Form 3160-3
(June 2015)

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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.
NMNM132949

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.
STOVE PIPE FEDERAL COM
704H (315644)

2. Name of Operator
COG OPERATING LLC (229137)

9. API Well No.
30-025-46504

3a. Address	3b. Phone No. *(include area code)*	10. Field and Pool, or Exploratory
600 West Illinois Ave Midland TX 79701	(432)683-7443	MESA VERDE / BONE SPRING

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface SESW / 270 FSL / 1485 FWL / LAT 32.167464 / LONG -103.410295
At proposed prod. zone LOT 4 / 50 FSL / 1230 FWL / LAT 32.137825 / LONG -103.411161

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 31 / T24S / R35E / NMP

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

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)	16. No of acres in lease	17. Spacing Unit dedicated to this well
50 feet	80.48	640.54

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
30 feet	12939 feet / 23536 feet	FED: NMB000215

21. Elevations (Show whether DF, KDB, RT, GL, etc.)	22. Approximate date work will start*	23. Estimated duration
3328 feet	10/01/2019	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)748-6940	06/18/2019

Title
Regulatory Analyst

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
(Electronic Submission)	Cody Layton / Ph: (575)234-5959	11/08/2019

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.

GCP Rec 11/12/19

APPROVED WITH CONDITIONS

KZ 11/13/19

Approval Date: 11/08/2019

(Continued on page 2)

*(Instructions on page 2)

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 I: 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 wen, 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.C. 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.

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Additional Operator Remarks

Location of Well

1. SHL: SESW / 270 FSL / 1485 FWL / TWSP: 24S / RANGE: 35E / SECTION: 31 / LAT: 32.167464 / LONG: -103.410295 (TVD: 0 feet, MD: 0 feet)
   PPP: LOT 4 / 100 FNL / 1230 FWL / TWSP: 25S / RANGE: 35E / SECTION: 6 / LAT: 32.166448 / LONG: -103.411115 (TVD: 12758 feet, MD: 12800 feet)
   PPP: LOT 7 / 1321 FSL / 1230 FWL / TWSP: 25S / RANGE: 35E / SECTION: 6 / LAT: 32.155827 / LONG: -103.411139 (TVD: 12923 feet, MD: 16800 feet)
   BHL: LOT 4 / 50 FSL / 1230 FWL / TWSP: 25S / RANGE: 35E / SECTION: 7 / LAT: 32.137825 / LONG: -103.411161 (TVD: 12939 feet, MD: 23536 feet)

BLM Point of Contact

Name: Deborah Ham
Title: Legal Landlaw Examiner
Phone: 5752345965
Email: dham@blm.gov

Approval Date: 11/08/2019

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.

PECOS DISTRICT
DRILLING OPERATIONS
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**COG Operating LLC**
LEASE NO.:	**NMNM132949**
WELL NAME & NO.:	**Stove Pipe Federal Com 704H**
SURFACE HOLE FOOTAGE:	**270' FSL & 1485' FWL**
BOTTOM HOLE FOOTAGE	**50' FSL & 1230' FWL**
LOCATION:	**Section 31, T 24S, R 35E, NMPM**
COUNTY:	**Lea County, New Mexico**

H2S	○ Yes	◉ No	
Potash	◉ None	○ Secretary	○ R-111-P
Cave/Karst Potential	◉ Low	○ Medium	○ High
Variance	○ None	◉ Flex Hose	○ Other
Wellhead	◉ Conventional	○ Multibowl	○ Both
Other	☐ 4 String Area	☐ Capitan Reef	☐ WIPP
Other	☐ Fluid Filled	☐ Cement Squeeze	☐ Pilot Hole
Special Requirements	☐ Water Disposal	☑ COM	☐ Unit

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"** surface casing shall be set at approximately **1200'** (a minimum of 25' into the Rustler Anhydrite and above the salt) and cemented to surface.
   a. **If cement does not circulate to 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 **6 hours** after pumping cement, ideally between 8-10 hours after completing the cement job.
   b. WOC time for a primary cement job will be a minimum of **8 hours** or **500 psi** compressive strength, whichever is greater. This is to include the lead cement.
   c. If cement falls back, remedial cementing will be done prior to drilling out that string.
   d. WOC time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 psi compressive strength, whichever is greater.

2. The **9-5/8"** intermediate casing shall be cemented to surface.
   a. **If cement does not circulate to surface,** see B.1.a, c & d.
   b. Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.
      i. 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 the second stage.
      ii. Second stage via DV tool: Cement to surface. If cement does not circulate, contact the appropriate BLM office.
3. The **5-1/2"** production casing shall be cemented with at least 200' tie-back into the previous casing.

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 intermediate casing shoe shall be **10,000 (10M)** psi. **Variance approved to use a 5M annular. The annular must be tested to full working pressure (5000 psi).**

D. SPECIAL REQUIREMENTS

1. 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.
2. The well sign on location shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

DR 10/7/2019

GENERAL REQUIREMENTS

1. 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. BOP/BOPE tests (minimum of 4 hours)

   ☒ 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

2. 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:
      i. Notify the BLM when moving in and removing the Spudder Rig.
      ii. 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.
      iii. BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
3. 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.
4. 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 available upon request. 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. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.
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. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.
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: The flex line must meet the requirements of API 16C. 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. 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.
   e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
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, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).
   c. The tests shall be done by an independent service company utilizing a test plug. The results of the test shall be reported to the appropriate BLM office.
   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. All tests are required to be recorded on a calibrated test chart and shall be made available upon request.

f. 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. This test shall be performed prior to the test at full stack pressure.

g. 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

1. 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

1. 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.
2. Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

AFMSS

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

APD Print Report

11/11/2019

APD ID: 10400042901 **Submission Date:** 06/18/2019

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

Well Name: STOVE PIPE FEDERAL COM **Well Number:** 704H

Show Final Text

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

Application

Section 1 - General

APD ID: 10400042901 **Tie to previous NOS?** **Submission Date:** 06/18/2019

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: NMNM132949 **Lease Acres:** 80.48

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 **Master Development Plan name:**

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

Operator Name: COG OPERATING LLC

Well Name: STOVE PIPE FEDERAL COM **Well Number:** 704H

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

Well Name: STOVE PIPE FEDERAL COM **Well Number:** 704H **Well API Number:**

Field/Pool or Exploratory? Field and Pool **Field Name:** MESA VERDE **Pool Name:** BONE SPRING

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

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:** STOVE PIPE FEDERAL COM **Number:** 602H, 703H, 704H, 705H

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: 9 Miles **Distance to nearest well:** 30 FT **Distance to lease line:** 50 FT

Reservoir well spacing assigned acres Measurement: 640.54 Acres

Well plat: COG_Stove_Pipe_704H_C102_20190618135204.pdf

Well work start Date: 10/01/2019 **Duration:** 30 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NAVD88

Survey number: **Reference Datum:**

Wellbore	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	Will this well produce
SHL Leg #1	270	FSL	1485	FWL	24S	35E	31	Aliquot SESW	32.167464	-103.410295	LEA	NEW MEXICO	NEW MEXICO	F	FEE	3328	0	0	
KOP Leg #1	270	FSL	1485	FWL	24S	35E	31	Aliquot SESW	32.167464	-103.410295	LEA	NEW MEXICO	NEW MEXICO	F	FEE	3328	0	0	

Operator Name: COG OPERATING LLC

Well Name: STOVE PIPE FEDERAL COM **Well Number:** 704H

Wellbore	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	Will this well produce
PPP Leg #1	100	FNL	1230	FWL	25S	35E	6	Lot 4	32.166448	-103.411115	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 132949	-9430	12800	12758	
PPP Leg #1	1321	FSL	1230	FWL	25S	35E	6	Lot 7	32.155827	-103.411133	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 120913	-9595	16800	12923	
EXIT Leg #1	100	FNL	1230	FWL	25S	35E	7	Lot 4	32.137963	-103.411161	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 119760	-9563	23486	12891	
BHL Leg #1	50	FSL	1230	FWL	25S	35E	7	Lot 4	32.137825	-103.411161	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 119760	-9611	23536	12939	

Drilling Plan

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1	UNKNOWN	3328	0	0		NONE	N
2	RUSTLER	2446	882	882		NONE	N
3	TOP SALT	1945	1383	1383	SALT	NONE	N
4	BOTTOM SALT	-1890	5218	5218	ANHYDRITE	NONE	N
5	LAMAR	-2184	5512	5512	LIMESTONE	NATURAL GAS,OIL	N
6	BELL CANYON	-2225	5553	5553		NONE	N
7	CHERRY CANYON	-3146	6474	6474		NATURAL GAS,OIL	N
8	BRUSHY CANYON	-4790	8118	8118		NATURAL GAS,OIL	N
9	BONE SPRING LIME	-6060	9388	9388	SANDSTONE	NATURAL GAS,OIL	N
10	BONE SPRING 1ST	-7250	10578	10578	HALITE	NATURAL GAS,OIL	N

Operator Name: COG OPERATING LLC

Well Name: STOVE PIPE FEDERAL COM **Well Number:** 704H

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
11	BONE SPRING 2ND	-7781	11109	11109		NATURAL GAS,OIL	N
12	BONE SPRING 3RD	-8880	12208	12208		NATURAL GAS,OIL	N
13	WOLFCAMP	-9320	12648	12648	SHALE	NATURAL GAS,OIL	N
14	WOLFCAMP	-9455	12783	12783		NATURAL GAS,OIL	Y
15	WOLFCAMP	-9670	12998	12998		NATURAL GAS,OIL	N

Section 2 - Blowout Prevention

Pressure Rating (PSI): 10M **Rating Depth:** 12939

Equipment: 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: Request a 5M annular variance on a 10M system. (5M variance attached in section 8). 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_Stove_Pipe_704H_10M_Choke_20190618140350.pdf

BOP Diagram Attachment:

COG_Stove_Pipe_704H_10M_BOP_20190618140358.pdf

COG_Stove_Pipe_704H_Flex_Hose_20190618140423.pdf

Pressure Rating (PSI): 5M **Rating Depth:** 12200

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: STOVE PIPE FEDERAL COM **Well Number:** 704H

Choke Diagram Attachment:

COG_Stove_Pipe_704H_5M_Choke_20190618140451.pdf

BOP Diagram Attachment:

COG_Stove_Pipe_704H_5M_BOP_20190618140458.pdf

COG_Stove_Pipe_704H_Flex_Hose_20190618140514.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	Body SF
1	SURFACE	17.5	13.375	NEW	API	N	0	1200	0	1200	-9411	-10581	1200	J-55	54.5	ST&C	2.11	6.29	DRY	7.86	DRY	7.
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	12200	0	12200	-9411	-21491	12200	HCL-80	47	OTHER - BTC	1.52	1.02	DRY	1.96	DRY	1.
3	PRODUCTION	8.75	5.5	NEW	API	N	0	23536	0	12939	-9411	-29318	23536	P-110	23	OTHER - BTC	1.73	2.04	DRY	2.43	DRY	2.

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

COG_Stove_Pipe_704H_Casing_Prog_20190618140614.pdf

Operator Name: COG OPERATING LLC

Well Name: STOVE PIPE FEDERAL COM **Well Number:** 704H

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

COG_Stove_Pipe_704H_Casing_Prog_20190618140622.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

COG_Stove_Pipe_704H_Casing_Prog_20190618140629.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	1200	530	1.75	13.5	927	50	Class C	4% Gel
SURFACE	Tail		0	1200	250	1.34	14.8	335	50	Class C	2% CaCl2
INTERMEDIATE	Lead	5530	0	12200	1000	2.8	11	2800	50	Stage 1: Lead NeoCem. Stage 2: Cementing attached in Section 8.	As needed

Operator Name: COG OPERATING LLC

Well Name: STOVE PIPE FEDERAL COM **Well Number:** 704H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
INTERMEDIATE	Tail		0	12200	300	1.1	16.4	330	50	Class H (Cementing attached in Section 8)	As needed
PRODUCTION	Lead		11200	23536	400	2	12.7	800	35	Lead: 35:65:6 H BLEND	As needed
PRODUCTION	Tail		11200	23536	3120	1.24	14.4	3868	35	Tail: 50:50:2 Class H Blend.	As needed

Section 5 - Circulating Medium

Mud System Type: Closed

Will 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
12200	23536	OIL-BASED MUD	10.5	12.5							OBM
0	1200	OTHER : FW Gel	8.4	8.6							FW Gel
1200	12200	OTHER : Diesel Brine Emulsion	8.6	8.9							Diesel Brine Emulsion

NORTHERN DELAWARE BASIN

LEA COUNTY, NM
BULLDOG
STOVE PIPE FEDERAL COM #704H

OWB

Plan: PWP1

Standard Survey Report

12 June, 2019

Survey Report

Company:	NORTHERN DELAWARE BASIN	**Local Co-ordinate Reference:**	Well STOVE PIPE FEDERAL COM #704H
Project:	LEA COUNTY, NM	**TVD Reference:**	RKB = 3330' + 30' @ 3358.4usft (Nabors 894)
Site:	BULLDOG	**MD Reference:**	RKB = 3330' + 30' @ 3358.4usft (Nabors 894)
Well:	STOVE PIPE FEDERAL COM #704H	**North Reference:**	Grid
Wellbore:	OWB	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP1	**Database:**	EDM_Users

Project	LEA COUNTY, NM		
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 BULLDOG

Site Position:		**Northing:**	398,637.10 usft	**Latitude:**	32° 5' 36.820 N
From:	Map	**Easting:**	741,887.40 usft	**Longitude:**	103° 33' 8.116 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.42 °

Well STOVE PIPE FEDERAL COM #704H

Well Position	**+N/-S**	0.0 usft	**Northing:**	425,824.80 usft	**Latitude:**	32° 10' 2.419 N
	+E/-W	0.0 usft	**Easting:**	785,766.50 usft	**Longitude:**	103° 24' 35.375 W
Position Uncertainty		3.0 usft	**Wellhead Elevation:**	usft	**Ground Level:**	3,328.4 usft

Wellbore OWB

Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	WMM2015	2/4/2019	6.73	59.99	47,737.71643874

Design PWP1

Audit Notes:

Version:		**Phase:**	PLAN	**Tie On Depth:**	0.0

Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**
	0.0	0.0	0.0	180.94

Survey Tool Program **Date** 6/12/2019

From (usft)	**To (usft)**	**Survey (Wellbore)**	**Tool Name**	**Description**
0.0	12,365.0	PWP1 (OWB)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4
12,365.0	23,536.1	PWP1 (OWB)	MWD+IFR1+MS	OWSG MWD + IFR1 + Multi-Station Correction

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)**
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00

Survey Report

Company:	NORTHERN DELAWARE BASIN	**Local Co-ordinate Reference:**	Well STOVE PIPE FEDERAL COM #704H
Project:	LEA COUNTY, NM	**TVD Reference:**	RKB = 3330' + 30' @ 3358.4usft (Nabors 894)
Site:	BULLDOG	**MD Reference:**	RKB = 3330' + 30' @ 3358.4usft (Nabors 894)
Well:	STOVE PIPE FEDERAL COM #704H	**North Reference:**	Grid
Wellbore:	OWB	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP1	**Database:**	EDM_Users

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)
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	0.00
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	0.00
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	0.00
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	0.00
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00
5,100.0	0.00	0.00	5,100.0	0.0	0.0	0.0	0.00	0.00	0.00
5,200.0	0.00	0.00	5,200.0	0.0	0.0	0.0	0.00	0.00	0.00

Survey Report

Company:	NORTHERN DELAWARE BASIN	**Local Co-ordinate Reference:**	Well STOVE PIPE FEDERAL COM #704H
Project:	LEA COUNTY, NM	**TVD Reference:**	RKB = 3330' + 30' @ 3358.4usft (Nabors 894)
Site:	BULLDOG	**MD Reference:**	RKB = 3330' + 30' @ 3358.4usft (Nabors 894)
Well:	STOVE PIPE FEDERAL COM #704H	**North Reference:**	Grid
Wellbore:	OWB	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP1	**Database:**	EDM_Users

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,300.0	0.00	0.00	5,300.0	0.0	0.0	0.0	0.00	0.00	0.00
5,400.0	0.00	0.00	5,400.0	0.0	0.0	0.0	0.00	0.00	0.00
5,500.0	0.00	0.00	5,500.0	0.0	0.0	0.0	0.00	0.00	0.00
Start Build 2.00									
5,568.2	1.36	288.20	5,568.2	0.3	-0.8	-0.2	2.00	2.00	0.00
Start 6797.1 hold at 5568.2 MD									
5,600.0	1.36	288.20	5,600.0	0.5	-1.5	-0.5	0.00	0.00	0.00
5,700.0	1.36	288.20	5,700.0	1.2	-3.8	-1.2	0.00	0.00	0.00
5,800.0	1.36	288.20	5,799.9	2.0	-6.0	-1.9	0.00	0.00	0.00
5,900.0	1.36	288.20	5,899.9	2.7	-8.3	-2.6	0.00	0.00	0.00
6,000.0	1.36	288.20	5,999.9	3.5	-10.5	-3.3	0.00	0.00	0.00
6,100.0	1.36	288.20	6,099.8	4.2	-12.8	-4.0	0.00	0.00	0.00
6,200.0	1.36	288.20	6,199.8	4.9	-15.1	-4.7	0.00	0.00	0.00
6,300.0	1.36	288.20	6,299.8	5.7	-17.3	-5.4	0.00	0.00	0.00
6,400.0	1.36	288.20	6,399.8	6.4	-19.6	-6.1	0.00	0.00	0.00
6,500.0	1.36	288.20	6,499.7	7.2	-21.8	-6.8	0.00	0.00	0.00
6,600.0	1.36	288.20	6,599.7	7.9	-24.1	-7.5	0.00	0.00	0.00
6,700.0	1.36	288.20	6,699.7	8.7	-26.4	-8.2	0.00	0.00	0.00
6,800.0	1.36	288.20	6,799.6	9.4	-28.6	-8.9	0.00	0.00	0.00
6,900.0	1.36	288.20	6,899.6	10.2	-30.9	-9.6	0.00	0.00	0.00
7,000.0	1.36	288.20	6,999.6	10.9	-33.1	-10.4	0.00	0.00	0.00
7,100.0	1.36	288.20	7,099.6	11.6	-35.4	-11.1	0.00	0.00	0.00
7,200.0	1.36	288.20	7,199.5	12.4	-37.7	-11.8	0.00	0.00	0.00
7,300.0	1.36	288.20	7,299.5	13.1	-39.9	-12.5	0.00	0.00	0.00
7,400.0	1.36	288.20	7,399.5	13.9	-42.2	-13.2	0.00	0.00	0.00
7,500.0	1.36	288.20	7,499.4	14.6	-44.4	-13.9	0.00	0.00	0.00
7,600.0	1.36	288.20	7,599.4	15.4	-46.7	-14.6	0.00	0.00	0.00
7,700.0	1.36	288.20	7,699.4	16.1	-49.0	-15.3	0.00	0.00	0.00
7,800.0	1.36	288.20	7,799.4	16.8	-51.2	-16.0	0.00	0.00	0.00
7,900.0	1.36	288.20	7,899.3	17.6	-53.5	-16.7	0.00	0.00	0.00
8,000.0	1.36	288.20	7,999.3	18.3	-55.8	-17.4	0.00	0.00	0.00
8,100.0	1.36	288.20	8,099.3	19.1	-58.0	-18.1	0.00	0.00	0.00
8,200.0	1.36	288.20	8,199.2	19.8	-60.3	-18.8	0.00	0.00	0.00
8,300.0	1.36	288.20	8,299.2	20.6	-62.5	-19.5	0.00	0.00	0.00
8,400.0	1.36	288.20	8,399.2	21.3	-64.8	-20.2	0.00	0.00	0.00
8,500.0	1.36	288.20	8,499.2	22.0	-67.1	-20.9	0.00	0.00	0.00
8,600.0	1.36	288.20	8,599.1	22.8	-69.3	-21.7	0.00	0.00	0.00
8,700.0	1.36	288.20	8,699.1	23.5	-71.6	-22.4	0.00	0.00	0.00
8,800.0	1.36	288.20	8,799.1	24.3	-73.8	-23.1	0.00	0.00	0.00
8,900.0	1.36	288.20	8,899.0	25.0	-76.1	-23.8	0.00	0.00	0.00
9,000.0	1.36	288.20	8,999.0	25.8	-78.4	-24.5	0.00	0.00	0.00
9,100.0	1.36	288.20	9,099.0	26.5	-80.6	-25.2	0.00	0.00	0.00
9,200.0	1.36	288.20	9,199.0	27.2	-82.9	-25.9	0.00	0.00	0.00
9,300.0	1.36	288.20	9,298.9	28.0	-85.1	-26.6	0.00	0.00	0.00

Survey Report

Company:	NORTHERN DELAWARE BASIN	**Local Co-ordinate Reference:**	Well STOVE PIPE FEDERAL COM #704H
Project:	LEA COUNTY, NM	**TVD Reference:**	RKB = 3330' + 30' @ 3358.4usft (Nabors 894)
Site:	BULLDOG	**MD Reference:**	RKB = 3330' + 30' @ 3358.4usft (Nabors 894)
Well:	STOVE PIPE FEDERAL COM #704H	**North Reference:**	Grid
Wellbore:	OWB	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP1	**Database:**	EDM_Users

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)
9,400.0	1.36	288.20	9,398.9	28.7	-87.4	-27.3	0.00	0.00	0.00
9,500.0	1.36	288.20	9,498.9	29.5	-89.7	-28.0	0.00	0.00	0.00
9,600.0	1.36	288.20	9,598.9	30.2	-91.9	-28.7	0.00	0.00	0.00
9,700.0	1.36	288.20	9,698.8	31.0	-94.2	-29.4	0.00	0.00	0.00
9,800.0	1.36	288.20	9,798.8	31.7	-96.4	-30.1	0.00	0.00	0.00
9,900.0	1.36	288.20	9,898.8	32.4	-98.7	-30.8	0.00	0.00	0.00
10,000.0	1.36	288.20	9,998.7	33.2	-101.0	-31.5	0.00	0.00	0.00
10,100.0	1.36	288.20	10,098.7	33.9	-103.2	-32.2	0.00	0.00	0.00
10,200.0	1.36	288.20	10,198.7	34.7	-105.5	-33.0	0.00	0.00	0.00
10,300.0	1.36	288.20	10,298.7	35.4	-107.8	-33.7	0.00	0.00	0.00
10,400.0	1.36	288.20	10,398.6	36.2	-110.0	-34.4	0.00	0.00	0.00
10,500.0	1.36	288.20	10,498.6	36.9	-112.3	-35.1	0.00	0.00	0.00
10,600.0	1.36	288.20	10,598.6	37.7	-114.5	-35.8	0.00	0.00	0.00
10,700.0	1.36	288.20	10,698.5	38.4	-116.8	-36.5	0.00	0.00	0.00
10,800.0	1.36	288.20	10,798.5	39.1	-119.1	-37.2	0.00	0.00	0.00
10,900.0	1.36	288.20	10,898.5	39.9	-121.3	-37.9	0.00	0.00	0.00
11,000.0	1.36	288.20	10,998.5	40.6	-123.6	-38.6	0.00	0.00	0.00
11,100.0	1.36	288.20	11,098.4	41.4	-125.8	-39.3	0.00	0.00	0.00
11,200.0	1.36	288.20	11,198.4	42.1	-128.1	-40.0	0.00	0.00	0.00
11,300.0	1.36	288.20	11,298.4	42.9	-130.4	-40.7	0.00	0.00	0.00
11,400.0	1.36	288.20	11,398.3	43.6	-132.6	-41.4	0.00	0.00	0.00
11,500.0	1.36	288.20	11,498.3	44.3	-134.9	-42.1	0.00	0.00	0.00
11,600.0	1.36	288.20	11,598.3	45.1	-137.1	-42.8	0.00	0.00	0.00
11,700.0	1.36	288.20	11,698.3	45.8	-139.4	-43.5	0.00	0.00	0.00
11,800.0	1.36	288.20	11,798.2	46.6	-141.7	-44.2	0.00	0.00	0.00
11,900.0	1.36	288.20	11,898.2	47.3	-143.9	-45.0	0.00	0.00	0.00
12,000.0	1.36	288.20	11,998.2	48.1	-146.2	-45.7	0.00	0.00	0.00
12,100.0	1.36	288.20	12,098.1	48.8	-148.5	-46.4	0.00	0.00	0.00
12,200.0	1.36	288.20	12,198.1	49.5	-150.7	-47.1	0.00	0.00	0.00
12,300.0	1.36	288.20	12,298.1	50.3	-153.0	-47.8	0.00	0.00	0.00
12,365.3	1.36	288.20	12,363.4	50.8	-154.4	-48.2	0.00	0.00	0.00
Start DLS 10.00 TFO -101.99									
12,400.0	3.45	208.90	12,398.0	50.0	-155.3	-47.4	10.00	6.02	-228.54
12,500.0	13.25	191.88	12,496.9	36.1	-159.2	-33.5	10.00	9.80	-17.02
12,600.0	23.22	189.32	12,591.7	5.3	-164.7	-2.7	10.00	9.97	-2.56
12,700.0	33.21	188.24	12,679.7	-41.3	-171.9	44.1	10.00	9.99	-1.07
12,800.0	43.20	187.63	12,758.2	-102.5	-180.4	105.4	10.00	9.99	-0.62
12,900.0	53.20	187.20	12,824.8	-176.3	-190.0	179.4	10.00	10.00	-0.42
13,000.0	63.19	186.88	12,877.4	-260.6	-200.3	263.8	10.00	10.00	-0.32
13,100.0	73.19	186.61	12,914.5	-352.7	-211.2	356.1	10.00	10.00	-0.27
13,200.0	83.19	186.37	12,935.0	-449.8	-222.3	453.4	10.00	10.00	-0.24
13,270.8	90.26	186.20	12,939.0	-520.0	-230.0	523.7	10.00	10.00	-0.23
Start DLS 2.00 TFO -89.95									

Survey Report

Company:	NORTHERN DELAWARE BASIN	**Local Co-ordinate Reference:**	Well STOVE PIPE FEDERAL COM #704H
Project:	LEA COUNTY, NM	**TVD Reference:**	RKB = 3330' + 30' @ 3358.4usft (Nabors 894)
Site:	BULLDOG	**MD Reference:**	RKB = 3330' + 30' @ 3358.4usft (Nabors 894)
Well:	STOVE PIPE FEDERAL COM #704H	**North Reference:**	Grid
Wellbore:	OWB	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP1	**Database:**	EDM_Users

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)
13,300.0	90.26	185.62	12,938.9	-549.1	-233.0	552.8	2.00	0.00	-2.00
13,400.0	90.27	183.62	12,938.4	-648.7	-241.1	652.6	2.00	0.00	-2.00
13,500.0	90.27	181.62	12,937.9	-748.6	-245.6	752.5	2.00	0.00	-2.00
13,600.0	90.27	179.62	12,937.5	-848.6	-246.7	852.5	2.00	0.00	-2.00
13,601.1	90.27	179.59	12,937.5	-849.7	-246.7	853.7	2.00	0.00	-2.00
Start 9935.0 hold at 13601.1 MD									
13,700.0	90.27	179.59	12,937.0	-948.6	-246.0	952.5	0.00	0.00	0.00
13,800.0	90.27	179.59	12,936.5	-1,048.6	-245.3	1,052.5	0.00	0.00	0.00
13,900.0	90.27	179.59	12,936.1	-1,148.6	-244.6	1,152.4	0.00	0.00	0.00
14,000.0	90.27	179.59	12,935.6	-1,248.6	-243.8	1,252.4	0.00	0.00	0.00
14,100.0	90.27	179.59	12,935.1	-1,348.6	-243.1	1,352.4	0.00	0.00	0.00
14,200.0	90.27	179.59	12,934.7	-1,448.6	-242.4	1,452.4	0.00	0.00	0.00
14,300.0	90.27	179.59	12,934.2	-1,548.6	-241.7	1,552.3	0.00	0.00	0.00
14,400.0	90.27	179.59	12,933.7	-1,648.6	-241.0	1,652.3	0.00	0.00	0.00
14,500.0	90.27	179.59	12,933.3	-1,748.6	-240.3	1,752.3	0.00	0.00	0.00
14,600.0	90.27	179.59	12,932.8	-1,848.6	-239.6	1,852.2	0.00	0.00	0.00
14,700.0	90.27	179.59	12,932.3	-1,948.6	-238.9	1,952.2	0.00	0.00	0.00
14,800.0	90.27	179.59	12,931.9	-2,048.6	-238.2	2,052.2	0.00	0.00	0.00
14,900.0	90.27	179.59	12,931.4	-2,148.6	-237.5	2,152.2	0.00	0.00	0.00
15,000.0	90.27	179.59	12,930.9	-2,248.6	-236.7	2,252.1	0.00	0.00	0.00
15,100.0	90.27	179.59	12,930.5	-2,348.6	-236.0	2,352.1	0.00	0.00	0.00
15,200.0	90.27	179.59	12,930.0	-2,448.6	-235.3	2,452.1	0.00	0.00	0.00
15,300.0	90.27	179.59	12,929.5	-2,548.6	-234.6	2,552.0	0.00	0.00	0.00
15,400.0	90.27	179.59	12,929.1	-2,648.5	-233.9	2,652.0	0.00	0.00	0.00
15,500.0	90.27	179.59	12,928.6	-2,748.5	-233.2	2,752.0	0.00	0.00	0.00
15,600.0	90.27	179.59	12,928.1	-2,848.5	-232.5	2,852.0	0.00	0.00	0.00
15,700.0	90.27	179.59	12,927.6	-2,948.5	-231.8	2,951.9	0.00	0.00	0.00
15,800.0	90.27	179.59	12,927.2	-3,048.5	-231.1	3,051.9	0.00	0.00	0.00
15,900.0	90.27	179.59	12,926.7	-3,148.5	-230.4	3,151.9	0.00	0.00	0.00
16,000.0	90.27	179.59	12,926.2	-3,248.5	-229.6	3,251.8	0.00	0.00	0.00
16,100.0	90.27	179.59	12,925.8	-3,348.5	-228.9	3,351.8	0.00	0.00	0.00
16,200.0	90.27	179.59	12,925.3	-3,448.5	-228.2	3,451.8	0.00	0.00	0.00
16,300.0	90.27	179.59	12,924.8	-3,548.5	-227.5	3,551.8	0.00	0.00	0.00
16,400.0	90.27	179.59	12,924.4	-3,648.5	-226.8	3,651.7	0.00	0.00	0.00
16,500.0	90.27	179.59	12,923.9	-3,748.5	-226.1	3,751.7	0.00	0.00	0.00
16,600.0	90.27	179.59	12,923.4	-3,848.5	-225.4	3,851.7	0.00	0.00	0.00
16,700.0	90.27	179.59	12,923.0	-3,948.5	-224.7	3,951.6	0.00	0.00	0.00
16,800.0	90.27	179.59	12,922.5	-4,048.5	-224.0	4,051.6	0.00	0.00	0.00
16,900.0	90.27	179.59	12,922.0	-4,148.5	-223.2	4,151.6	0.00	0.00	0.00
17,000.0	90.27	179.59	12,921.6	-4,248.5	-222.5	4,251.6	0.00	0.00	0.00
17,100.0	90.27	179.59	12,921.1	-4,348.5	-221.8	4,351.5	0.00	0.00	0.00
17,200.0	90.27	179.59	12,920.6	-4,448.5	-221.1	4,451.5	0.00	0.00	0.00
17,300.0	90.27	179.59	12,920.2	-4,548.5	-220.4	4,551.5	0.00	0.00	0.00
17,400.0	90.27	179.59	12,919.7	-4,648.5	-219.7	4,651.4	0.00	0.00	0.00

Survey Report

Company:	NORTHERN DELAWARE BASIN	**Local Co-ordinate Reference:**	Well STOVE PIPE FEDERAL COM #704H
Project:	LEA COUNTY, NM	**TVD Reference:**	RKB = 3330' + 30' @ 3358.4usft (Nabors 894)
Site:	BULLDOG	**MD Reference:**	RKB = 3330' + 30' @ 3358.4usft (Nabors 894)
Well:	STOVE PIPE FEDERAL COM #704H	**North Reference:**	Grid
Wellbore:	OWB	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP1	**Database:**	EDM_Users

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)
17,500.0	90.27	179.59	12,919.2	-4,748.5	-219.0	4,751.4	0.00	0.00	0.00
17,600.0	90.27	179.59	12,918.8	-4,848.5	-218.3	4,851.4	0.00	0.00	0.00
17,700.0	90.27	179.59	12,918.3	-4,948.5	-217.6	4,951.4	0.00	0.00	0.00
17,800.0	90.27	179.59	12,917.8	-5,048.5	-216.9	5,051.3	0.00	0.00	0.00
17,900.0	90.27	179.59	12,917.4	-5,148.5	-216.1	5,151.3	0.00	0.00	0.00
18,000.0	90.27	179.59	12,916.9	-5,248.5	-215.4	5,251.3	0.00	0.00	0.00
18,100.0	90.27	179.59	12,916.4	-5,348.5	-214.7	5,351.2	0.00	0.00	0.00
18,200.0	90.27	179.59	12,916.0	-5,448.4	-214.0	5,451.2	0.00	0.00	0.00
18,300.0	90.27	179.59	12,915.5	-5,548.4	-213.3	5,551.2	0.00	0.00	0.00
18,400.0	90.27	179.59	12,915.0	-5,648.4	-212.6	5,651.2	0.00	0.00	0.00
18,500.0	90.27	179.59	12,914.6	-5,748.4	-211.9	5,751.1	0.00	0.00	0.00
18,600.0	90.27	179.59	12,914.1	-5,848.4	-211.2	5,851.1	0.00	0.00	0.00
18,700.0	90.27	179.59	12,913.6	-5,948.4	-210.5	5,951.1	0.00	0.00	0.00
18,800.0	90.27	179.59	12,913.1	-6,048.4	-209.7	6,051.0	0.00	0.00	0.00
18,900.0	90.27	179.59	12,912.7	-6,148.4	-209.0	6,151.0	0.00	0.00	0.00
19,000.0	90.27	179.59	12,912.2	-6,248.4	-208.3	6,251.0	0.00	0.00	0.00
19,100.0	90.27	179.59	12,911.7	-6,348.4	-207.6	6,351.0	0.00	0.00	0.00
19,200.0	90.27	179.59	12,911.3	-6,448.4	-206.9	6,450.9	0.00	0.00	0.00
19,300.0	90.27	179.59	12,910.8	-6,548.4	-206.2	6,550.9	0.00	0.00	0.00
19,400.0	90.27	179.59	12,910.3	-6,648.4	-205.5	6,650.9	0.00	0.00	0.00
19,500.0	90.27	179.59	12,909.9	-6,748.4	-204.8	6,750.8	0.00	0.00	0.00
19,600.0	90.27	179.59	12,909.4	-6,848.4	-204.1	6,850.8	0.00	0.00	0.00
19,700.0	90.27	179.59	12,908.9	-6,948.4	-203.4	6,950.8	0.00	0.00	0.00
19,800.0	90.27	179.59	12,908.5	-7,048.4	-202.6	7,050.8	0.00	0.00	0.00
19,900.0	90.27	179.59	12,908.0	-7,148.4	-201.9	7,150.7	0.00	0.00	0.00
20,000.0	90.27	179.59	12,907.5	-7,248.4	-201.2	7,250.7	0.00	0.00	0.00
20,100.0	90.27	179.59	12,907.1	-7,348.4	-200.5	7,350.7	0.00	0.00	0.00
20,200.0	90.27	179.59	12,906.6	-7,448.4	-199.8	7,450.6	0.00	0.00	0.00
20,300.0	90.27	179.59	12,906.1	-7,548.4	-199.1	7,550.6	0.00	0.00	0.00
20,400.0	90.27	179.59	12,905.7	-7,648.4	-198.4	7,650.6	0.00	0.00	0.00
20,500.0	90.27	179.59	12,905.2	-7,748.4	-197.7	7,750.6	0.00	0.00	0.00
20,600.0	90.27	179.59	12,904.7	-7,848.4	-197.0	7,850.5	0.00	0.00	0.00
20,700.0	90.27	179.59	12,904.3	-7,948.4	-196.2	7,950.5	0.00	0.00	0.00
20,800.0	90.27	179.59	12,903.8	-8,048.4	-195.5	8,050.5	0.00	0.00	0.00
20,900.0	90.27	179.59	12,903.3	-8,148.3	-194.8	8,150.4	0.00	0.00	0.00
21,000.0	90.27	179.59	12,902.9	-8,248.3	-194.1	8,250.4	0.00	0.00	0.00
21,100.0	90.27	179.59	12,902.4	-8,348.3	-193.4	8,350.4	0.00	0.00	0.00
21,200.0	90.27	179.59	12,901.9	-8,448.3	-192.7	8,450.4	0.00	0.00	0.00
21,300.0	90.27	179.59	12,901.5	-8,548.3	-192.0	8,550.3	0.00	0.00	0.00
21,400.0	90.27	179.59	12,901.0	-8,648.3	-191.3	8,650.3	0.00	0.00	0.00
21,500.0	90.27	179.59	12,900.5	-8,748.3	-190.6	8,750.3	0.00	0.00	0.00
21,600.0	90.27	179.59	12,900.1	-8,848.3	-189.9	8,850.2	0.00	0.00	0.00
21,700.0	90.27	179.59	12,899.6	-8,948.3	-189.1	8,950.2	0.00	0.00	0.00

Survey Report

Company:	NORTHERN DELAWARE BASIN	**Local Co-ordinate Reference:**	Well STOVE PIPE FEDERAL COM #704H
Project:	LEA COUNTY, NM	**TVD Reference:**	RKB = 3330' + 30' @ 3358.4usft (Nabors 894)
Site:	BULLDOG	**MD Reference:**	RKB = 3330' + 30' @ 3358.4usft (Nabors 894)
Well:	STOVE PIPE FEDERAL COM #704H	**North Reference:**	Grid
Wellbore:	OWB	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP1	**Database:**	EDM_Users

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)
21,800.0	90.27	179.59	12,899.1	-9,048.3	-188.4	9,050.2	0.00	0.00	0.00
21,900.0	90.27	179.59	12,898.7	-9,148.3	-187.7	9,150.2	0.00	0.00	0.00
22,000.0	90.27	179.59	12,898.2	-9,248.3	-187.0	9,250.1	0.00	0.00	0.00
22,100.0	90.27	179.59	12,897.7	-9,348.3	-186.3	9,350.1	0.00	0.00	0.00
22,200.0	90.27	179.59	12,897.2	-9,448.3	-185.6	9,450.1	0.00	0.00	0.00
22,300.0	90.27	179.59	12,896.8	-9,548.3	-184.9	9,550.0	0.00	0.00	0.00
22,400.0	90.27	179.59	12,896.3	-9,648.3	-184.2	9,650.0	0.00	0.00	0.00
22,500.0	90.27	179.59	12,895.8	-9,748.3	-183.5	9,750.0	0.00	0.00	0.00
22,600.0	90.27	179.59	12,895.4	-9,848.3	-182.8	9,850.0	0.00	0.00	0.00
22,700.0	90.27	179.59	12,894.9	-9,948.3	-182.0	9,949.9	0.00	0.00	0.00
22,800.0	90.27	179.59	12,894.4	-10,048.3	-181.3	10,049.9	0.00	0.00	0.00
22,900.0	90.27	179.59	12,894.0	-10,148.3	-180.6	10,149.9	0.00	0.00	0.00
23,000.0	90.27	179.59	12,893.5	-10,248.3	-179.9	10,249.8	0.00	0.00	0.00
23,100.0	90.27	179.59	12,893.0	-10,348.3	-179.2	10,349.8	0.00	0.00	0.00
23,200.0	90.27	179.59	12,892.6	-10,448.3	-178.5	10,449.8	0.00	0.00	0.00
23,300.0	90.27	179.59	12,892.1	-10,548.3	-177.8	10,549.8	0.00	0.00	0.00
23,400.0	90.27	179.59	12,891.6	-10,648.3	-177.1	10,649.7	0.00	0.00	0.00
23,500.0	90.27	179.59	12,891.2	-10,748.3	-176.4	10,749.7	0.00	0.00	0.00
23,536.1	90.27	179.59	12,891.0	-10,784.4	-176.1	10,785.8	0.00	0.00	0.00
TD at 23536.1									

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
LTP (STOVE PIPE FE	0.00	0.00	12,891.0	-10,734.4	-176.5	415,090.40	785,590.00	32° 8' 16.215 N	103° 24' 38.498 W
- plan misses target center by 0.2usft at 23486.1usft MD (12891.2 TVD, -10734.4 N, -176.5 E)									
- Point									
PBHL (STOVE PIPE I	0.00	0.00	12,891.0	-10,784.4	-176.1	415,040.40	785,590.40	32° 8' 15.720 N	103° 24' 38.499 W
- plan hits target center									
- Point									
FTP (STOVE PIPE FE	0.00	0.00	12,939.0	-371.9	-250.7	425,452.90	785,515.80	32° 9' 58.760 N	103° 24' 38.328 W
- plan misses target center by 40.9usft at 13128.1usft MD (12922.0 TVD, -379.6 N, -214.3 E)									
- Circle (radius 50.0)									

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
5500	5500	0	0	Start Build 2.00
5568	5568	0	-1	Start 6797.1 hold at 5568.2 MD
12,365	12,363	51	-154	Start DLS 10.00 TFO -101.99
13,271	12,939	-520	-230	Start DLS 2.00 TFO -89.95
13,601	12,937	-850	-247	Start 9935.0 hold at 13601.1 MD
23,536	12,891	-10,784	-176	TD at 23536.1

Survey Report

Company:	NORTHERN DELAWARE BASIN	**Local Co-ordinate Reference:**	Well STOVE PIPE FEDERAL COM #704H
Project:	LEA COUNTY, NM	**TVD Reference:**	RKB = 3330' + 30' @ 3358.4usft (Nabors 894)
Site:	BULLDOG	**MD Reference:**	RKB = 3330' + 30' @ 3358.4usft (Nabors 894)
Well:	STOVE PIPE FEDERAL COM #704H	**North Reference:**	Grid
Wellbore:	OWB	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP1	**Database:**	EDM_Users

Checked By: _____ Approved By: _____ Date: _____

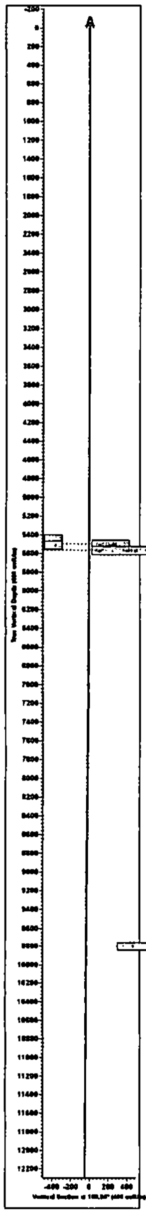
Project: LEA COUNTY, NM
Site: BULLDOG
Well: STOVE PIPE FEDERAL COM #704H
Wellbore: OWB
Design: PWP1
GL: 3328.4
RKB = 3330' + 30' @ 3358.4usft (Nabors 894)

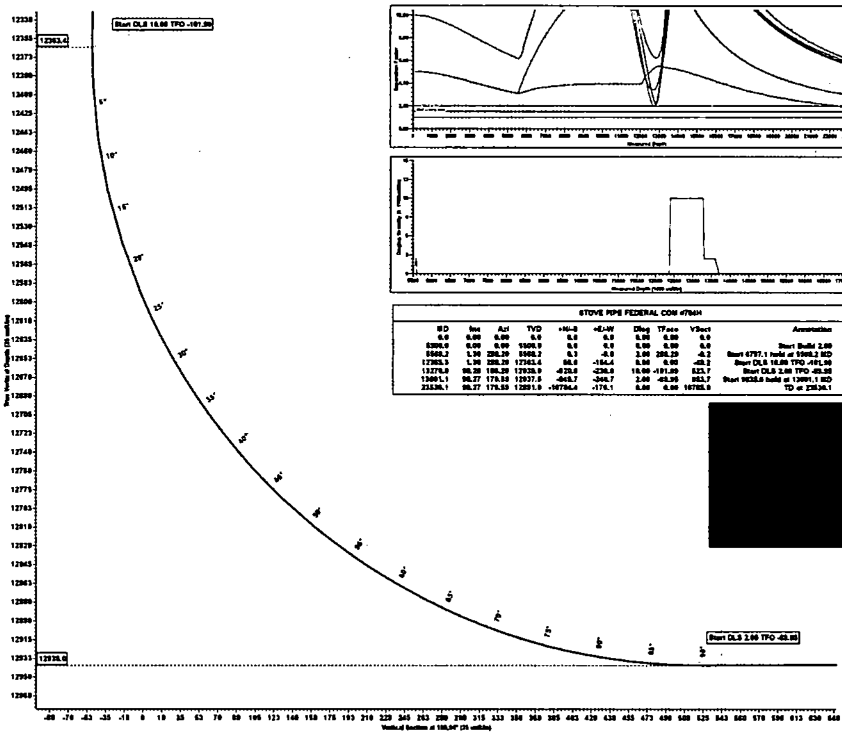
WELL DETAILS: STOVE PIPE FEDERAL COM #704H

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	425824.00	785706.00	32° 10' 2.410 N	103° 34' 38.375 W

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
LTP (STOVE PIPE FEDERAL COM #704H)	12891.0	-16734.4	-176.8	416090.40	785530.00	32° 8' 16.215 N	103° 34' 38.490 W
PBHL (STOVE PIPE FEDERAL COM #704H)	12891.0	-16784.4	-176.1	416040.40	785530.40	32° 8' 15.720 N	103° 34' 38.490 W
FTP (STOVE PIPE FEDERAL COM #704H)	12939.0	-371.0	-250.7	425453.00	785515.00	32° 9' 58.700 N	103° 34' 38.379 W

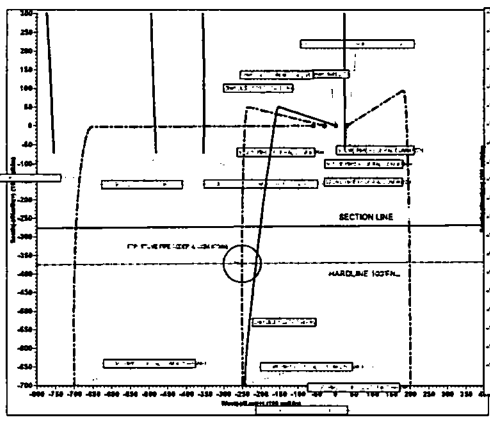


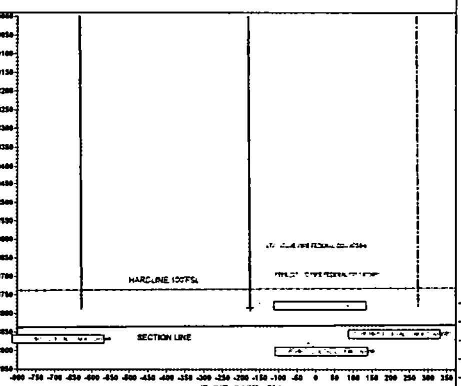


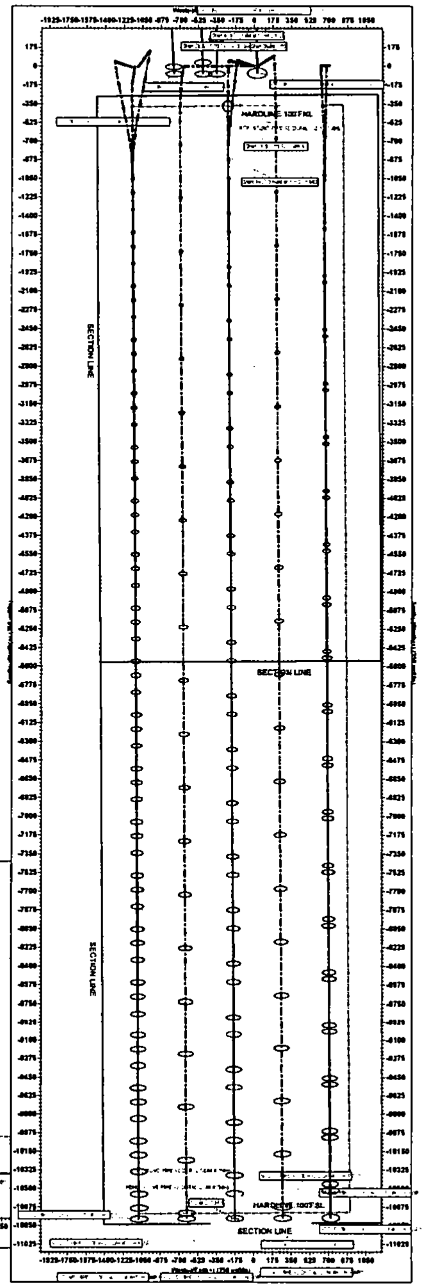
STOVE PIPE FEDERAL COM #704H

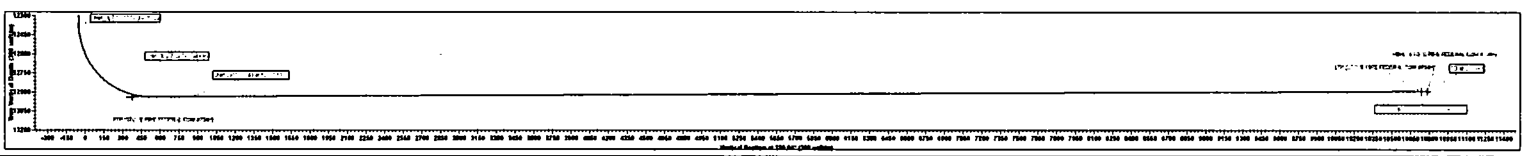
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
5500.0	0.00	0.00	5500.0	0.0	0.0	0.00	0.00	0.0	Start Build 2.00
5560.2	1.30	288.29	5560.2	0.1	-0.0	2.00	288.29	-0.2	Start 6797.1 hold at 5560.2 MD
12363.3	1.30	288.29	12363.4	64.0	-164.4	0.00	0.00	-42.2	Start DLS 10.00 TFO -101.90
13278.0	90.28	180.28	12938.9	-820.8	-230.8	10.00	-101.90	523.7	Start DLS 2.00 TFO -83.96
13601.1	90.27	179.55	12937.5	-843.7	-340.7	2.00	-83.96	883.7	Start 9935.0 hold at 13601.1 MD
23536.1	90.27	179.55	12891.0	-16784.4	-176.1	0.00	0.00	16785.9	TD at 23536.1

[redacted]









COG Operating, LLC - Stove Pipe Federal Com #704H

1. Geologic Formations

TVD of target	12,939'	Pilot hole depth	NA
MD at TD:	23,536'	Deepest expected fresh water:	300'

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Quaternary Fill	Surface	Water	
Rustler	882	Water	
Top of Salt	1383	Salt	
Base of Salt	5218	Salt	
Lamar	5512	Salt Water	
Bell Canyon	5553	Salt Water	
Cherry Canyon	6474	Oil/Gas	
Brushy Canyon	8118	Oil/Gas	
Bone Spring Lime	9388	Oil/Gas	
1st Bone Spring Sand	10578	Oil/Gas	
2nd Bone Spring Sand	11109	Oil/Gas	
3rd Bone Spring Sand	12208	Oil/Gas	
Wolfcamp	12648	Oil/Gas	
Wolfcamp A Shale	12783	Target Oil/Gas	
Wolfcamp B	12998	Not Penetrated	

2. Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
	From	To							
17.5"	0	1200	13.375"	54.5	J55	STC	2.11	6.29	7.86
12.25"	0	12200	9.625"	47	HCL80	BTC	1.52	1.02	1.96
8.75"	0	23,536	5.5"	23	P110	BTC	1.73	2.04	2.43
			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 - Stove Pipe Federal Com #704H

	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_20 gal/sk	500# Comp. Strength (hours)	Slurry Description
Surf.	530	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	1000	11	2.8	19	48	Lead: NeoCem
	300	16.4	1.1	5	8	Tail: Class H
DV Tool @ 5530'						
Inter. Stage2	770	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
	3120	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	11,200'	35%

COG Operating, LLC - Stove Pipe Federal Com #704H

4. Pressure Control Equipment

Y	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"	5M	Annular	x	2500 psi
			Blind Ram	x	5M
			Pipe Ram	x	
			Double Ram		
			Other*		
8-3/4"	13-5/8"	10M	5M Annular	x	5000 psi
			Blind Ram	x	10M
			Pipe Ram	x	
			Double Ram		
			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 - 8.9	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	8415 psi at 12939' TVD
Abnormal Temperature	NO 185 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
x	5M Annular Variance