PECOS DISTRICT DRILLING
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**COG Operating, LLC**
LEASE NO.:	**NMNM-134886**
WELL NAME & NO.:	**Bonaid Federal Com 14H**
SURFACE HOLE FOOTAGE:	**0210' FNL & 1110' FWL**
BOTTOM HOLE FOOTAGE	**0200' FSL & 1650' FWL Sec. 20, T. 24 S., R 35 E.**
LOCATION:	**Section 17, T. 24 S., R 35 E., NMPM**
COUNTY:	**County, New Mexico**

Submit NMOCD Gas Capture Plan Via Sundry Notice

Communitization Agreement

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

A. DRILLING OPERATIONS 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)

☐ **Lea County**

Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575) 3933612

1. **Hydrogen Sulfide (H2S) monitors shall be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the**

Hydrogen Sulfide area shall meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.

2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a "Major" violation.**

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

4. **The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be 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.**

B. CASING

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.

Centralizers required on surface casing per Onshore Order 2.III.B.1.f.

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.

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.

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

Possibility of water flows in the Salado and Castile.
Possibility of lost circulation in the Rustler, Red Beds, and Delaware.
Abnormal pressures may be encountered upon penetrating the 3rd Bone Spring Lime and subsequent formations.

1. The **13-3/8** inch surface casing shall be set at approximately **900** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface. **If salt is encountered, set casing at least 25 feet above the salt. Excess calculates to 9% - Additional cement may be required.**

    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 is to include the lead cement slurry.**

    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 shall be kept fluid filled while running into hole to meet BLM minimum collapse requirements.

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.

Centralizers required on horizontal leg, must be type for horizontal service and a minimum of one every other joint.

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.

4. 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.

C. 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 53.

2. Variance approved to use flex line from BOP to choke manifold. 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.** If the BLM inspector questions the straightness of the hose, a BLM engineer will be contacted and will review in the field or via picture supplied by inspector to determine if changes are required (operator shall expect delays if this occurs).

3. **In the case where the only BOP installed is an annular preventer, it shall be tested to a minimum of 2000 psi (which may require upgrading to 3M or 5M annular).**

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

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

6. The appropriate BLM office shall be notified a minimum of 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).

a. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**.

b. 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.

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

d. 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.**

e. 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.

D. DRILL STEM TEST

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

E. 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 062118

PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG Operating LLC
LEASE NO.:	NMNM134886
WELL NAME & NO.:	Bonaid Federal Com 14H
SURFACE HOLE FOOTAGE:	210'/N & 1110'/W
BOTTOM HOLE FOOTAGE	200'/S & 1650'/W
LOCATION:	Section 17, T.24 S., R.35 E., NMPM
COUNTY:	Lea County, New Mexico

TABLE OF CONTENTS

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

I. GENERAL PROVISIONS

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

II. PERMIT EXPIRATION

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

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

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

IV. NOXIOUS WEEDS

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

V. SPECIAL REQUIREMENT(S)

Timing Limitation Stipulation / Condition of Approval for lesser prairie-chicken: Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 feet from the source of the noise.

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well. For more installation details, contact the Carlsbad Field Office at 575-234-5972.

This authorization is subject to your Certificate of Participation and/or Certificate of Inclusion under the New Mexico Candidate Conservation Agreement. Because it involves surface disturbing activities covered under your Certificate, your Habitat Conservation Fund Account with the Center of Excellence for Hazardous Materials Management (CEHMM) will be debited according to Exhibit B Part 2 of the Certificate of Participation.

VI. CONSTRUCTION

A. NOTIFICATION

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

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

B. TOPSOIL

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

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

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

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

D. FEDERAL MINERAL MATERIALS PIT

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

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

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

F. EXCLOSURE FENCING (CELLARS & PITS)

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

G. ON LEASE ACCESS ROADS

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

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

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

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

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

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

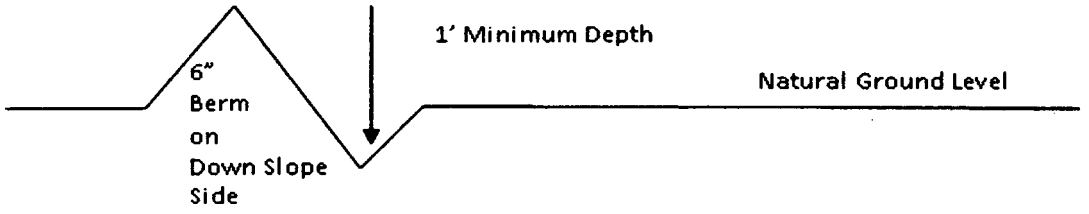
Turnouts
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage

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

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

Cross Section of a Typical Lead-off Ditch



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

Formula for Spacing Interval of Lead-off Ditches

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

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

Cattle guards

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

Fence Requirement

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

Public Access

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

Construction Steps

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

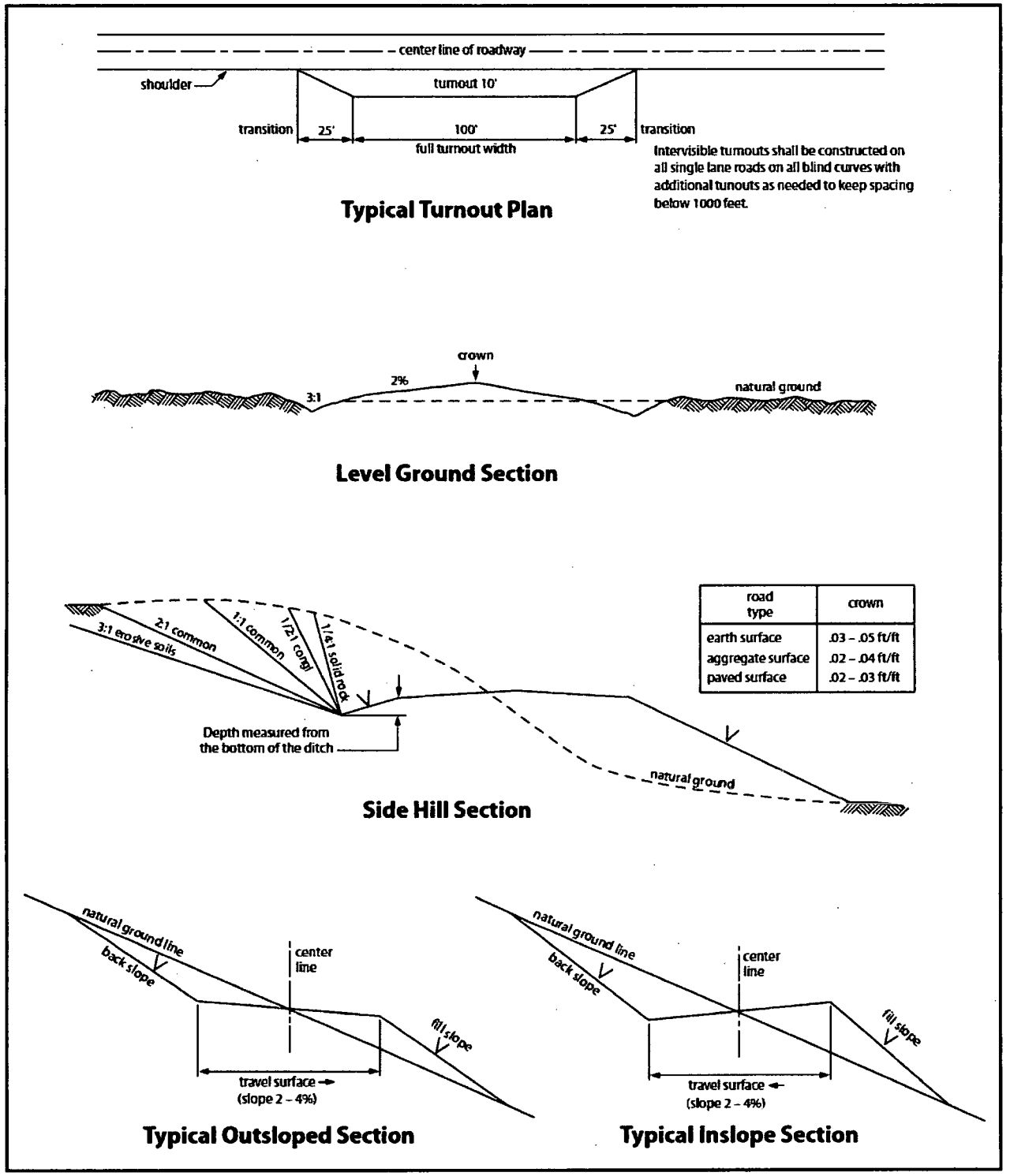


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

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

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

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

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

Containment Structures

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

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

VIII. INTERIM RECLAMATION

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

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

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

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

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

IX. FINAL ABANDONMENT & RECLAMATION

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

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory

revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

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

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

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well.

Company: COG
Lease #:NMNM134886
Well name: Bonaid Federal 14H and 15H
May 21st, 2018

Seed Mixture for LPC Sand/Shinnery Sites

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

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

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

Species	lb/acre
Plains Bristlegrass	5lbs/A
Sand Bluestem	5lbs/A
Little Bluestem	3lbs/A
Big Bluestem	6lbs/A
Plains Coreopsis	2lbs/A
Sand Dropseed	1lbs/A

*Pounds of pure live seed:

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

Approval Date: 07/13/2018

AFMSS

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

Operator Certification Data Report

07/22/2018

Operator Certification

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.

NAME: Mayte Reyes **Signed on:** 03/12/2018

Title: Regulatory Analyst

Street Address: 2208 W Main Street

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

Phone: (575)748-6945

Email address: Mreyes1@concho.com

Field Representative

Representative Name: Rand French

Street Address: 2208 West Main Street

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

Phone: (575)748-6940

Email address: rfrench@concho.com

COG OPERATING LLC
HYDROGEN SULFIDE DRILLING OPERATIONS PLAN

1. HYDROGEN SULFIDE TRAINING

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

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

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

a. The effects of H2S on metal components. If high tensile tubulars are to be used, personnel will be trained in their special maintenance requirements.
b. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
c. The contents and requirements of the H_2S Drilling Operations Plan and the Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H2S zone (within 3 days or 500 feet) and weekly H2S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H2S Drilling Operations Plan and the Public Protection Plan. This plan shall be available at the well site. All personnel will be required to carry documentation that they have received the proper training.

2. H_2S SAFETY EQUIPMENT AND SYSTEMS

Note: All H_2S safety equipment and systems will be installed, tested, and operational when drilling reaches a depth of 500 feet above, or three days prior to penetrating the first zone containing or reasonably expected to contain H2S. If H2S greater than 100 ppm is encountered in the gas stream we will shut in and install H2S equipment.

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

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

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

d. Visual warning systems:
Caution/Danger signs shall be posted on roads providing direct access to location. Signs will be painted a high visibility yellow with black lettering of sufficient size to be readable at a reasonable distance from the immediate location. Bilingual signs will be used, when appropriate. See example attached.

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

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

g. Communication:
Company vehicles equipped with cellular telephone.

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

W A R N I N G

YOU ARE ENTERING AN H_2S AREA
AUTHORIZED PERSONNEL ONLY

1. ***BEARDS OR CONTACT LENSES NOT ALLOWED***
2. ***HARD HATS REQUIRED***
3. ***SMOKING IN DESIGNATED AREAS ONLY***
4. ***BE WIND CONSCIOUS AT ALL TIMES***
5. ***CK WITH COG OPERATING LLC FOREMAN AT MAIN OFFICE***

COG OPERATING LLC

1-575-748-6940

EMERGENCY CALL LIST

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

EMERGENCY RESPONSE NUMBERS

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

COG OPERATING, LLC

Lea County, NM (NAD27) NMEZ
Bonaid Federal COM
#14H

OH

Plan: Plan #1 - IP

Standard Planning Report

12 March, 2018

Database:	EDM 5000.14 Single User Db	**Local Co-ordinate Reference:**	Well #14H
Company:	COG OPERATING, LLC	**TVD Reference:**	RKB @ 3401.70usft (Rig KB = 25')
Project:	Lea County, NM (NAD27) NMEZ	**MD Reference:**	RKB @ 3401.70usft (Rig KB = 25')
Site:	Bonaid Federal COM	**North Reference:**	Grid
Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - IP		

Project	Lea County, NM (NAD27) NMEZ		
Map System:	US State Plane 1927 (Exact solution)	**System Datum:**	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Bonaid Federal COM				
Site Position:		**Northing:**	446,509.70 usft	**Latitude:**	32° 13' 26.694 N
From:	Map	**Easting:**	790,481.60 usft	**Longitude:**	103° 23' 38.423 W
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.50 °

Well	#14H					
Well Position	**+N/-S**	0.00 usft	**Northing:**	446,509.70 usft	**Latitude:**	32° 13' 26.694 N
	+E/-W	0.00 usft	**Easting:**	790,481.60 usft	**Longitude:**	103° 23' 38.423 W
Position Uncertainty		0.00 usft	**Wellhead Elevation:**		**Ground Level:**	3,376.70 usft

Wellbore	OH				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	02/07/18	6.80	60.08	47,890.88701531

Design	Plan #1 - IP				
Audit Notes:					
Version:		**Phase:**	PLAN	**Tie On Depth:**	0.00
Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**	
	0.00	0.00	0.00	179.49	

Plan Survey Tool Program **Date** 02/07/18

	Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	20,200.41	Plan #1 - IP (OH)	MWD	
				MWD v3:standard declination	

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	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,566.67	1.00	90.00	1,566.66	0.00	0.58	1.50	1.50	0.00	90.00	
9,712.27	1.00	90.00	9,711.03	0.00	142.74	0.00	0.00	0.00	0.00	
10,444.88	88.30	157.20	10,185.00	-424.22	329.10	12.00	11.92	9.17	67.23	
11,558.69	88.30	179.49	10,218.47	-1,507.71	552.63	2.00	0.00	2.00	90.34	
20,200.44	88.30	179.49	10,475.00	-10,145.30	630.10	0.00	0.00	0.00	0.00	

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Site:	Bonaid Federal COM	**North Reference:**	Grid
Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - IP		

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
SHL(BFC#14H) - TW(BFC#14H)									
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
Start of Nudge: 1° INC, 90°AZ@1.5°DLS									
1,566.67	1.00	90.00	1,566.66	0.00	0.58	0.01	1.50	1.50	0.00
1,600.00	1.00	90.00	1,599.99	0.00	1.16	0.01	0.00	0.00	0.00
1,700.00	1.00	90.00	1,699.98	0.00	2.91	0.03	0.00	0.00	0.00
1,800.00	1.00	90.00	1,799.96	0.00	4.65	0.04	0.00	0.00	0.00
1,900.00	1.00	90.00	1,899.95	0.00	6.40	0.06	0.00	0.00	0.00
2,000.00	1.00	90.00	1,999.93	0.00	8.14	0.07	0.00	0.00	0.00
2,100.00	1.00	90.00	2,099.92	0.00	9.89	0.09	0.00	0.00	0.00
2,200.00	1.00	90.00	2,199.90	0.00	11.63	0.10	0.00	0.00	0.00
2,300.00	1.00	90.00	2,299.88	0.00	13.38	0.12	0.00	0.00	0.00
2,400.00	1.00	90.00	2,399.87	0.00	15.13	0.13	0.00	0.00	0.00
2,500.00	1.00	90.00	2,499.85	0.00	16.87	0.15	0.00	0.00	0.00
2,600.00	1.00	90.00	2,599.84	0.00	18.62	0.17	0.00	0.00	0.00
2,700.00	1.00	90.00	2,699.82	0.00	20.36	0.18	0.00	0.00	0.00
2,800.00	1.00	90.00	2,799.81	0.00	22.11	0.20	0.00	0.00	0.00
2,900.00	1.00	90.00	2,899.79	0.00	23.85	0.21	0.00	0.00	0.00
3,000.00	1.00	90.00	2,999.78	0.00	25.60	0.23	0.00	0.00	0.00
3,100.00	1.00	90.00	3,099.76	0.00	27.34	0.24	0.00	0.00	0.00
3,200.00	1.00	90.00	3,199.75	0.00	29.09	0.26	0.00	0.00	0.00
3,300.00	1.00	90.00	3,299.73	0.00	30.83	0.27	0.00	0.00	0.00
3,400.00	1.00	90.00	3,399.72	0.00	32.58	0.29	0.00	0.00	0.00
3,500.00	1.00	90.00	3,499.70	0.00	34.32	0.31	0.00	0.00	0.00
3,600.00	1.00	90.00	3,599.69	0.00	36.07	0.32	0.00	0.00	0.00
3,700.00	1.00	90.00	3,699.67	0.00	37.81	0.34	0.00	0.00	0.00
3,800.00	1.00	90.00	3,799.66	0.00	39.56	0.35	0.00	0.00	0.00
3,900.00	1.00	90.00	3,899.64	0.00	41.30	0.37	0.00	0.00	0.00
4,000.00	1.00	90.00	3,999.63	0.00	43.05	0.38	0.00	0.00	0.00
4,100.00	1.00	90.00	4,099.61	0.00	44.79	0.40	0.00	0.00	0.00
4,200.00	1.00	90.00	4,199.60	0.00	46.54	0.41	0.00	0.00	0.00
4,300.00	1.00	90.00	4,299.58	0.00	48.29	0.43	0.00	0.00	0.00
4,400.00	1.00	90.00	4,399.57	0.00	50.03	0.45	0.00	0.00	0.00
4,500.00	1.00	90.00	4,499.55	0.00	51.78	0.46	0.00	0.00	0.00
4,600.00	1.00	90.00	4,599.53	0.00	53.52	0.48	0.00	0.00	0.00
4,700.00	1.00	90.00	4,699.52	0.00	55.27	0.49	0.00	0.00	0.00
4,800.00	1.00	90.00	4,799.50	0.00	57.01	0.51	0.00	0.00	0.00
4,900.00	1.00	90.00	4,899.49	0.00	58.76	0.52	0.00	0.00	0.00

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Site:	Bonaid Federal COM	**North Reference:**	Grid
Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - IP		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,000.00	1.00	90.00	4,999.47	0.00	60.50	0.54	0.00	0.00	0.00
5,100.00	1.00	90.00	5,099.46	0.00	62.25	0.55	0.00	0.00	0.00
5,200.00	1.00	90.00	5,199.44	0.00	63.99	0.57	0.00	0.00	0.00
5,300.00	1.00	90.00	5,299.43	0.00	65.74	0.59	0.00	0.00	0.00
5,400.00	1.00	90.00	5,399.41	0.00	67.48	0.60	0.00	0.00	0.00
5,500.00	1.00	90.00	5,499.40	0.00	69.23	0.62	0.00	0.00	0.00
5,600.00	1.00	90.00	5,599.38	0.00	70.97	0.63	0.00	0.00	0.00
5,700.00	1.00	90.00	5,699.37	0.00	72.72	0.65	0.00	0.00	0.00
5,800.00	1.00	90.00	5,799.35	0.00	74.46	0.66	0.00	0.00	0.00
5,900.00	1.00	90.00	5,899.34	0.00	76.21	0.68	0.00	0.00	0.00
6,000.00	1.00	90.00	5,999.32	0.00	77.95	0.69	0.00	0.00	0.00
6,100.00	1.00	90.00	6,099.31	0.00	79.70	0.71	0.00	0.00	0.00
6,200.00	1.00	90.00	6,199.29	0.00	81.44	0.72	0.00	0.00	0.00
6,300.00	1.00	90.00	6,299.28	0.00	83.19	0.74	0.00	0.00	0.00
6,400.00	1.00	90.00	6,399.26	0.00	84.94	0.76	0.00	0.00	0.00
6,500.00	1.00	90.00	6,499.25	0.00	86.68	0.77	0.00	0.00	0.00
6,600.00	1.00	90.00	6,599.23	0.00	88.43	0.79	0.00	0.00	0.00
6,700.00	1.00	90.00	6,699.21	0.00	90.17	0.80	0.00	0.00	0.00
6,800.00	1.00	90.00	6,799.20	0.00	91.92	0.82	0.00	0.00	0.00
6,900.00	1.00	90.00	6,899.18	0.00	93.66	0.83	0.00	0.00	0.00
7,000.00	1.00	90.00	6,999.17	0.00	95.41	0.85	0.00	0.00	0.00
7,100.00	1.00	90.00	7,099.15	0.00	97.15	0.86	0.00	0.00	0.00
7,200.00	1.00	90.00	7,199.14	0.00	98.90	0.88	0.00	0.00	0.00
7,300.00	1.00	90.00	7,299.12	0.00	100.64	0.90	0.00	0.00	0.00
7,400.00	1.00	90.00	7,399.11	0.00	102.39	0.91	0.00	0.00	0.00
7,500.00	1.00	90.00	7,499.09	0.00	104.13	0.93	0.00	0.00	0.00
7,600.00	1.00	90.00	7,599.08	0.00	105.88	0.94	0.00	0.00	0.00
7,700.00	1.00	90.00	7,699.06	0.00	107.62	0.96	0.00	0.00	0.00
7,800.00	1.00	90.00	7,799.05	0.00	109.37	0.97	0.00	0.00	0.00
7,900.00	1.00	90.00	7,899.03	0.00	111.11	0.99	0.00	0.00	0.00
8,000.00	1.00	90.00	7,999.02	0.00	112.86	1.00	0.00	0.00	0.00
8,100.00	1.00	90.00	8,099.00	0.00	114.60	1.02	0.00	0.00	0.00
8,200.00	1.00	90.00	8,198.99	0.00	116.35	1.04	0.00	0.00	0.00
8,300.00	1.00	90.00	8,298.97	0.00	118.09	1.05	0.00	0.00	0.00
8,400.00	1.00	90.00	8,398.96	0.00	119.84	1.07	0.00	0.00	0.00
8,500.00	1.00	90.00	8,498.94	0.00	121.59	1.08	0.00	0.00	0.00
8,600.00	1.00	90.00	8,598.93	0.00	123.33	1.10	0.00	0.00	0.00
8,700.00	1.00	90.00	8,698.91	0.00	125.08	1.11	0.00	0.00	0.00
8,800.00	1.00	90.00	8,798.90	0.00	126.82	1.13	0.00	0.00	0.00
8,900.00	1.00	90.00	8,898.88	0.00	128.57	1.14	0.00	0.00	0.00
9,000.00	1.00	90.00	8,998.86	0.00	130.31	1.16	0.00	0.00	0.00
9,100.00	1.00	90.00	9,098.85	0.00	132.06	1.18	0.00	0.00	0.00
9,200.00	1.00	90.00	9,198.83	0.00	133.80	1.19	0.00	0.00	0.00
9,300.00	1.00	90.00	9,298.82	0.00	135.55	1.21	0.00	0.00	0.00
9,400.00	1.00	90.00	9,398.80	0.00	137.29	1.22	0.00	0.00	0.00
9,500.00	1.00	90.00	9,498.79	0.00	139.04	1.24	0.00	0.00	0.00
9,600.00	1.00	90.00	9,598.77	0.00	140.78	1.25	0.00	0.00	0.00
9,700.00	1.00	90.00	9,698.76	0.00	142.53	1.27	0.00	0.00	0.00
9,712.27	1.00	90.00	9,711.03	0.00	142.74	1.27	0.00	0.00	0.00
KOP: 9712.27' MD, 9711.03' TVD - Build at 12°/100ft to 88.3° INC @ 157.20° AZ									
9,725.00	2.12	131.52	9,723.75	-0.16	143.03	1.43	12.00	8.83	326.13
9,750.00	5.00	146.63	9,748.70	-1.37	143.98	2.66	12.00	11.50	60.44
9,775.00	7.97	150.62	9,773.54	-3.79	145.43	5.09	12.00	11.87	15.99
9,800.00	10.95	152.46	9,798.20	-7.41	147.37	8.72	12.00	11.94	7.33

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Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - IP		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,825.00	13.94	153.51	9,822.61	-12.21	149.82	13.55	12.00	11.97	4.22
9,850.00	16.94	154.20	9,846.70	-18.19	152.75	19.55	12.00	11.98	2.75
9,875.00	19.93	154.68	9,870.41	-25.32	156.15	26.71	12.00	11.98	1.94
9,900.00	22.93	155.05	9,893.68	-33.59	160.03	35.02	12.00	11.99	1.45
9,925.00	25.93	155.33	9,916.44	-42.98	164.37	44.44	12.00	11.99	1.13
9,950.00	28.93	155.56	9,938.63	-53.45	169.15	54.95	12.00	11.99	0.91
9,975.00	31.93	155.75	9,960.18	-64.98	174.37	66.53	12.00	11.99	0.75
10,000.00	34.92	155.91	9,981.05	-77.55	180.01	79.15	12.00	11.99	0.64
10,025.00	37.92	156.04	10,001.16	-91.10	186.05	92.76	12.00	12.00	0.55
10,050.00	40.92	156.16	10,020.47	-105.62	192.48	107.33	12.00	12.00	0.48
10,075.00	43.92	156.27	10,038.92	-121.05	199.28	122.82	12.00	12.00	0.42
10,100.00	46.92	156.37	10,056.47	-137.35	206.43	139.19	12.00	12.00	0.38
10,125.00	49.92	156.45	10,073.06	-154.49	213.92	156.39	12.00	12.00	0.35
10,150.00	52.92	156.53	10,088.65	-172.41	221.71	174.38	12.00	12.00	0.32
10,175.00	55.92	156.60	10,103.19	-191.06	229.80	193.10	12.00	12.00	0.29
10,200.00	58.92	156.67	10,116.65	-210.40	238.15	212.51	12.00	12.00	0.27
10,225.00	61.92	156.74	10,128.99	-230.37	246.75	232.55	12.00	12.00	0.26
10,250.00	64.92	156.80	10,140.18	-250.91	255.56	253.17	12.00	12.00	0.24
10,256.31	65.67	156.81	10,142.81	-256.17	257.82	258.46	12.00	12.00	0.23
FTP(BFC#14H)									
10,275.00	67.92	156.85	10,150.18	-271.97	264.58	274.31	12.00	12.00	0.23
10,300.00	70.92	156.91	10,158.97	-293.49	273.77	295.92	12.00	12.00	0.22
10,325.00	73.92	156.96	10,166.52	-315.42	283.10	317.92	12.00	12.00	0.21
10,350.00	76.92	157.01	10,172.81	-337.68	292.56	340.27	12.00	12.00	0.21
10,375.00	79.92	157.06	10,177.83	-360.23	302.11	362.91	12.00	12.00	0.20
10,400.00	82.92	157.11	10,181.56	-383.00	311.74	385.76	12.00	12.00	0.20
10,425.00	85.91	157.16	10,183.99	-405.92	321.40	408.77	12.00	12.00	0.20
10,444.88	88.30	157.20	10,185.00	-424.22	329.10	427.13	12.00	12.00	0.19
Turn to 179.49° AZ@ 2°DLS - EOC: 10444.88' MD, 10185.00' TVD, 88.30° INC, 157.20° AZ, 427.13' VS									
10,500.00	88.29	158.30	10,186.64	-475.21	349.96	478.31	2.00	-0.01	2.00
10,600.00	88.28	160.30	10,189.62	-568.71	385.29	572.12	2.00	-0.01	2.00
10,700.00	88.28	162.30	10,192.62	-663.39	417.33	667.08	2.00	-0.01	2.00
10,800.00	88.27	164.31	10,195.64	-759.13	446.04	763.07	2.00	-0.01	2.00
10,900.00	88.27	166.31	10,198.66	-855.81	471.39	859.97	2.00	0.00	2.00
11,000.00	88.27	168.31	10,201.68	-953.31	493.35	957.67	2.00	0.00	2.00
11,100.00	88.27	170.31	10,204.70	-1,051.53	511.90	1,056.04	2.00	0.00	2.00
11,200.00	88.27	172.31	10,207.72	-1,150.33	527.00	1,154.97	2.00	0.00	2.00
11,300.00	88.28	174.31	10,210.74	-1,249.60	538.65	1,254.34	2.00	0.01	2.00
11,400.00	88.28	176.31	10,213.74	-1,349.21	546.82	1,354.03	2.00	0.01	2.00
11,500.00	88.29	178.31	10,216.73	-1,449.05	551.51	1,453.90	2.00	0.01	2.00
11,558.69	88.30	179.49	10,218.47	-1,507.71	552.63	1,512.56	2.00	0.01	2.00
11,600.00	88.30	179.49	10,219.70	-1,549.00	553.00	1,553.86	0.00	0.00	0.00
11,700.00	88.30	179.49	10,222.67	-1,648.95	553.90	1,653.81	0.00	0.00	0.00
11,800.00	88.30	179.49	10,225.64	-1,748.90	554.80	1,753.77	0.00	0.00	0.00
11,900.00	88.30	179.49	10,228.61	-1,848.85	555.69	1,853.72	0.00	0.00	0.00
12,000.00	88.30	179.49	10,231.57	-1,948.80	556.59	1,953.68	0.00	0.00	0.00
12,100.00	88.30	179.49	10,234.54	-2,048.75	557.48	2,053.64	0.00	0.00	0.00
12,200.00	88.30	179.49	10,237.51	-2,148.71	558.38	2,153.59	0.00	0.00	0.00
12,300.00	88.30	179.49	10,240.48	-2,248.66	559.28	2,253.55	0.00	0.00	0.00
12,400.00	88.30	179.49	10,243.45	-2,348.61	560.17	2,353.50	0.00	0.00	0.00
12,500.00	88.30	179.49	10,246.42	-2,448.56	561.07	2,453.46	0.00	0.00	0.00
12,600.00	88.30	179.49	10,249.38	-2,548.51	561.97	2,553.42	0.00	0.00	0.00
12,700.00	88.30	179.49	10,252.35	-2,648.47	562.86	2,653.37	0.00	0.00	0.00

Database:	EDM 5000.14 Single User Db	**Local Co-ordinate Reference:**	Well #14H
Company:	COG OPERATING, LLC	**TVD Reference:**	RKB @ 3401.70usft (Rig KB = 25')
Project:	Lea County, NM (NAD27) NMEZ	**MD Reference:**	RKB @ 3401.70usft (Rig KB = 25')
Site:	Bonaid Federal COM	**North Reference:**	Grid
Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - IP		

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)
12,800.00	88.30	179.49	10,255.32	-2,748.42	563.76	2,753.33	0.00	0.00	0.00
12,900.00	88.30	179.49	10,258.29	-2,848.37	564.66	2,853.28	0.00	0.00	0.00
13,000.00	88.30	179.49	10,261.26	-2,948.32	565.55	2,953.24	0.00	0.00	0.00
13,100.00	88.30	179.49	10,264.23	-3,048.27	566.45	3,053.20	0.00	0.00	0.00
13,200.00	88.30	179.49	10,267.20	-3,148.23	567.35	3,153.15	0.00	0.00	0.00
13,300.00	88.30	179.49	10,270.16	-3,248.18	568.24	3,253.11	0.00	0.00	0.00
13,400.00	88.30	179.49	10,273.13	-3,348.13	569.14	3,353.06	0.00	0.00	0.00
13,500.00	88.30	179.49	10,276.10	-3,448.08	570.04	3,453.02	0.00	0.00	0.00
13,600.00	88.30	179.49	10,279.07	-3,548.03	570.93	3,552.97	0.00	0.00	0.00
13,700.00	88.30	179.49	10,282.04	-3,647.99	571.83	3,652.93	0.00	0.00	0.00
13,800.00	88.30	179.49	10,285.01	-3,747.94	572.72	3,752.89	0.00	0.00	0.00
13,900.00	88.30	179.49	10,287.97	-3,847.89	573.62	3,852.84	0.00	0.00	0.00
14,000.00	88.30	179.49	10,290.94	-3,947.84	574.52	3,952.80	0.00	0.00	0.00
14,100.00	88.30	179.49	10,293.91	-4,047.79	575.41	4,052.75	0.00	0.00	0.00
14,200.00	88.30	179.49	10,296.88	-4,147.74	576.31	4,152.71	0.00	0.00	0.00
14,300.00	88.30	179.49	10,299.85	-4,247.70	577.21	4,252.67	0.00	0.00	0.00
14,400.00	88.30	179.49	10,302.82	-4,347.65	578.10	4,352.62	0.00	0.00	0.00
14,500.00	88.30	179.49	10,305.79	-4,447.60	579.00	4,452.58	0.00	0.00	0.00
14,600.00	88.30	179.49	10,308.75	-4,547.55	579.90	4,552.53	0.00	0.00	0.00
14,700.00	88.30	179.49	10,311.72	-4,647.50	580.79	4,652.49	0.00	0.00	0.00
14,800.00	88.30	179.49	10,314.69	-4,747.46	581.69	4,752.45	0.00	0.00	0.00
14,900.00	88.30	179.49	10,317.66	-4,847.41	582.59	4,852.40	0.00	0.00	0.00
15,000.00	88.30	179.49	10,320.63	-4,947.36	583.48	4,952.36	0.00	0.00	0.00
15,100.00	88.30	179.49	10,323.60	-5,047.31	584.38	5,052.31	0.00	0.00	0.00
15,200.00	88.30	179.49	10,326.56	-5,147.26	585.27	5,152.27	0.00	0.00	0.00
15,300.00	88.30	179.49	10,329.53	-5,247.22	586.17	5,252.23	0.00	0.00	0.00
15,400.00	88.30	179.49	10,332.50	-5,347.17	587.07	5,352.18	0.00	0.00	0.00
15,500.00	88.30	179.49	10,335.47	-5,447.12	587.96	5,452.14	0.00	0.00	0.00
15,600.00	88.30	179.49	10,338.44	-5,547.07	588.86	5,552.09	0.00	0.00	0.00
15,700.00	88.30	179.49	10,341.41	-5,647.02	589.76	5,652.05	0.00	0.00	0.00
15,800.00	88.30	179.49	10,344.38	-5,746.98	590.65	5,752.01	0.00	0.00	0.00
15,900.00	88.30	179.49	10,347.34	-5,846.93	591.55	5,851.96	0.00	0.00	0.00
16,000.00	88.30	179.49	10,350.31	-5,946.88	592.45	5,951.92	0.00	0.00	0.00
16,100.00	88.30	179.49	10,353.28	-6,046.83	593.34	6,051.87	0.00	0.00	0.00
16,200.00	88.30	179.49	10,356.25	-6,146.78	594.24	6,151.83	0.00	0.00	0.00
16,300.00	88.30	179.49	10,359.22	-6,246.74	595.14	6,251.78	0.00	0.00	0.00
16,400.00	88.30	179.49	10,362.19	-6,346.69	596.03	6,351.74	0.00	0.00	0.00
16,500.00	88.30	179.49	10,365.15	-6,446.64	596.93	6,451.70	0.00	0.00	0.00
16,600.00	88.30	179.49	10,368.12	-6,546.59	597.82	6,551.65	0.00	0.00	0.00
16,700.00	88.30	179.49	10,371.09	-6,646.54	598.72	6,651.61	0.00	0.00	0.00
16,800.00	88.30	179.49	10,374.06	-6,746.49	599.62	6,751.56	0.00	0.00	0.00
16,900.00	88.30	179.49	10,377.03	-6,846.45	600.51	6,851.52	0.00	0.00	0.00
17,000.00	88.30	179.49	10,380.00	-6,946.40	601.41	6,951.48	0.00	0.00	0.00
17,100.00	88.30	179.49	10,382.96	-7,046.35	602.31	7,051.43	0.00	0.00	0.00
17,200.00	88.30	179.49	10,385.93	-7,146.30	603.20	7,151.39	0.00	0.00	0.00
17,300.00	88.30	179.49	10,388.90	-7,246.25	604.10	7,251.34	0.00	0.00	0.00
17,400.00	88.30	179.49	10,391.87	-7,346.21	605.00	7,351.30	0.00	0.00	0.00
17,500.00	88.30	179.49	10,394.84	-7,446.16	605.89	7,451.26	0.00	0.00	0.00
17,600.00	88.30	179.49	10,397.81	-7,546.11	606.79	7,551.21	0.00	0.00	0.00
17,700.00	88.30	179.49	10,400.78	-7,646.06	607.69	7,651.17	0.00	0.00	0.00
17,800.00	88.30	179.49	10,403.74	-7,746.01	608.58	7,751.12	0.00	0.00	0.00
17,900.00	88.30	179.49	10,406.71	-7,845.97	609.48	7,851.08	0.00	0.00	0.00
18,000.00	88.30	179.49	10,409.68	-7,945.92	610.37	7,951.04	0.00	0.00	0.00
18,100.00	88.30	179.49	10,412.65	-8,045.87	611.27	8,050.99	0.00	0.00	0.00

Database:	EDM 5000.14 Single User Db	**Local Co-ordinate Reference:**	Well #14H
Company:	COG OPERATING, LLC	**TVD Reference:**	RKB @ 3401.70usft (Rig KB = 25')
Project:	Lea County, NM (NAD27) NMEZ	**MD Reference:**	RKB @ 3401.70usft (Rig KB = 25')
Site:	Bonaid Federal COM	**North Reference:**	Grid
Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - IP		

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)
18,200.00	88.30	179.49	10,415.62	-8,145.82	612.17	8,150.95	0.00	0.00	0.00
18,300.00	88.30	179.49	10,418.59	-8,245.77	613.06	8,250.90	0.00	0.00	0.00
18,400.00	88.30	179.49	10,421.55	-8,345.73	613.96	8,350.86	0.00	0.00	0.00
18,500.00	88.30	179.49	10,424.52	-8,445.68	614.86	8,450.82	0.00	0.00	0.00
18,600.00	88.30	179.49	10,427.49	-8,545.63	615.75	8,550.77	0.00	0.00	0.00
18,700.00	88.30	179.49	10,430.46	-8,645.58	616.65	8,650.73	0.00	0.00	0.00
18,800.00	88.30	179.49	10,433.43	-8,745.53	617.55	8,750.68	0.00	0.00	0.00
18,900.00	88.30	179.49	10,436.40	-8,845.48	618.44	8,850.64	0.00	0.00	0.00
19,000.00	88.30	179.49	10,439.37	-8,945.44	619.34	8,950.60	0.00	0.00	0.00
19,100.00	88.30	179.49	10,442.33	-9,045.39	620.24	9,050.55	0.00	0.00	0.00
19,200.00	88.30	179.49	10,445.30	-9,145.34	621.13	9,150.51	0.00	0.00	0.00
19,300.00	88.30	179.49	10,448.27	-9,245.29	622.03	9,250.46	0.00	0.00	0.00
19,400.00	88.30	179.49	10,451.24	-9,345.24	622.92	9,350.42	0.00	0.00	0.00
19,500.00	88.30	179.49	10,454.21	-9,445.20	623.82	9,450.37	0.00	0.00	0.00
19,600.00	88.30	179.49	10,457.18	-9,545.15	624.72	9,550.33	0.00	0.00	0.00
19,700.00	88.30	179.49	10,460.14	-9,645.10	625.61	9,650.29	0.00	0.00	0.00
19,800.00	88.30	179.49	10,463.11	-9,745.05	626.51	9,750.24	0.00	0.00	0.00
19,900.00	88.30	179.49	10,466.08	-9,845.00	627.41	9,850.20	0.00	0.00	0.00
20,000.00	88.30	179.49	10,469.05	-9,944.96	628.30	9,950.15	0.00	0.00	0.00
20,100.00	88.30	179.49	10,472.02	-10,044.91	629.20	10,050.11	0.00	0.00	0.00
20,200.44	88.30	179.49	10,475.00	-10,145.30	630.10	10,150.51	0.00	0.00	0.00

TD: 20200.44' MD, 10475.00' TVD - PBHL(BFC#14H)

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SHL(BFC#14H) - plan hits target center - Point	0.00	0.00	0.00	0.00	0.00	446,509.70	790,481.60	32° 13' 26.694 N	103° 23' 38.423 W
TW(BFC#14H) - plan misses target center by 10164.85usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Rectangle (sides W80.00 H10,150.51 D0.00)	0.00	0.00	0.00	-10,145.30	630.10	436,364.40	791,111.70	32° 11' 46.251 N	103° 23' 32.123 W
FTP(BFC#14H) - plan misses target center by 319.44usft at 10256.31usft MD (10142.81 TVD, -256.17 N, 257.82 E) - Point	0.00	0.00	10,185.00	-114.84	541.17	446,394.86	791,022.77	32° 13' 25.511 N	103° 23' 32.136 W
PBHL(BFC#14H) - plan hits target center - Point	0.00	0.00	10,475.00	-10,145.30	630.10	436,364.40	791,111.70	32° 11' 46.251 N	103° 23' 32.123 W

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
1,500.00	1,500.00	0.00	0.00	Start of Nudge: 1° INC, 90°AZ/@1.5°DLS
9,712.27	9,711.03	0.00	142.74	KOP: 9712.27' MD, 9711.03' TVD
9,712.27	9,711.03	0.00	142.74	Build at 12°/100ft to 88.3° INC @ 157.20° AZ
10,444.88	10,185.00	-424.22	329.10	Turn to 179.49° AZ@ 2°DLS
10,444.88	10,185.00	-424.22	329.10	EOC: 10444.88' MD, 10185.00' TVD, 88.30° INC, 157.20° AZ, 427.13' VS
20,200.44	10,475.00	-10,145.30	630.10	TD: 20200.44' MD, 10475.00' TVD

CONCHO

COG OPERATING, LLC
Project: Lea County, NM (NAD27) NMEZ
Site: Bonaid Federal COM
Well: #14H
Wellbore: OH
Plan: Plan #1 - IP (#14H/OH)

WELL DETAILS: #14H

Ground Elevation:: 3376.70
RKB Elevation: RKB @ 3401.70usft (Rig KB = 25')
Rig Name: Rig KB = 25'

Surface Hole Location

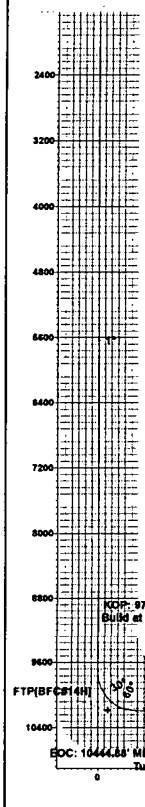
Northing	Easting	Latitude	Longitude
446509.70	790481.60	32° 13' 26.694 N	103° 23' 38.423 W

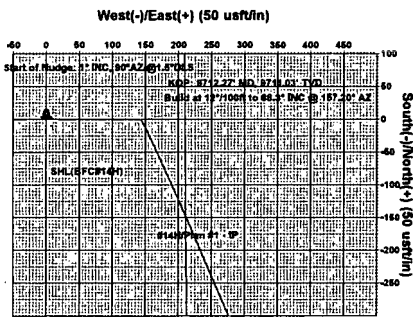
Azimuths to Grid North
True North: -0.50°
Magnetic North: 6.30°

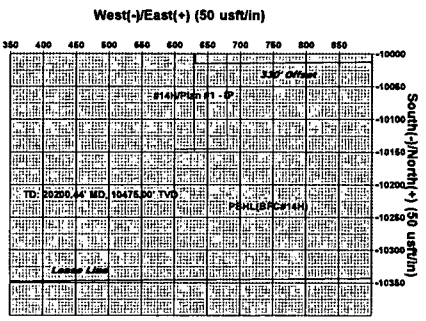
Magnetic Field
Strength: 47890.9snT
Dip Angle: 60.08°
Date: 02/07/2018
Model: IGRF2015

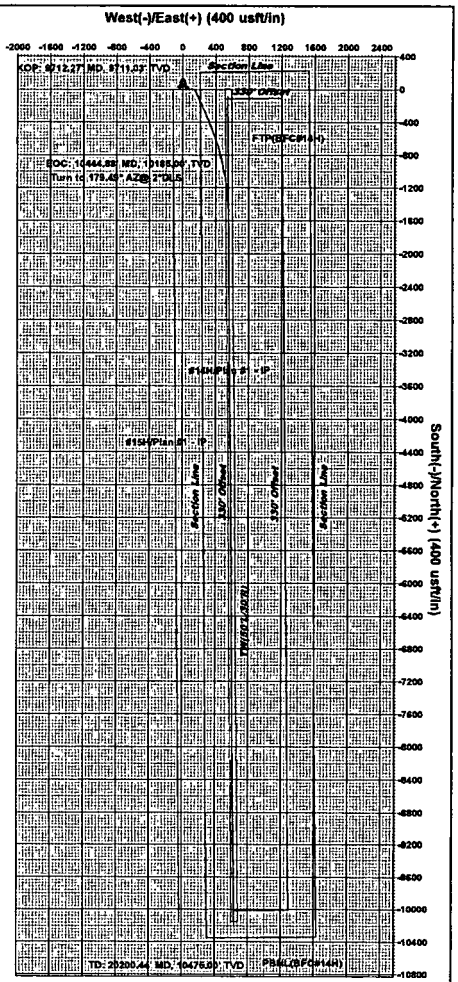
Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	1500.00	0.00	0.00	1500.00	0.00	0.00	0.00	0.00	0.00
3	1566.67	1.00	90.00	1566.66	0.00	0.58	1.50	90.00	0.01
4	9712.27	1.00	90.00	9711.03	0.00	142.74	0.00	0.00	1.27
5	10444.88	88.30	157.20	10185.00	-424.22	329.10	12.00	67.23	427.13
6	11558.69	88.30	179.49	10218.47	-1507.71	552.63	2.00	90.34	1512.56
7	20200.44	88.30	179.49	10475.00	-10145.30	630.10	0.00	0.00	10150.51





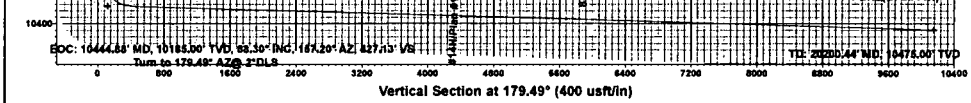




DESIGN TARGET DETAILS

Name	+N/-S	+E/-W	Northing	Easting
FTP(BFC#14H)	-114.84	541.17	446394.86	791022.77
PBHL(BFC#14H)	-10145.30	630.10	436364.40	791111.70
SHL(BFC#14H)	0.00	0.00	446509.70	790481.60
TW(BFC#14H)	-10145.30	630.10	436364.40	791111.70

PROJECT DETAILS: Lea County, NM (NAD27) NMEZ
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level
Local North: Grid



Vertical Section at 179.49° (400 usft/in)

VON ENERGY SERVICES, LLC.

VON Directional
2407 E. Murphy St. Bldg. E3 Odessa, TX 79761
Phone: 432-232-8838

Plan: Plan #1 - IP (#14H/OH)
Created By: Gabriel Cruz Date: 18:10, February 07 2018

COG OPERATING, LLC

Lea County, NM (NAD27) NMEZ
Bonaid Federal COM
#14H

OH
Plan #1 - IP

Anticollision Report

07 February, 2018

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #14H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3401.70usft (Rig KB = 25')
Reference Site:	Bonaid Federal COM	**MD Reference:**	RKB @ 3401.70usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Reference	Plan #1 - IP		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 9,999.98 usft	**Error Surface:**	Pedal Curve
Warning Levels Evaluated at:	2.000 **Sigma**	**Casing Method:**	Not applied

Survey Tool Program **Date** 02/07/18

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	20,200.41	Plan #1 - IP (OH)	MWD	MWD v3:standard declination

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Bonaid Federal COM						
#15H - OH - Plan #1 - IP	1,500.00	1,499.80	30.00	23.54	4.643	CC, ES
#15H - OH - Plan #1 - IP	1,566.67	1,567.41	31.16	24.41	4.620	SF

Offset Design Bonaid Federal COM - #15H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

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

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.20	-0.20	0.00	0.00	-90.57	-0.30	-30.00	30.00				
100.00	100.00	100.20	99.80	0.08	0.08	-90.57	-0.30	-30.00	30.00	29.83	.169	177.498	
200.00	200.00	200.20	199.80	0.31	0.31	-90.57	-0.30	-30.00	30.00	29.38	.619	48.502	
300.00	300.00	300.20	299.80	0.53	0.53	-90.57	-0.30	-30.00	30.00	28.93	1.068	28.089	
400.00	400.00	400.20	399.80	0.76	0.76	-90.57	-0.30	-30.00	30.00	28.48	1.518	19.769	
500.00	500.00	500.20	499.80	0.98	0.98	-90.57	-0.30	-30.00	30.00	28.03	1.967	15.251	
600.00	600.00	600.20	599.80	1.21	1.21	-90.57	-0.30	-30.00	30.00	27.58	2.417	12.414	
700.00	700.00	700.20	699.80	1.43	1.43	-90.57	-0.30	-30.00	30.00	27.14	2.866	10.467	
800.00	800.00	800.20	799.80	1.66	1.66	-90.57	-0.30	-30.00	30.00	26.69	3.316	9.048	
900.00	900.00	900.20	899.80	1.88	1.88	-90.57	-0.30	-30.00	30.00	26.24	3.765	7.968	
1,000.00	1,000.00	1,000.20	999.80	2.11	2.11	-90.57	-0.30	-30.00	30.00	25.79	4.215	7.118	
1,100.00	1,100.00	1,100.20	1,099.80	2.33	2.33	-90.57	-0.30	-30.00	30.00	25.34	4.664	6.432	
1,200.00	1,200.00	1,200.20	1,199.80	2.56	2.56	-90.57	-0.30	-30.00	30.00	24.89	5.114	5.867	
1,300.00	1,300.00	1,300.20	1,299.80	2.78	2.78	-90.57	-0.30	-30.00	30.00	24.44	5.563	5.393	
1,400.00	1,400.00	1,400.20	1,399.80	3.01	3.01	-90.57	-0.30	-30.00	30.00	23.99	6.013	4.989	
1,500.00	1,500.00	1,499.80	1,499.80	3.23	3.23	-90.57	-0.30	-30.00	30.00	23.54	6.462	4.643	CC, ES
1,566.67	1,566.66	1,567.41	1,565.92	3.37	3.37	179.45	-0.30	-30.57	31.16	24.41	6.744	4.620	SF
1,600.00	1,599.99	1,600.76	1,599.23	3.44	3.44	179.47	-0.30	-31.15	32.32	25.44	6.876	4.701	
1,700.00	1,699.98	1,700.83	1,699.15	3.64	3.64	179.52	-0.30	-32.89	35.81	28.54	7.274	4.923	
1,800.00	1,799.96	1,800.89	1,799.08	3.84	3.84	179.56	-0.30	-34.64	39.30	31.62	7.678	5.119	
1,900.00	1,899.95	1,900.95	1,899.00	4.05	4.05	179.60	-0.30	-36.38	42.79	34.70	8.087	5.291	
2,000.00	1,999.93	2,001.01	1,998.92	4.25	4.26	179.63	-0.30	-38.13	46.28	37.78	8.500	5.445	
2,100.00	2,099.92	2,101.07	2,098.85	4.46	4.47	179.65	-0.30	-39.87	49.77	40.85	8.916	5.582	
2,200.00	2,199.90	2,201.13	2,198.77	4.68	4.68	179.68	-0.30	-41.62	53.26	43.92	9.336	5.705	
2,300.00	2,299.88	2,301.19	2,298.69	4.89	4.89	179.70	-0.30	-43.36	56.75	46.99	9.759	5.815	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #14H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3401.70usft (Rig KB = 25')
Reference Site:	Bonaid Federal COM	**MD Reference:**	RKB @ 3401.70usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Bonaid Federal COM - #15H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

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

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
2,400.00	2,399.87	2,401.25	2,398.62	5.10	5.11	179.71	-0.30	-45.10	60.24	50.06	10.184	5.915	
2,500.00	2,499.85	2,501.31	2,498.54	5.32	5.32	179.73	-0.30	-46.85	63.73	53.12	10.611	6.006	
2,600.00	2,599.84	2,601.37	2,598.47	5.53	5.54	179.74	-0.30	-48.59	67.22	56.18	11.039	6.089	
2,700.00	2,699.82	2,701.43	2,698.39	5.75	5.75	179.76	-0.30	-50.34	70.71	59.24	11.470	6.165	
2,800.00	2,799.81	2,801.50	2,798.31	5.97	5.97	179.77	-0.30	-52.08	74.20	62.30	11.902	6.234	
2,900.00	2,899.79	2,901.56	2,898.24	6.19	6.19	179.78	-0.30	-53.82	77.69	65.35	12.335	6.298	
3,000.00	2,999.78	3,001.62	2,998.16	6.40	6.41	179.79	-0.30	-55.57	81.18	68.41	12.770	6.357	
3,100.00	3,099.76	3,101.68	3,098.09	6.62	6.63	179.80	-0.30	-57.31	84.67	71.46	13.205	6.412	
3,200.00	3,199.75	3,201.74	3,198.01	6.84	6.85	179.80	-0.30	-59.06	88.16	74.52	13.641	6.463	
3,300.00	3,299.73	3,301.80	3,297.93	7.06	7.07	179.81	-0.30	-60.80	91.65	77.57	14.079	6.510	
3,400.00	3,399.72	3,401.86	3,397.86	7.28	7.29	179.82	-0.30	-62.55	95.14	80.62	14.517	6.554	
3,500.00	3,499.70	3,501.92	3,497.78	7.51	7.51	179.83	-0.30	-64.29	98.63	83.67	14.956	6.595	
3,600.00	3,599.69	3,601.98	3,597.70	7.73	7.73	179.83	-0.30	-66.03	102.12	86.72	15.395	6.633	
3,700.00	3,699.67	3,702.04	3,697.63	7.95	7.96	179.84	-0.30	-67.78	105.61	89.77	15.835	6.669	
3,800.00	3,799.66	3,802.10	3,797.55	8.17	8.18	179.84	-0.30	-69.52	109.10	92.82	16.276	6.703	
3,900.00	3,899.64	3,902.17	3,897.48	8.39	8.40	179.85	-0.30	-71.27	112.59	95.87	16.717	6.735	
4,000.00	3,999.63	4,002.23	3,997.40	8.62	8.62	179.85	-0.30	-73.01	116.08	98.92	17.159	6.765	
4,100.00	4,099.61	4,102.29	4,097.32	8.84	8.85	179.86	-0.30	-74.75	119.57	101.97	17.601	6.793	
4,200.00	4,199.60	4,202.35	4,197.25	9.06	9.07	179.86	-0.30	-76.50	123.06	105.01	18.043	6.820	
4,300.00	4,299.58	4,302.41	4,297.17	9.29	9.29	179.86	-0.30	-78.24	126.55	108.06	18.486	6.845	
4,400.00	4,399.57	4,402.47	4,397.10	9.51	9.52	179.87	-0.30	-79.99	130.04	111.11	18.930	6.870	
4,500.00	4,499.55	4,502.53	4,497.02	9.73	9.74	179.87	-0.30	-81.73	133.53	114.15	19.373	6.892	
4,600.00	4,599.53	4,602.59	4,596.94	9.96	9.97	179.87	-0.30	-83.48	137.02	117.20	19.817	6.914	
4,700.00	4,699.52	4,702.65	4,696.87	10.18	10.19	179.88	-0.30	-85.22	140.51	120.25	20.261	6.935	
4,800.00	4,799.50	4,802.71	4,796.79	10.40	10.41	179.88	-0.30	-86.96	144.00	123.29	20.706	6.955	
4,900.00	4,899.49	4,897.23	4,896.72	10.63	10.63	179.88	-0.30	-88.71	147.49	126.35	21.138	6.977	
5,000.00	4,999.47	5,002.84	4,996.64	10.85	10.86	179.89	-0.30	-90.45	150.98	129.38	21.595	6.991	
5,100.00	5,099.46	5,102.90	5,096.56	11.08	11.09	179.89	-0.30	-92.20	154.47	132.43	22.040	7.008	
5,200.00	5,199.44	5,202.96	5,196.49	11.30	11.31	179.89	-0.30	-93.94	157.96	135.47	22.486	7.025	
5,300.00	5,299.43	5,303.02	5,296.41	11.53	11.54	179.89	-0.30	-95.68	161.45	138.52	22.931	7.041	
5,400.00	5,399.41	5,403.08	5,396.33	11.75	11.76	179.90	-0.30	-97.43	164.94	141.56	23.377	7.056	
5,500.00	5,499.40	5,503.14	5,496.26	11.97	11.99	179.90	-0.30	-99.17	168.43	144.60	23.823	7.070	
5,600.00	5,599.38	5,603.20	5,596.18	12.20	12.21	179.90	-0.30	-100.92	171.92	147.65	24.269	7.084	
5,700.00	5,699.37	5,703.26	5,696.11	12.42	12.44	179.90	-0.30	-102.66	175.41	150.69	24.715	7.097	
5,800.00	5,799.35	5,803.32	5,796.03	12.65	12.66	179.90	-0.30	-104.41	178.90	153.74	25.161	7.110	
5,900.00	5,899.34	5,903.38	5,895.95	12.87	12.89	179.91	-0.30	-106.15	182.39	156.78	25.608	7.122	
6,000.00	5,999.32	6,003.44	5,995.88	13.10	13.11	179.91	-0.30	-107.89	185.88	159.82	26.054	7.134	
6,100.00	6,099.31	6,103.51	6,095.80	13.32	13.34	179.91	-0.30	-109.64	189.37	162.87	26.501	7.146	
6,200.00	6,199.29	6,203.57	6,195.73	13.55	13.56	179.91	-0.30	-111.38	192.86	165.91	26.948	7.157	
6,300.00	6,299.28	6,303.63	6,295.65	13.78	13.79	179.91	-0.30	-113.13	196.35	168.95	27.395	7.167	
6,400.00	6,399.26	6,403.69	6,395.57	14.00	14.02	179.91	-0.30	-114.87	199.84	171.99	27.842	7.177	
6,500.00	6,499.25	6,503.75	6,495.50	14.23	14.24	179.92	-0.30	-116.61	203.33	175.04	28.289	7.187	
6,600.00	6,599.23	6,603.81	6,595.42	14.45	14.47	179.92	-0.30	-118.36	206.82	178.08	28.737	7.197	
6,700.00	6,699.21	6,696.13	6,695.34	14.68	14.68	179.92	-0.30	-120.10	210.31	181.14	29.167	7.210	
6,800.00	6,799.20	6,800.21	6,799.00	14.90	14.90	179.92	-0.30	-120.77	212.68	183.07	29.614	7.182	
6,900.00	6,899.18	6,900.23	6,898.98	15.13	15.10	179.92	-0.30	-120.77	214.43	184.38	30.044	7.137	
7,000.00	6,999.17	7,000.24	6,998.97	15.35	15.31	179.92	-0.30	-120.77	216.17	185.70	30.476	7.093	
7,100.00	7,099.15	7,100.26	7,098.95	15.58	15.52	179.92	-0.30	-120.77	217.92	187.01	30.907	7.051	
7,200.00	7,199.14	7,200.27	7,198.94	15.80	15.72	179.92	-0.30	-120.77	219.66	188.32	31.339	7.009	
7,300.00	7,299.12	7,300.29	7,298.92	16.03	15.93	179.92	-0.30	-120.77	221.41	189.64	31.772	6.969	
7,400.00	7,399.11	7,400.30	7,398.91	16.26	16.14	179.92	-0.30	-120.77	223.15	190.95	32.205	6.929	
7,500.00	7,499.09	7,500.32	7,498.89	16.48	16.35	179.92	-0.30	-120.77	224.90	192.26	32.639	6.891	

Anticollision Report

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Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Bonaid Federal COM - #15H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

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

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
7,600.00	7,599.08	7,600.33	7,598.88	16.71	16.56	179.92	-0.30	-120.77	226.64	193.57	33.073	6.853	
7,700.00	7,699.06	7,700.35	7,698.86	16.93	16.77	179.92	-0.30	-120.77	228.39	194.88	33.507	6.816	
7,800.00	7,799.05	7,800.36	7,798.85	17.16	16.98	179.93	-0.30	-120.77	230.13	196.19	33.942	6.780	
7,900.00	7,899.03	7,900.38	7,898.83	17.39	17.19	179.93	-0.30	-120.77	231.88	197.50	34.377	6.745	
8,000.00	7,999.02	8,000.39	7,998.82	17.61	17.40	179.93	-0.30	-120.77	233.63	198.81	34.813	6.711	
8,100.00	8,099.00	8,100.41	8,098.80	17.84	17.61	179.93	-0.30	-120.77	235.37	200.12	35.248	6.677	
8,200.00	8,198.99	8,200.43	8,198.79	18.06	17.82	179.93	-0.30	-120.77	237.12	201.43	35.685	6.645	
8,300.00	8,298.97	8,300.44	8,298.77	18.29	18.04	179.93	-0.30	-120.77	238.86	202.74	36.121	6.613	
8,400.00	8,398.96	8,400.46	8,398.76	18.52	18.25	179.93	-0.30	-120.77	240.61	204.05	36.558	6.581	
8,500.00	8,498.94	8,500.47	8,498.74	18.74	18.46	179.93	-0.30	-120.77	242.35	205.36	36.995	6.551	
8,600.00	8,598.93	8,600.49	8,598.73	18.97	18.67	179.93	-0.30	-120.77	244.10	206.66	37.433	6.521	
8,700.00	8,698.91	8,700.50	8,698.71	19.19	18.89	179.93	-0.30	-120.77	245.84	207.97	37.871	6.492	
8,800.00	8,798.90	8,800.52	8,798.70	19.42	19.10	179.93	-0.30	-120.77	247.59	209.28	38.309	6.463	
8,900.00	8,898.88	8,900.53	8,898.68	19.65	19.31	179.93	-0.30	-120.77	249.33	210.59	38.747	6.435	
9,000.00	8,998.86	9,000.55	8,998.66	19.87	19.53	179.93	-0.30	-120.77	251.08	211.89	39.186	6.407	
9,100.00	9,098.85	9,100.56	9,098.65	20.10	19.74	179.93	-0.30	-120.77	252.82	213.20	39.625	6.380	
9,200.00	9,198.83	9,200.58	9,198.63	20.32	19.96	179.93	-0.30	-120.77	254.57	214.50	40.064	6.354	
9,300.00	9,298.82	9,300.59	9,298.62	20.55	20.17	179.93	-0.30	-120.77	256.31	215.81	40.503	6.328	
9,400.00	9,398.80	9,400.61	9,398.60	20.78	20.39	179.93	-0.30	-120.77	258.06	217.12	40.943	6.303	
9,500.00	9,498.79	9,500.62	9,498.59	21.00	20.60	179.93	-0.30	-120.77	259.80	218.42	41.383	6.278	
9,600.00	9,598.77	9,600.64	9,598.57	21.23	20.82	179.93	-0.30	-120.77	261.55	219.73	41.823	6.254	
9,700.00	9,698.76	9,700.65	9,698.56	21.46	21.03	179.93	-0.30	-120.77	263.29	221.03	42.263	6.230	
9,712.27	9,711.03	9,711.62	9,710.83	21.48	21.06	179.93	-0.30	-120.77	263.51	221.19	42.314	6.227	
9,725.00	9,723.75	9,724.34	9,723.55	21.51	21.08	138.43	-0.30	-120.77	263.80	221.43	42.370	6.226	
9,750.00	9,748.70	9,749.29	9,748.50	21.57	21.14	123.51	-0.30	-120.77	264.74	222.27	42.477	6.233	
9,775.00	9,773.54	9,774.13	9,773.34	21.62	21.19	119.89	-0.30	-120.77	266.22	223.63	42.583	6.252	
9,800.00	9,798.20	9,801.22	9,798.00	21.68	21.25	118.62	-0.30	-120.77	268.23	225.54	42.694	6.283	
9,825.00	9,822.61	9,823.19	9,822.41	21.74	21.30	118.29	-0.30	-120.77	270.65	228.05	42.793	6.329	
9,850.00	9,846.70	9,847.29	9,846.50	21.80	21.35	118.47	-0.30	-120.77	274.10	231.20	42.897	6.390	
9,875.00	9,870.41	9,871.00	9,870.21	21.87	21.40	118.96	-0.30	-120.77	278.05	235.05	43.000	6.466	
9,900.00	9,893.68	9,905.73	9,893.48	21.93	21.47	119.65	-0.30	-120.77	282.77	239.64	43.126	6.557	
9,925.00	9,916.44	9,917.03	9,916.24	22.00	21.50	120.46	-0.30	-120.77	288.31	245.11	43.201	6.674	
9,950.00	9,938.63	9,939.22	9,938.43	22.07	21.55	121.34	-0.30	-120.77	294.75	251.45	43.300	6.807	
9,975.00	9,960.18	9,960.77	9,959.98	22.14	21.59	122.24	-0.30	-120.77	302.14	258.75	43.396	6.962	
10,000.00	9,981.05	9,981.63	9,980.85	22.22	21.64	123.11	-0.30	-120.77	310.54	267.05	43.490	7.140	
10,025.00	10,001.16	10,001.75	10,000.96	22.30	21.68	123.92	-0.30	-120.77	319.97	276.39	43.582	7.342	
10,050.00	10,020.47	10,021.06	10,020.27	22.38	21.72	124.62	-0.30	-120.77	330.48	286.81	43.671	7.567	
10,075.00	10,038.92	10,039.51	10,038.72	22.47	21.76	125.20	-0.30	-120.77	342.07	298.31	43.757	7.817	
10,100.00	10,056.47	10,057.06	10,056.27	22.57	21.80	125.61	-0.30	-120.77	354.74	310.90	43.840	8.092	
10,125.00	10,073.06	10,073.65	10,072.86	22.67	21.84	125.84	-0.30	-120.77	368.49	324.58	43.918	8.390	
10,150.00	10,088.65	10,089.23	10,088.45	22.78	21.87	125.84	-0.30	-120.77	383.29	339.30	43.993	8.713	
10,175.00	10,103.19	10,103.78	10,102.99	22.90	21.90	125.60	-0.30	-120.77	399.10	355.04	44.063	9.058	
10,200.00	10,116.65	10,117.24	10,116.45	23.02	21.93	125.07	-0.30	-120.77	415.89	371.76	44.128	9.425	
10,225.00	10,128.99	10,129.58	10,128.79	23.16	21.96	124.22	-0.30	-120.77	433.58	389.40	44.188	9.812	
10,250.00	10,140.18	10,140.77	10,139.98	23.30	21.98	123.00	-0.30	-120.77	452.14	407.90	44.244	10.219	
10,275.00	10,150.18	10,150.77	10,149.98	23.45	22.00	121.36	-0.30	-120.77	471.48	427.19	44.293	10.645	
10,300.00	10,158.97	10,159.55	10,158.77	23.61	22.02	119.24	-0.30	-120.77	491.55	447.21	44.338	11.086	
10,325.00	10,166.52	10,167.11	10,166.32	23.78	22.04	116.56	-0.30	-120.77	512.26	467.88	44.376	11.544	
10,350.00	10,172.81	10,173.40	10,172.61	23.96	22.05	113.25	-0.30	-120.77	533.54	489.13	44.409	12.014	
10,375.00	10,177.83	10,178.42	10,177.63	24.15	22.06	109.23	-0.30	-120.77	555.32	510.88	44.437	12.497	
10,400.00	10,181.56	10,182.15	10,181.36	24.35	22.07	104.43	-0.30	-120.77	577.51	533.05	44.459	12.990	
10,425.00	10,183.99	10,184.58	10,183.79	24.56	22.08	98.83	-0.30	-120.77	600.04	555.56	44.476	13.491	

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

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #14H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3401.70usft (Rig KB = 25')
Reference Site:	Bonaid Federal COM	**MD Reference:**	RKB @ 3401.70usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Bonaid Federal COM - #15H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

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

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
10,444.88	10,185.00	10,185.59	10,184.80	24.73	22.08	93.83	-0.30	-120.77	618.14	573.65	44.485	13.895	
10,500.00	10,186.64	10,187.22	10,186.44	25.22	22.08	94.00	-0.30	-120.77	668.68	624.17	44.505	15.025	
10,600.00	10,189.62	10,209.79	10,189.42	26.20	22.13	94.24	-0.30	-120.77	761.04	716.46	44.581	17.071	
10,700.00	10,192.62	10,206.79	10,192.42	27.29	22.13	94.40	-0.30	-120.77	853.95	809.35	44.600	19.147	
10,800.00	10,195.64	10,203.78	10,195.44	28.45	22.12	94.48	-0.30	-120.77	947.15	902.53	44.617	21.228	
10,900.00	10,198.66	10,200.76	10,198.46	29.68	22.11	94.50	-0.30	-120.77	1,040.45	995.82	44.633	23.311	
11,000.00	10,201.68	10,202.27	10,201.48	30.96	22.12	94.48	-0.30	-120.77	1,133.74	1,089.09	44.658	25.387	
11,100.00	10,204.70	10,205.29	10,204.50	32.27	22.12	94.42	-0.30	-120.77	1,226.92	1,182.24	44.686	27.456	
11,200.00	10,207.72	10,208.31	10,207.52	33.62	22.13	94.34	-0.30	-120.77	1,319.91	1,275.20	44.714	29.519	
11,300.00	10,210.74	10,211.33	10,210.54	34.98	22.14	94.23	-0.30	-120.77	1,412.65	1,367.90	44.741	31.574	
11,400.00	10,213.74	10,214.33	10,213.54	36.35	22.14	94.11	-0.30	-120.77	1,505.07	1,460.30	44.768	33.619	
11,500.00	10,216.73	10,217.32	10,216.53	37.73	22.15	93.98	-0.30	-120.77	1,597.13	1,552.34	44.795	35.654	
11,558.69	10,218.47	10,219.06	10,218.27	38.54	22.15	93.89	-0.30	-120.77	1,650.98	1,606.17	44.811	36.843	
11,600.00	10,219.70	10,220.29	10,219.50	39.12	22.15	94.00	-0.30	-120.77	1,688.91	1,644.09	44.824	37.679	
11,700.00	10,222.67	10,223.26	10,222.47	40.53	22.16	94.26	-0.30	-120.77	1,781.35	1,736.49	44.858	39.711	
11,800.00	10,225.64	13,384.44	11,972.72	41.98	40.00	159.33	-1,671.92	-105.80	1,869.58	1,814.16	55.423	33.733	
11,900.00	10,228.61	13,484.43	11,977.46	43.46	41.43	159.35	-1,771.79	-104.91	1,871.24	1,814.70	56.539	33.097	
12,000.00	10,231.57	13,584.41	11,982.20	44.97	42.90	159.37	-1,871.66	-104.02	1,872.90	1,815.20	57.693	32.463	
12,100.00	10,234.54	13,684.39	11,986.94	46.50	44.40	159.39	-1,971.52	-103.12	1,874.56	1,815.67	58.884	31.835	
12,200.00	10,237.51	13,784.38	11,991.68	48.06	45.92	159.40	-2,071.39	-102.23	1,876.21	1,816.11	60.108	31.214	
12,300.00	10,240.48	13,884.36	11,996.41	49.63	47.47	159.42	-2,171.26	-101.33	1,877.87	1,816.51	61.365	30.602	
12,400.00	10,243.45	13,984.35	12,001.15	51.22	49.04	159.44	-2,271.13	-100.44	1,879.53	1,816.88	62.651	30.000	
12,500.00	10,246.42	14,084.33	12,005.89	52.83	50.63	159.46	-2,371.00	-99.55	1,881.19	1,817.23	63.965	29.410	
12,600.00	10,249.38	14,184.32	12,010.63	54.46	52.23	159.48	-2,470.86	-98.65	1,882.85	1,817.54	65.306	28.831	
12,700.00	10,252.35	14,284.30	12,015.36	56.10	53.85	159.50	-2,570.73	-97.76	1,884.51	1,817.84	66.670	28.266	
12,800.00	10,255.32	14,384.28	12,020.10	57.75	55.49	159.52	-2,670.60	-96.86	1,886.17	1,818.11	68.058	27.714	
12,900.00	10,258.29	14,484.27	12,024.84	59.42	57.13	159.54	-2,770.47	-95.97	1,887.83	1,818.36	69.467	27.176	
13,000.00	10,261.26	14,584.25	12,029.58	61.09	58.79	159.56	-2,870.34	-95.08	1,889.49	1,818.59	70.897	26.651	
13,100.00	10,264.23	14,684.24	12,034.32	62.78	60.47	159.57	-2,970.20	-94.18	1,891.15	1,818.81	72.345	26.141	
13,200.00	10,267.20	14,784.22	12,039.05	64.47	62.15	159.59	-3,070.07	-93.29	1,892.81	1,819.00	73.811	25.644	
13,300.00	10,270.16	14,884.21	12,043.79	66.17	63.84	159.61	-3,169.94	-92.39	1,894.47	1,819.18	75.293	25.161	
13,400.00	10,273.13	14,984.19	12,048.53	67.88	65.54	159.63	-3,269.81	-91.50	1,896.13	1,819.34	76.791	24.692	
13,500.00	10,276.10	15,084.17	12,053.27	69.60	67.25	159.65	-3,369.68	-90.61	1,897.79	1,819.49	78.303	24.236	
13,600.00	10,279.07	15,184.16	12,058.00	71.32	68.96	159.67	-3,469.54	-89.71	1,899.46	1,819.63	79.829	23.794	
13,700.00	10,282.04	15,284.14	12,062.74	73.06	70.68	159.69	-3,569.41	-88.82	1,901.12	1,819.75	81.368	23.364	
13,800.00	10,285.01	15,384.13	12,067.48	74.79	72.41	159.70	-3,669.28	-87.92	1,902.78	1,819.86	82.919	22.947	
13,900.00	10,287.97	15,484.11	12,072.22	76.53	74.14	159.72	-3,769.15	-87.03	1,904.44	1,819.96	84.481	22.543	
14,000.00	10,290.94	15,584.10	12,076.96	78.28	75.88	159.74	-3,869.02	-86.14	1,906.10	1,820.05	86.054	22.150	
14,100.00	10,293.91	15,684.08	12,081.69	80.03	77.63	159.76	-3,968.88	-85.24	1,907.77	1,820.13	87.636	21.769	
14,200.00	10,296.88	15,784.06	12,086.43	81.79	79.38	159.78	-4,068.75	-84.35	1,909.43	1,820.20	89.228	21.399	
14,300.00	10,299.85	15,884.05	12,091.17	83.55	81.13	159.80	-4,168.62	-83.45	1,911.09	1,820.26	90.829	21.041	
14,400.00	10,302.82	15,984.03	12,095.91	85.31	82.89	159.81	-4,268.49	-82.56	1,912.76	1,820.32	92.438	20.692	
14,500.00	10,305.79	16,084.02	12,100.64	87.08	84.65	159.83	-4,368.36	-81.67	1,914.42	1,820.36	94.055	20.354	
14,600.00	10,308.75	16,184.00	12,105.38	88.85	86.42	159.85	-4,468.22	-80.77	1,916.08	1,820.40	95.679	20.026	
14,700.00	10,311.72	16,283.99	12,110.12	90.63	88.19	159.87	-4,568.09	-79.88	1,917.75	1,820.44	97.310	19.708	
14,800.00	10,314.69	16,383.97	12,114.86	92.41	89.96	159.89	-4,667.96	-78.98	1,919.41	1,820.46	98.948	19.398	
14,900.00	10,317.66	16,483.95	12,119.60	94.19	91.74	159.91	-4,767.83	-78.09	1,921.07	1,820.48	100.591	19.098	
15,000.00	10,320.63	16,583.94	12,124.33	95.97	93.52	159.92	-4,867.70	-77.20	1,922.74	1,820.50	102.241	18.806	
15,100.00	10,323.60	16,683.92	12,129.07	97.75	95.30	159.94	-4,967.56	-76.30	1,924.40	1,820.51	103.896	18.522	
15,200.00	10,326.56	16,783.91	12,133.81	99.54	97.08	159.96	-5,067.43	-75.41	1,926.07	1,820.51	105.556	18.247	
15,300.00	10,329.53	16,883.89	12,138.55	101.33	98.87	159.98	-5,167.30	-74.51	1,927.73	1,820.51	107.220	17.979	
15,400.00	10,332.50	16,983.88	12,143.28	103.13	100.66	160.00	-5,267.17	-73.62	1,929.40	1,820.51	108.890	17.719	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #14H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3401.70usft (Rig KB = 25')
Reference Site:	Bonaid Federal COM	**MD Reference:**	RKB @ 3401.70usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

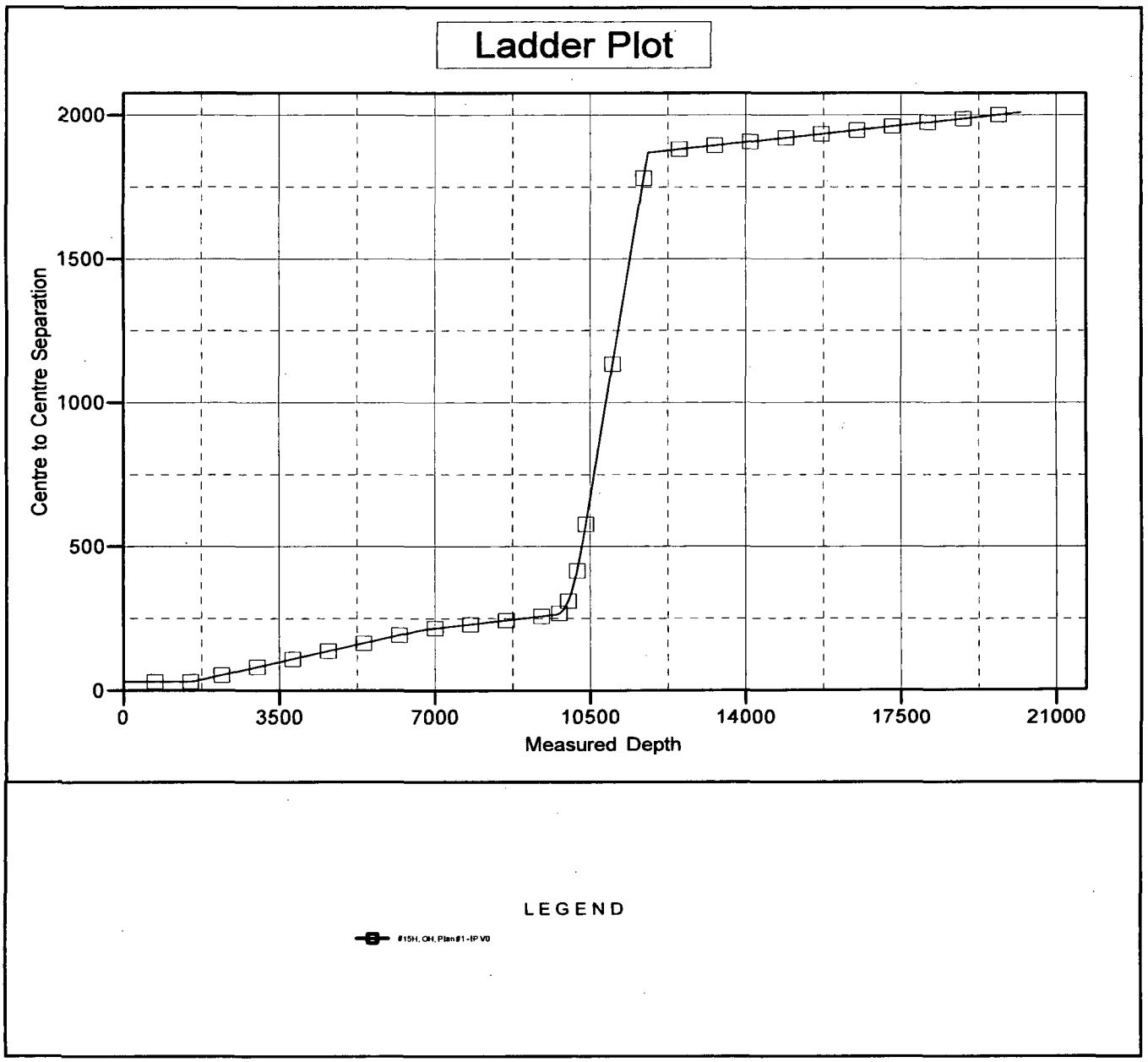
Offset Design Bonaid Federal COM - #15H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

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

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
15,500.00	10,335.47	17,083.86	12,148.02	104.92	102.45	160.01	-5,367.04	-72.73	1,931.06	1,820.50	110.563	17.466	
15,600.00	10,338.44	17,183.84	12,152.76	106.72	104.24	160.03	-5,466.90	-71.83	1,932.73	1,820.49	112.241	17.219	
15,700.00	10,341.41	17,283.83	12,157.50	108.52	106.04	160.05	-5,566.77	-70.94	1,934.39	1,820.47	113.923	16.980	
15,800.00	10,344.38	17,383.81	12,162.24	110.32	107.83	160.07	-5,666.64	-70.05	1,936.06	1,820.45	115.608	16.747	
15,900.00	10,347.34	17,483.80	12,166.97	112.12	109.63	160.08	-5,766.51	-69.15	1,937.72	1,820.43	117.296	16.520	
16,000.00	10,350.31	17,583.78	12,171.71	113.92	111.43	160.10	-5,866.38	-68.26	1,939.39	1,820.40	118.988	16.299	
16,100.00	10,353.28	17,683.77	12,176.45	115.73	113.23	160.12	-5,966.24	-67.36	1,941.06	1,820.37	120.683	16.084	
16,200.00	10,356.25	17,783.75	12,181.19	117.53	115.04	160.14	-6,066.11	-66.47	1,942.72	1,820.34	122.380	15.874	
16,300.00	10,359.22	17,883.74	12,185.92	119.34	116.84	160.16	-6,165.98	-65.58	1,944.39	1,820.31	124.081	15.670	
16,400.00	10,362.19	17,983.72	12,190.66	121.15	118.65	160.17	-6,265.85	-64.68	1,946.06	1,820.27	125.783	15.471	
16,500.00	10,365.15	18,083.70	12,195.40	122.96	120.46	160.19	-6,365.72	-63.79	1,947.72	1,820.24	127.489	15.278	
16,600.00	10,368.12	18,183.69	12,200.14	124.77	122.27	160.21	-6,465.58	-62.89	1,949.39	1,820.20	129.196	15.089	
16,700.00	10,371.09	18,283.67	12,204.88	126.59	124.08	160.23	-6,565.45	-62.00	1,951.06	1,820.15	130.905	14.904	
16,800.00	10,374.06	18,383.66	12,209.61	128.40	125.89	160.24	-6,665.32	-61.11	1,952.73	1,820.11	132.617	14.725	
16,900.00	10,377.03	18,483.64	12,214.35	130.22	127.70	160.26	-6,765.19	-60.21	1,954.39	1,820.06	134.330	14.549	
17,000.00	10,380.00	18,583.63	12,219.09	132.03	129.52	160.28	-6,865.06	-59.32	1,956.06	1,820.02	136.045	14.378	
17,100.00	10,382.96	18,683.61	12,223.83	133.85	131.33	160.30	-6,964.92	-58.42	1,957.73	1,819.97	137.762	14.211	
17,200.00	10,385.93	18,783.59	12,228.57	135.67	133.15	160.31	-7,064.79	-57.53	1,959.40	1,819.92	139.481	14.048	
17,300.00	10,388.90	18,883.58	12,233.30	137.49	134.96	160.33	-7,164.66	-56.64	1,961.07	1,819.87	141.200	13.889	
17,400.00	10,391.87	18,983.56	12,238.04	139.31	136.78	160.35	-7,264.53	-55.74	1,962.74	1,819.81	142.922	13.733	
17,500.00	10,394.84	19,083.55	12,242.78	141.13	138.60	160.37	-7,364.40	-54.85	1,964.40	1,819.76	144.644	13.581	
17,600.00	10,397.81	19,183.53	12,247.52	142.95	140.42	160.38	-7,464.26	-53.95	1,966.07	1,819.71	146.368	13.432	
17,700.00	10,400.78	19,283.52	12,252.25	144.77	142.24	160.40	-7,564.13	-53.06	1,967.74	1,819.65	148.092	13.287	
17,800.00	10,403.74	19,383.50	12,256.99	146.60	144.06	160.42	-7,664.00	-52.17	1,969.41	1,819.59	149.818	13.145	
17,900.00	10,406.71	19,483.48	12,261.73	148.42	145.88	160.43	-7,763.87	-51.27	1,971.08	1,819.54	151.545	13.007	
18,000.00	10,409.68	19,583.47	12,266.47	150.24	147.71	160.45	-7,863.74	-50.38	1,972.75	1,819.48	153.273	12.871	
18,100.00	10,412.65	19,683.45	12,271.21	152.07	149.53	160.47	-7,963.60	-49.48	1,974.42	1,819.42	155.001	12.738	
18,200.00	10,415.62	19,783.44	12,275.94	153.90	151.35	160.49	-8,063.47	-48.59	1,976.09	1,819.36	156.730	12.608	
18,300.00	10,418.59	19,883.42	12,280.68	155.72	153.18	160.50	-8,163.34	-47.70	1,977.76	1,819.30	158.460	12.481	
18,400.00	10,421.55	19,983.41	12,285.42	157.55	155.00	160.52	-8,263.21	-46.80	1,979.43	1,819.24	160.191	12.357	
18,500.00	10,424.52	20,083.39	12,290.16	159.38	156.83	160.54	-8,363.08	-45.91	1,981.10	1,819.18	161.922	12.235	
18,600.00	10,427.49	20,183.37	12,294.89	161.20	158.66	160.55	-8,462.94	-45.01	1,982.77	1,819.12	163.654	12.116	
18,700.00	10,430.46	20,283.36	12,299.63	163.03	160.48	160.57	-8,562.81	-44.12	1,984.44	1,819.06	165.387	11.999	
18,800.00	10,433.43	20,383.34	12,304.37	164.86	162.31	160.59	-8,662.68	-43.23	1,986.12	1,819.00	167.119	11.884	
18,900.00	10,436.40	20,483.33	12,309.11	166.69	164.14	160.61	-8,762.55	-42.33	1,987.79	1,818.93	168.853	11.772	
19,000.00	10,439.37	20,583.31	12,313.85	168.52	165.97	160.62	-8,862.42	-41.44	1,989.46	1,818.87	170.586	11.662	
19,100.00	10,442.33	20,683.30	12,318.58	170.35	167.80	160.64	-8,962.28	-40.55	1,991.13	1,818.81	172.320	11.555	
19,200.00	10,445.30	20,783.28	12,323.32	172.18	169.62	160.66	-9,062.15	-39.65	1,992.80	1,818.75	174.054	11.449	
19,300.00	10,448.27	20,883.26	12,328.06	174.02	171.45	160.67	-9,162.02	-38.76	1,994.47	1,818.68	175.789	11.346	
19,400.00	10,451.24	20,983.25	12,332.80	175.85	173.29	160.69	-9,261.89	-37.86	1,996.15	1,818.62	177.524	11.244	
19,500.00	10,454.21	21,083.23	12,337.53	177.68	175.12	160.71	-9,361.76	-36.97	1,997.82	1,818.56	179.259	11.145	
19,600.00	10,457.18	21,183.22	12,342.27	179.51	176.95	160.72	-9,461.62	-36.08	1,999.49	1,818.50	180.994	11.047	
19,700.00	10,460.14	21,283.20	12,347.01	181.35	178.78	160.74	-9,561.49	-35.18	2,001.16	1,818.43	182.729	10.952	
19,800.00	10,463.11	21,383.19	12,351.75	183.18	180.61	160.76	-9,661.36	-34.29	2,002.84	1,818.37	184.464	10.858	
19,900.00	10,466.08	21,483.17	12,356.49	185.02	182.44	160.77	-9,761.23	-33.39	2,004.51	1,818.31	186.199	10.765	
20,000.00	10,469.05	21,583.15	12,361.22	186.85	184.28	160.79	-9,861.10	-32.50	2,006.18	1,818.25	187.935	10.675	
20,100.00	10,472.02	21,683.14	12,365.96	188.68	186.11	160.81	-9,960.96	-31.61	2,007.86	1,818.19	189.670	10.586	
20,200.44	10,475.00	21,783.56	12,370.72	190.53	187.95	160.82	-10,061.27	-30.71	2,009.54	1,818.12	191.413	10.498	

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #14H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3401.70usft (Rig KB = 25')
Reference Site:	Bonaid Federal COM	**MD Reference:**	RKB @ 3401.70usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	*Plan #1 - IP*	***Offset TVD Reference:***	*Offset Datum*

Reference Depths are relative to RKB @ 3401.70usft (Rig KB = 25')	Coordinates are relative to: #14H
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Central Meridian is 104° 20' 0.000 W	Grid Convergence at Surface is: 0.50°



Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #14H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3401.70usft (Rig KB = 25')
Reference Site:	Bonaid Federal COM	**MD Reference:**	RKB @ 3401.70usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to RKB @ 3401.70usft (Rig KB = 25')	Coordinates are relative to: #14H
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Central Meridian is 104° 20' 0.000 W	Grid Convergence at Surface is: 0.50°