146.27	145.84	87.30	9,684.08	523.62	687.65	395.54	292.10	2.354	
20,900.00	11,023.76	20,905.39	10,991.71	147.65	147.22	87.29	9,784.07	522.37	687.10	392 22	294.88	2.330	
21,000.00	11,023.54	21,005.39	10,991.50	149.04	148.61	87.29	9,884.06	521.12	686.55	388.90	297.65	2.307	
21,100.00	11,023.32	21,105.39	10,991.29	150.43	150.00	87.29	9,984.05	519.87	686.00	385.58	300.42	2.283	
21,200.00	11,023.10	21,205.39	10,991.08	151.82	151.37	87.29	10,084.04	518.62	685.45	382.26	303.19	2.261	
21,241.12	11,023.01	21,243.26	10,991.00	152.30	151.83	87.29	10,121 93	518.14	685.23	381.11	304.12	2.253	
21,243.94	11,023.00	21,243.28	10,991.00	152.33	151.83	87.29	10,121.93	518.14	685.23	381.08	304.16	2.253	

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well 25H
Project:	Eddy County, NM (NAD27 NME)	**TVD Reference:**	RKB @ 2918.10usft (Ensign 155)
Reference Site:	Hambone Federal Com	**MD Reference:**	RKB @ 2918.10usft (Ensign 155)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	25H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	USA Compass
Reference Design:	Plan 1 03-28-18	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to RKB @ 2918.10usft (Ensign 155)	Coordinates are relative to: 25H
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Central Meridian is 104° 18' 60.00000 W	Grid Convergence at Surface is: 0.17°



Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well 25H
Project:	Eddy County, NM (NAD27 NME)	**TVD Reference:**	RKB @ 2918.10usft (Ensign 155)
Reference Site:	Hambone Federal Com	**MD Reference:**	RKB @ 2918.10usft (Ensign 155)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	25H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	USA Compass
Reference Design:	Plan 1 03-28-18	**Offset TVD Reference:**	Offset Datum

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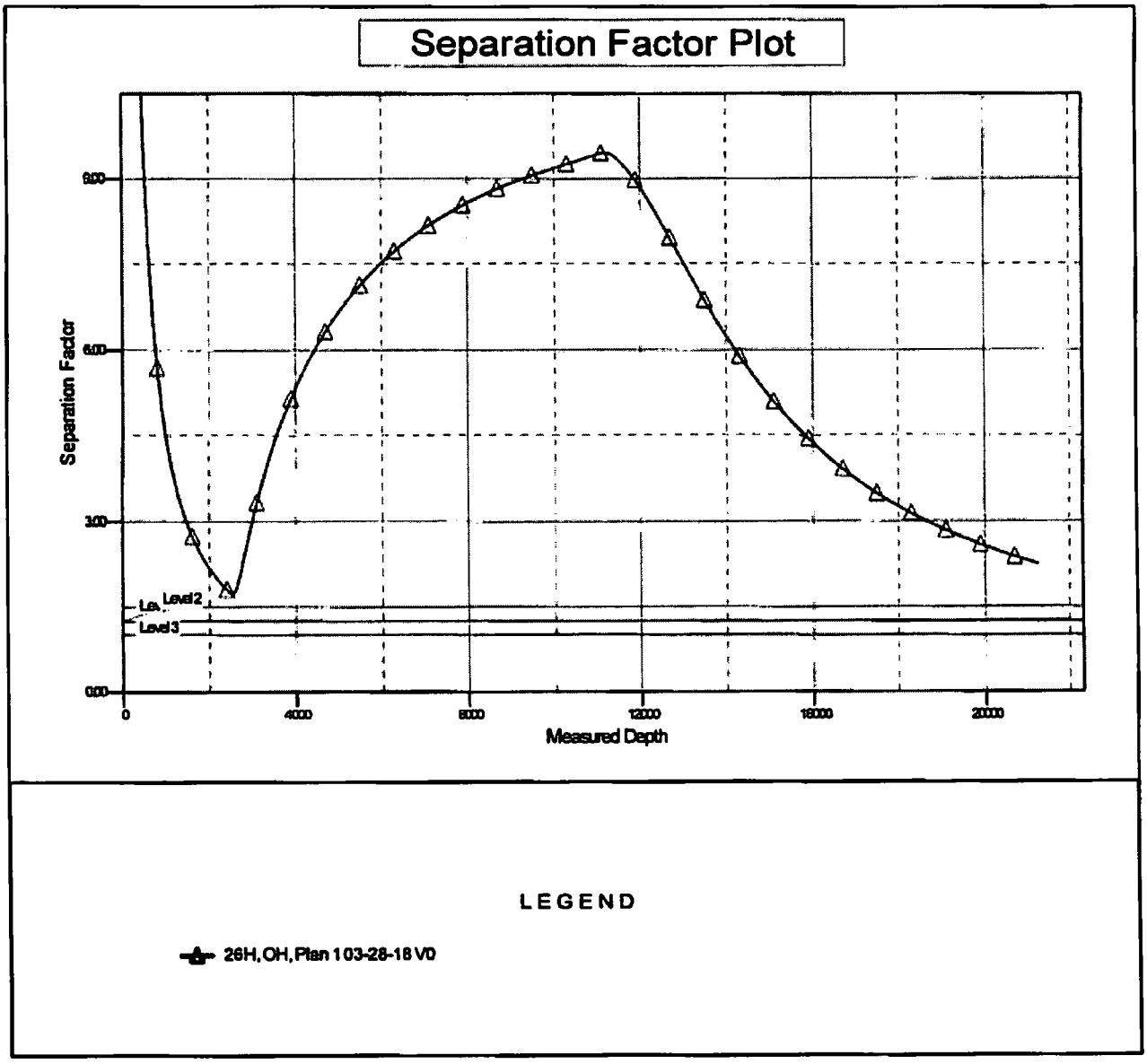
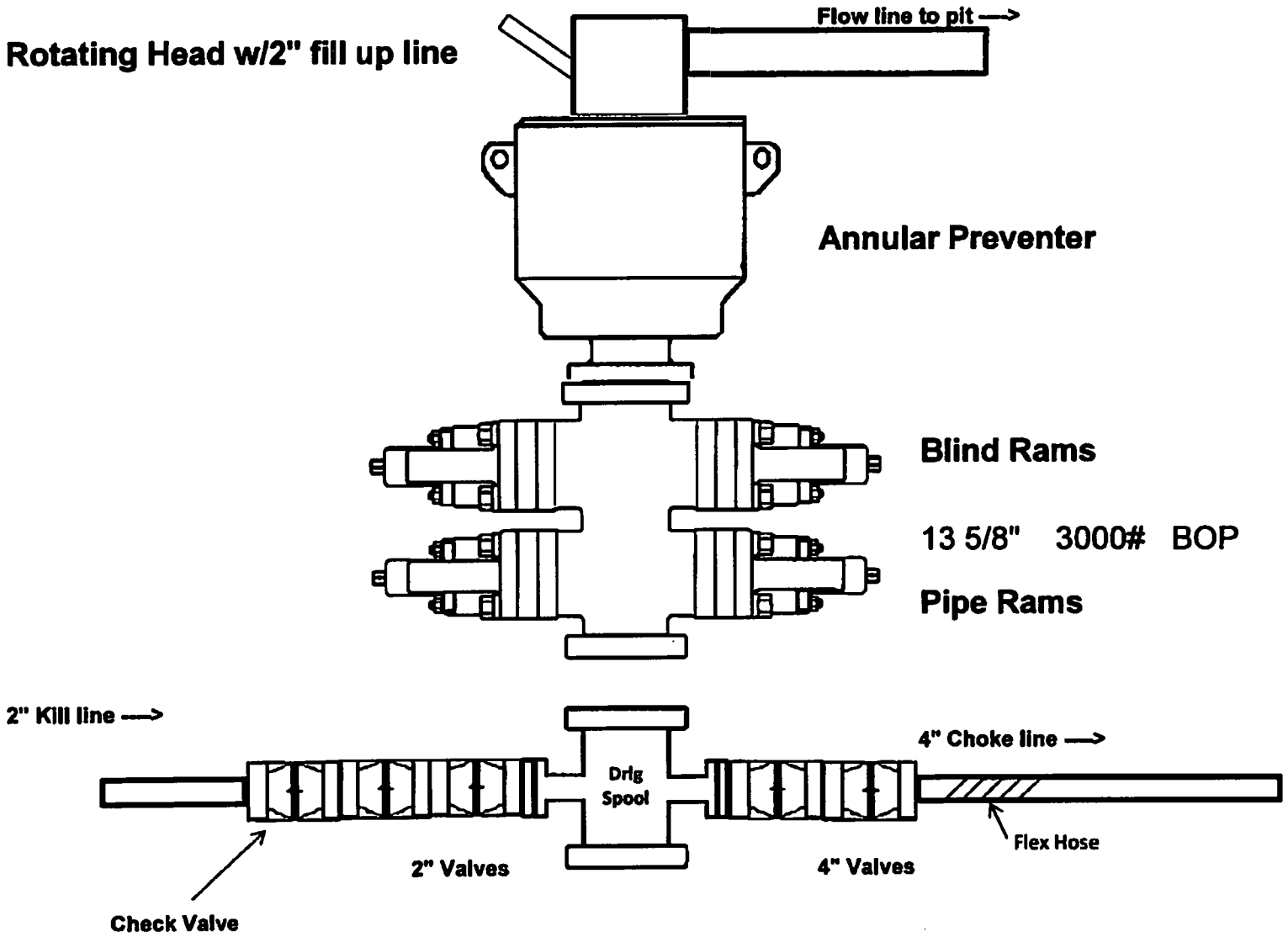
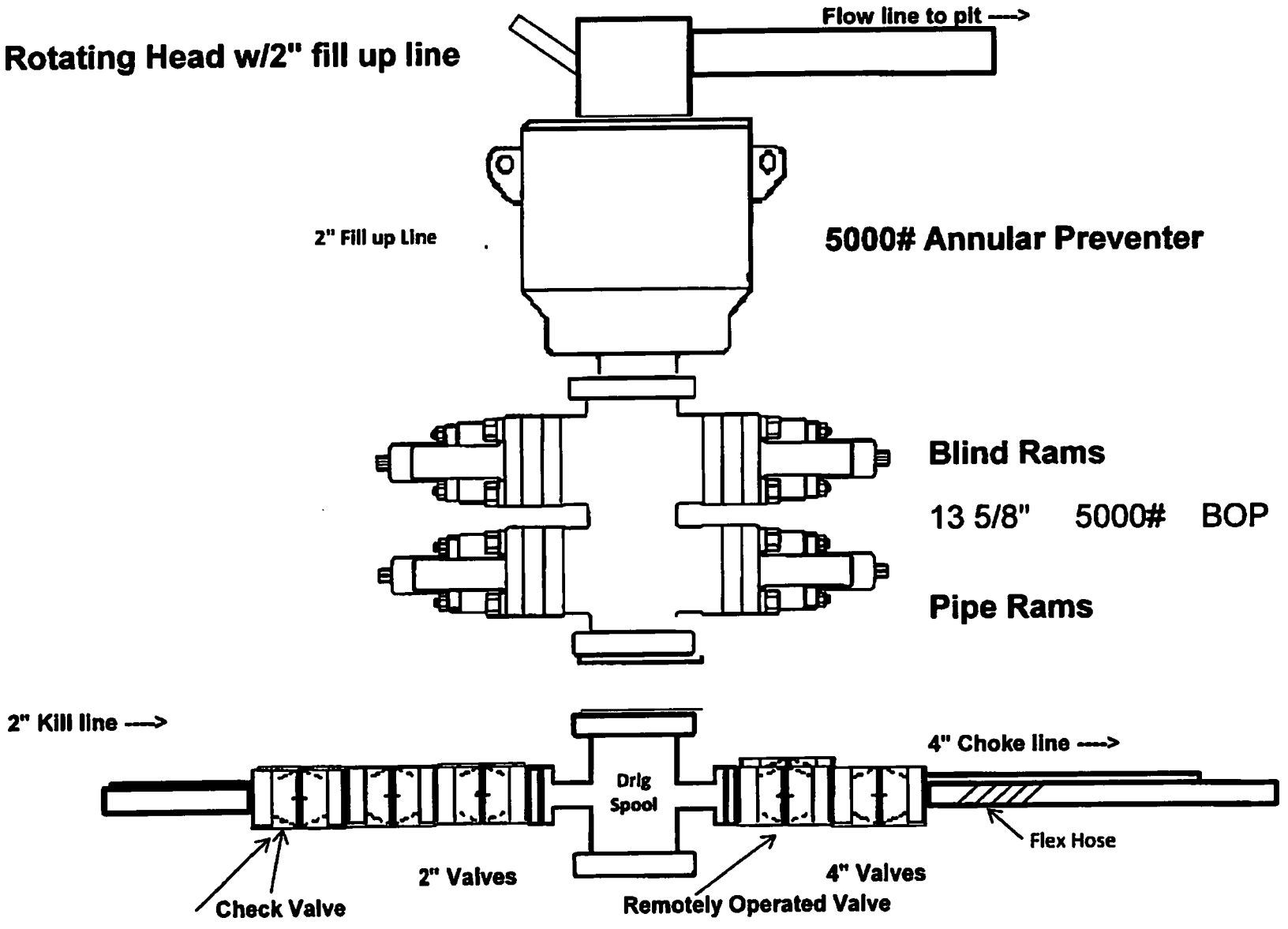
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Central Meridian is 104° 19' 60.00000 W	Grid Convergence at Surface is: 0.17°



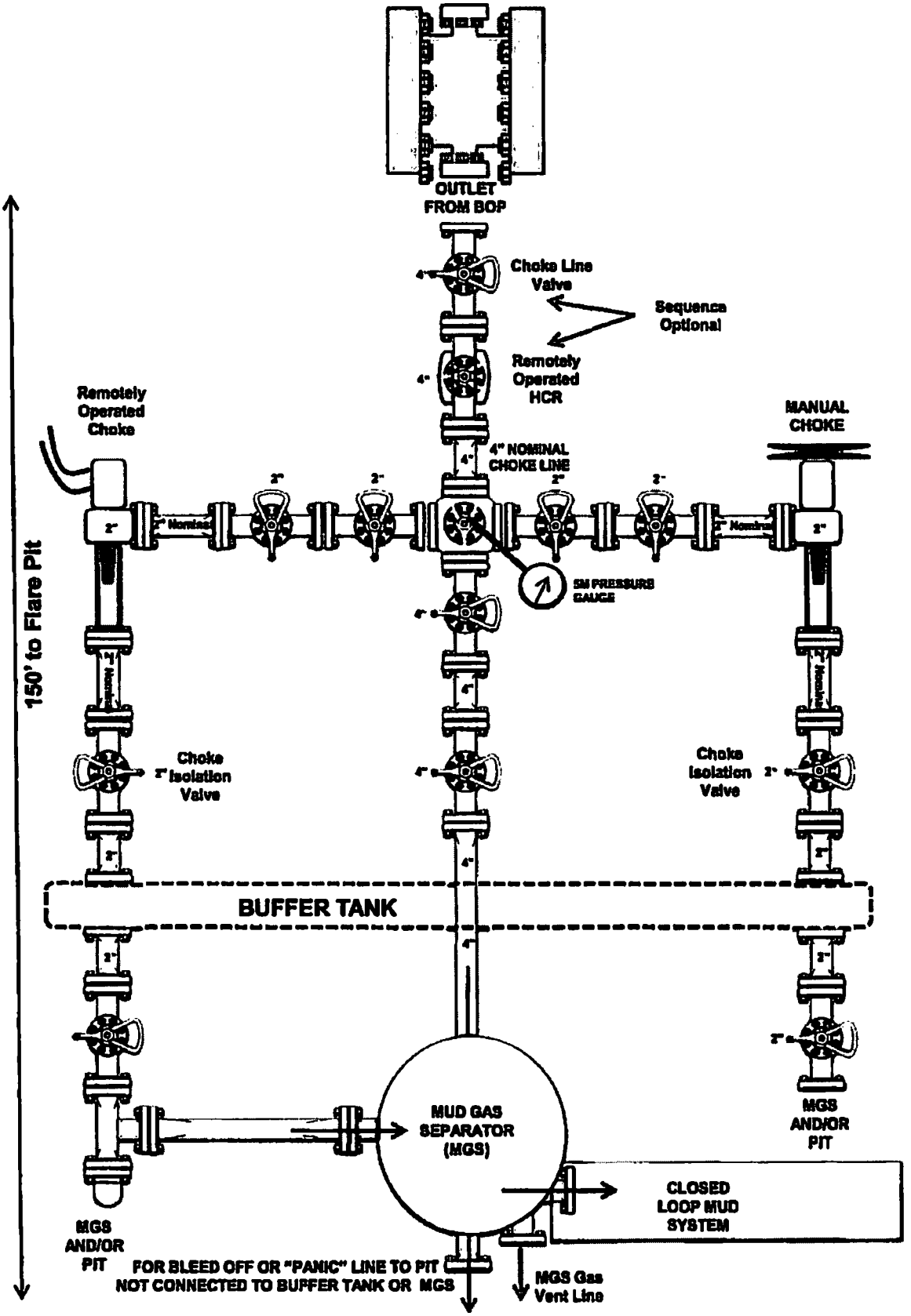
3,000 psi BOP Schematic



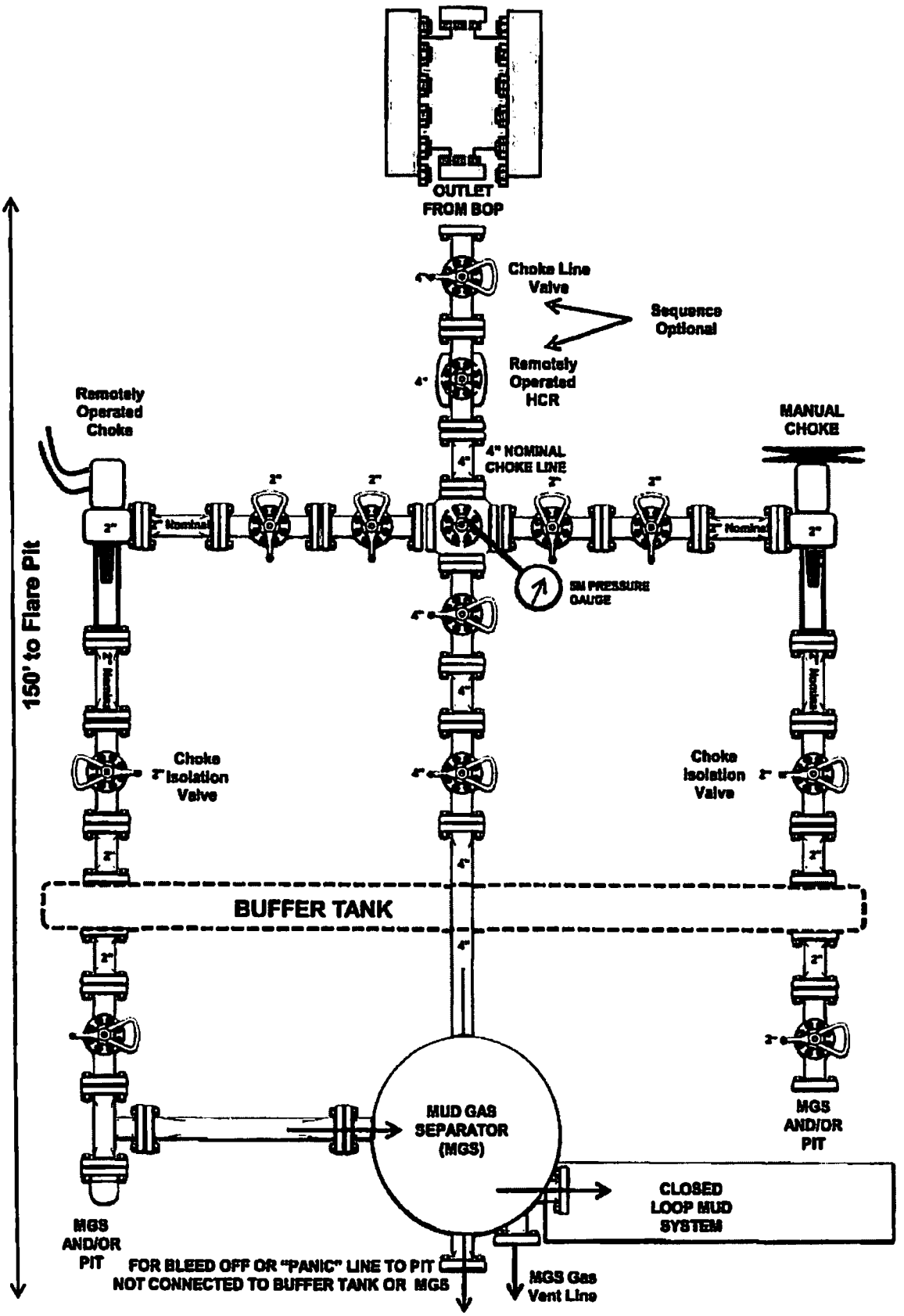
5,000 psi BOP Schematic



3M Choke Manifold Equipment (WITH MGS + CLOSED LOOP)



5M Choke Manifold Equipment (WITH MGS + CLOSED LOOP)



Continental

ContiTech Fluid Technology

COPY

ContiTech Oil & Marine Corp. # 11535 Brittmoore Park Dr., Houston, TX 77041-6918 USA

NDTUSA- ODESSA
2500 W OREGON
ODESSA TX 79764

Delivery Note

Document No.	83854547
Document Date	06/28/2017
Customer Number	11721
Customer VAT No.	
Supplier Number	
N° EORI:	FR4102795330002
Purchase Order No.	13999606
Purchase Order Date	06/26/2017
Sales Order Number	974000
Sales Order Date	06/26/2017
Unloading Point	

Page 1 of 2

Transport-Details - Shipping

Conditions

Shipping Conditions	0 days
Inco Terms	EXW Houston Ex Works

~~Weights (Gross / Net)~~

Total Weight	1,700.000 LB
Net Weight	1,700.000 LB

Buyer: Andras Kruppa
E-mail: Andras.Kruppa@nabors.com

PR#14438486

Rig: X31

Item	Material/Description	Quantity	Weight
10	OORECERTIFY	1 PC	1,700.000 LB

Recertification of HP Hoses Serial#62205
3" ID 10K Choke and Kill Hose x 35ft OAL

End 1: 4 - 1/16" 10Kpsi API Spec 17D SV Swivel Flange
End 2: 4 - 1/16" 10Kpsi API Spec 17D SV Swivel Flange
c/w BX155 ring groove SS inlay each end
Standard: API Spec 16C - Monogrammed
Working Pressure: 10,000psi
Test Pressure: 15,000psi

Asset # 66-0945

Inspection & Certification includes:
External inspection of the hose & couplings
Internal boroscopic inspection of hose liner
Hydrostatic pressure test of hose assembly

Continental

ContiTech Fluid Technology

Conditions		Delivery Note	
Shipping Conditions	0 days	Document No.	83864547
Inco Terms	EXW Houston	Document Date	06/28/2017
	Ex Works	Page 2 of 2	

Repair of any external damage to hose body and end connections (limited to minor repairs)
Clean & protect end connections
Inspection Report

Disposal of hose assembly if hose fails inspection and recertification process

Please Flush Hoses before sending them to our Facility.

Buyer: Andras Kruppa
E-mail: Andras.Kruppa@nabors.com

PR#14438486

Rig: X31

Inner packages

Quantity	Packaging	Material	Charge
1	420"X15"X15" -Loose	OORECERTIFY	1

Package number 123198224

Hydrostatic Test Certificate

ContiTech

Certificate Number	COM Order Reference	Customer Name & Address
4000	974000	Nabors Lux Finance 2 S.a.r.L. 8-10 Avenue de la Gare L-1610 LUXEMBOURG
Customer Purchase Order No:	13999608	
Project:		

Test Center Address	Accepted by COM Inspection	Accepted by Client Inspection
ContiTech Oil & Marine Corp. 11535 Brittmoore Park Drive Houston, TX 77041 USA	Signed: Roger Suarez Date: 6/27/17	

We certify that the goods detailed hereon have been inspected as described below by our Quality Management System, and to the best of our knowledge are found to conform the requirements of the above referenced purchase order as issued to ContiTech Oil & Marine Corporation.

Item	Part No.	Description	Qnty	Serial Number	Work. Press.	Test Press.	Test Time (minutes)
20		RECERTIFICATION - 3" ID 10K Choke & Kill Hose x 35 ft OAL	1	62205 Asset # 66-0945	10,000 psi	15,000 psi	60

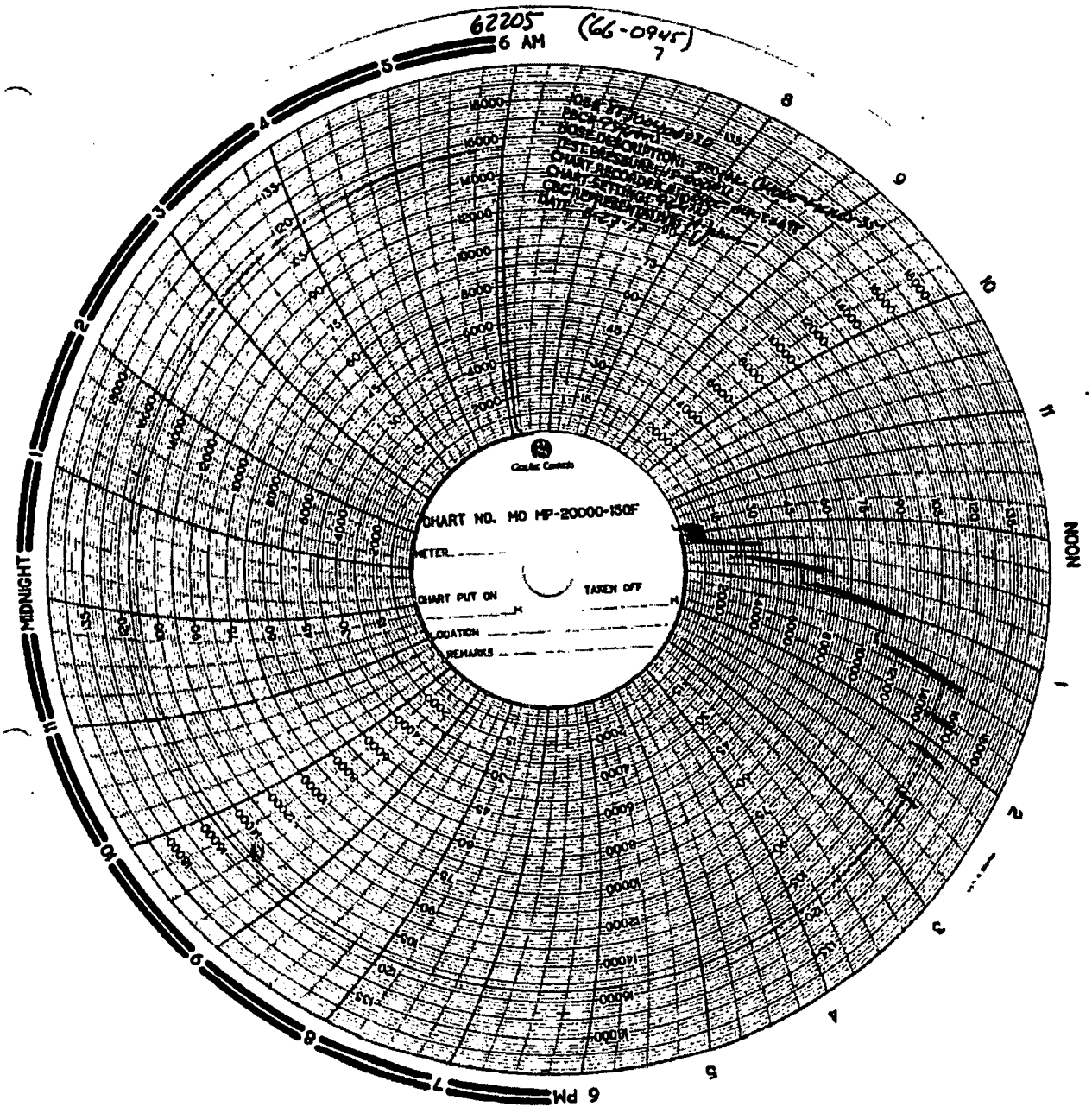
Certificate of Conformity

ContiTech

rtificate Number 4000	COM Order Reference 974000	Customer Name & Address
Customer Purchase Order No:	13999606	Nabors Lux Finance 2 S.a.r.L. 8-10 Avenue de la Gare L-1610 LUXEMBOURG
Project:		
Test Center Address	Accepted by COM Inspection	Accepted by Client Inspection
ContiTech Oil & Marine Corp. 11535 Brittmoore Park Drive Houston, TX 77041 USA	Signed: Roger Suarez Date: 8/27/13	

We certify that the items detailed below meet the requirements of the customer's Purchase Order referenced above, and are in conformance with the specifications given below.

Item	Part No.	Description	Qnty	Serial Number	Specifications
20		RECERTIFICATION - 3" ID 10K Choke & Kill Hose x 35 ft OAL	1	62205 Asset # 68-0945	ContiTech Standard


62205 (66-0945)
6 AM
NOON
6 PM
MIDNIGHT
Cryptic Controls
CHART NO. MD MP-20000-150F
METER
CHART PUT ON
TAKEN OFF
LOCATION
REMARKS

Hose Inspection Report

ContiTech Oil & Marine

Customer	Customer Reference #	COM Reference #	COM Inspector	Date of Inspection
Nabors	13999606	974000	A. Jaimes	06/27/2017

Hose Manufacturer	Contitech Rubber Industrial

Hose Serial #	62205 (66-0945)	Date of Manufacture	12/2011
Hose I.D.	3"	Working Pressure	10000PSI
Hose Type	Choke and Kill	Test Pressure	15000PSI
Manufacturing Standard	API 16C		

Connections

End A: 4.1/16" 10Kpsi API Spec 17D Swivel Flange	End B: 4.1/16" 10Kpsi API Spec 17D Swivel Flange
• Dents	• No damage
Material: Carbon Steel	Material: Carbon Steel
Seal Face: BX155	Seal Face: BX155
Length Before Hydro Test: 35'	Length After Hydro test: 35'

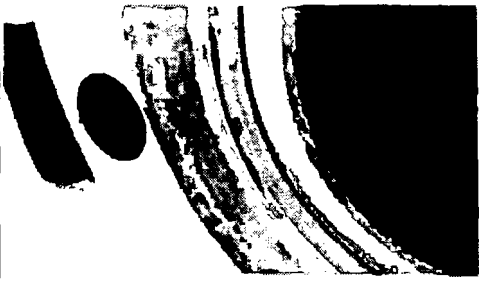
Conclusion: Hose #62205 passed the external inspection with no notable damage to the hose armor. The flange face on end A did have minor dents but did not affect the test outcome. It is advised that additional care be taken in order to avoid further damage to the flange face. Internal borescope of the hose showed no damage to the liner. Hose #62205 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes. **Hose #62205 is suitable for continued service.**

Recommendations: In general the hose should be inspected on a regular on-going basis. The frequency and degree of the inspection should as a minimum follow these guidelines:

Visual inspection: Every 3 to 6 months (or during installation/removal)
Annual: In-situ pressure test (in addition to the 3 to 6 monthly inspections)
Initial 5 years service: Major inspection
2nd Major inspection: Following subsequent 3 year life cycle
(Detailed description of test regime available upon request, QCP 206-1)

**NOTE: There are a number of critical elements in the hose that cannot be thoroughly checked through standard inspection techniques. Away from dissecting the hose body, the best way to evaluate the condition of the hose is through review of the operating conditions recorded during the hose service life, in particular maximums and peak conditions.

External Damage Pre – Hydro test
End A has minor dents at the edge of the seal face but did
not compromise the hydrostatic pressure test. Additional
care should be take in order to avoid further damage



(1) Ship-to party
NDTUSA- ODESSA
2500 W OREGON
ODESSA TX 79764

(2) Unloading point - storage location - usage

(3) Delivery note no.
83854547

(4) Vendor address (short name, plant, ZIP, city)
ContiTech Oil & Marine Corp.
11535 Brittmoore Park Drive
Houston TX 77041-6916

(5) Supplier ref. no.
00RECERTIFY

(9) Quantity
1

(5) Net weight
1,700 LB

(6) Gross weight
1,700 LB

(7) Number of packages
1

(10) Description of delivery, service
Recertification of HP Hoses Se

(12) ContiTech Sales order no.
974000

(13) Packing date
06/28/17

(14) Engineering change status

(15) Package no.
123198224

(16) Customer PO no.
13999606

Material label VDA 4902 Vers. 4

66-0945 62205

QUALITY CONTROL INSPECTION AND TEST CERTIFICATE				CERT. N°:	682	
PURCHASER:	ContiTech Oil & Marine Corp.			P.O. N°:	4500984922	
CONTITECH RUBBER order N°:	987778	HOSE TYPE:	3" ID	Choke and Kill Hose		
HOSE SERIAL N°:	73981	NOMINAL / ACTUAL LENGTH:		13,72 m / 13,80 m		
W.P. 69,0 MPa	10000 psi	T.P. 103,5 MPa	15000 psi	Duration:	60	min.

Pressure test with water at ambient temperature

See attachment (1 page)

COUPLINGS Type	Serial N°		Quality	Heat N°
3" coupling with	8077	8083	AISI 4130	A0939Y
4 1/16" 10K API Swivel Flange end			AISI 4130	037184 85913
Hub			AISI 4130	A0939Y

Not Designed For Well Testing **API Spec 16 C 2nd Edition– FSL2**

TAG NO.: 66-1486 **Temperature rate: "B"**

All metal parts are flawless

WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER INSPECTED AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.

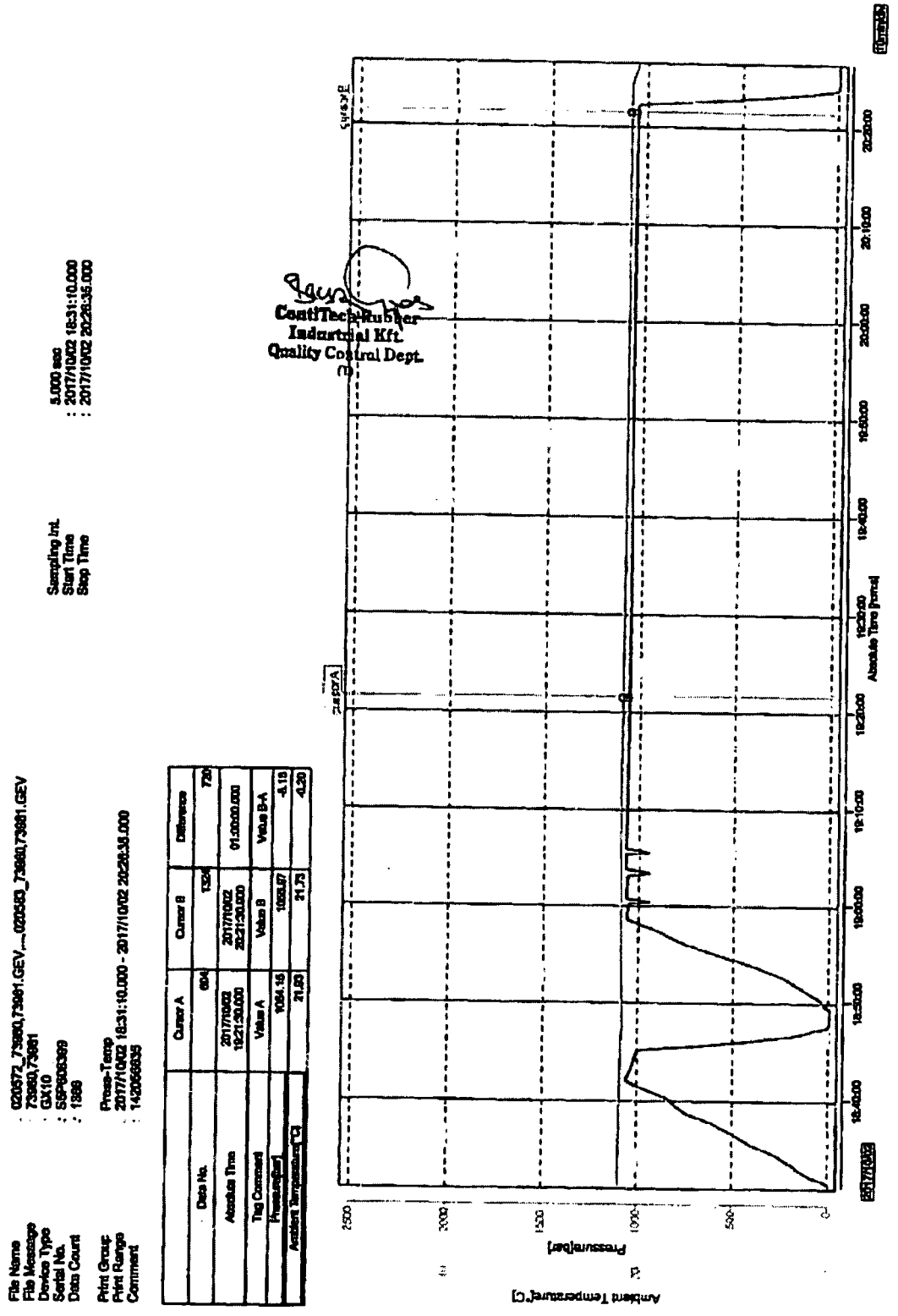
STATEMENT OF CONFORMITY: We hereby certify that the above items/equipment supplied by us are in conformity with the terms, conditions and specifications of the above Purchaser Order and that these items/equipment were fabricated inspected and tested in accordance with the referenced standards, codes and specifications and meet the relevant acceptance criteria and design requirements.

COUNTRY OF ORIGIN HUNGARY/EU

Date:	Inspector	Quality Control
03. October 2017.		ContiTech Rubber Industrial Kft. Quality Control Dept.

ATTACHMENT OF QUALITY CONTROL INSPECTION AND TEST CERTIFICATE
No: 681, 682

CONTITECH RUBBER Industrial Kft.	No: QC-DB- 298 / 2017
	Page: 9 / 119



Hose Data Sheet

CRI Order No.	987778
Customer	ContiTech Oil & Marine Corp
Customer Order No	4500984922 CO987640
Item No.	10
Hose Type	Flexible Hose
Standard	**API SPEC 16C 2ND EDITION FSL2**
Inside dia in inches	3
Length	45 ft
Type of coupling one end	FLANGE 4.1/16" 10KPSI API SPEC 17D SV SWIVEL FLANGE C/W BX155ST/ST INLAID RING GROOVE SOUR
Type of coupling other end	FLANGE 4.1/16" 10KPSI API SPEC 17D SV SWIVEL FLANGE C/W BX155 ST/ST INLAID RING GROOVE SOUR
H2S service NACE MR0175	Yes
Working Pressure	10 000 psi
Design Pressure	10 000 psi
Test Pressure	15 000 psi
Safety Factor	2,25
Marking	CONTINENTAL CONTITECH
Cover	NOT FIRE RESISTANT
Outside protection	St.steel outer wrap
Internal stripwound tube	No
Lining	OIL + GAS RESISTANT SOUR
Safety clamp	Yes
Lifting collar	Yes
Element C	Yes
Safety chain	No
Safety wire rope	Yes
Max.design temperature [°C]	100
Min.design temperature [°C]	-20
Min. Bend Radius operating [m]	0,90
Min. Bend Radius storage [m]	0,90
Electrical continuity	The Hose is electrically continuous
Type of packing	WOODEN CRATE ISPM-15

ContiTech Rubber
Industrial Kft.
QC 2

Continental

ContiTech Fluid Technology

COPY

ContiTech Oil & Marine Corp, # 11535 Brittmoore Park Dr., Houston, TX 77041-6918 USA

NDTUSA- ODESSA
2500 W OREGON
ODESSA TX 79764

Delivery Note

Document No.	83854547
Document Date	06/28/2017
Customer Number	11721
Customer VAT No.	
Supplier Number	
N° EORI:	FR4102795330002
Purchase Order No.	13999606
Purchase Order Date	06/26/2017
Sales Order Number	974000
Sales Order Date	06/26/2017
Unloading Point	

Page 1 of 2

Transport-Details - Shipping

Conditions

Shipping Conditions	0 days
Inco Terms	EXW Houston Ex Works

~~Weights (Gross / Net)~~

Total Weight	1,700.000 LB
Net Weight	1,700.000 LB

Buyer: Andras Kruppa
E-mail: Andras.Kruppa@nabors.com

PR#14438486

Rig: X31

Item	Material/Description	Quantity	Weight
10	OORECERTIFY	1 PC	1,700.000 LB

Recertification of HP Hoses Serial#62205
3" ID 10K Choke and Kill Hose x 35ft OAL

End 1: 4 - 1/16" 10Kpsi API Spec 17D SV Swivel Flange
End 2: 4 - 1/16" 10Kpsi API Spec 17D SV Swivel Flange
c/w BX155 ring groove SS inlay each end
Standard: API Spec 16C - Monogrammed
Working Pressure: 10,000psi
Test Pressure: 15,000psi

Asset # 66-0945

Inspection & Certification includes:
External inspection of the hose & couplings
Internal boroscopic inspection of hose liner
Hydrostatic pressure test of hose assembly

Continental

ContiTech Fluid Technology

Conditions	
Shipping Conditions	0 days
Inco Terms	EXW Houston Ex Works

Delivery Note
Document No. 83854547
Document Date 06/28/2017

Repair of any external damage to hose body and end connections (limited to minor repairs)
Clean & protect end connections
Inspection Report

Disposal of hose assembly if hose fails inspection and recertification process

Please Flush Hoses before sending them to our Facility.

Buyer: Andras Kruppa
E-mail: Andras.Kruppa@nabors.com

PR#14438486

Rig: X31

Inner packages

Quantity	Packaging	Material	Charge
1	420"X16"X16" -Loose	00RECERTIFY	1

Package number 123198224

Hydrostatic Test Certificate

ContiTech

Certificate Number 4000	COM Order Reference 974000	Customer Name & Address
Customer Purchase Order No:	13999506	Nabors Lux Finance 2 S.a.r.L. 8-10 Avenue de la Gare L-1610 LUXEMBOURG
Project:		

Test Center Address	Accepted by COM Inspection	Accepted by Client Inspection
ContiTech Oil & Marine Corp. 11535 Brittmoore Park Drive Houston, TX 77041 USA	Signed: Roger Suarez Date: 6/27/17	

We certify that the goods detailed hereon have been inspected as described below by our Quality Management System, and to the best of our knowledge are found to conform the requirements of the above referenced purchase order as issued to ContiTech Oil & Marine Corporation.

Item	Part No.	Description	Qnty	Serial Number	Work. Press.	Test Press.	Test Time (minutes)
20		RECERTIFICATION - 3" ID 10K Choke & Kill Hose x 35 ft OAL	1	62205 Asset # 66-0945	10,000 psi	15,000 psi	60

Certificate of Conformity

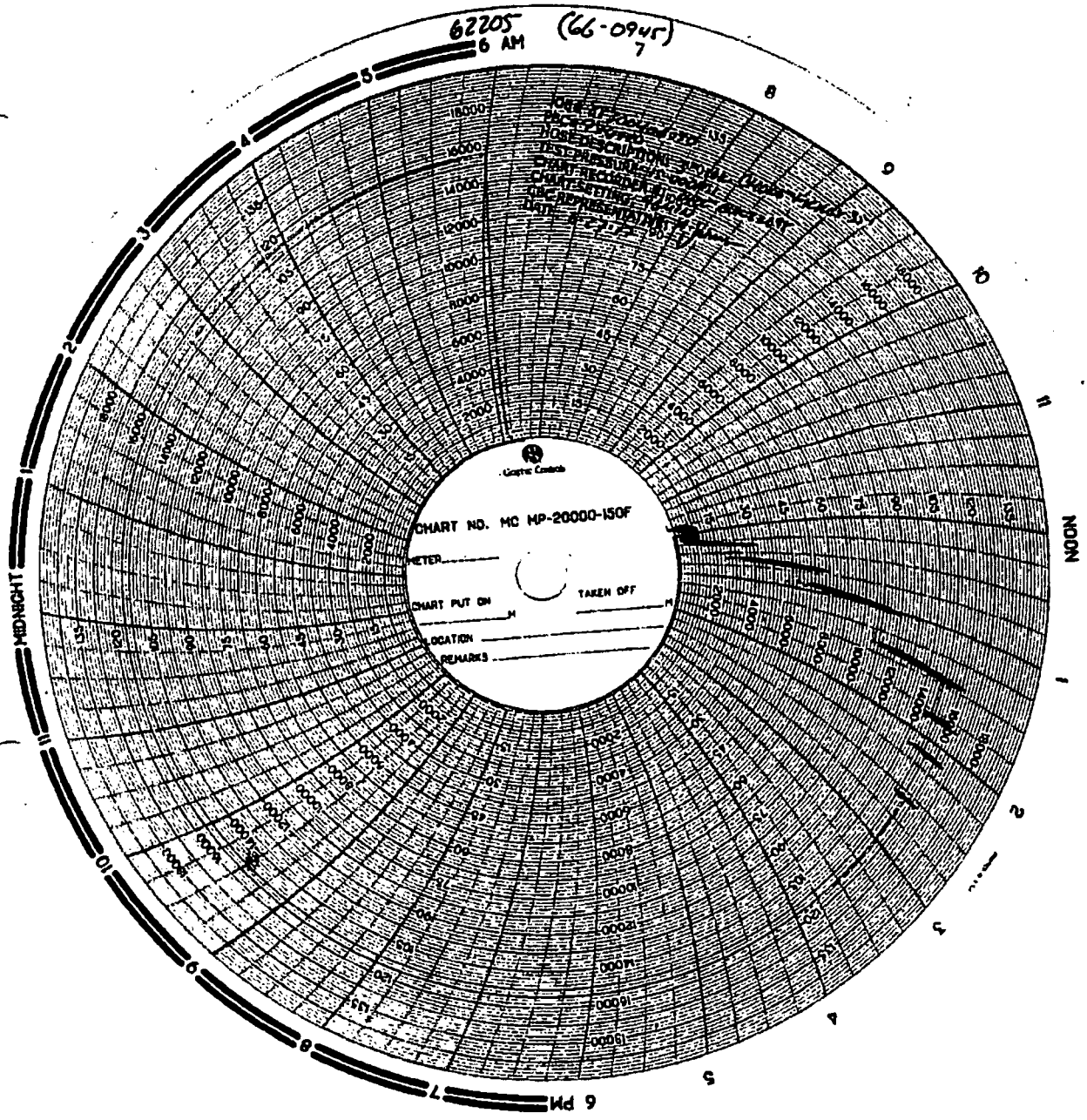
ContiTech

rtificate Number 4000	COM Order Reference 974000	Customer Name & Address
Customer Purchase Order No:	13999606	Nabors Lux Finance 2 S.a.r.L. 8-10 Avenue de la Gare L-1610 LUXEMBOURG
Project:		

Test Center Address	Accepted by COM Inspection		Accepted by Client Inspection
ContiTech Oil & Marine Corp. 11535 Brittmoore Park Drive Houston, TX 77041 USA	Signed: Date:	Roger Suarez 6/27/17	

We certify that the items detailed below meet the requirements of the customer's Purchase Order referenced above, and are in conformance with the specifications given below.

Item	Part No.	Description	Qnty	Serial Number	Specifications
20		RECERTIFICATION - 3" ID 10K Choke & Kill Hose x 35 ft OAL	1	62205 Assest # 66-0945	ContiTech Standard


62205 (66-09 45)
6 AM
NOON
MIDNIGHT
6 PM
CHART NO. MC MP-20000-150F
METER
CHART PUT ON
TAKEN OFF
LOCATION
REMARKS

Hose Inspection Report

ContiTech Oil & Marine

Customer	Customer Reference #	COM Reference #	COM Inspector	Date of Inspection
Nabors	13999606	974000	A. Jaimes	06/27/2017

Hose Manufacturer	Contitech Rubber Industrial

Hose Serial #	62205 (66-0945)	Date of Manufacture	12/2011
Hose I.D.	3"	Working Pressure	10000PSI
Hose Type	Choke and Kill	Test Pressure	15000PSI
Manufacturing Standard	API 16C		

Connections

End A: 4.1/16" 10Kpsi API Spec 17D Swivel Flange	End B: 4.1/16" 10Kpsi API Spec 17D Swivel Flange
• Dents	• No damage
Material: Carbon Steel	Material: Carbon Steel
Seal Face: BX155	Seal Face: BX155
Length Before Hydro Test: 35'	Length After Hydro test: 35'

Conclusion: Hose #62205 passed the external inspection with no notable damage to the hose armor. The flange face on end A did have minor dents but did not affect the test outcome. It is advised that additional care be taken in order to avoid further damage to the flange face. Internal borescope of the hose showed no damage to the liner. Hose #62205 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes. **Hose #62205 is suitable for continued service.**

Recommendations: In general the hose should be inspected on a regular on-going basis. The frequency and degree of the inspection should as a minimum follow these guidelines:

Visual Inspection: Every 3 to 6 months (or during installation/removal)
Annual: In-situ pressure test (in addition to the 3 to 6 monthly inspections)
Initial 5 years service: Major inspection
2nd Major inspection: Following subsequent 3 year life cycle
(Detailed description of test regime available upon request, QCP 206-1)

**NOTE: There are a number of critical elements in the hose that cannot be thoroughly checked through standard inspection techniques. Away from dissecting the hose body, the best way to evaluate the condition of the hose is through review of the operating conditions recorded during the hose service life, in particular maximums and peak conditions.

External Damage Pre – Hydro test
End A has minor dents at the edge of the seal face but did
not compromise the hydrostatic pressure test. Additional
care should be take in order to avoid further damage

Issued By: Alejandro Jaimes
Date: 6/27/2017

Checked By: Gerson Mejia-Lazo
Date: 6/27/2017

(1) Ship-to party
NDTUSA- ODESSA
2500 W OREGON
ODESSA TX 79764

(2) Unloading point - storage location - usage

(3) Delivery note no.
83854547

(4) Vendor address (short name, street, ZIP, city)
ContiTech Oil & Marine Corp.
11535 Brittmoore Park Drive
Houston TX 77041-6916

(8) Supplier ref. no.
00RECERTIFY

(9) Quantity
1

(5) Net weight
1,700 LB

(6) Gross weight
1,700 LB

(7) Number of packages
1

(10) Description of delivery, service
Recertification of HP Hoses Se

(12) ContiTech Sales order no.
974000

(13) Packing date
06/28/17

(14) Engineering change status

(15) Package no.
123198224

(16) Customer PO no.
13999606

Material label VDA 4902 Vers. 4

66-0945 62205

QUALITY CONTROL INSPECTION AND TEST CERTIFICATE				CERT. N°:	682	
PURCHASER:	ContiTech Oil & Marine Corp.			P.O. N°:	4500984922	
CONTITECH RUBBER order N°:	987778	HOSE TYPE:	3" ID	Choke and Kill Hose		
HOSE SERIAL N°:	73981	NOMINAL / ACTUAL LENGTH:		13,72 m / 13,80 m		
W.P. 69,0 MPa 10000 psi		T.P. 103,5 MPa 15000 psi		Duration:	60	min.

Pressure test with water at ambient temperature

See attachment (1 page)

COUPLINGS Type	Serial N°	Quality	Heat N°
3" coupling with	8077 8083	AISI 4130	A0939Y
4 1/16" 10K API Swivel Flange end		AISI 4130	037184 85913
Hub		AISI 4130	A0939Y

Not Designed For Well Testing

API Spec 16 C 2nd Edition– FSL2

TAG NO.: 66-1486

Temperature rate: "B"

All metal parts are flawless

WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER INSPECTED AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.

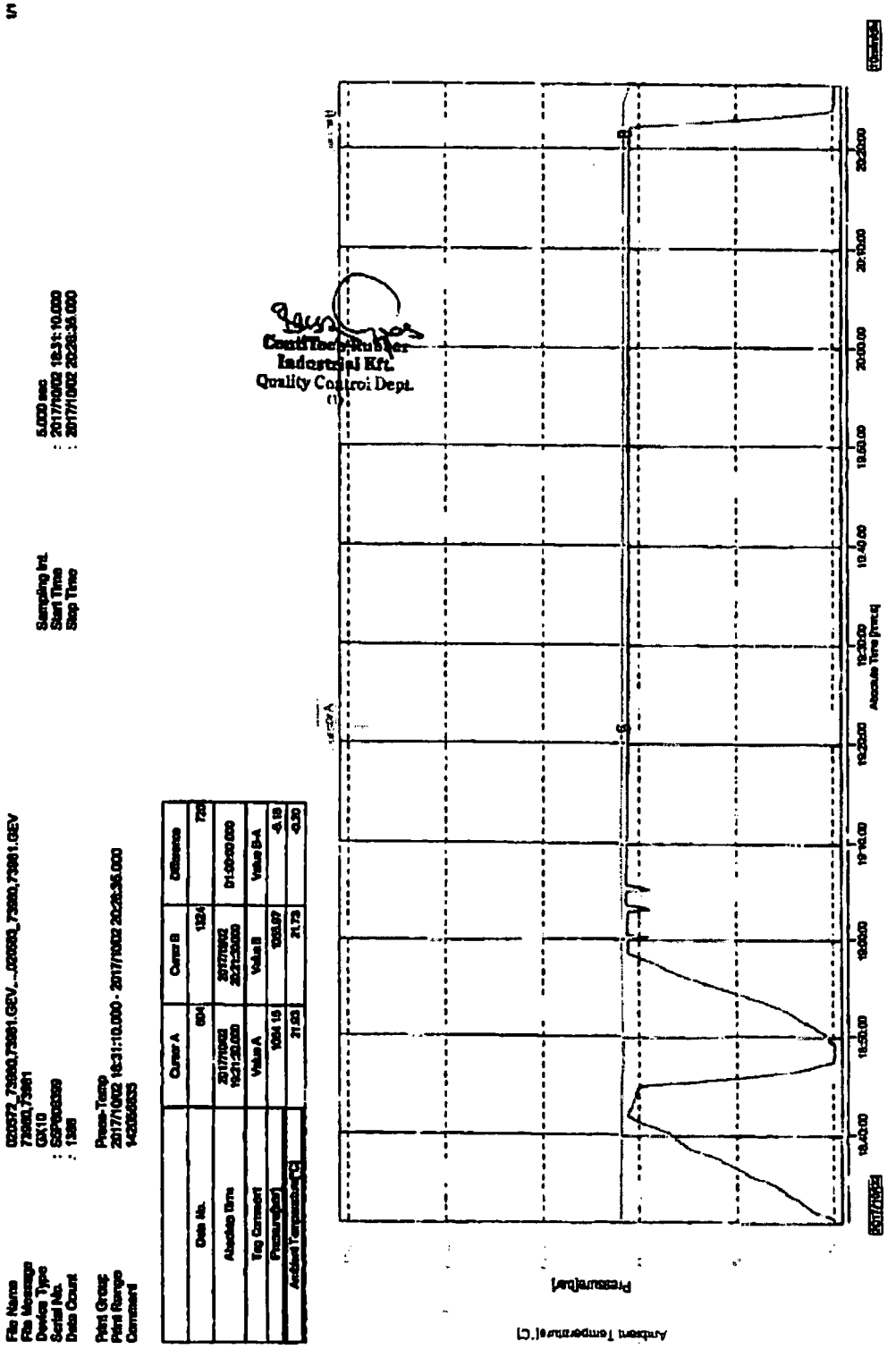
STATEMENT OF CONFORMITY: We hereby certify that the above items/equipment supplied by us are in conformity with the terms, conditions and specifications of the above Purchaser Order and that these items/equipment were fabricated inspected and tested in accordance with the referenced standards, codes and specifications and meet the relevant acceptance criteria and design requirements.

COUNTRY OF ORIGIN HUNGARY/EU

Date:	Inspector	Quality Control
03. October 2017.		ContiTech Rubber Industrial Kft. Quality Control

ATTACHMENT OF QUALITY CONTROL INSPECTION AND TEST CERTIFICATE
No: 681, 682

CONTITECH RUBBER Industrial Kft.	No: QC-DB- 298 / 2017
	Page: 9 / 119



Hose Data Sheet

CRI Order No.	987778
Customer	ContiTech Oil & Marine Corp
Customer Order No	4500984922 CO987640
Item No.	10
Hose Type	Flexible Hose
Standard	**API SPEC 16C 2ND EDITION FSL2**
Inside dia in inches	3
Length	45 ft
Type of coupling one end	FLANGE 4.1/16" 10KPSI API SPEC 17D SV SWIVEL FLANGE C/W BX155ST/ST INLAID RING GROOVE SOUR
Type of coupling other end	FLANGE 4.1/16" 10KPSI API SPEC 17D SV SWIVEL FLANGE C/W BX155 ST/ST INLAID RING GROOVE SOUR
H2S service NACE MR0175	Yes
Working Pressure	10 000 psi
Design Pressure	10 000 psi
Test Pressure	15 000 psi
Safety Factor	2,25
Marking	CONTINENTAL CONTITECH
Cover	NOT FIRE RESISTANT
Outside protection	St.steel outer wrap
Internal stripwound tube	No
Lining	OIL + GAS RESISTANT SOUR
Safety clamp	Yes
Lifting collar	Yes
Element C	Yes
Safety chain	No
Safety wire rope	Yes
Max.design temperature [°C]	100
Min.design temperature [°C]	-20
Min. Bend Radius operating [m]	0,90
Min. Bend Radius storage [m]	0,90
Electrical continuity	The Hose is electrically continuous
Type of packing	WOODEN CRATE ISPM-15

ContiTech Rubber
Industrial Kft.
QC 2

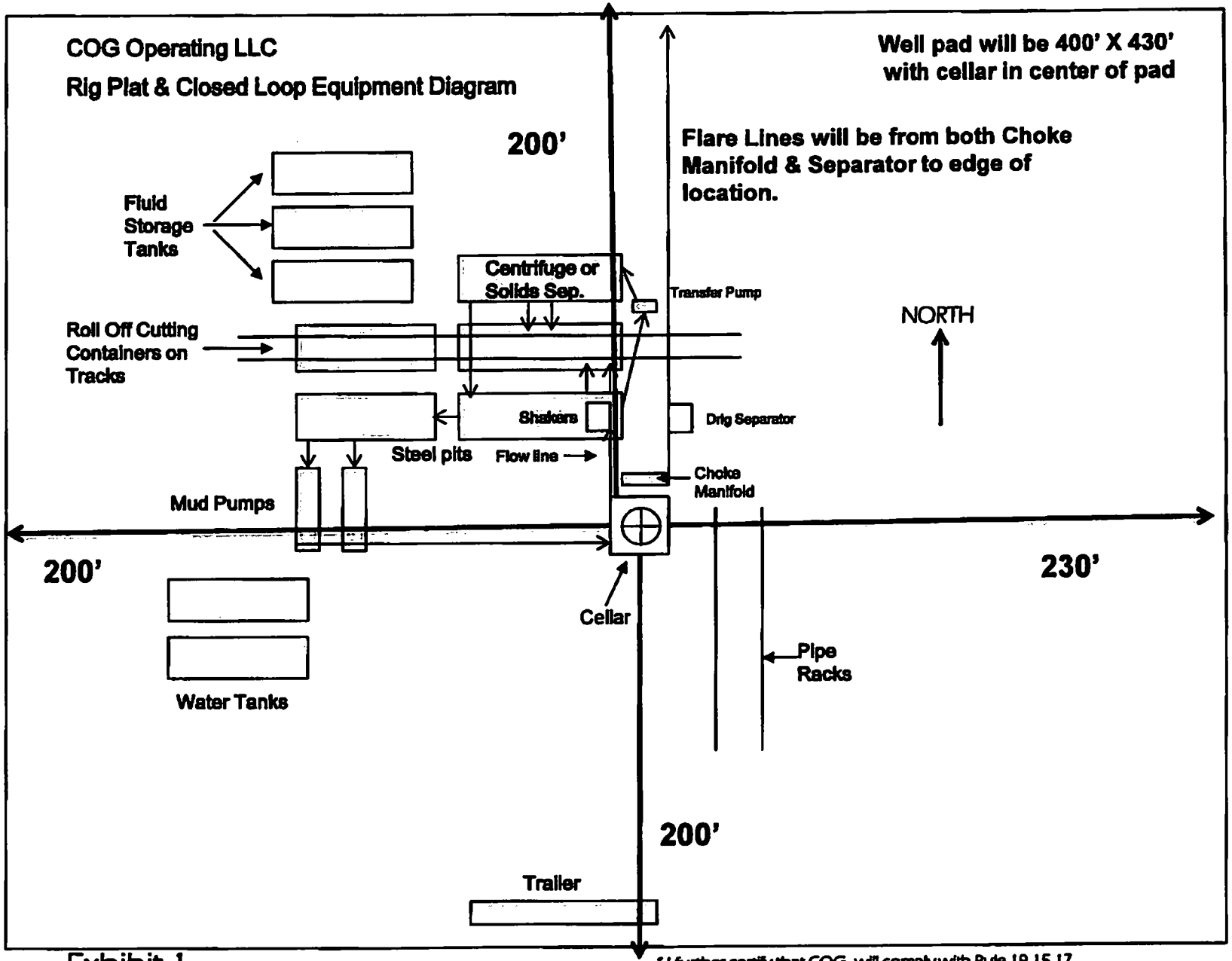
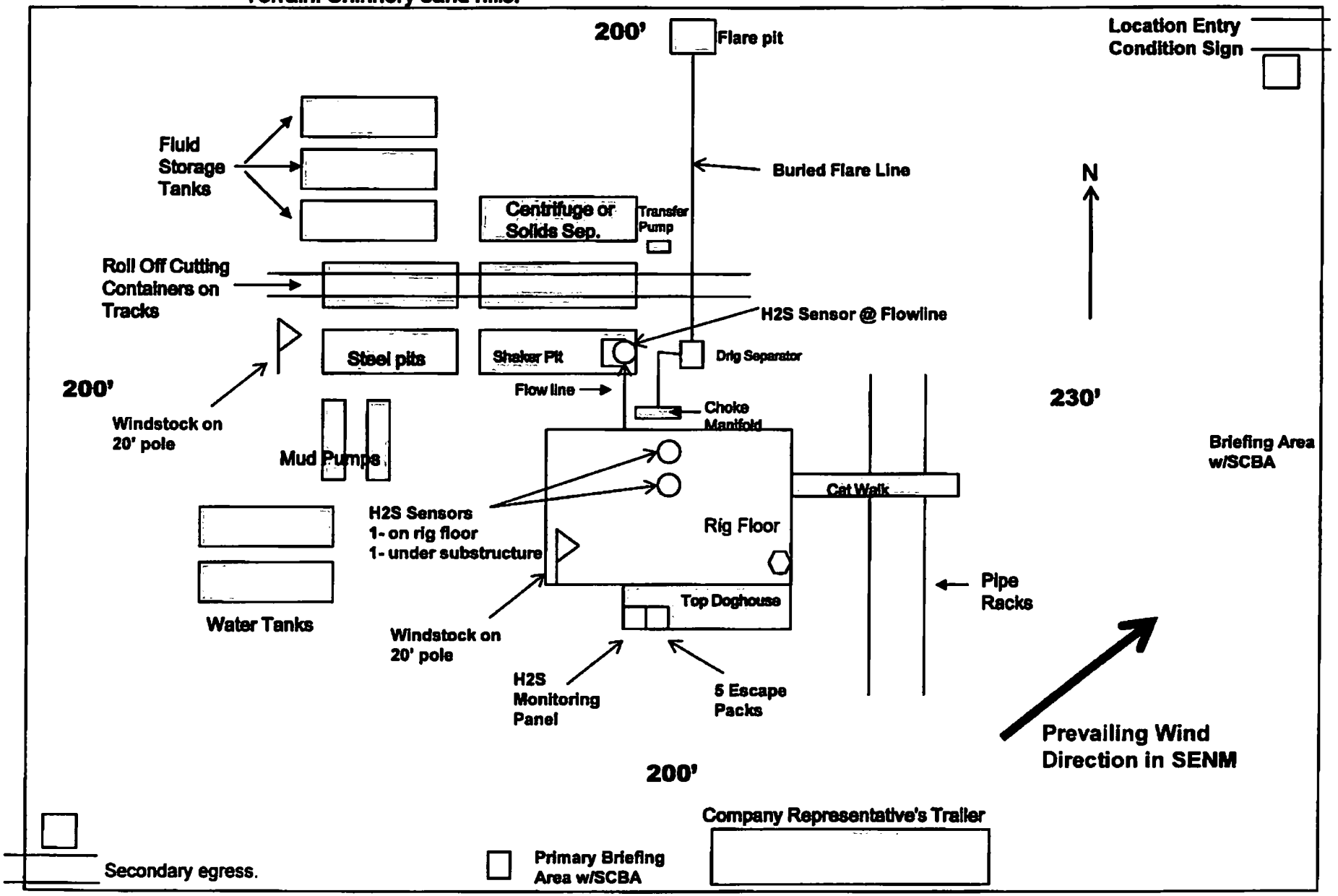


Exhibit 1

"I further certify that COG will comply with Rule 19.15.17 NMAC by using a Closed Loop System."

COG Operating LLC
H_2S Equipment Schematic
Terrain: Shinnery sand hills.

Well pad will be 400' x 430'
with cellar in center of pad



COG OPERATING LLC
HYDROGEN SULFIDE DRILLING OPERATIONS PLAN

1. 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:

a. The hazards and characteristics of hydrogen sulfide (H_2S).
b. The proper use and maintenance of personal protective equipment and life support systems.
c. The proper use of H_2S detectors, alarms, warning systems, briefing areas, evacuation procedures, and prevailing winds.
d. The proper techniques for first aid and rescue procedures.

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

a. The effects of H2S on metal components. If high tensile tubulars are to be used, personnel will be trained in their special maintenance requirements.
b. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
c. The contents and requirements of the H_2S Drilling Operations Plan and the 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. This plan shall be available at the well site. All personnel will be required to carry documentation that they have received the proper training.

2. H_2S SAFETY EQUIPMENT AND SYSTEMS

Note: All H_2S 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 reasonably expected to contain H2S. If H2S greater than 100 ppm is encountered in the gas stream we will shut in and install H2S equipment.

a. Well Control Equipment:
   Flare line.
   Choke manifold with remotely operated choke.
   Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit.
   Auxiliary equipment to include: annular preventer, mud-gas separator, rotating head.

b. Protective equipment for essential personnel:
Mark II Surviveair 30-minute units located in the dog house and at briefing areas.

c. H2S detection and monitoring equipment:
2 - portable H2S monitor positioned on location for best coverage and response. These units have warning lights and audible sirens when H2S levels of 20 ppm are reached.

d. Visual warning systems:
Caution/Danger signs 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.

e. Mud Program:
The mud program has been designed to minimize the volume of H2S circulated to the surface.

f. Metallurgy:
All drill strings, casings, tubing, wellhead, blowout preventers, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H2S service.

g. Communication:
Company vehicles equipped with cellular telephone.

COG OPERATING LLC has conducted a review to determine if an H2S contingency plan is required for the above referenced well. We were able to conclude that any potential hazardous volume would be minimal. H2S concentrations of wells in this area from surface to TD are low enough; therefore, we do not believe that an H2S contingency plan is necessary.

WARNING

YOU ARE ENTERING AN H_2S AREA
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. ***CK WITH COG OPERATING LLC FOREMAN AT MAIN OFFICE***

COG OPERATING LLC

1-575-748-6940

EMERGENCY CALL LIST

	OFFICE	MOBILE
COG OPERATING LLC OFFICE	575-748-6940	
SETH WILD	432-683-7443	432-528-3633
WALTER ROYE	575-748-6940	432-934-1886

EMERGENCY RESPONSE NUMBERS

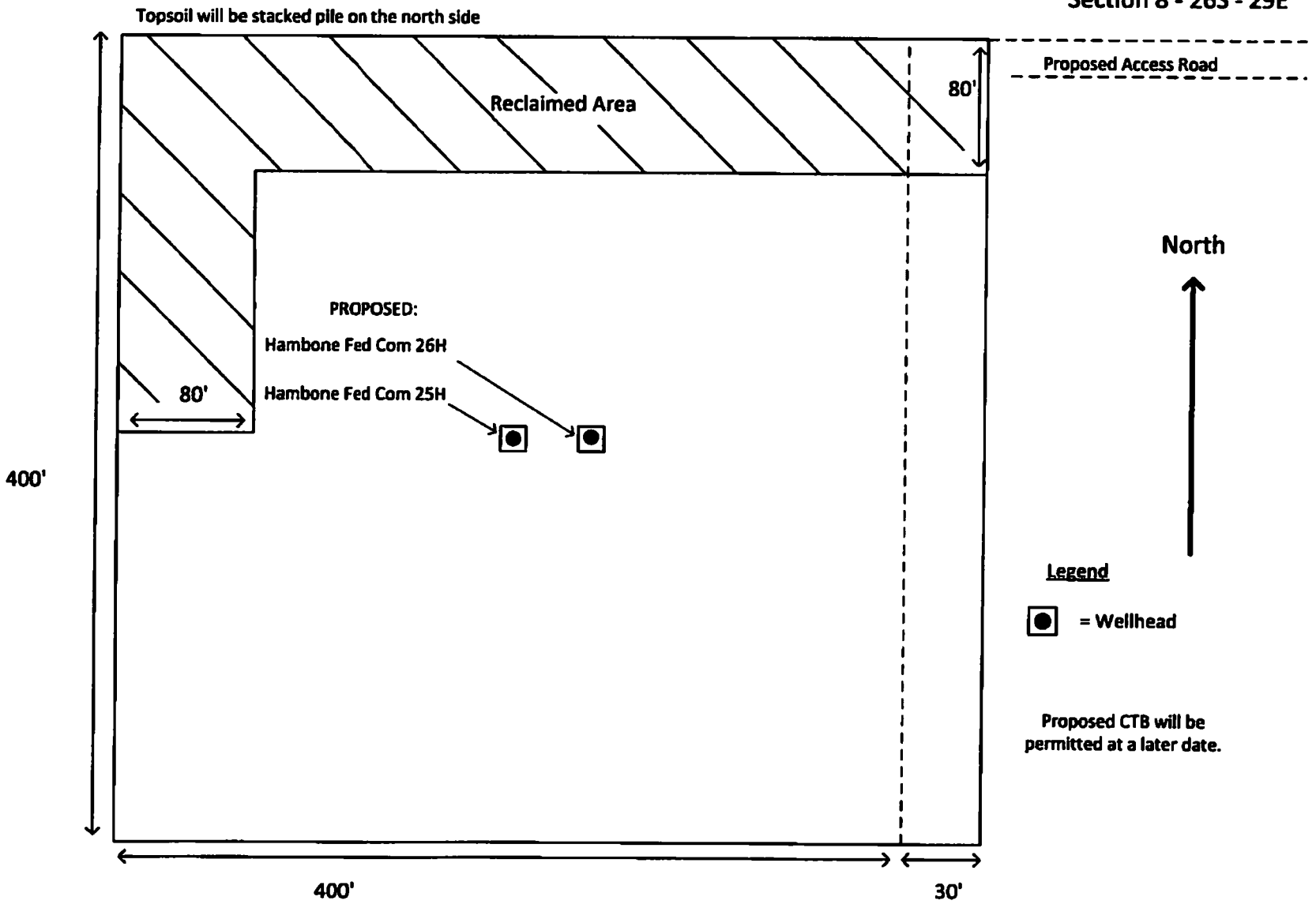
	OFFICE
STATE POLICE	575-748-9718
EDDY COUNTY SHERIFF	575-746-2701
EMERGENCY MEDICAL SERVICES (AMBULANCE)	911 or 575-746-2701
EDDY COUNTY EMERGENCY MANAGEMENT (HARRY BURGESS)	575-887-9511
STATE EMERGENCY RESPONSE CENTER (SERC)	575-476-9620
CARLSBAD POLICE DEPARTMENT	575-885-2111
CARLSBAD FIRE DEPARTMENT	575-885-3125
NEW MEXICO OIL CONSERVATION DIVISION	575-748-1283
INDIAN FIRE & SAFETY	800-530-8693
HALLIBURTON SERVICES	800-844-8451

CONCHO

COG Operating LLC
2208 West Main Street
Artesia, NM 88210

Exhibit 3

Well Site Layout
Production Facility Layout
Hambone Federal Com 25H
Section 8 - 26S - 29E



PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG OPERATING LLC.
LEASE NO.:	NMNM123925
WELL NAME & NO.:	25H-HAMBONE FEDERAL COM
SURFACE HOLE FOOTAGE:	330'/S & 2410'/W
BOTTOM HOLE FOOTAGE	200'/N & 2310'/W
LOCATION:	Section. 8.,T26S., R.29E., NMP
COUNTY:	EDDY County, New Mexico

Potash	◉ None	○ Secretary	○ R-111-P
Cave/Karst Potential	○ Low	◉ Medium	○ High
Variance	○ None	◉ Flex Hose	○ Other
Wellhead	◉ Conventional	○ Multibowl	
Other	☐ 4 String Area	☐ Capitan Reef	☐ WIPP

A. Hydrogen Sulfide

1. Hydrogen Sulfide (H2S) monitors shall be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.

B. CASING

1. The **13 3/8** inch surface casing shall be set at approximately **400** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.

    a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.

    b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)

    c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength,

whichever is greater.

d. If cement falls back, remedial cementing will be done prior to drilling out that string.

2. The minimum required fill of cement behind the **9 5/8** inch intermediate casing is:

Operator has proposed DV tool at depth of 6524', but will adjust cement proportionately if moved. DV tool shall be set a minimum of 50' below previous shoe and a minimum of 200' above current shoe. Operator shall submit sundry if DV tool depth cannot be set in this range. If an ECP is used, it is to be set a minimum of 50' below the shoe to provide cement across the shoe. If it cannot be set below the shoe, a CBL shall be run to verify cement coverage.

a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.

b. Second stage above DV tool:

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

❖ In **Medium Cave/Karst Areas** if cement does not circulate to surface on the first two casing strings , the cement on the 3rd casing string must come to surface.

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

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

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).

2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **3000 (3M)** psi.

3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9 5/8** intermediate casing shoe shall be **5000 (5M)** psi.

D. SPECIAL REQUIREMENT(S)

Communitization Agreement

- The operator will submit a Communitization Agreement to the Carlsbad Field Office, 620 E Greene St. Carlsbad, New Mexico 88220, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

MHH 11272018

GENERAL REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

a. Spudding well (minimum of 24 hours)
b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
c. BOPE tests (minimum of 4 hours)

☒ Chaves and Roosevelt Counties
Call the Roswell Field Office, 2909 West Second St., Roswell NM 88201.
During office hours call (575) 627-0272.
After office hours call (575)

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

☒ Lea County
Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575) 393-3612

1. 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.

   a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
   b. When the operator proposes to set surface casing with Spudder Rig
      - Notify the BLM when moving in and removing the Spudder Rig.
      - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
      - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.

2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.

3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.

2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log.

3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements.

4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.

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

6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.

7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.

2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.

3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.

4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:

    a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
    b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
    c. Manufacturer representative shall install the test plug for the initial BOP test.
    d. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
    e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.

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

    a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the

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

b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time.

c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).

d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.

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

f. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.

g. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the Wolfcamp formation, and shall be used until production casing is run and cemented.

D. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG OPERATING LLC.
LEASE NO.:	NMNM123925
WELL NAME & NO.:	25H-HAMBONE FEDERAL COM
SURFACE HOLE FOOTAGE:	330'/S & 2410'/W
BOTTOM HOLE FOOTAGE	200'/N & 2310'/W
LOCATION:	Section. 8.,T26S., R.29E., NMP
COUNTY:	EDDY County, New Mexico

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Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

I. GENERAL PROVISIONS

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

II. PERMIT EXPIRATION

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

IV. NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

V. SPECIAL STATUS PLANT SPECIES

Unsurveyed potential habitats for Sheer's Beehive Cactus (Coryphantha robustispina var. scheeri) were identified within or adjacent to the project area for the proposed action.

Scheer's beehive cactus is a U.S. Fish and Wildlife Species of Concern, a BLM Special Status Species, and a New Mexico State Endangered species. This species sparsely occupies calcareous gravelly to loamy soils in desert grassland and Chihuahuan desert scrub, usually in slightly-sloping to nearly level areas between 900 meters and 1,100 meters (3,000-3,600 feet) in elevation, on or surrounding limestone or gypsum benches, hills and bajadas within Brewster, Crockett, Loving, Pecos, Reeves, Terrell, and Ward counties, Texas and Chaves and Eddy counties, New Mexico.

To limit any impacts to vegetation and to protect any Scheer's beehive cactus that were not observed during the field survey, vehicles and equipment should be kept on existing roads and approved surfaces only, and should avoid travel across undisturbed surfaces; workers would be instructed not to park off the roads or ROW in undisturbed areas. BLM special status plant surveys would be required for subsequent actions tiered from this analysis when the impacts effects zones of the proposed actions intersect SSPS potential habitat that has not been surveyed within three years prior to the notice of application for the proposed action.

Project field participants will be trained in identification of the relevant BLM special status plant species, and any suspected observations of the relevant species will be reported (via an e-mail including an image and GPS coordinates for each observation) to the Authorized Officer as soon as possible.

If occupied habitat is observed within the impacts effects zones for the proposed action(s), the proposed action(s) will avoid occupied habitat and mitigate anticipated impacts as determined appropriate for the conservation of the species by the Authorized Officer in coordination with a native plant conservation specialist. Such mitigation measures may include, but are not limited to, the following practices:

1) Restricting development within 990 feet of occupied habitat.
2) Adjusting the location of the disturbance to be at least 990 feet from the edge of occupied or suitable habitat and ideally outside of the plant consideration area.
3) Minimizing the area of disturbance.
4) Using dust abatement measures.
5) Using signs, fencing, and other deterrents to reduce possible human disturbance.
6) Requiring construction to occur outside of the blooming season (i.e., construction could occur November through March), involving possibly delaying the project by more than 60 days.
7) Requiring specialized reclamation procedures (e.g., separating soil and subsoil layers with barriers to reclaim in the correct order and additional emphasis on forbs in seed mixes to promote pollinator habitat).
8) Conducting long-term monitoring of the species and/or habitat.

9) Using a qualified, independent third-party contractor to provide general oversight and assure compliance with project terms and conditions.
10) Conducting non-native or invasive species monitoring and control.

VI. SPECIAL REQUIREMENT(S)

Hydrology:

The entire well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad. The compacted berm shall be constructed at a minimum of 12 inches with impermeable mineral material (e.g. caliche). Topsoil shall not be used to construct the berm. No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad. The integrity of the berm shall be maintained around the surfaced pad throughout the life of the well and around the downsized pad after interim reclamation has been completed. Any water erosion that may occur due to the construction of the well pad during the life of the well will be quickly corrected and proper measures will be taken to prevent future erosion. Stockpiling of topsoil is required. The top soil shall be stockpiled in an appropriate location to prevent loss of soil due to water or wind erosion and not used for berming or erosion control. If fluid collects within the bermed area, the fluid must be vacuumed into a safe container and disposed of properly at a state approved facility.

Tank battery locations will be lined and bermed. A 20 mil permanent liner will be installed with a 4 oz. felt backing to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank or 24 hour production, whichever is greater. Automatic shut off, check valves, or similar systems will be installed for tanks to minimize the effects of catastrophic line failures used in production or drilling.

A leak detection plan will be submitted to the BLM Carlsbad Field Office for approval prior to pipeline installation. The method could incorporate gauges to detect pressure drops, situating valves and lines so they can be visually inspected periodically or installing electronic sensors to alarm when a leak is present. The leak detection plan will incorporate an automatic shut off system that will be installed for proposed pipelines to minimize the effects of an undesirable event.

Electric Lines: Any water erosion that may occur due to the construction of overhead electric line and during the life of the power line will be quickly corrected and proper measures will be taken to prevent future erosion.

Cave Karst

Cave/Karst Surface Mitigation

The following stipulations will be applied to minimize impacts during construction, drilling and production:

Construction:

In the advent that any underground voids are opened up during construction activities, construction activities will be halted and the BLM will be notified immediately.

No Blasting:

No blasting will be utilized for pad construction. The pad will be constructed and leveled by adding the necessary fill and caliche.

Pad Berming:

- The entire perimeter of the well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad.
- The compacted berm shall be constructed at a minimum of 12 inches high with impermeable mineral material (e.g., caliche).
- No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad.
- The topsoil stockpile shall be located outside the bermed well pad.
- Topsoil, either from the well pad or surrounding area, shall not be used to construct the berm.
- No storm drains, tubing or openings shall be placed in the berm.
- If fluid collects within the bermed area, the fluid must be vacuumed into a safe container and disposed of properly at a state approved facility.
- The integrity of the berm shall be maintained around the surfaced pad throughout the life of the well and around the downsized pad after interim reclamation has been completed.
- Any access road entering the well pad shall be constructed so that the integrity of the berm height surrounding the well pad is not compromised. (Any access road crossing the berm cannot be lower than the berm height.)
- Following a rain event, all fluids will vacuumed off of the pad and hauled off-site and disposed at a proper disposal facility.

Tank Battery Liners and Berms:

Tank battery locations and all facilities will be lined and bermed. A 20 mil permanent liner will be installed with a 4 oz. felt backing, or equivalent, to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank.

Leak Detection System:

A method of detecting leaks is required. The method could incorporate gauges to measure loss, situating values and lines so they can be visually inspected, or installing electronic sensors to alarm when a leak is present. Leak detection plan will be submitted to BLM for approval.

Automatic Shut-off Systems:

Automatic shut off, check values, or similar systems will be installed for pipelines and tanks to minimize the effects of catastrophic line failures used in production or drilling.

Cave/Karst Subsurface Mitigation

The following stipulations will be applied to protect cave/karst and ground water concerns:

Rotary Drilling with Fresh Water:

Fresh water will be used as a circulating medium in zones where caves or karst features are expected. SEE ALSO: Drilling COAs for this well.

Directional Drilling:

Kick off for directional drilling will occur at least 100 feet below the bottom of the cave occurrence zone. SEE ALSO: Drilling COAs for this well.

Lost Circulation:

ALL lost circulation zones from the surface to the base of the cave occurrence zone will be logged and reported in the drilling report.

Regardless of the type of drilling machinery used, if a void of four feet or more and circulation losses greater than 70 percent occur simultaneously while drilling in any cave-bearing zone, the BLM will be notified immediately by the operator. The BLM will assess the situation and work with the operator on corrective actions to resolve the problem.

Abandonment Cementing:

Upon well abandonment in cave karst areas additional plugging conditions of approval may be required. The BLM will assess the situation and work with the operator to ensure proper plugging of the wellbore.

Pressure Testing:

Annual pressure monitoring will be performed by the operator on all casing annuli and reported in a sundry notice. If the test results indicated a casing failure has occurred, remedial action will be undertaken to correct the problem to the BLM's approval.

VII. CONSTRUCTION

A. NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (575) 234-5909 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and Conditions of Approval (COA) on the well site and they shall be made available upon request by the Authorized Officer.

B. TOPSOIL

The operator shall strip the top portion of the soil (root zone) from the entire well pad area and stockpile the topsoil along the edge of the well pad as depicted in the APD. The root zone is typically six (6) inches in depth. All the stockpiled topsoil will be redistributed over the interim reclamation areas. Topsoil shall not be used for berming the pad or facilities. For final reclamation, the topsoil shall be spread over the entire pad area for seeding preparation.

Other subsoil (below six inches) stockpiles must be completely segregated from the topsoil stockpile. Large rocks or subsoil clods (not evident in the surrounding terrain) must be buried within the approved area for interim and final reclamation.

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

The operator shall properly dispose of drilling contents at an authorized disposal site.

D. FEDERAL MINERAL MATERIALS PIT

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the Carlsbad Field Office at (575) 234-5972.

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation. The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

F. EXCLOSURE FENCING (CELLARS & PITS)

Exclosure Fencing
The operator will install and maintain exclosure fencing for all open well cellars to prevent access to public, livestock, and large forms of wildlife before and after drilling operations until the pit is free of fluids and the operator initiates backfilling. (For examples of exclosure fencing design, refer to BLM's Oil and Gas Gold Book, Exclosure Fence Illustrations, Figure 1, Page 18.)

G. ON LEASE ACCESS ROADS

Road Width
The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed twenty-five (25) feet.

Surfacing
Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

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

The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

Crowning
Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

Ditching
Ditching shall be required on both sides of the road.

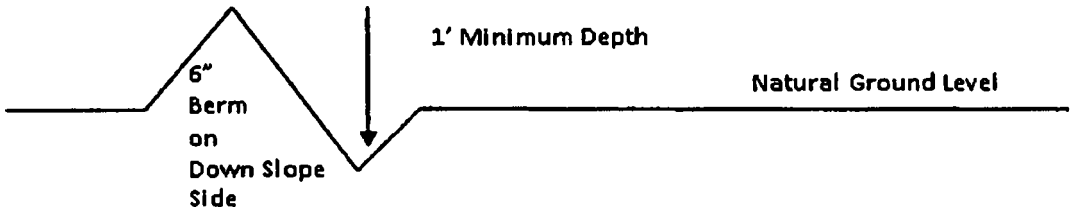
Turnouts
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping and insloping, lead-off ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.

Cross Section of a Typical Lead-off Ditch



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

Formula for Spacing Interval of Lead-off Ditches

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

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

Cattle guards

An appropriately sized cattle guard sufficient to carry out the project shall be installed and maintained at fence/road crossings. Any existing cattle guards on the access road route shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattle guards that are in place and are utilized during lease operations.

Fence Requirement

Where entry is granted across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences.

Public Access

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

Construction Steps

1. Salvage topsoil
2. Construct road
3. Redistribute topsoil
4. Revegetate slopes

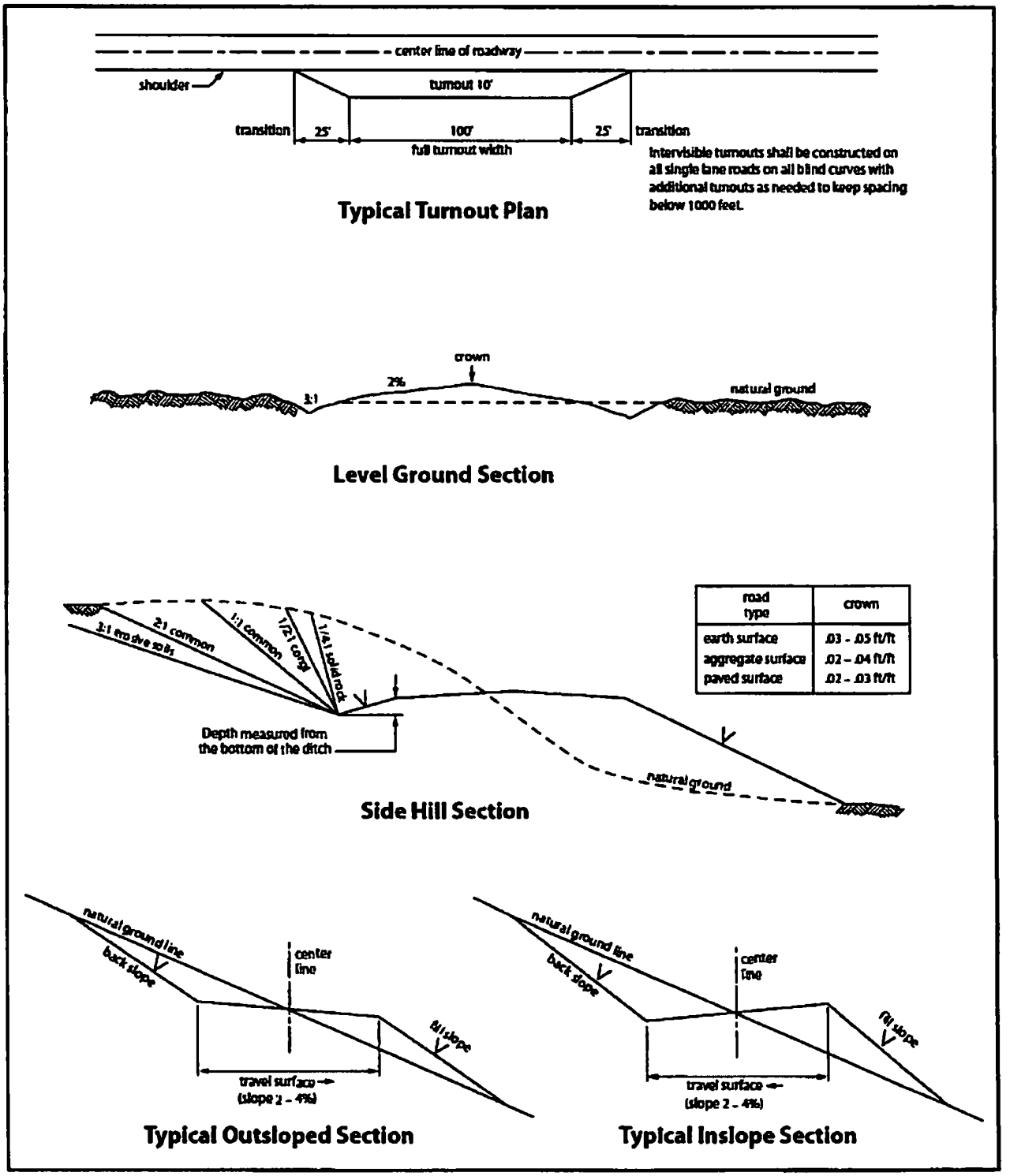


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VIII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

Placement of Production Facilities
Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

Exclosure Netting (Open-top Tanks)
Immediately following active drilling or completion operations, the operator will take actions necessary to prevent wildlife and livestock access, including avian wildlife, to all open-topped tanks that contain or have the potential to contain salinity sufficient to cause harm to wildlife or livestock, hydrocarbons, or Resource Conservation and Recovery Act of 1976-exempt hazardous substances. At a minimum, the operator will net, screen, or cover open-topped tanks to exclude wildlife and livestock and prevent mortality. If the operator uses netting, the operator will cover and secure the open portion of the tank to prevent wildlife entry. The operator will net, screen, or cover the tanks until the operator removes the tanks from the location or the tanks no longer contain substances that could be harmful to wildlife or livestock. Use a maximum netting mesh size of 1 ½ inches. The netting must not be in contact with fluids and must not have holes or gaps.

Chemical and Fuel Secondary Containment and Exclosure Screening
The operator will prevent all hazardous, poisonous, flammable, and toxic substances from coming into contact with soil and water. At a minimum, the operator will install and maintain an impervious secondary containment system for any tank or barrel containing hazardous, poisonous, flammable, or toxic substances sufficient to contain the contents of the tank or barrel and any drips, leaks, and anticipated precipitation. The operator will dispose of fluids within the containment system that do not meet applicable state or U. S. Environmental Protection Agency livestock water standards in accordance with state law; the operator must not drain the fluids to the soil or ground. The operator will design, construct, and maintain all secondary containment systems to prevent wildlife and livestock exposure to harmful substances. At a minimum, the operator will install effective wildlife and livestock exclosure systems such as fencing, netting, expanded metal mesh, lids, and grate covers. Use a maximum netting mesh size of 1 ½ inches.

Open-Vent Exhaust Stack Exclosures
The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. (*Recommended exclosure structures on open-vent exhaust stacks are in the shape of a cone.*) Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers.

Containment Structures

Proposed production facilities such as storage tanks and other vessels will have a secondary containment structure that is constructed to hold the capacity of 1.5 times the largest tank, plus freeboard to account for precipitation, unless more stringent protective requirements are deemed necessary.

Painting Requirement
All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color, **Shale Green** from the BLM Standard Environmental Color Chart (CC-001: June 2008).

IX. INTERIM RECLAMATION

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

Within six (6) months of well completion, operators should work with BLM surface management specialists (Jim Amos: 575-234-5909) to devise the best strategies to reduce the size of the location. Interim reclamation should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche that is free of contaminants may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

All disturbed areas after they have been satisfactorily prepared need to be reseeded with the seed mixture provided below.

Upon completion of interim reclamation, the operator shall submit a Sundry Notices and Reports on Wells, Subsequent Report of Reclamation (Form 3160-5).

X. FINAL ABANDONMENT & RECLAMATION

At final abandonment, well locations, production facilities, and access roads must undergo "final" reclamation so that the character and productivity of the land are restored.

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

After all disturbed areas have been satisfactorily prepared, these areas need to be revegetated with the seed mixture provided below. Seeding should be accomplished by drilling on the contour whenever practical or by other approved methods. Seeding may need to be repeated until revegetation is successful, as determined by the BLM.

Operators shall contact a BLM surface protection specialist prior to surface abandonment operations for site specific objectives (Jim Amos: 575-234-5909).

Seed Mixture 2, for Sandy Sites

The holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed will be done in accordance with State law (s) and within nine (9) months prior to purchase. Commercial seed will be either certified or registered seed. The seed container will be tagged in accordance with State law(s) and available for inspection by the authorized officer.

Seed will be planted using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (smaller/heavier seeds have a tendency to drop the bottom of the drill and are planted first). The holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed* per acre:

Species	lb/acre
Sand dropseed (Sporobolus cryptandrus)	1.0
Sand love grass (Eragrostis trichodes)	1.0
Plains bristlegrass (Setaria macrostachya)	2.0

*Pounds of pure live seed:

Pounds of seed x percent purity x percent germination = pounds pure live seed