

PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

HOBBS OCD
MAY 31 2018
RECEIVED

OPERATOR'S NAME:	COG Production LLC
LEASE NO.:	NMNM120907
WELL NAME & NO.:	108H-Eider Federal
SURFACE HOLE FOOTAGE:	650'/S & 345'/E
BOTTOM HOLE FOOTAGE:	2410'/S & 330''/E
LOCATION:	Section 35, R32 E, T24S. NMPM
COUNTY:	Lea County. New Mexico.

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

A. Hydrogen Sulfide

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

B. CASING

1. The 13 3/8 inch surface casing shall be set at approximately **1045** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. Wait on cement (WOC) time for a primary cement job will be a minimum of 8 hours or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
 - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.

- d. If cement falls back, remedial cementing will be done prior to drilling out that string.
2. The minimum required fill of cement behind the 9 5/8 inch intermediate casing is:
 - Cement to surface. If cement does not circulate see B.1.a, c-d above.
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. **Excess calculates to 20% - additional cement might be required.**

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).
2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M) psi Annular. 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).**
3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the 9 5/8 inch intermediate casing shoe shall be **3000 (3M) psi.**

D. SPECIAL REQUIREMENT(S)

Waste Minimization Plan (WMP)

In the interest of resource development, submission of additional well gas capture development plan information is deferred but may be required by the BLM Authorized Officer at a later date.

MHH 05192018

GENERAL REQUIREMENTS

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

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

☒ Chaves and Roosevelt Counties

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

☒ Eddy County

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

☒ Lea County

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

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
 - a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
 - b. When the operator proposes to set surface casing with Spudder Rig
 - Notify the BLM when moving in and removing the Spudder Rig.
 - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
 - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.

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

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.
2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log.
3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements.
4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.
5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.
7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

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

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.
3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.
4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
 - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
 - c. Manufacturer representative shall install the test plug for the initial BOP test.
 - d. Operator shall perform the intermediate casing integrity test to 70% of the casing burst. This will test the multi-bowl seals.
 - e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
 - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after

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

- b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time.
- c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).
- d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
- e. The results of the test shall be reported to the appropriate BLM office.
- f. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.
- g. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.
- h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

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

D. WASTE MATERIAL AND FLUIDS

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

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

**PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL**

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

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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.

Below 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.

Range

The operator must contact the allotment holder prior to construction to identify the location of the pipeline. The operator must take measures to protect the pipeline from compression or other damages. If the pipeline is damaged or compromised in any way near the proposed project as a result of oil and gas activity, the operator is responsible for repairing the pipeline immediately. The operator must notify the BLM office (575-234-5972) and the private surface landowner or the grazing allotment holder if any damage occurs to structures that provide water to livestock.

Tank Battery (CTB): Any water erosion that may occur due to the construction of the well pad during the life of the well will be quickly corrected and proper measures will be taken to prevent future erosion. Tank battery locations will be lined and bermed. A 20 mil permanent liner will be installed with a 4 oz. felt backing to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank or 24 hour production, whichever is greater. Automatic shut off, check valves, or similar systems will be installed for tanks to minimize the effects of catastrophic line failures used in production or drilling.

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

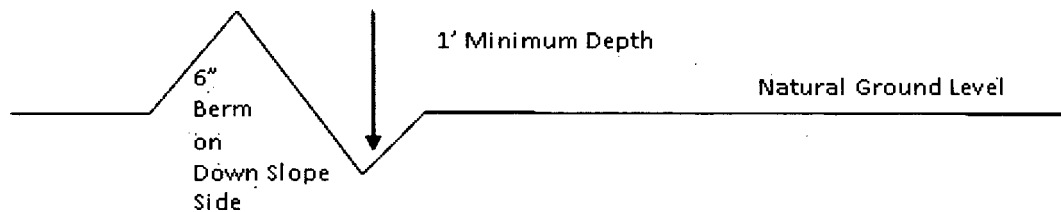
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outslowing 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:

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

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

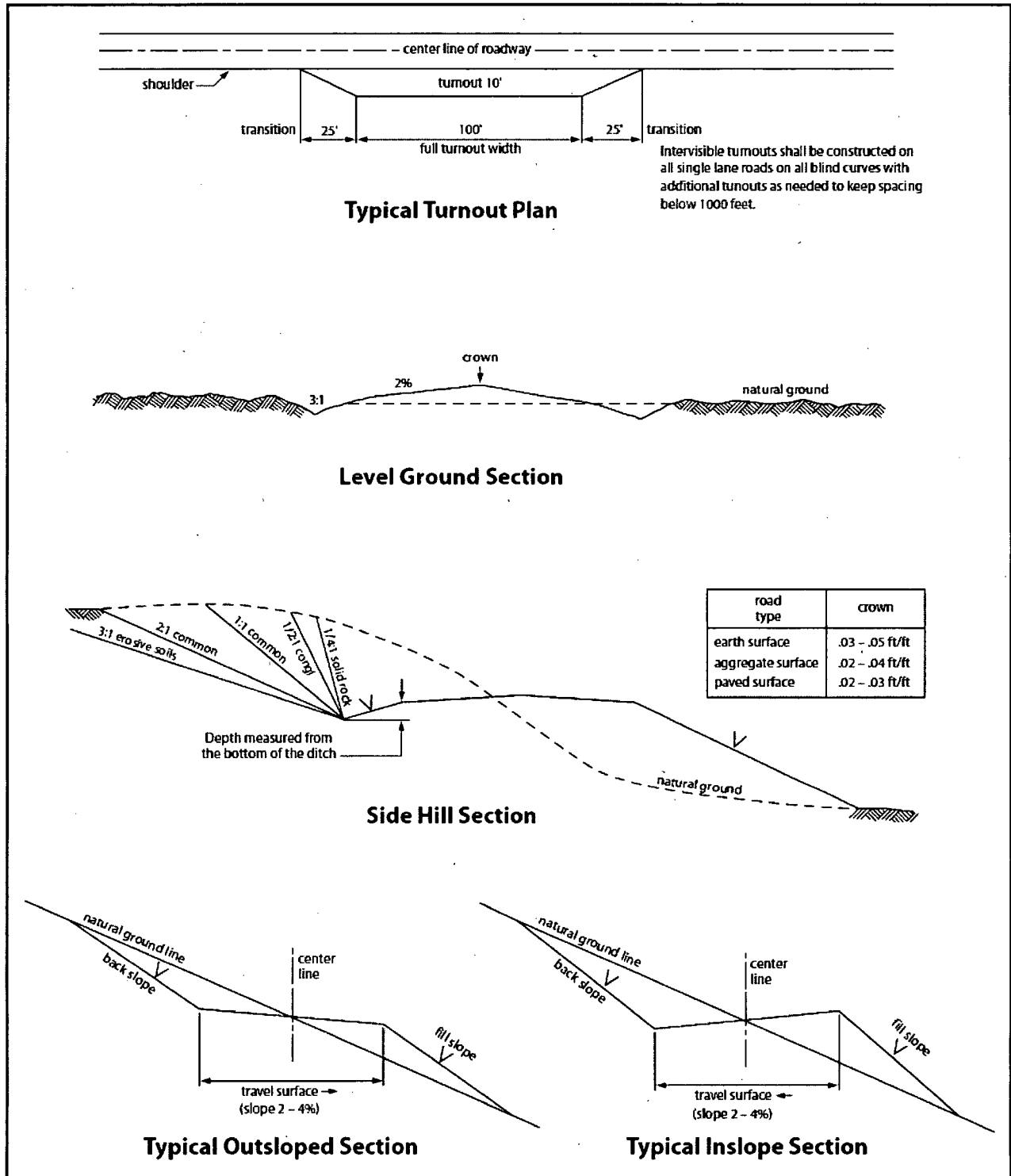


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

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).

B. PIPELINES

STANDARD STIPULATIONS FOR SURFACE INSTALLED PIPELINES

A copy of the Grant and attachments, including stipulations, survey plat(s) and/or map(s), shall be on location during construction. BLM personnel may request to review a copy of your permit during construction to ensure compliance with all stipulations.

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. Holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.
2. Holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, Holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC § 2601 *et seq.* (1982) with regard to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant (*see* 40 CFR, Part 702-799 and in particular, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193). Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the Authorized Officer concurrent with the filing of the reports to the involved Federal agency or State government.
3. Holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. § 9601, *et seq.* or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, *et seq.*) on the Right-of-Way (unless the release or threatened release is wholly unrelated to activity of the Right-of-Way Holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way Holder on the Right-of-Way. This provision applies without regard to whether a release is caused by Holder, its agent, or unrelated third parties.

4. Holder shall be liable for damage or injury to the United States to the extent provided by 43 CFR Sec. 2883.1-4. Holder shall be held to a standard of strict liability for damage or injury to the United States resulting from pipe rupture, fire, or spills caused or substantially aggravated by any of the following within the right-of-way or permit area:

- a. Activities of Holder including, but not limited to: construction, operation, maintenance, and termination of the facility;
- b. Activities of other parties including, but not limited to:
 - (1) Land clearing
 - (2) Earth-disturbing and earth-moving work
 - (3) Blasting
 - (4) Vandalism and sabotage;

c. Acts of God.

The maximum limitation for such strict liability damages shall not exceed one million dollars (\$1,000,000) for any one event, and any liability in excess of such amount shall be determined by the ordinary rules of negligence of the jurisdiction in which the damage or injury occurred.

This section shall not impose strict liability for damage or injury resulting primarily from an act of war or from the negligent acts or omissions of the United States.

5. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil, salt water, or other pollutant should be discharged from the pipeline system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil, salt water, or other pollutant, wherever found, shall be the responsibility of Holder, regardless of fault. Upon failure of Holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages resulting therefrom, on the Federal lands, the Authorized Officer may take such measures as he/she deems necessary to control and clean up the discharge and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of Holder. Such action by the Authorized Officer shall not relieve Holder of any responsibility as provided herein.

6. All construction and maintenance activity shall be confined to the authorized right-of-way width of 20 feet. If the pipeline route follows an existing road or buried pipeline right-of-way, the surface pipeline shall be installed no farther than 10 feet from the edge of the road or buried pipeline right-of-way. If existing surface pipelines prevent this distance, the proposed surface pipeline shall be installed immediately adjacent to the outer surface pipeline. All construction and maintenance activity shall be confined to existing roads or right-of-ways.

7. No blading or clearing of any vegetation shall be allowed unless approved in writing by the Authorized Officer.

8. Holder shall install the pipeline on the surface in such a manner that will minimize suspension of the pipeline across low areas in the terrain. In hummocky or dune areas, the pipeline shall be "snaked" around hummocks and dunes rather than suspended across these features.

9. The pipeline shall be buried with a minimum of 24 inches under all roads, "two-tracks," and trails. Burial of the pipe will continue for 20 feet on each side of each crossing. The condition of the road, upon completion of construction, shall be returned to at least its former state with no bumps or dips remaining in the road surface.

10. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

12. Excluding the pipe, all above-ground structures not subject to safety requirement shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be a color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2; designated by the Rocky Mountain Five State Interagency Committee.

13. The pipeline will be identified by signs at the point of origin and completion of the right-of-way and at all road crossings. At a minimum, signs will state the holder's name, BLM serial number, and the product being transported. Signs will be maintained in a legible condition for the life of the pipeline.

14. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway.

15. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the authorized officer. Holder 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 will be made by the authorized officer to determine appropriate cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made

by the authorized officer after consulting with the holder.

16. 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, powerline 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.

17. Surface pipelines shall be less than or equal to 4 inches and a working pressure below 125 psi.

18. Special Stipulations:

- a. **Lesser Prairie-Chicken:** Oil and gas activities 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 and 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. Normal vehicle use on existing roads will not be restricted.

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).

Below 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.

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:

<u>Species</u>	<u>lb/acre</u>
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

COG PRODUCTION 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 (H₂S).
- b. The proper use and maintenance of personal protective equipment and life support systems.
- c. The proper use of H₂S 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 H₂S 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. H₂S SAFETY EQUIPMENT AND SYSTEMS

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

1-575-748-6940

EMERGENCY CALL LIST

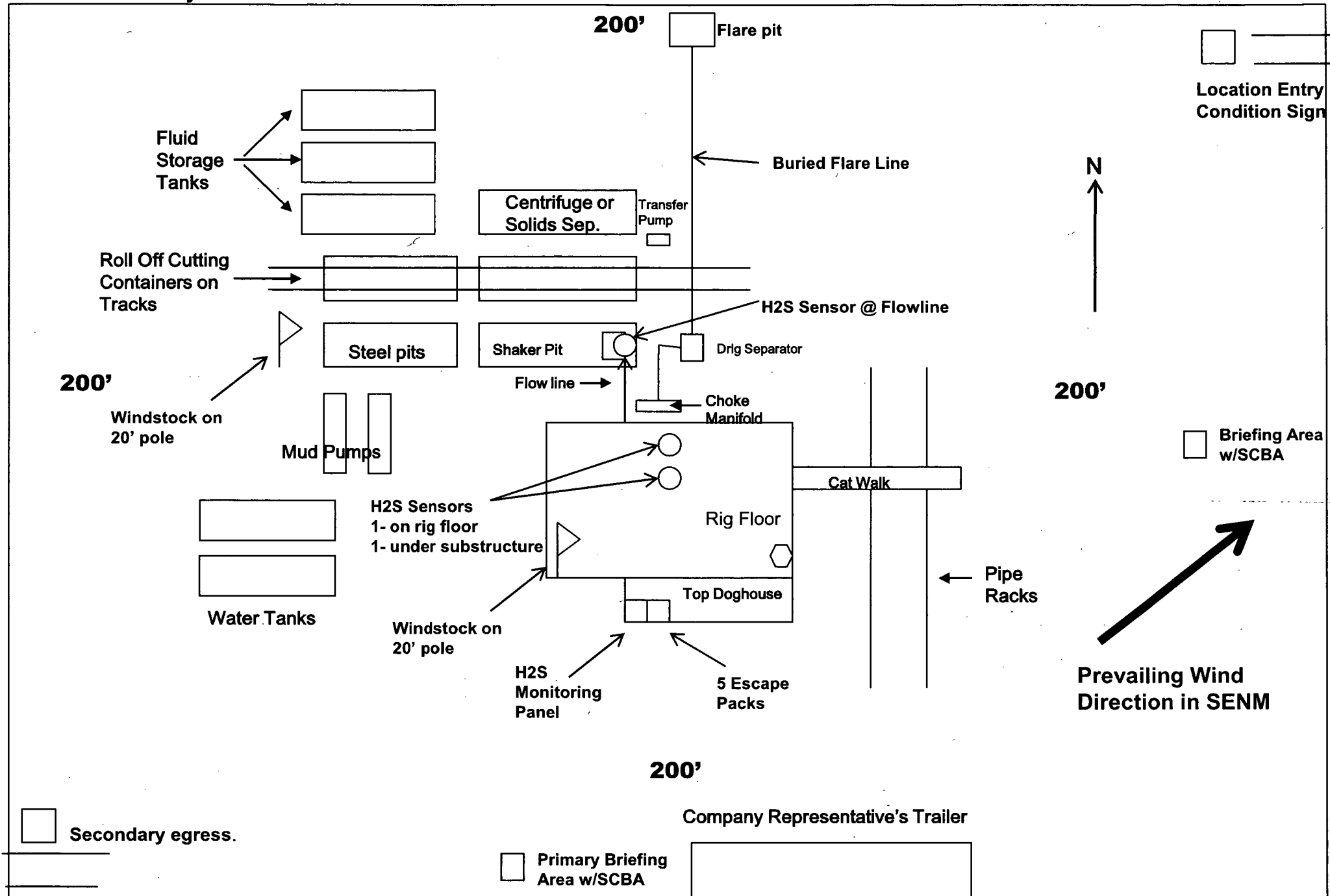
	<u>OFFICE</u>	<u>MOBILE</u>
COG PRODUCTION LLC OFFICE	575-748-6940	
SETH WILD	432-683-7443	432-528-3633
WALTER ROYE	575-748-6940	432-934-1886

EMERGENCY RESPONSE NUMBERS

	<u>OFFICE</u>
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 Production LLC
H₂S Equipment Schematic
Terrain: Shinnery sand hills.

Well pad will be 400' X 400'
with cellar in center of pad





C O N C H O

COG Operating L L C

Lea County, NM (NAD27 NME)

Sec. 35, T 24 S. , R 32 E

Eider Federal 108H

Wellbore #1

Plan #1

Anticollision Report

13 October, 2017





Integrity Directional Services, LLC
Anticollision Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Reference Site:	Sec. 35, T 24 S. , R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Site Error:	5.00 ft	North Reference:	Grid
Reference Well:	Eider Federal 108H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference	Plan #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD + Stations Interval 100.00ft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.00 ft	Error Surface:	Circular Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date 10/13/2017		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	16,684.31	Plan #1 (Wellbore #1)	MWD	MWD - Standard

Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Sec. 35, T 24 S. , R 32 E						
Eider Federal 107H - Wellbore #1 - Plan #1	5,000.00	4,999.10	30.00	7.81	1.352	Level 3, CC, ES, SF
Eider Federal 207H - Wellbore #1 - Plan #1	4,400.00	4,398.60	42.50	23.00	2.180	CC, ES
Eider Federal 207H - Wellbore #1 - Plan #1	16,684.31	16,915.14	348.31	84.57	1.321	Level 3, SF
Eider Federal 307H - Wellbore #1 - Plan #1	4,466.60	4,466.80	30.00	10.21	1.516	CC
Eider Federal 307H - Wellbore #1 - Plan #1	4,500.00	4,500.00	30.00	10.06	1.504	ES
Eider Federal 307H - Wellbore #1 - Plan #1	16,684.31	17,046.25	330.80	68.31	1.260	Level 3, SF
Eider Federal 401H - Wellbore #1 - Plan #1	4,400.00	4,399.30	30.00	10.51	1.539	CC, ES, SF
Eider Federal 601H - Wellbore #1 - Plan #1	4,400.00	4,399.60	42.29	22.79	2.169	CC, ES, SF

Offset Design												Offset Site Error:		0.00 ft
Survey Program: 0-MWD												Offset Well Error:		0.00 ft
Reference		Offset		Semi Major Axis		Distance							Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	-90.57	-0.30	-30.00	30.02					
100.00	100.00	99.10	99.10	0.08	0.08	-90.57	-0.30	-30.00	30.00	29.84	0.17	181.192		
200.00	200.00	199.10	199.10	0.31	0.31	-90.57	-0.30	-30.00	30.00	29.39	0.61	48.876		
300.00	300.00	299.10	299.10	0.53	0.53	-90.57	-0.30	-30.00	30.00	28.94	1.06	28.214		
400.00	400.00	399.10	399.10	0.76	0.76	-90.57	-0.30	-30.00	30.00	28.49	1.51	19.830		
500.00	500.00	499.10	499.10	0.98	0.98	-90.57	-0.30	-30.00	30.00	28.04	1.96	15.288		
600.00	600.00	599.10	599.10	1.21	1.20	-90.57	-0.30	-30.00	30.00	27.59	2.41	12.439		
700.00	700.00	699.10	699.10	1.43	1.43	-90.57	-0.30	-30.00	30.00	27.14	2.86	10.485		
800.00	800.00	799.10	799.10	1.66	1.65	-90.57	-0.30	-30.00	30.00	26.69	3.31	9.061		
900.00	900.00	899.10	899.10	1.88	1.88	-90.57	-0.30	-30.00	30.00	26.24	3.76	7.978		
1,000.00	1,000.00	999.10	999.10	2.11	2.10	-90.57	-0.30	-30.00	30.00	25.79	4.21	7.126		
1,100.00	1,100.00	1,099.10	1,099.10	2.33	2.33	-90.57	-0.30	-30.00	30.00	25.34	4.66	6.439		
1,200.00	1,200.00	1,199.10	1,199.10	2.56	2.55	-90.57	-0.30	-30.00	30.00	24.89	5.11	5.872		
1,300.00	1,300.00	1,299.10	1,299.10	2.78	2.78	-90.57	-0.30	-30.00	30.00	24.44	5.56	5.397		
1,400.00	1,400.00	1,399.10	1,399.10	3.01	3.00	-90.57	-0.30	-30.00	30.00	23.99	6.01	4.993		
1,500.00	1,500.00	1,499.10	1,499.10	3.23	3.23	-90.57	-0.30	-30.00	30.00	23.54	6.46	4.646		
1,600.00	1,600.00	1,599.10	1,599.10	3.45	3.45	-90.57	-0.30	-30.00	30.00	23.09	6.91	4.343		
1,700.00	1,700.00	1,699.10	1,699.10	3.68	3.68	-90.57	-0.30	-30.00	30.00	22.64	7.36	4.078		
1,800.00	1,800.00	1,799.10	1,799.10	3.90	3.90	-90.57	-0.30	-30.00	30.00	22.20	7.81	3.843		
1,900.00	1,900.00	1,899.10	1,899.10	4.13	4.13	-90.57	-0.30	-30.00	30.00	21.75	8.26	3.634		

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



Integrity Directional Services, LLC

Anticollision Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Reference Site:	Sec. 35, T 24 S., R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Site Error:	5.00 ft	North Reference:	Grid
Reference Well:	Eider Federal 108H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Sec. 35, T 24 S., R 32 E - Eider Federal 107H - Wellbore #1 - Plan #1											Offset Site Error: 0.00 ft	
Survey Program: 0-MWD											Offset Well Error: 0.00 ft	
Reference		Offset		Semi Major Axis			Distance		Minimum Separation (ft)	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)				Between Centres (ft)
2,000.00	2,000.00	1,999.10	1,999.10	4.35	4.35	-90.57	-0.30	-30.00	30.00	21.30	8.71	3.446
2,100.00	2,100.00	2,099.10	2,099.10	4.58	4.58	-90.57	-0.30	-30.00	30.00	20.85	9.15	3.277
2,200.00	2,200.00	2,199.10	2,199.10	4.80	4.80	-90.57	-0.30	-30.00	30.00	20.40	9.60	3.124
2,300.00	2,300.00	2,299.10	2,299.10	5.03	5.03	-90.57	-0.30	-30.00	30.00	19.95	10.05	2.984
2,400.00	2,400.00	2,399.10	2,399.10	5.25	5.25	-90.57	-0.30	-30.00	30.00	19.50	10.50	2.856
2,500.00	2,500.00	2,499.10	2,499.10	5.48	5.48	-90.57	-0.30	-30.00	30.00	19.05	10.95	2.739
2,600.00	2,600.00	2,599.10	2,599.10	5.70	5.70	-90.57	-0.30	-30.00	30.00	18.60	11.40	2.631
2,700.00	2,700.00	2,699.10	2,699.10	5.93	5.93	-90.57	-0.30	-30.00	30.00	18.15	11.85	2.531
2,800.00	2,800.00	2,799.10	2,799.10	6.15	6.15	-90.57	-0.30	-30.00	30.00	17.70	12.30	2.439
2,900.00	2,900.00	2,899.10	2,899.10	6.38	6.37	-90.57	-0.30	-30.00	30.00	17.25	12.75	2.353
3,000.00	3,000.00	2,999.10	2,999.10	6.60	6.60	-90.57	-0.30	-30.00	30.00	16.80	13.20	2.273
3,100.00	3,100.00	3,099.10	3,099.10	6.83	6.82	-90.57	-0.30	-30.00	30.00	16.35	13.65	2.198
3,200.00	3,200.00	3,199.10	3,199.10	7.05	7.05	-90.57	-0.30	-30.00	30.00	15.90	14.10	2.128
3,300.00	3,300.00	3,299.10	3,299.10	7.28	7.27	-90.57	-0.30	-30.00	30.00	15.45	14.55	2.062
3,400.00	3,400.00	3,399.10	3,399.10	7.50	7.50	-90.57	-0.30	-30.00	30.00	15.00	15.00	2.000
3,500.00	3,500.00	3,499.10	3,499.10	7.73	7.72	-90.57	-0.30	-30.00	30.00	14.55	15.45	1.942
3,600.00	3,600.00	3,599.10	3,599.10	7.95	7.95	-90.57	-0.30	-30.00	30.00	14.10	15.90	1.887
3,700.00	3,700.00	3,699.10	3,699.10	8.17	8.17	-90.57	-0.30	-30.00	30.00	13.65	16.35	1.835
3,800.00	3,800.00	3,799.10	3,799.10	8.40	8.40	-90.57	-0.30	-30.00	30.00	13.20	16.80	1.786
3,900.00	3,900.00	3,899.10	3,899.10	8.62	8.62	-90.57	-0.30	-30.00	30.00	12.76	17.25	1.740
4,000.00	4,000.00	3,999.10	3,999.10	8.85	8.85	-90.57	-0.30	-30.00	30.00	12.31	17.70	1.695
4,100.00	4,100.00	4,099.10	4,099.10	9.07	9.07	-90.57	-0.30	-30.00	30.00	11.86	18.15	1.653
4,200.00	4,200.00	4,199.10	4,199.10	9.30	9.30	-90.57	-0.30	-30.00	30.00	11.41	18.60	1.613
4,300.00	4,300.00	4,299.10	4,299.10	9.52	9.52	-90.57	-0.30	-30.00	30.00	10.96	19.04	1.575
4,400.00	4,400.00	4,399.10	4,399.10	9.75	9.75	-90.57	-0.30	-30.00	30.00	10.51	19.49	1.539
4,500.00	4,500.00	4,499.10	4,499.10	9.97	9.97	-90.57	-0.30	-30.00	30.00	10.06	19.94	1.504
4,600.00	4,600.00	4,599.10	4,599.10	10.20	10.20	-90.57	-0.30	-30.00	30.00	9.61	20.39	1.471 Level 3
4,700.00	4,700.00	4,699.10	4,699.10	10.42	10.42	-90.57	-0.30	-30.00	30.00	9.16	20.84	1.439 Level 3
4,800.00	4,800.00	4,799.10	4,799.10	10.65	10.65	-90.57	-0.30	-30.00	30.00	8.71	21.29	1.409 Level 3
4,900.00	4,900.00	4,899.10	4,899.10	10.87	10.87	-90.57	-0.30	-30.00	30.00	8.26	21.74	1.380 Level 3
5,000.00	5,000.00	4,999.10	4,999.10	11.10	11.09	-90.57	-0.30	-30.00	30.00	7.81	22.19	1.352 Level 3, CC, ES, SF
5,100.00	5,099.98	5,098.40	5,098.39	11.29	11.29	73.47	-1.57	-31.12	30.63	8.04	22.59	1.356 Level 3
5,200.00	5,199.84	5,197.67	5,197.51	11.46	11.47	75.42	-5.40	-34.52	32.57	9.64	22.93	1.420 Level 3
5,300.00	5,299.45	5,296.87	5,296.34	11.63	11.65	78.17	-11.81	-40.19	35.89	12.61	23.28	1.542
5,400.00	5,398.70	5,395.98	5,394.72	11.81	11.83	81.22	-20.76	-48.11	40.66	17.02	23.64	1.720
5,421.10	5,419.59	5,416.88	5,415.41	11.85	11.87	81.86	-22.97	-50.07	41.85	18.14	23.71	1.765
5,500.00	5,497.63	5,494.96	5,492.51	11.99	12.02	82.98	-32.23	-58.27	47.03	23.03	24.00	1.959
5,600.00	5,596.56	5,593.68	5,589.44	12.17	12.22	81.35	-46.19	-70.63	55.24	30.85	24.39	2.265
5,700.00	5,695.48	5,692.37	5,685.70	12.37	12.44	77.82	-62.48	-85.05	65.34	40.54	24.80	2.634
5,800.00	5,794.40	5,791.73	5,782.46	12.57	12.67	74.82	-79.38	-100.01	76.07	50.83	25.24	3.014
5,900.00	5,893.32	5,891.08	5,879.21	12.78	12.91	72.56	-96.28	-114.98	86.96	61.26	25.69	3.384
6,000.00	5,992.24	5,990.43	5,975.97	12.99	13.17	70.81	-113.19	-129.94	97.95	71.78	26.17	3.743
6,100.00	6,091.16	6,089.79	6,072.72	13.21	13.44	69.41	-130.09	-144.91	109.01	82.35	26.66	4.089
6,200.00	6,190.09	6,189.14	6,169.48	13.44	13.72	68.27	-146.99	-159.88	120.12	92.96	27.17	4.422
6,300.00	6,289.01	6,288.50	6,266.24	13.67	14.02	67.32	-163.90	-174.84	131.28	103.59	27.69	4.741
6,400.00	6,387.93	6,387.85	6,362.99	13.91	14.32	66.52	-180.80	-189.81	142.46	114.24	28.23	5.047
6,500.00	6,486.85	6,487.21	6,459.75	14.15	14.63	65.84	-197.70	-204.77	153.67	124.89	28.78	5.340
6,600.00	6,585.77	6,586.56	6,556.50	14.39	14.95	65.25	-214.61	-219.74	164.89	135.55	29.34	5.619
6,700.00	6,684.69	6,685.92	6,653.26	14.64	15.28	64.74	-231.51	-234.70	176.13	146.21	29.92	5.887
6,800.00	6,783.62	6,785.27	6,750.01	14.90	15.61	64.29	-248.41	-249.67	187.39	156.88	30.51	6.142
6,900.00	6,882.54	6,884.63	6,846.77	15.16	15.95	63.88	-265.32	-264.63	198.65	167.54	31.11	6.385
7,000.00	6,981.46	6,983.98	6,943.53	15.42	16.30	63.53	-282.22	-279.60	209.92	178.20	31.72	6.618

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



Integrity Directional Services, LLC

Anticollision Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandriil Freedom)
Reference Site:	Sec. 35, T 24 S., R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandriil Freedom)
Site Error:	5.00 ft	North Reference:	Grid
Reference Well:	Eider Federal 108H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Sec. 35, T 24 S., R 32 E - Eider Federal 107H - Wellbore #1 - Plan #1														Offset Site Error:	0.00 ft
Survey Program: 0-MWD														Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)					
7,100.00	7,080.38	7,083.34	7,040.28	15.68	16.66	63.20	-299.12	-294.56	221.20	188.86	32.34	6.840			
7,200.00	7,179.30	7,182.69	7,137.04	15.95	17.02	62.91	-316.03	-309.53	232.49	199.52	32.97	7.051			
7,300.00	7,278.22	7,282.04	7,233.79	16.22	17.39	62.65	-332.93	-324.49	243.78	210.17	33.61	7.253			
7,400.00	7,377.15	7,381.40	7,330.55	16.50	17.76	62.41	-349.83	-339.46	255.07	220.82	34.25	7.446			
7,500.00	7,476.07	7,480.75	7,427.30	16.77	18.13	62.19	-366.74	-354.42	266.37	231.46	34.91	7.631			
7,600.00	7,574.99	7,580.11	7,524.06	17.05	18.51	61.99	-383.64	-369.39	277.68	242.11	35.57	7.807			
7,700.00	7,673.91	7,679.46	7,620.81	17.34	18.90	61.80	-400.54	-384.36	288.98	252.74	36.24	7.975			
7,800.00	7,772.83	7,778.82	7,717.57	17.62	19.29	61.63	-417.45	-399.32	300.29	263.38	36.91	8.135			
7,900.00	7,871.75	7,878.17	7,814.33	17.91	19.68	61.47	-434.35	-414.29	311.60	274.01	37.59	8.289			
8,000.00	7,970.67	7,977.53	7,911.08	18.20	20.08	61.32	-451.25	-429.25	322.91	284.64	38.28	8.436			
8,100.00	8,069.60	8,076.88	8,007.84	18.49	20.48	61.18	-468.16	-444.22	334.23	295.26	38.97	8.577			
8,200.00	8,168.52	8,176.24	8,104.59	18.78	20.88	61.05	-485.06	-459.18	345.55	305.88	39.67	8.712			
8,300.00	8,267.44	8,275.59	8,201.35	19.08	21.29	60.93	-501.96	-474.15	356.87	316.50	40.37	8.841			
8,400.00	8,366.36	8,374.95	8,298.10	19.38	21.70	60.82	-518.87	-489.11	368.19	327.11	41.07	8.964			
8,500.00	8,465.28	8,474.30	8,394.86	19.68	22.11	60.71	-535.77	-504.08	379.51	337.72	41.78	9.083			
8,600.00	8,564.20	8,573.65	8,491.62	19.98	22.52	60.61	-552.67	-519.04	390.83	348.33	42.50	9.196			
8,700.00	8,663.13	8,673.01	8,588.37	20.28	22.94	60.52	-569.58	-534.01	402.16	358.94	43.22	9.305			
8,774.32	8,736.64	8,746.84	8,660.28	20.51	23.25	60.45	-582.14	-545.13	410.57	366.82	43.75	9.384			
8,800.00	8,762.14	8,772.31	8,685.08	20.58	23.36	59.70	-586.47	-548.97	413.80	369.87	43.93	9.419			
8,825.00	8,787.08	8,796.95	8,709.07	20.63	23.46	56.40	-590.66	-552.68	417.56	373.46	44.09	9.470			
8,850.00	8,812.07	8,822.70	8,734.15	20.68	23.57	-96.68	-594.99	-556.56	421.92	377.67	44.25	9.535			
8,875.00	8,837.05	8,852.82	8,763.68	20.72	23.67	-113.49	-598.74	-561.13	426.66	382.26	44.39	9.611			
8,900.00	8,861.95	8,883.23	8,793.67	20.76	23.76	-115.15	-600.60	-565.79	431.67	387.16	44.52	9.697			
8,925.00	8,886.69	8,913.91	8,823.98	20.78	23.84	-115.62	-600.51	-570.50	436.94	392.32	44.62	9.792			
8,950.00	8,911.21	8,944.83	8,854.46	20.79	23.91	-115.68	-598.44	-575.25	442.44	397.73	44.70	9.897			
8,975.00	8,935.45	8,975.96	8,884.95	20.80	23.96	-115.51	-594.33	-580.01	448.15	403.38	44.76	10.011			
9,000.00	8,959.33	9,007.28	8,915.28	20.80	24.00	-115.18	-588.19	-584.75	454.05	409.25	44.80	10.134			
9,025.00	8,982.80	9,038.74	8,945.29	20.79	24.03	-114.71	-580.00	-589.45	460.13	415.31	44.82	10.266			
9,050.00	9,005.78	9,070.33	8,974.81	20.78	24.04	-114.13	-569.78	-594.09	466.38	421.55	44.82	10.405			
9,075.00	9,028.22	9,102.01	9,003.68	20.76	24.04	-113.46	-557.57	-598.64	472.76	427.96	44.80	10.553			
9,100.00	9,050.04	9,133.75	9,031.74	20.73	24.03	-112.69	-543.43	-603.06	479.27	434.51	44.76	10.708			
9,125.00	9,071.21	9,165.53	9,058.84	20.70	24.00	-111.84	-527.41	-607.35	485.90	441.20	44.70	10.870			
9,150.00	9,091.64	9,197.30	9,084.82	20.67	23.97	-110.91	-509.59	-611.47	492.62	447.99	44.63	11.038			
9,175.00	9,111.29	9,229.06	9,109.56	20.63	23.92	-109.92	-490.09	-615.41	499.43	454.89	44.55	11.212			
9,200.00	9,130.11	9,260.77	9,132.93	20.59	23.86	-108.86	-468.99	-619.14	506.31	461.86	44.45	11.391			
9,225.00	9,148.04	9,292.40	9,154.81	20.54	23.80	-107.75	-446.42	-622.65	513.25	468.91	44.34	11.575			
9,250.00	9,165.04	9,323.95	9,175.11	20.50	23.73	-106.59	-422.51	-625.92	520.22	476.00	44.23	11.763			
9,275.00	9,181.05	9,355.38	9,193.75	20.46	23.65	-105.39	-397.38	-628.93	527.23	483.12	44.11	11.953			
9,300.00	9,196.04	9,386.68	9,210.64	20.42	23.57	-104.15	-371.18	-631.68	534.25	490.26	43.98	12.146			
9,325.00	9,209.96	9,417.84	9,225.73	20.38	23.48	-102.88	-344.04	-634.15	541.26	497.40	43.86	12.341			
9,350.00	9,222.77	9,448.84	9,238.98	20.34	23.39	-101.59	-316.11	-636.34	548.26	504.53	43.74	12.536			
9,375.00	9,234.44	9,479.66	9,250.35	20.31	23.30	-100.27	-287.53	-638.24	555.23	511.62	43.61	12.730			
9,400.00	9,244.94	9,510.30	9,259.82	20.28	23.22	-98.95	-258.44	-639.84	562.15	518.66	43.50	12.924			
9,425.00	9,254.24	9,540.75	9,267.39	20.26	23.13	-97.62	-228.98	-641.16	569.01	525.63	43.39	13.115			
9,450.00	9,262.31	9,570.99	9,273.05	20.24	23.04	-96.28	-199.29	-642.17	575.80	532.51	43.28	13.303			
9,475.00	9,269.13	9,601.03	9,276.82	20.23	22.96	-94.94	-169.51	-642.90	582.49	539.30	43.19	13.487			
9,500.00	9,274.69	9,630.85	9,278.74	20.23	22.88	-93.61	-139.76	-643.33	589.07	545.96	43.11	13.665			
9,525.00	9,278.96	9,657.52	9,279.04	20.23	22.81	-92.36	-113.09	-643.51	595.55	552.51	43.04	13.837			
9,550.00	9,281.93	9,681.47	9,279.12	20.24	22.75	-91.27	-89.14	-643.63	602.09	559.09	43.00	14.003			
9,575.00	9,283.60	9,705.54	9,279.20	20.26	22.70	-90.30	-65.07	-643.75	608.67	565.71	42.96	14.168			
9,592.47	9,284.00	9,722.38	9,279.26	20.28	22.66	-89.69	-48.23	-643.84	613.28	570.33	42.94	14.282			
9,600.00	9,284.03	9,729.65	9,279.28	20.28	22.65	-89.69	-40.96	-643.88	615.24	572.32	42.93	14.332			

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



Integrity Directional Services, LLC

Anticollision Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Reference Site:	Sec. 35, T 24 S. , R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Site Error:	5.00 ft	North Reference:	Grid
Reference Well:	Eider Federal 108H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Sec. 35, T 24 S. , R 32 E - Eider Federal 107H - Wellbore #1 - Plan #1														Offset Site Error:	0.00 ft
Survey Program: 0-MWD														Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)					
9,700.00	9,284.45	9,827.07	9,279.61	20.29	22.53	-89.69	56.46	-644.38	637.72	594.90	42.82	14.892			
9,800.00	9,284.87	9,925.82	9,279.94	20.44	22.60	-89.67	155.21	-644.89	653.35	610.31	43.04	15.179			
9,900.00	9,285.30	10,025.42	9,280.27	20.74	22.96	-89.66	254.81	-645.40	662.06	618.35	43.70	15.150			
9,975.71	9,285.62	10,101.10	9,280.53	21.05	23.41	-89.64	330.48	-645.79	664.01	619.55	44.46	14.934			
10,000.00	9,285.72	10,125.39	9,280.61	21.19	23.57	-89.64	354.77	-645.91	664.00	619.24	44.76	14.835			
10,100.00	9,286.15	10,225.39	9,280.94	21.87	24.34	-89.63	454.77	-646.43	663.93	617.72	46.21	14.367			
10,200.00	9,286.57	10,325.39	9,281.28	22.68	25.23	-89.62	554.77	-646.94	663.87	615.97	47.91	13.857			
10,300.00	9,286.99	10,425.39	9,281.61	23.61	26.21	-89.61	654.76	-647.46	663.81	614.00	49.82	13.326			
10,400.00	9,287.41	10,525.39	9,281.95	24.64	27.27	-89.61	754.76	-647.97	663.75	611.85	51.91	12.788			
10,500.00	9,287.84	10,625.39	9,282.28	25.75	28.40	-89.60	854.76	-648.49	663.69	609.54	54.16	12.255			
10,600.00	9,288.26	10,725.39	9,282.62	26.95	29.61	-89.59	954.76	-649.00	663.63	607.08	56.55	11.735			
10,700.00	9,288.68	10,825.39	9,282.95	28.21	30.86	-89.58	1,054.76	-649.52	663.57	604.50	59.07	11.233			
10,800.00	9,289.11	10,925.39	9,283.29	29.53	32.17	-89.58	1,154.75	-650.03	663.51	601.81	61.71	10.753			
10,900.00	9,289.53	11,025.39	9,283.62	30.91	33.53	-89.57	1,254.75	-650.54	663.45	599.02	64.44	10.296			
11,000.00	9,289.95	11,125.39	9,283.96	32.32	34.93	-89.56	1,354.75	-651.06	663.39	596.14	67.25	9.865			
11,100.00	9,290.38	11,225.39	9,284.29	33.78	36.36	-89.55	1,454.75	-651.57	663.33	593.19	70.14	9.457			
11,200.00	9,290.80	11,325.39	9,284.63	35.27	37.82	-89.54	1,554.75	-652.09	663.27	590.18	73.10	9.074			
11,300.00	9,291.22	11,425.39	9,284.96	36.79	39.32	-89.54	1,654.74	-652.60	663.21	587.10	76.11	8.714			
11,400.00	9,291.65	11,525.39	9,285.30	38.34	40.84	-89.53	1,754.74	-653.12	663.15	583.97	79.18	8.375			
11,500.00	9,292.07	11,625.39	9,285.64	39.91	42.38	-89.52	1,854.74	-653.63	663.09	580.80	82.30	8.057			
11,600.00	9,292.49	11,725.39	9,285.97	41.51	43.94	-89.51	1,954.74	-654.15	663.03	577.58	85.45	7.759			
11,700.00	9,292.91	11,825.39	9,286.31	43.12	45.53	-89.51	2,054.74	-654.66	662.97	574.33	88.65	7.479			
11,800.00	9,293.34	11,925.39	9,286.64	44.75	47.13	-89.50	2,154.73	-655.18	662.91	571.04	91.87	7.216			
11,900.00	9,293.76	12,025.39	9,286.98	46.39	48.74	-89.49	2,254.73	-655.69	662.85	567.72	95.13	6.968			
12,000.00	9,294.18	12,125.39	9,287.31	48.04	50.37	-89.48	2,354.73	-656.21	662.79	564.38	98.42	6.735			
12,100.00	9,294.61	12,225.39	9,287.65	49.71	52.01	-89.48	2,454.73	-656.72	662.73	561.01	101.72	6.515			
12,200.00	9,295.03	12,325.39	9,287.98	51.39	53.67	-89.47	2,554.73	-657.23	662.67	557.62	105.06	6.308			
12,300.00	9,295.45	12,425.39	9,288.32	53.08	55.33	-89.46	2,654.73	-657.75	662.61	554.21	108.41	6.112			
12,400.00	9,295.88	12,525.39	9,288.65	54.77	57.01	-89.45	2,754.72	-658.26	662.55	550.78	111.78	5.927			
12,500.00	9,296.30	12,625.39	9,288.99	56.48	58.69	-89.45	2,854.72	-658.78	662.49	547.33	115.16	5.753			
12,600.00	9,296.72	12,725.39	9,289.32	58.19	60.38	-89.44	2,954.72	-659.29	662.43	543.87	118.57	5.587			
12,700.00	9,297.14	12,825.39	9,289.66	59.91	62.08	-89.43	3,054.72	-659.81	662.37	540.39	121.98	5.430			
12,800.00	9,297.57	12,925.39	9,289.99	61.63	63.78	-89.42	3,154.72	-660.32	662.31	536.90	125.41	5.281			
12,900.00	9,297.99	13,025.39	9,290.33	63.36	65.49	-89.41	3,254.71	-660.84	662.25	533.40	128.85	5.140			
13,000.00	9,298.41	13,125.39	9,290.66	65.10	67.21	-89.41	3,354.71	-661.35	662.19	529.89	132.31	5.005			
13,100.00	9,298.84	13,225.39	9,291.00	66.84	68.93	-89.40	3,454.71	-661.87	662.13	526.37	135.77	4.877			
13,200.00	9,299.26	13,325.39	9,291.33	68.58	70.66	-89.39	3,554.71	-662.38	662.07	522.83	139.24	4.755			
13,300.00	9,299.68	13,425.39	9,291.67	70.33	72.39	-89.38	3,654.71	-662.90	662.01	519.29	142.72	4.638			
13,400.00	9,300.11	13,525.39	9,292.00	72.08	74.13	-89.38	3,754.70	-663.41	661.96	515.74	146.21	4.527			
13,500.00	9,300.53	13,625.39	9,292.34	73.84	75.87	-89.37	3,854.70	-663.92	661.90	512.19	149.71	4.421			
13,600.00	9,300.95	13,725.39	9,292.67	75.60	77.61	-89.36	3,954.70	-664.44	661.84	508.62	153.21	4.320			
13,700.00	9,301.38	13,825.39	9,293.01	77.36	79.36	-89.35	4,054.70	-664.95	661.78	505.05	156.72	4.223			
13,800.00	9,301.80	13,925.39	9,293.34	79.13	81.11	-89.35	4,154.70	-665.47	661.72	501.48	160.24	4.130			
13,900.00	9,302.22	14,025.39	9,293.68	80.89	82.87	-89.34	4,254.69	-665.98	661.66	497.90	163.76	4.040			
14,000.00	9,302.64	14,125.39	9,294.01	82.66	84.62	-89.33	4,354.69	-666.50	661.60	494.31	167.29	3.955			
14,100.00	9,303.07	14,225.39	9,294.35	84.44	86.38	-89.32	4,454.69	-667.01	661.54	490.72	170.82	3.873			
14,200.00	9,303.49	14,325.39	9,294.68	86.21	88.15	-89.31	4,554.69	-667.53	661.48	487.12	174.36	3.794			
14,300.00	9,303.91	14,425.39	9,295.02	87.99	89.91	-89.31	4,654.69	-668.04	661.42	483.52	177.90	3.718			
14,400.00	9,304.34	14,525.39	9,295.35	89.77	91.68	-89.30	4,754.68	-668.56	661.36	479.91	181.45	3.645			
14,500.00	9,304.76	14,625.39	9,295.69	91.55	93.45	-89.29	4,854.68	-669.07	661.30	476.30	185.00	3.575			
14,600.00	9,305.18	14,725.39	9,296.02	93.33	95.22	-89.28	4,954.68	-669.59	661.24	472.69	188.55	3.507			
14,700.00	9,305.61	14,825.39	9,296.36	95.11	97.00	-89.28	5,054.68	-670.10	661.18	469.07	192.11	3.442			

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



Integrity Directional Services, LLC
Anticollision Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Reference Site:	Sec. 35, T 24 S. , R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Site Error:	5.00 ft	North Reference:	Grid
Reference Well:	Eider Federal 108H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Sec. 35, T 24 S. , R 32 E - Eider Federal 107H - Wellbore #1 - Plan #1													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
14,800.00	9,306.03	14,925.39	9,296.69	96.90	98.77	-89.27	5,154.68	-670.61	661.12	465.45	195.67	3.379		
14,900.00	9,306.45	15,025.39	9,297.03	98.69	100.55	-89.26	5,254.67	-671.13	661.06	461.82	199.23	3.318		
15,000.00	9,306.87	15,125.39	9,297.36	100.47	102.33	-89.25	5,354.67	-671.64	661.00	458.20	202.80	3.259		
15,100.00	9,307.30	15,225.39	9,297.70	102.26	104.11	-89.25	5,454.67	-672.16	660.94	454.57	206.37	3.203		
15,200.00	9,307.72	15,325.39	9,298.03	104.06	105.89	-89.24	5,554.67	-672.67	660.88	450.94	209.94	3.148		
15,300.00	9,308.14	15,425.39	9,298.37	105.85	107.67	-89.23	5,654.67	-673.19	660.82	447.30	213.52	3.095		
15,400.00	9,308.57	15,525.39	9,298.70	107.64	109.46	-89.22	5,754.66	-673.70	660.76	443.66	217.10	3.044		
15,500.00	9,308.99	15,625.39	9,299.04	109.43	111.24	-89.21	5,854.66	-674.22	660.70	440.02	220.68	2.994		
15,600.00	9,309.41	15,725.39	9,299.37	111.23	113.03	-89.21	5,954.66	-674.73	660.64	436.38	224.26	2.946		
15,700.00	9,309.84	15,825.39	9,299.71	113.03	114.82	-89.20	6,054.66	-675.25	660.58	432.74	227.85	2.899		
15,800.00	9,310.26	15,925.39	9,300.04	114.82	116.61	-89.19	6,154.66	-675.76	660.52	429.09	231.43	2.854		
15,900.00	9,310.68	16,025.38	9,300.38	116.62	118.40	-89.18	6,254.66	-676.28	660.46	425.44	235.02	2.810		
16,000.00	9,311.11	16,125.38	9,300.71	118.42	120.19	-89.18	6,354.65	-676.79	660.40	421.79	238.61	2.768		
16,100.00	9,311.53	16,225.38	9,301.05	120.22	121.98	-89.17	6,454.65	-677.30	660.34	418.14	242.20	2.726		
16,200.00	9,311.95	16,325.38	9,301.38	122.02	123.78	-89.16	6,554.65	-677.82	660.29	414.49	245.80	2.686		
16,300.00	9,312.37	16,425.38	9,301.72	123.82	125.57	-89.15	6,654.65	-678.33	660.23	410.83	249.39	2.647		
16,400.00	9,312.80	16,525.38	9,302.05	125.62	127.37	-89.15	6,754.65	-678.85	660.17	407.18	252.99	2.609		
16,500.00	9,313.22	16,625.38	9,302.39	127.42	129.16	-89.14	6,854.64	-679.36	660.11	403.52	256.59	2.573		
16,600.00	9,313.64	16,725.38	9,302.72	129.23	130.96	-89.13	6,954.64	-679.88	660.05	399.86	260.19	2.537		
16,662.94	9,313.91	16,788.32	9,302.94	130.36	132.09	-89.13	7,017.58	-680.20	660.01	397.56	262.45	2.515		
16,684.31	9,314.00	16,807.66	9,303.00	130.75	132.44	-89.12	7,036.91	-680.30	660.00	396.81	263.19	2.508		

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

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Reference Site:	Sec. 35, T 24 S. , R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Site Error:	5.00 ft	North Reference:	Grid
Reference Well:	Eider Federal 108H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Sec. 35, T 24 S. , R 32 E - Eider Federal 207H - Wellbore #1 - Plan #1													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Distance Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.00	0.00	0.00	0.00	0.00	0.00	-135.29	-30.20	-29.90	42.52					
100.00	100.00	98.60	98.60	0.08	0.08	-135.29	-30.20	-29.90	42.50	42.33	0.17	257.308		
200.00	200.00	198.60	198.60	0.31	0.30	-135.29	-30.20	-29.90	42.50	41.89	0.61	69.360		
300.00	300.00	298.60	298.60	0.53	0.53	-135.29	-30.20	-29.90	42.50	41.44	1.06	40.007		
400.00	400.00	398.60	398.60	0.76	0.75	-135.29	-30.20	-29.90	42.50	40.99	1.51	28.111		
500.00	500.00	498.60	498.60	0.98	0.98	-135.29	-30.20	-29.90	42.50	40.54	1.96	21.668		
600.00	600.00	598.60	598.60	1.21	1.20	-135.29	-30.20	-29.90	42.50	40.09	2.41	17.628		
700.00	700.00	698.60	698.60	1.43	1.43	-135.29	-30.20	-29.90	42.50	39.64	2.86	14.857		
800.00	800.00	798.60	798.60	1.66	1.65	-135.29	-30.20	-29.90	42.50	39.19	3.31	12.840		
900.00	900.00	898.60	898.60	1.88	1.88	-135.29	-30.20	-29.90	42.50	38.74	3.76	11.304		
1,000.00	1,000.00	998.60	998.60	2.11	2.10	-135.29	-30.20	-29.90	42.50	38.29	4.21	10.097		
1,100.00	1,100.00	1,098.60	1,098.60	2.33	2.33	-135.29	-30.20	-29.90	42.50	37.84	4.66	9.123		
1,200.00	1,200.00	1,198.60	1,198.60	2.56	2.55	-135.29	-30.20	-29.90	42.50	37.39	5.11	8.320		
1,300.00	1,300.00	1,298.60	1,298.60	2.78	2.78	-135.29	-30.20	-29.90	42.50	36.94	5.56	7.647		
1,400.00	1,400.00	1,398.60	1,398.60	3.01	3.00	-135.29	-30.20	-29.90	42.50	36.49	6.01	7.075		
1,500.00	1,500.00	1,498.60	1,498.60	3.23	3.23	-135.29	-30.20	-29.90	42.50	36.04	6.46	6.582		
1,600.00	1,600.00	1,598.60	1,598.60	3.45	3.45	-135.29	-30.20	-29.90	42.50	35.59	6.91	6.154		
1,700.00	1,700.00	1,698.60	1,698.60	3.68	3.68	-135.29	-30.20	-29.90	42.50	35.14	7.36	5.778		
1,800.00	1,800.00	1,798.60	1,798.60	3.90	3.90	-135.29	-30.20	-29.90	42.50	34.69	7.81	5.445		
1,900.00	1,900.00	1,898.60	1,898.60	4.13	4.13	-135.29	-30.20	-29.90	42.50	34.24	8.25	5.148		
2,000.00	2,000.00	1,998.60	1,998.60	4.35	4.35	-135.29	-30.20	-29.90	42.50	33.79	8.70	4.882		
2,100.00	2,100.00	2,098.60	2,098.60	4.58	4.58	-135.29	-30.20	-29.90	42.50	33.34	9.15	4.643		
2,200.00	2,200.00	2,198.60	2,198.60	4.80	4.80	-135.29	-30.20	-29.90	42.50	32.89	9.60	4.425		
2,300.00	2,300.00	2,298.60	2,298.60	5.03	5.02	-135.29	-30.20	-29.90	42.50	32.44	10.05	4.227		
2,400.00	2,400.00	2,398.60	2,398.60	5.25	5.25	-135.29	-30.20	-29.90	42.50	32.00	10.50	4.046		
2,500.00	2,500.00	2,498.60	2,498.60	5.48	5.47	-135.29	-30.20	-29.90	42.50	31.55	10.95	3.880		
2,600.00	2,600.00	2,598.60	2,598.60	5.70	5.70	-135.29	-30.20	-29.90	42.50	31.10	11.40	3.727		
2,700.00	2,700.00	2,698.60	2,698.60	5.93	5.92	-135.29	-30.20	-29.90	42.50	30.65	11.85	3.586		
2,800.00	2,800.00	2,798.60	2,798.60	6.15	6.15	-135.29	-30.20	-29.90	42.50	30.20	12.30	3.455		
2,900.00	2,900.00	2,898.60	2,898.60	6.38	6.37	-135.29	-30.20	-29.90	42.50	29.75	12.75	3.333		
3,000.00	3,000.00	2,998.60	2,998.60	6.60	6.60	-135.29	-30.20	-29.90	42.50	29.30	13.20	3.220		
3,100.00	3,100.00	3,098.60	3,098.60	6.83	6.82	-135.29	-30.20	-29.90	42.50	28.85	13.65	3.114		
3,200.00	3,200.00	3,198.60	3,198.60	7.05	7.05	-135.29	-30.20	-29.90	42.50	28.40	14.10	3.014		
3,300.00	3,300.00	3,298.60	3,298.60	7.28	7.27	-135.29	-30.20	-29.90	42.50	27.95	14.55	2.921		
3,400.00	3,400.00	3,398.60	3,398.60	7.50	7.50	-135.29	-30.20	-29.90	42.50	27.50	15.00	2.834		
3,500.00	3,500.00	3,498.60	3,498.60	7.73	7.72	-135.29	-30.20	-29.90	42.50	27.05	15.45	2.751		
3,600.00	3,600.00	3,598.60	3,598.60	7.95	7.95	-135.29	-30.20	-29.90	42.50	26.60	15.90	2.673		
3,700.00	3,700.00	3,698.60	3,698.60	8.17	8.17	-135.29	-30.20	-29.90	42.50	26.15	16.35	2.600		
3,800.00	3,800.00	3,798.60	3,798.60	8.40	8.40	-135.29	-30.20	-29.90	42.50	25.70	16.80	2.530		
3,900.00	3,900.00	3,898.60	3,898.60	8.62	8.62	-135.29	-30.20	-29.90	42.50	25.25	17.25	2.464		
4,000.00	4,000.00	3,998.60	3,998.60	8.85	8.85	-135.29	-30.20	-29.90	42.50	24.80	17.69	2.402		
4,100.00	4,100.00	4,098.60	4,098.60	9.07	9.07	-135.29	-30.20	-29.90	42.50	24.35	18.14	2.342		
4,200.00	4,200.00	4,198.60	4,198.60	9.30	9.30	-135.29	-30.20	-29.90	42.50	23.90	18.59	2.286		
4,300.00	4,300.00	4,298.60	4,298.60	9.52	9.52	-135.29	-30.20	-29.90	42.50	23.45	19.04	2.232		
4,400.00	4,400.00	4,398.60	4,398.60	9.75	9.74	-135.29	-30.20	-29.90	42.50	23.00	19.49	2.180 CC, ES		
4,500.00	4,500.00	4,497.22	4,497.20	9.97	9.94	-136.06	-31.71	-30.56	44.06	24.15	19.91	2.213		
4,600.00	4,600.00	4,595.58	4,595.43	10.20	10.11	-138.10	-36.31	-32.58	48.89	28.58	20.31	2.408		
4,700.00	4,700.00	4,693.49	4,692.98	10.42	10.28	-140.73	-43.96	-35.93	57.05	36.35	20.70	2.756		
4,800.00	4,800.00	4,790.72	4,789.51	10.65	10.45	-143.36	-54.56	-40.59	68.61	47.51	21.10	3.252		
4,900.00	4,900.00	4,889.18	4,886.96	10.87	10.63	-145.56	-67.42	-46.23	82.57	61.06	21.50	3.840		
5,000.00	5,000.00	4,988.15	4,984.91	11.10	10.82	-147.15	-80.41	-51.93	96.70	74.78	21.92	4.412		
5,100.00	5,099.98	5,087.34	5,083.08	11.29	11.02	15.14	-93.44	-57.64	109.21	86.89	22.31	4.894		

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



Integrity Directional Services, LLC

Anticollision Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
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Reference Site:	Sec. 35, T 24 S., R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Site Error:	5.00 ft	North Reference:	Grid
Reference Well:	Eider Federal 108H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Sec. 35, T 24 S., R 32 E - Eider Federal 207H - Wellbore #1 - Plan #1														Offset Site Error: 0.00 ft	
Survey Program: 0-MWD														Offset Well Error: 0.00 ft	
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor			
5,200.00	5,199.84	5,186.91	5,181.62	11.46	11.23	14.77	-106.51	-63.38	118.38	95.70	22.69	5.218			
5,300.00	5,299.45	5,286.74	5,280.42	11.63	11.44	14.87	-119.62	-69.12	124.20	101.12	23.07	5.383			
5,400.00	5,398.70	5,386.70	5,379.34	11.81	11.66	15.38	-132.74	-74.88	126.64	103.18	23.47	5.397			
5,421.10	5,419.59	5,407.80	5,400.22	11.85	11.71	15.54	-135.51	-76.10	126.73	103.18	23.55	5.381			
5,500.00	5,497.63	5,486.68	5,478.29	11.99	11.89	16.18	-145.87	-80.64	126.79	102.92	23.87	5.311			
5,600.00	5,596.56	5,586.67	5,577.24	12.17	12.12	16.98	-159.00	-86.40	126.89	102.60	24.29	5.224			
5,700.00	5,695.48	5,686.65	5,676.19	12.37	12.36	17.79	-172.13	-92.16	127.02	102.29	24.72	5.137			
5,800.00	5,794.40	5,786.63	5,775.14	12.57	12.60	18.60	-185.26	-97.92	127.16	102.00	25.17	5.053			
5,900.00	5,893.32	5,886.62	5,874.09	12.78	12.84	19.40	-198.39	-103.68	127.34	101.71	25.62	4.969			
6,000.00	5,992.24	5,986.60	5,973.05	12.99	13.10	20.20	-211.52	-109.44	127.54	101.45	26.09	4.888			
6,100.00	6,091.16	6,086.59	6,072.00	13.21	13.35	21.00	-224.64	-115.19	127.76	101.19	26.57	4.809			
6,200.00	6,190.09	6,186.57	6,170.95	13.44	13.61	21.80	-237.77	-120.95	128.01	100.96	27.05	4.732			
6,300.00	6,289.01	6,286.55	6,269.90	13.67	13.88	22.59	-250.90	-126.71	128.28	100.73	27.55	4.657			
6,400.00	6,387.93	6,386.54	6,368.85	13.91	14.14	23.38	-264.03	-132.47	128.58	100.53	28.05	4.584			
6,500.00	6,486.85	6,486.52	6,467.80	14.15	14.42	24.16	-277.16	-138.23	128.90	100.34	28.56	4.513			
6,600.00	6,585.77	6,586.50	6,566.75	14.39	14.69	24.94	-290.29	-143.99	129.25	100.16	29.08	4.444			
6,700.00	6,684.69	6,686.49	6,665.70	14.64	14.97	25.72	-303.41	-149.75	129.62	100.01	29.61	4.377			
6,800.00	6,783.62	6,786.47	6,764.65	14.90	15.25	26.49	-316.54	-155.51	130.01	99.86	30.14	4.313			
6,900.00	6,882.54	6,886.46	6,863.60	15.16	15.53	27.26	-329.67	-161.27	130.43	99.74	30.69	4.250			
7,000.00	6,981.46	6,986.44	6,962.55	15.42	15.81	28.02	-342.80	-167.03	130.87	99.63	31.23	4.190			
7,100.00	7,080.38	7,086.42	7,061.50	15.68	16.10	28.78	-355.93	-172.78	131.33	99.54	31.78	4.132			
7,200.00	7,179.30	7,186.41	7,160.46	15.95	16.39	29.53	-369.06	-178.54	131.82	99.47	32.34	4.076			
7,300.00	7,278.22	7,286.39	7,259.41	16.22	16.68	30.27	-382.18	-184.30	132.32	99.42	32.91	4.021			
7,400.00	7,377.15	7,386.38	7,358.36	16.50	16.98	31.01	-395.31	-190.06	132.85	99.38	33.48	3.969			
7,500.00	7,476.07	7,486.36	7,457.31	16.77	17.27	31.75	-408.44	-195.82	133.41	99.36	34.05	3.918			
7,600.00	7,574.99	7,586.34	7,556.26	17.05	17.57	32.48	-421.57	-201.58	133.98	99.35	34.63	3.869			
7,700.00	7,673.91	7,686.33	7,655.21	17.34	17.87	33.20	-434.70	-207.34	134.58	99.37	35.21	3.822			
7,800.00	7,772.83	7,786.31	7,754.16	17.62	18.17	33.91	-447.83	-213.10	135.19	99.40	35.80	3.777			
7,900.00	7,871.75	7,886.30	7,853.11	17.91	18.48	34.62	-460.96	-218.86	135.83	99.45	36.39	3.733			
8,000.00	7,970.67	7,986.28	7,952.06	18.20	18.78	35.32	-474.08	-224.61	136.49	99.51	36.98	3.691			
8,100.00	8,069.60	8,086.26	8,051.01	18.49	19.09	36.02	-487.21	-230.37	137.17	99.59	37.58	3.650			
8,200.00	8,168.52	8,186.25	8,149.96	18.78	19.39	36.71	-500.34	-236.13	137.87	99.69	38.18	3.611			
8,300.00	8,267.44	8,286.23	8,248.91	19.08	19.70	37.39	-513.47	-241.89	138.59	99.80	38.78	3.573			
8,400.00	8,366.36	8,386.22	8,347.87	19.38	20.01	38.06	-526.60	-247.65	139.32	99.93	39.39	3.537			
8,500.00	8,465.28	8,486.20	8,446.82	19.68	20.32	38.73	-539.73	-253.41	140.08	100.08	40.00	3.502			
8,600.00	8,564.20	8,586.18	8,545.77	19.98	20.64	39.39	-552.85	-259.17	140.85	100.24	40.61	3.468			
8,700.00	8,663.13	8,686.17	8,644.72	20.28	20.95	40.04	-565.98	-264.93	141.65	100.42	41.23	3.436			
8,774.32	8,736.64	8,760.47	8,718.25	20.51	21.18	40.52	-575.74	-269.21	142.25	100.56	41.69	3.412			
8,800.00	8,762.14	8,786.14	8,743.66	20.58	21.26	39.57	-579.11	-270.69	142.97	101.13	41.84	3.417			
8,825.00	8,787.08	8,811.06	8,768.32	20.63	21.34	35.89	-582.38	-272.12	144.66	102.68	41.98	3.446			
8,850.00	8,812.07	8,835.85	8,792.86	20.68	21.42	-117.71	-585.64	-273.55	147.32	105.22	42.10	3.499			
8,875.00	8,837.05	8,860.44	8,817.19	20.72	21.50	-135.24	-588.87	-274.96	151.00	108.78	42.22	3.576			
8,900.00	8,861.95	8,884.77	8,841.26	20.76	21.57	-137.88	-592.06	-276.37	155.71	113.38	42.33	3.678			
8,925.00	8,886.69	8,908.75	8,865.00	20.78	21.65	-139.57	-595.21	-277.75	161.48	119.05	42.43	3.806			
8,950.00	8,911.21	8,932.34	8,888.35	20.79	21.72	-141.02	-598.31	-279.11	168.36	125.84	42.52	3.960			
8,975.00	8,935.45	8,961.25	8,917.02	20.80	21.80	-142.67	-601.49	-280.78	176.06	133.46	42.61	4.132			
9,000.00	8,959.33	8,992.26	8,947.94	20.80	21.88	-144.05	-602.99	-282.59	183.93	141.25	42.68	4.310			
9,025.00	8,982.80	9,024.09	8,979.71	20.79	21.93	-145.10	-602.43	-284.46	191.87	149.15	42.73	4.491			
9,050.00	9,005.78	9,056.75	9,012.18	20.78	21.98	-145.85	-599.66	-286.39	199.83	157.07	42.76	4.673			
9,075.00	9,028.22	9,090.24	9,045.21	20.76	22.01	-146.31	-594.51	-288.36	207.72	164.96	42.77	4.857			
9,100.00	9,050.04	9,124.56	9,078.59	20.73	22.03	-146.52	-586.85	-290.37	215.52	172.76	42.76	5.040			
9,125.00	9,071.21	9,159.68	9,112.10	20.70	22.03	-146.48	-576.54	-292.40	223.15	180.42	42.73	5.223			

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



Integrity Directional Services, LLC

Anticollision Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Reference Site:	Sec. 35, T 24 S., R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Site Error:	5.00 ft	North Reference:	Grid
Reference Well:	Eider Federal 108H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Sec. 35, T 24 S., R 32 E - Eider Federal 207H - Wellbore #1 - Plan #1													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (ft)	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Between Centres (ft)	Between Ellipses (ft)						
9,150.00	9,091.64	9,195.57	9,145.46	20.67	22.01	-146.21	-563.49	-294.43	230.59	187.91	42.68	5.403		
9,175.00	9,111.29	9,232.20	9,178.40	20.63	21.98	-145.71	-547.61	-296.45	237.79	195.18	42.61	5.581		
9,200.00	9,130.11	9,269.50	9,210.60	20.59	21.93	-145.01	-528.90	-298.44	244.72	202.20	42.52	5.755		
9,225.00	9,148.04	9,307.41	9,241.72	20.54	21.87	-144.10	-507.36	-300.39	251.36	208.94	42.42	5.926		
9,250.00	9,165.04	9,345.83	9,271.42	20.50	21.80	-143.00	-483.08	-302.27	257.68	215.38	42.30	6.091		
9,275.00	9,181.05	9,384.68	9,299.37	20.46	21.72	-141.73	-456.17	-304.05	263.69	221.51	42.18	6.251		
9,300.00	9,196.04	9,423.85	9,325.25	20.42	21.63	-140.29	-426.83	-305.73	269.36	227.30	42.05	6.405		
9,325.00	9,209.96	9,463.22	9,348.75	20.38	21.54	-138.70	-395.29	-307.28	274.69	232.77	41.92	6.553		
9,350.00	9,222.77	9,502.68	9,369.63	20.34	21.45	-136.96	-361.85	-308.68	279.70	237.91	41.79	6.693		
9,375.00	9,234.44	9,542.10	9,387.66	20.31	21.35	-135.10	-326.83	-309.92	284.40	242.73	41.66	6.826		
9,400.00	9,244.94	9,581.38	9,402.69	20.28	21.26	-133.12	-290.57	-311.00	288.79	247.25	41.55	6.951		
9,425.00	9,254.24	9,620.39	9,414.63	20.26	21.18	-131.04	-253.45	-311.89	292.91	251.47	41.44	7.069		
9,450.00	9,262.31	9,659.03	9,423.43	20.24	21.10	-128.87	-215.84	-312.61	296.78	255.43	41.34	7.178		
9,475.00	9,269.13	9,697.22	9,429.13	20.23	21.04	-126.63	-178.10	-313.14	300.42	259.15	41.27	7.280		
9,500.00	9,274.69	9,734.87	9,431.77	20.23	20.98	-124.33	-140.56	-313.49	303.86	262.65	41.21	7.374		
9,525.00	9,278.96	9,764.21	9,431.98	20.23	20.95	-122.43	-111.22	-313.66	307.32	266.13	41.18	7.462		
9,550.00	9,281.93	9,788.15	9,431.96	20.24	20.94	-120.94	-87.28	-313.78	311.51	270.33	41.18	7.565		
9,575.00	9,283.60	9,812.21	9,431.93	20.26	20.93	-119.57	-63.22	-313.90	316.46	275.27	41.20	7.682		
9,592.47	9,284.00	9,829.05	9,431.91	20.28	20.94	-118.69	-46.37	-313.99	320.34	279.11	41.23	7.770		
9,600.00	9,284.03	9,836.32	9,431.90	20.28	20.95	-118.48	-39.11	-314.03	322.06	280.82	41.24	7.810		
9,700.00	9,284.45	9,933.74	9,431.80	20.29	21.15	-116.24	58.31	-314.53	341.91	300.46	41.44	8.250		
9,800.00	9,284.87	10,032.49	9,431.69	20.44	21.58	-114.80	157.06	-315.03	355.82	313.80	42.02	8.468		
9,900.00	9,285.30	10,132.09	9,431.57	20.74	22.17	-114.01	256.66	-315.55	363.53	320.63	42.90	8.473		
9,975.71	9,285.62	10,207.76	9,431.49	21.05	22.69	-113.78	332.33	-315.94	365.15	321.41	43.74	8.347		
10,000.00	9,285.72	10,232.05	9,431.46	21.19	22.88	-113.77	356.62	-316.06	365.09	321.02	44.07	8.284		
10,100.00	9,286.15	10,332.05	9,431.35	21.87	23.72	-113.69	456.62	-316.57	364.82	319.23	45.59	8.003		
10,200.00	9,286.57	10,432.05	9,431.24	22.68	24.65	-113.62	556.61	-317.09	364.54	317.21	47.33	7.702		
10,300.00	9,286.99	10,532.05	9,431.13	23.61	25.68	-113.55	656.61	-317.60	364.27	314.99	49.29	7.391		
10,400.00	9,287.41	10,632.05	9,431.02	24.64	26.79	-113.47	756.61	-318.12	364.00	312.58	51.42	7.079		
10,500.00	9,287.84	10,732.04	9,430.90	25.75	27.97	-113.40	856.61	-318.63	363.74	310.01	53.72	6.771		
10,600.00	9,288.26	10,832.04	9,430.79	26.95	29.22	-113.33	956.60	-319.14	363.47	307.30	56.16	6.472		
10,700.00	9,288.68	10,932.04	9,430.68	28.21	30.52	-113.25	1,056.60	-319.66	363.20	304.47	58.73	6.184		
10,800.00	9,289.11	11,032.04	9,430.57	29.53	31.87	-113.18	1,156.60	-320.17	362.93	301.53	61.41	5.910		
10,900.00	9,289.53	11,132.04	9,430.46	30.91	33.27	-113.11	1,256.59	-320.68	362.66	298.49	64.18	5.651		
11,000.00	9,289.95	11,232.04	9,430.35	32.32	34.71	-113.03	1,356.59	-321.20	362.40	295.37	67.03	5.406		
11,100.00	9,290.38	11,332.04	9,430.23	33.78	36.18	-112.96	1,456.59	-321.71	362.13	292.17	69.96	5.176		
11,200.00	9,290.80	11,432.03	9,430.12	35.27	37.68	-112.88	1,556.59	-322.23	361.87	288.91	72.95	4.960		
11,300.00	9,291.22	11,532.03	9,430.01	36.79	39.21	-112.81	1,656.58	-322.74	361.60	285.60	76.00	4.758		
11,400.00	9,291.65	11,632.03	9,429.90	38.34	40.76	-112.74	1,756.58	-323.25	361.34	282.23	79.11	4.568		
11,500.00	9,292.07	11,732.03	9,429.79	39.91	42.34	-112.66	1,856.58	-323.77	361.08	278.83	82.25	4.390		
11,600.00	9,292.49	11,832.03	9,429.68	41.51	43.93	-112.59	1,956.57	-324.28	360.81	275.38	85.44	4.223		
11,700.00	9,292.91	11,932.03	9,429.56	43.12	45.54	-112.51	2,056.57	-324.80	360.55	271.89	88.66	4.067		
11,800.00	9,293.34	12,032.03	9,429.45	44.75	47.17	-112.44	2,156.57	-325.31	360.29	268.38	91.91	3.920		
11,900.00	9,293.76	12,132.02	9,429.34	46.39	48.81	-112.36	2,256.57	-325.82	360.03	264.83	95.20	3.782		
12,000.00	9,294.18	12,232.02	9,429.23	48.04	50.46	-112.29	2,356.56	-326.34	359.77	261.27	98.50	3.652		
12,100.00	9,294.61	12,332.02	9,429.12	49.71	52.13	-112.21	2,456.56	-326.85	359.51	257.68	101.84	3.530		
12,200.00	9,295.03	12,432.02	9,429.01	51.39	53.80	-112.14	2,556.56	-327.36	359.25	254.06	105.19	3.415		
12,300.00	9,295.45	12,532.02	9,428.89	53.08	55.48	-112.06	2,656.55	-327.88	358.99	250.43	108.56	3.307		
12,400.00	9,295.88	12,632.02	9,428.78	54.77	57.18	-111.99	2,756.55	-328.39	358.74	246.79	111.95	3.204		
12,500.00	9,296.30	12,732.02	9,428.67	56.48	58.88	-111.91	2,856.55	-328.91	358.48	243.13	115.35	3.108		
12,600.00	9,296.72	12,832.01	9,428.56	58.19	60.59	-111.83	2,956.55	-329.42	358.22	239.45	118.77	3.016		
12,700.00	9,297.14	12,932.01	9,428.45	59.91	62.30	-111.76	3,056.54	-329.93	357.97	235.76	122.21	2.929		

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



Integrity Directional Services, LLC
Anticollision Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Reference Site:	Sec. 35, T 24 S., R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Site Error:	5.00 ft	North Reference:	Grid
Reference Well:	Eider Federal 108H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Sec. 35, T 24 S., R 32 E - Eider Federal 207H - Wellbore #1 - Plan #1														Offset Site Error:	0.00 ft
Survey Program: 0-MWD														Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance								
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
12,800.00	9,297.57	13,032.01	9,428.34	61.63	64.02	-111.68	3,156.54	-330.45	357.71	232.06	125.65	2.847			
12,900.00	9,297.99	13,132.01	9,428.22	63.36	65.75	-111.61	3,256.54	-330.96	357.46	228.35	129.11	2.769			
13,000.00	9,298.41	13,232.01	9,428.11	65.10	67.48	-111.53	3,356.54	-331.48	357.20	224.63	132.57	2.694			
13,100.00	9,298.84	13,332.01	9,428.00	66.84	69.21	-111.45	3,456.53	-331.99	356.95	220.90	136.05	2.624			
13,200.00	9,299.26	13,432.01	9,427.89	68.58	70.95	-111.38	3,556.53	-332.50	356.70	217.16	139.54	2.556			
13,300.00	9,299.68	13,532.00	9,427.78	70.33	72.70	-111.30	3,656.53	-333.02	356.45	213.42	143.03	2.492			
13,400.00	9,300.11	13,632.00	9,427.67	72.08	74.45	-111.23	3,756.52	-333.53	356.20	209.67	146.53	2.431			
13,500.00	9,300.53	13,732.00	9,427.55	73.84	76.20	-111.15	3,856.52	-334.04	355.95	205.91	150.04	2.372			
13,600.00	9,300.95	13,832.00	9,427.44	75.60	77.95	-111.07	3,956.52	-334.56	355.70	202.14	153.55	2.316			
13,700.00	9,301.38	13,932.00	9,427.33	77.36	79.71	-111.00	4,056.52	-335.07	355.45	198.37	157.07	2.263			
13,800.00	9,301.80	14,032.00	9,427.22	79.13	81.47	-110.92	4,156.51	-335.59	355.20	194.60	160.60	2.212			
13,900.00	9,302.22	14,132.00	9,427.11	80.89	83.24	-110.84	4,256.51	-336.10	354.95	190.82	164.13	2.163			
14,000.00	9,302.64	14,231.99	9,427.00	82.66	85.00	-110.76	4,356.51	-336.61	354.70	187.03	167.67	2.116			
14,100.00	9,303.07	14,331.99	9,426.88	84.44	86.77	-110.69	4,456.50	-337.13	354.45	183.25	171.21	2.070			
14,200.00	9,303.49	14,431.99	9,426.77	86.21	88.54	-110.61	4,556.50	-337.64	354.21	179.45	174.76	2.027			
14,300.00	9,303.91	14,531.99	9,426.66	87.99	90.32	-110.53	4,656.50	-338.15	353.96	175.66	178.31	1.985			
14,400.00	9,304.34	14,631.99	9,426.55	89.77	92.09	-110.45	4,756.50	-338.67	353.72	171.86	181.86	1.945			
14,500.00	9,304.76	14,731.99	9,426.44	91.55	93.87	-110.38	4,856.49	-339.18	353.47	168.06	185.42	1.906			
14,600.00	9,305.18	14,831.99	9,426.33	93.33	95.65	-110.30	4,956.49	-339.70	353.23	164.25	188.98	1.869			
14,700.00	9,305.61	14,931.98	9,426.21	95.11	97.43	-110.22	5,056.49	-340.21	352.99	160.44	192.54	1.833			
14,800.00	9,306.03	15,031.98	9,426.10	96.90	99.21	-110.14	5,156.48	-340.72	352.75	156.63	196.11	1.799			
14,900.00	9,306.45	15,131.98	9,425.99	98.69	101.00	-110.06	5,256.48	-341.24	352.50	152.82	199.68	1.765			
15,000.00	9,306.87	15,231.98	9,425.88	100.47	102.78	-109.99	5,356.48	-341.75	352.26	149.01	203.26	1.733			
15,100.00	9,307.30	15,331.98	9,425.77	102.26	104.57	-109.91	5,456.48	-342.27	352.02	145.19	206.83	1.702			
15,200.00	9,307.72	15,431.98	9,425.66	104.06	106.36	-109.83	5,556.47	-342.78	351.78	141.37	210.41	1.672			
15,300.00	9,308.14	15,531.98	9,425.54	105.85	108.14	-109.75	5,656.47	-343.29	351.54	137.55	213.99	1.643			
15,400.00	9,308.57	15,631.97	9,425.43	107.64	109.93	-109.67	5,756.47	-343.81	351.31	133.73	217.58	1.615			
15,500.00	9,308.99	15,731.97	9,425.32	109.43	111.73	-109.59	5,856.46	-344.32	351.07	129.91	221.16	1.587			
15,600.00	9,309.41	15,831.97	9,425.21	111.23	113.52	-109.51	5,956.46	-344.83	350.83	126.08	224.75	1.561			
15,700.00	9,309.84	15,931.97	9,425.10	113.03	115.31	-109.44	6,056.46	-345.35	350.60	122.26	228.34	1.535			
15,800.00	9,310.26	16,031.97	9,424.99	114.82	117.11	-109.36	6,156.46	-345.86	350.36	118.43	231.93	1.511			
15,900.00	9,310.68	16,131.97	9,424.87	116.62	118.90	-109.28	6,256.45	-346.38	350.12	114.60	235.52	1.487 Level 3			
16,000.00	9,311.11	16,231.97	9,424.76	118.42	120.70	-109.20	6,356.45	-346.89	349.89	110.77	239.12	1.463 Level 3			
16,100.00	9,311.53	16,331.96	9,424.65	120.22	122.50	-109.12	6,456.45	-347.40	349.66	106.94	242.71	1.441 Level 3			
16,200.00	9,311.95	16,431.96	9,424.54	122.02	124.29	-109.04	6,556.44	-347.92	349.42	103.11	246.31	1.419 Level 3			
16,300.00	9,312.37	16,531.96	9,424.43	123.82	126.09	-108.96	6,656.44	-348.43	349.19	99.28	249.91	1.397 Level 3			
16,400.00	9,312.80	16,631.96	9,424.32	125.62	127.89	-108.88	6,756.44	-348.95	348.96	95.45	253.51	1.376 Level 3			
16,500.00	9,313.22	16,731.96	9,424.20	127.42	129.69	-108.80	6,856.44	-349.46	348.73	91.61	257.12	1.356 Level 3			
16,600.00	9,313.64	16,831.96	9,424.09	129.23	131.49	-108.72	6,956.43	-349.97	348.50	87.78	260.72	1.337 Level 3			
16,677.70	9,313.97	16,909.66	9,424.01	130.63	132.89	-108.66	7,034.14	-350.37	348.32	84.80	263.52	1.322 Level 3			
16,684.31	9,314.00	16,915.14	9,424.00	130.75	132.99	-108.65	7,039.61	-350.40	348.31	84.57	263.74	1.321 Level 3, SF			

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



Integrity Directional Services, LLC

Anticollision Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Reference Site:	Sec. 35, T 24 S. , R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Site Error:	5.00 ft	North Reference:	Grid
Reference Well:	Eider Federal 108H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Sec. 35, T 24 S. , R 32 E - Eider Federal 307H - Wellbore #1 - Plan #1		Offset Site Error:		0.00 ft	
Survey Program: 0-MWD													Offset Well Error:		0.00 ft			
Reference		Offset		Semi Major Axis			Distance											
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre	Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning						
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)							
0.00	0.00	0.20	0.20	0.00	0.00	89.43	0.30	30.00	30.00									
100.00	100.00	100.20	100.20	0.08	0.08	89.43	0.30	30.00	30.00	29.83	0.17	179.891						
200.00	200.00	200.20	200.20	0.31	0.31	89.43	0.30	30.00	30.00	29.39	0.62	48.679						
300.00	300.00	300.20	300.20	0.53	0.53	89.43	0.30	30.00	30.00	28.94	1.07	28.148						
400.00	400.00	400.20	400.20	0.76	0.76	89.43	0.30	30.00	30.00	28.49	1.52	19.798						
500.00	500.00	500.20	500.20	0.98	0.98	89.43	0.30	30.00	30.00	28.04	1.96	15.269						
600.00	600.00	600.20	600.20	1.21	1.21	89.43	0.30	30.00	30.00	27.59	2.41	12.426						
700.00	700.00	700.20	700.20	1.43	1.43	89.43	0.30	30.00	30.00	27.14	2.86	10.476						
800.00	800.00	800.20	800.20	1.66	1.66	89.43	0.30	30.00	30.00	26.69	3.31	9.054						
900.00	900.00	900.20	900.20	1.88	1.88	89.43	0.30	30.00	30.00	26.24	3.76	7.973						
1,000.00	1,000.00	1,000.20	1,000.20	2.11	2.11	89.43	0.30	30.00	30.00	25.79	4.21	7.122						
1,100.00	1,100.00	1,100.20	1,100.20	2.33	2.33	89.43	0.30	30.00	30.00	25.34	4.66	6.435						
1,200.00	1,200.00	1,200.20	1,200.20	2.56	2.56	89.43	0.30	30.00	30.00	24.89	5.11	5.869						
1,300.00	1,300.00	1,300.20	1,300.20	2.78	2.78	89.43	0.30	30.00	30.00	24.44	5.56	5.395						
1,400.00	1,400.00	1,400.20	1,400.20	3.01	3.01	89.43	0.30	30.00	30.00	23.99	6.01	4.991						
1,500.00	1,500.00	1,500.20	1,500.20	3.23	3.23	89.43	0.30	30.00	30.00	23.54	6.46	4.644						
1,600.00	1,600.00	1,600.20	1,600.20	3.45	3.46	89.43	0.30	30.00	30.00	23.09	6.91	4.342						
1,700.00	1,700.00	1,700.20	1,700.20	3.68	3.68	89.43	0.30	30.00	30.00	22.64	7.36	4.077						
1,800.00	1,800.00	1,800.20	1,800.20	3.90	3.90	89.43	0.30	30.00	30.00	22.19	7.81	3.842						
1,900.00	1,900.00	1,900.20	1,900.20	4.13	4.13	89.43	0.30	30.00	30.00	21.74	8.26	3.633						
2,000.00	2,000.00	2,000.20	2,000.20	4.35	4.35	89.43	0.30	30.00	30.00	21.29	8.71	3.445						
2,100.00	2,100.00	2,100.20	2,100.20	4.58	4.58	89.43	0.30	30.00	30.00	20.84	9.16	3.276						
2,200.00	2,200.00	2,200.20	2,200.20	4.80	4.80	89.43	0.30	30.00	30.00	20.39	9.61	3.123						
2,300.00	2,300.00	2,300.20	2,300.20	5.03	5.03	89.43	0.30	30.00	30.00	19.95	10.06	2.983						
2,400.00	2,400.00	2,400.20	2,400.20	5.25	5.25	89.43	0.30	30.00	30.00	19.50	10.51	2.856						
2,500.00	2,500.00	2,500.20	2,500.20	5.48	5.48	89.43	0.30	30.00	30.00	19.05	10.96	2.738						
2,600.00	2,600.00	2,600.20	2,600.20	5.70	5.70	89.43	0.30	30.00	30.00	18.60	11.41	2.631						
2,700.00	2,700.00	2,700.20	2,700.20	5.93	5.93	89.43	0.30	30.00	30.00	18.15	11.85	2.531						
2,800.00	2,800.00	2,800.20	2,800.20	6.15	6.15	89.43	0.30	30.00	30.00	17.70	12.30	2.438						
2,900.00	2,900.00	2,900.20	2,900.20	6.38	6.38	89.43	0.30	30.00	30.00	17.25	12.75	2.352						
3,000.00	3,000.00	3,000.20	3,000.20	6.60	6.60	89.43	0.30	30.00	30.00	16.80	13.20	2.272						
3,100.00	3,100.00	3,100.20	3,100.20	6.83	6.83	89.43	0.30	30.00	30.00	16.35	13.65	2.197						
3,200.00	3,200.00	3,200.20	3,200.20	7.05	7.05	89.43	0.30	30.00	30.00	15.90	14.10	2.127						
3,300.00	3,300.00	3,300.20	3,300.20	7.28	7.28	89.43	0.30	30.00	30.00	15.45	14.55	2.062						
3,400.00	3,400.00	3,400.20	3,400.20	7.50	7.50	89.43	0.30	30.00	30.00	15.00	15.00	2.000						
3,500.00	3,500.00	3,500.20	3,500.20	7.73	7.73	89.43	0.30	30.00	30.00	14.55	15.45	1.942						
3,600.00	3,600.00	3,600.20	3,600.20	7.95	7.95	89.43	0.30	30.00	30.00	14.10	15.90	1.887						
3,700.00	3,700.00	3,700.20	3,700.20	8.17	8.18	89.43	0.30	30.00	30.00	13.65	16.35	1.835						
3,800.00	3,800.00	3,800.20	3,800.20	8.40	8.40	89.43	0.30	30.00	30.00	13.20	16.80	1.786						
3,900.00	3,900.00	3,900.20	3,900.20	8.62	8.62	89.43	0.30	30.00	30.00	12.75	17.25	1.739						
4,000.00	4,000.00	4,000.20	4,000.20	8.85	8.85	89.43	0.30	30.00	30.00	12.30	17.70	1.695						
4,100.00	4,100.00	4,100.20	4,100.20	9.07	9.07	89.43	0.30	30.00	30.00	11.85	18.15	1.653						
4,200.00	4,200.00	4,200.20	4,200.20	9.30	9.30	89.43	0.30	30.00	30.00	11.40	18.60	1.613						
4,300.00	4,300.00	4,300.20	4,300.20	9.52	9.52	89.43	0.30	30.00	30.00	10.95	19.05	1.575						
4,400.00	4,400.00	4,400.20	4,400.20	9.75	9.75	89.43	0.30	30.00	30.00	10.50	19.50	1.539						
4,466.60	4,466.60	4,466.80	4,466.80	9.90	9.90	89.43	0.30	30.00	30.00	10.21	19.80	1.516 CC						
4,500.00	4,500.00	4,500.00	4,500.00	9.97	9.97	89.43	0.30	30.00	30.00	10.06	19.95	1.504 ES						
4,600.00	4,600.00	4,599.50	4,599.48	10.20	10.17	91.88	-1.02	31.11	31.14	10.77	20.37	1.529						
4,700.00	4,700.00	4,698.56	4,698.40	10.42	10.35	98.21	-4.97	34.42	34.82	14.06	20.77	1.677						
4,800.00	4,800.00	4,798.30	4,797.90	10.65	10.52	104.83	-10.30	38.89	40.30	19.13	21.17	1.903						
4,900.00	4,900.00	4,898.06	4,897.41	10.87	10.71	109.82	-15.63	43.37	46.18	24.60	21.58	2.140						
5,000.00	5,000.00	4,997.55	4,996.58	11.10	10.89	115.45	-22.54	47.35	52.57	30.58	21.98	2.391						

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



Integrity Directional Services, LLC
Anticollision Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Reference Site:	Sec. 35, T 24 S. , R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Site Error:	5.00 ft	North Reference:	Grid
Reference Well:	Eider Federal 108H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Sec. 35, T 24 S. , R 32 E - Eider Federal 307H - Wellbore #1 - Plan #1		Offset Site Error: 0.00 ft	
Survey Program: 0-MWD													Offset Well Error: 0.00 ft			
Reference		Offset		Semi Major Axis			Distance						Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor				
5,100.00	5,099.98	5,096.83	5,095.29	11.29	11.06	-75.21	-32.64	50.37	59.75	37.40	22.36	2.673				
5,200.00	5,199.84	5,196.54	5,194.34	11.46	11.25	-72.43	-43.81	53.08	66.68	43.97	22.71	2.936				
5,300.00	5,299.45	5,296.36	5,293.49	11.63	11.44	-72.77	-54.99	55.81	72.62	49.54	23.07	3.147				
5,400.00	5,398.70	5,396.16	5,392.62	11.81	11.64	-75.53	-66.17	58.53	77.62	54.18	23.44	3.311				
5,421.10	5,419.59	5,417.20	5,413.53	11.85	11.68	-76.38	-68.53	59.10	78.59	55.07	23.52	3.341				
5,500.00	5,497.63	5,495.88	5,491.68	11.99	11.84	-79.64	-77.35	61.25	82.33	58.50	23.82	3.456				
5,600.00	5,596.56	5,595.60	5,590.73	12.17	12.04	-83.36	-88.52	63.97	87.41	63.19	24.22	3.609				
5,700.00	5,695.48	5,695.32	5,689.79	12.37	12.25	-86.66	-99.69	66.68	92.82	68.20	24.62	3.770				
5,800.00	5,794.40	5,795.03	5,788.84	12.57	12.47	-89.59	-110.86	69.40	98.50	73.46	25.04	3.934				
5,900.00	5,893.32	5,894.75	5,887.90	12.78	12.69	-92.20	-122.03	72.12	104.41	78.95	25.46	4.100				
6,000.00	5,992.24	5,994.47	5,986.95	12.99	12.91	-94.52	-133.20	74.84	110.52	84.61	25.90	4.267				
6,100.00	6,091.16	6,094.19	6,086.00	13.21	13.13	-96.60	-144.38	77.56	116.78	90.43	26.35	4.432				
6,200.00	6,190.09	6,193.91	6,185.06	13.44	13.36	-98.46	-155.55	80.28	123.19	96.38	26.80	4.596				
6,300.00	6,289.01	6,293.63	6,284.11	13.67	13.59	-100.14	-166.72	83.00	129.71	102.44	27.27	4.757				
6,400.00	6,387.93	6,393.35	6,383.16	13.91	13.83	-101.65	-177.89	85.72	136.33	108.59	27.74	4.915				
6,500.00	6,486.85	6,493.07	6,482.22	14.15	14.07	-103.03	-189.06	88.44	143.03	114.82	28.22	5.069				
6,600.00	6,585.77	6,592.78	6,581.27	14.39	14.31	-104.28	-200.23	91.16	149.81	121.11	28.70	5.219				
6,700.00	6,684.69	6,692.50	6,680.32	14.64	14.55	-105.42	-211.40	93.88	156.66	127.46	29.20	5.366				
6,800.00	6,783.62	6,792.22	6,779.38	14.90	14.80	-106.47	-222.58	96.59	163.56	133.87	29.70	5.508				
6,900.00	6,882.54	6,891.94	6,878.43	15.16	15.05	-107.43	-233.75	99.31	170.52	140.32	30.20	5.646				
7,000.00	6,981.46	6,991.66	6,977.49	15.42	15.30	-108.32	-244.92	102.03	177.51	146.80	30.71	5.780				
7,100.00	7,080.38	7,091.38	7,076.54	15.68	15.55	-109.13	-256.09	104.75	184.55	153.32	31.23	5.909				
7,200.00	7,179.30	7,191.10	7,175.59	15.95	15.80	-109.89	-267.26	107.47	191.62	159.87	31.75	6.035				
7,300.00	7,278.22	7,290.82	7,274.65	16.22	16.06	-110.60	-278.43	110.19	198.72	166.44	32.28	6.156				
7,400.00	7,377.15	7,390.53	7,373.70	16.50	16.32	-111.25	-289.61	112.91	205.85	173.04	32.81	6.273				
7,500.00	7,476.07	7,490.25	7,472.75	16.77	16.58	-111.87	-300.78	115.63	213.01	179.66	33.35	6.387				
7,600.00	7,574.99	7,589.97	7,571.81	17.05	16.84	-112.44	-311.95	118.35	220.19	186.29	33.89	6.496				
7,700.00	7,673.91	7,689.69	7,670.86	17.34	17.10	-112.97	-323.12	121.07	227.39	192.95	34.44	6.602				
7,800.00	7,772.83	7,789.41	7,769.92	17.62	17.37	-113.48	-334.29	123.78	234.60	199.61	34.99	6.705				
7,900.00	7,871.75	7,889.13	7,868.97	17.91	17.63	-113.95	-345.46	126.50	241.84	206.29	35.54	6.804				
8,000.00	7,970.67	7,988.85	7,968.02	18.20	17.90	-114.39	-356.63	129.22	249.09	212.99	36.10	6.900				
8,100.00	8,069.60	8,088.57	8,067.08	18.49	18.17	-114.81	-367.81	131.94	256.35	219.69	36.66	6.992				
8,200.00	8,168.52	8,188.28	8,166.13	18.78	18.44	-115.21	-378.98	134.66	263.63	226.40	37.22	7.082				
8,300.00	8,267.44	8,288.00	8,265.18	19.08	18.71	-115.59	-390.15	137.38	270.91	233.12	37.79	7.169				
8,400.00	8,366.36	8,387.72	8,364.24	19.38	18.98	-115.94	-401.32	140.10	278.21	239.85	38.36	7.252				
8,500.00	8,465.28	8,487.44	8,463.29	19.68	19.26	-116.28	-412.49	142.82	285.52	246.59	38.93	7.333				
8,600.00	8,564.20	8,587.16	8,562.34	19.98	19.53	-116.60	-423.66	145.54	292.84	253.33	39.51	7.412				
8,700.00	8,663.13	8,686.88	8,661.40	20.28	19.81	-116.91	-434.83	148.26	300.17	260.08	40.09	7.488				
8,774.32	8,736.64	8,760.98	8,735.01	20.51	20.01	-117.12	-443.14	150.28	305.62	265.10	40.52	7.542				
8,800.00	8,762.14	8,786.62	8,760.47	20.58	20.09	-118.24	-446.01	150.98	307.21	266.54	40.66	7.555				
8,825.00	8,787.08	8,811.55	8,785.24	20.63	20.15	-121.52	-448.80	151.66	308.18	267.40	40.79	7.556				
8,850.00	8,812.07	8,836.41	8,809.94	20.68	20.22	85.80	-451.59	152.33	308.62	267.71	40.91	7.544				
8,875.00	8,837.05	8,861.12	8,834.48	20.72	20.29	69.68	-454.36	153.01	308.53	267.51	41.02	7.522				
8,900.00	8,861.95	8,885.62	8,858.81	20.76	20.36	68.88	-457.10	153.67	307.97	266.85	41.12	7.490				
8,925.00	8,886.69	8,909.83	8,882.87	20.78	20.43	69.43	-459.81	154.33	306.99	265.78	41.21	7.450				
8,950.00	8,911.21	8,933.70	8,906.57	20.79	20.49	70.54	-462.49	154.99	305.67	264.38	41.29	7.403				
8,975.00	8,935.45	8,957.15	8,929.87	20.80	20.56	72.01	-465.11	155.62	304.10	262.74	41.36	7.352				
9,000.00	8,959.33	8,980.12	8,952.68	20.80	20.62	73.75	-467.69	156.25	302.38	260.95	41.43	7.299				
9,025.00	8,982.80	9,002.55	8,974.97	20.79	20.69	75.72	-470.20	156.86	300.62	259.14	41.48	7.247				
9,050.00	9,005.78	9,024.38	8,996.65	20.78	20.75	77.85	-472.65	157.46	298.97	257.44	41.53	7.199				
9,075.00	9,028.22	9,045.54	9,017.67	20.76	20.81	80.11	-475.02	158.04	297.57	256.00	41.57	7.159				
9,100.00	9,050.04	9,065.99	9,037.98	20.73	20.87	82.45	-477.31	158.59	296.57	254.97	41.60	7.130				

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



Integrity Directional Services, LLC

Anticollision Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Reference Site:	Sec. 35, T 24 S., R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Site Error:	5.00 ft	North Reference:	Grid
Reference Well:	Eider Federal 108H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Sec. 35, T 24 S., R 32 E - Eider Federal 307H - Wellbore #1 - Plan #1													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference														
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning	
				Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
9,125.00	9,071.21	9,085.66	9,057.52	20.70	20.92	84.81	-479.51	159.13	296.13	254.51	41.62	7.115		
9,128.30	9,073.95	9,088.20	9,060.04	20.70	20.93	85.12	-479.79	159.20	296.13	254.50	41.62	7.114		
9,150.00	9,091.64	9,104.50	9,076.23	20.67	20.97	87.14	-481.62	159.64	296.43	254.79	41.64	7.119		
9,175.00	9,111.29	9,122.45	9,094.07	20.63	21.02	89.38	-483.63	160.13	297.61	255.96	41.65	7.145		
9,200.00	9,130.11	9,139.47	9,110.98	20.59	21.07	91.48	-485.54	160.60	299.83	258.17	41.66	7.197		
9,225.00	9,148.04	9,155.52	9,126.92	20.54	21.12	93.39	-487.34	161.03	303.22	261.55	41.66	7.278		
9,250.00	9,165.04	9,171.53	9,142.81	20.50	21.16	95.23	-489.12	161.47	307.88	266.22	41.66	7.390		
9,275.00	9,181.05	9,197.44	9,168.64	20.46	21.22	98.45	-491.22	161.99	313.59	271.91	41.68	7.523		
9,300.00	9,196.04	9,225.16	9,196.34	20.42	21.28	101.79	-491.95	162.20	320.11	278.42	41.70	7.677		
9,325.00	9,209.96	9,255.07	9,226.23	20.38	21.33	105.29	-490.98	162.02	327.38	285.68	41.71	7.850		
9,350.00	9,222.77	9,287.69	9,258.68	20.34	21.37	109.00	-487.85	161.34	335.32	293.61	41.71	8.039		
9,375.00	9,234.44	9,323.68	9,294.15	20.31	21.40	112.99	-481.89	160.01	343.82	302.11	41.71	8.243		
9,400.00	9,244.94	9,363.96	9,333.16	20.28	21.41	117.34	-472.17	157.82	352.73	311.03	41.69	8.460		
9,425.00	9,254.24	9,409.70	9,376.26	20.26	21.41	122.15	-457.29	154.45	361.87	320.20	41.67	8.685		
9,450.00	9,262.31	9,462.47	9,423.90	20.24	21.38	127.52	-435.22	149.42	370.98	329.36	41.62	8.913		
9,475.00	9,269.13	9,524.27	9,476.12	20.23	21.32	133.53	-403.06	142.07	379.74	338.19	41.55	9.139		
9,500.00	9,274.69	9,597.44	9,531.80	20.23	21.23	140.23	-356.91	131.49	387.68	346.23	41.45	9.352		
9,525.00	9,278.96	9,684.17	9,587.50	20.23	21.12	147.58	-292.27	116.65	394.19	352.84	41.35	9.533		
9,550.00	9,281.93	9,785.33	9,636.07	20.24	21.05	155.41	-205.99	96.80	398.50	357.21	41.29	9.652		
9,575.00	9,283.60	9,898.58	9,667.00	20.26	21.09	163.47	-100.10	72.40	399.82	358.47	41.35	9.669		
9,592.47	9,284.00	9,977.19	9,673.00	20.28	21.22	168.80	-23.82	54.80	398.63	357.14	41.49	9.607		
9,600.00	9,284.03	9,983.48	9,672.97	20.28	21.22	169.18	-17.69	53.40	397.82	356.31	41.51	9.585		
9,700.00	9,284.45	10,071.13	9,672.62	20.29	21.34	173.96	68.35	36.74	390.48	348.85	41.63	9.380		
9,800.00	9,284.87	10,165.23	9,672.24	20.44	21.56	177.66	161.67	24.74	387.52	345.52	42.00	9.226		
9,900.00	9,285.30	10,263.55	9,671.85	20.74	21.89	179.69	259.79	18.79	386.36	343.72	42.63	9.062		
9,975.71	9,285.62	10,339.18	9,671.55	21.05	22.30	-179.98	335.41	18.05	385.73	342.38	43.35	8.898		
10,000.00	9,285.72	10,363.47	9,671.45	21.19	22.46	-179.98	359.70	17.91	385.53	341.89	43.64	8.834		
10,100.00	9,286.15	10,463.46	9,671.05	21.87	23.18	-179.98	459.69	17.34	384.71	339.66	45.05	8.539		
10,200.00	9,286.57	10,563.46	9,670.66	22.68	24.03	-179.98	559.69	16.76	383.89	337.18	46.71	8.218		
10,300.00	9,286.99	10,663.46	9,670.26	23.61	24.98	-179.98	659.68	16.19	383.07	334.48	48.59	7.884		
10,400.00	9,287.41	10,763.45	9,669.87	24.64	26.03	-179.98	759.67	15.62	382.26	331.59	50.67	7.545		
10,500.00	9,287.84	10,863.45	9,669.47	25.75	27.16	-179.98	859.67	15.04	381.44	328.52	52.91	7.209		
10,600.00	9,288.26	10,963.45	9,669.08	26.95	28.36	-179.98	959.66	14.47	380.62	325.31	55.31	6.882		
10,700.00	9,288.68	11,063.44	9,668.68	28.21	29.63	-179.98	1,059.66	13.90	379.80	321.96	57.84	6.567		
10,800.00	9,289.11	11,163.44	9,668.28	29.53	30.95	-179.98	1,159.65	13.32	378.98	318.50	60.48	6.266		
10,900.00	9,289.53	11,263.44	9,667.89	30.91	32.32	-179.98	1,259.65	12.75	378.16	314.93	63.23	5.981		
11,000.00	9,289.95	11,363.43	9,667.49	32.32	33.74	-179.98	1,359.64	12.18	377.34	311.28	66.06	5.712		
11,100.00	9,290.38	11,463.43	9,667.10	33.78	35.19	-179.98	1,459.63	11.60	376.52	307.55	68.97	5.459		
11,200.00	9,290.80	11,563.43	9,666.70	35.27	36.67	-179.98	1,559.63	11.03	375.70	303.76	71.95	5.222		
11,300.00	9,291.22	11,663.42	9,666.31	36.79	38.19	-179.98	1,659.62	10.46	374.89	299.90	74.99	4.999		
11,400.00	9,291.65	11,763.42	9,665.91	38.34	39.73	-179.98	1,759.62	9.88	374.07	295.99	78.07	4.791		
11,500.00	9,292.07	11,863.42	9,665.51	39.91	41.30	-179.98	1,859.61	9.31	373.25	292.04	81.21	4.596		
11,600.00	9,292.49	11,963.41	9,665.12	41.51	42.88	-179.98	1,959.61	8.74	372.43	288.04	84.39	4.413		
11,700.00	9,292.91	12,063.41	9,664.72	43.12	44.49	-179.98	2,059.60	8.16	371.61	284.01	87.60	4.242		
11,800.00	9,293.34	12,163.41	9,664.33	44.75	46.11	-179.98	2,159.59	7.59	370.79	279.94	90.85	4.081		
11,900.00	9,293.76	12,263.40	9,663.93	46.39	47.74	-179.98	2,259.59	7.02	369.97	275.84	94.13	3.931		
12,000.00	9,294.18	12,363.40	9,663.53	48.04	49.39	-179.98	2,359.58	6.44	369.15	271.72	97.43	3.789		
12,100.00	9,294.61	12,463.40	9,663.14	49.71	51.05	-179.98	2,459.58	5.87	368.34	267.58	100.76	3.656		
12,200.00	9,295.03	12,563.39	9,662.74	51.39	52.72	-179.99	2,559.57	5.30	367.52	263.41	104.11	3.530		
12,300.00	9,295.45	12,663.39	9,662.35	53.08	54.40	-179.99	2,659.56	4.72	366.70	259.22	107.48	3.412		
12,400.00	9,295.88	12,763.39	9,661.95	54.77	56.09	-179.99	2,759.56	4.15	365.88	255.01	110.87	3.300		
12,500.00	9,296.30	12,863.38	9,661.56	56.48	57.79	-179.99	2,859.55	3.58	365.06	250.79	114.27	3.195		

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



Integrity Directional Services, LLC
Anticollision Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Elder Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Reference Site:	Sec. 35, T 24 S., R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Site Error:	5.00 ft	North Reference:	Grid
Reference Well:	Elder Federal 108H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Sec. 35, T 24 S., R 32 E - Elder Federal 307H - Wellbore #1 - Plan #1		Offset Site Error:		0.00 ft
Survey Program: 0-MWD													Offset Well Error:		0.00 ft		
Reference		Offset		Semi Major Axis			Distance							Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor					
12,600.00	9,296.72	12,963.38	9,661.16	58.19	59.50	-179.99	2,959.55	3.00	364.24	246.56	117.69	3.095					
12,700.00	9,297.14	13,063.38	9,660.76	59.91	61.21	-179.99	3,059.54	2.43	363.42	242.31	121.12	3.001					
12,800.00	9,297.57	13,163.37	9,660.37	61.63	62.93	-179.99	3,159.54	1.86	362.60	238.04	124.56	2.911					
12,900.00	9,297.99	13,263.37	9,659.97	63.36	64.65	-179.99	3,259.53	1.28	361.78	233.77	128.02	2.826					
13,000.00	9,298.41	13,363.37	9,659.58	65.10	66.38	-179.99	3,359.52	0.71	360.97	229.48	131.48	2.745					
13,100.00	9,298.84	13,463.36	9,659.18	66.84	68.12	-179.99	3,459.52	0.14	360.15	225.19	134.96	2.669					
13,200.00	9,299.26	13,563.36	9,658.79	68.58	69.86	-179.99	3,559.51	-0.43	359.33	220.89	138.44	2.596					
13,300.00	9,299.68	13,663.36	9,658.39	70.33	71.60	-179.99	3,659.51	-1.01	358.51	216.57	141.93	2.526					
13,400.00	9,300.11	13,763.35	9,657.99	72.08	73.35	-179.99	3,759.50	-1.58	357.69	212.26	145.43	2.459					
13,500.00	9,300.53	13,863.35	9,657.60	73.84	75.10	-179.99	3,859.50	-2.15	356.87	207.93	148.94	2.396					
13,600.00	9,300.95	13,963.35	9,657.20	75.60	76.86	-179.99	3,959.49	-2.73	356.05	203.60	152.46	2.335					
13,700.00	9,301.38	14,063.34	9,656.81	77.36	78.62	-179.99	4,059.48	-3.30	355.23	199.26	155.98	2.277					
13,800.00	9,301.80	14,163.34	9,656.41	79.13	80.38	-179.99	4,159.48	-3.87	354.42	194.91	159.50	2.222					
13,900.00	9,302.22	14,263.34	9,656.01	80.89	82.14	-179.99	4,259.47	-4.45	353.60	190.56	163.04	2.169					
14,000.00	9,302.64	14,363.33	9,655.62	82.66	83.91	-179.99	4,359.47	-5.02	352.78	186.20	166.57	2.118					
14,100.00	9,303.07	14,463.33	9,655.22	84.44	85.68	-179.99	4,459.46	-5.59	351.96	181.84	170.11	2.069					
14,200.00	9,303.49	14,563.33	9,654.83	86.21	87.45	-179.99	4,559.46	-6.17	351.14	177.48	173.66	2.022					
14,300.00	9,303.91	14,663.32	9,654.43	87.99	89.22	-179.99	4,659.45	-6.74	350.32	173.11	177.21	1.977					
14,400.00	9,304.34	14,763.32	9,654.04	89.77	91.00	-179.99	4,759.44	-7.31	349.50	168.74	180.77	1.933					
14,500.00	9,304.76	14,863.32	9,653.64	91.55	92.78	-179.99	4,859.44	-7.89	348.68	164.36	184.32	1.892					
14,600.00	9,305.18	14,963.31	9,653.24	93.33	94.56	-179.99	4,959.43	-8.46	347.86	159.98	187.89	1.851					
14,700.00	9,305.61	15,063.31	9,652.85	95.11	96.34	-179.99	5,059.43	-9.03	347.05	155.60	191.45	1.813					
14,800.00	9,306.03	15,163.31	9,652.45	96.90	98.12	-179.99	5,159.42	-9.61	346.23	151.21	195.02	1.775					
14,900.00	9,306.45	15,263.30	9,652.06	98.69	99.90	-179.99	5,259.41	-10.18	345.41	146.82	198.59	1.739					
15,000.00	9,306.87	15,363.30	9,651.66	100.47	101.69	-179.99	5,359.41	-10.75	344.59	142.43	202.16	1.705					
15,100.00	9,307.30	15,463.30	9,651.27	102.26	103.48	-179.99	5,459.40	-11.33	343.77	138.03	205.74	1.671					
15,200.00	9,307.72	15,563.29	9,650.87	104.06	105.26	-179.99	5,559.40	-11.90	342.95	133.63	209.32	1.638					
15,300.00	9,308.14	15,663.29	9,650.47	105.85	107.05	-180.00	5,659.39	-12.47	342.13	129.23	212.90	1.607					
15,400.00	9,308.57	15,763.29	9,650.08	107.64	108.84	-180.00	5,759.39	-13.05	341.31	124.83	216.48	1.577					
15,500.00	9,308.99	15,863.28	9,649.68	109.43	110.64	-180.00	5,859.38	-13.62	340.49	120.42	220.07	1.547					
15,600.00	9,309.41	15,963.28	9,649.29	111.23	112.43	-180.00	5,959.37	-14.19	339.68	116.02	223.66	1.519					
15,700.00	9,309.84	16,063.28	9,648.89	113.03	114.22	-180.00	6,059.37	-14.77	338.86	111.61	227.25	1.491 Level 3					
15,800.00	9,310.26	16,163.27	9,648.50	114.82	116.02	-180.00	6,159.36	-15.34	338.04	107.20	230.84	1.464 Level 3					
15,900.00	9,310.68	16,263.27	9,648.10	116.62	117.81	-180.00	6,259.36	-15.91	337.22	102.79	234.43	1.438 Level 3					
16,000.00	9,311.11	16,363.27	9,647.70	118.42	119.61	-180.00	6,359.35	-16.48	336.40	98.37	238.03	1.413 Level 3					
16,100.00	9,311.53	16,463.26	9,647.31	120.22	121.41	-180.00	6,459.35	-17.06	335.58	93.96	241.63	1.389 Level 3					
16,200.00	9,311.95	16,563.26	9,646.91	122.02	123.21	-180.00	6,559.34	-17.63	334.76	89.54	245.23	1.365 Level 3					
16,300.00	9,312.37	16,663.26	9,646.52	123.82	125.01	-180.00	6,659.33	-18.20	333.94	85.12	248.83	1.342 Level 3					
16,400.00	9,312.80	16,763.25	9,646.12	125.62	126.81	-180.00	6,759.33	-18.78	333.13	80.70	252.43	1.320 Level 3					
16,500.00	9,313.22	16,863.25	9,645.72	127.42	128.61	-180.00	6,859.32	-19.35	332.31	76.28	256.03	1.298 Level 3					
16,600.00	9,313.64	16,963.25	9,645.33	129.23	130.41	-180.00	6,959.32	-19.92	331.49	71.85	259.63	1.277 Level 3					
16,684.31	9,314.00	17,046.25	9,645.00	130.75	131.75	180.00	7,042.31	-20.40	330.80	68.31	262.49	1.260 Level 3, SF					

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



Integrity Directional Services, LLC
Anticollision Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Reference Site:	Sec. 35, T 24 S. , R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Site Error:	5.00 ft	North Reference:	Grid
Reference Well:	Eider Federal 108H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Sec. 35, T 24 S. , R 32 E - Eider Federal 401H - Wellbore #1 - Plan #1		Offset Site Error:		0.00 ft	
Survey Program: 0-MWD															Offset Well Error:		0.00 ft	
Reference		Offset		Semi Major Axis			Distance											
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre	Between Centres	Between Ellipses	Minlimum Separation	Separation Factor	Warning						
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)							
0.00	0.00	0.00	0.00	0.00	0.00	179.81	-30.00	0.10	30.01									
100.00	100.00	99.30	99.30	0.08	0.08	179.81	-30.00	0.10	30.00	29.83	0.17	181.002						
200.00	200.00	199.30	199.30	0.31	0.31	179.81	-30.00	0.10	30.00	29.39	0.61	48.838						
300.00	300.00	299.30	299.30	0.53	0.53	179.81	-30.00	0.10	30.00	28.94	1.06	28.201						
400.00	400.00	399.30	399.30	0.76	0.76	179.81	-30.00	0.10	30.00	28.49	1.51	19.824						
500.00	500.00	499.30	499.30	0.98	0.98	179.81	-30.00	0.10	30.00	28.04	1.96	15.284						
600.00	600.00	599.30	599.30	1.21	1.21	179.81	-30.00	0.10	30.00	27.59	2.41	12.436						
700.00	700.00	699.30	699.30	1.43	1.43	179.81	-30.00	0.10	30.00	27.14	2.86	10.482						
800.00	800.00	799.30	799.30	1.66	1.65	179.81	-30.00	0.10	30.00	26.69	3.31	9.059						
900.00	900.00	899.30	899.30	1.88	1.88	179.81	-30.00	0.10	30.00	26.24	3.76	7.977						
1,000.00	1,000.00	999.30	999.30	2.11	2.10	179.81	-30.00	0.10	30.00	25.79	4.21	7.125						
1,100.00	1,100.00	1,099.30	1,099.30	2.33	2.33	179.81	-30.00	0.10	30.00	25.34	4.66	6.438						
1,200.00	1,200.00	1,199.30	1,199.30	2.56	2.55	179.81	-30.00	0.10	30.00	24.89	5.11	5.871						
1,300.00	1,300.00	1,299.30	1,299.30	2.78	2.78	179.81	-30.00	0.10	30.00	24.44	5.56	5.397						
1,400.00	1,400.00	1,399.30	1,399.30	3.01	3.00	179.81	-30.00	0.10	30.00	23.99	6.01	4.993						
1,500.00	1,500.00	1,499.30	1,499.30	3.23	3.23	179.81	-30.00	0.10	30.00	23.54	6.46	4.645						
1,600.00	1,600.00	1,599.30	1,599.30	3.45	3.45	179.81	-30.00	0.10	30.00	23.09	6.91	4.343						
1,700.00	1,700.00	1,699.30	1,699.30	3.68	3.68	179.81	-30.00	0.10	30.00	22.64	7.36	4.078						
1,800.00	1,800.00	1,799.30	1,799.30	3.90	3.90	179.81	-30.00	0.10	30.00	22.19	7.81	3.843						
1,900.00	1,900.00	1,899.30	1,899.30	4.13	4.13	179.81	-30.00	0.10	30.00	21.74	8.26	3.634						
2,000.00	2,000.00	1,999.30	1,999.30	4.35	4.35	179.81	-30.00	0.10	30.00	21.29	8.71	3.446						
2,100.00	2,100.00	2,099.30	2,099.30	4.58	4.58	179.81	-30.00	0.10	30.00	20.84	9.16	3.277						
2,200.00	2,200.00	2,199.30	2,199.30	4.80	4.80	179.81	-30.00	0.10	30.00	20.40	9.60	3.123						
2,300.00	2,300.00	2,299.30	2,299.30	5.03	5.03	179.81	-30.00	0.10	30.00	19.95	10.05	2.984						
2,400.00	2,400.00	2,399.30	2,399.30	5.25	5.25	179.81	-30.00	0.10	30.00	19.50	10.50	2.856						
2,500.00	2,500.00	2,499.30	2,499.30	5.48	5.48	179.81	-30.00	0.10	30.00	19.05	10.95	2.739						
2,600.00	2,600.00	2,599.30	2,599.30	5.70	5.70	179.81	-30.00	0.10	30.00	18.60	11.40	2.631						
2,700.00	2,700.00	2,699.30	2,699.30	5.93	5.93	179.81	-30.00	0.10	30.00	18.15	11.85	2.531						
2,800.00	2,800.00	2,799.30	2,799.30	6.15	6.15	179.81	-30.00	0.10	30.00	17.70	12.30	2.439						
2,900.00	2,900.00	2,899.30	2,899.30	6.38	6.38	179.81	-30.00	0.10	30.00	17.25	12.75	2.353						
3,000.00	3,000.00	2,999.30	2,999.30	6.60	6.60	179.81	-30.00	0.10	30.00	16.80	13.20	2.273						
3,100.00	3,100.00	3,099.30	3,099.30	6.83	6.82	179.81	-30.00	0.10	30.00	16.35	13.65	2.198						
3,200.00	3,200.00	3,199.30	3,199.30	7.05	7.05	179.81	-30.00	0.10	30.00	15.90	14.10	2.128						
3,300.00	3,300.00	3,299.30	3,299.30	7.28	7.27	179.81	-30.00	0.10	30.00	15.45	14.55	2.062						
3,400.00	3,400.00	3,399.30	3,399.30	7.50	7.50	179.81	-30.00	0.10	30.00	15.00	15.00	2.000						
3,500.00	3,500.00	3,499.30	3,499.30	7.73	7.72	179.81	-30.00	0.10	30.00	14.55	15.45	1.942						
3,600.00	3,600.00	3,599.30	3,599.30	7.95	7.95	179.81	-30.00	0.10	30.00	14.10	15.90	1.887						
3,700.00	3,700.00	3,699.30	3,699.30	8.17	8.17	179.81	-30.00	0.10	30.00	13.65	16.35	1.835						
3,800.00	3,800.00	3,799.30	3,799.30	8.40	8.40	179.81	-30.00	0.10	30.00	13.20	16.80	1.786						
3,900.00	3,900.00	3,899.30	3,899.30	8.62	8.62	179.81	-30.00	0.10	30.00	12.75	17.25	1.739						
4,000.00	4,000.00	3,999.30	3,999.30	8.85	8.85	179.81	-30.00	0.10	30.00	12.30	17.70	1.695						
4,100.00	4,100.00	4,099.30	4,099.30	9.07	9.07	179.81	-30.00	0.10	30.00	11.85	18.15	1.653						
4,200.00	4,200.00	4,199.30	4,199.30	9.30	9.30	179.81	-30.00	0.10	30.00	11.40	18.60	1.613						
4,300.00	4,300.00	4,299.30	4,299.30	9.52	9.52	179.81	-30.00	0.10	30.00	10.96	19.05	1.575						
4,400.00	4,400.00	4,399.30	4,399.30	9.75	9.75	179.81	-30.00	0.10	30.00	10.51	19.49	1.539 CC, ES, SF						
4,500.00	4,500.00	4,498.24	4,498.22	9.97	9.94	-179.83	-31.67	-0.09	31.69	11.78	19.91	1.592						
4,600.00	4,600.00	4,596.94	4,596.78	10.20	10.11	-178.95	-36.72	-0.67	36.81	16.51	20.30	1.813						
4,700.00	4,700.00	4,695.42	4,694.90	10.42	10.28	-177.92	-45.08	-1.63	45.32	24.62	20.70	2.190						
4,800.00	4,800.00	4,794.94	4,793.95	10.65	10.45	-177.13	-54.71	-2.74	55.04	33.95	21.09	2.609						
4,900.00	4,900.00	4,894.46	4,893.00	10.87	10.62	-176.57	-64.35	-3.85	64.77	43.28	21.49	3.014						
5,000.00	5,000.00	4,993.99	4,992.05	11.10	10.80	-176.16	-73.98	-4.96	74.50	52.60	21.90	3.402						
5,100.00	5,099.98	5,093.66	5,091.24	11.29	10.99	-12.78	-83.63	-6.07	82.54	60.26	22.28	3.704						

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



Integrity Directional Services, LLC

Anticollision Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Reference Site:	Sec. 35, T 24 S., R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Site Error:	5.00 ft	North Reference:	Grid
Reference Well:	Eider Federal 108H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Sec. 35, T 24 S., R 32 E - Eider Federal 401H - Wellbore #1 - Plan #1		Offset Site Error: 0.00 ft	
Survey Program: 0-MWD													Offset Well Error: 0.00 ft			
Reference		Offset		Semi Major Axis			Distance						Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor				
5,200.00	5,199.84	5,193.54	5,190.65	11.46	11.18	-13.22	-93.30	-7.18	87.19	64.54	22.64	3.850				
5,300.00	5,299.45	5,293.52	5,290.15	11.63	11.38	-14.17	-102.98	-8.30	88.45	65.44	23.01	3.844				
5,400.00	5,398.70	5,393.47	5,389.62	11.81	11.58	-15.70	-112.66	-9.41	86.37	62.99	23.38	3.694				
5,421.10	5,419.59	5,414.54	5,410.60	11.85	11.62	-16.12	-114.70	-9.64	85.51	62.05	23.46	3.644				
5,500.00	5,497.63	5,493.33	5,489.01	11.99	11.78	-17.81	-122.32	-10.52	82.07	58.30	23.77	3.453				
5,600.00	5,596.56	5,593.18	5,588.39	12.17	11.99	-20.15	-131.99	-11.63	77.81	53.65	24.16	3.221				
5,700.00	5,695.48	5,693.04	5,687.77	12.37	12.20	-22.77	-141.66	-12.75	73.70	49.14	24.56	3.000				
5,800.00	5,794.40	5,792.89	5,787.15	12.57	12.41	-25.68	-151.33	-13.86	69.76	44.78	24.98	2.793				
5,900.00	5,893.32	5,892.75	5,886.53	12.78	12.63	-28.94	-160.99	-14.97	66.02	40.62	25.40	2.599				
6,000.00	5,992.24	5,992.60	5,985.91	12.99	12.84	-32.57	-170.66	-16.08	62.52	36.69	25.84	2.420				
6,100.00	6,091.16	6,092.46	6,085.29	13.21	13.07	-36.61	-180.33	-17.19	59.31	33.02	26.28	2.257				
6,200.00	6,190.09	6,192.32	6,184.67	13.44	13.29	-41.08	-190.00	-18.31	56.41	29.68	26.73	2.110				
6,300.00	6,289.01	6,292.17	6,284.05	13.67	13.52	-46.01	-199.66	-19.42	53.90	26.72	27.19	1.983				
6,400.00	6,387.93	6,392.03	6,383.43	13.91	13.75	-51.38	-209.33	-20.53	51.83	24.18	27.65	1.874				
6,500.00	6,486.85	6,491.88	6,482.81	14.15	13.98	-57.13	-219.00	-21.64	50.25	22.12	28.13	1.786				
6,600.00	6,585.77	6,591.74	6,582.19	14.39	14.21	-63.19	-228.67	-22.76	49.20	20.59	28.61	1.720				
6,700.00	6,684.69	6,691.60	6,681.58	14.64	14.45	-69.44	-238.33	-23.87	48.73	19.64	29.09	1.675				
6,730.50	6,714.87	6,722.05	6,711.89	14.72	14.52	-71.37	-241.28	-24.21	48.70	19.46	29.24	1.665				
6,800.00	6,783.62	6,791.45	6,780.96	14.90	14.68	-75.74	-248.00	-24.98	48.84	19.26	29.58	1.651				
6,900.00	6,882.54	6,891.31	6,880.34	15.16	14.92	-81.94	-257.67	-26.09	49.54	19.46	30.08	1.647				
7,000.00	6,981.46	6,991.16	6,979.72	15.42	15.16	-87.89	-267.34	-27.20	50.80	20.22	30.58	1.661				
7,100.00	7,080.38	7,091.02	7,079.10	15.68	15.40	-93.50	-277.00	-28.32	52.58	21.50	31.09	1.691				
7,200.00	7,179.30	7,190.87	7,178.48	15.95	15.65	-98.70	-286.67	-29.43	54.83	23.23	31.60	1.735				
7,300.00	7,278.22	7,290.73	7,277.86	16.22	15.89	-103.45	-296.34	-30.54	57.50	25.38	32.12	1.790				
7,400.00	7,377.15	7,390.59	7,377.24	16.50	16.14	-107.76	-306.01	-31.65	60.52	27.89	32.64	1.854				
7,500.00	7,476.07	7,490.44	7,476.62	16.77	16.39	-111.63	-315.67	-32.77	63.86	30.70	33.16	1.926				
7,600.00	7,574.99	7,590.30	7,576.00	17.05	16.64	-115.11	-325.34	-33.88	67.46	33.76	33.69	2.002				
7,700.00	7,673.91	7,690.15	7,675.38	17.34	16.89	-118.23	-335.01	-34.99	71.28	37.05	34.23	2.083				
7,800.00	7,772.83	7,790.01	7,774.76	17.62	17.14	-121.02	-344.68	-36.10	75.28	40.52	34.76	2.166				
7,900.00	7,871.75	7,889.87	7,874.14	17.91	17.39	-123.53	-354.34	-37.21	79.45	44.15	35.30	2.251				
8,000.00	7,970.67	7,989.72	7,973.52	18.20	17.65	-125.78	-364.01	-38.33	83.76	47.92	35.85	2.337				
8,100.00	8,069.60	8,089.58	8,072.90	18.49	17.90	-127.81	-373.68	-39.44	88.18	51.79	36.39	2.423				
8,200.00	8,168.52	8,189.43	8,172.28	18.78	18.16	-129.64	-383.35	-40.55	92.71	55.76	36.94	2.510				
8,300.00	8,267.44	8,289.29	8,271.66	19.08	18.41	-131.30	-393.01	-41.66	97.32	59.82	37.49	2.595				
8,400.00	8,366.36	8,389.14	8,371.04	19.38	18.67	-132.81	-402.68	-42.77	102.00	63.95	38.05	2.681				
8,500.00	8,465.28	8,489.00	8,470.42	19.68	18.93	-134.19	-412.35	-43.89	106.75	68.14	38.61	2.765				
8,600.00	8,564.20	8,588.86	8,569.80	19.98	19.19	-135.45	-422.02	-45.00	111.55	72.38	39.17	2.848				
8,700.00	8,663.13	8,688.71	8,669.19	20.28	19.45	-136.60	-431.68	-46.11	116.40	76.67	39.73	2.930				
8,774.32	8,736.64	8,762.92	8,743.04	20.51	19.65	-137.40	-438.87	-46.94	120.04	79.89	40.15	2.990				
8,800.00	8,762.14	8,788.59	8,768.59	20.58	19.71	-138.49	-441.35	-47.22	120.80	80.52	40.29	2.998				
8,825.00	8,787.08	8,813.57	8,793.45	20.63	19.78	-141.51	-443.77	-47.50	120.60	80.19	40.41	2.984				
8,850.00	8,812.07	8,838.48	8,818.24	20.68	19.84	66.32	-446.18	-47.78	119.49	78.96	40.53	2.948				
8,875.00	8,837.05	8,863.25	8,842.89	20.72	19.91	51.00	-448.58	-48.06	117.50	76.87	40.63	2.892				
8,900.00	8,861.95	8,887.81	8,867.33	20.76	19.97	51.32	-450.96	-48.33	114.72	73.99	40.73	2.817				
8,925.00	8,886.69	8,912.09	8,891.50	20.78	20.04	53.40	-453.31	-48.60	111.25	70.43	40.82	2.726				
8,950.00	8,911.21	8,936.03	8,915.32	20.79	20.10	56.52	-455.63	-48.87	107.24	66.35	40.89	2.622				
8,975.00	8,935.45	8,959.56	8,938.74	20.80	20.16	60.58	-457.91	-49.13	102.92	61.96	40.96	2.513				
9,000.00	8,959.33	8,982.62	8,961.69	20.80	20.22	65.56	-460.14	-49.39	98.56	57.54	41.02	2.403				
9,025.00	8,982.80	9,005.14	8,984.10	20.79	20.28	71.44	-462.32	-49.64	94.54	53.47	41.07	2.302				
9,050.00	9,005.78	9,027.06	9,005.92	20.78	20.34	78.10	-464.44	-49.88	91.34	50.22	41.12	2.221				
9,075.00	9,028.22	9,048.32	9,027.09	20.76	20.40	85.31	-466.50	-50.12	89.52	48.37	41.15	2.175				
9,086.19	9,038.06	9,057.61	9,036.33	20.75	20.42	88.63	-467.40	-50.22	89.31	48.14	41.17	2.169				

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



CONCHO

Integrity Directional Services, LLC

Anticollision Report



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Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Reference Site:	Sec. 35, T 24 S., R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Site Error:	5.00 ft	North Reference:	Grid
Reference Well:	Eider Federal 108H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Sec. 35, T 24 S., R 32 E - Eider Federal 401H - Wellbore #1 - Plan #1													Offset Site Error:
Survey Program: 0-MWD													Offset Well Error:
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)			
9,100.00	9,050.04	9,068.87	9,047.54	20.73	20.45	92.74	-468.49	-50.35	89.66	48.48	41.18	2.177	
9,125.00	9,071.21	9,088.65	9,067.22	20.70	20.50	100.00	-470.40	-50.57	92.24	51.04	41.20	2.239	
9,150.00	9,091.64	9,107.60	9,086.08	20.67	20.55	106.74	-472.24	-50.78	97.56	56.34	41.22	2.367	
9,175.00	9,111.29	9,126.67	9,104.06	20.63	20.60	112.71	-473.99	-50.98	105.64	64.42	41.23	2.563	
9,200.00	9,130.11	9,142.81	9,121.12	20.59	20.64	117.80	-475.65	-51.17	116.32	75.09	41.23	2.821	
9,225.00	9,148.04	9,158.98	9,137.21	20.54	20.69	121.97	-477.21	-51.35	129.29	88.06	41.23	3.136	
9,250.00	9,165.04	9,174.12	9,152.29	20.50	20.73	125.28	-478.68	-51.52	144.26	103.03	41.23	3.499	
9,275.00	9,181.05	9,188.21	9,166.30	20.46	20.76	127.75	-480.04	-51.67	160.91	119.69	41.22	3.903	
9,300.00	9,196.04	9,201.19	9,179.23	20.42	20.80	129.45	-481.30	-51.82	179.00	137.78	41.22	4.343	
9,325.00	9,209.96	9,213.04	9,191.02	20.38	20.83	130.41	-482.45	-51.95	198.31	157.10	41.21	4.814	
9,350.00	9,222.77	9,223.73	9,201.65	20.34	20.86	130.62	-483.48	-52.07	218.65	177.45	41.20	5.307	
9,375.00	9,234.44	9,233.21	9,211.09	20.31	20.88	130.04	-484.40	-52.18	239.88	198.69	41.19	5.823	
9,400.00	9,244.94	9,241.47	9,219.32	20.28	20.91	128.58	-485.20	-52.27	261.86	220.67	41.19	6.358	
9,425.00	9,254.24	9,248.49	9,226.30	20.26	20.92	126.10	-485.88	-52.35	284.47	243.28	41.18	6.907	
9,450.00	9,262.31	9,254.24	9,232.02	20.24	20.94	122.36	-486.44	-52.41	307.60	266.42	41.18	7.469	
9,475.00	9,269.13	9,258.71	9,236.47	20.23	20.95	117.03	-486.87	-52.46	331.15	289.97	41.18	8.041	
9,500.00	9,274.69	9,261.89	9,239.63	20.23	20.96	109.73	-487.18	-52.50	355.03	313.84	41.19	8.620	
9,525.00	9,278.96	9,263.76	9,241.50	20.23	20.96	100.15	-487.36	-52.52	379.15	337.95	41.20	9.203	
9,550.00	9,281.93	9,264.33	9,242.06	20.24	20.97	88.36	-487.41	-52.52	403.42	362.21	41.21	9.790	
9,575.00	9,283.60	9,263.59	9,241.33	20.26	20.96	75.21	-487.34	-52.51	427.77	386.54	41.23	10.376	
9,592.47	9,284.00	9,262.30	9,240.04	20.28	20.96	66.04	-487.22	-52.50	444.78	403.54	41.24	10.785	
9,600.00	9,284.03	9,261.60	9,239.35	20.28	20.96	65.15	-487.15	-52.49	452.12	410.88	41.24	10.963	
9,700.00	9,284.45	9,252.34	9,230.13	20.29	20.93	47.72	-486.25	-52.39	550.51	509.29	41.22	13.355	
9,800.00	9,284.87	9,243.02	9,220.86	20.44	20.91	13.73	-485.35	-52.29	649.86	608.50	41.35	15.715	
9,900.00	9,285.30	9,233.71	9,211.59	20.74	20.89	-25.81	-484.45	-52.18	749.39	707.77	41.62	18.004	
9,975.71	9,285.62	9,226.68	9,204.59	21.05	20.87	-44.30	-483.77	-52.10	824.59	782.67	41.92	19.670	
10,000.00	9,285.72	9,224.43	9,202.36	21.19	20.86	-43.47	-483.55	-52.08	848.68	806.63	42.05	20.184	
10,100.00	9,286.15	9,215.18	9,193.15	21.87	20.84	-40.29	-482.65	-51.98	947.89	905.18	42.71	22.196	
10,200.00	9,286.57	9,205.93	9,183.94	22.68	20.81	-37.47	-481.76	-51.87	1,047.17	1,003.68	43.49	24.077	
10,300.00	9,286.99	9,196.67	9,174.73	23.61	20.79	-34.97	-480.86	-51.77	1,146.50	1,102.11	44.40	25.825	
10,400.00	9,287.41	9,187.42	9,165.52	24.64	20.76	-32.74	-479.97	-51.67	1,245.87	1,200.47	45.40	27.443	
10,500.00	9,287.84	9,178.16	9,156.31	25.75	20.74	-30.74	-479.07	-51.56	1,345.27	1,298.78	46.49	28.936	
10,600.00	9,288.26	9,168.91	9,147.10	26.95	20.71	-28.95	-478.18	-51.46	1,444.70	1,397.03	47.66	30.311	
10,700.00	9,288.68	9,159.66	9,137.89	28.21	20.69	-27.33	-477.28	-51.36	1,544.14	1,495.24	48.90	31.577	
10,800.00	9,289.11	12,454.34	10,872.91	29.53	33.12	-179.86	1,157.03	9.63	1,584.51	1,521.86	62.65	25.292	
10,900.00	9,289.53	12,554.34	10,872.98	30.91	34.43	-179.86	1,257.03	9.12	1,584.16	1,518.82	65.34	24.245	
11,000.00	9,289.95	12,654.34	10,873.05	32.32	35.80	-179.87	1,357.03	8.61	1,583.80	1,515.68	68.12	23.250	
11,100.00	9,290.38	12,754.34	10,873.12	33.78	37.20	-179.87	1,457.03	8.10	1,583.45	1,512.47	70.98	22.309	
11,200.00	9,290.80	12,854.34	10,873.19	35.27	38.63	-179.87	1,557.02	7.59	1,583.10	1,509.19	73.91	21.420	
11,300.00	9,291.22	12,954.34	10,873.26	36.79	40.10	-179.87	1,657.02	7.08	1,582.74	1,505.84	76.90	20.582	
11,400.00	9,291.65	13,054.33	10,873.33	38.34	41.60	-179.88	1,757.02	6.57	1,582.39	1,502.45	79.94	19.794	
11,500.00	9,292.07	13,154.33	10,873.40	39.91	43.12	-179.88	1,857.02	6.06	1,582.04	1,499.00	83.04	19.052	
11,600.00	9,292.49	13,254.33	10,873.47	41.51	44.67	-179.88	1,957.02	5.55	1,581.68	1,495.51	86.18	18.354	
11,700.00	9,292.91	13,354.33	10,873.54	43.12	46.23	-179.88	2,057.01	5.04	1,581.33	1,491.98	89.35	17.698	
11,800.00	9,293.34	13,454.33	10,873.61	44.75	47.82	-179.88	2,157.01	4.53	1,580.97	1,488.41	92.56	17.080	
11,900.00	9,293.76	13,554.33	10,873.68	46.39	49.42	-179.89	2,257.01	4.02	1,580.62	1,484.82	95.81	16.498	
12,000.00	9,294.18	13,654.33	10,873.75	48.04	51.03	-179.89	2,357.01	3.51	1,580.27	1,481.19	99.08	15.950	
12,100.00	9,294.61	13,754.33	10,873.82	49.71	52.66	-179.89	2,457.01	3.00	1,579.91	1,477.54	102.37	15.433	
12,200.00	9,295.03	13,854.33	10,873.89	51.39	54.30	-179.89	2,557.00	2.49	1,579.56	1,473.87	105.69	14.945	
12,300.00	9,295.45	13,954.33	10,873.96	53.08	55.96	-179.90	2,657.00	1.98	1,579.21	1,470.17	109.03	14.484	
12,400.00	9,295.88	14,054.33	10,874.02	54.77	57.62	-179.90	2,757.00	1.47	1,578.85	1,466.46	112.39	14.048	
12,500.00	9,296.30	14,154.33	10,874.09	56.48	59.29	-179.90	2,857.00	0.96	1,578.50	1,462.73	115.77	13.635	

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



Integrity Directional Services, LLC

Anticollision Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Reference Site:	Sec. 35, T 24 S., R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Site Error:	5.00 ft	North Reference:	Grid
Reference Well:	Eider Federal 108H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Sec. 35, T 24 S., R 32 E - Eider Federal 401H - Wellbore #1 - Plan #1		Offset Site Error: 0.00 ft	
Survey Program: 0-MWD													Offset Well Error: 0.00 ft			
Reference		Offset		Semi Major Axis			Distance							Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor				
12,600.00	9,296.72	14,254.33	10,874.16	58.19	60.98	-179.90	2,957.00	0.44	1,578.14	1,458.98	119.16	13.243				
12,700.00	9,297.14	14,354.33	10,874.23	59.91	62.67	-179.91	3,057.00	-0.07	1,577.79	1,455.22	122.57	12.872				
12,800.00	9,297.57	14,454.33	10,874.30	61.63	64.36	-179.91	3,156.99	-0.58	1,577.44	1,451.44	125.99	12.520				
12,900.00	9,297.99	14,554.32	10,874.37	63.36	66.07	-179.91	3,256.99	-1.09	1,577.08	1,447.66	129.43	12.185				
13,000.00	9,298.41	14,654.32	10,874.44	65.10	67.78	-179.91	3,356.99	-1.60	1,576.73	1,443.86	132.87	11.866				
13,100.00	9,298.84	14,754.32	10,874.51	66.84	69.49	-179.92	3,456.99	-2.11	1,576.38	1,440.05	136.33	11.563				
13,200.00	9,299.26	14,854.32	10,874.58	68.58	71.21	-179.92	3,556.99	-2.62	1,576.02	1,436.23	139.80	11.274				
13,300.00	9,299.68	14,954.32	10,874.65	70.33	72.94	-179.92	3,656.98	-3.13	1,575.67	1,432.40	143.27	10.998				
13,400.00	9,300.11	15,054.32	10,874.72	72.08	74.67	-179.92	3,756.98	-3.64	1,575.31	1,428.56	146.75	10.734				
13,500.00	9,300.53	15,154.32	10,874.79	73.84	76.41	-179.92	3,856.98	-4.15	1,574.96	1,424.71	150.25	10.483				
13,600.00	9,300.95	15,254.32	10,874.86	75.60	78.15	-179.93	3,956.98	-4.66	1,574.61	1,420.86	153.74	10.242				
13,700.00	9,301.38	15,354.32	10,874.93	77.36	79.89	-179.93	4,056.98	-5.17	1,574.25	1,417.00	157.25	10.011				
13,800.00	9,301.80	15,454.32	10,875.00	79.13	81.64	-179.93	4,156.97	-5.68	1,573.90	1,413.14	160.76	9.790				
13,900.00	9,302.22	15,554.32	10,875.07	80.89	83.39	-179.93	4,256.97	-6.19	1,573.55	1,409.27	164.28	9.578				
14,000.00	9,302.64	15,654.32	10,875.14	82.66	85.14	-179.94	4,356.97	-6.70	1,573.19	1,405.39	167.80	9.375				
14,100.00	9,303.07	15,754.32	10,875.21	84.44	86.90	-179.94	4,456.97	-7.21	1,572.84	1,401.51	171.33	9.180				
14,200.00	9,303.49	15,854.32	10,875.27	86.21	88.66	-179.94	4,556.97	-7.72	1,572.49	1,397.62	174.87	8.992				
14,300.00	9,303.91	15,954.32	10,875.34	87.99	90.42	-179.94	4,656.96	-8.23	1,572.13	1,393.73	178.41	8.812				
14,400.00	9,304.34	16,054.32	10,875.41	89.77	92.18	-179.95	4,756.96	-8.74	1,571.78	1,389.83	181.95	8.639				
14,500.00	9,304.76	16,154.31	10,875.48	91.55	93.95	-179.95	4,856.96	-9.25	1,571.42	1,385.93	185.50	8.471				
14,600.00	9,305.18	16,254.31	10,875.55	93.33	95.72	-179.95	4,956.96	-9.76	1,571.07	1,382.02	189.05	8.310				
14,700.00	9,305.61	16,354.31	10,875.62	95.11	97.49	-179.95	5,056.96	-10.27	1,570.72	1,378.11	192.60	8.155				
14,800.00	9,306.03	16,454.31	10,875.69	96.90	99.26	-179.96	5,156.95	-10.78	1,570.36	1,374.20	196.16	8.006				
14,900.00	9,306.45	16,554.31	10,875.76	98.69	101.04	-179.96	5,256.95	-11.29	1,570.01	1,370.29	199.72	7.861				
15,000.00	9,306.87	16,654.31	10,875.83	100.47	102.81	-179.96	5,356.95	-11.80	1,569.66	1,366.37	203.29	7.721				
15,100.00	9,307.30	16,754.31	10,875.90	102.26	104.59	-179.96	5,456.95	-12.31	1,569.30	1,362.45	206.85	7.587				
15,200.00	9,307.72	16,854.31	10,875.97	104.06	106.37	-179.96	5,556.95	-12.82	1,568.95	1,358.52	210.42	7.456				
15,300.00	9,308.14	16,954.31	10,876.04	105.85	108.15	-179.97	5,656.94	-13.33	1,568.59	1,354.60	214.00	7.330				
15,400.00	9,308.57	17,054.31	10,876.11	107.64	109.93	-179.97	5,756.94	-13.84	1,568.24	1,350.67	217.57	7.208				
15,500.00	9,308.99	17,154.31	10,876.18	109.43	111.72	-179.97	5,856.94	-14.35	1,567.89	1,346.74	221.15	7.090				
15,600.00	9,309.41	17,254.31	10,876.25	111.23	113.50	-179.97	5,956.94	-14.86	1,567.53	1,342.80	224.73	6.975				
15,700.00	9,309.84	17,354.31	10,876.32	113.03	115.29	-179.98	6,056.94	-15.37	1,567.18	1,338.87	228.31	6.864				
15,800.00	9,310.26	17,454.31	10,876.39	114.82	117.08	-179.98	6,156.93	-15.88	1,566.83	1,334.93	231.90	6.757				
15,900.00	9,310.68	17,554.31	10,876.45	116.62	118.86	-179.98	6,256.93	-16.39	1,566.47	1,330.99	235.49	6.652				
16,000.00	9,311.11	17,654.30	10,876.52	118.42	120.65	-179.98	6,356.93	-16.90	1,566.12	1,327.05	239.07	6.551				
16,100.00	9,311.53	17,754.30	10,876.59	120.22	122.45	-179.99	6,456.93	-17.41	1,565.77	1,323.10	242.66	6.452				
16,200.00	9,311.95	17,854.30	10,876.66	122.02	124.24	-179.99	6,556.93	-17.92	1,565.41	1,319.16	246.26	6.357				
16,300.00	9,312.37	17,954.30	10,876.73	123.82	126.03	-179.99	6,656.92	-18.43	1,565.06	1,315.21	249.85	6.264				
16,400.00	9,312.80	18,054.30	10,876.80	125.62	127.82	-179.99	6,756.92	-18.94	1,564.71	1,311.26	253.45	6.174				
16,500.00	9,313.22	18,154.30	10,876.87	127.42	129.62	-180.00	6,856.92	-19.45	1,564.35	1,307.31	257.04	6.086				
16,600.00	9,313.64	18,254.30	10,876.94	129.23	131.41	-180.00	6,956.92	-19.96	1,564.00	1,303.36	260.64	6.001				
16,684.31	9,314.00	18,338.61	10,877.00	130.75	132.80	-180.00	7,041.23	-20.39	1,563.70	1,300.15	263.55	5.933				

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



Integrity Directional Services, LLC

Anticollision Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Reference Site:	Sec. 35, T 24 S. , R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Site Error:	5.00 ft	North Reference:	Grid
Reference Well:	Eider Federal 108H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Sec. 35, T 24 S. , R 32 E - Eider Federal 601H - Wellbore #1 - Plan #1													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
0.00	0.00	0.00	0.00	0.00	0.00	134.62	-29.70	30.10	42.29					
100.00	100.00	99.60	99.60	0.08	0.08	134.62	-29.70	30.10	42.29	42.12	0.17	254.744		
200.00	200.00	199.60	199.60	0.31	0.31	134.62	-29.70	30.10	42.29	41.67	0.61	68.762		
300.00	300.00	299.60	299.60	0.53	0.53	134.62	-29.70	30.10	42.29	41.22	1.06	39.724		
400.00	400.00	399.60	399.60	0.76	0.76	134.62	-29.70	30.10	42.29	40.77	1.51	27.930		
500.00	500.00	499.60	499.60	0.98	0.98	134.62	-29.70	30.10	42.29	40.32	1.96	21.535		
600.00	600.00	599.60	599.60	1.21	1.21	134.62	-29.70	30.10	42.29	39.87	2.41	17.524		
700.00	700.00	699.60	699.60	1.43	1.43	134.62	-29.70	30.10	42.29	39.42	2.86	14.772		
800.00	800.00	799.60	799.60	1.66	1.66	134.62	-29.70	30.10	42.29	38.97	3.31	12.767		
900.00	900.00	899.60	899.60	1.88	1.88	134.62	-29.70	30.10	42.29	38.52	3.76	11.241		
1,000.00	1,000.00	999.60	999.60	2.11	2.11	134.62	-29.70	30.10	42.29	38.07	4.21	10.041		
1,100.00	1,100.00	1,099.60	1,099.60	2.33	2.33	134.62	-29.70	30.10	42.29	37.63	4.66	9.073		
1,200.00	1,200.00	1,199.60	1,199.60	2.56	2.55	134.62	-29.70	30.10	42.29	37.18	5.11	8.275		
1,300.00	1,300.00	1,299.60	1,299.60	2.78	2.78	134.62	-29.70	30.10	42.29	36.73	5.56	7.606		
1,400.00	1,400.00	1,399.60	1,399.60	3.01	3.00	134.62	-29.70	30.10	42.29	36.28	6.01	7.037		
1,500.00	1,500.00	1,499.60	1,499.60	3.23	3.23	134.62	-29.70	30.10	42.29	35.83	6.46	6.547		
1,600.00	1,600.00	1,599.60	1,599.60	3.45	3.45	134.62	-29.70	30.10	42.29	35.38	6.91	6.121		
1,700.00	1,700.00	1,699.60	1,699.60	3.68	3.68	134.62	-29.70	30.10	42.29	34.93	7.36	5.747		
1,800.00	1,800.00	1,799.60	1,799.60	3.90	3.90	134.62	-29.70	30.10	42.29	34.48	7.81	5.416		
1,900.00	1,900.00	1,899.60	1,899.60	4.13	4.13	134.62	-29.70	30.10	42.29	34.03	8.26	5.121		
2,000.00	2,000.00	1,999.60	1,999.60	4.35	4.35	134.62	-29.70	30.10	42.29	33.58	8.71	4.857		
2,100.00	2,100.00	2,099.60	2,099.60	4.58	4.58	134.62	-29.70	30.10	42.29	33.13	9.16	4.618		
2,200.00	2,200.00	2,199.60	2,199.60	4.80	4.80	134.62	-29.70	30.10	42.29	32.68	9.61	4.402		
2,300.00	2,300.00	2,299.60	2,299.60	5.03	5.03	134.62	-29.70	30.10	42.29	32.23	10.06	4.205		
2,400.00	2,400.00	2,399.60	2,399.60	5.25	5.25	134.62	-29.70	30.10	42.29	31.78	10.50	4.025		
2,500.00	2,500.00	2,499.60	2,499.60	5.48	5.48	134.62	-29.70	30.10	42.29	31.33	10.95	3.860		
2,600.00	2,600.00	2,599.60	2,599.60	5.70	5.70	134.62	-29.70	30.10	42.29	30.88	11.40	3.708		
2,700.00	2,700.00	2,699.60	2,699.60	5.93	5.93	134.62	-29.70	30.10	42.29	30.43	11.85	3.567		
2,800.00	2,800.00	2,799.60	2,799.60	6.15	6.15	134.62	-29.70	30.10	42.29	29.98	12.30	3.437		
2,900.00	2,900.00	2,899.60	2,899.60	6.38	6.38	134.62	-29.70	30.10	42.29	29.53	12.75	3.316		
3,000.00	3,000.00	2,999.60	2,999.60	6.60	6.60	134.62	-29.70	30.10	42.29	29.08	13.20	3.203		
3,100.00	3,100.00	3,099.60	3,099.60	6.83	6.83	134.62	-29.70	30.10	42.29	28.63	13.65	3.098		
3,200.00	3,200.00	3,199.60	3,199.60	7.05	7.05	134.62	-29.70	30.10	42.29	28.19	14.10	2.999		
3,300.00	3,300.00	3,299.60	3,299.60	7.28	7.27	134.62	-29.70	30.10	42.29	27.74	14.55	2.906		
3,400.00	3,400.00	3,399.60	3,399.60	7.50	7.50	134.62	-29.70	30.10	42.29	27.29	15.00	2.819		
3,500.00	3,500.00	3,499.60	3,499.60	7.73	7.72	134.62	-29.70	30.10	42.29	26.84	15.45	2.737		
3,600.00	3,600.00	3,599.60	3,599.60	7.95	7.95	134.62	-29.70	30.10	42.29	26.39	15.90	2.660		
3,700.00	3,700.00	3,699.60	3,699.60	8.17	8.17	134.62	-29.70	30.10	42.29	25.94	16.35	2.587		
3,800.00	3,800.00	3,799.60	3,799.60	8.40	8.40	134.62	-29.70	30.10	42.29	25.49	16.80	2.517		
3,900.00	3,900.00	3,899.60	3,899.60	8.62	8.62	134.62	-29.70	30.10	42.29	25.04	17.25	2.452		
4,000.00	4,000.00	3,999.60	3,999.60	8.85	8.85	134.62	-29.70	30.10	42.29	24.59	17.70	2.389		
4,100.00	4,100.00	4,099.60	4,099.60	9.07	9.07	134.62	-29.70	30.10	42.29	24.14	18.15	2.330		
4,200.00	4,200.00	4,199.60	4,199.60	9.30	9.30	134.62	-29.70	30.10	42.29	23.69	18.60	2.274		
4,300.00	4,300.00	4,299.60	4,299.60	9.52	9.52	134.62	-29.70	30.10	42.29	23.24	19.05	2.220		
4,400.00	4,400.00	4,399.60	4,399.60	9.75	9.75	134.62	-29.70	30.10	42.29	22.79	19.50	2.169 CC, ES, SF		
4,500.00	4,500.00	4,498.56	4,498.54	9.97	9.94	136.24	-31.39	30.07	43.48	23.57	19.91	2.184		
4,600.00	4,600.00	4,597.28	4,597.12	10.20	10.11	140.60	-36.49	29.97	47.29	26.98	20.31	2.329		
4,700.00	4,700.00	4,696.67	4,696.22	10.42	10.28	145.91	-44.08	29.83	53.33	32.63	20.70	2.577		
4,800.00	4,800.00	4,796.36	4,795.62	10.65	10.45	150.19	-51.80	29.69	59.84	38.74	21.10	2.837		
4,900.00	4,900.00	4,896.06	4,895.02	10.87	10.62	153.61	-59.53	29.54	66.61	45.12	21.49	3.099		
5,000.00	5,000.00	4,995.76	4,994.42	11.10	10.80	156.39	-67.25	29.40	73.58	51.68	21.90	3.360		
5,100.00	5,099.98	5,095.57	5,093.93	11.29	10.98	-38.72	-74.98	29.25	79.32	57.04	22.28	3.561		

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



Integrity Directional Services, LLC

Anticollision Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Reference Site:	Sec. 35, T 24 S., R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Site Error:	5.00 ft	North Reference:	Grid
Reference Well:	Eider Federal 108H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Sec. 35, T 24 S., R 32 E - Eider Federal 601H - Wellbore #1 - Plan #1		Offset Site Error:		0.00 ft
Survey Program: 0-MWD															Offset Well Error:		0.00 ft
Reference		Offset		Semi Major Axis			Distance										
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning				
5,200.00	5,199.84	5,195.52	5,193.57	11.46	11.17	-38.84	-82.72	29.11	82.37	59.73	22.63	3.639					
5,300.00	5,299.45	5,295.49	5,293.24	11.63	11.36	-40.51	-90.47	28.96	82.73	59.74	22.99	3.598					
5,400.00	5,398.70	5,395.35	5,392.80	11.81	11.55	-43.85	-98.20	28.82	80.61	57.25	23.36	3.451					
5,421.10	5,419.59	5,416.39	5,413.78	11.85	11.60	-44.81	-99.83	28.79	79.89	56.44	23.44	3.408					
5,500.00	5,497.63	5,495.07	5,492.22	11.99	11.75	-48.65	-105.93	28.67	77.17	53.44	23.74	3.251					
5,600.00	5,596.56	5,594.79	5,591.64	12.17	11.95	-53.89	-113.65	28.53	74.27	50.15	24.12	3.079					
5,700.00	5,695.48	5,694.50	5,691.06	12.37	12.15	-59.50	-121.38	28.38	72.04	47.52	24.52	2.938					
5,800.00	5,794.40	5,794.22	5,790.47	12.57	12.35	-65.41	-129.10	28.24	70.55	45.62	24.92	2.830					
5,900.00	5,893.32	5,893.94	5,889.89	12.78	12.56	-71.50	-136.83	28.09	69.83	44.49	25.34	2.756					
5,938.69	5,931.59	5,932.51	5,928.35	12.86	12.64	-73.88	-139.81	28.04	69.77	44.27	25.50	2.736					
6,000.00	5,992.24	5,993.65	5,989.31	12.99	12.77	-77.65	-144.55	27.95	69.92	44.16	25.76	2.714					
6,100.00	6,091.16	6,093.37	6,088.73	13.21	12.98	-83.71	-152.28	27.80	70.82	44.62	26.19	2.704					
6,200.00	6,190.09	6,193.09	6,188.14	13.44	13.19	-89.56	-160.00	27.66	72.48	45.85	26.63	2.722					
6,300.00	6,289.01	6,292.81	6,287.56	13.67	13.41	-95.10	-167.72	27.51	74.87	47.79	27.08	2.765					
6,400.00	6,387.93	6,392.52	6,386.98	13.91	13.62	-100.24	-175.45	27.37	77.91	50.38	27.53	2.830					
6,500.00	6,486.85	6,492.24	6,486.40	14.15	13.84	-104.97	-183.17	27.22	81.54	53.55	27.99	2.913					
6,600.00	6,585.77	6,591.96	6,585.81	14.39	14.06	-109.27	-190.90	27.08	85.67	57.21	28.45	3.011					
6,700.00	6,684.69	6,691.67	6,685.23	14.64	14.28	-113.16	-198.62	26.93	90.24	61.31	28.93	3.120					
6,800.00	6,783.62	6,791.39	6,784.65	14.90	14.50	-116.66	-206.35	26.79	95.18	65.78	29.40	3.237					
6,900.00	6,882.54	6,891.11	6,884.07	15.16	14.73	-119.80	-214.07	26.64	100.45	70.56	29.88	3.361					
7,000.00	6,981.46	6,990.83	6,983.48	15.42	14.95	-122.63	-221.80	26.50	105.98	75.61	30.37	3.489					
7,100.00	7,080.38	7,090.54	7,082.90	15.68	15.18	-125.17	-229.52	26.35	111.75	80.89	30.86	3.621					
7,200.00	7,179.30	7,190.26	7,182.32	15.95	15.41	-127.45	-237.25	26.21	117.72	86.35	31.36	3.754					
7,300.00	7,278.22	7,289.98	7,281.74	16.22	15.64	-129.52	-244.97	26.06	123.85	91.99	31.86	3.887					
7,400.00	7,377.15	7,389.69	7,381.15	16.50	15.87	-131.38	-252.70	25.92	130.13	97.76	32.37	4.020					
7,500.00	7,476.07	7,489.41	7,480.57	16.77	16.10	-133.08	-260.42	25.77	136.53	103.66	32.88	4.153					
7,600.00	7,574.99	7,589.13	7,579.99	17.05	16.33	-134.62	-268.14	25.63	143.05	109.66	33.39	4.284					
7,700.00	7,673.91	7,688.85	7,679.40	17.34	16.57	-136.02	-275.87	25.49	149.65	115.75	33.91	4.414					
7,800.00	7,772.83	7,788.56	7,778.82	17.62	16.80	-137.31	-283.59	25.34	156.34	121.92	34.43	4.541					
7,900.00	7,871.75	7,888.28	7,878.24	17.91	17.04	-138.49	-291.32	25.20	163.10	128.15	34.95	4.667					
8,000.00	7,970.67	7,988.00	7,977.66	18.20	17.28	-139.58	-299.04	25.05	169.93	134.45	35.48	4.790					
8,100.00	8,069.60	8,087.71	8,077.07	18.49	17.51	-140.58	-306.77	24.91	176.81	140.80	36.00	4.911					
8,200.00	8,168.52	8,187.43	8,176.49	18.78	17.75	-141.51	-314.49	24.76	183.74	147.20	36.54	5.029					
8,300.00	8,267.44	8,287.15	8,275.91	19.08	17.99	-142.37	-322.22	24.62	190.71	153.64	37.07	5.144					
8,400.00	8,366.36	8,386.87	8,375.33	19.38	18.23	-143.16	-329.94	24.47	197.73	160.12	37.61	5.257					
8,500.00	8,465.28	8,486.58	8,474.74	19.68	18.47	-143.91	-337.67	24.33	204.78	166.63	38.15	5.368					
8,600.00	8,564.20	8,586.30	8,574.16	19.98	18.71	-144.60	-345.39	24.18	211.86	173.17	38.69	5.476					
8,700.00	8,663.13	8,686.02	8,673.58	20.28	18.96	-145.25	-353.11	24.04	218.97	179.74	39.24	5.581					
8,774.32	8,736.64	8,760.12	8,747.46	20.51	19.14	-145.71	-358.86	23.93	224.27	184.63	39.64	5.657					
8,800.00	8,762.14	8,785.77	8,773.03	20.58	19.20	-146.83	-360.84	23.89	225.55	185.78	39.78	5.671					
8,825.00	8,787.08	8,810.76	8,797.95	20.63	19.26	-150.14	-362.78	23.86	225.72	185.83	39.89	5.658					
8,850.00	8,812.07	8,835.70	8,822.82	20.68	19.32	57.16	-364.71	23.82	224.84	184.83	40.00	5.620					
8,875.00	8,837.05	8,860.54	8,847.57	20.72	19.38	41.03	-366.63	23.78	222.91	182.81	40.10	5.558					
8,900.00	8,861.95	8,885.19	8,872.15	20.76	19.44	40.24	-368.54	23.75	219.98	179.79	40.20	5.473					
8,925.00	8,886.69	8,909.59	8,896.47	20.78	19.50	40.87	-370.43	23.71	216.08	175.80	40.28	5.365					
8,950.00	8,911.21	8,933.67	8,920.49	20.79	19.56	42.14	-372.30	23.68	211.27	170.92	40.35	5.235					
8,975.00	8,935.45	8,957.37	8,944.12	20.80	19.62	43.93	-374.14	23.64	205.62	165.20	40.42	5.087					
9,000.00	8,959.33	8,980.63	8,967.30	20.80	19.67	46.18	-375.94	23.61	199.22	158.74	40.48	4.922					
9,025.00	8,982.80	9,003.37	8,989.98	20.79	19.73	48.93	-377.70	23.58	192.18	151.66	40.52	4.743					
9,050.00	9,005.78	9,025.54	9,012.08	20.78	19.79	52.17	-379.42	23.54	184.67	144.11	40.56	4.553					
9,075.00	9,028.22	9,047.08	9,033.56	20.76	19.84	55.93	-381.08	23.51	176.86	136.26	40.60	4.357					
9,100.00	9,050.04	9,067.92	9,054.34	20.73	19.89	60.19	-382.70	23.48	168.99	128.37	40.62	4.160					

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



Integrity Directional Services, LLC

Anticollision Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Reference Site:	Sec. 35, T 24 S. , R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Site Error:	5.00 ft	North Reference:	Grid
Reference Well:	Eider Federal 108H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Sec. 35, T 24 S. , R 32 E - Eider Federal 601H - Wellbore #1 - Plan #1		Offset Site Error: 0.00 ft	
Survey Program: 0-MWD													Offset Well Error: 0.00 ft			
Reference		Offset		Semi Major Axis			Distance						Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor				
9,125.00	9,071.21	9,088.02	9,074.37	20.70	19.94	64.92	-384.26	23.45	161.35	120.71	40.64	3.970				
9,150.00	9,091.64	9,107.31	9,093.60	20.67	19.99	70.04	-385.75	23.43	154.31	113.66	40.65	3.796				
9,175.00	9,111.29	9,125.74	9,111.98	20.63	20.03	75.40	-387.18	23.40	148.30	107.64	40.66	3.647				
9,200.00	9,130.11	9,143.26	9,129.45	20.59	20.07	80.81	-388.54	23.37	143.79	103.13	40.66	3.536				
9,225.00	9,148.04	9,159.83	9,145.97	20.54	20.11	86.09	-389.82	23.35	141.31	100.65	40.66	3.475				
9,237.75	9,156.83	9,167.89	9,154.01	20.52	20.13	88.66	-390.44	23.34	140.97	100.31	40.66	3.467				
9,250.00	9,165.04	9,175.39	9,161.48	20.50	20.15	91.02	-391.02	23.33	141.29	100.64	40.65	3.475				
9,275.00	9,181.05	9,189.91	9,175.96	20.46	20.19	95.44	-392.15	23.31	144.09	103.44	40.65	3.545				
9,300.00	9,196.04	9,203.35	9,189.36	20.42	20.22	99.22	-393.19	23.29	149.83	109.19	40.64	3.687				
9,325.00	9,209.96	9,215.66	9,201.63	20.38	20.25	102.28	-394.14	23.27	158.48	117.85	40.63	3.900				
9,350.00	9,222.77	9,226.82	9,212.76	20.34	20.28	104.57	-395.01	23.25	169.80	129.18	40.62	4.180				
9,375.00	9,234.44	9,236.80	9,222.70	20.31	20.30	106.07	-395.78	23.24	183.49	142.88	40.61	4.518				
9,400.00	9,244.94	9,245.56	9,231.44	20.28	20.33	106.75	-396.46	23.22	199.21	158.61	40.61	4.906				
9,425.00	9,254.24	9,253.08	9,238.94	20.26	20.34	106.57	-397.04	23.21	216.63	176.03	40.60	5.335				
9,450.00	9,262.31	9,259.35	9,245.19	20.24	20.36	105.49	-397.53	23.20	235.45	194.85	40.60	5.799				
9,475.00	9,269.13	9,264.34	9,250.16	20.23	20.37	103.46	-397.91	23.20	255.40	214.80	40.60	6.290				
9,500.00	9,274.69	9,268.04	9,253.86	20.23	20.38	100.39	-398.20	23.19	276.27	235.66	40.61	6.803				
9,525.00	9,278.96	9,270.45	9,256.25	20.23	20.39	96.24	-398.39	23.19	297.85	257.23	40.62	7.333				
9,550.00	9,281.93	9,271.55	9,257.35	20.24	20.39	90.97	-398.47	23.19	319.98	279.34	40.63	7.875				
9,575.00	9,283.60	9,271.34	9,257.14	20.26	20.39	84.66	-398.46	23.19	342.51	301.86	40.65	8.426				
9,592.47	9,284.00	9,270.42	9,256.22	20.28	20.39	79.72	-398.39	23.19	358.42	317.75	40.67	8.814				
9,600.00	9,284.03	9,269.88	9,255.69	20.28	20.39	79.39	-398.34	23.19	365.32	324.65	40.67	8.983				
9,700.00	9,284.45	9,262.72	9,248.54	20.29	20.37	73.61	-397.79	23.20	459.86	419.21	40.66	11.311				
9,800.00	9,284.87	9,255.46	9,241.31	20.44	20.35	62.82	-397.23	23.21	557.65	516.86	40.79	13.670				
9,900.00	9,285.30	9,248.16	9,234.03	20.74	20.33	37.88	-396.66	23.22	656.87	615.79	41.07	15.993				
9,975.71	9,285.62	9,242.61	9,228.50	21.05	20.32	0.88	-396.23	23.23	732.33	690.96	41.37	17.701				
10,000.00	9,285.72	9,240.83	9,226.72	21.19	20.31	0.86	-396.09	23.23	756.56	715.06	41.50	18.230				
10,100.00	9,286.15	9,233.51	9,219.42	21.87	20.30	0.77	-395.53	23.24	856.29	814.12	42.17	20.308				
10,200.00	9,286.57	9,226.18	9,212.12	22.68	20.28	0.70	-394.96	23.25	956.02	913.06	42.96	22.254				
10,300.00	9,286.99	9,218.86	9,204.82	23.61	20.26	0.65	-394.39	23.26	1,055.75	1,011.88	43.87	24.066				
10,400.00	9,287.41	9,211.54	9,197.52	24.64	20.24	0.60	-393.82	23.27	1,155.48	1,110.60	44.88	25.747				
10,500.00	9,287.84	9,204.21	9,190.22	25.75	20.22	0.56	-393.26	23.28	1,255.21	1,209.24	45.98	27.301				
10,600.00	9,288.26	9,196.89	9,182.91	26.95	20.21	0.53	-392.69	23.30	1,354.95	1,307.79	47.15	28.734				
10,700.00	9,288.68	9,189.57	9,175.61	28.21	20.19	0.50	-392.12	23.31	1,454.68	1,406.28	48.40	30.056				
10,800.00	9,289.11	9,182.24	9,168.31	29.53	20.17	0.47	-391.55	23.32	1,554.41	1,504.71	49.70	31.274				
10,900.00	9,289.53	9,174.92	9,161.01	30.91	20.15	0.45	-390.99	23.33	1,654.14	1,603.08	51.06	32.397				
11,000.00	9,289.95	9,167.59	9,153.71	32.32	20.13	0.43	-390.42	23.34	1,753.87	1,701.41	52.46	33.434				
11,100.00	9,290.38	9,160.27	9,146.41	33.78	20.12	0.42	-389.85	23.35	1,853.60	1,799.70	53.90	34.391				
11,200.00	9,290.80	9,152.95	9,139.10	35.27	20.10	0.40	-389.29	23.36	1,953.33	1,897.96	55.37	35.277				
11,300.00	9,291.22	9,145.62	9,131.80	36.79	20.08	0.39	-388.72	23.37	2,053.07	1,996.19	56.87	36.098				
11,400.00	9,291.65	9,138.30	9,124.50	38.34	20.06	0.37	-388.15	23.38	2,152.80	2,094.39	58.41	36.860				
11,500.00	9,292.07	9,130.98	9,117.20	39.91	20.04	0.36	-387.58	23.39	2,252.53	2,192.57	59.96	37.568				
11,600.00	9,292.49	9,123.65	9,109.90	41.51	20.03	0.35	-387.02	23.40	2,352.26	2,290.73	61.53	38.227				
11,700.00	9,292.91	9,116.33	9,102.60	43.12	20.01	0.34	-386.45	23.41	2,451.99	2,388.87	63.13	38.843				
11,800.00	9,293.34	9,109.00	9,095.29	44.75	19.99	0.33	-385.88	23.42	2,551.72	2,486.99	64.74	39.418				
11,900.00	9,293.76	9,101.68	9,087.99	46.39	19.97	0.32	-385.31	23.43	2,651.45	2,585.09	66.36	39.956				
12,000.00	9,294.18	9,094.36	9,080.69	48.04	19.95	0.32	-384.75	23.44	2,751.19	2,683.19	68.00	40.460				
12,100.00	9,294.61	9,087.03	9,073.39	49.71	19.94	0.31	-384.18	23.45	2,850.92	2,781.27	69.65	40.934				
12,200.00	9,295.03	9,079.71	9,066.09	51.39	19.92	0.30	-383.61	23.47	2,950.65	2,879.34	71.31	41.380				
12,300.00	9,295.45	15,389.84	12,320.94	53.08	58.03	-179.95	2,655.99	1.95	3,025.89	2,914.78	111.11	27.234				
12,400.00	9,295.88	15,489.84	12,321.01	54.77	59.66	-179.95	2,755.98	1.44	3,025.53	2,911.10	114.43	26.440				
12,500.00	9,296.30	15,589.84	12,321.08	56.48	61.30	-179.95	2,855.98	0.93	3,025.18	2,907.41	117.77	25.686				

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



Integrity Directional Services, LLC

Anticollision Report



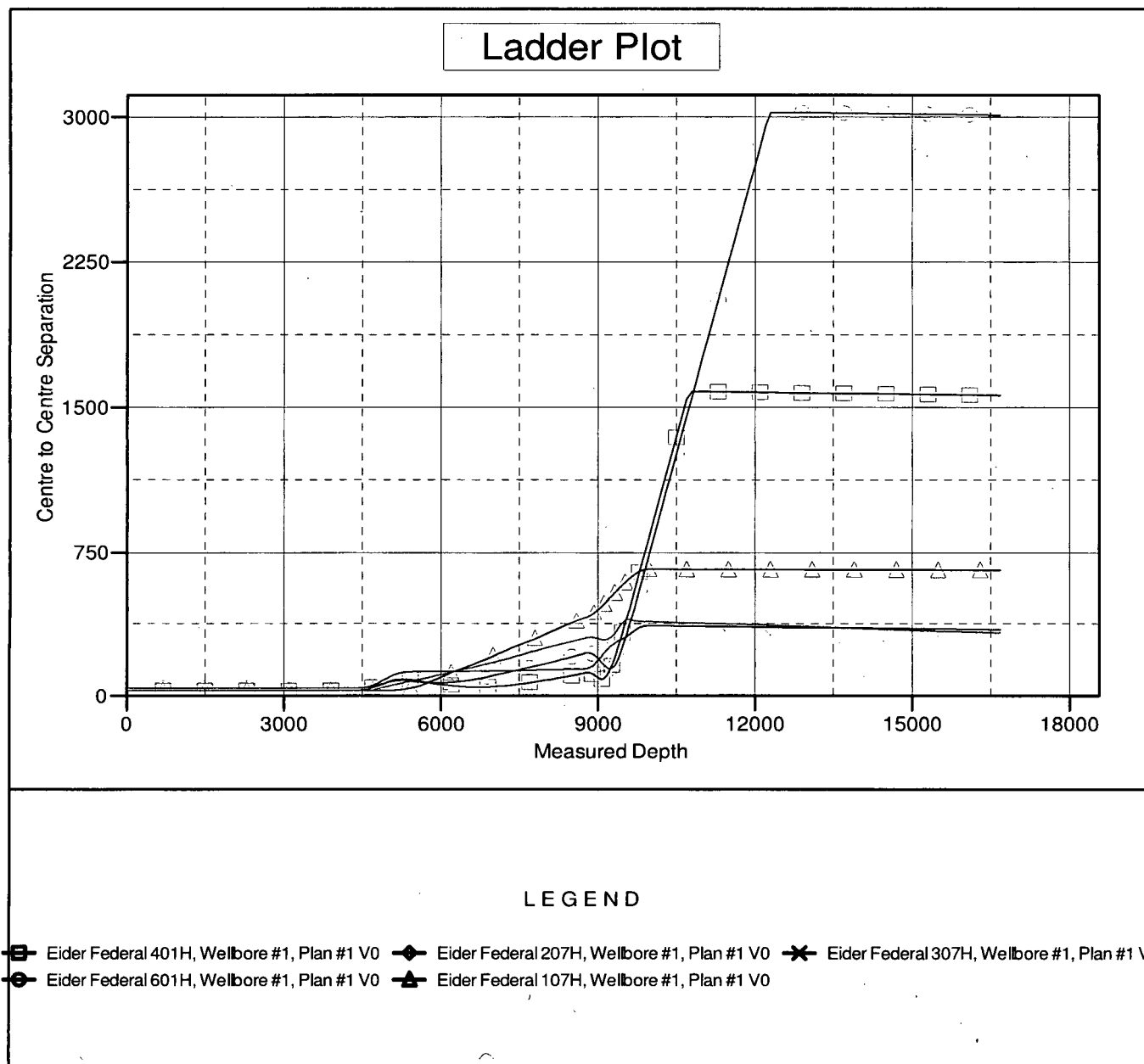
Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Reference Site:	Sec. 35, T 24 S., R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Site Error:	5.00 ft	North Reference:	Grid
Reference Well:	Eider Federal 108H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Sec. 35, T 24 S., R 32 E - Eider Federal 601H - Wellbore #1 - Plan #1													Offset Site Error: 0.00 ft	
Survey Program: 0-MWD													Offset Well Error: 0.00 ft	
Reference				Offset		Semi Major Axis			Distance				Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
12,600.00	9,296.72	15,689.84	12,321.15	58.19	62.95	-179.95	2,955.98	0.42	3,024.83	2,903.69	121.13	24.971		
12,700.00	9,297.14	15,789.84	12,321.22	59.91	64.60	-179.95	3,055.98	-0.09	3,024.48	2,899.96	124.51	24.291		
12,800.00	9,297.57	15,889.84	12,321.29	61.63	66.27	-179.95	3,155.98	-0.60	3,024.12	2,896.22	127.90	23.644		
12,900.00	9,297.99	15,989.84	12,321.36	63.36	67.95	-179.95	3,255.98	-1.11	3,023.77	2,892.46	131.31	23.028		
13,000.00	9,298.41	16,089.84	12,321.43	65.10	69.63	-179.95	3,355.97	-1.62	3,023.42	2,888.69	134.72	22.441		
13,100.00	9,298.84	16,189.84	12,321.50	66.84	71.32	-179.96	3,455.97	-2.13	3,023.06	2,884.91	138.15	21.882		
13,200.00	9,299.26	16,289.84	12,321.57	68.58	73.01	-179.96	3,555.97	-2.64	3,022.71	2,881.11	141.59	21.348		
13,300.00	9,299.68	16,389.84	12,321.64	70.33	74.71	-179.96	3,655.97	-3.15	3,022.36	2,877.31	145.04	20.837		
13,400.00	9,300.11	16,489.84	12,321.71	72.08	76.42	-179.96	3,755.97	-3.66	3,022.00	2,873.50	148.50	20.350		
13,500.00	9,300.53	16,589.84	12,321.78	73.84	78.13	-179.96	3,855.96	-4.17	3,021.65	2,869.68	151.97	19.883		
13,600.00	9,300.95	16,689.83	12,321.85	75.60	79.85	-179.96	3,955.96	-4.68	3,021.30	2,865.84	155.45	19.436		
13,700.00	9,301.38	16,789.83	12,321.92	77.36	81.57	-179.96	4,055.96	-5.19	3,020.94	2,862.01	158.94	19.007		
13,800.00	9,301.80	16,889.83	12,321.99	79.13	83.30	-179.96	4,155.96	-5.70	3,020.59	2,858.16	162.43	18.597		
13,900.00	9,302.22	16,989.83	12,322.06	80.89	85.03	-179.97	4,255.96	-6.20	3,020.24	2,854.31	165.93	18.202		
14,000.00	9,302.64	17,089.83	12,322.13	82.66	86.77	-179.97	4,355.95	-6.71	3,019.88	2,850.45	169.43	17.824		
14,100.00	9,303.07	17,189.83	12,322.20	84.44	88.51	-179.97	4,455.95	-7.22	3,019.53	2,846.59	172.94	17.460		
14,200.00	9,303.49	17,289.83	12,322.27	86.21	90.25	-179.97	4,555.95	-7.73	3,019.18	2,842.72	176.46	17.110		
14,300.00	9,303.91	17,389.83	12,322.33	87.99	91.99	-179.97	4,655.95	-8.24	3,018.82	2,838.84	179.98	16.773		
14,400.00	9,304.34	17,489.83	12,322.40	89.77	93.74	-179.97	4,755.95	-8.75	3,018.47	2,834.96	183.51	16.449		
14,500.00	9,304.76	17,589.83	12,322.47	91.55	95.49	-179.97	4,855.94	-9.26	3,018.12	2,831.08	187.04	16.136		
14,600.00	9,305.18	17,689.83	12,322.54	93.33	97.24	-179.97	4,955.94	-9.77	3,017.76	2,827.19	190.57	15.835		
14,700.00	9,305.61	17,789.83	12,322.61	95.11	99.00	-179.98	5,055.94	-10.28	3,017.41	2,823.29	194.11	15.544		
14,800.00	9,306.03	17,889.83	12,322.68	96.90	100.76	-179.98	5,155.94	-10.79	3,017.06	2,819.40	197.66	15.264		
14,900.00	9,306.45	17,989.83	12,322.75	98.69	102.52	-179.98	5,255.94	-11.30	3,016.70	2,815.50	201.21	14.993		
15,000.00	9,306.87	18,089.83	12,322.82	100.47	104.28	-179.98	5,355.93	-11.81	3,016.35	2,811.59	204.76	14.731		
15,100.00	9,307.30	18,189.82	12,322.89	102.26	106.05	-179.98	5,455.93	-12.32	3,016.00	2,807.68	208.31	14.478		
15,200.00	9,307.72	18,289.82	12,322.96	104.06	107.82	-179.98	5,555.93	-12.83	3,015.64	2,803.77	211.87	14.233		
15,300.00	9,308.14	18,389.82	12,323.03	105.85	109.58	-179.98	5,655.93	-13.34	3,015.29	2,799.86	215.43	13.996		
15,400.00	9,308.57	18,489.82	12,323.10	107.64	111.36	-179.98	5,755.93	-13.85	3,014.94	2,795.94	219.00	13.767		
15,500.00	9,308.99	18,589.82	12,323.17	109.43	113.13	-179.99	5,855.92	-14.36	3,014.58	2,792.02	222.56	13.545		
15,600.00	9,309.41	18,689.82	12,323.24	111.23	114.90	-179.99	5,955.92	-14.87	3,014.23	2,788.10	226.13	13.329		
15,700.00	9,309.84	18,789.82	12,323.31	113.03	116.68	-179.99	6,055.92	-15.38	3,013.88	2,784.17	229.70	13.121		
15,800.00	9,310.26	18,889.82	12,323.38	114.82	118.46	-179.99	6,155.92	-15.89	3,013.52	2,780.25	233.28	12.918		
15,900.00	9,310.68	18,989.82	12,323.45	116.62	120.23	-179.99	6,255.92	-16.40	3,013.17	2,776.32	236.86	12.722		
16,000.00	9,311.11	19,089.82	12,323.52	118.42	122.01	-179.99	6,355.91	-16.91	3,012.82	2,772.38	240.43	12.531		
16,100.00	9,311.53	19,189.82	12,323.59	120.22	123.80	-179.99	6,455.91	-17.42	3,012.46	2,768.45	244.02	12.345		
16,200.00	9,311.95	19,289.82	12,323.66	122.02	125.58	-179.99	6,555.91	-17.93	3,012.11	2,764.51	247.60	12.165		
16,300.00	9,312.37	19,389.82	12,323.73	123.82	127.36	-180.00	6,655.91	-18.44	3,011.76	2,760.57	251.18	11.990		
16,400.00	9,312.80	19,489.82	12,323.80	125.62	129.15	-180.00	6,755.91	-18.95	3,011.40	2,756.63	254.77	11.820		
16,500.00	9,313.22	19,589.82	12,323.87	127.42	130.93	-180.00	6,855.90	-19.46	3,011.05	2,752.69	258.36	11.655		
16,600.00	9,313.64	19,689.82	12,323.94	129.23	132.72	-180.00	6,955.90	-19.96	3,010.70	2,748.75	261.95	11.493		
16,684.31	9,314.00	19,774.13	12,324.00	130.75	134.23	-180.00	7,040.21	-20.39	3,010.40	2,745.42	264.98	11.361		

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

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Reference Site:	Sec. 35, T 24 S., R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Site Error:	5.00 ft	North Reference:	Grid
Reference Well:	Eider Federal 108H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB=26' @ 3577.70ft (Scandril Freedom) Coordinates are relative to: Eider Federal 108H
 Offset Depths are relative to Offset Datum
 Central Meridian is -104.333334
 Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Grid Convergence at Surface is: 0.37°





Integrity Directional Services, LLC

Anticollision Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandriil Freedom)
Reference Site:	Sec. 35, T 24 S. , R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandriil Freedom)
Site Error:	5.00 ft	North Reference:	Grid
Reference Well:	Eider Federal 108H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB=26' @ 3577.70ft (Scandriil FreedcCoordinates are relative to: Eider Federal 108H

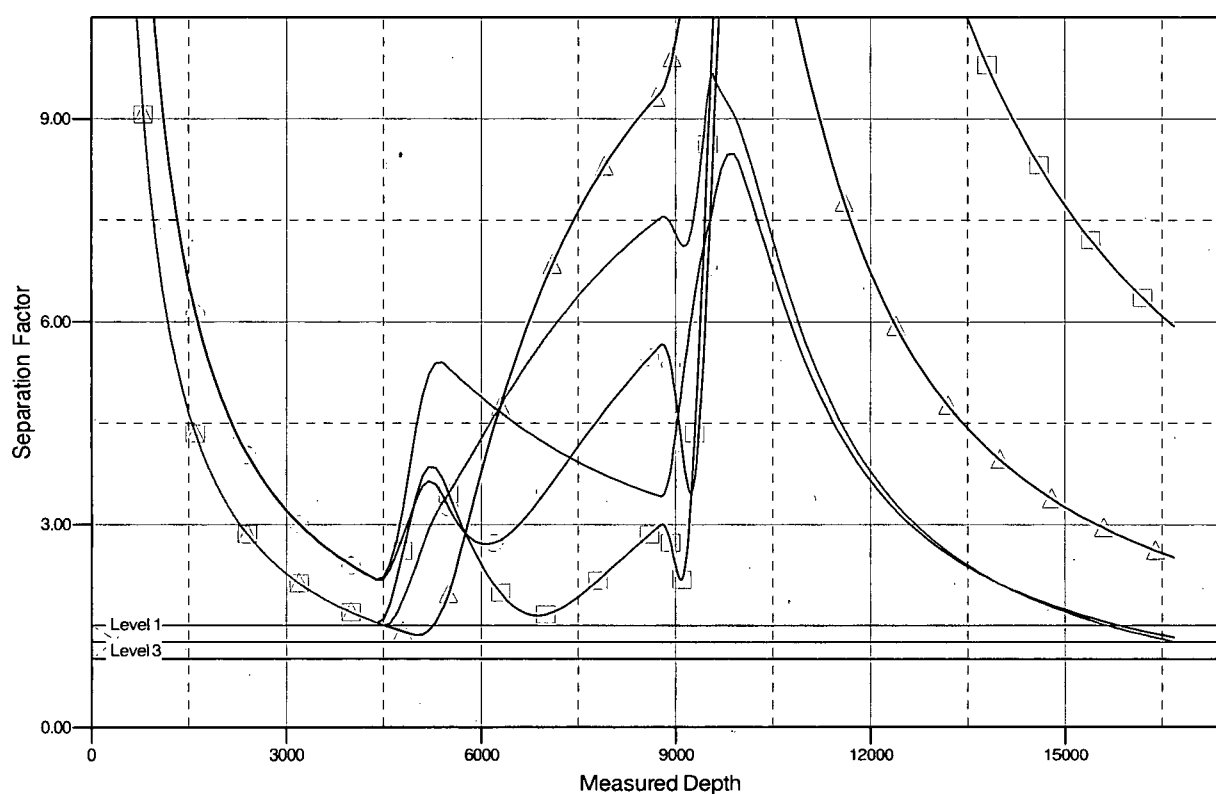
Offset Depths are relative to Offset Datum

Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30

Central Meridian is -104.333334

Grid Convergence at Surface is: 0.37°

Separation Factor Plot



LEGEND

- Eider Federal 401H, Wellbore #1, Plan #1 V0
- ◆ Eider Federal 207H, Wellbore #1, Plan #1 V0
- ✕ Eider Federal 307H, Wellbore #1, Plan #1 V0
- Eider Federal 601H, Wellbore #1, Plan #1 V0
- ▲ Eider Federal 107H, Wellbore #1, Plan #1 V0

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



COG Operating L L C
 Project: Lea County, NM (NAD27 NME)
 Site: Sec. 35, T 24 S., R 32 E
 Well: Elder Federal 108H
 Wellbore: Wellbore #1
 Plan: Plan #1 (Elder Federal 108H/Wellbore #1)
 Scandriil Freedom



WELL DETAILS: Elder Federal 108H

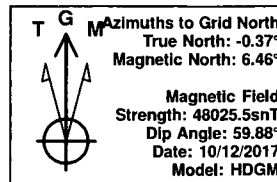
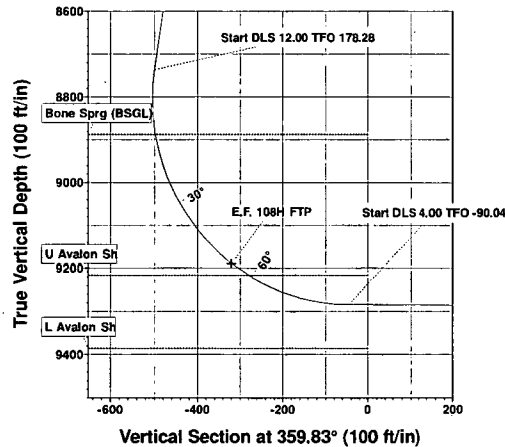
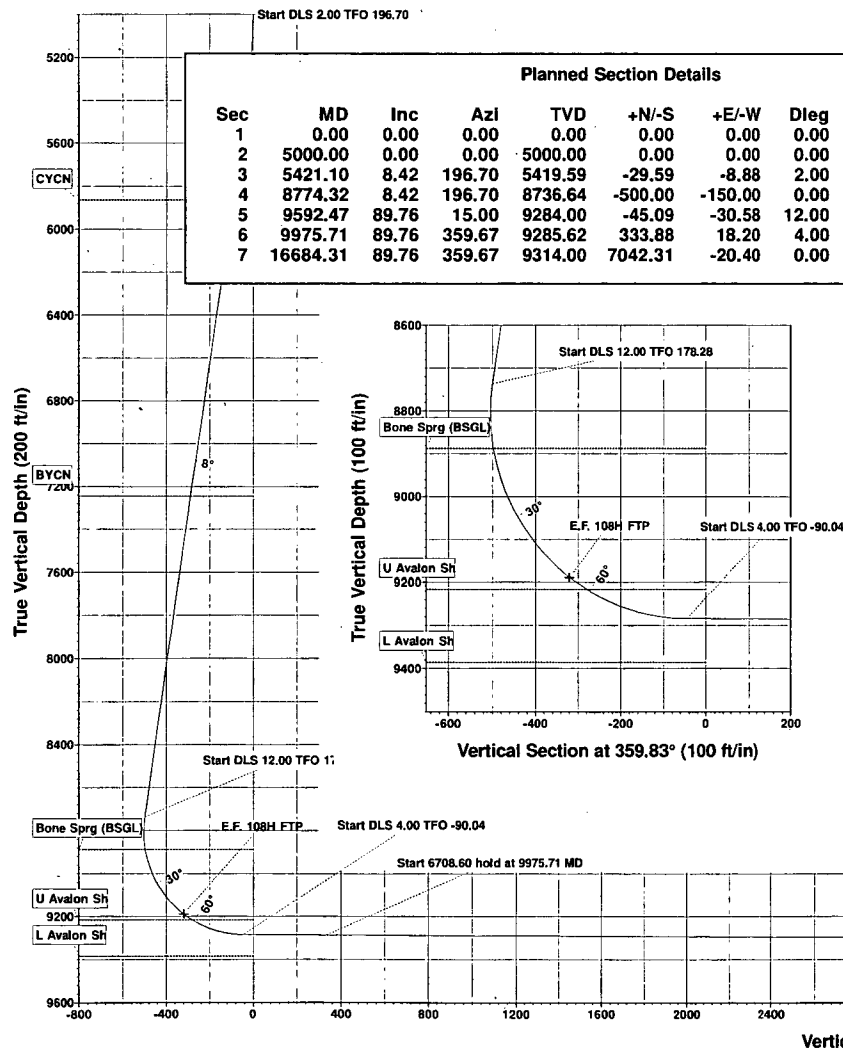
Ground Elevation:: 3551.70
 RKB Elevation: KB=26' @ 3577.70ft (Scandriil Freedom)
 Rig Name: Scandriil Freedom

Northing 425720.5000 Easting 715293.3000 Latitude 32.168509 Longitude -103.637559

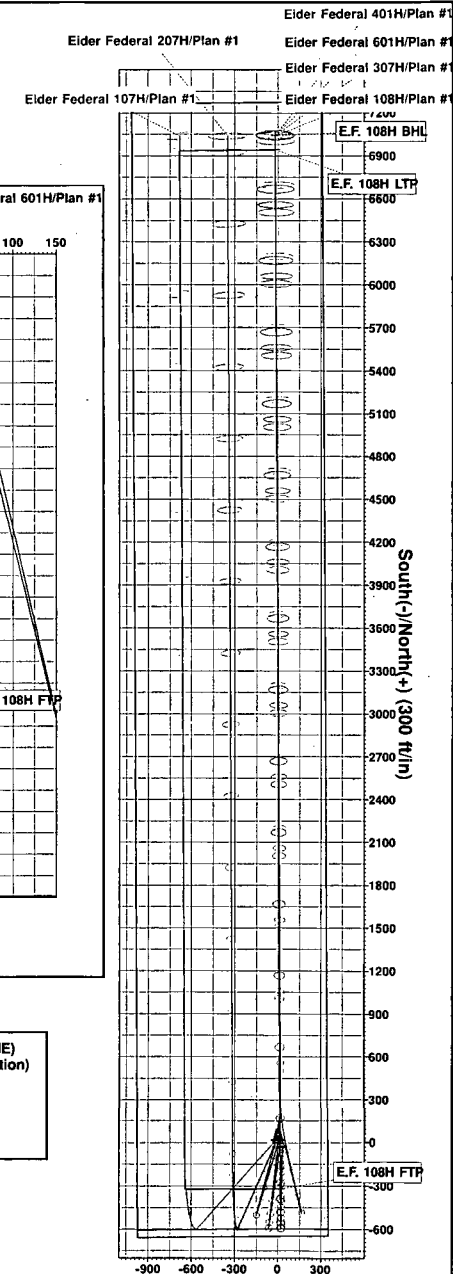
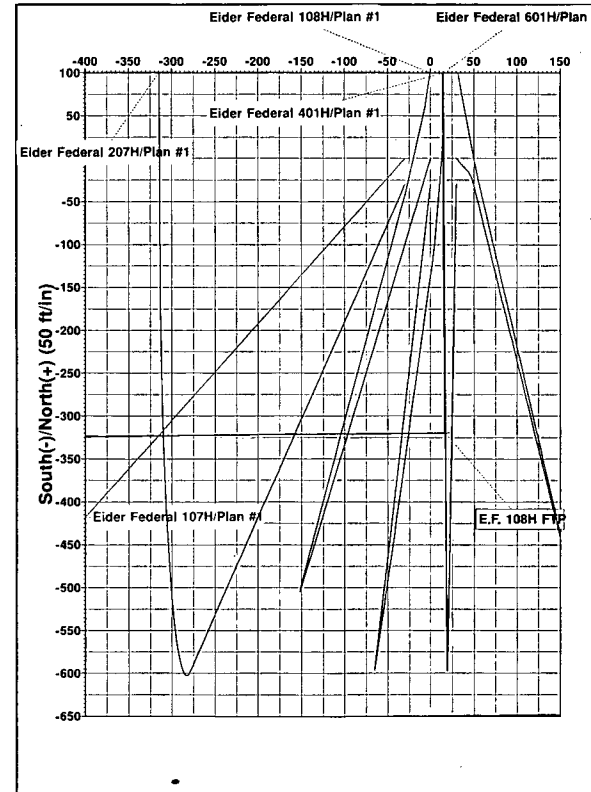
Start DLS 2.00 TFO 196.70

Planned 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	5000.00	0.00	0.00	5000.00	0.00	0.00	0.00	0.00	0.00
3	5421.10	8.42	196.70	5419.59	-29.59	-8.88	2.00	196.70	-29.56
4	8774.32	8.42	196.70	8736.64	-500.00	-150.00	0.00	0.00	-499.56
5	9592.47	89.76	15.00	9284.00	-45.09	-30.58	12.00	178.28	-45.00
6	9975.71	89.76	359.67	9285.62	333.88	18.20	4.00	-90.04	333.83
7	16684.31	89.76	359.67	9314.00	7042.31	-20.40	0.00	0.00	7042.34



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



Vertical Section at 359.83° (200 ft/in)



C O N C H O

COG Operating L L C

Lea County, NM (NAD27 NME)

Sec. 35, T 24 S. , R 32 E

Eider Federal 108H

Wellbore #1

Plan: Plan #1

Standard Survey Report

13 October, 2017





Integrity Directional Services, LLC

Survey Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandrill Freedom)
Site:	Sec. 35, T 24 S. , R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandrill Freedom)
Well:	Eider Federal 108H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Multi User Db

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

Site	Sec. 35, T 24 S. , R 32 E		
Site Position:		Northing:	425,243.2930 usft
From:	Map	Easting:	711,320.5000 usft
Position Uncertainty:	5.00 ft	Slot Radius:	13-3/16 "
		Latitude:	32.167268
		Longitude:	-103.650407
		Grid Convergence:	0.36 °

Well	Eider Federal 108H		
Well Position	+N/-S	0.00 ft	Northing:
	+E/-W	0.00 ft	Easting:
Position Uncertainty	0.00 ft	Wellhead Elevation:	0.00 ft
		Latitude:	32.168509
		Longitude:	-103.637559
		Ground Level:	3,551.70 ft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination
	HDGM	10/12/2017	(°)
			6.83
			Dip Angle
			(°)
			59.88
			Field Strength
			(nT)
			48,026

Design	Plan #1		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(ft)	(ft)	(ft)
	0.00	0.00	0.00
			Direction
			(°)
			359.83

Survey Tool Program	Date 10/13/2017		
From	To	Survey (Wellbore)	Tool Name
(ft)	(ft)		Description
0.00	16,684.31	Plan #1 (Wellbore #1)	MWD
			MWD - Standard

Planned Survey										
Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Vertical Section	Dogleg Rate	Build Rate	Turn Rate	
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(°/100usft)	(°/100usft)	(°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
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	



CONCHO

Integrity Directional Services, LLC

Survey Report



Company: COG Operating L L C
 Project: Lea County, NM (NAD27 NME)
 Site: Sec. 35, T 24 S., R 32 E
 Well: Eider Federal 108H
 Wellbore: Wellbore #1
 Design: Plan #1

Local Co-ordinate Reference: Well Eider Federal 108H
 TVD Reference: KB=26' @ 3577.70ft (Scandril Freedom)
 MD Reference: KB=26' @ 3577.70ft (Scandril Freedom)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
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
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00
Start DLS 2.00 TFO 196.70									
5,100.00	2.00	196.70	5,099.98	-1.67	-0.50	-1.67	2.00	2.00	0.00
5,200.00	4.00	196.70	5,199.84	-6.68	-2.01	-6.68	2.00	2.00	0.00



Integrity Directional Services, LLC

Survey Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandrill Freedom)
Site:	Sec. 35, T 24 S., R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandrill Freedom)
Well:	Eider Federal 108H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,300.00	6.00	196.70	5,299.45	-15.03	-4.51	-15.02	2.00	2.00	0.00
5,400.00	8.00	196.70	5,398.70	-26.70	-8.01	-26.68	2.00	2.00	0.00
5,421.10	8.42	196.70	5,419.59	-29.59	-8.88	-29.56	2.00	2.00	0.00
Start 3353.21 hold at 5421.10 MD									
5,500.00	8.42	196.70	5,497.63	-40.66	-12.20	-40.62	0.00	0.00	0.00
5,600.00	8.42	196.70	5,596.56	-54.69	-16.41	-54.64	0.00	0.00	0.00
5,700.00	8.42	196.70	5,695.48	-68.72	-20.61	-68.66	0.00	0.00	0.00
5,800.00	8.42	196.70	5,794.40	-82.74	-24.82	-82.67	0.00	0.00	0.00
5,900.00	8.42	196.70	5,893.32	-96.77	-29.03	-96.69	0.00	0.00	0.00
6,000.00	8.42	196.70	5,992.24	-110.80	-33.24	-110.71	0.00	0.00	0.00
6,100.00	8.42	196.70	6,091.16	-124.83	-37.45	-124.72	0.00	0.00	0.00
6,200.00	8.42	196.70	6,190.09	-138.86	-41.66	-138.74	0.00	0.00	0.00
6,300.00	8.42	196.70	6,289.01	-152.89	-45.87	-152.75	0.00	0.00	0.00
6,400.00	8.42	196.70	6,387.93	-166.92	-50.07	-166.77	0.00	0.00	0.00
6,500.00	8.42	196.70	6,486.85	-180.95	-54.28	-180.79	0.00	0.00	0.00
6,600.00	8.42	196.70	6,585.77	-194.97	-58.49	-194.80	0.00	0.00	0.00
6,700.00	8.42	196.70	6,684.69	-209.00	-62.70	-208.82	0.00	0.00	0.00
6,800.00	8.42	196.70	6,783.62	-223.03	-66.91	-222.84	0.00	0.00	0.00
6,900.00	8.42	196.70	6,882.54	-237.06	-71.12	-236.85	0.00	0.00	0.00
7,000.00	8.42	196.70	6,981.46	-251.09	-75.33	-250.87	0.00	0.00	0.00
7,100.00	8.42	196.70	7,080.38	-265.12	-79.54	-264.89	0.00	0.00	0.00
7,200.00	8.42	196.70	7,179.30	-279.15	-83.74	-278.90	0.00	0.00	0.00
7,300.00	8.42	196.70	7,278.22	-293.17	-87.95	-292.92	0.00	0.00	0.00
7,400.00	8.42	196.70	7,377.15	-307.20	-92.16	-306.93	0.00	0.00	0.00
7,500.00	8.42	196.70	7,476.07	-321.23	-96.37	-320.95	0.00	0.00	0.00
7,600.00	8.42	196.70	7,574.99	-335.26	-100.58	-334.97	0.00	0.00	0.00
7,700.00	8.42	196.70	7,673.91	-349.29	-104.79	-348.98	0.00	0.00	0.00
7,800.00	8.42	196.70	7,772.83	-363.32	-109.00	-363.00	0.00	0.00	0.00
7,900.00	8.42	196.70	7,871.75	-377.35	-113.20	-377.02	0.00	0.00	0.00
8,000.00	8.42	196.70	7,970.67	-391.37	-117.41	-391.03	0.00	0.00	0.00
8,100.00	8.42	196.70	8,069.60	-405.40	-121.62	-405.05	0.00	0.00	0.00
8,200.00	8.42	196.70	8,168.52	-419.43	-125.83	-419.07	0.00	0.00	0.00
8,300.00	8.42	196.70	8,267.44	-433.46	-130.04	-433.08	0.00	0.00	0.00
8,400.00	8.42	196.70	8,366.36	-447.49	-134.25	-447.10	0.00	0.00	0.00
8,500.00	8.42	196.70	8,465.28	-461.52	-138.46	-461.11	0.00	0.00	0.00
8,600.00	8.42	196.70	8,564.20	-475.55	-142.66	-475.13	0.00	0.00	0.00
8,700.00	8.42	196.70	8,663.13	-489.57	-146.87	-489.15	0.00	0.00	0.00
8,774.32	8.42	196.70	8,736.64	-500.00	-150.00	-499.56	0.00	0.00	0.00
Start DLS 12.00 TFO 178.28									
8,800.00	5.34	197.69	8,762.14	-502.94	-150.90	-502.50	12.00	-11.99	3.86
8,900.00	6.67	12.85	8,861.95	-501.71	-151.03	-501.27	12.00	1.33	175.16
9,000.00	18.67	14.26	8,959.33	-480.46	-145.78	-480.04	12.00	12.00	1.41
9,100.00	30.66	14.58	9,050.04	-440.13	-135.38	-439.73	12.00	12.00	0.32
9,200.00	42.66	14.73	9,130.11	-382.46	-120.29	-382.11	12.00	12.00	0.15



Integrity Directional Services, LLC

Survey Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandrill Freedom)
Site:	Sec. 35, T 24 S., R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandrill Freedom)
Well:	Eider Federal 108H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,300.00	54.66	14.82	9,196.04	-310.00	-101.17	-309.70	12.00	12.00	0.09
9,314.50	56.40	14.83	9,204.24	-298.44	-98.11	-298.16	12.00	12.00	0.08
E.F. 108H FTP									
9,400.00	66.66	14.89	9,244.94	-225.89	-78.86	-225.66	12.00	12.00	0.07
9,500.00	78.66	14.95	9,274.69	-133.82	-54.32	-133.66	12.00	12.00	0.06
9,592.47	89.76	15.00	9,284.00	-45.09	-30.58	-45.00	12.00	12.00	0.05
Start DLS 4.00 TFO -90.04									
9,600.00	89.76	14.70	9,284.03	-37.81	-28.65	-37.72	4.00	0.00	-4.00
9,700.00	89.76	10.70	9,284.45	59.73	-6.68	59.75	4.00	0.00	-4.00
9,800.00	89.76	6.70	9,284.87	158.56	8.45	158.53	4.00	0.00	-4.00
9,900.00	89.76	2.70	9,285.30	258.20	16.64	258.15	4.00	0.00	-4.00
9,975.71	89.76	359.67	9,285.62	333.88	18.20	333.83	4.00	0.00	-4.00
Start 6708.60 hold at 9975.71 MD									
10,000.00	89.76	359.67	9,285.72	358.17	18.06	358.12	0.00	0.00	0.00
10,100.00	89.76	359.67	9,286.15	458.17	17.48	458.12	0.00	0.00	0.00
10,200.00	89.76	359.67	9,286.57	558.17	16.91	558.12	0.00	0.00	0.00
10,300.00	89.76	359.67	9,286.99	658.16	16.33	658.11	0.00	0.00	0.00
10,400.00	89.76	359.67	9,287.41	758.16	15.76	758.11	0.00	0.00	0.00
10,500.00	89.76	359.67	9,287.84	858.16	15.18	858.11	0.00	0.00	0.00
10,600.00	89.76	359.67	9,288.26	958.16	14.61	958.11	0.00	0.00	0.00
10,700.00	89.76	359.67	9,288.68	1,058.15	14.03	1,058.11	0.00	0.00	0.00
10,800.00	89.76	359.67	9,289.11	1,158.15	13.46	1,158.11	0.00	0.00	0.00
10,900.00	89.76	359.67	9,289.53	1,258.15	12.88	1,258.11	0.00	0.00	0.00
11,000.00	89.76	359.67	9,289.95	1,358.15	12.31	1,358.11	0.00	0.00	0.00
11,100.00	89.76	359.67	9,290.38	1,458.14	11.73	1,458.10	0.00	0.00	0.00
11,200.00	89.76	359.67	9,290.80	1,558.14	11.16	1,558.10	0.00	0.00	0.00
11,300.00	89.76	359.67	9,291.22	1,658.14	10.58	1,658.10	0.00	0.00	0.00
11,400.00	89.76	359.67	9,291.65	1,758.14	10.00	1,758.10	0.00	0.00	0.00
11,500.00	89.76	359.67	9,292.07	1,858.13	9.43	1,858.10	0.00	0.00	0.00
11,600.00	89.76	359.67	9,292.49	1,958.13	8.85	1,958.10	0.00	0.00	0.00
11,700.00	89.76	359.67	9,292.91	2,058.13	8.28	2,058.10	0.00	0.00	0.00
11,800.00	89.76	359.67	9,293.34	2,158.13	7.70	2,158.10	0.00	0.00	0.00
11,900.00	89.76	359.67	9,293.76	2,258.12	7.13	2,258.09	0.00	0.00	0.00
12,000.00	89.76	359.67	9,294.18	2,358.12	6.55	2,358.09	0.00	0.00	0.00
12,100.00	89.76	359.67	9,294.61	2,458.12	5.98	2,458.09	0.00	0.00	0.00
12,200.00	89.76	359.67	9,295.03	2,558.12	5.40	2,558.09	0.00	0.00	0.00
12,300.00	89.76	359.67	9,295.45	2,658.11	4.83	2,658.09	0.00	0.00	0.00
12,400.00	89.76	359.67	9,295.88	2,758.11	4.25	2,758.09	0.00	0.00	0.00
12,500.00	89.76	359.67	9,296.30	2,858.11	3.68	2,858.09	0.00	0.00	0.00
12,600.00	89.76	359.67	9,296.72	2,958.11	3.10	2,958.08	0.00	0.00	0.00
12,700.00	89.76	359.67	9,297.14	3,058.10	2.52	3,058.08	0.00	0.00	0.00
12,800.00	89.76	359.67	9,297.57	3,158.10	1.95	3,158.08	0.00	0.00	0.00
12,900.00	89.76	359.67	9,297.99	3,258.10	1.37	3,258.08	0.00	0.00	0.00



Integrity Directional Services, LLC
Survey Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandrill Freedom)
Site:	Sec. 35, T 24 S., R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandrill Freedom)
Well:	Eider Federal 108H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Multi User Db

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,000.00	89.76	359.67	9,298.41	3,358.10	0.80	3,358.08	0.00	0.00	0.00
13,100.00	89.76	359.67	9,298.84	3,458.09	0.22	3,458.08	0.00	0.00	0.00
13,200.00	89.76	359.67	9,299.26	3,558.09	-0.35	3,558.08	0.00	0.00	0.00
13,300.00	89.76	359.67	9,299.68	3,658.09	-0.93	3,658.08	0.00	0.00	0.00
13,400.00	89.76	359.67	9,300.11	3,758.09	-1.50	3,758.07	0.00	0.00	0.00
13,500.00	89.76	359.67	9,300.53	3,858.08	-2.08	3,858.07	0.00	0.00	0.00
13,600.00	89.76	359.67	9,300.95	3,958.08	-2.65	3,958.07	0.00	0.00	0.00
13,700.00	89.76	359.67	9,301.38	4,058.08	-3.23	4,058.07	0.00	0.00	0.00
13,800.00	89.76	359.67	9,301.80	4,158.08	-3.80	4,158.07	0.00	0.00	0.00
13,900.00	89.76	359.67	9,302.22	4,258.07	-4.38	4,258.07	0.00	0.00	0.00
14,000.00	89.76	359.67	9,302.64	4,358.07	-4.96	4,358.07	0.00	0.00	0.00
14,100.00	89.76	359.67	9,303.07	4,458.07	-5.53	4,458.07	0.00	0.00	0.00
14,200.00	89.76	359.67	9,303.49	4,558.07	-6.11	4,558.06	0.00	0.00	0.00
14,300.00	89.76	359.67	9,303.91	4,658.06	-6.68	4,658.06	0.00	0.00	0.00
14,400.00	89.76	359.67	9,304.34	4,758.06	-7.26	4,758.06	0.00	0.00	0.00
14,500.00	89.76	359.67	9,304.76	4,858.06	-7.83	4,858.06	0.00	0.00	0.00
14,600.00	89.76	359.67	9,305.18	4,958.06	-8.41	4,958.06	0.00	0.00	0.00
14,700.00	89.76	359.67	9,305.61	5,058.05	-8.98	5,058.06	0.00	0.00	0.00
14,800.00	89.76	359.67	9,306.03	5,158.05	-9.56	5,158.06	0.00	0.00	0.00
14,900.00	89.76	359.67	9,306.45	5,258.05	-10.13	5,258.06	0.00	0.00	0.00
15,000.00	89.76	359.67	9,306.87	5,358.05	-10.71	5,358.05	0.00	0.00	0.00
15,100.00	89.76	359.67	9,307.30	5,458.04	-11.28	5,458.05	0.00	0.00	0.00
15,200.00	89.76	359.67	9,307.72	5,558.04	-11.86	5,558.05	0.00	0.00	0.00
15,300.00	89.76	359.67	9,308.14	5,658.04	-12.43	5,658.05	0.00	0.00	0.00
15,400.00	89.76	359.67	9,308.57	5,758.04	-13.01	5,758.05	0.00	0.00	0.00
15,500.00	89.76	359.67	9,308.99	5,858.03	-13.59	5,858.05	0.00	0.00	0.00
15,600.00	89.76	359.67	9,309.41	5,958.03	-14.16	5,958.05	0.00	0.00	0.00
15,700.00	89.76	359.67	9,309.84	6,058.03	-14.74	6,058.04	0.00	0.00	0.00
15,800.00	89.76	359.67	9,310.26	6,158.02	-15.31	6,158.04	0.00	0.00	0.00
15,900.00	89.76	359.67	9,310.68	6,258.02	-15.89	6,258.04	0.00	0.00	0.00
16,000.00	89.76	359.67	9,311.11	6,358.02	-16.46	6,358.04	0.00	0.00	0.00
16,100.00	89.76	359.67	9,311.53	6,458.02	-17.04	6,458.04	0.00	0.00	0.00
16,200.00	89.76	359.67	9,311.95	6,558.01	-17.61	6,558.04	0.00	0.00	0.00
16,300.00	89.76	359.67	9,312.37	6,658.01	-18.19	6,658.04	0.00	0.00	0.00
16,400.00	89.76	359.67	9,312.80	6,758.01	-18.76	6,758.04	0.00	0.00	0.00
16,500.00	89.76	359.67	9,313.22	6,858.01	-19.34	6,858.03	0.00	0.00	0.00
16,584.41	89.76	359.67	9,313.58	6,942.41	-19.83	6,942.44	0.00	0.00	0.00
E.F. 108H LTP									
16,600.00	89.76	359.67	9,313.64	6,958.00	-19.91	6,958.03	0.00	0.00	0.00
16,684.31	89.76	359.67	9,314.00	7,042.31	-20.40	7,042.34	0.00	0.00	0.00
TD at 16684.31 - E.F. 108H BHL									

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 108H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Site:	Sec. 35, T 24 S., R 32 E	MD Reference:	KB=26' @ 3577.70ft (Scandril Freedom)
Well:	Eider Federal 108H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Multi User Db

Design Targets
Target Name

- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)		
E.F. 108H FTP	0.00	0.00	9,188.66	-319.78	16.58	425,400.7251	715,309.8813	32.167630	-103.637512
- plan misses target center by 117.69ft at 9312.88ft MD (9203.34 TVD, -299.75 N, -98.46 E)									
- Point									
E.F. 108H LTP	0.00	0.00	9,313.58	6,942.41	-19.87	432,662.8985	715,273.4305	32.187593	-103.637478
- plan misses target center by 0.04ft at 16584.41ft MD (9313.58 TVD, 6942.41 N, -19.83 E)									
- Point									
E.F. 108H BHL	0.00	0.00	9,314.00	7,042.31	-20.40	432,762.8000	715,272.9000	32.187868	-103.637478
- plan hits target center									
- Point									

Formations

Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction
(ft)	(ft)			(°)	(°)
1,015.70	1,015.70	Rustler		0.00	
1,348.70	1,348.70	TOS		0.00	
4,682.70	4,682.70	BOS (Fletcher)		0.00	
4,910.70	4,910.70	LMAR (Top Delaware)		0.00	
4,956.70	4,956.70	BLCN		0.00	
5,872.08	5,865.70	CYCN		0.00	
7,267.12	7,245.70	BYCN		0.00	
8,926.03	8,887.70	Bone Sprg (BSGL)		0.00	
9,337.88	9,216.70	U Avalon Sh		0.00	

Plan Annotations

Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S	+E/-W	
(ft)	(ft)	(ft)	(ft)	
5000	5000	0	0	Start DLS 2.00 TFO 196.70
5421	5420	-30	-9	Start 3353.21 hold at 5421.10 MD
8774	8737	-500	-150	Start DLS 12.00 TFO 178.28
9592	9284	-45	-31	Start DLS 4.00 TFO -90.04
9976	9286	334	18	Start 6708.60 hold at 9975.71 MD
16,684	9314	7042	-20	TD at 16684.31

Checked By: _____ Approved By: _____ Date: _____

COG Operating, LLC - Eider Federal #108H

1. Geologic Formations

TVD of target	9,314' EOL	Pilot hole depth	NA
MD at TD:	16,684'	Deepest expected fresh water:	380'

Formation	Depth (TVD) from KB	Water/Mineral Bearing/Target Zone?	Hazards
Quaternary Fill	Surface	Water	
Rustler	1016	Water	
Top of Salt	1349	Salt	
Base of Salt	4683	Salt	
Lamar	4911	Salt Water	
Bell Canyon	4957	Salt Water	
Cherry Canyon	5866	Oil/Gas	
Brushy Canyon	7246	Oil/Gas	
Bone Spring Lime	8888	Oil/Gas	
U. Avalon Shale	9217	Oil/Gas	
L. Avalon Shale	9386	Not Penetrated	
1st Bone Spring Sand	X	Not Penetrated	
2nd Bone Spring Sand	X	Not Penetrated	
3rd Bone Spring Sand	X	Not Penetrated	
Wolfcamp	X	Not Penetrated	

2. Casing Program

Hole Size	Casing		Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
	From	To							
17.5"	0	1045	13.375"	54.5	J55	STC	2.36	1.25	9.03
12.25"	0	4000	9.625"	40	J55	LTC	1.22	1.11	3.25
12.25"	4000	4940	9.625"	40	L80	LTC	1.19	1.61	5.73
8.75"	0	16,684	5.5"	17	P110	LTC	1.66	2.98	2.81
BLM Minimum Safety Factor							1.125	1	1.6 Dry 1.8 Wet

Intermediate casing will be kept at least 1/3 full while running casing to mitigate collapse. Intermediate burst based on 0.7 frac gradient at the shoe with Gas Gradient 0.1 psi/ft to surface.

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

October 16, 2017

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