


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**

|  |                                       |   |
|--|---------------------------------------|---|
| 1a. Type of work: <input type="checkbox"/> DRILL <input type="checkbox"/> REENTER<br>1b. Type of Well: <input type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other<br>1c. Type of Completion: <input type="checkbox"/> Hydraulic Fracturing <input type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone |                                       | 5. Lease Serial No.<br><br>6. If Indian, Allottee or Tribe Name<br><br>7. If Unit or CA Agreement, Name and No.<br><br>8. Lease Name and Well No. |
| 2. Name of Operator  |                                       | 9. API Well No. <b>30 015 47580</b>   |
| 3a. Address  | 3b. Phone No. (include area code)     | 10. Field and Pool, or Exploratory<br>                         |
| 4. Location of Well (Report location clearly and in accordance with any State requirements. *)<br>At surface<br>At proposed prod. zone   |                                       | 11. Sec., T. R. M. or Blk. and Survey or Area   |
| 14. Distance in miles and direction from nearest town or post office*  |                                       | 12. County or Parish  |
| 13. State  |                                       |   |
| 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   |
| 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  |
| 21. Elevations (Show whether DF, KDB, RT, GL, etc.)  | 22. Approximate date work will start* | 23. Estimated duration  |
| 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.<br>2. A Drilling Plan.<br>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).<br>5. Operator certification.<br>6. Such other site specific information and/or plans as may be requested by the BLM. |
|---|---|

|                         |                      |      |
|-------------------------|----------------------|------|
| 25. Signature           | Name (Printed/Typed) | Date |
| Title                   |                      |      |
| Approved by (Signature) | Name (Printed/Typed) | Date |
| Title                   |                      |      |
| Office                  |                      |      |

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.  
Conditions of approval, if any, are attached.

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.

Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system

- Will require a directional survey with the C-104

Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string

APPROVED WITH CONDITIONS

SL  
(Continued on page 2)

KP 10/19/2020 GEO Review

\*(Instructions on page 2)

Approval Date: 10/08/2020

Entered - KMS NMOC

DISTRICT I  
1625 N. FRENCH DR., HOBBS, NM 88240  
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II  
811 S. FIRST ST., ARTESIA, NM 88210  
Phone: (575) 748-1283 Fax: (575) 748-9720

DISTRICT III  
1000 RIO BRAZOS RD., AZTEC, NM 87410  
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV  
1220 S. ST. FRANCIS DR., SANTA FE, NM 87505  
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico  
Energy, Minerals & Natural Resources Department  
**OIL CONSERVATION DIVISION**  
1220 SOUTH ST. FRANCIS DR.  
Santa Fe, New Mexico 87505

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

☐ AMENDED REPORT

**WELL LOCATION AND ACREAGE DEDICATION PLAT**

|                                   |  |   |
|-----------------------------------|--|---|
| API Number<br><b>30-015-47580</b> | Pool Code<br><b>98220</b>                      | Pool Name<br><b>Purple Sage; Wolfcamp (Gas)</b> |
| Property Code<br><b>329756</b>    | Property Name<br><b>ROCK JELLY FEDERAL COM</b> | Well Number<br><b>704H</b>                      |
| OGRID No.<br><b>229137</b>        | Operator Name<br><b>COG OPERATING, LLC</b>     | Elevation<br><b>2978.4'</b>                     |

**Surface Location**


| UL or lot No. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---------------|---------|----------|-------|---------|---------------|------------------|---------------|----------------|--------|
| 3             | 3       | 26-S     | 29-E  |         | 350           | NORTH            | 1500          | WEST           | EDDY   |

**Bottom Hole Location If Different From Surface**

| UL or lot No. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---------------|---------|----------|-------|---------|---------------|------------------|---------------|----------------|--------|
| N             | 10      | 26-S     | 29-E  |         | 200           | SOUTH            | 1485          | WEST           | EDDY   |

| Dedicated Acres | Joint or Infill | Consolidation Code | Order No. |
|-----------------|-----------------|--------------------|-----------|
| 1280            |                 |                    |           |

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

|  |  |  |   |
|--|--|--|---|
| <p>Y=392642.4 N<br/>X=650543.2 E</p> <p>ETP<br/>330' FNL &amp; 1485' FWL<br/>Y=392318.4 N<br/>X=652038.9 E<br/>LAT.=32.078059° N<br/>LONG.=103.975916° W<br/>GRID AZ. TO ETP<br/>321°52'29"</p> <p>LEASE X-ING<br/>LAT.=32.064303° N<br/>LONG.=103.975781° W</p> <p>LEASE X-ING<br/>LAT.=32.056971° N<br/>LONG.=103.975709° W</p> <p>LTP<br/>330' FSL &amp; 1485' FWL<br/>Y=382307.5 N<br/>X=652155.8 E<br/>LAT.=32.050538° N<br/>LONG.=103.975646° W</p> <p>Y=381998.4 N<br/>X=650671.1 E</p> | <p>1500'</p> <p>350'</p> <p>S.L.</p> <p>LOT 4<br/>41.14 Ac</p> <p>LOT 3<br/>41.33 Ac</p> <p>LOT 2<br/>41.28 Ac</p> <p>LOT 1<br/>41.46 Ac</p> <p>GRID AZ. 179°19'52"<br/>HORZ. DIST. 10141.7'</p> <p>SECTION 03</p> <p>SECTION 10</p> <p>1485'</p> <p>B.H.<br/>200'</p> | <p>Y=392663.6 N<br/>X=655847.3 E</p> <p>NAD 83 NME<br/>SURFACE LOCATION<br/>Y=392298.5 N<br/>X=652054.6 E<br/>LAT.=32.078004° N<br/>LONG.=103.975866° W</p> <p>NAD 83 NME<br/>PROPOSED BOTTOM<br/>HOLE LOCATION<br/>Y=382177.4 N<br/>X=652157.4 E<br/>LAT.=32.050181° N<br/>LONG.=103.975642° W</p> <p>Y=381920.6 N<br/>X=656056.9 E</p> | <p><b>OPERATOR CERTIFICATION</b></p> <p>I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.</p> <p><i>Stan Wagner</i> 11/1/19<br/>Signature Date<br/>Stan Wagner<br/>Printed Name<br/>E-mail Address</p> <p><b>SURVEYOR CERTIFICATION</b></p> <p>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.</p> <p>OCTOBER 11, 2019<br/>Date of Survey</p> <p>Signature &amp; Seal of Professional Surveyor</p> <p><br/>10/18/19<br/>Certificate No. CHAD HARCROW 17777<br/>W.O. # 19-1833 DRAWN BY: AH</p> |
|--|--|--|---|

Intent ☒ As Drilled ☐

API #  
30-015-

|                   |                        |             |
|-------------------|------------------------|-------------|
| Operator Name:    | Property Name:         | Well Number |
| COG Operating LLC | Rock Jelly Federal Com | 704H        |

Kick Off Point (KOP)

|          |         |          |       |     |           |          |      |          |        |
|----------|---------|----------|-------|-----|-----------|----------|------|----------|--------|
| UL       | Section | Township | Range | Lot | Feet      | From N/S | Feet | From E/W | County |
|          | 3       | 26S      | 29E   | 3   |           |          |      |          | Eddy   |
| Latitude |         |          |       |     | Longitude |          |      |          | NAD    |
|          |         |          |       |     |           |          |      |          | 83     |

First Take Point (FTP)

|           |         |          |       |     |             |          |      |          |        |
|-----------|---------|----------|-------|-----|-------------|----------|------|----------|--------|
| UL        | Section | Township | Range | Lot | Feet        | From N/S | Feet | From E/W | County |
|           | 3       | 26S      | 29E   | 3   | 330         | North    | 1485 | West     | Eddy   |
| Latitude  |         |          |       |     | Longitude   |          |      |          | NAD    |
| 32.078059 |         |          |       |     | -103.975916 |          |      |          | NAD 83 |

Last Take Point (LTP)

|           |         |          |       |     |             |          |      |          |        |
|-----------|---------|----------|-------|-----|-------------|----------|------|----------|--------|
| UL        | Section | Township | Range | Lot | Feet        | From N/S | Feet | From E/W | County |
| N         | 10      | 26S      | 29E   |     | 330         | South    | 1485 | West     | Eddy   |
| Latitude  |         |          |       |     | Longitude   |          |      |          | NAD    |
| 32.050538 |         |          |       |     | -103.975646 |          |      |          | NAD 83 |

Is this well the defining well for the Horizontal Spacing Unit? ☐ No

Is this well an infill well? ☐ Yes

If infill is yes please provide API if available, Operator Name and well number for Defining well for Horizontal Spacing Unit.

API #  
30-015-

|                   |                        |             |
|-------------------|------------------------|-------------|
| Operator Name:    | Property Name:         | Well Number |
| COG Operating LLC | Rock Jelly Federal Com | 703H        |

KZ 06/29/2018



# PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

|                              |  |
|------------------------------|--|
| <b>OPERATOR'S NAME:</b>      | <b>COG Operating, LLC</b>                                |
| <b>LEASE NO.:</b>            | <b>NMNM-0138834</b>                                      |
| <b>WELL NAME &amp; NO.:</b>  | <b>Rock Jelly Federal Com 704H</b>                       |
| <b>SURFACE HOLE FOOTAGE:</b> | <b>0350 FNL &amp; 1500 FWL</b>                           |
| <b>BOTTOM HOLE FOOTAGE:</b>  | <b>0200 FSL &amp; 1485 FWL Sec. 10, T.26 S., R.29 E.</b> |
| <b>LOCATION:</b>             | <b>Section 03, T.26 S., R.29 E., NMPM</b>                |
| <b>COUNTY:</b>               | <b>Eddy County, New Mexico</b>                           |

COA

|                      |  |  |                                     |
|----------------------|--|--|-------------------------------------|
| H2S                  | <input type="radio"/> Yes                        | <input checked="" type="radio"/> No        |                                     |
| Potash               | <input checked="" type="radio"/> None            | <input type="radio"/> Secretary            | <input type="radio"/> R-111-P       |
| Cave/Karst Potential | <input type="radio"/> Low                        | <input checked="" type="radio"/> Medium    | <input type="radio"/> High          |
| Cave/Karst Potential | <input type="radio"/> Critical                   |  |                                     |
| Variance             | <input type="radio"/> None                       | <input checked="" type="radio"/> Flex Hose | <input type="radio"/> Other         |
| Wellhead             | <input checked="" type="radio"/> Conventional    | <input type="radio"/> Multibowl            | <input type="radio"/> Both          |
| Other                | <input type="checkbox"/> 4 String Area           | <input type="checkbox"/> Capitan Reef      | <input type="checkbox"/> WIPP       |
| Other                | <input checked="" type="checkbox"/> Fluid Filled | <input type="checkbox"/> Cement Squeeze    | <input type="checkbox"/> Pilot Hole |
| Special Requirements | <input type="checkbox"/> Water Disposal          | <input checked="" type="checkbox"/> COM    | <input type="checkbox"/> Unit       |

## Medium Cave/Karst

**Possibility of water flows in the Salado and Castile.**

**Possibility of lost circulation in the Rustler and Delaware.**

**Abnormal pressures can be expected near the base of the Third Bone Spring Sandstone into the top of the Wolfcamp Formation.**

## A. HYDROGEN SULFIDE

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 **390** feet (a minimum of 70 feet (Eddy County) 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.

**Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.**

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:
  - Cement to surface. If cement does not circulate see B.1.a, c-d above.  
**Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst.**
  - ❖ 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 intermediate casing shoe shall be **5000 (5M)** psi.

#### **D. SPECIAL REQUIREMENT (S)**

##### **Communitization Agreement**

- The operator will submit a Communitization Agreement to the Santa Fe Office, 301 Dinosaur Trail Santa Fe, New Mexico 87508, 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.

## 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)

☒ Eddy County

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

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 2<sup>nd</sup> 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 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 integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
3. 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.
4. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
5. 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.
6. 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.



## 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.
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. 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).

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

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.

**JAM 10052020**

# COG Operating, LLC - Rock Jelly Federal 704H

## 1. Geologic Formations

|               |             |                               |      |
|---------------|-------------|-------------------------------|------|
| TVD of target | 10,109' EOC | Pilot hole depth              | NA   |
| MD at TD:     | 20,298'     | Deepest expected fresh water: | 250' |

| Formation            | Depth (TVD)<br>from KB | Water/Mineral Bearing/<br>Target Zone? | Hazards* |
|----------------------|------------------------|--|----------|
| Quaternary Fill      | Surface                | Water                                  |          |
| Rustler              | 294                    | Water                                  |          |
| Top of Salt          | 636                    | Salt                                   |          |
| Base of Salt         | 2839                   | Salt                                   |          |
| Lamar                | 3068                   | Salt Water                             |          |
| Bell Canyon          | 3097                   | Water                                  |          |
| Cherry Canyon        | 3910                   | Oil/Gas                                |          |
| Brushy Canyon        | 5215                   | Oil/Gas                                |          |
| Bone Spring Lime     | 6768                   | Oil/Gas                                |          |
| Upper Avalon Shale   | 7368                   | Oil/Gas                                |          |
| 1st Bone Spring Sand | 7683                   | Oil/Gas                                |          |
| 2nd Bone Spring Sand | 8367                   | Oil/Gas                                |          |
| 3rd Bone Spring Sand | 9560                   | Oil/Gas                                |          |
| Wolfcamp             | 9926                   | Oil/Gas                                |          |
| Wolfcamp A Shale     | 10057                  | Target Oil/Gas                         |          |

## 2. Casing Program

| Hole Size                 | Casing Interval |        | Csg. Size | Weight<br>(lbs) | Grade  | Conn. | SF<br>Collapse | SF Burst | SF<br>Tension      |
|---------------------------|-----------------|--------|-----------|-----------------|--------|-------|----------------|----------|--------------------|
|                           | From            | To     |           |                 |        |       |                |          |                    |
| 17.5"                     | 0               | 320    | 13.375"   | 54.5            | J55    | BTC   | 11.32          | 23.86    | 48.91              |
| 12.25"                    | 0               | 9465   | 9.625"    | 40              | L80 HC | BTC   | 1.30           | 1.10     | 2.42               |
| 8.75"                     | 0               | 20,298 | 5.5"      | 20              | P110   | BTC   | 2.47           | 2.08     | 3.17               |
| BLM Minimum Safety Factor |                 |        |           |                 |        |       | 1.125          | 1        | 1.6 Dry<br>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 - Rock Jelly Federal 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?   | N      |
|  |        |
| Is well located in SOPA but not in R-111-P?  | N      |
| If yes, are the first 2 strings cemented to surface and 3 <sup>rd</sup> 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 2 <sup>nd</sup> 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?   |        |

## COG Operating, LLC - Rock Jelly Federal 704H

### 3. Cementing Program

| Casing         | # Sks | Wt. lb/<br>gal | Yld ft <sup>3</sup> /<br>sack | H <sub>2</sub> O gal/sk | 500# Comp.<br>Strength<br>(hours) | Slurry Description                            |
|----------------|-------|----------------|-------------------------------|-------------------------|-----------------------------------|---|
| Surf.          | 100   | 13.5           | 1.75                          | 9                       | 12                                | Lead: Class C + 4% Gel + 1% CaCl <sub>2</sub> |
|                | 390   | 14.8           | 1.34                          | 6.34                    | 8                                 | Tail: Class C + 2% CaCl <sub>2</sub>          |
| Inter.Stage 1  | 1300  | 12.7           | 2.0                           | 9.6                     | 16                                | Lead: 35:65:6 C Blend                         |
|                | 360   | 14.8           | 1.34                          | 6.34                    | 8                                 | Tail: Class H                                 |
| DV/ECP @ 3020  |       |                |                               |                         |                                   |   |
| Inter, Stage 2 | 590   | 12.7           | 1.98                          | 10.6                    | 16                                | Lead: 35:65:6 C Blend                         |
|                | 180   | 14.8           | 1.34                          | 6.34                    | 8                                 | Tail: Class C + 2% CaCl                       |
| 5.5 Prod       | 940   | 11.9           | 2.5                           | 19                      | 72                                | Lead: 50:50:10 H Blend                        |
|                | 4930  | 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%   |
| 1 <sup>st</sup> Intermediate | 0'     | 50%   |
| Production                   | 2,997' | 35% OH in Lateral (KOP to EOL) – 40% OH in Vertical |

#### 4. Pressure Control Equipment

|   |   |
|---|---|
| N | A variance is requested for the use of a diverter on the surface casing.<br>See attached for schematic. |
|---|---|

| BOP installed and tested before drilling which hole? | Size ?  | Min. Required WP | Type       | x | Tested to: |
|--|---------|------------------|------------|---|------------|
| 12.25  | 13-5/8" | 3M               | Annular    | x | 2500       |
|  |         |                  | Blind Ram  | x | 3M         |
|  |         |                  | Pipe Ram   | x |            |
|  |         |                  | Double Ram |   |            |
|  |         |                  | Other*     |   |            |
| 8.75   | 13-5/8" | 5M               | Annular    | x | 2500       |
|  |         |                  | Blind Ram  | x | 5M         |
|  |         |                  | 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.<br><br>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?   |
| Y | 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.  |



## COG Operating, LLC - Rock Jelly Federal 704H

### 5. Mud Program

| Depth           |                 | Type         | Weight (ppg) | Viscosity | Water Loss |
|-----------------|-----------------|--------------|--------------|-----------|------------|
| From            | To              |              |              |           |            |
| 0               | Surf. Shoe      | FW Gel       | 8.6 - 8.8    | 28-34     | N/C        |
| Surf. Shoe      | 9-5/8" Int shoe | Brine Diesel | 9 - 9.4      | 32-45     | N/C        |
| 9-5/8" Int shoe | Lateral TD      | OBM          | 10.5 - 12    | 55-65     | N/C        |

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. |
| Y                            | No 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<br>(If cement not circulated to surface) |
| Y                       | Mud log     | Intermediate shoe to TD                                    |
| N                       | PEX         |  |

## COG Operating, LLC - Rock Jelly Federal 704H

### 7. Drilling Conditions

| Condition                  | Specify what type and where? |
|----------------------------|------------------------------|
| BH Pressure at deepest TVD | 6310 psi at 10109' TVD       |
| Abnormal Temperature       | NO 160 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 (H<sub>2</sub>S) monitors will be installed prior to drilling out the surface shoe. If H<sub>2</sub>S 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 | H <sub>2</sub> S is present    |
| Y | H <sub>2</sub> S Plan attached |

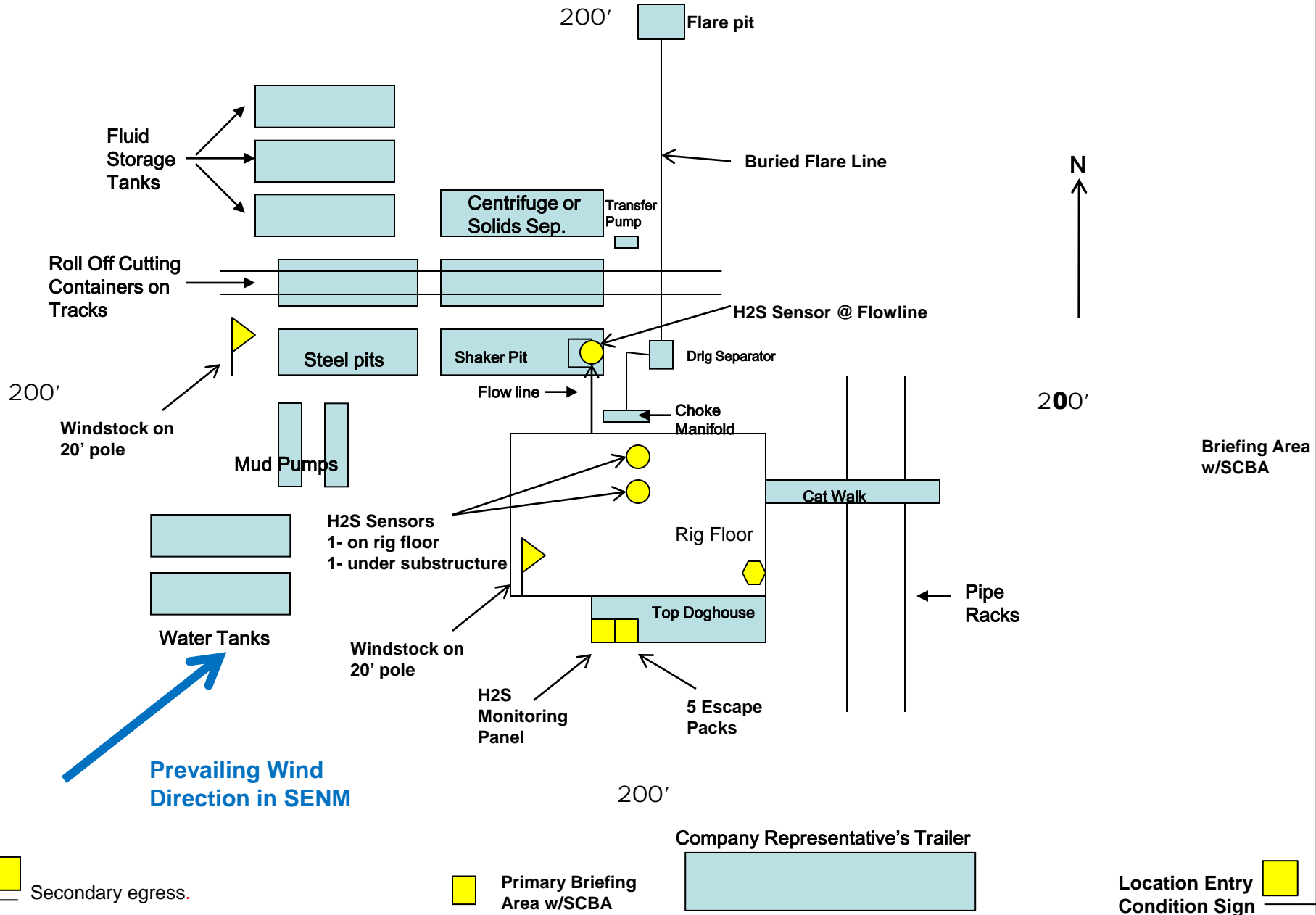
### 8. Other Facets of Operation

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

|   |                         |
|---|-------------------------|
| x | H <sub>2</sub> S Plan.  |
| x | BOP & Choke Schematics. |
| x | Directional Plan        |

COG Operating LLC  
H<sub>2</sub>S Equipment Schematic  
Terrain: Shinnery sand hills.

Well pad will be 400' x 400'  
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<sub>2</sub>S).
- b. The proper use and maintenance of personal protective equipment and life support systems.
- c. The proper use of H<sub>2</sub>S 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 H<sub>2</sub>S 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<sub>2</sub>S Drilling Operations Plan and the Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H<sub>2</sub>S zone (within 3 days or 500 feet) and weekly H<sub>2</sub>S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H<sub>2</sub>S Drilling Operations Plan and the Public Protection Plan. 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<sub>2</sub>S SAFETY EQUIPMENT AND SYSTEMS**

Note: All H<sub>2</sub>S 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 H<sub>2</sub>S. If H<sub>2</sub>S greater than 100 ppm is encountered in the gas stream we will shut in and install H<sub>2</sub>S 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.

# **W A R N I N G**

**YOU ARE ENTERING AN H<sub>2</sub>S 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**

|                          | <b><u>OFFICE</u></b> | <b><u>MOBILE</u></b> |
|--------------------------|----------------------|----------------------|
| COG OPERATING LLC OFFICE | 575-748-6940         |                      |
| SETH WILD                | 432-683-7443         | 432-528-3633         |
| JOHN COFFMAN             | 432-685-4310         | 432-631-9762         |

## **EMERGENCY RESPONSE NUMBERS**

|  | <b><u>OFFICE</u></b> |
|--|----------------------|
| 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         |

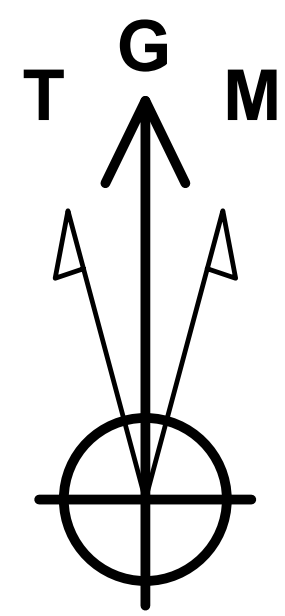




Project: Eddy County, NM (NAD27 NME)  
Site: Rock Jelly Fed Com  
Well: 704H  
Wellbore: OH  
Design: Plan 1 10-30-19  
Rig: Ensign 155

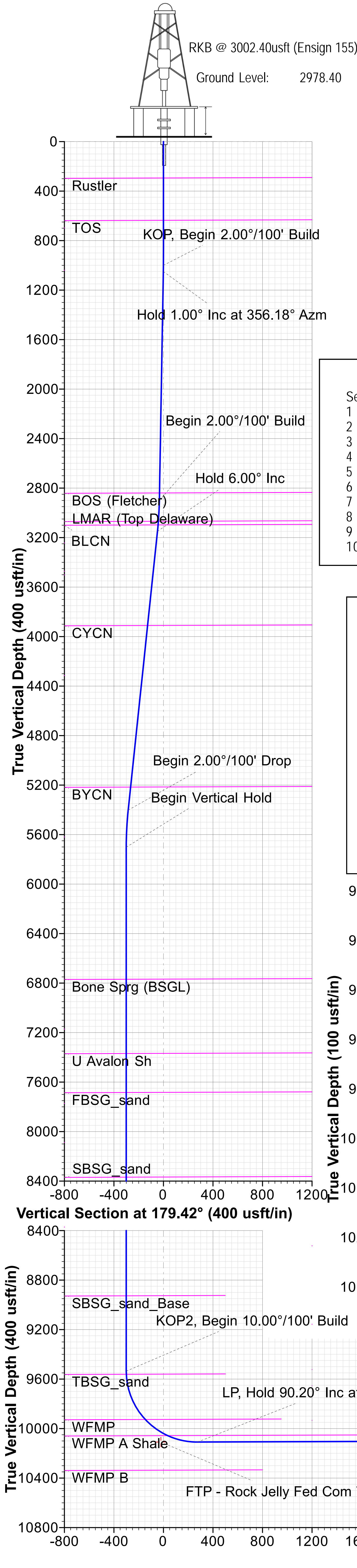


PHOENIX  
TECHNOLOGY SERVICES



Azimuths to Grid North  
True North: -0.19°  
Magnetic North: 6.56°

Magnetic Field  
Strength: 47762.5nT  
Dip Angle: 59.68°  
Date: 12/23/2019  
Model: MVHD



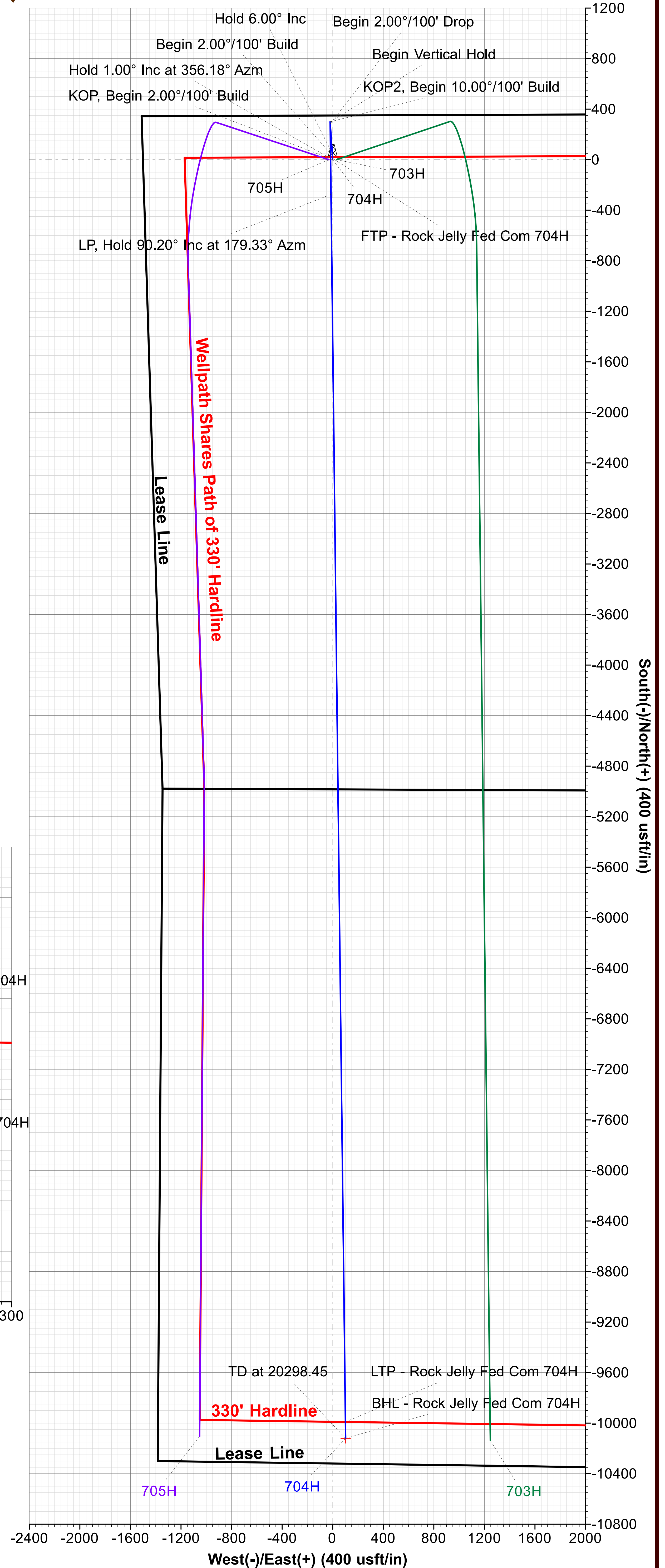
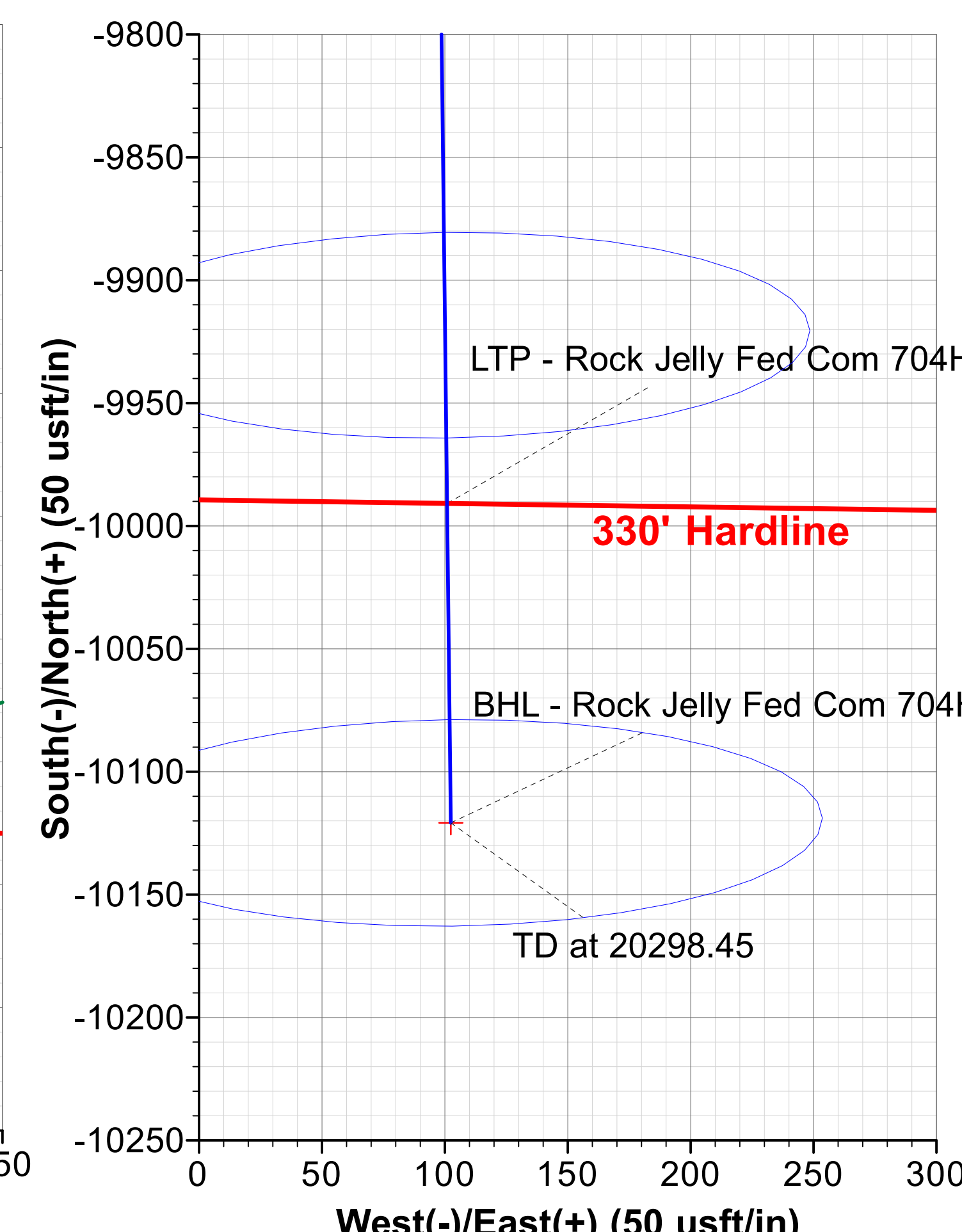
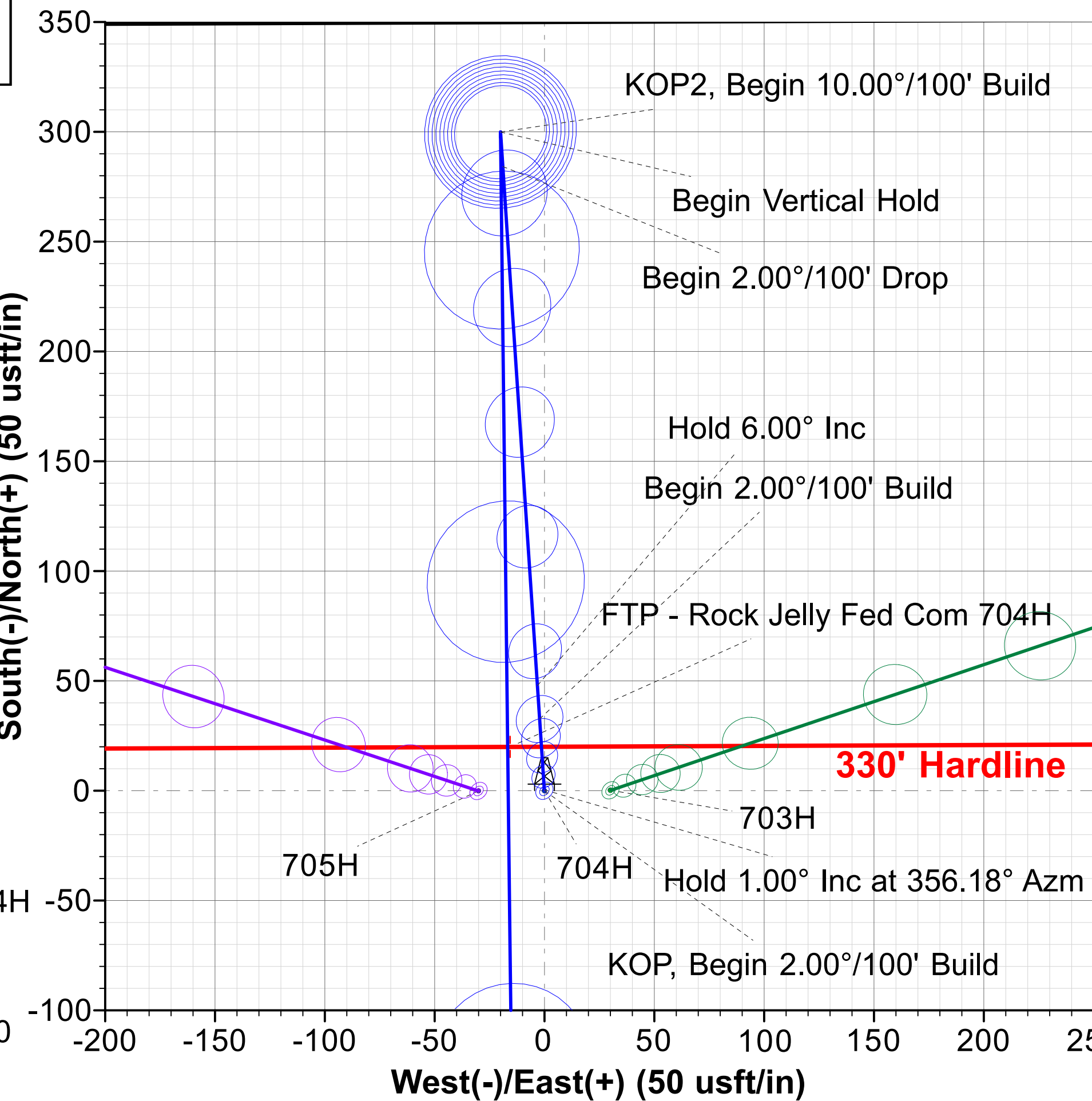
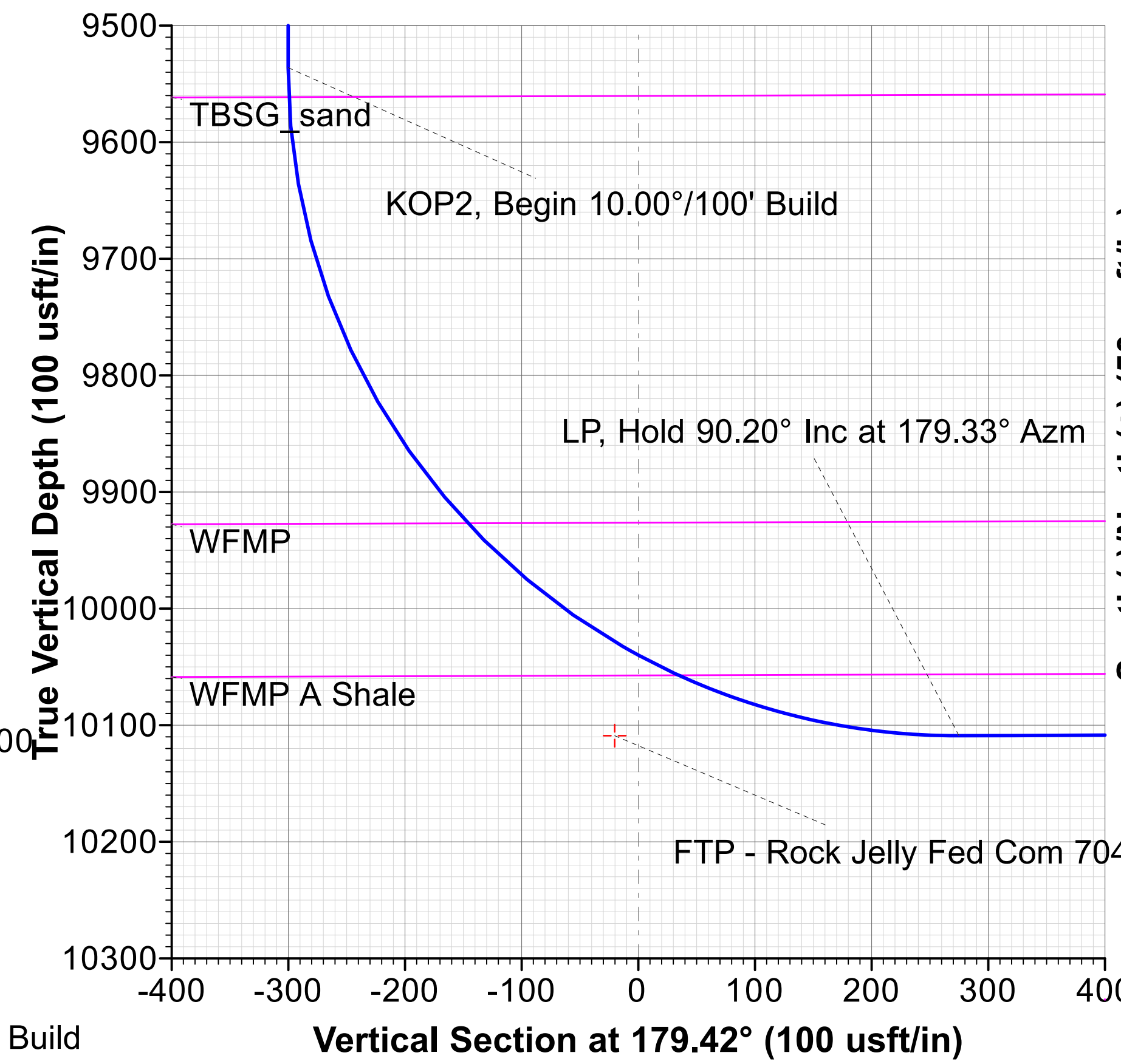
| WELL DETAILS          |       |           |           |                    |                      |  |
|-----------------------|-------|-----------|-----------|--------------------|----------------------|--|
| Ground Level: 2978.40 |       |           |           |                    |                      |  |
| +N/-S                 | +E/-W | Northing  | Eastings  | Latitude           | Longitude            |  |
| 0.00                  | 0.00  | 392240.60 | 610869.30 | 32° 4' 40.365937 N | 103° 58' 31.376774 W |  |

| DESIGN TARGET DETAILS         |          |           |        |           |           |                    |                      |
|-------------------------------|----------|-----------|--------|-----------|-----------|--------------------|----------------------|
| Name                          | TVD      | +N/-S     | +E/-W  | Northing  | Eastings  | Latitude           | Longitude            |
| BHL - Rock Jelly Fed Com 704H | 10074.00 | -10120.80 | 102.50 | 382119.80 | 610971.80 | 32° 3' 0.202654 N  | 103° 58' 30.575822 W |
| LTP - Rock Jelly Fed Com 704H | 10074.46 | -9990.80  | 101.00 | 382249.80 | 610970.30 | 32° 3' 1.489243 N  | 103° 58' 30.588240 W |
| FTP - Rock Jelly Fed Com 704H | 10109.00 | 20.00     | -15.60 | 392260.60 | 610853.70 | 32° 4' 40.564378 N | 103° 58' 31.557317 W |

| SECTION DETAILS |          |       |        |          |           |        |       |        |         |        |                                    |
|-----------------|----------|-------|--------|----------|-----------|--------|-------|--------|---------|--------|------------------------------------|
| Sec             | MD       | Inc   | Azi    | TVD      | +N/-S     | +E/-W  | Dleg  | TFace  | VSec    | Target | Annotation                         |
| 1               | 0.00     | 0.00  | 0.00   | 0.00     | 0.00      | 0.00   | 0.00  | 0.00   | 0.00    | 0.00   | KOP, Begin 2.00°/100' Build        |
| 2               | 1000.00  | 0.00  | 0.00   | 1000.00  | 0.00      | 0.00   | 0.00  | 0.00   | 0.00    | 0.00   | Hold 1.00° Inc at 356.18° Azm      |
| 3               | 1050.00  | 1.00  | 356.18 | 1050.00  | 0.44      | -0.03  | 2.00  | 356.18 | -0.44   | 0.00   | Begin 2.00°/100' Build             |
| 4               | 2900.00  | 1.00  | 356.18 | 2899.72  | 32.65     | -2.18  | 0.00  | 0.00   | -32.67  | 0.00   | Hold 6.00° Inc                     |
| 5               | 3150.08  | 6.00  | 356.18 | 3149.25  | 47.88     | -3.19  | 2.00  | 0.00   | -47.91  | 0.00   | Begin 2.00°/100' Drop              |
| 6               | 5415.72  | 6.00  | 356.18 | 5402.47  | 284.24    | -18.96 | 0.00  | 0.00   | -284.42 | 0.00   | Begin Vertical Hold                |
| 7               | 5715.80  | 0.00  | 0.00   | 5702.00  | 299.91    | -20.00 | 2.00  | 180.00 | -300.10 | 0.00   | KOP2, Begin 10.00°/100' Build      |
| 8               | 9549.92  | 0.00  | 0.00   | 9536.12  | 299.91    | -20.00 | 0.00  | 0.00   | -300.10 | 0.00   | LP, Hold 90.20° Inc at 179.33° Azm |
| 9               | 10451.96 | 90.20 | 179.33 | 10109.07 | -275.05   | -13.24 | 10.00 | 179.33 | 274.90  | 0.00   | TD at 20298.45                     |
| 10              | 20298.45 | 90.20 | 179.33 | 10074.00 | -10120.80 | 102.50 | 0.00  | 0.00   | 0.00    | 0.00   | BHL - Rock Jelly Fed Com 704H      |

| FORMATION TOP DETAILS |          |                     |          |        |
|-----------------------|----------|---------------------|----------|--------|
| TVDPath               | MDPath   | Formation           | DipAngle | DipDir |
| 294.40                | 294.40   | Rustler             | -0.20    | 179.42 |
| 636.40                | 636.40   | TOS                 | -0.20    | 179.42 |
| 2839.51               | 2839.79  | BOS (Fletcher)      | -0.20    | 179.42 |
| 3068.54               | 3069.04  | LMAR (Top Delaware) | -0.20    | 179.42 |
| 3097.55               | 3098.14  | BLCN                | -0.20    | 179.42 |
| 3910.85               | 3915.87  | CYCN                | -0.20    | 179.42 |
| 5216.32               | 5228.55  | BYCN                | -0.20    | 179.42 |
| 6769.45               | 6783.24  | Bone Sprg (BSGL)    | -0.20    | 179.42 |
| 7369.45               | 7383.24  | U Avalon Sh         | -0.20    | 179.42 |
| 7684.45               | 7698.24  | FBSG_sand           | -0.20    | 179.42 |
| 8368.45               | 8382.24  | SBSG_sand           | -0.20    | 179.42 |
| 8927.45               | 8941.24  | SBSG_sand_Base      | -0.20    | 179.42 |
| 9561.45               | 9575.25  | TBSG_sand           | -0.20    | 179.42 |
| 9926.91               | 9979.96  | WFMP                | -0.20    | 179.42 |
| 10057.28              | 10204.41 | WFMP A Shale        | -0.20    | 179.42 |

| LEGEND                       |  |
|------------------------------|--|
| 705H, OH, Plan 1 10-30-19 V0 |  |
| 703H, OH, Plan 1 10-30-19 V0 |  |
| Plan 1 10-30-19              |  |







## **COG Operating LLC**

**Eddy County, NM (NAD27 NME)**

**Rock Jelly Fed Com**

**704H**

**OH**

**Plan: Plan 1 10-30-19**

## **Standard Planning Report**

**30 October, 2019**



|                  |                             |                                     |                                |
|------------------|-----------------------------|-------------------------------------|--------------------------------|
| <b>Database:</b> | USA Compass                 | <b>Local Co-ordinate Reference:</b> | Well 704H                      |
| <b>Company:</b>  | COG Operating LLC           | <b>TVD Reference:</b>               | RKB @ 3002.40usft (Ensign 155) |
| <b>Project:</b>  | Eddy County, NM (NAD27 NME) | <b>MD Reference:</b>                | RKB @ 3002.40usft (Ensign 155) |
| <b>Site:</b>     | Rock Jelly Fed Com          | <b>North Reference:</b>             | Grid                           |
| <b>Well:</b>     | 704H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature              |
| <b>Wellbore:</b> | OH                          |                                     |                                |
| <b>Design:</b>   | Plan 1 10-30-19             |                                     |                                |

|                    |                                      |                      |                |
|--------------------|--------------------------------------|----------------------|----------------|
| <b>Project</b>     | Eddy County, NM (NAD27 NME)          |                      |                |
| <b>Map System:</b> | US State Plane 1927 (Exact solution) | <b>System Datum:</b> | Mean Sea Level |
| <b>Geo Datum:</b>  | NAD 1927 (NADCON CONUS)              |                      |                |
| <b>Map Zone:</b>   | New Mexico East 3001                 |                      |                |

|                       |                    |           |                 |            |                      |        |
|-----------------------|--------------------|-----------|-----------------|------------|----------------------|--------|
| Site                  | Rock Jelly Fed Com |           |                 |            |                      |        |
| Site Position:        |                    | Northing: | 392,391.60 usft | Latitude:  | 32° 4' 41.768994 N   |        |
| From:                 | Map                | Easting:  | 613,615.90 usft | Longitude: | 103° 57' 59.447893 W |        |
| Position Uncertainty: |                    | 0.00 usft | Slot Radius:    | 13-3/16 "  | Grid Convergence:    | 0.19 ° |

|                      |       |                |                     |                 |               |                      |
|----------------------|-------|----------------|---------------------|-----------------|---------------|----------------------|
| Well                 | 704H  |                |                     |                 |               |                      |
| Well Position        | +N/-S | -151.00 usft   | Northing:           | 392,240.60 usft | Latitude:     | 32° 4' 40.365938 N   |
|                      | +E/-W | -2,746.60 usft | Easting:            | 610,869.30 usft | Longitude:    | 103° 58' 31.376774 W |
| Position Uncertainty |       | 1.00 usft      | Wellhead Elevation: |                 | Ground Level: | 2,978.40 usft        |

|                  |                   |                    |                        |                      |                            |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| <b>Wellbore</b>  | OH                |                    |                        |                      |                            |
| <b>Magnetics</b> | <b>Model Name</b> | <b>Sample Date</b> | <b>Declination (°)</b> | <b>Dip Angle (°)</b> | <b>Field Strength (nT)</b> |
|                  | MVHD              | 12/23/2019         | 6.76                   | 59.68                | 47,762.51260026            |

|                          |                                |                     |                      |                      |
|--------------------------|--------------------------------|---------------------|----------------------|----------------------|
| <b>Design</b>            | Plan 1 10-30-19                |                     |                      |                      |
| <b>Audit Notes:</b>      |                                |                     |                      |                      |
| <b>Version:</b>          | <b>Phase:</b>                  | PLAN                | <b>Tie On Depth:</b> | 0.00                 |
| <b>Vertical Section:</b> | <b>Depth From (TVD) (usft)</b> | <b>+N/-S (usft)</b> | <b>+E/-W (usft)</b>  | <b>Direction (°)</b> |
|                          | 0.00                           | 0.00                | 0.00                 | 179.42               |

|                                 |                        |                                |                  |                |
|---------------------------------|------------------------|--------------------------------|------------------|----------------|
| <b>Plan Survey Tool Program</b> | <b>Date</b>            | 10/29/2019                     |                  |                |
| <b>Depth From (usft)</b>        | <b>Depth To (usft)</b> | <b>Survey (Wellbore)</b>       | <b>Tool Name</b> | <b>Remarks</b> |
| 1                               | 0.00                   | 20,298.45 Plan 1 10-30-19 (OH) | MWD+HRGM         |                |
|                                 |                        |                                | OWSG MWD + HRGM  |                |



|                  |                             |                                     |                                |
|------------------|-----------------------------|-------------------------------------|--------------------------------|
| <b>Database:</b> | USA Compass                 | <b>Local Co-ordinate Reference:</b> | Well 704H                      |
| <b>Company:</b>  | COG Operating LLC           | <b>TVD Reference:</b>               | RKB @ 3002.40usft (Ensign 155) |
| <b>Project:</b>  | Eddy County, NM (NAD27 NME) | <b>MD Reference:</b>                | RKB @ 3002.40usft (Ensign 155) |
| <b>Site:</b>     | Rock Jelly Fed Com          | <b>North Reference:</b>             | Grid                           |
| <b>Well:</b>     | 704H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature              |
| <b>Wellbore:</b> | OH                          |                                     |                                |
| <b>Design:</b>   | Plan 1 10-30-19             |                                     |                                |

| 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    |                      |
| 1,000.00              | 0.00            | 0.00        | 1,000.00              | 0.00         | 0.00         | 0.00                    | 0.00                   | 0.00                  | 0.00    |                      |
| 1,050.00              | 1.00            | 356.19      | 1,050.00              | 0.44         | -0.03        | 2.00                    | 2.00                   | 0.00                  | 356.19  |                      |
| 2,900.00              | 1.00            | 356.19      | 2,899.72              | 32.65        | -2.18        | 0.00                    | 0.00                   | 0.00                  | 0.00    |                      |
| 3,150.08              | 6.00            | 356.18      | 3,149.25              | 47.88        | -3.19        | 2.00                    | 2.00                   | 0.00                  | 0.00    |                      |
| 5,415.72              | 6.00            | 356.18      | 5,402.47              | 284.24       | -18.96       | 0.00                    | 0.00                   | 0.00                  | 0.00    |                      |
| 5,715.80              | 0.00            | 0.00        | 5,702.00              | 299.91       | -20.00       | 2.00                    | -2.00                  | 0.00                  | 180.00  |                      |
| 9,549.92              | 0.00            | 0.00        | 9,536.12              | 299.91       | -20.00       | 0.00                    | 0.00                   | 0.00                  | 0.00    |                      |
| 10,451.96             | 90.20           | 179.33      | 10,109.07             | -275.05      | -13.24       | 10.00                   | 10.00                  | 19.88                 | 179.33  |                      |
| 20,298.45             | 90.20           | 179.33      | 10,074.00             | -10,120.80   | 102.50       | 0.00                    | 0.00                   | 0.00                  | 0.00    | BHL - Rock Jelly Fed |

|                  |                             |                                     |                                |
|------------------|-----------------------------|-------------------------------------|--------------------------------|
| <b>Database:</b> | USA Compass                 | <b>Local Co-ordinate Reference:</b> | Well 704H                      |
| <b>Company:</b>  | COG Operating LLC           | <b>TVD Reference:</b>               | RKB @ 3002.40usft (Ensign 155) |
| <b>Project:</b>  | Eddy County, NM (NAD27 NME) | <b>MD Reference:</b>                | RKB @ 3002.40usft (Ensign 155) |
| <b>Site:</b>     | Rock Jelly Fed Com          | <b>North Reference:</b>             | Grid                           |
| <b>Well:</b>     | 704H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature              |
| <b>Wellbore:</b> | OH                          |                                     |                                |
| <b>Design:</b>   | Plan 1 10-30-19             |                                     |                                |

| 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                  |
| 294.40                               | 0.00            | 0.00        | 294.40                | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| <b>Rustler</b>                       |                 |             |                       |              |              |                         |                         |                        |                       |
| 636.40                               | 0.00            | 0.00        | 636.40                | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| <b>TOS</b>                           |                 |             |                       |              |              |                         |                         |                        |                       |
| 1,000.00                             | 0.00            | 0.00        | 1,000.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| <b>KOP, Begin 2.00°/100' Build</b>   |                 |             |                       |              |              |                         |                         |                        |                       |
| 1,050.00                             | 1.00            | 356.19      | 1,050.00              | 0.44         | -0.03        | -0.44                   | 2.00                    | 2.00                   | 0.00                  |
| <b>Hold 1.00° Inc at 356.18° Azm</b> |                 |             |                       |              |              |                         |                         |                        |                       |
| 1,100.00                             | 1.00            | 356.19      | 1,099.99              | 1.31         | -0.09        | -1.31                   | 0.00                    | 0.00                   | 0.00                  |
| 1,200.00                             | 1.00            | 356.19      | 1,199.97              | 3.05         | -0.20        | -3.05                   | 0.00                    | 0.00                   | 0.00                  |
| 1,300.00                             | 1.00            | 356.19      | 1,299.96              | 4.79         | -0.32        | -4.79                   | 0.00                    | 0.00                   | 0.00                  |
| 1,400.00                             | 1.00            | 356.19      | 1,399.94              | 6.53         | -0.44        | -6.53                   | 0.00                    | 0.00                   | 0.00                  |
| 1,500.00                             | 1.00            | 356.19      | 1,499.93              | 8.27         | -0.55        | -8.28                   | 0.00                    | 0.00                   | 0.00                  |
| 1,600.00                             | 1.00            | 356.19      | 1,599.91              | 10.01        | -0.67        | -10.02                  | 0.00                    | 0.00                   | 0.00                  |
| 1,700.00                             | 1.00            | 356.19      | 1,699.90              | 11.75        | -0.78        | -11.76                  | 0.00                    | 0.00                   | 0.00                  |
| 1,800.00                             | 1.00            | 356.19      | 1,799.88              | 13.50        | -0.90        | -13.50                  | 0.00                    | 0.00                   | 0.00                  |
| 1,900.00                             | 1.00            | 356.19      | 1,899.87              | 15.24        | -1.02        | -15.25                  | 0.00                    | 0.00                   | 0.00                  |
| 2,000.00                             | 1.00            | 356.19      | 1,999.85              | 16.98        | -1.13        | -16.99                  | 0.00                    | 0.00                   | 0.00                  |
| 2,100.00                             | 1.00            | 356.19      | 2,099.84              | 18.72        | -1.25        | -18.73                  | 0.00                    | 0.00                   | 0.00                  |
| 2,200.00                             | 1.00            | 356.19      | 2,199.82              | 20.46        | -1.36        | -20.47                  | 0.00                    | 0.00                   | 0.00                  |
| 2,300.00                             | 1.00            | 356.19      | 2,299.81              | 22.20        | -1.48        | -22.22                  | 0.00                    | 0.00                   | 0.00                  |
| 2,400.00                             | 1.00            | 356.19      | 2,399.79              | 23.94        | -1.60        | -23.96                  | 0.00                    | 0.00                   | 0.00                  |
| 2,500.00                             | 1.00            | 356.19      | 2,499.78              | 25.69        | -1.71        | -25.70                  | 0.00                    | 0.00                   | 0.00                  |
| 2,600.00                             | 1.00            | 356.19      | 2,599.76              | 27.43        | -1.83        | -27.44                  | 0.00                    | 0.00                   | 0.00                  |
| 2,700.00                             | 1.00            | 356.19      | 2,699.75              | 29.17        | -1.95        | -29.19                  | 0.00                    | 0.00                   | 0.00                  |
| 2,800.00                             | 1.00            | 356.19      | 2,799.73              | 30.91        | -2.06        | -30.93                  | 0.00                    | 0.00                   | 0.00                  |
| 2,839.79                             | 1.00            | 356.19      | 2,839.51              | 31.60        | -2.11        | -31.62                  | 0.00                    | 0.00                   | 0.00                  |
| <b>BOS (Fletcher)</b>                |                 |             |                       |              |              |                         |                         |                        |                       |
| 2,900.00                             | 1.00            | 356.19      | 2,899.72              | 32.65        | -2.18        | -32.67                  | 0.00                    | 0.00                   | 0.00                  |
| <b>Begin 2.00°/100' Build</b>        |                 |             |                       |              |              |                         |                         |                        |                       |
| 3,000.00                             | 3.00            | 356.18      | 2,999.65              | 36.13        | -2.41        | -36.16                  | 2.00                    | 2.00                   | 0.00                  |
| 3,069.04                             | 4.38            | 356.18      | 3,068.54              | 40.57        | -2.71        | -40.59                  | 2.00                    | 2.00                   | 0.00                  |
| <b>LMAR (Top Delaware)</b>           |                 |             |                       |              |              |                         |                         |                        |                       |
| 3,098.14                             | 4.96            | 356.18      | 3,097.55              | 42.93        | -2.86        | -42.96                  | 2.00                    | 2.00                   | 0.00                  |
| <b>BLCN</b>                          |                 |             |                       |              |              |                         |                         |                        |                       |
| 3,100.00                             | 5.00            | 356.18      | 3,099.40              | 43.09        | -2.87        | -43.12                  | 2.00                    | 2.00                   | 0.00                  |
| 3,150.08                             | 6.00            | 356.18      | 3,149.25              | 47.88        | -3.19        | -47.91                  | 2.00                    | 2.00                   | 0.00                  |
| <b>Hold 6.00° Inc</b>                |                 |             |                       |              |              |                         |                         |                        |                       |
| 3,200.00                             | 6.00            | 356.18      | 3,198.90              | 53.09        | -3.54        | -53.12                  | 0.00                    | 0.00                   | 0.00                  |
| 3,300.00                             | 6.00            | 356.18      | 3,298.35              | 63.52        | -4.24        | -63.56                  | 0.00                    | 0.00                   | 0.00                  |
| 3,400.00                             | 6.00            | 356.18      | 3,397.80              | 73.96        | -4.93        | -74.00                  | 0.00                    | 0.00                   | 0.00                  |
| 3,500.00                             | 6.00            | 356.18      | 3,497.25              | 84.39        | -5.63        | -84.44                  | 0.00                    | 0.00                   | 0.00                  |
| 3,600.00                             | 6.00            | 356.18      | 3,596.70              | 94.82        | -6.32        | -94.88                  | 0.00                    | 0.00                   | 0.00                  |
| 3,700.00                             | 6.00            | 356.18      | 3,696.16              | 105.25       | -7.02        | -105.32                 | 0.00                    | 0.00                   | 0.00                  |
| 3,800.00                             | 6.00            | 356.18      | 3,795.61              | 115.68       | -7.71        | -115.76                 | 0.00                    | 0.00                   | 0.00                  |
| 3,900.00                             | 6.00            | 356.18      | 3,895.06              | 126.12       | -8.41        | -126.20                 | 0.00                    | 0.00                   | 0.00                  |
| 3,915.87                             | 6.00            | 356.18      | 3,910.85              | 127.77       | -8.52        | -127.85                 | 0.00                    | 0.00                   | 0.00                  |
| <b>CYCN</b>                          |                 |             |                       |              |              |                         |                         |                        |                       |
| 4,000.00                             | 6.00            | 356.18      | 3,994.51              | 136.55       | -9.11        | -136.63                 | 0.00                    | 0.00                   | 0.00                  |
| 4,100.00                             | 6.00            | 356.18      | 4,093.96              | 146.98       | -9.80        | -147.07                 | 0.00                    | 0.00                   | 0.00                  |
| 4,200.00                             | 6.00            | 356.18      | 4,193.42              | 157.41       | -10.50       | -157.51                 | 0.00                    | 0.00                   | 0.00                  |
| 4,300.00                             | 6.00            | 356.18      | 4,292.87              | 167.85       | -11.19       | -167.95                 | 0.00                    | 0.00                   | 0.00                  |



|                  |                             |                                     |                                |
|------------------|-----------------------------|-------------------------------------|--------------------------------|
| <b>Database:</b> | USA Compass                 | <b>Local Co-ordinate Reference:</b> | Well 704H                      |
| <b>Company:</b>  | COG Operating LLC           | <b>TVD Reference:</b>               | RKB @ 3002.40usft (Ensign 155) |
| <b>Project:</b>  | Eddy County, NM (NAD27 NME) | <b>MD Reference:</b>                | RKB @ 3002.40usft (Ensign 155) |
| <b>Site:</b>     | Rock Jelly Fed Com          | <b>North Reference:</b>             | Grid                           |
| <b>Well:</b>     | 704H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature              |
| <b>Wellbore:</b> | OH                          |                                     |                                |
| <b>Design:</b>   | Plan 1 10-30-19             |                                     |                                |

| 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) |
| 4,400.00                     | 6.00            | 356.18      | 4,392.32              | 178.28       | -11.89       | -178.39                 | 0.00                    | 0.00                   | 0.00                  |
| 4,500.00                     | 6.00            | 356.18      | 4,491.77              | 188.71       | -12.58       | -188.83                 | 0.00                    | 0.00                   | 0.00                  |
| 4,600.00                     | 6.00            | 356.18      | 4,591.22              | 199.14       | -13.28       | -199.27                 | 0.00                    | 0.00                   | 0.00                  |
| 4,700.00                     | 6.00            | 356.18      | 4,690.67              | 209.58       | -13.98       | -209.71                 | 0.00                    | 0.00                   | 0.00                  |
| 4,800.00                     | 6.00            | 356.18      | 4,790.13              | 220.01       | -14.67       | -220.15                 | 0.00                    | 0.00                   | 0.00                  |
| 4,900.00                     | 6.00            | 356.18      | 4,889.58              | 230.44       | -15.37       | -230.59                 | 0.00                    | 0.00                   | 0.00                  |
| 5,000.00                     | 6.00            | 356.18      | 4,989.03              | 240.87       | -16.06       | -241.02                 | 0.00                    | 0.00                   | 0.00                  |
| 5,100.00                     | 6.00            | 356.18      | 5,088.48              | 251.31       | -16.76       | -251.46                 | 0.00                    | 0.00                   | 0.00                  |
| 5,200.00                     | 6.00            | 356.18      | 5,187.93              | 261.74       | -17.45       | -261.90                 | 0.00                    | 0.00                   | 0.00                  |
| 5,228.55                     | 6.00            | 356.18      | 5,216.32              | 264.72       | -17.65       | -264.88                 | 0.00                    | 0.00                   | 0.00                  |
| <b>BYCN</b>                  |                 |             |                       |              |              |                         |                         |                        |                       |
| 5,300.00                     | 6.00            | 356.18      | 5,287.39              | 272.17       | -18.15       | -272.34                 | 0.00                    | 0.00                   | 0.00                  |
| 5,400.00                     | 6.00            | 356.18      | 5,386.84              | 282.60       | -18.85       | -282.78                 | 0.00                    | 0.00                   | 0.00                  |
| 5,415.72                     | 6.00            | 356.18      | 5,402.47              | 284.24       | -18.96       | -284.42                 | 0.00                    | 0.00                   | 0.00                  |
| <b>Begin 2.00°/100' Drop</b> |                 |             |                       |              |              |                         |                         |                        |                       |
| 5,500.00                     | 4.32            | 356.18      | 5,486.41              | 291.80       | -19.46       | -291.99                 | 2.00                    | -2.00                  | 0.00                  |
| 5,600.00                     | 2.32            | 356.18      | 5,586.24              | 297.58       | -19.84       | -297.76                 | 2.00                    | -2.00                  | 0.00                  |
| 5,700.00                     | 0.32            | 356.18      | 5,686.20              | 299.87       | -20.00       | -300.05                 | 2.00                    | -2.00                  | 0.00                  |
| 5,715.80                     | 0.00            | 0.00        | 5,702.00              | 299.91       | -20.00       | -300.10                 | 2.00                    | -2.00                  | 0.00                  |
| <b>Begin Vertical Hold</b>   |                 |             |                       |              |              |                         |                         |                        |                       |
| 5,800.00                     | 0.00            | 0.00        | 5,786.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 5,900.00                     | 0.00            | 0.00        | 5,886.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 6,000.00                     | 0.00            | 0.00        | 5,986.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 6,100.00                     | 0.00            | 0.00        | 6,086.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 6,200.00                     | 0.00            | 0.00        | 6,186.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 6,300.00                     | 0.00            | 0.00        | 6,286.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 6,400.00                     | 0.00            | 0.00        | 6,386.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 6,500.00                     | 0.00            | 0.00        | 6,486.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 6,600.00                     | 0.00            | 0.00        | 6,586.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 6,700.00                     | 0.00            | 0.00        | 6,686.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 6,783.24                     | 0.00            | 0.00        | 6,769.45              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| <b>Bone Sprg (BSGL)</b>      |                 |             |                       |              |              |                         |                         |                        |                       |
| 6,800.00                     | 0.00            | 0.00        | 6,786.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 6,900.00                     | 0.00            | 0.00        | 6,886.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 7,000.00                     | 0.00            | 0.00        | 6,986.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 7,100.00                     | 0.00            | 0.00        | 7,086.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 7,200.00                     | 0.00            | 0.00        | 7,186.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 7,300.00                     | 0.00            | 0.00        | 7,286.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 7,383.24                     | 0.00            | 0.00        | 7,369.45              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| <b>U Avalon Sh</b>           |                 |             |                       |              |              |                         |                         |                        |                       |
| 7,400.00                     | 0.00            | 0.00        | 7,386.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 7,500.00                     | 0.00            | 0.00        | 7,486.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 7,600.00                     | 0.00            | 0.00        | 7,586.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 7,698.24                     | 0.00            | 0.00        | 7,684.45              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| <b>FBSG_sand</b>             |                 |             |                       |              |              |                         |                         |                        |                       |
| 7,700.00                     | 0.00            | 0.00        | 7,686.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 7,800.00                     | 0.00            | 0.00        | 7,786.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 7,900.00                     | 0.00            | 0.00        | 7,886.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 8,000.00                     | 0.00            | 0.00        | 7,986.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 8,100.00                     | 0.00            | 0.00        | 8,086.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 8,200.00                     | 0.00            | 0.00        | 8,186.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 8,300.00                     | 0.00            | 0.00        | 8,286.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |
| 8,382.24                     | 0.00            | 0.00        | 8,368.45              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |

|                  |                             |                                     |                                |
|------------------|-----------------------------|-------------------------------------|--------------------------------|
| <b>Database:</b> | USA Compass                 | <b>Local Co-ordinate Reference:</b> | Well 704H                      |
| <b>Company:</b>  | COG Operating LLC           | <b>TVD Reference:</b>               | RKB @ 3002.40usft (Ensign 155) |
| <b>Project:</b>  | Eddy County, NM (NAD27 NME) | <b>MD Reference:</b>                | RKB @ 3002.40usft (Ensign 155) |
| <b>Site:</b>     | Rock Jelly Fed Com          | <b>North Reference:</b>             | Grid                           |
| <b>Well:</b>     | 704H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature              |
| <b>Wellbore:</b> | OH                          |                                     |                                |
| <b>Design:</b>   | Plan 1 10-30-19             |                                     |                                |

| 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) |  |
| <b>SBSG_sand</b>                          |                 |             |                       |              |              |                         |                         |                        |                       |  |
| 8,400.00                                  | 0.00            | 0.00        | 8,386.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |  |
| 8,500.00                                  | 0.00            | 0.00        | 8,486.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |  |
| 8,600.00                                  | 0.00            | 0.00        | 8,586.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |  |
| 8,700.00                                  | 0.00            | 0.00        | 8,686.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |  |
| 8,800.00                                  | 0.00            | 0.00        | 8,786.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |  |
| 8,900.00                                  | 0.00            | 0.00        | 8,886.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |  |
| 8,941.24                                  | 0.00            | 0.00        | 8,927.45              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |  |
| <b>SBSG_sand_Base</b>                     |                 |             |                       |              |              |                         |                         |                        |                       |  |
| 9,000.00                                  | 0.00            | 0.00        | 8,986.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |  |
| 9,100.00                                  | 0.00            | 0.00        | 9,086.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |  |
| 9,200.00                                  | 0.00            | 0.00        | 9,186.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |  |
| 9,300.00                                  | 0.00            | 0.00        | 9,286.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |  |
| 9,400.00                                  | 0.00            | 0.00        | 9,386.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |  |
| 9,500.00                                  | 0.00            | 0.00        | 9,486.20              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |  |
| 9,549.92                                  | 0.00            | 0.00        | 9,536.12              | 299.91       | -20.00       | -300.10                 | 0.00                    | 0.00                   | 0.00                  |  |
| <b>KOP2, Begin 10.00°/100' Build</b>      |                 |             |                       |              |              |                         |                         |                        |                       |  |
| 9,575.25                                  | 2.53            | 179.33      | 9,561.45              | 299.35       | -19.99       | -299.54                 | 10.00                   | 10.00                  | 0.00                  |  |
| <b>TBSG_sand</b>                          |                 |             |                       |              |              |                         |                         |                        |                       |  |
| 9,600.00                                  | 5.01            | 179.33      | 9,586.14              | 297.72       | -19.97       | -297.91                 | 10.00                   | 10.00                  | 0.00                  |  |
| 9,700.00                                  | 15.01           | 179.33      | 9,684.49              | 280.37       | -19.77       | -280.55                 | 10.00                   | 10.00                  | 0.00                  |  |
| 9,800.00                                  | 25.01           | 179.33      | 9,778.34              | 246.20       | -19.37       | -246.38                 | 10.00                   | 10.00                  | 0.00                  |  |
| 9,900.00                                  | 35.01           | 179.33      | 9,864.82              | 196.25       | -18.78       | -196.43                 | 10.00                   | 10.00                  | 0.00                  |  |
| 9,979.96                                  | 43.00           | 179.33      | 9,926.91              | 145.97       | -18.19       | -146.14                 | 10.00                   | 10.00                  | 0.00                  |  |
| <b>WFMP</b>                               |                 |             |                       |              |              |                         |                         |                        |                       |  |
| 10,000.00                                 | 45.01           | 179.33      | 9,941.32              | 132.05       | -18.03       | -132.22                 | 10.00                   | 10.00                  | 0.00                  |  |
| 10,100.00                                 | 55.01           | 179.33      | 10,005.51             | 55.54        | -17.13       | -55.71                  | 10.00                   | 10.00                  | 0.00                  |  |
| 10,200.00                                 | 65.01           | 179.33      | 10,055.43             | -30.96       | -16.11       | 30.79                   | 10.00                   | 10.00                  | 0.00                  |  |
| 10,204.41                                 | 65.45           | 179.33      | 10,057.28             | -34.96       | -16.06       | 34.80                   | 10.00                   | 10.00                  | 0.00                  |  |
| <b>WFMP A Shale</b>                       |                 |             |                       |              |              |                         |                         |                        |                       |  |
| 10,300.00                                 | 75.01           | 179.33      | 10,089.58             | -124.81      | -15.01       | 124.65                  | 10.00                   | 10.00                  | 0.00                  |  |
| 10,400.00                                 | 85.01           | 179.33      | 10,106.91             | -223.16      | -13.85       | 223.01                  | 10.00                   | 10.00                  | 0.00                  |  |
| 10,451.96                                 | 90.20           | 179.33      | 10,109.07             | -275.05      | -13.24       | 274.90                  | 10.00                   | 10.00                  | 0.00                  |  |
| <b>LP, Hold 90.20° Inc at 179.33° Azm</b> |                 |             |                       |              |              |                         |                         |                        |                       |  |
| 10,500.00                                 | 90.20           | 179.33      | 10,108.90             | -323.09      | -12.68       | 322.94                  | 0.00                    | 0.00                   | 0.00                  |  |
| 10,600.00                                 | 90.20           | 179.33      | 10,108.55             | -423.08      | -11.50       | 422.94                  | 0.00                    | 0.00                   | 0.00                  |  |
| 10,700.00                                 | 90.20           | 179.33      | 10,108.19             | -523.07      | -10.33       | 522.94                  | 0.00                    | 0.00                   | 0.00                  |  |
| 10,800.00                                 | 90.20           | 179.33      | 10,107.83             | -623.07      | -9.15        | 622.94                  | 0.00                    | 0.00                   | 0.00                  |  |
| 10,900.00                                 | 90.20           | 179.33      | 10,107.48             | -723.06      | -7.97        | 722.94                  | 0.00                    | 0.00                   | 0.00                  |  |
| 11,000.00                                 | 90.20           | 179.33      | 10,107.12             | -823.05      | -6.80        | 822.94                  | 0.00                    | 0.00                   | 0.00                  |  |
| 11,100.00                                 | 90.20           | 179.33      | 10,106.77             | -923.04      | -5.62        | 922.94                  | 0.00                    | 0.00                   | 0.00                  |  |
| 11,200.00                                 | 90.20           | 179.33      | 10,106.41             | -1,023.04    | -4.45        | 1,022.94                | 0.00                    | 0.00                   | 0.00                  |  |
| 11,300.00                                 | 90.20           | 179.33      | 10,106.05             | -1,123.03    | -3.27        | 1,122.94                | 0.00                    | 0.00                   | 0.00                  |  |
| 11,400.00                                 | 90.20           | 179.33      | 10,105.70             | -1,223.02    | -2.10        | 1,222.94                | 0.00                    | 0.00                   | 0.00                  |  |
| 11,500.00                                 | 90.20           | 179.33      | 10,105.34             | -1,323.01    | -0.92        | 1,322.94                | 0.00                    | 0.00                   | 0.00                  |  |
| 11,600.00                                 | 90.20           | 179.33      | 10,104.98             | -1,423.00    | 0.25         | 1,422.93                | 0.00                    | 0.00                   | 0.00                  |  |
| 11,700.00                                 | 90.20           | 179.33      | 10,104.63             | -1,523.00    | 1.43         | 1,522.93                | 0.00                    | 0.00                   | 0.00                  |  |
| 11,800.00                                 | 90.20           | 179.33      | 10,104.27             | -1,622.99    | 2.60         | 1,622.93                | 0.00                    | 0.00                   | 0.00                  |  |
| 11,900.00                                 | 90.20           | 179.33      | 10,103.92             | -1,722.98    | 3.78         | 1,722.93                | 0.00                    | 0.00                   | 0.00                  |  |
| 12,000.00                                 | 90.20           | 179.33      | 10,103.56             | -1,822.97    | 4.96         | 1,822.93                | 0.00                    | 0.00                   | 0.00                  |  |
| 12,100.00                                 | 90.20           | 179.33      | 10,103.20             | -1,922.97    | 6.13         | 1,922.93                | 0.00                    | 0.00                   | 0.00                  |  |
| 12,200.00                                 | 90.20           | 179.33      | 10,102.85             | -2,022.96    | 7.31         | 2,022.93                | 0.00                    | 0.00                   | 0.00                  |  |
| 12,300.00                                 | 90.20           | 179.33      | 10,102.49             | -2,122.95    | 8.48         | 2,122.93                | 0.00                    | 0.00                   | 0.00                  |  |

|                  |                             |                                     |                                |
|------------------|-----------------------------|-------------------------------------|--------------------------------|
| <b>Database:</b> | USA Compass                 | <b>Local Co-ordinate Reference:</b> | Well 704H                      |
| <b>Company:</b>  | COG Operating LLC           | <b>TVD Reference:</b>               | RKB @ 3002.40usft (Ensign 155) |
| <b>Project:</b>  | Eddy County, NM (NAD27 NME) | <b>MD Reference:</b>                | RKB @ 3002.40usft (Ensign 155) |
| <b>Site:</b>     | Rock Jelly Fed Com          | <b>North Reference:</b>             | Grid                           |
| <b>Well:</b>     | 704H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature              |
| <b>Wellbore:</b> | OH                          |                                     |                                |
| <b>Design:</b>   | Plan 1 10-30-19             |                                     |                                |

| 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) |  |
| 12,400.00             | 90.20           | 179.33      | 10,102.14             | -2,222.94    | 9.66         | 2,222.93                | 0.00                    | 0.00                   | 0.00                  |  |
| 12,500.00             | 90.20           | 179.33      | 10,101.78             | -2,322.94    | 10.83        | 2,322.93                | 0.00                    | 0.00                   | 0.00                  |  |
| 12,600.00             | 90.20           | 179.33      | 10,101.42             | -2,422.93    | 12.01        | 2,422.93                | 0.00                    | 0.00                   | 0.00                  |  |
| 12,700.00             | 90.20           | 179.33      | 10,101.07             | -2,522.92    | 13.18        | 2,522.93                | 0.00                    | 0.00                   | 0.00                  |  |
| 12,800.00             | 90.20           | 179.33      | 10,100.71             | -2,622.91    | 14.36        | 2,622.93                | 0.00                    | 0.00                   | 0.00                  |  |
| 12,900.00             | 90.20           | 179.33      | 10,100.35             | -2,722.91    | 15.53        | 2,722.92                | 0.00                    | 0.00                   | 0.00                  |  |
| 13,000.00             | 90.20           | 179.33      | 10,100.00             | -2,822.90    | 16.71        | 2,822.92                | 0.00                    | 0.00                   | 0.00                  |  |
| 13,100.00             | 90.20           | 179.33      | 10,099.64             | -2,922.89    | 17.89        | 2,922.92                | 0.00                    | 0.00                   | 0.00                  |  |
| 13,200.00             | 90.20           | 179.33      | 10,099.29             | -3,022.88    | 19.06        | 3,022.92                | 0.00                    | 0.00                   | 0.00                  |  |
| 13,300.00             | 90.20           | 179.33      | 10,098.93             | -3,122.88    | 20.24        | 3,122.92                | 0.00                    | 0.00                   | 0.00                  |  |
| 13,400.00             | 90.20           | 179.33      | 10,098.57             | -3,222.87    | 21.41        | 3,222.92                | 0.00                    | 0.00                   | 0.00                  |  |
| 13,500.00             | 90.20           | 179.33      | 10,098.22             | -3,322.86    | 22.59        | 3,322.92                | 0.00                    | 0.00                   | 0.00                  |  |
| 13,600.00             | 90.20           | 179.33      | 10,097.86             | -3,422.85    | 23.76        | 3,422.92                | 0.00                    | 0.00                   | 0.00                  |  |
| 13,700.00             | 90.20           | 179.33      | 10,097.50             | -3,522.85    | 24.94        | 3,522.92                | 0.00                    | 0.00                   | 0.00                  |  |
| 13,800.00             | 90.20           | 179.33      | 10,097.15             | -3,622.84    | 26.11        | 3,622.92                | 0.00                    | 0.00                   | 0.00                  |  |
| 13,900.00             | 90.20           | 179.33      | 10,096.79             | -3,722.83    | 27.29        | 3,722.92                | 0.00                    | 0.00                   | 0.00                  |  |
| 14,000.00             | 90.20           | 179.33      | 10,096.44             | -3,822.82    | 28.46        | 3,822.92                | 0.00                    | 0.00                   | 0.00                  |  |
| 14,100.00             | 90.20           | 179.33      | 10,096.08             | -3,922.82    | 29.64        | 3,922.92                | 0.00                    | 0.00                   | 0.00                  |  |
| 14,200.00             | 90.20           | 179.33      | 10,095.72             | -4,022.81    | 30.82        | 4,022.91                | 0.00                    | 0.00                   | 0.00                  |  |
| 14,300.00             | 90.20           | 179.33      | 10,095.37             | -4,122.80    | 31.99        | 4,122.91                | 0.00                    | 0.00                   | 0.00                  |  |
| 14,400.00             | 90.20           | 179.33      | 10,095.01             | -4,222.79    | 33.17        | 4,222.91                | 0.00                    | 0.00                   | 0.00                  |  |
| 14,500.00             | 90.20           | 179.33      | 10,094.65             | -4,322.79    | 34.34        | 4,322.91                | 0.00                    | 0.00                   | 0.00                  |  |
| 14,600.00             | 90.20           | 179.33      | 10,094.30             | -4,422.78    | 35.52        | 4,422.91                | 0.00                    | 0.00                   | 0.00                  |  |
| 14,700.00             | 90.20           | 179.33      | 10,093.94             | -4,522.77    | 36.69        | 4,522.91                | 0.00                    | 0.00                   | 0.00                  |  |
| 14,800.00             | 90.20           | 179.33      | 10,093.59             | -4,622.76    | 37.87        | 4,622.91                | 0.00                    | 0.00                   | 0.00                  |  |
| 14,900.00             | 90.20           | 179.33      | 10,093.23             | -4,722.76    | 39.04        | 4,722.91                | 0.00                    | 0.00                   | 0.00                  |  |
| 15,000.00             | 90.20           | 179.33      | 10,092.87             | -4,822.75    | 40.22        | 4,822.91                | 0.00                    | 0.00                   | 0.00                  |  |
| 15,100.00             | 90.20           | 179.33      | 10,092.52             | -4,922.74    | 41.39        | 4,922.91                | 0.00                    | 0.00                   | 0.00                  |  |
| 15,200.00             | 90.20           | 179.33      | 10,092.16             | -5,022.73    | 42.57        | 5,022.91                | 0.00                    | 0.00                   | 0.00                  |  |
| 15,300.00             | 90.20           | 179.33      | 10,091.81             | -5,122.73    | 43.75        | 5,122.91                | 0.00                    | 0.00                   | 0.00                  |  |
| 15,400.00             | 90.20           | 179.33      | 10,091.45             | -5,222.72    | 44.92        | 5,222.91                | 0.00                    | 0.00                   | 0.00                  |  |
| 15,500.00             | 90.20           | 179.33      | 10,091.09             | -5,322.71    | 46.10        | 5,322.90                | 0.00                    | 0.00                   | 0.00                  |  |
| 15,600.00             | 90.20           | 179.33      | 10,090.74             | -5,422.70    | 47.27        | 5,422.90                | 0.00                    | 0.00                   | 0.00                  |  |
| 15,700.00             | 90.20           | 179.33      | 10,090.38             | -5,522.70    | 48.45        | 5,522.90                | 0.00                    | 0.00                   | 0.00                  |  |
| 15,800.00             | 90.20           | 179.33      | 10,090.02             | -5,622.69    | 49.62        | 5,622.90                | 0.00                    | 0.00                   | 0.00                  |  |
| 15,900.00             | 90.20           | 179.33      | 10,089.67             | -5,722.68    | 50.80        | 5,722.90                | 0.00                    | 0.00                   | 0.00                  |  |
| 16,000.00             | 90.20           | 179.33      | 10,089.31             | -5,822.67    | 51.97        | 5,822.90                | 0.00                    | 0.00                   | 0.00                  |  |
| 16,100.00             | 90.20           | 179.33      | 10,088.96             | -5,922.67    | 53.15        | 5,922.90                | 0.00                    | 0.00                   | 0.00                  |  |
| 16,200.00             | 90.20           | 179.33      | 10,088.60             | -6,022.66    | 54.32        | 6,022.90                | 0.00                    | 0.00                   | 0.00                  |  |
| 16,300.00             | 90.20           | 179.33      | 10,088.24             | -6,122.65    | 55.50        | 6,122.90                | 0.00                    | 0.00                   | 0.00                  |  |
| 16,400.00             | 90.20           | 179.33      | 10,087.89             | -6,222.64    | 56.68        | 6,222.90                | 0.00                    | 0.00                   | 0.00                  |  |
| 16,500.00             | 90.20           | 179.33      | 10,087.53             | -6,322.64    | 57.85        | 6,322.90                | 0.00                    | 0.00                   | 0.00                  |  |
| 16,600.00             | 90.20           | 179.33      | 10,087.17             | -6,422.63    | 59.03        | 6,422.90                | 0.00                    | 0.00                   | 0.00                  |  |
| 16,700.00             | 90.20           | 179.33      | 10,086.82             | -6,522.62    | 60.20        | 6,522.90                | 0.00                    | 0.00                   | 0.00                  |  |
| 16,800.00             | 90.20           | 179.33      | 10,086.46             | -6,622.61    | 61.38        | 6,622.89                | 0.00                    | 0.00                   | 0.00                  |  |
| 16,900.00             | 90.20           | 179.33      | 10,086.11             | -6,722.61    | 62.55        | 6,722.89                | 0.00                    | 0.00                   | 0.00                  |  |
| 17,000.00             | 90.20           | 179.33      | 10,085.75             | -6,822.60    | 63.73        | 6,822.89                | 0.00                    | 0.00                   | 0.00                  |  |
| 17,100.00             | 90.20           | 179.33      | 10,085.39             | -6,922.59    | 64.90        | 6,922.89                | 0.00                    | 0.00                   | 0.00                  |  |
| 17,200.00             | 90.20           | 179.33      | 10,085.04             | -7,022.58    | 66.08        | 7,022.89                | 0.00                    | 0.00                   | 0.00                  |  |
| 17,300.00             | 90.20           | 179.33      | 10,084.68             | -7,122.58    | 67.25        | 7,122.89                | 0.00                    | 0.00                   | 0.00                  |  |
| 17,400.00             | 90.20           | 179.33      | 10,084.32             | -7,222.57    | 68.43        | 7,222.89                | 0.00                    | 0.00                   | 0.00                  |  |
| 17,500.00             | 90.20           | 179.33      | 10,083.97             | -7,322.56    | 69.61        | 7,322.89                | 0.00                    | 0.00                   | 0.00                  |  |
| 17,600.00             | 90.20           | 179.33      | 10,083.61             | -7,422.55    | 70.78        | 7,422.89                | 0.00                    | 0.00                   | 0.00                  |  |
| 17,700.00             | 90.20           | 179.33      | 10,083.26             | -7,522.54    | 71.96        | 7,522.89                | 0.00                    | 0.00                   | 0.00                  |  |

|                  |                             |                                     |                                |
|------------------|-----------------------------|-------------------------------------|--------------------------------|
| <b>Database:</b> | USA Compass                 | <b>Local Co-ordinate Reference:</b> | Well 704H                      |
| <b>Company:</b>  | COG Operating LLC           | <b>TVD Reference:</b>               | RKB @ 3002.40usft (Ensign 155) |
| <b>Project:</b>  | Eddy County, NM (NAD27 NME) | <b>MD Reference:</b>                | RKB @ 3002.40usft (Ensign 155) |
| <b>Site:</b>     | Rock Jelly Fed Com          | <b>North Reference:</b>             | Grid                           |
| <b>Well:</b>     | 704H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature              |
| <b>Wellbore:</b> | OH                          |                                     |                                |
| <b>Design:</b>   | Plan 1 10-30-19             |                                     |                                |

| 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) |  |
| 17,800.00             | 90.20           | 179.33      | 10,082.90             | -7,622.54    | 73.13        | 7,622.89                | 0.00                    | 0.00                   | 0.00                  |  |
| 17,900.00             | 90.20           | 179.33      | 10,082.54             | -7,722.53    | 74.31        | 7,722.89                | 0.00                    | 0.00                   | 0.00                  |  |
| 18,000.00             | 90.20           | 179.33      | 10,082.19             | -7,822.52    | 75.48        | 7,822.89                | 0.00                    | 0.00                   | 0.00                  |  |
| 18,100.00             | 90.20           | 179.33      | 10,081.83             | -7,922.51    | 76.66        | 7,922.88                | 0.00                    | 0.00                   | 0.00                  |  |
| 18,200.00             | 90.20           | 179.33      | 10,081.48             | -8,022.51    | 77.83        | 8,022.88                | 0.00                    | 0.00                   | 0.00                  |  |
| 18,300.00             | 90.20           | 179.33      | 10,081.12             | -8,122.50    | 79.01        | 8,122.88                | 0.00                    | 0.00                   | 0.00                  |  |
| 18,400.00             | 90.20           | 179.33      | 10,080.76             | -8,222.49    | 80.18        | 8,222.88                | 0.00                    | 0.00                   | 0.00                  |  |
| 18,500.00             | 90.20           | 179.33      | 10,080.41             | -8,322.48    | 81.36        | 8,322.88                | 0.00                    | 0.00                   | 0.00                  |  |
| 18,600.00             | 90.20           | 179.33      | 10,080.05             | -8,422.48    | 82.54        | 8,422.88                | 0.00                    | 0.00                   | 0.00                  |  |
| 18,700.00             | 90.20           | 179.33      | 10,079.69             | -8,522.47    | 83.71        | 8,522.88                | 0.00                    | 0.00                   | 0.00                  |  |
| 18,800.00             | 90.20           | 179.33      | 10,079.34             | -8,622.46    | 84.89        | 8,622.88                | 0.00                    | 0.00                   | 0.00                  |  |
| 18,900.00             | 90.20           | 179.33      | 10,078.98             | -8,722.45    | 86.06        | 8,722.88                | 0.00                    | 0.00                   | 0.00                  |  |
| 19,000.00             | 90.20           | 179.33      | 10,078.63             | -8,822.45    | 87.24        | 8,822.88                | 0.00                    | 0.00                   | 0.00                  |  |
| 19,100.00             | 90.20           | 179.33      | 10,078.27             | -8,922.44    | 88.41        | 8,922.88                | 0.00                    | 0.00                   | 0.00                  |  |
| 19,200.00             | 90.20           | 179.33      | 10,077.91             | -9,022.43    | 89.59        | 9,022.88                | 0.00                    | 0.00                   | 0.00                  |  |
| 19,300.00             | 90.20           | 179.33      | 10,077.56             | -9,122.42    | 90.76        | 9,122.88                | 0.00                    | 0.00                   | 0.00                  |  |
| 19,400.00             | 90.20           | 179.33      | 10,077.20             | -9,222.42    | 91.94        | 9,222.87                | 0.00                    | 0.00                   | 0.00                  |  |
| 19,500.00             | 90.20           | 179.33      | 10,076.84             | -9,322.41    | 93.11        | 9,322.87                | 0.00                    | 0.00                   | 0.00                  |  |
| 19,600.00             | 90.20           | 179.33      | 10,076.49             | -9,422.40    | 94.29        | 9,422.87                | 0.00                    | 0.00                   | 0.00                  |  |
| 19,700.00             | 90.20           | 179.33      | 10,076.13             | -9,522.39    | 95.47        | 9,522.87                | 0.00                    | 0.00                   | 0.00                  |  |
| 19,800.00             | 90.20           | 179.33      | 10,075.78             | -9,622.39    | 96.64        | 9,622.87                | 0.00                    | 0.00                   | 0.00                  |  |
| 19,900.00             | 90.20           | 179.33      | 10,075.42             | -9,722.38    | 97.82        | 9,722.87                | 0.00                    | 0.00                   | 0.00                  |  |
| 20,000.00             | 90.20           | 179.33      | 10,075.06             | -9,822.37    | 98.99        | 9,822.87                | 0.00                    | 0.00                   | 0.00                  |  |
| 20,100.00             | 90.20           | 179.33      | 10,074.71             | -9,922.36    | 100.17       | 9,922.87                | 0.00                    | 0.00                   | 0.00                  |  |
| 20,200.00             | 90.20           | 179.33      | 10,074.35             | -10,022.36   | 101.34       | 10,022.87               | 0.00                    | 0.00                   | 0.00                  |  |
| 20,298.45             | 90.20           | 179.33      | 10,074.00             | -10,120.80   | 102.50       | 10,121.32               | 0.00                    | 0.00                   | 0.00                  |  |
| TD at 20298.45        |                 |             |                       |              |              |                         |                         |                        |                       |  |

| Design Targets  |               |              |            |              |              |                 |                |   |           |
|---|---------------|--------------|------------|--------------|--------------|-----------------|----------------|---|-----------|
| Target Name   | Dip Angle (°) | Dip Dir. (°) | TVD (usft) | +N/-S (usft) | +E/-W (usft) | Northing (usft) | Easting (usft) | Latitude                                | Longitude |
| BHL - Rock Jelly Fed Cc<br>- hit/miss target<br>- Shape<br>- Point  | 0.00          | 0.00         | 10,074.00  | -10,120.80   | 102.50       | 382,119.80      | 610,971.80     | 32° 3' 0.202654 N 103° 58' 30.575822 W  |           |
| LTP - Rock Jelly Fed Co<br>- plan misses target center by 0.03usft at 20168.44usft MD (10074.46 TVD, -9990.80 N, 100.97 E)<br>- Point | 0.00          | 0.00         | 10,074.46  | -9,990.80    | 101.00       | 382,249.80      | 610,970.30     | 32° 3' 1.489243 N 103° 58' 30.588240 W  |           |
| FTP - Rock Jelly Fed Cc<br>- plan misses target center by 70.62usft at 10182.63usft MD (10047.85 TVD, -15.33 N, -16.29 E)<br>- Point  | 0.00          | 0.00         | 10,109.00  | 20.00        | -15.60       | 392,260.60      | 610,853.70     | 32° 4' 40.564378 N 103° 58' 31.557317 W |           |

|                  |                             |                                     |                                |
|------------------|-----------------------------|-------------------------------------|--------------------------------|
| <b>Database:</b> | USA Compass                 | <b>Local Co-ordinate Reference:</b> | Well 704H                      |
| <b>Company:</b>  | COG Operating LLC           | <b>TVD Reference:</b>               | RKB @ 3002.40usft (Ensign 155) |
| <b>Project:</b>  | Eddy County, NM (NAD27 NME) | <b>MD Reference:</b>                | RKB @ 3002.40usft (Ensign 155) |
| <b>Site:</b>     | Rock Jelly Fed Com          | <b>North Reference:</b>             | Grid                           |
| <b>Well:</b>     | 704H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature              |
| <b>Wellbore:</b> | OH                          |                                     |                                |
| <b>Design:</b>   | Plan 1 10-30-19             |                                     |                                |

| Formations            |                       |                     |           |         |                   |  |
|-----------------------|-----------------------|---------------------|-----------|---------|-------------------|--|
| Measured Depth (usft) | Vertical Depth (usft) | Name                | Lithology | Dip (°) | Dip Direction (°) |  |
| 294.40                | 294.40                | Rustler             |           | -0.20   | 179.42            |  |
| 636.40                | 636.40                | TOS                 |           | -0.20   | 179.42            |  |
| 2,839.79              | 2,839.51              | BOS (Fletcher)      |           | -0.20   | 179.42            |  |
| 3,069.04              | 3,068.54              | LMAR (Top Delaware) |           | -0.20   | 179.42            |  |
| 3,098.14              | 3,097.55              | BLCN                |           | -0.20   | 179.42            |  |
| 3,915.87              | 3,910.85              | CYCN                |           | -0.20   | 179.42            |  |
| 5,228.55              | 5,216.32              | BYCN                |           | -0.20   | 179.42            |  |
| 6,783.24              | 6,769.45              | Bone Sprg (BSGL)    |           | -0.20   | 179.42            |  |
| 7,383.24              | 7,369.45              | U Avalon Sh         |           | -0.20   | 179.42            |  |
| 7,698.24              | 7,684.45              | FBSG_sand           |           | -0.20   | 179.42            |  |
| 8,382.24              | 8,368.45              | SBSG_sand           |           | -0.20   | 179.42            |  |
| 8,941.24              | 8,927.45              | SBSG_sand_Base      |           | -0.20   | 179.42            |  |
| 9,575.25              | 9,561.45              | TBSG_sand           |           | -0.20   | 179.42            |  |
| 9,979.96              | 9,926.91              | WFMP                |           | -0.20   | 179.42            |  |
| 10,204.41             | 10,057.28             | WFMP A Shale        |           | -0.20   | 179.42            |  |

| Plan Annotations      |                       |                   |              |                                    |  |
|-----------------------|-----------------------|-------------------|--------------|------------------------------------|--|
| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates |              |                                    |  |
|                       |                       | +N/-S (usft)      | +E/-W (usft) | Comment                            |  |
| 1,000.00              | 1,000.00              | 0.00              | 0.00         | KOP, Begin 2.00°/100' Build        |  |
| 1,050.00              | 1,050.00              | 0.44              | -0.03        | Hold 1.00° Inc at 356.18° Azm      |  |
| 2,900.00              | 2,899.72              | 32.65             | -2.18        | Begin 2.00°/100' Build             |  |
| 3,150.08              | 3,149.25              | 47.88             | -3.19        | Hold 6.00° Inc                     |  |
| 5,415.72              | 5,402.47              | 284.24            | -18.96       | Begin 2.00°/100' Drop              |  |
| 5,715.80              | 5,702.00              | 299.91            | -20.00       | Begin Vertical Hold                |  |
| 9,549.92              | 9,536.12              | 299.91            | -20.00       | KOP2, Begin 10.00°/100' Build      |  |
| 10,451.96             | 10,109.07             | -275.05           | -13.24       | LP, Hold 90.20° Inc at 179.33° Azm |  |
| 20,298.45             | 10,074.00             | -10,120.80        | 102.50       | TD at 20298.45                     |  |

District I  
1625 N. French Dr., Hobbs, NM 88240  
District II  
811 S. First St., Artesia, NM 88210  
District III  
1000 Rio Brazos Road, Aztec, NM 87410  
District IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico  
Energy, Minerals and Natural Resources Department  
Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

Submit Original  
to Appropriate  
District Office

### GAS CAPTURE PLAN

Date: 10/22/19

☒ Original

Operator & OGRID No.: COG Operating LLC, (229137)

☐ Amended - Reason for Amendment: \_\_\_\_\_

This Gas Capture Plan outlines actions to be taken by the Operator to reduce well/production facility flaring/venting for new completion (new drill, recomple to new zone, re-frac) activity.

*Note: Form C-129 must be submitted and approved prior to exceeding 60 days allowed by Rule (Subsection A of 19.15.18.12 NMAC).*

#### Well(s)/Production Facility – Name of facility

The well(s) that will be located at the production facility are shown in the table below.

| Well Name                   | API     | Well Location (ULSTR) | Footages             | Expected MCF/D | Flared or Vented | Comments                              |
|-----------------------------|---------|-----------------------|----------------------|----------------|------------------|---------------------------------------|
| Rock Jelly Federal Com 701H | 30-015- | 1-3-26S-29E           | 210' FNL & 1055' FEL | ±2500          | None Planned     | APD Submission Plan Subject to change |
| Rock Jelly Federal Com 702H | 30-015- | 1-3-26S-29E           | 210' FNL & 1085' FEL | ±2500          | None Planned     | APD Submission Plan Subject to change |
| Rock Jelly Federal Com 703H | 30-015- | 3-3-26S-29E           | 350' FNL & 1530' FWL | ±2500          | None Planned     | APD Submission Plan Subject to change |
| Rock Jelly Federal Com 704H | 30-015- | 3-3-26S-29E           | 350' FNL & 1500' FWL | ±2500          | None Planned     | APD Submission Plan Subject to change |
| Rock Jelly Federal Com 705H | 30-015- | 3-3-26S-29E           | 350' FNL & 1470' FWL | ±2500          | None Planned     | APD Submission Plan Subject to change |
|                             |         |                       |                      |                |                  |                                       |

#### Gathering System and Pipeline Notification

Well(s) will be connected to a production facility after flowback operations are complete, if gas transporter system is in place. The gas produced from production facility is dedicated to **ETC Field Services LLC** and will be connected to **Red Bluff** low pressure gathering system located in **Culberson** County, Texas. **COG Operating LLC** provides (periodically) to **ETC Field Services LLC** a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, **COG Operating LLC** and **ETC Field Services LLC** have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at **ETC Field Services LLC** Processing Plant located in Sec. **35**, Blk. **57, T2**, **Culberson** County, Texas. The actual flow of the gas will be based on compression operating parameters and gathering system pressures.

#### Flowback Strategy

After the fracture treatment/completion operations, well(s) will be produced to temporary production tanks and gas will be flared or vented. During flowback, the fluids and sand content will be monitored. When the produced fluids contain minimal sand, the wells will be turned to production facilities. Gas sales should start as soon as the wells start flowing through the production facilities, unless there are operational issues on Gas Transporter system at that time. Based on current information, it is Operator's belief the system can take this gas upon completion of the well(s).

Safety requirements during cleanout operations from the use of underbalanced air cleanout systems may necessitate that sand and non-pipeline quality gas be vented and/or flared rather than sold on a temporary basis.



### **Alternatives to Reduce Flaring**

Below are alternatives considered from a conceptual standpoint to reduce the amount of gas flared.

- Power Generation – On lease
  - Only a portion of gas is consumed operating the generator, remainder of gas will be flared
- Compressed Natural Gas – On lease
  - Gas flared would be minimal, but might be uneconomical to operate when gas volume declines
- NGL Removal – On lease
  - Plants are expensive, residue gas is still flared, and uneconomical to operate when gas volume declines