Form 3160-3
(March 2012)

FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.: NMLC028731A

6. If Indian, Allotee or Tribe Name:

1a. Type of work: ☑ DRILL ☐ REENTER

7. If Unit or CA Agreement, Name and No.: NMNM88525X

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

8. Lease Name and Well No.: BURCH KEELY UNIT 951H 308086

2. Name of Operator: COG OPERATING LLC 229137

9. API Well No.: 30-015-44657

3a. Address: 600 West Illinois Ave Midland TX 79701

3b. Phone No. *(include area code)*: (432)683-7443

10. Field and Pool, or Exploratory: BURCH KEELY / GLORIETA-UPPER YE

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

At surface: NESE / 1720 FSL / 90 FEL / LAT 32.8175329 / LONG -104.0543344

At proposed prod. zone: LOT 8 / 1650 FSL / 245 FWL / LAT 32.8173198 / LONG -104.0188526

11. Sec., T. R. M. or Blk. and Survey or Area: SEC 22 / T17S / R29E / NMP

14. Distance in miles and direction from nearest town or post office*: 4 miles

12. County or Parish: EDDY

13. State: NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any): 120 feet

16. No. of acres in lease: 600

17. Spacing Unit dedicated to this well: 357.41

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.: 1 feet

19. Proposed Depth: 4950 feet / 15657 feet

20. BLM/BIA Bond No. on file: FED: NMB000215

21. Elevations (Show whether DF, KDB, RT, GL, etc.): 3584 feet

22. Approximate date work will start*: 08/31/2017

23. Estimated duration: 15 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, must be attached to this form:

1. Well plat certified by a registered surveyor.
2. A Drilling Plan.
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).
4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification
6. Such other site specific information and/or plans as may be required by the BLM.

25. Signature	Name *(Printed/Typed)*	Date
(Electronic Submission)	Robyn Odom / Ph: (432)685-4385	04/20/2017

Title: Regulatory Analyst

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
(Electronic Submission)	Cody Layton / Ph: (575)234-5959	01/29/2018

Title	Office
Supervisor Multiple Resources	CARLSBAD

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

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

*(Instructions on page 2)

APPROVED WITH CONDITIONS

Approval Date: 01/29/2018

NM OIL CONSERVATION
ARTESIA DISTRICT
FEB 01 2018
RECEIVED

RP 2-2-2018

INSTRUCTIONS

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

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

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

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

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

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

NOTICES

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

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

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

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Additional Operator Remarks

Location of Well

1. SHL: NESE / 1720 FSL / 90 FEL / TWSP: 17S / RANGE: 29E / SECTION: 22 / LAT: 32.8175329 / LONG: -104.0543344 (TVD: 0 feet, MD: 0 feet)
   PPP: NWSW / 1700 FSL / 1 FWL / TWSP: 17S / RANGE: 29E / SECTION: 24 / LAT: 32.817436 / LONG: -104.036789 (TVD: 4950 feet, MD: 10100 feet)
   PPP: NWSE / 1700 FSL / 2639 FEL / TWSP: 17S / RANGE: 29E / SECTION: 23 / LAT: 32.817456 / LONG: -104.045372 (TVD: 4950 feet, MD: 7500 feet)
   PPP: NWSW / 1650 FSL / 330 FEL / TWSP: 17S / RANGE: 29E / SECTION: 23 / LAT: 32.817475 / LONG: -104.052961 (TVD: 4929 feet, MD: 5100 feet)
   BHL: LOT 8 / 1650 FSL / 245 FWL / TWSP: 17S / RANGE: 30E / SECTION: 19 / LAT: 32.8173198 / LONG: -104.0188526 (TVD: 4950 feet, MD: 15657 feet)

BLM Point of Contact

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

Approval Date: 01/29/2018

Review and Appeal Rights

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

PECOS DISTRICT
DRILLING OPERATIONS
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG Operating, LLC
LEASE NO.:	NMNM-88525X
WELL NAME & NO.:	Burch Keely Unit 951H
SURFACE HOLE FOOTAGE:	1720' FSL & 0090' FEL
BOTTOM HOLE FOOTAGE	1650' FSL & 0245' FWL Sec. 19, T. 17 S., R 30 E.
LOCATION:	Section 22, T. 17 S., R 29 E., NMPM
COUNTY:	County, New Mexico

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

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

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

Unit Wells
The well sign for a unit well shall include the unit number in addition to the surface and bottom hole lease numbers.

A. **Hydrogen Sulfide**

1. A Hydrogen Sulfide (H2S) Drilling Plan shall be activated 500 feet prior to drilling into the **Yates** formation. **As a result, the Hydrogen Sulfide area must meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, please provide measured values and formations to the BLM.**

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

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

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

A. CASING

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

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

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

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

Medium Cave/Karst
Possibility of water flows in the Artesia Group and Salado.
Possibility of lost circulation in the San Andres and Grayburg.

1. The **13-3/8** inch surface casing shall be set at approximately **275** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface. **If salt is encountered, set casing at least 25 feet above the salt.**

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

    b. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.**

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

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

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing, which shall be set at approximately **980** feet **(in the base of the Tansill Formation)**, is:

Option #1:

☐ Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst.**

Option #2:

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

a. First stage to DV tool:___

☒ Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with second stage cement job. Operator should have plans as to how they will achieve circulation on the next stage.

b. Second stage above DV tool:

☐ Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst.**

If cement does not circulate to surface on the intermediate casing, the cement on the production casing must come to surface.

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

3. The minimum required fill of cement behind the **7 X 5-1/2** inch production casing is:

Option #1:

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

Option #2:

DV tool shall be set a minimum of 50' below previous shoe and a minimum of 200' above current shoe. Operator shall submit sundry if DV tool depth cannot be set in this range.

a. First stage to DV tool:___

☐ Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with second stage cement job. Operator should have plans as to how they will achieve circulation on the next stage.

b. Second stage above DV tool:

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

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

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 53.

2. **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 surface casing shoe shall be psi.

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

    a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

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

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

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

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

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

the test at full stack pressure.

C. DRILL STEM TEST

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

D. WASTE MATERIAL AND FLUIDS

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

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

JAM 012418

PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG OPERATING LLC.
LEASE NO.:	NMLC028731A
WELL NAME & NO.:	951H –BURCH KEELY UNIT
SURFACE HOLE FOOTAGE:	1700'/S & 90'/E
BOTTOM HOLE FOOTAGE	1650'/S & 245'/W
LOCATION:	Section 22 T.17 S., R.29 E., NMP
COUNTY:	EDDY County, New Mexico

TABLE OF CONTENTS

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

I. GENERAL PROVISIONS

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

II. PERMIT EXPIRATION

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

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

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

IV. NOXIOUS WEEDS

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

V. SPECIAL REQUIREMENT(S)

COA Mid Karst

Cave and Karst

** Depending on location, additional Drilling, Casing, and Cementing procedures may be required by engineering to protect critical karst groundwater recharge areas.

Cave/Karst Surface Mitigation

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

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

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

Pad Berming:
The entire perimeter of the well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad.

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

Tank Battery Liners and Berms:

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

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

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

Cave/Karst Subsurface Mitigation

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

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

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

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

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

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

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

Watershed

- The entire well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad. Topsoil shall not be used to construct the berm. No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad. The berm shall be maintained through the life of the well and after interim reclamation has been completed.
- Any water erosion that may occur due to the construction of the well pad during the life of the well will be quickly corrected and proper measures will be taken to prevent future erosion.

VI. CONSTRUCTION

A. NOTIFICATION

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

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

B. TOPSOIL

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

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

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

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

D. FEDERAL MINERAL MATERIALS PIT

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

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

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

F. EXCLOSURE FENCING (CELLARS & PITS)

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

G. ON LEASE ACCESS ROADS

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

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

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

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

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

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

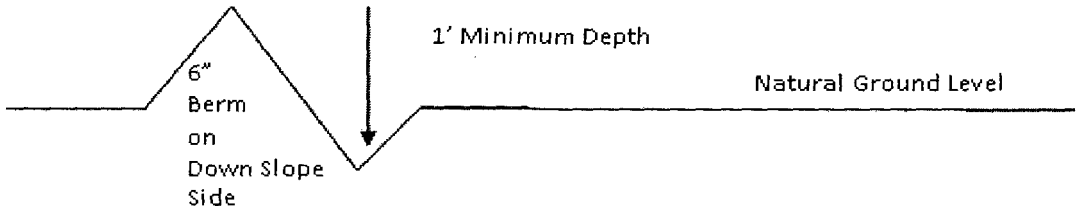
Turnouts
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage

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

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

Cross Section of a Typical Lead-off Ditch



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

Formula for Spacing Interval of Lead-off Ditches

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

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

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

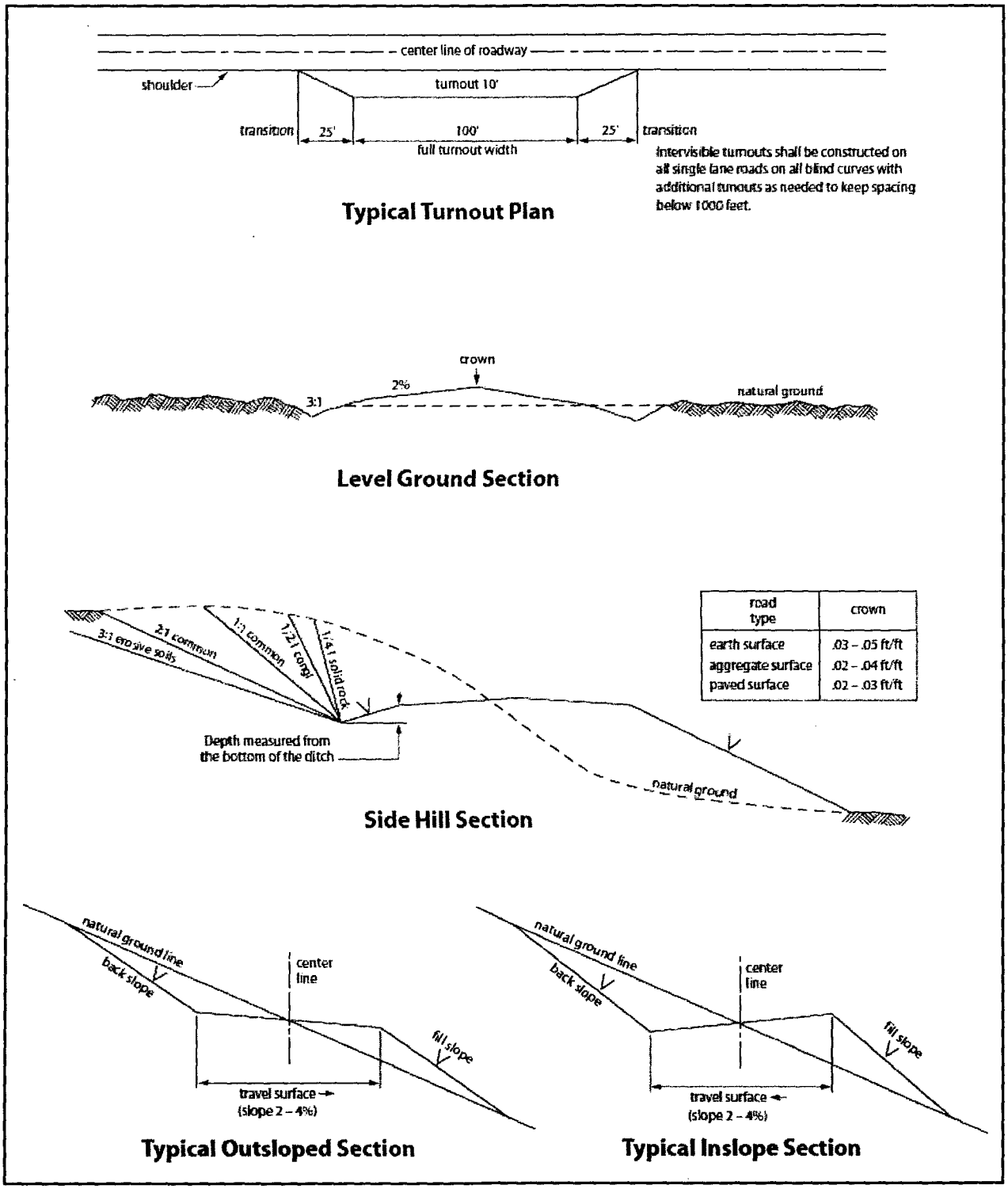


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

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 of duney 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.

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).

Seed Mixture 1 for Loamy 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 shall be tested and the viability testing of seed will be done in accordance with State law(s) and within nine (9) months prior to purchase. Commercial seed 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 shall be planted using a drill equipped with a depth regulator to ensure proper depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture shall be evenly and uniformly planted over the disturbed area (small/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 shall be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre shall be doubled. The seeding shall be repeated until a satisfactory stand is established as determined by the Authorized Officer. Evaluation of growth may not be made before completion of at least one full growing season after seeding.

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

Species	lb/acre
Plains lovegrass (Eragrostis intermedia)	0.5
Sand dropseed (Sporobolus cryptandrus)	1.0
Sideoats grama (Bouteloua curtipendula)	5.0
Plains bristlegrass (Setaria macrostachya)	2.0

*Pounds of pure live seed:

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

AFMSS

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

ator Certification Data Report

01/30/2018

Operator Certification

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

NAME: Robyn Odom **Signed on:** 04/20/2017

Title: Regulatory Analyst

Street Address: 600 W Illinois Ave

City: Midland **State:** TX **Zip:** 79701

Phone: (432)685-4385

Email address: rodom@concho.com

Field Representative

Representative Name:

Street Address:

City: **State:** **Zip:**

Phone:

Email address:

APD ID: 10400011772 **Submission Date:** 04/20/2017

Operator Name: COG OPERATING LLC

Well Name: BURCH KEELY UNIT **Well Number:** 951H

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

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - General

APD ID: 10400011772 **Tie to previous NOS?** 10400004804 **Submission Date:** 04/20/2017

BLM Office: CARLSBAD **User:** Robyn Odom **Title:** Regulatory Analyst

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

Lease number: NMLC028731A **Lease Acres:** 600

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

Agreement in place? YES **Federal or Indian agreement:** FEDERAL

Agreement number: NMNM88525X

Agreement name:

Keep application confidential? NO

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

Operator letter of designation:

Operator Info

Operator Organization Name: COG OPERATING LLC

Operator Address: 600 West Illinois Ave **Zip:** 79701

Operator PO Box:

Operator City: Midland **State:** TX

Operator Phone: (432)683-7443

Operator Internet Address: RODOM@CONCHO.COM

Section 2 - Well Information

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

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

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

Well Name: BURCH KEELY UNIT **Well Number:** 951H **Well API Number:**

Field/Pool or Exploratory? Field and Pool **Field Name:** BURCH KEELY **Pool Name:** GLORIETA-UPPER YESO

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

Operator Name: COG OPERATING LLC

Well Name: BURCH KEELY UNIT **Well Number:** 951H

Describe other minerals:

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

Type of Well Pad: SINGLE WELL **Multiple Well Pad Name:** **Number:**

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

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: INFILL

Describe sub-type:

Distance to town: 4 Miles **Distance to nearest well:** 1 FT **Distance to lease line:** 120 FT

Reservoir well spacing assigned acres Measurement: 357.41 Acres

Well plat: Burch_Keely_Unit_951H_C102_20170908073718.pdf

Well work start Date: 08/31/2017 **Duration:** 15 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NAVD88

Survey number:

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
SHL Leg #1	1720	FSL	90	FEL	17S	29E	22	Aliquot NESE	32.8175329	-104.0543344	EDDY	NEW MEXICO	NEW MEXICO	F	NMLC028731A	3584	0	0
KOP Leg #1	1720	FSL	90	FEL	17S	29E	22	Aliquot NESE	32.8175329	-104.0543344	EDDY	NEW MEXICO	NEW MEXICO	F	NMLC028731A	-845	4429	4429
PPP Leg #1	1650	FSL	330	FEL	17S	29E	23	Aliquot NWSW	32.817475	-104.052961	EDDY	NEW MEXICO	NEW MEXICO	F	NMLC028784B	-1345	5100	4929

Operator Name: COG OPERATING LLC

Well Name: BURCH KEELY UNIT **Well Number:** 951H

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
PPP Leg #1	1700	FSL	2639	FEL	17S	29E	23	Aliquot NWSE	32.817456	-104.045372	EDDY	NEW MEXICO	NEW MEXICO	F	NMLC028793C	-1366	7500	4950
PPP Leg #1	1700	FSL	1	FWL	17S	29E	24	Aliquot NWSW	32.817436	-104.036789	EDDY	NEW MEXICO	NEW MEXICO	F	NMLC028784A	-1366	10100	4950
EXIT Leg #1	1650	FSL	245	FWL	17S	30E	19	Aliquot NWSW	32.817319 8	-104.018852 6	EDDY	NEW MEXICO	NEW MEXICO	F	NMLC028793A	-1366	15657	4950
BHL Leg #1	1650	FSL	245	FWL	17S	30E	19	Lot 8	32.817319 8	-104.018852 6	EDDY	NEW MEXICO	NEW MEXICO	F	NMLC028793A	-1366	15657	4950

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

Choke Diagram Attachment:

2M Choke Schematic_12-19-2016.pdf

BOP Diagram Attachment:

2M ANNULAR BOP_12-19-2016.pdf

Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	SURFACE	17.5	13.375	NEW	API	N	0	275	0	275	-1366	-1641	275	H-40	48	STC	4.36	9.79	DRY	16.77	DRY	16.77
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	980	0	980	-1366	-2346	980	J-55	40	LTC	4.92	1.71	DRY	12.89	DRY	12.89
3	PRODUCTION	8.75	7.0	NEW	API	N	0	4429	0	4429	-1366	-5745	4429	L-80	29	LTC	3.31	1.33	DRY	2.68	DRY	2.68
4	PRODUCTION	8.75	5.5	NEW	API	N	4429	5247	4429	4950	-5745	-6266	818	L-80	17	LTC	2.66	1.26	DRY	3.74	DRY	3.74
5	PRODUCTION	7.875	5.5	NEW	API	N	5247	15657	4950	4950	-6266	-6266	10410	L-80	17	LTC	2.66	1.26	DRY	7.68	DRY	7.68

Casing Attachments

Operator Name: COG OPERATING LLC

Well Name: BURCH KEELY UNIT **Well Number:** 951H

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Casing_Design_Attachement_04-19-2017.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Casing_Design_Attachement_04-19-2017.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Casing_Design_Attachement_04-19-2017.pdf

Operator Name: COG OPERATING LLC

Well Name: BURCH KEELY UNIT **Well Number:** 951H

Casing Attachments

Casing ID: 4 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Casing_Design_Attachement_04-19-2017.pdf

Casing ID: 5 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Casing_Design_Attachement_04-19-2017.pdf

Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	275	350	1.32	14.8	462	142	Class C	2% CaCl2+ 0.25 pps CF
INTERMEDIATE	Lead		0	980	200	2.45	11.8	490		50:50:10 C:Poz:Gel	5%Salt+5pps LCM+0.25pps CF
INTERMEDIATE	Tail				200	1.32	14.8	264	195	Class C	2% CaCl2
PRODUCTION	Lead		0	15657	500	2.01	12.5	1005		35:65:6 C:Poz:Gel	5%Salt+5pps LCM+0.25pps CF

Operator Name: COG OPERATING LLC

Well Name: BURCH KEELY UNIT **Well Number:** 951H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
PRODUCTION	Tail				2700	1.37	14	3699	80	50:50:2 C:Poz:Gel	5%salt+3pps LCM+0.6%SMS+1%FL-25+1%Ba-58+0.125pps
PRODUCTION	Lead		0	15657	500	2.01	12.5	1005		35:65:6 C:Poz:Gel	5%Salt+5pps LCM+0.25pps CF
PRODUCTION	Tail				2700	1.37	14	3699	80	50:50:2 C:Poz:Gel	5%salt+3pps LCM+0.6%SMS+1%FL-25+1%Ba-58+0.125pps
PRODUCTION	Lead		0	15657	500	2.01	12.5	1005		35:65:6 C:Poz:Gel	5%Salt+5pps LCM+0.25pps CF
PRODUCTION	Tail				2700	1.37	14	3699	80	50:50:2 C:Poz:Gel	5%salt+3pps LCM+0.6%SMS+1%FL-25+1%Ba-58+0.125pps

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

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

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

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

Describe the mud monitoring system utilized: PVT/PASON/VISUAL MONITORING

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
4429	15657	WATER-BASED MUD	8.6	8.8							
0	4429	SALT SATURATED	10	10.2							
0	275	WATER-BASED MUD	8.5	9.2							

Operator Name: COG OPERATING LLC

Well Name: BURCH KEELY UNIT **Well Number:** 951H

Section 6 - Test, Logging, Coring

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

Interval perforating, Fracture stimulating, Flow back testing.

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

CNL,MUDLOG

Coring operation description for the well:

N/A

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 2156 **Anticipated Surface Pressure:** 1067

Anticipated Bottom Hole Temperature(F): 106

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

Describe:

Contingency Plans geoharzards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

H2S Plan_12-20-2016.pdf

Burch_Keely_Unit_951H_H2S_Diagram_03-10-2017.pdf

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Burch_Keely_Unit_951H_Design_2_Rpt_20170908074332.pdf

Burch_Keely_Unit_951H_Design_2_AC_Rpt_20170908074342.pdf

Other proposed operations facets description:

Other proposed operations facets attachment:

Closed Loop Schematic_12-20-2016.pdf

BKU_951H_Production_Cement_Breakdown_04-19-2017.pdf

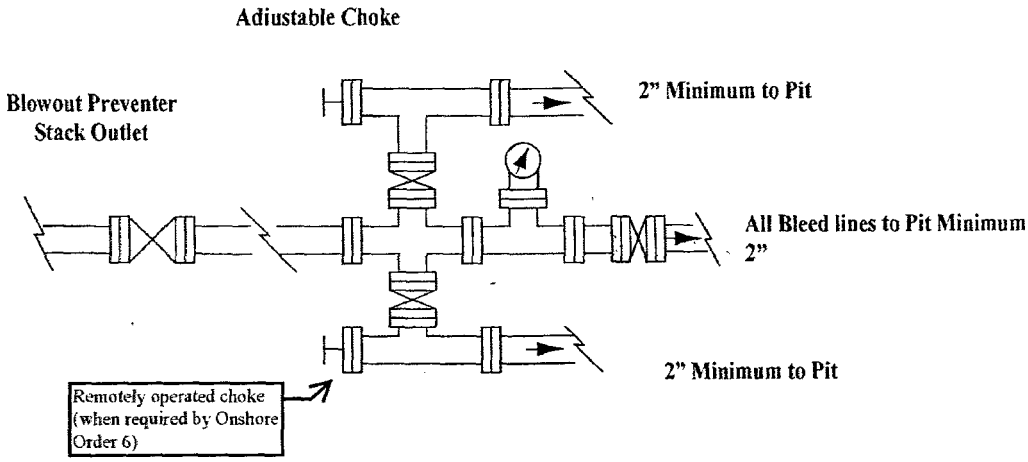
Burch_Keely_Unit_951H_GCP_20170908074353.pdf

Burch_Keely_Unit_951H_Contingent_Multi_Stage_Cmt_Plan_20170908074400.pdf

Other Variance attachment:

COG Operating LLC
Exhibit #9
Choke Schematic

Choke Manifold Requirement (2000 psi WP)



NOTES REGARDING THE BLOWOUT PREVENTERS

Master Drilling Plan
Eddy County, New Mexico

1. Drilling nipple to be so constructed that it can be removed without use of a welder through rotary table opening, with minimum I.D. equal to preventer bore.

2. Wear ring to be properly installed in head.

3. Blow out preventer and all fittings must be in good condition. 2000 psi WP minimum.

4. All fittings to be flanged.

5. Safety valve must be available on rig floor at all times with proper connections, valve to be full 2000 psi WP minimum.

6. All choke and fill lines to be securely anchored especially ends of choke lines.

7. Equipment through which bit must pass shall be at least as large as the diameter of the casing being drilled through.

8. Kelly cock on Kelly.

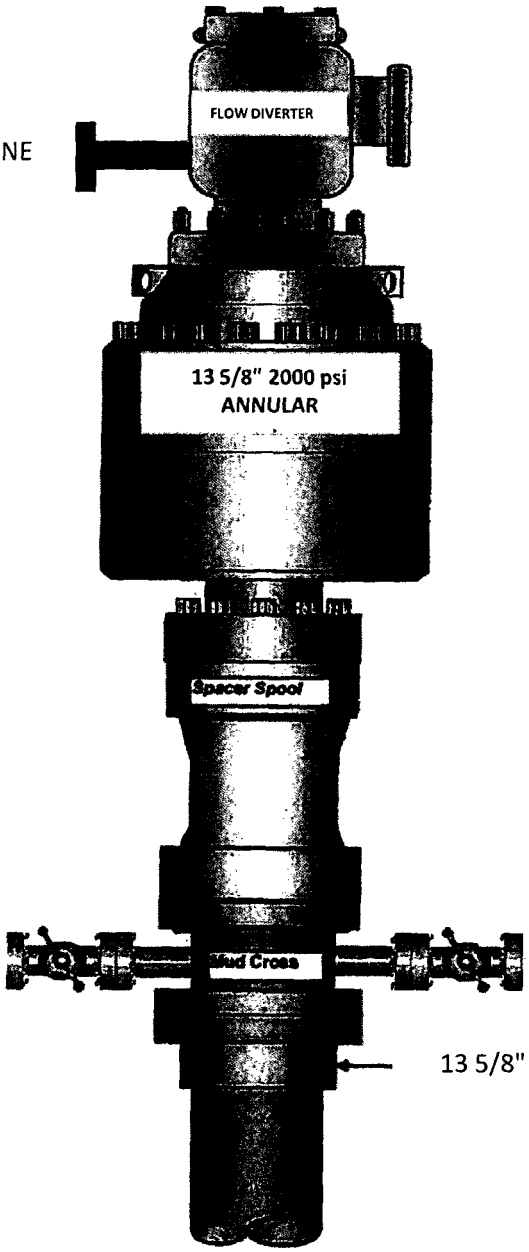
9. Extension wrenches and hands wheels to be properly installed.

10. Blow out preventer control to be located as close to driller's position as feasible.

11. Blow out preventer closing equipment to include minimum 40-gallon accumulator, two independent sources of pump power on each closing unit installation all API specifications.

Exhibit #10

13 5/8" 2K ANNULAR



FILL LINE

4-1/16",2K VALVES

13 5/8" 3K "A" SECTION

Casing Program

	Collapse SF	Burst SF	Tension SF
BLM Minimum Safety Factor	1.125	1	1.6 Dry 1.8 Wet

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

Assumed 9.0ppg MW equivalent pore pressure from 9 5/8" shoe to deepest TVD in wellbore.

BLM standard formulas were used on all SF calculations.
Casing design does meet and/or exceed BLM's minimum standards.
The pipe will be kept at a minimum 1/3 fluid fill to avoid approaching the collapse pressure rating of the casing.

This well is not located within the Capitan Reef.
This well is not located in the SOPA or in the R-111-P.

This well is not located in a high or critical Cave/Karst area.

This is not a walking operation.
We will not be pre-setting casing.
All completion intervals are planned to be fracture stimulated.

Casing Program

	Collapse SF	Burst SF	Tension SF
BLM Minimum Safety Factor	1.125	1	1.6 Dry 1.8 Wet

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

Assumed 9.0ppg MW equivalent pore pressure from 9 5/8" shoe to deepest TVD in wellbore.

BLM standard formulas were used on all SF calculations.
Casing design does meet and/or exceed BLM's minimum standards.
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Casing Program

	Collapse SF	Burst SF	Tension SF
BLM Minimum Safety Factor	1.125	1	1.6 Dry 1.8 Wet

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

Assumed 9.0ppg MW equivalent pore pressure from 9 5/8" shoe to deepest TVD in wellbore.

BLM standard formulas were used on all SF calculations.
Casing design does meet and/or exceed BLM's minimum standards.
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This is not a walking operation.
We will not be pre-setting casing.
All completion intervals are planned to be fracture stimulated.

COG Operating LLC

Hydrogen Sulfide Drilling Operation Plan

I. 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:

1. The hazards an characteristics of hydrogen sulfide (H2S)
2. The proper use and maintenance of personal protective equipment and life support systems.
3. The proper use of H2S detectors alarms warning systems, briefing areas, evacuation procedures, and prevailing winds.
4. The proper techniques for first aid and rescue procedures.

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

1. The effects of H2S on metal components. If high tensile tubular are to be used, personnel well be trained in their special maintenance requirements.
2. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
3. The contents and requirements of the H2S Drilling Operations Plan and 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. **The concentrations of H2S of wells in this area from surface to TD are low enough that a contingency plan is not required.**

II. 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 reasonable expected to contain H2S.

1. **Well Control Equipment:**

   A. Flare line.

   B. Choke manifold with minimum of one remotely operated choke.

   C. Closed Loop Blow Down Tank

   D. Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit.

   E. Auxiliary equipment may include if applicable: mud-gas separator, annular preventer & rotating head.

2. **Protective equipment for essential personnel:**

   A. SCBA (Self contained breathing apparatus) 30-minute units located in the doghouse and at briefing areas, as indicated on well site diagram.

3. **H2S detection and monitoring equipment:**

   A. Portable H2S monitors positioned on location for best coverage and response. These units have warning lights and audible sirens when H2S levels of 20 PPM are reached.

4. **Visual warning systems:**

   A. Wind direction indicators as shown on well site diagram.

   B. Caution/Danger signs (Exhibit #7) 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.

5. **Mud program:**

   A. The mud program has been designed to minimize the volume of H2S circulated to surface. Proper mud weight, safe drilling practices, and the use of H2S scavengers will minimize hazards when penetrating H2S bearing zones.

6. **Metallurgy:**

   A. All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H2S service.

   B. All elastomers used for packing and seals shall be H2S trim.

7. **Communication:**

   A. Radio communications in company vehicles including cellular telephone and 2-way radio.

   B. Land line (telephone) communication at Office.

8. **Well testing:**

   A. Drill stem testing will be performed with a minimum number of personnel in the immediate vicinity, which are necessary to safely and adequately conduct the test. The drill stem testing will be conducted during daylight hours and formation fluids will not be flowed to the surface. All drill-stem-testing operations conducted in an H2S environment will use the closed chamber method of testing.

   B. There will be no drill stem testing.

EXHIBIT #7

WARNING

YOU ARE ENTERING AN H2S

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. CHECK WITH COG OPERATING FOREMAN AT

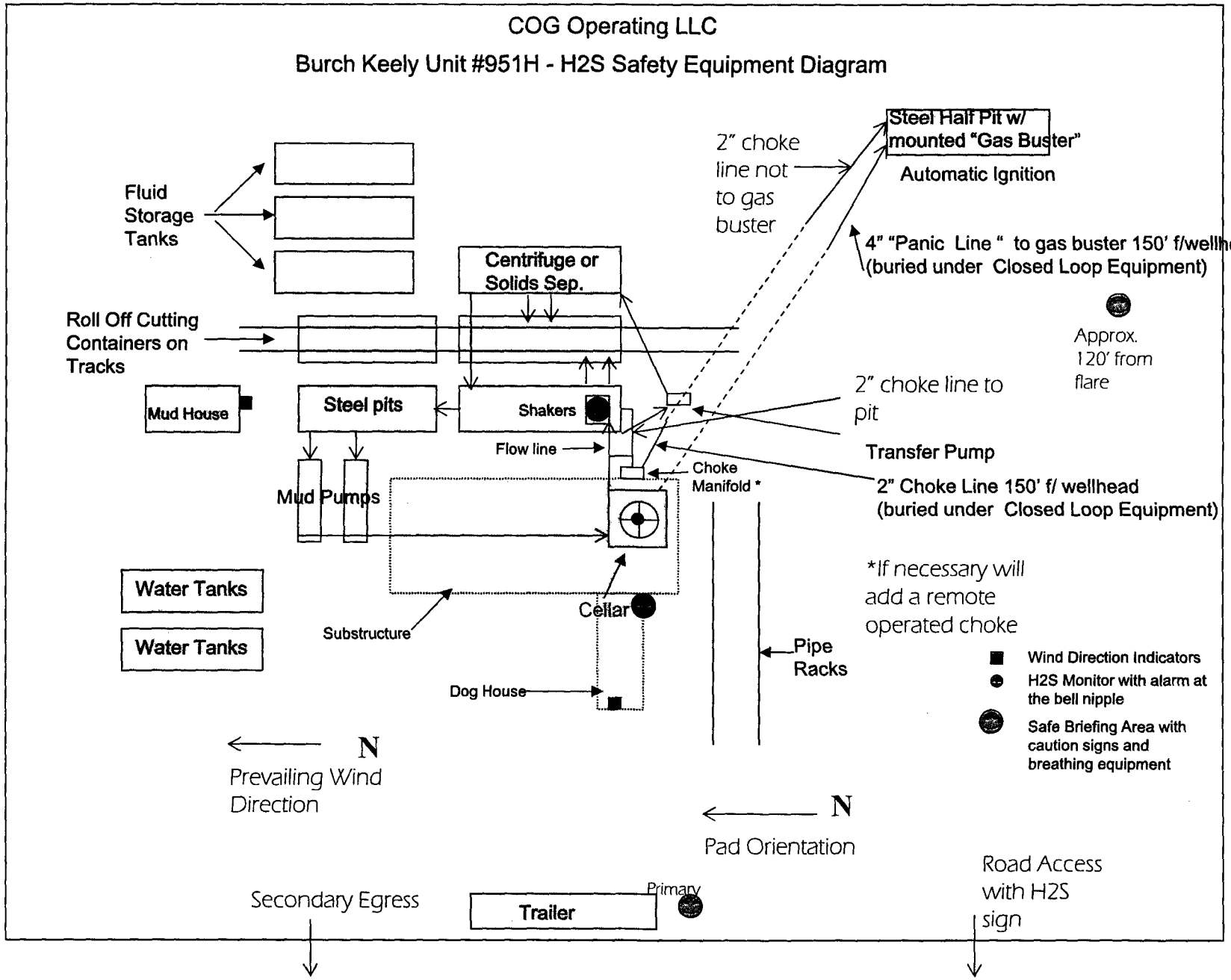
COG OPERATING LLC
1-432-683-7443
1-575-746-2010

EDDY COUNTY EMERGENCY NUMBERS
ARTESIA FIRE DEPT. 575-746-5050
ARTESIA POLICE DEPT. 575-746-5000
EDDY CO. SHERIFF DEPT. 575-746-9888

LEA COUNTY EMERGENCY NUMBERS
HOBBS FIRE DEPT. 575-397-9308
HOBBS POLICE DEPT. 575-397-9285
LEA CO. SHERIFF DEPT. 575-396-1196

COG Operating LLC

Burch Keely Unit #951H - H2S Safety Equipment Diagram



COG Operating LLC

Eddy County, NM (NAD-27 2015)
Burch Keely Unit #951H
SHL: 1720' FSL, 90' FEL, Sec 22, T17S, R29E, Unit I
PP: 1718' FSL, 330' FWL, Sec 23, T17S, R29E, Unit L
BHL: 1650' FSL, 245' FWL, Sec 19, T17S, R30E, Lot 8

Plan: Design #2

Standard Planning Report

11 April, 2017

TERRA DIRECTIONAL SERVICES, L.L.C.

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Site Burch Keely Unit #951H
Company:	COG Operating LLC	**TVD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD-27 2015)	**MD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Site:	Burch Keely Unit #951H	**North Reference:**	Grid
Well:	SHL: 1720' FSL, 90' FEL, Sec 22, T17S, R29E, Unit I	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	BHL: 1650' FSL, 245' FWL, Sec 19, T17S, R30E, Lot 8		
Design:	Design #2		

Project	Eddy County, NM (NAD-27 2015)		
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	Burch Keely Unit #951H				
Site Position:		**Northing:**	661,200.90 usft	**Latitude:**	32° 49' 2.701 N
From:	Map	**Easting:**	585,868.80 usft	**Longitude:**	104° 3' 13.770 W
Position Uncertainty:	0.00 usft	**Slot Radius:**	13.20 in	**Grid Convergence:**	0.15 °

Well	SHL: 1720' FSL, 90' FEL, Sec 22, T17S, R29E, Unit I					
Well Position	**+N/-S**	0.00 usft	**Northing:**	661,200.90 usft	**Latitude:**	32° 49' 2.701 N
	+E/-W	0.00 usft	**Easting:**	585,868.80 usft	**Longitude:**	104° 3' 13.770 W
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	0.00 usft	**Ground Level:**	3,584.00 usft

Wellbore BHL: 1650' FSL, 245' FWL, Sec 19, T17S, R30E, Lot 8

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	2/1/2017	7.26	60.53	48,276

Design Design #2

Audit Notes:

Version:		**Phase:**	PLAN	**Tie On Depth:**	0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	90.25

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,379.13	0.00	0.00	4,379.13	0.00	0.00	0.00	0.00	0.00	0.00	
5,197.31	90.00	90.25	4,900.00	-2.25	520.87	11.00	11.00	11.03	90.25	
15,577.04	90.00	90.25	4,900.00	-47.00	10,900.50	0.00	0.00	0.00	0.00	PBHL-D2 (BKU#951H

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Site Burch Keely Unit #951H
Company:	COG Operating LLC	**TVD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD-27 2015)	**MD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Site:	Burch Keely Unit #951H	**North Reference:**	Grid
Well:	SHL: 1720' FSL, 90' FEL, Sec 22, T17S, R29E, Unit I	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	BHL: 1650' FSL, 245' FWL, Sec 19, T17S, R30E, Lot 8		
Design:	Design #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
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
4,379.13	0.00	0.00	4,379.13	0.00	0.00	0.00	0.00	0.00	0.00
Start DLS 11.00 TFO 90.25									
4,400.00	2.30	90.25	4,399.99	0.00	0.42	0.42	11.00	11.00	0.00
4,450.00	7.80	90.25	4,449.78	-0.02	4.81	4.81	11.00	11.00	0.00
4,500.00	13.30	90.25	4,498.92	-0.06	13.96	13.96	11.00	11.00	0.00
4,550.00	18.80	90.25	4,546.95	-0.12	27.78	27.78	11.00	11.00	0.00
4,600.00	24.30	90.25	4,593.44	-0.20	46.13	46.13	11.00	11.00	0.00
4,650.00	29.80	90.25	4,637.96	-0.30	68.86	68.86	11.00	11.00	0.00

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Wellbore:	BHL: 1650' FSL, 245' FWL, Sec 19, T17S, R30E, Lot 8		
Design:	Design #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,700.00	35.30	90.25	4,680.09	-0.41	95.75	95.75	11.00	11.00	0.00
4,750.00	40.80	90.25	4,719.45	-0.55	126.55	126.55	11.00	11.00	0.00
4,800.00	46.30	90.25	4,755.68	-0.69	160.98	160.98	11.00	11.00	0.00
4,850.00	51.80	90.25	4,788.44	-0.86	198.73	198.73	11.00	11.00	0.00
4,900.00	57.30	90.25	4,817.43	-1.03	239.44	239.44	11.00	11.00	0.00
4,950.00	62.80	90.25	4,842.38	-1.22	282.74	282.75	11.00	11.00	0.00
5,000.00	68.30	90.25	4,863.07	-1.42	328.24	328.24	11.00	11.00	0.00
5,050.00	73.80	90.25	4,879.31	-1.62	375.51	375.51	11.00	11.00	0.00
5,100.00	79.30	90.25	4,890.94	-1.83	424.12	424.12	11.00	11.00	0.00
5,150.00	84.80	90.25	4,897.85	-2.04	473.62	473.62	11.00	11.00	0.00
5,197.31	90.00	90.25	4,900.00	-2.25	520.86	520.87	11.00	11.00	0.00
Start 10379.73 hold at 5197.31 MD									
5,200.00	90.00	90.25	4,900.00	-2.26	523.55	523.56	0.01	0.01	0.00
5,300.00	90.00	90.25	4,900.00	-2.69	623.55	623.56	0.00	0.00	0.00
5,400.00	90.00	90.25	4,900.00	-3.12	723.55	723.56	0.00	0.00	0.00
5,500.00	90.00	90.25	4,900.00	-3.55	823.55	823.56	0.00	0.00	0.00
5,600.00	90.00	90.25	4,900.00	-3.98	923.55	923.56	0.00	0.00	0.00
5,700.00	90.00	90.25	4,900.00	-4.41	1,023.55	1,023.56	0.00	0.00	0.00
5,800.00	90.00	90.25	4,900.00	-4.84	1,123.55	1,123.56	0.00	0.00	0.00
5,900.00	90.00	90.25	4,900.00	-5.28	1,223.55	1,223.56	0.00	0.00	0.00
6,000.00	90.00	90.25	4,900.00	-5.71	1,323.55	1,323.56	0.00	0.00	0.00
6,100.00	90.00	90.25	4,900.00	-6.14	1,423.55	1,423.56	0.00	0.00	0.00
6,200.00	90.00	90.25	4,900.00	-6.57	1,523.54	1,523.56	0.00	0.00	0.00
6,300.00	90.00	90.25	4,900.00	-7.00	1,623.54	1,623.56	0.00	0.00	0.00
6,400.00	90.00	90.25	4,900.00	-7.43	1,723.54	1,723.56	0.00	0.00	0.00
6,500.00	90.00	90.25	4,900.00	-7.86	1,823.54	1,823.56	0.00	0.00	0.00
6,600.00	90.00	90.25	4,900.00	-8.29	1,923.54	1,923.56	0.00	0.00	0.00
6,700.00	90.00	90.25	4,900.00	-8.72	2,023.54	2,023.56	0.00	0.00	0.00
6,800.00	90.00	90.25	4,900.00	-9.16	2,123.54	2,123.56	0.00	0.00	0.00
6,900.00	90.00	90.25	4,900.00	-9.59	2,223.54	2,223.56	0.00	0.00	0.00
7,000.00	90.00	90.25	4,900.00	-10.02	2,323.54	2,323.56	0.00	0.00	0.00
7,100.00	90.00	90.25	4,900.00	-10.45	2,423.54	2,423.56	0.00	0.00	0.00
7,200.00	90.00	90.25	4,900.00	-10.88	2,523.54	2,523.56	0.00	0.00	0.00
7,300.00	90.00	90.25	4,900.00	-11.31	2,623.53	2,623.56	0.00	0.00	0.00
7,400.00	90.00	90.25	4,900.00	-11.74	2,723.53	2,723.56	0.00	0.00	0.00
7,500.00	90.00	90.25	4,900.00	-12.17	2,823.53	2,823.56	0.00	0.00	0.00
7,600.00	90.00	90.25	4,900.00	-12.61	2,923.53	2,923.56	0.00	0.00	0.00
7,700.00	90.00	90.25	4,900.00	-13.04	3,023.53	3,023.56	0.00	0.00	0.00
7,800.00	90.00	90.25	4,900.00	-13.47	3,123.53	3,123.56	0.00	0.00	0.00
7,900.00	90.00	90.25	4,900.00	-13.90	3,223.53	3,223.56	0.00	0.00	0.00
8,000.00	90.00	90.25	4,900.00	-14.33	3,323.53	3,323.56	0.00	0.00	0.00
8,100.00	90.00	90.25	4,900.00	-14.76	3,423.53	3,423.56	0.00	0.00	0.00
8,200.00	90.00	90.25	4,900.00	-15.19	3,523.53	3,523.56	0.00	0.00	0.00
8,300.00	90.00	90.25	4,900.00	-15.62	3,623.53	3,623.56	0.00	0.00	0.00
8,400.00	90.00	90.25	4,900.00	-16.05	3,723.52	3,723.56	0.00	0.00	0.00
8,500.00	90.00	90.25	4,900.00	-16.49	3,823.52	3,823.56	0.00	0.00	0.00
8,600.00	90.00	90.25	4,900.00	-16.92	3,923.52	3,923.56	0.00	0.00	0.00
8,700.00	90.00	90.25	4,900.00	-17.35	4,023.52	4,023.56	0.00	0.00	0.00
8,800.00	90.00	90.25	4,900.00	-17.78	4,123.52	4,123.56	0.00	0.00	0.00
8,900.00	90.00	90.25	4,900.00	-18.21	4,223.52	4,223.56	0.00	0.00	0.00
9,000.00	90.00	90.25	4,900.00	-18.64	4,323.52	4,323.56	0.00	0.00	0.00
9,100.00	90.00	90.25	4,900.00	-19.07	4,423.52	4,423.56	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Site Burch Keely Unit #951H
Company:	COG Operating LLC	**TVD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD-27 2015)	**MD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Site:	Burch Keely Unit #951H	**North Reference:**	Grid
Well:	SHL: 1720' FSL, 90' FEL, Sec 22, T17S, R29E, Unit I	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	BHL: 1650' FSL, 245' FWL, Sec 19, T17S, R30E, Lot 8		
Design:	Design #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,200.00	90.00	90.25	4,900.00	-19.50	4,523.52	4,523.56	0.00	0.00	0.00
9,300.00	90.00	90.25	4,900.00	-19.94	4,623.52	4,623.56	0.00	0.00	0.00
9,400.00	90.00	90.25	4,900.00	-20.37	4,723.52	4,723.56	0.00	0.00	0.00
9,500.00	90.00	90.25	4,900.00	-20.80	4,823.51	4,823.56	0.00	0.00	0.00
9,600.00	90.00	90.25	4,900.00	-21.23	4,923.51	4,923.56	0.00	0.00	0.00
9,700.00	90.00	90.25	4,900.00	-21.66	5,023.51	5,023.56	0.00	0.00	0.00
9,800.00	90.00	90.25	4,900.00	-22.09	5,123.51	5,123.56	0.00	0.00	0.00
9,900.00	90.00	90.25	4,900.00	-22.52	5,223.51	5,223.56	0.00	0.00	0.00
10,000.00	90.00	90.25	4,900.00	-22.95	5,323.51	5,323.56	0.00	0.00	0.00
10,100.00	90.00	90.25	4,900.00	-23.38	5,423.51	5,423.56	0.00	0.00	0.00
10,200.00	90.00	90.25	4,900.00	-23.82	5,523.51	5,523.56	0.00	0.00	0.00
10,300.00	90.00	90.25	4,900.00	-24.25	5,623.51	5,623.56	0.00	0.00	0.00
10,400.00	90.00	90.25	4,900.00	-24.68	5,723.51	5,723.56	0.00	0.00	0.00
10,500.00	90.00	90.25	4,900.00	-25.11	5,823.50	5,823.56	0.00	0.00	0.00
10,600.00	90.00	90.25	4,900.00	-25.54	5,923.50	5,923.56	0.00	0.00	0.00
10,700.00	90.00	90.25	4,900.00	-25.97	6,023.50	6,023.56	0.00	0.00	0.00
10,800.00	90.00	90.25	4,900.00	-26.40	6,123.50	6,123.56	0.00	0.00	0.00
10,900.00	90.00	90.25	4,900.00	-26.83	6,223.50	6,223.56	0.00	0.00	0.00
11,000.00	90.00	90.25	4,900.00	-27.27	6,323.50	6,323.56	0.00	0.00	0.00
11,100.00	90.00	90.25	4,900.00	-27.70	6,423.50	6,423.56	0.00	0.00	0.00
11,200.00	90.00	90.25	4,900.00	-28.13	6,523.50	6,523.56	0.00	0.00	0.00
11,300.00	90.00	90.25	4,900.00	-28.56	6,623.50	6,623.56	0.00	0.00	0.00
11,400.00	90.00	90.25	4,900.00	-28.99	6,723.50	6,723.56	0.00	0.00	0.00
11,500.00	90.00	90.25	4,900.00	-29.42	6,823.50	6,823.56	0.00	0.00	0.00
11,600.00	90.00	90.25	4,900.00	-29.85	6,923.49	6,923.56	0.00	0.00	0.00
11,700.00	90.00	90.25	4,900.00	-30.28	7,023.49	7,023.56	0.00	0.00	0.00
11,800.00	90.00	90.25	4,900.00	-30.71	7,123.49	7,123.56	0.00	0.00	0.00
11,900.00	90.00	90.25	4,900.00	-31.15	7,223.49	7,223.56	0.00	0.00	0.00
12,000.00	90.00	90.25	4,900.00	-31.58	7,323.49	7,323.56	0.00	0.00	0.00
12,100.00	90.00	90.25	4,900.00	-32.01	7,423.49	7,423.56	0.00	0.00	0.00
12,200.00	90.00	90.25	4,900.00	-32.44	7,523.49	7,523.56	0.00	0.00	0.00
12,300.00	90.00	90.25	4,900.00	-32.87	7,623.49	7,623.56	0.00	0.00	0.00
12,400.00	90.00	90.25	4,900.00	-33.30	7,723.49	7,723.56	0.00	0.00	0.00
12,500.00	90.00	90.25	4,900.00	-33.73	7,823.49	7,823.56	0.00	0.00	0.00
12,600.00	90.00	90.25	4,900.00	-34.16	7,923.49	7,923.56	0.00	0.00	0.00
12,700.00	90.00	90.25	4,900.00	-34.60	8,023.48	8,023.56	0.00	0.00	0.00
12,800.00	90.00	90.25	4,900.00	-35.03	8,123.48	8,123.56	0.00	0.00	0.00
12,900.00	90.00	90.25	4,900.00	-35.46	8,223.48	8,223.56	0.00	0.00	0.00
13,000.00	90.00	90.25	4,900.00	-35.89	8,323.48	8,323.56	0.00	0.00	0.00
13,100.00	90.00	90.25	4,900.00	-36.32	8,423.48	8,423.56	0.00	0.00	0.00
13,200.00	90.00	90.25	4,900.00	-36.75	8,523.48	8,523.56	0.00	0.00	0.00
13,300.00	90.00	90.25	4,900.00	-37.18	8,623.48	8,623.56	0.00	0.00	0.00
13,400.00	90.00	90.25	4,900.00	-37.61	8,723.48	8,723.56	0.00	0.00	0.00
13,500.00	90.00	90.25	4,900.00	-38.04	8,823.48	8,823.56	0.00	0.00	0.00
13,600.00	90.00	90.25	4,900.00	-38.48	8,923.48	8,923.56	0.00	0.00	0.00
13,700.00	90.00	90.25	4,900.00	-38.91	9,023.48	9,023.56	0.00	0.00	0.00
13,800.00	90.00	90.25	4,900.00	-39.34	9,123.47	9,123.56	0.00	0.00	0.00
13,900.00	90.00	90.25	4,900.00	-39.77	9,223.47	9,223.56	0.00	0.00	0.00
14,000.00	90.00	90.25	4,900.00	-40.20	9,323.47	9,323.56	0.00	0.00	0.00
14,100.00	90.00	90.25	4,900.00	-40.63	9,423.47	9,423.56	0.00	0.00	0.00
14,200.00	90.00	90.25	4,900.00	-41.06	9,523.47	9,523.56	0.00	0.00	0.00
14,300.00	90.00	90.25	4,900.00	-41.49	9,623.47	9,623.56	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Site Burch Keely Unit #951H
Company:	COG Operating LLC	**TVD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD-27 2015)	**MD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Site:	Burch Keely Unit #951H	**North Reference:**	Grid
Well:	SHL: 1720' FSL, 90' FEL, Sec 22, T17S, R29E, Unit I	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	BHL: 1650' FSL, 245' FWL, Sec 19, T17S, R30E, Lot 8		
Design:	Design #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
14,400.00	90.00	90.25	4,900.00	-41.92	9,723.47	9,723.56	0.00	0.00	0.00
14,500.00	90.00	90.25	4,900.00	-42.36	9,823.47	9,823.56	0.00	0.00	0.00
14,600.00	90.00	90.25	4,900.00	-42.79	9,923.47	9,923.56	0.00	0.00	0.00
14,700.00	90.00	90.25	4,900.00	-43.22	10,023.47	10,023.56	0.00	0.00	0.00
14,800.00	90.00	90.25	4,900.00	-43.65	10,123.47	10,123.56	0.00	0.00	0.00
14,900.00	90.00	90.25	4,900.00	-44.08	10,223.46	10,223.56	0.00	0.00	0.00
15,000.00	90.00	90.25	4,900.00	-44.51	10,323.46	10,323.56	0.00	0.00	0.00
15,100.00	90.00	90.25	4,900.00	-44.94	10,423.46	10,423.56	0.00	0.00	0.00
15,200.00	90.00	90.25	4,900.00	-45.37	10,523.46	10,523.56	0.00	0.00	0.00
15,300.00	90.00	90.25	4,900.00	-45.81	10,623.46	10,623.56	0.00	0.00	0.00
15,400.00	90.00	90.25	4,900.00	-46.24	10,723.46	10,723.56	0.00	0.00	0.00
15,500.00	90.00	90.25	4,900.00	-46.67	10,823.46	10,823.56	0.00	0.00	0.00
15,577.04	90.00	90.25	4,900.00	-47.00	10,900.50	10,900.60	0.00	0.00	0.00
TD at 15577.04									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Max Dev 92.32' @ 4649 - plan misses target center by 4901.15usft at 14999.44usft MD (4900.00 TVD, -44.51 N, 10322.90 E) - Circle (radius 92.32)	0.00	0.00	0.00	61.78	10,323.36	661,262.68	596,192.16	32° 49' 3.026 N	104° 1' 12.798 W
Max Dev 62.64' @ 4599 - plan misses target center by 425.51usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Circle (radius 62.64)	0.00	0.00	0.00	-69.03	419.87	661,131.87	586,288.67	32° 49' 2.007 N	104° 3' 8.852 W
Max Dev 63.37' @ 4559 - plan misses target center by 255.23usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Circle (radius 63.37)	0.00	0.00	0.00	10.80	-255.00	661,211.70	585,613.80	32° 49' 2.815 N	104° 3' 16.757 W
Max Dev 89.87' @ 4764 - plan misses target center by 4901.94usft at 13280.92usft MD (4900.00 TVD, -37.10 N, 8604.39 E) - Circle (radius 89.87)	0.00	0.00	0.00	-174.90	8,603.80	661,026.00	594,472.60	32° 49' 0.734 N	104° 1' 32.956 W
KOP-D2 (BKU#951H/L1 - plan hits target center - Point	0.00	0.00	4,379.13	0.00	0.00	661,200.90	585,868.80	32° 49' 2.701 N	104° 3' 13.770 W
PP-D2 (BKU#951H/L1) - plan hits target center - Point	0.00	0.00	4,890.12	-1.81	419.91	661,199.09	586,288.71	32° 49' 2.672 N	104° 3' 8.849 W
PBHL-D2 (BKU#951H/L - plan hits target center - Point	0.00	0.00	4,900.00	-47.00	10,900.50	661,153.90	596,769.30	32° 49' 1.933 N	104° 1' 6.038 W
EOC-D2 (BKU#951H/L1 - plan hits target center - Point	0.00	0.00	4,900.00	-2.25	520.86	661,198.66	586,389.67	32° 49' 2.665 N	104° 3' 7.666 W

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Site Burch Keely Unit #951H
Company:	COG Operating LLC	**TVD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD-27 2015)	**MD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Site:	Burch Keely Unit #951H	**North Reference:**	Grid
Well:	SHL: 1720' FSL, 90' FEL, Sec 22, T17S, R29E, Unit I	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	BHL: 1650' FSL, 245' FWL, Sec 19, T17S, R30E, Lot 8		
Design:	Design #2		

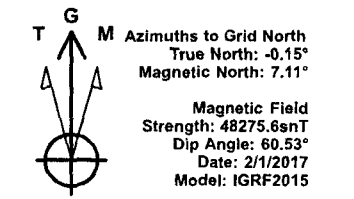
Plan Annotations

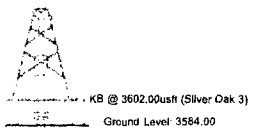
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
4,379.13	4,379.13	0.00	0.00	Start DLS 11.00 TFO 90.25
5,197.31	4,900.00	-1.81	419.91	Start 10379.73 hold at 5197.31 MD
15,577.04	4,900.00	-2.25	520.86	TD at 15577.04

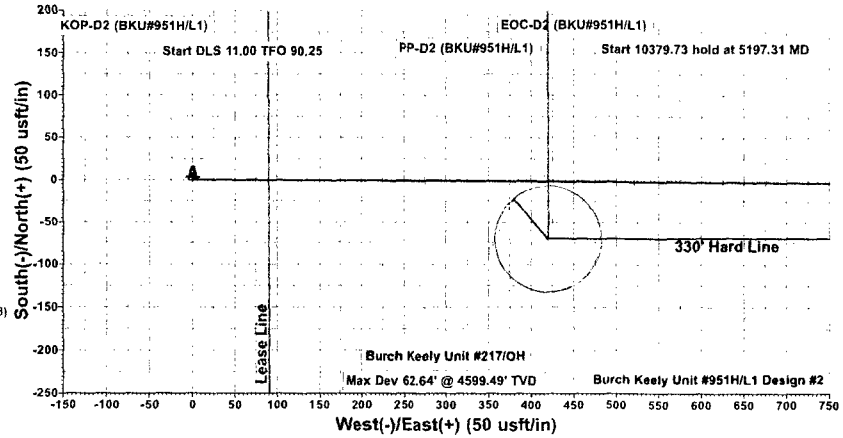
COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Site: Burch Keely Unit #951H
Well: SHL: 1720' FSL, 90' FEL, Sec 22, T17S, R29E, Unit I
Wellbore: BHL: 1650' FSL, 245' FWL, Sec 19, T17S, R30E, Lot 8
Plan: Design #2 (SHL: 1720' FSL, 90' FEL, Sec 22, T17S, R29E, Unit I/BHL: 1650' FSL, 245' FWL, Sec 19, T17S, R30E, Lot 8)

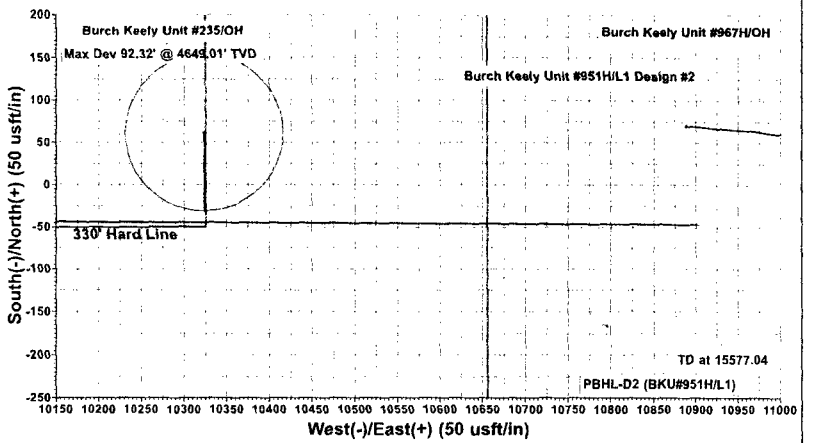
Section Details

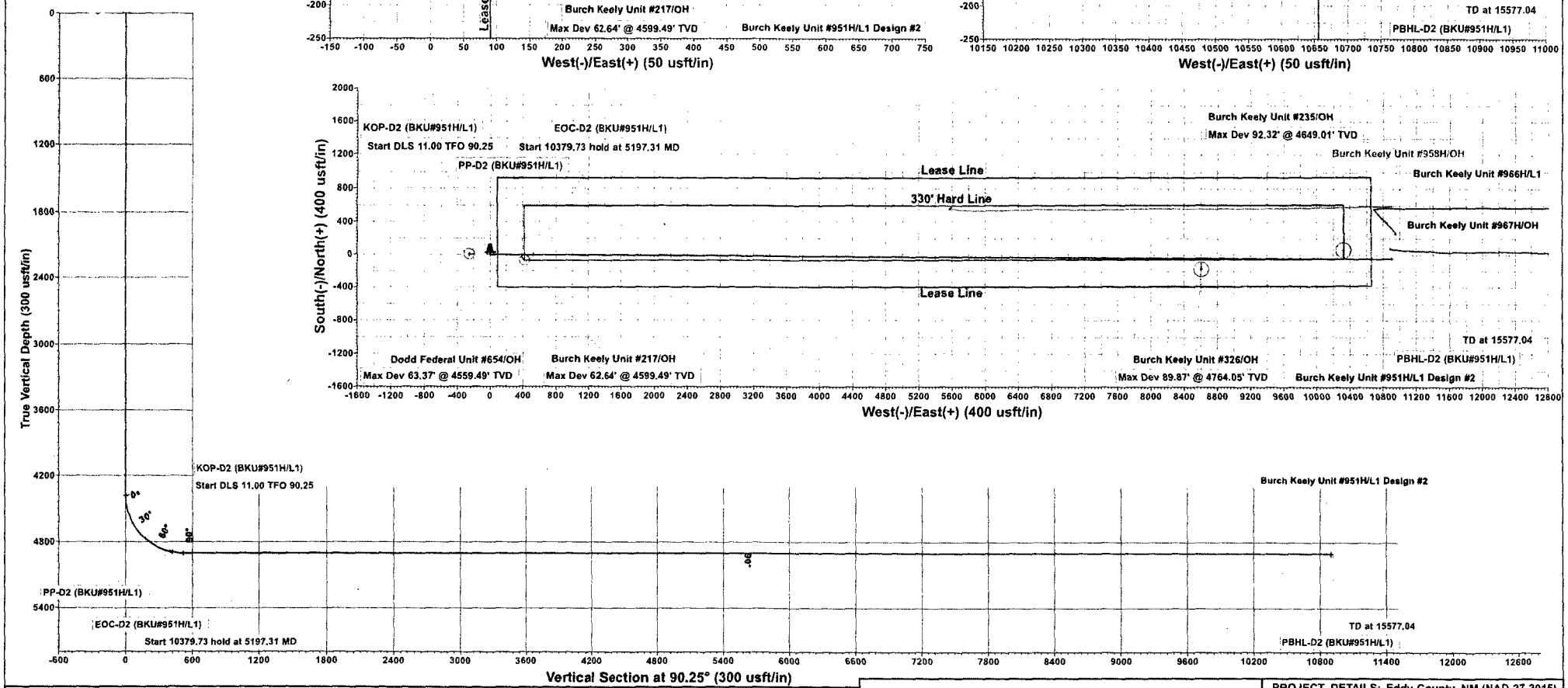
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	4379.13	0.00	0.00	4379.13	0.00	0.00	0.00	0.00	0.00	
3	5197.31	90.00	90.25	4900.00	-2.25	520.87	11.00	90.25	520.87	
4	15577.04	90.00	90.25	4900.00	-47.00	10900.50	0.00	0.00	10900.60	PBHL-D2 (BKU#951H/L1)











Terra Directional Services LLC
3705 South County Road 1210, Midland, TX 79706
Phone: 432-618-1210

Ground Elevation:: 3584.00
RKB Elevation: KB @ 3602.00usft (Silver Oak 3)

Northing	Easting	Latitude	Longitude
661200.90	585868.80	32° 49' 2.701 N	104° 3' 13.770 W

PROJECT DETAILS: Eddy County, NM (NAD-27 2015)
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

COG Operating LLC

Eddy County, NM (NAD-27 2015)
Burch Keely Unit #951H
SHL: 1720' FSL, 90' FEL, Sec 22, T17S, R29E, Unit I
PP: 1718' FSL, 330' FWL, Sec 23, T17S, R29E, Unit L
BHL: 1650' FSL, 245' FWL, Sec 19, T17S, R30E, Lot 8
Design #2

Anticollision Report

11 April, 2017

TERRA DIRECTIONAL SERVICES, L.L.C.

TDS
Anticollision Report

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Site Burch Keely Unit #951H
Project:	Eddy County, NM (NAD-27 2015)	**TVD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Reference Site:	Burch Keely Unit #951H	**MD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	SHL: 1720' FSL, 90' FEL, Sec 22, T17S, R29E, Unit I	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	BHL: 1650' FSL, 245' FWL, Sec 19, T17S, R30E, Lot 8	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #2	**Offset TVD Reference:**	Offset Datum

Reference	Design #2		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum separation factor of 5.00	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	2.00 **Sigma**	**Casing Method:**	Not applied

Survey Tool Program **Date** 4/11/2017

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	15,577.04	Design #2 (BHL: 1650' FSL, 245' FWL, Se	MWD	MWD - Standard

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Burch Keely Unit #966H						
SHL: 1957' FSL, 290' FWL, Sec 19, T17S, R30E, Unit L	15,577.04	4,955.42	639.36	340.76	2.141	CC, ES, SF
Eddy County Offset Wells						
Burch Keely Unit #217 - OH - OH	4,750.00	4,600.00	274.26	110.07	1.670	ES, SF
Burch Keely Unit #217 - OH - OH	4,917.20	4,600.00	246.08	158.50	2.810	CC
Burch Keely Unit #235 - OH - OH	14,999.84	4,650.00	269.35	187.76	3.301	CC
Burch Keely Unit #235 - OH - OH	15,200.00	4,650.00	335.59	92.50	1.380	Level 3, ES, SF
Burch Keely Unit #246 - OH - OH	15,577.04	4,715.00	2,183.39	1,744.98	4.980	CC, ES, SF
Burch Keely Unit #326 - OH - OH	13,280.53	4,765.00	146.99	21.27	1.169	Level 2, CC
Burch Keely Unit #326 - OH - OH	13,400.00	4,765.00	189.42	-74.70	0.717	Level 1, ES, SF
Burch Keely Unit #958H - OH - OH	10,581.59	4,998.13	561.02	389.26	3.266	CC
Burch Keely Unit #958H - OH - OH	15,577.04	9,994.51	639.11	196.29	1.443	Level 3, ES, SF
Burch Keely Unit #967H - OH - OH	15,577.04	4,780.23	298.29	178.65	2.493	CC, ES, SF
Dodd Federal Unit #654 - OH - OH	4,382.29	4,357.97	192.86	93.96	1.950	CC
Dodd Federal Unit #654 - OH - OH	4,400.00	4,375.57	193.16	93.87	1.945	ES, SF

Offset Design Burch Keely Unit #966H - SHL: 1957' FSL, 290' FWL, Sec 19, T17S, R30E, Unit L - BHL: 2290' FSL, 22 — **Offset Site Error:** 0.00 usft

Survey Program: 25-VES-ISCWSA-GYRO-3, 1058-MWD — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
14,900.00	4,900.00	4,594.52	4,547.85	280.54	9.66	-57.61	568.47	10,768.96	908.30	706.46	201.84	4.500	
15,000.00	4,900.00	4,631.21	4,577.92	283.30	9.63	-59.70	569.62	10,789.95	851.13	634.47	216.67	3.928	
15,100.00	4,900.00	4,675.00	4,612.29	286.06	9.59	-62.16	570.08	10,817.05	799.53	567.67	231.86	3.448	
15,200.00	4,900.00	4,713.87	4,641.20	288.81	9.55	-64.30	569.95	10,843.03	754.21	507.15	247.05	3.053	
15,300.00	4,900.00	4,773.08	4,683.32	291.57	9.51	-67.55	569.40	10,884.63	715.23	453.40	261.83	2.732	
15,400.00	4,900.00	4,838.16	4,728.61	294.33	9.48	-71.22	568.71	10,931.37	682.07	405.92	276.15	2.470	
15,500.00	4,900.00	4,903.84	4,773.26	297.09	9.69	-75.01	568.12	10,979.53	655.34	365.87	289.46	2.264	
15,577.04	4,900.00	4,955.42	4,807.62	299.22	10.18	-78.04	567.79	11,017.99	639.36	340.76	298.60	2.141	CC, ES, SF

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

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Site Burch Keely Unit #951H
Project:	Eddy County, NM (NAD-27 2015)	**TVD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Reference Site:	Burch Keely Unit #951H	**MD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	SHL: 1720' FSL, 90' FEL, Sec 22, T17S, R29E, Unit I	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	BHL: 1650' FSL, 245' FWL, Sec 19, T17S, R30E, Lot 8	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #2	**Offset TVD Reference:**	Offset Datum

Offset Design Eddy County Offset Wells - Burch Keely Unit #217 - OH - OH — **Offset Site Error:** 0.00 usft

Survey Program: 410-INC — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
1,900.00	1,900.00	1,886.56	1,886.24	4.14	104.72	96.42	-44.96	399.70	402.23	321.50	80.73	4.983	
2,000.00	2,000.00	1,986.75	1,986.42	4.36	108.48	96.33	-44.27	399.13	401.58	317.58	84.00	4.781	
2,100.00	2,100.00	2,087.00	2,086.67	4.59	112.45	96.23	-43.52	398.49	400.87	313.43	87.44	4.584	
2,200.00	2,200.00	2,187.25	2,186.91	4.81	116.41	96.13	-42.70	397.80	400.10	309.20	90.90	4.402	
2,300.00	2,300.00	2,287.49	2,287.15	5.04	120.38	96.01	-41.81	397.06	399.27	304.89	94.38	4.231	
2,400.00	2,400.00	2,387.74	2,387.39	5.26	124.34	95.89	-40.85	396.26	398.37	300.50	97.87	4.070	
2,500.00	2,500.00	2,487.45	2,487.09	5.49	127.75	95.76	-39.88	395.45	397.47	296.49	100.98	3.936	
2,600.00	2,600.00	2,587.03	2,586.67	5.71	131.01	95.65	-39.03	394.73	396.67	292.68	103.99	3.815	
2,700.00	2,700.00	2,686.61	2,686.24	5.94	134.28	95.55	-38.29	394.11	395.97	289.00	106.98	3.702	
2,800.00	2,800.00	2,786.20	2,785.82	6.16	137.54	95.47	-37.66	393.58	395.38	285.43	109.95	3.596	
2,900.00	2,900.00	2,885.78	2,885.41	6.39	140.81	95.40	-37.14	393.15	394.90	281.99	112.91	3.498	
3,000.00	3,000.00	2,985.37	2,985.00	6.61	144.08	95.34	-36.73	392.80	394.52	278.67	115.85	3.406	
3,100.00	3,100.00	3,085.79	3,085.42	6.84	147.39	95.29	-36.33	392.47	394.15	275.32	118.83	3.317	
3,200.00	3,200.00	3,186.39	3,186.01	7.06	150.72	95.21	-35.78	392.01	393.64	271.78	121.86	3.230	
3,300.00	3,300.00	3,286.98	3,286.60	7.28	154.04	95.12	-35.06	391.40	392.98	268.05	124.93	3.146	
3,400.00	3,400.00	3,387.57	3,387.18	7.51	157.37	95.00	-34.17	390.66	392.17	264.13	128.03	3.063	
3,500.00	3,500.00	3,487.71	3,487.31	7.73	161.67	94.86	-33.17	389.82	391.25	259.42	131.83	2.968	
3,600.00	3,600.00	3,587.70	3,587.29	7.96	166.28	94.73	-32.17	388.98	390.33	254.47	135.86	2.873	
3,700.00	3,700.00	3,687.69	3,687.28	8.18	170.89	94.59	-31.16	388.14	389.41	249.52	139.89	2.784	
3,800.00	3,800.00	3,787.68	3,787.26	8.41	175.50	94.45	-30.16	387.30	388.49	244.55	143.94	2.699	
3,900.00	3,900.00	3,887.67	3,887.24	8.63	180.11	94.31	-29.16	386.46	387.58	239.58	148.00	2.619	
4,000.00	4,000.00	3,987.67	3,987.22	8.86	184.72	94.18	-28.15	385.62	386.66	234.59	152.07	2.543	
4,100.00	4,100.00	4,087.82	4,087.37	9.08	189.84	94.03	-27.13	384.76	385.74	229.24	156.49	2.465	
4,200.00	4,200.00	4,188.01	4,187.55	9.31	195.07	93.88	-26.05	383.86	384.76	223.74	161.02	2.390	
4,300.00	4,300.00	4,288.19	4,287.72	9.53	200.31	93.72	-24.92	382.91	383.74	218.16	165.58	2.318	
4,379.13	4,379.13	4,367.46	4,366.98	9.71	204.45	93.59	-23.98	382.12	382.89	213.69	169.21	2.263	
4,400.00	4,399.99	4,388.36	4,387.88	9.75	205.54	3.32	-23.72	381.91	382.25	212.09	170.16	2.246	
4,450.00	4,449.78	4,438.19	4,437.70	9.85	208.14	3.30	-23.11	381.39	377.31	204.94	172.37	2.189	
4,500.00	4,498.92	4,487.32	4,486.82	9.96	210.71	3.35	-22.49	380.87	367.62	193.14	174.48	2.107	
4,550.00	4,546.95	4,535.28	4,534.78	10.07	213.22	3.48	-21.87	380.36	353.27	176.81	176.47	2.002	
4,600.00	4,593.44	4,581.64	4,581.13	10.19	215.64	3.71	-21.26	379.85	334.40	156.12	178.29	1.876	
4,650.00	4,637.96	4,600.00	4,599.49	10.34	216.60	3.95	-21.02	379.64	312.26	133.98	178.28	1.751	
4,700.00	4,680.09	4,600.00	4,599.49	10.52	216.60	4.12	-21.02	379.64	291.81	118.03	173.79	1.679	
4,750.00	4,719.45	4,600.00	4,599.49	10.76	216.60	4.27	-21.02	379.64	274.26	110.07	164.19	1.670 ES, SF	
4,800.00	4,755.68	4,600.00	4,599.49	11.06	216.60	4.39	-21.02	379.64	260.37	111.82	148.56	1.753	
4,850.00	4,788.44	4,600.00	4,599.49	11.44	216.60	4.48	-21.02	379.64	250.89	124.44	126.44	1.984	
4,900.00	4,817.43	4,600.00	4,599.49	11.91	216.60	4.51	-21.02	379.64	246.40	148.05	98.35	2.505	
4,917.20	4,826.48	4,600.00	4,599.49	12.11	216.60	4.52	-21.02	379.64	246.08	158.50	87.58	2.810 CC	
4,950.00	4,842.38	4,600.00	4,599.49	12.49	216.60	4.51	-21.02	379.64	247.24	181.24	65.99	3.746	
5,150.00	4,897.85	4,600.00	4,599.49	15.80	216.60	4.07	-21.02	379.64	297.92	231.19	66.73	4.464	
5,197.31	4,900.00	4,600.00	4,599.49	16.75	216.60	3.90	-21.02	379.64	317.92	228.13	89.80	3.540	
5,200.00	4,900.00	4,600.00	4,599.49	16.80	216.60	3.90	-21.02	379.64	319.12	228.13	90.99	3.507	
5,300.00	4,900.00	4,600.00	4,599.49	18.96	216.60	3.90	-21.02	379.64	374.98	248.14	126.84	2.956	
5,400.00	4,900.00	4,600.00	4,599.49	21.25	216.60	3.90	-21.02	379.64	446.51	298.38	148.13	3.014	
5,500.00	4,900.00	4,600.00	4,599.49	23.64	216.60	3.90	-21.02	379.64	527.39	366.69	160.69	3.282	
5,600.00	4,900.00	4,600.00	4,599.49	26.11	216.60	3.90	-21.02	379.64	613.93	445.56	168.37	3.646	
5,700.00	4,900.00	4,600.00	4,599.49	28.63	216.60	3.90	-21.02	379.64	704.04	530.77	173.27	4.063	
5,800.00	4,900.00	4,600.00	4,599.49	31.19	216.60	3.90	-21.02	379.64	796.52	619.98	176.53	4.512	
5,900.00	4,900.00	4,600.00	4,599.49	33.78	216.60	3.90	-21.02	379.64	890.62	711.82	178.80	4.981	

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

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Site Burch Keely Unit #951H
Project:	Eddy County, NM (NAD-27 2015)	**TVD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Reference Site:	Burch Keely Unit #951H	**MD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	SHL: 1720' FSL, 90' FEL, Sec 22, T17S, R29E, Unit I	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	BHL: 1650' FSL, 245' FWL, Sec 19, T17S, R30E, Lot 8	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #2	**Offset TVD Reference:**	Offset Datum

Offset Design Eddy County Offset Wells - Burch Keely Unit #235 - OH - OH — **Offset Site Error:** 0.00 usft

Survey Program: 417-INC — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
13,500.00	4,900.00	4,650.00	4,649.01	241.93	303.76	-2.97	-30.54	10,323.36	1,523.83	1,206.39	317.44	4.800	
13,600.00	4,900.00	4,650.00	4,649.01	244.69	303.76	-2.97	-30.54	10,323.36	1,425.52	1,108.07	317.44	4.491	
13,700.00	4,900.00	4,650.00	4,649.01	247.45	303.76	-2.97	-30.54	10,323.36	1,327.45	1,010.04	317.41	4.182	
13,800.00	4,900.00	4,650.00	4,649.01	250.20	303.76	-2.97	-30.54	10,323.36	1,229.70	912.39	317.31	3.875	
13,900.00	4,900.00	4,650.00	4,649.01	252.96	303.76	-2.97	-30.54	10,323.36	1,132.34	815.22	317.12	3.571	
14,000.00	4,900.00	4,650.00	4,649.01	255.72	303.76	-2.97	-30.54	10,323.36	1,035.48	718.71	316.77	3.269	
14,100.00	4,900.00	4,650.00	4,649.01	258.48	303.76	-2.97	-30.54	10,323.36	939.29	623.11	316.18	2.971	
14,200.00	4,900.00	4,650.00	4,649.01	261.23	303.76	-2.97	-30.54	10,323.36	843.97	528.80	315.17	2.678	
14,300.00	4,900.00	4,650.00	4,649.01	263.99	303.76	-2.97	-30.54	10,323.36	749.88	436.41	313.47	2.392	
14,400.00	4,900.00	4,650.00	4,649.01	266.75	303.76	-2.97	-30.54	10,323.36	657.54	346.99	310.55	2.117	
14,500.00	4,900.00	4,650.00	4,649.01	269.51	303.76	-2.97	-30.54	10,323.36	567.79	262.41	305.38	1.859	
14,600.00	4,900.00	4,650.00	4,649.01	272.27	303.76	-2.97	-30.54	10,323.36	482.10	186.18	295.92	1.629	
14,700.00	4,900.00	4,650.00	4,649.01	275.02	303.76	-2.97	-30.54	10,323.36	403.06	125.16	277.89	1.450	Level 3
14,800.00	4,900.00	4,650.00	4,649.01	277.78	303.76	-2.97	-30.54	10,323.36	335.39	92.58	242.81	1.381	Level 3
14,900.00	4,900.00	4,650.00	4,649.01	280.54	303.76	-2.97	-30.54	10,323.36	287.26	109.86	177.40	1.619	
14,999.84	4,900.00	4,650.00	4,649.01	283.29	303.76	-2.97	-30.54	10,323.36	269.35	187.76	81.60	3.301	CC
15,000.00	4,900.00	4,650.00	4,649.01	283.30	303.76	-2.97	-30.54	10,323.36	269.35	187.76	81.60	3.301	
15,100.00	4,900.00	4,650.00	4,649.01	286.06	303.76	-2.97	-30.54	10,323.36	287.38	109.69	177.69	1.617	
15,200.00	4,900.00	4,650.00	4,649.01	288.81	303.76	-2.97	-30.54	10,323.36	335.59	92.50	243.09	1.380	Level 3, ES, SF
15,300.00	4,900.00	4,650.00	4,649.01	291.57	303.76	-2.97	-30.54	10,323.36	403.30	125.10	278.19	1.450	Level 3
15,400.00	4,900.00	4,650.00	4,649.01	294.33	303.76	-2.97	-30.54	10,323.36	482.37	186.11	296.26	1.628	
15,500.00	4,900.00	4,650.00	4,649.01	297.09	303.76	-2.97	-30.54	10,323.36	568.08	262.30	305.78	1.858	
15,577.04	4,900.00	4,650.00	4,649.01	299.22	303.76	-2.97	-30.54	10,323.36	636.96	326.89	310.07	2.054	

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Site Burch Keely Unit #951H
Project:	Eddy County, NM (NAD-27 2015)	**TVD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Reference Site:	Burch Keely Unit #951H	**MD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	SHL: 1720' FSL, 90' FEL, Sec 22, T17S, R29E, Unit I	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	BHL: 1650' FSL, 245' FWL, Sec 19, T17S, R30E, Lot 8	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #2	**Offset TVD Reference:**	Offset Datum

Offset Design Eddy County Offset Wells - Burch Keely Unit #246 - OH - OH — **Offset Site Error:** 0.00 usft

Survey Program: 412-INC — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
15,577.04	4,900.00	4,715.00	4,713.66	299.22	352.90	-74.83	727.16	12,930.96	2,183.39	1,744.98	438.40	4.980	CC, ES, SF

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Site Burch Keely Unit #951H
Project:	Eddy County, NM (NAD-27 2015)	**TVD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Reference Site:	Burch Keely Unit #951H	**MD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	SHL: 1720' FSL, 90' FEL, Sec 22, T17S, R29E, Unit I	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	BHL: 1650' FSL, 245' FWL, Sec 19, T17S, R30E, Lot 8	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #2	**Offset TVD Reference:**	Offset Datum

Offset Design Eddy County Offset Wells - Burch Keely Unit #326 - OH - OH

Offset Site Error: 0.00 usft

Survey Program: 852-INC

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
11,800.00	4,900.00	4,765.00	4,764.05	195.07	296.03	19.03	-85.03	8,603.80	1,487.81	1,178.01	309.79	4.803	
11,900.00	4,900.00	4,765.00	4,764.05	197.82	296.03	19.03	-85.03	8,603.80	1,388.33	1,078.32	310.01	4.478	
12,000.00	4,900.00	4,765.00	4,764.05	200.58	296.03	19.03	-85.03	8,603.80	1,288.94	978.67	310.27	4.154	
12,100.00	4,900.00	4,765.00	4,764.05	203.33	296.03	19.03	-85.03	8,603.80	1,189.64	879.09	310.56	3.831	
12,200.00	4,900.00	4,765.00	4,764.05	206.09	296.03	19.03	-85.03	8,603.80	1,090.48	779.59	310.89	3.508	
12,300.00	4,900.00	4,765.00	4,764.05	208.85	296.03	19.03	-85.03	8,603.80	991.48	680.21	311.28	3.185	
12,400.00	4,900.00	4,765.00	4,764.05	211.60	296.03	19.03	-85.03	8,603.80	892.71	580.99	311.72	2.864	
12,500.00	4,900.00	4,765.00	4,764.05	214.36	296.03	19.03	-85.03	8,603.80	794.25	482.03	312.22	2.544	
12,600.00	4,900.00	4,765.00	4,764.05	217.12	296.03	19.03	-85.03	8,603.80	696.22	383.47	312.75	2.226	
12,700.00	4,900.00	4,765.00	4,764.05	219.87	296.03	19.03	-85.03	8,603.80	598.85	285.63	313.22	1.912	
12,800.00	4,900.00	4,765.00	4,764.05	222.63	296.03	19.03	-85.03	8,603.80	502.51	189.11	313.40	1.603	
12,900.00	4,900.00	4,765.00	4,764.05	225.39	296.03	19.03	-85.03	8,603.80	407.93	95.41	312.52	1.305	Level 3
13,000.00	4,900.00	4,765.00	4,764.05	228.14	296.03	19.03	-85.03	8,603.80	316.70	8.53	308.17	1.028	Level 2
13,100.00	4,900.00	4,765.00	4,764.05	230.90	296.03	19.03	-85.03	8,603.80	232.80	-58.64	291.44	0.799	Level 1
13,200.00	4,900.00	4,765.00	4,764.05	233.66	296.03	19.03	-85.03	8,603.80	167.60	-61.26	228.87	0.732	Level 1
13,280.53	4,900.00	4,765.00	4,764.05	235.88	296.03	19.03	-85.03	8,603.80	146.99	21.27	125.72	1.169	Level 2, CC
13,300.00	4,900.00	4,765.00	4,764.05	236.42	296.03	19.03	-85.03	8,603.80	148.27	3.70	144.57	1.026	Level 2
13,400.00	4,900.00	4,765.00	4,764.05	239.17	296.03	19.03	-85.03	8,603.80	189.42	-74.70	264.12	0.717	Level 1, ES, SF
13,500.00	4,900.00	4,765.00	4,764.05	241.93	296.03	19.03	-85.03	8,603.80	264.15	-37.84	301.99	0.875	Level 1
13,600.00	4,900.00	4,765.00	4,764.05	244.69	296.03	19.03	-85.03	8,603.80	351.67	39.73	311.93	1.127	Level 2
13,700.00	4,900.00	4,765.00	4,764.05	247.45	296.03	19.03	-85.03	8,603.80	444.48	130.07	314.41	1.414	Level 3
13,800.00	4,900.00	4,765.00	4,764.05	250.20	296.03	19.03	-85.03	8,603.80	539.87	225.13	314.73	1.715	
13,900.00	4,900.00	4,765.00	4,764.05	252.96	296.03	19.03	-85.03	8,603.80	636.67	322.26	314.41	2.025	
14,000.00	4,900.00	4,765.00	4,764.05	255.72	296.03	19.03	-85.03	8,603.80	734.33	420.41	313.92	2.339	
14,100.00	4,900.00	4,765.00	4,764.05	258.48	296.03	19.03	-85.03	8,603.80	832.55	519.11	313.44	2.656	
14,200.00	4,900.00	4,765.00	4,764.05	261.23	296.03	19.03	-85.03	8,603.80	931.15	618.15	313.00	2.975	
14,300.00	4,900.00	4,765.00	4,764.05	263.99	296.03	19.03	-85.03	8,603.80	1,030.01	717.39	312.62	3.295	
14,400.00	4,900.00	4,765.00	4,764.05	266.75	296.03	19.03	-85.03	8,603.80	1,129.08	816.78	312.30	3.615	
14,500.00	4,900.00	4,765.00	4,764.05	269.51	296.03	19.03	-85.03	8,603.80	1,228.30	916.26	312.04	3.936	
14,600.00	4,900.00	4,765.00	4,764.05	272.27	296.03	19.03	-85.03	8,603.80	1,327.63	1,015.81	311.82	4.258	
14,700.00	4,900.00	4,765.00	4,764.05	275.02	296.03	19.03	-85.03	8,603.80	1,427.06	1,115.42	311.64	4.579	
14,800.00	4,900.00	4,765.00	4,764.05	277.78	296.03	19.03	-85.03	8,603.80	1,526.57	1,215.07	311.49	4.901	

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

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Site Burch Keely Unit #951H
Project:	Eddy County, NM (NAD-27 2015)	**TVD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Reference Site:	Burch Keely Unit #951H	**MD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	SHL: 1720' FSL, 90' FEL, Sec 22, T17S, R29E, Unit I	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	BHL: 1650' FSL, 245' FWL, Sec 19, T17S, R30E, Lot 8	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #2	**Offset TVD Reference:**	Offset Datum

Offset Design *Eddy County Offset Wells - Burch Keely Unit #958H - OH - OH* — **Offset Site Error:** 0.00 usft

Survey Program: 100-VES-ISCWSA-GYRO-3, 4267-MWD — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
10,100.00	4,900.00	4,739.00	4,708.41	148.24	7.86	-71.18	542.01	5,713.70	664.21	529.47	134.74	4.929	
10,200.00	4,900.00	4,771.00	4,732.72	150.99	8.04	-73.37	540.37	5,734.44	625.53	480.79	144.74	4.322	
10,300.00	4,900.00	4,832.33	4,776.87	153.75	8.47	-77.52	538.27	5,776.95	596.24	442.37	153.87	3.875	
10,400.00	4,900.00	4,887.25	4,813.63	156.50	8.99	-81.11	536.44	5,817.68	575.71	413.98	161.73	3.560	
10,500.00	4,900.00	4,949.08	4,851.27	159.25	9.73	-84.87	534.73	5,866.68	563.75	395.79	167.96	3.356	
10,581.59	4,900.00	4,998.13	4,878.44	161.50	10.41	-87.64	535.08	5,907.51	561.02	389.26	171.76	3.266	CC
10,600.00	4,900.00	5,011.95	4,885.49	162.01	10.62	-88.36	535.34	5,919.39	561.13	388.59	172.54	3.252	
10,700.00	4,900.00	5,104.26	4,924.37	164.76	12.26	-92.32	537.49	6,002.94	564.30	387.60	176.70	3.194	
10,800.00	4,900.00	5,211.23	4,949.02	167.51	14.55	-94.80	539.55	6,106.79	568.19	386.87	181.32	3.134	
10,900.00	4,900.00	5,317.76	4,954.91	170.27	17.06	-95.37	541.59	6,213.07	571.03	384.55	186.48	3.062	
11,000.00	4,900.00	5,413.00	4,953.58	173.02	19.40	-95.21	544.00	6,308.27	573.83	382.27	191.56	2.996	
11,100.00	4,900.00	5,508.00	4,951.34	175.78	21.80	-94.96	546.73	6,403.20	576.94	380.24	196.71	2.933	
11,200.00	4,900.00	5,604.00	4,949.00	178.53	24.26	-94.69	550.41	6,499.10	581.00	379.08	201.92	2.877	
11,300.00	4,900.00	5,725.96	4,946.83	181.29	27.45	-94.45	553.29	6,620.99	583.62	375.50	208.12	2.804	
11,400.00	4,900.00	5,831.11	4,945.85	184.04	30.23	-94.35	553.49	6,726.14	584.17	370.49	213.68	2.734	
11,500.00	4,900.00	5,935.85	4,945.14	186.80	33.03	-94.29	552.44	6,830.87	583.54	364.32	219.22	2.662	
11,600.00	4,900.00	6,038.16	4,944.24	189.55	35.77	-94.21	551.10	6,933.17	582.60	357.89	224.72	2.593	
11,700.00	4,900.00	6,139.85	4,941.62	192.31	38.50	-93.96	549.36	7,034.80	581.15	350.89	230.25	2.524	
11,800.00	4,900.00	6,240.04	4,938.33	195.07	41.21	-93.64	547.62	7,134.93	579.62	343.84	235.78	2.458	
11,883.86	4,900.00	6,315.01	4,935.66	197.38	43.23	-93.38	546.68	7,209.84	578.77	338.57	240.20	2.410	
11,900.00	4,900.00	6,328.66	4,935.25	197.82	43.60	-93.34	546.67	7,223.49	578.80	337.78	241.02	2.401	
12,000.00	4,900.00	6,422.20	4,932.78	200.58	46.13	-93.09	547.49	7,316.99	579.95	333.63	246.32	2.354	
12,100.00	4,900.00	6,518.70	4,930.48	203.33	48.74	-92.86	549.00	7,413.45	581.82	330.11	251.71	2.311	
12,200.00	4,900.00	6,620.81	4,928.58	206.09	51.51	-92.66	550.75	7,515.53	583.87	326.58	257.29	2.269	
12,300.00	4,900.00	6,714.67	4,926.87	208.85	54.06	-92.48	552.53	7,609.35	586.12	323.55	262.56	2.232	
12,400.00	4,900.00	6,810.92	4,925.37	211.60	56.68	-92.32	555.25	7,705.55	589.30	321.40	267.91	2.200	
12,500.00	4,900.00	6,910.61	4,924.17	214.36	59.39	-92.19	558.38	7,805.19	592.82	319.44	273.39	2.168	
12,600.00	4,900.00	7,006.35	4,923.15	217.12	61.99	-92.08	561.70	7,900.87	596.68	317.99	278.69	2.141	
12,700.00	4,900.00	7,119.64	4,923.87	219.87	65.08	-92.14	564.80	8,014.11	599.89	315.18	284.71	2.107	
12,800.00	4,900.00	7,235.43	4,923.76	222.63	68.25	-92.12	564.90	8,129.89	600.38	309.71	290.67	2.066	
12,900.00	4,900.00	7,342.51	4,920.13	225.39	71.18	-91.78	563.17	8,236.89	599.06	302.70	296.36	2.021	
13,000.00	4,900.00	7,436.33	4,916.15	228.14	73.75	-91.41	561.28	8,330.60	597.39	295.60	301.78	1.980	
13,031.32	4,900.00	7,463.12	4,915.38	229.01	74.48	-91.33	561.08	8,357.38	597.27	293.87	303.40	1.969	
13,100.00	4,900.00	7,528.48	4,913.99	230.90	76.27	-91.20	561.14	8,422.72	597.59	290.49	307.10	1.946	
13,200.00	4,900.00	7,628.50	4,911.41	233.66	79.01	-90.95	561.31	8,522.71	598.14	285.53	312.62	1.913	
13,300.00	4,900.00	7,724.40	4,908.75	236.42	81.64	-90.69	561.65	8,618.57	598.90	280.90	318.00	1.883	
13,400.00	4,900.00	7,825.64	4,906.65	239.17	84.41	-90.49	562.73	8,719.78	600.37	276.82	323.55	1.856	
13,500.00	4,900.00	7,926.21	4,904.39	241.93	87.17	-90.28	563.10	8,820.33	601.16	272.08	329.08	1.827	
13,600.00	4,900.00	8,027.60	4,902.09	244.69	89.95	-90.06	563.64	8,921.69	602.12	267.50	334.63	1.799	
13,700.00	4,900.00	8,125.81	4,900.02	247.45	92.64	-89.86	563.99	9,019.88	602.91	262.83	340.07	1.773	
13,800.00	4,900.00	8,225.15	4,898.21	250.20	95.36	-89.69	564.67	9,119.20	604.03	258.48	345.55	1.748	
13,900.00	4,900.00	8,328.05	4,895.95	252.96	98.19	-89.47	565.17	9,222.07	604.97	253.83	351.13	1.723	
14,000.00	4,900.00	8,425.20	4,893.56	255.72	100.85	-89.25	565.57	9,319.19	605.84	249.31	356.53	1.699	
14,100.00	4,900.00	8,525.04	4,891.30	258.48	103.59	-89.04	566.27	9,419.00	607.00	244.99	362.01	1.677	
14,200.00	4,900.00	8,624.75	4,889.23	261.23	106.33	-88.84	566.97	9,518.69	608.17	240.69	367.48	1.655	
14,300.00	4,900.00	8,720.85	4,887.67	263.99	108.97	-88.70	568.02	9,614.77	609.73	236.91	372.83	1.635	
14,400.00	4,900.00	8,820.87	4,886.48	266.75	111.71	-88.59	569.42	9,714.77	611.59	233.28	378.31	1.617	
14,500.00	4,900.00	8,920.85	4,885.44	269.51	114.45	-88.50	570.81	9,814.74	613.44	229.64	383.80	1.598	
14,600.00	4,900.00	9,020.79	4,884.37	272.27	117.20	-88.40	572.21	9,914.67	615.30	226.01	389.28	1.581	
14,700.00	4,900.00	9,119.71	4,882.84	275.02	119.91	-88.27	573.61	10,013.56	617.19	222.47	394.72	1.564	
14,800.00	4,900.00	9,217.52	4,881.43	277.78	122.60	-88.14	575.37	10,111.35	619.46	219.36	400.11	1.548	

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

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Site Burch Keely Unit #951H
Project:	Eddy County, NM (NAD-27 2015)	**TVD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Reference Site:	Burch Keely Unit #951H	**MD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	SHL: 1720' FSL, 90' FEL, Sec 22, T17S, R29E, Unit I	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	BHL: 1650' FSL, 245' FWL, Sec 19, T17S, R30E, Lot 8	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #2	**Offset TVD Reference:**	Offset Datum

Offset Design Eddy County Offset Wells - Burch Keely Unit #958H - OH - OH — **Offset Site Error:** 0.00 usft

Survey Program: 100-VES-ISCWSA-GYRO-3, 4267-MWD — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
14,900.00	4,900.00	9,317.60	4,880.61	280.54	125.34	-88.07	577.29	10,211.40	621.84	216.25	405.60	1.533	
15,000.00	4,900.00	9,414.41	4,880.13	283.30	128.00	-88.04	579.26	10,308.19	624.32	213.37	410.95	1.519	
15,100.00	4,900.00	9,510.02	4,880.16	286.06	130.62	-88.05	582.07	10,403.76	627.68	211.44	416.25	1.508	
15,200.00	4,900.00	9,610.08	4,880.21	288.81	133.37	-88.07	585.21	10,503.77	631.25	209.50	421.75	1.497	Level 3
15,300.00	4,900.00	9,722.73	4,881.17	291.57	136.46	-88.16	588.09	10,616.38	634.27	206.46	427.81	1.483	Level 3
15,400.00	4,900.00	9,822.81	4,880.70	294.33	139.21	-88.12	588.73	10,716.45	635.34	202.04	433.31	1.466	Level 3
15,500.00	4,900.00	9,918.26	4,880.03	297.09	141.83	-88.07	590.16	10,811.89	637.30	198.68	438.62	1.453	Level 3
15,577.04	4,900.00	9,994.51	4,879.59	299.22	143.92	-88.03	591.61	10,888.12	639.11	196.29	442.82	1.443	Level 3, ES, SF

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Site Burch Keely Unit #951H
Project:	Eddy County, NM (NAD-27 2015)	**TVD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Reference Site:	Burch Keely Unit #951H	**MD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	SHL: 1720' FSL, 90' FEL, Sec 22, T17S, R29E, Unit I	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	BHL: 1650' FSL, 245' FWL, Sec 19, T17S, R30E, Lot 8	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #2	**Offset TVD Reference:**	Offset Datum

Offset Design Eddy County Offset Wells - Burch Keely Unit #967H - OH - OH — **Offset Site Error:** 0.00 usft

Survey Program: 4323-MWD — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
15,400.00	4,900.00	4,704.00	4,667.83	294.33	3.02	-21.54	57.53	11,027.31	417.06	324.58	92.48	4.510	
15,500.00	4,900.00	4,743.35	4,695.76	297.09	3.66	-23.33	55.10	11,054.90	347.39	240.98	106.41	3.265	
15,577.04	4,900.00	4,780.23	4,720.05	299.22	4.32	-25.27	53.22	11,082.59	298.29	178.65	119.65	2.493	CC, ES, SF

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Site Burch Keely Unit #951H
Project:	Eddy County, NM (NAD-27 2015)	**TVD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Reference Site:	Burch Keely Unit #951H	**MD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	SHL: 1720' FSL, 90' FEL, Sec 22, T17S, R29E, Unit I	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	BHL: 1650' FSL, 245' FWL, Sec 19, T17S, R30E, Lot 8	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #2	**Offset TVD Reference:**	Offset Datum

Offset Design Eddy County Offset Wells - Dodd Federal Unit #654 - OH - OH — **Offset Site Error:** 0.00 usft

Survey Program: 230-INC — **Offset Well Error:** 0.00 usft

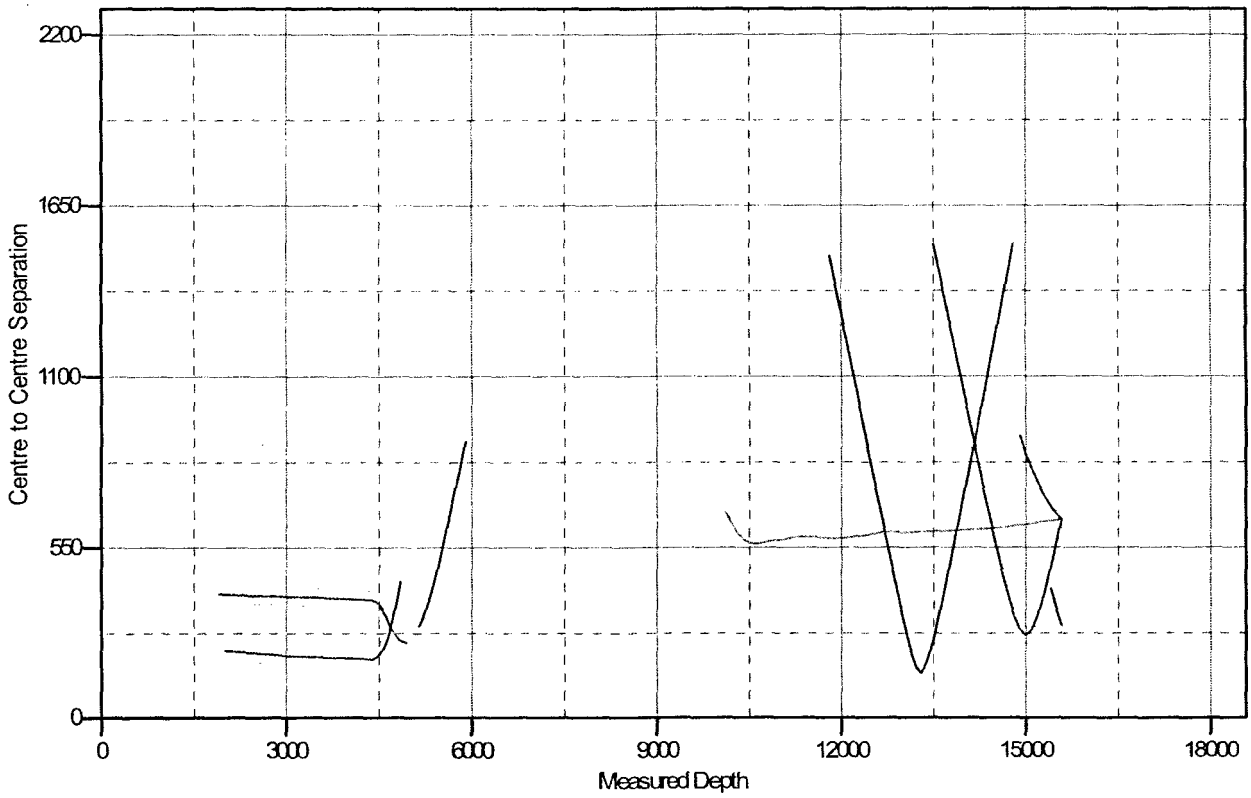
Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
2,000.00	2,000.00	1,978.45	1,978.13	4.36	114.87	-88.42	6.11	-220.69	220.81	176.24	44.58	4.954	
2,100.00	2,100.00	2,078.25	2,077.91	4.59	120.73	-88.47	5.86	-218.87	218.98	172.10	46.88	4.671	
2,200.00	2,200.00	2,178.05	2,177.70	4.81	126.60	-88.52	5.62	-217.13	217.24	168.05	49.19	4.416	
2,300.00	2,300.00	2,277.86	2,277.50	5.04	132.46	-88.57	5.39	-215.48	215.57	164.07	51.50	4.186	
2,400.00	2,400.00	2,377.68	2,377.31	5.26	138.32	-88.61	5.18	-213.90	213.99	160.18	53.81	3.977	
2,500.00	2,500.00	2,477.76	2,477.37	5.49	143.87	-88.66	4.96	-212.34	212.42	156.29	56.13	3.784	
2,600.00	2,600.00	2,577.83	2,577.43	5.71	149.42	-88.71	4.74	-210.74	210.82	152.36	58.46	3.606	
2,700.00	2,700.00	2,677.90	2,677.48	5.94	154.97	-88.76	4.52	-209.10	209.17	148.39	60.79	3.441	
2,800.00	2,800.00	2,777.97	2,777.54	6.16	160.52	-88.82	4.29	-207.41	207.49	144.37	63.12	3.287	
2,900.00	2,900.00	2,877.84	2,877.40	6.39	165.60	-88.87	4.06	-205.71	205.78	140.33	65.45	3.144	
3,000.00	3,000.00	2,977.25	2,976.79	6.61	169.53	-88.92	3.85	-204.21	204.27	136.55	67.72	3.016	
3,100.00	3,100.00	3,076.66	3,076.20	6.84	173.46	-88.96	3.69	-203.00	203.04	133.05	69.99	2.901	
3,200.00	3,200.00	3,176.08	3,175.61	7.06	177.39	-88.99	3.56	-202.06	202.10	129.85	72.25	2.797	
3,300.00	3,300.00	3,275.51	3,275.04	7.28	181.33	-89.01	3.47	-201.41	201.45	126.94	74.51	2.704	
3,400.00	3,400.00	3,375.58	3,375.11	7.51	184.32	-89.03	3.40	-200.91	200.94	124.20	76.74	2.618	
3,500.00	3,500.00	3,475.77	3,475.30	7.73	187.12	-89.05	3.32	-200.31	200.34	121.37	78.97	2.537	
3,600.00	3,600.00	3,575.97	3,575.49	7.96	189.92	-89.08	3.22	-199.61	199.64	118.43	81.21	2.458	
3,700.00	3,700.00	3,676.16	3,675.68	8.18	192.73	-89.10	3.11	-198.81	198.84	115.40	83.45	2.383	
3,800.00	3,800.00	3,776.33	3,775.85	8.41	195.59	-89.13	2.99	-197.92	197.95	112.26	85.69	2.310	
3,900.00	3,900.00	3,876.30	3,875.81	8.63	198.99	-89.17	2.86	-196.99	197.02	109.06	87.96	2.240	
4,000.00	4,000.00	3,976.27	3,975.78	8.86	202.39	-89.20	2.74	-196.08	196.11	105.88	90.23	2.173	
4,100.00	4,100.00	4,076.24	4,075.74	9.08	205.80	-89.23	2.62	-195.18	195.21	102.71	92.50	2.110	
4,200.00	4,200.00	4,176.21	4,175.71	9.31	209.20	-89.26	2.50	-194.30	194.32	99.55	94.77	2.050	
4,300.00	4,300.00	4,276.15	4,275.65	9.53	212.54	-89.30	2.38	-193.43	193.45	96.41	97.04	1.994	
4,379.13	4,379.13	4,354.83	4,354.32	9.71	214.18	-89.32	2.30	-192.85	192.87	94.04	98.83	1.952	
4,382.29	4,382.29	4,357.97	4,357.47	9.72	214.25	-179.57	2.29	-192.83	192.86	93.96	98.90	1.950 CC	
4,400.00	4,399.99	4,375.57	4,375.07	9.75	214.61	-179.57	2.28	-192.73	193.16	93.87	99.29	1.945 ES, SF	
4,450.00	4,449.78	4,425.09	4,424.58	9.85	215.64	-179.58	2.25	-192.49	197.32	96.91	100.41	1.965	
4,500.00	4,498.92	4,473.96	4,473.45	9.96	216.66	-179.60	2.23	-192.33	206.30	104.78	101.53	2.032	
4,550.00	4,546.95	4,521.71	4,521.21	10.07	217.65	-179.62	2.21	-192.24	220.03	117.41	102.62	2.144	
4,600.00	4,593.44	4,560.00	4,559.49	10.19	218.45	-179.63	2.21	-192.22	238.49	135.02	103.47	2.305	
4,650.00	4,637.96	4,560.00	4,559.49	10.34	218.45	-179.61	2.21	-192.22	266.31	164.66	101.65	2.620	
4,700.00	4,680.09	4,560.00	4,559.49	10.52	218.45	-179.56	2.21	-192.22	303.11	204.47	98.64	3.073	
4,750.00	4,719.45	4,560.00	4,559.49	10.76	218.45	-179.49	2.21	-192.22	345.78	249.95	95.83	3.608	
4,800.00	4,755.68	4,560.00	4,559.49	11.06	218.45	-179.35	2.21	-192.22	392.07	298.34	93.73	4.183	
4,850.00	4,788.44	4,560.00	4,559.49	11.44	218.45	-179.04	2.21	-192.22	440.49	348.09	92.40	4.767	

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

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Site Burch Keely Unit #951H
Project:	Eddy County, NM (NAD-27 2015)	**TVD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Reference Site:	Burch Keely Unit #951H	**MD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	SHL: 1720' FSL, 90' FEL, Sec 22, T17S, R29E, Unit I	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	BHL: 1650' FSL, 245' FWL, Sec 19, T17S, R30E, Lot 8	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #2	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to KB @ 3602.00usft (Silver Oak 3)	Coordinates are relative to: Burch Keely Unit #951H
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Central Meridian is 104° 20' 0.000 W	Grid Convergence at Surface is: 0.15°

Ladder Plot



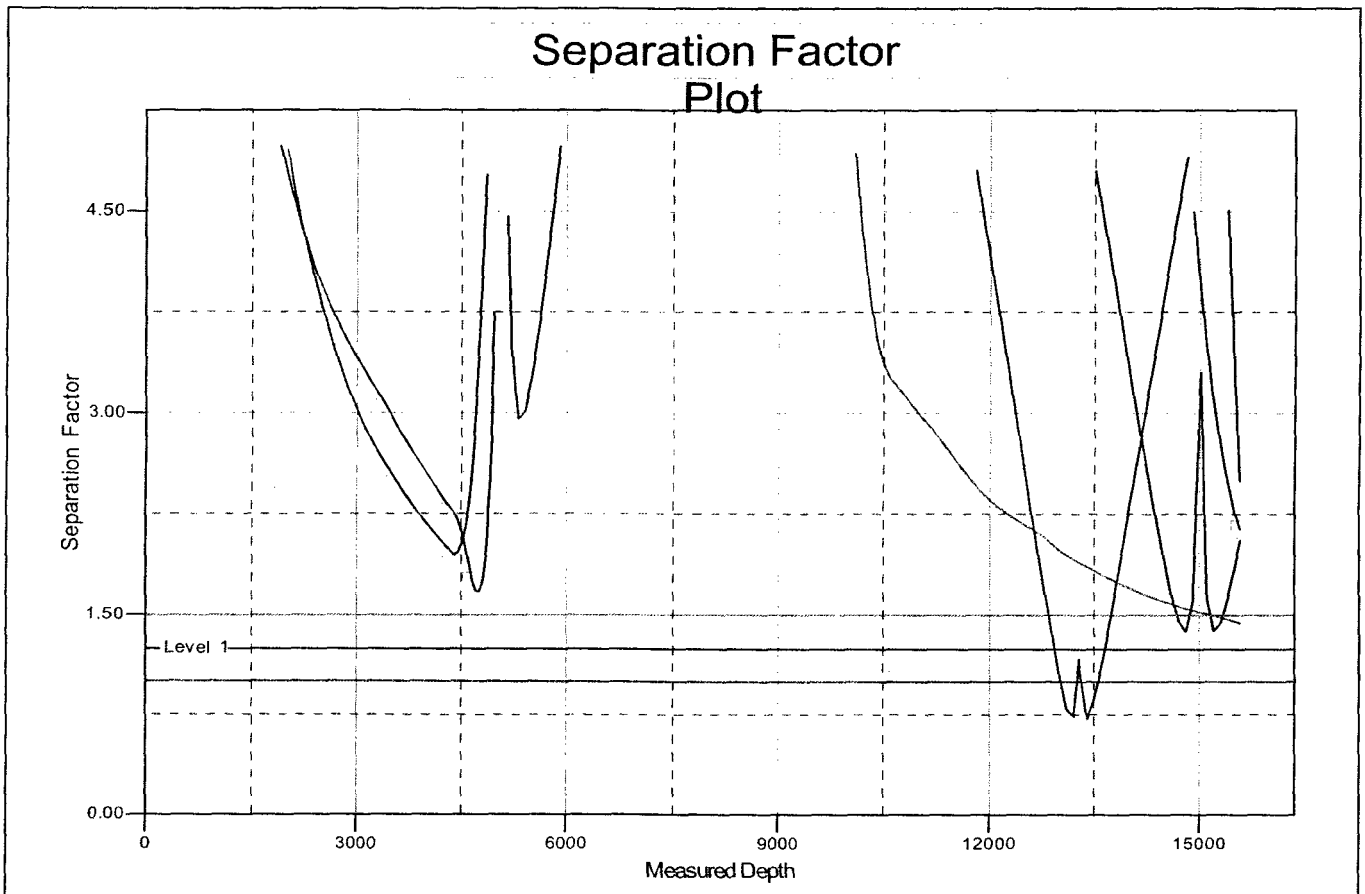
LEGEND

- Burch Keely Unit#217, OH, OH V0
- Burch Keely Unit#326, OH, OH V0
- Burch Keely Unit#235, OH, OH V0

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Site Burch Keely Unit #951H
Project:	Eddy County, NM (NAD-27 2015)	**TVD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Reference Site:	Burch Keely Unit #951H	**MD Reference:**	KB @ 3602.00usft (Silver Oak 3)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	SHL: 1720' FSL, 90' FEL, Sec 22, T17S, R29E, Unit I	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	BHL: 1650' FSL, 245' FWL, Sec 19, T17S, R30E, Lot 8	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #2	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to KB @ 3602.00usft (Silver Oak 3)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: Burch Keely Unit #951H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.15°



LEGEND

- Burch Keely Unit#217, OH, OH V0
- Burch Keely Unit#326, OH, OH V0
- Burch Keely Unit#235, OH, OH V0

Closed Loop Operation & Maintenance Procedure

All drilling fluid circulated over shaker(s) with cuttings discharged into roll off container.

Fluid and fines below shaker(s) are circulated with transfer pump through centrifuge(s) or solids separator with cuttings and fines discharged into roll off container.

Fluid is continuously re-circulated through equipment with polymer added to aid separation of cutting fines.

Roll off containers are lined and de-watered with fluids re-circulated into system.

Additional tank is used to capture unused drilling fluid or cement returns from casing jobs.

This equipment will be maintained 24 hrs./day by solids control personnel and or rig crews that stay on location.

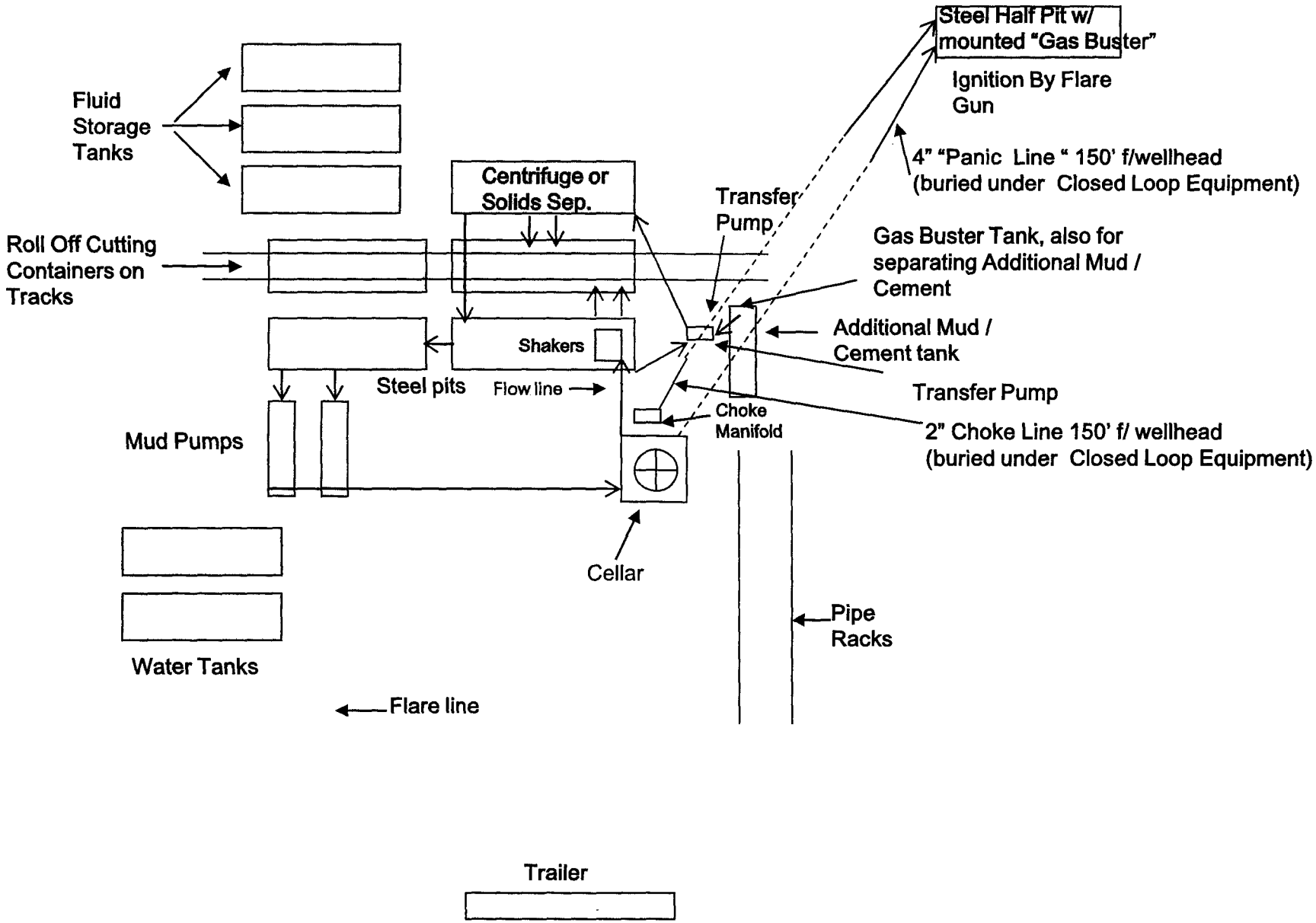
Cuttings will be hauled to either:

CRI (permit number R9166)
or
GMI (permit number 711-019-001)

dependent upon which rig is available to drill this well.

COG Operating LLC

Closed Loop Equipment Diagram



Contingent Multi-Stage Cement Discussion:

COG does not anticipate losing circulation or encountering water flows while drilling this well. If these situations arise, COG requests approval in this APD to set DV tools where necessary immediately without having to shut down the rig and wait for sundry approval.

Lost Circulation or Water flow Contingent DV Tool Cement Plans are as follows:

1. If lost circulation occurs while drilling the 12 ¼" intermediate hole, it may become necessary to set a DV tool in the 9 5/8" casing. The DV tool depth will be based on hole conditions and cement volumes will be adjusted proportionally. If the DV Tool is needed, it will be set a minimum of 50 feet below the previous casing and a minimum of 200 feet above the current shoe.

2. If water flows in the San Andres are encountered, it may become necessary to set a DV tool in the 7" casing. These water flows normally occur in areas where produced water disposal is happening. This dense cement is used to combat water flows. This cement recipe also has a right angle set time and is mixed a little under saturated so the water flow will be absorbed by cement. The DV tool depth will be based on hole conditions and cement volumes will be adjusted proportionally. If the DV tool is needed, it will be set a minimum of 50 feet below the previous casing and a minimum of 200 feet above the current shoe.

Casing	Bottom MD of Segment	Lead or Tail	Cement Type	Additives	Quantity (Sks)	Yield (cu.ft./sk)	Density (lbs./gal)
Inter. Multi-Stage	+/- 900'	1st Lead	50:50:10 C: Poz:Gel	5% Salt + 5 pps LCM + 0.25 pps CF	150	2.45	11.8
		1st Tail	Class C	2% Cacl2	200	1.32	14.8
		2nd Lead	50:50:10 C: Poz:Gel	5% Salt + 5 pps LCM + 0.25 pps CF	200	2.45	11.8
Prod. Multi-Stage	+/- 4000'	1st Lead	35:65:6 C:Poz Gel	5% salt+5 pps LCM+0.2% SMS + 1% FL-25+1% BA-58+0.3% FL-52A+ 0.125 pps CF	200	2.01	12.5
		1st Tail	Class C	0.3% R-3 + 1.5% CD-32	2700	1.37	14
		2nd Lead	35:65:6 C:Poz Gel	5% salt + 5 pp LCM + 0.2% SMS + 1% FL-25+ 1% BA-58 + 0.3% FL-52A + 0.125 pps CF	650	2.01	12.5
		2nd Tail	50:50:2 C: PozGel	5% salt + 3 pps LCM + 0.6% SMS + 1% FL-25 + 1% BA-58 + 0.125 pps CF	150	0.99	16.8

APD ID: 10400011772 **Submission Date:** 04/20/2017

Operator Name: COG OPERATING LLC

Well Name: BURCH KEELY UNIT **Well Number:** 951H

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

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map:

Burch_Keely_Unit_951H_Vacinity_plat_20170908074420.pdf

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

ROW ID(s)

ID:

Do the existing roads need to be improved? NO

Existing Road Improvement Description:

Existing Road Improvement Attachment:

Section 2 - New or Reconstructed Access Roads

Will new roads be needed? YES

New Road Map:

Burch_Keely_Unit_951H_New_Access_Road_Plat_20170908074437.pdf

New road type: RESOURCE

Length: 504.47 Feet **Width (ft.):** 30

Max slope (%): 3 **Max grade (%):** 1

Army Corp of Engineers (ACOE) permit required? NO

ACOE Permit Number(s):

New road travel width: 20

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

New road access plan or profile prepared? YES

New road access plan attachment:

New_Access_Road_Plan_04-20-2017.pdf

Access road engineering design? NO

Access road engineering design attachment:

Access surfacing type: OTHER

Access topsoil source: BOTH

Access surfacing type description: Caliche

Access onsite topsoil source depth: 6

Offsite topsoil source description: Surfacing material will consist of native caliche. Caliche will be obtained from the actual well site if available. Secondary candidate source will be NMSLO Caliche Pit located in S2/SW4 of Sec 32, T16S, R30E. A third candidate source will be Caswell Ranch owned Caliche Pit located in NESE of Sec 9, T17S, R32E.
Onsite topsoil removal process: See attached New Access Road Plan

Access other construction information:

Access miscellaneous information:

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

Drainage Control

New road drainage crossing: OTHER

Drainage Control comments: Drainage Control Comments & Erosion Control: Water will be diverted where necessary to avoid ponding, prevent erosion, maintain good drainage and to be consistent with local drainage patterns.
Road Drainage Control Structures (DCS) description: Drainage Control Comments & Erosion Control: Water will be diverted where necessary to avoid ponding, prevent erosion, maintain good drainage and to be consistent with local drainage patterns.
Road Drainage Control Structures (DCS) attachment:

Access Additional Attachments

Additional Attachment(s):

Section 3 - Location of Existing Wells

Existing Wells Map? YES

Attach Well map:

Burch_Keely_Unit_951H_1mileRadius_Map_04-20-2017.pdf

Existing Wells description:

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

Submit or defer a Proposed Production Facilities plan? SUBMIT

Production Facilities description: If the well is productive, contemplated facilities will be as follows: Two (2) proposed flowlines, will follow an archaeologically approved route to the Burch Keely Unit 23A Federal Tank Battery located in Section 22 in T17S R29E. The flowlines will be SDR 7 3" poly line laid on the surface and will be approximately 730 feet in length.

Normal working pressure of the flowlines will be below 70 psi and carry a mixture of produced oil, water, and gas. Flowlines will follow existing well-traveled or proposed roads. The tank battery and facilities including all flow lines and piping will be installed according to API specifications.

Production Facilities map:

Burch_Keely_Unit_951H_BKU_23A_Battery_Layout_03-10-2017.pdf

Section 5 - Location and Types of Water Supply

Water Source Table

Water source use type: DUST CONTROL, INTERMEDIATE/PRODUCTION CASING, SURFACE CASING

Water source type: GW WELL

Describe type:

Source latitude:

Source longitude:

Source datum: NAD83

Water source permit type: PRIVATE CONTRACT

Source land ownership: COMMERCIAL

Water source transport method: PIPELINE,TRUCKING

Source transportation land ownership: COMMERCIAL

Water source volume (barrels): 8000

Source volume (acre-feet): 1.0311447

Source volume (gal): 336000

Water source and transportation map:

Loco Hills Water Disposal Co Water Supply_12-19-2016.pdf

Caswell Ranch_Water Supply_12-19-2016.pdf

Water source comments: The well will be drilled with combination brine and fresh water mud system as outlined in the drilling program. Water will be obtained from commercial water stations in the area and hauled to location by transport truck over the existing and proposed access roads shown in Vicinity Map. A fresh water source is nearby and fast line may be laid along existing road ROW's and fresh water pumped to the well. Water will originate from private wells location described on the attached "Loco Hills Water Disposal Co" map attached to this APD. James R. Maloney, 575-677-2118. A secondary water source will be from 1 and/or all of the 3 private wells location depicted on the attached "Caswell Ranch Water Supply" Map. No water well will be drilled on the location.

New water well? NO

New Water Well Info

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

Well target aquifer:

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

Aquifer comments:

Aquifer documentation:

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

Operator Name: COG OPERATING LLC

Well Name: BURCH KEELY UNIT **Well Number:** 951H

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

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

Drilling method: **Drill material:**

Grout material: **Grout depth:**

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

Well Production type: **Completion Method:**

Water well additional information:

State appropriation permit:

Additional information attachment:

Section 6 - Construction Materials

Construction Materials description: Surfacing material will consist of native caliche. Caliche will be obtained from the actual well site if available. Secondary candidate source will be NMSLO Caliche Pit located in S2/SW4 of Sec 32, T16S, R30E. A third candidate source will be Caswell Ranch owned Caliche Pit located in NESE of Sec 9, T17S, R32E.
Construction Materials source location attachment:

NMSLO Caliche Pit_12-19-2016.pdf

Caswell Ranch Caliche Pit_12-19-2016.pdf

Construction Turn-Over Procedure_12-19-2016.pdf

Section 7 - Methods for Handling Waste

Waste type: DRILLING

Waste content description: Drill cuttings and drilling fluids

Amount of waste: 100 barrels

Waste disposal frequency : Daily

Safe containment description: Closed Loop System

Safe containmant attachment:

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

Disposal type description:

Disposal location description: R360's Disposal Site located at 4507 West Carlsbad Highway, Hobbs, NM 88240.

Waste type: PRODUCED WATER

Waste content description: Produced water

Amount of waste: 100 barrels

Waste disposal frequency : Daily

Safe containment description: Steel tanks

Safe containmant attachment:

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

Disposal location description: NMOCD approved commercial disposal facility. R360's Disposal Site located at 4507 West Carlsbad Highway, Hobbs, NM 88240.

Waste type: GARBAGE

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

Amount of waste: 100 pounds

Waste disposal frequency : Weekly

Safe containment description: Trash bin

Safe containmant attachment:

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

Disposal location description: Garbage and trash to be collected in trash bin and hauled to Lea Landfill LLC. located at mile marker 64, Highway 62-180 East, PO Box 3247, Carlsbad, NM 88221. No toxic waste or hazardous chemicals will be produced by this operation.

Waste type: SEWAGE

Waste content description: Human waste and grey water

Amount of waste: 100 gallons

Waste disposal frequency : Weekly

Safe containment description: Portable septic system and/or portable waste gathering system.

Safe containmant attachment:

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

Disposal location description: Hauled to NMOCD approved waste disposal facility.

Reserve Pit

Reserve Pit being used? NO

Temporary disposal of produced water into reserve pit?

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

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

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

Reserve pit liner

Reserve pit liner specifications and installation description

Operator Name: COG OPERATING LLC

Well Name: BURCH KEELY UNIT **Well Number:** 951H

Cuttings Area

Cuttings Area being used? NO

Are you storing cuttings on location? YES

Description of cuttings location Closed Loop Mud System: Roll-off style mud box.

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

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

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

WCuttings area liner

Cuttings area liner specifications and installation description

Section 8 - Ancillary Facilities

Are you requesting any Ancillary Facilities?: NO

Ancillary Facilities attachment:

Comments:

Section 9 - Well Site Layout

Well Site Layout Diagram:

Burch_Keely_Unit_951H_Well_Site_plat_20170908074510.pdf

Burch_Keely_Unit_951H_Interim_Reclamation_plat_20170908074518.pdf

Comments:

Section 10 - Plans for Surface Reclamation

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

Multiple Well Pad Number:

Recontouring attachment:

Drainage/Erosion control construction: No sedimentation or erosion control will be necessary on this location as it is generally flat with little to no slope or cut and fill.

Drainage/Erosion control reclamation: No sedimentation or erosion will be necessary on this location as it is generally flat with little to no slope or cut and fill.

Operator Name: COG OPERATING LLC

Well Name: BURCH KEELY UNIT **Well Number:** 951H

Wellpad long term disturbance (acres): 2.351

Wellpad short term disturbance (acres): 3.673

Access road long term disturbance (acres): 504.47

Access road short term disturbance (acres): 504.47

Pipeline long term disturbance (acres): 0.5027548

Pipeline short term disturbance (acres): 0.5027548

Other long term disturbance (acres): 0

Other short term disturbance (acres): 0

Total long term disturbance: 507.32376

Total short term disturbance: 508.64575

Reconstruction method: After well is completed, the pad will be downsized by reclaiming the areas not needed for production operations. The portions of the pad that are not needed for production operations will be re-contoured to its original state as much as possible. The caliche that is removed will be reused to either build another pad or for road repairs within the lease.
Topsoil redistribution: The stockpiled topsoil will be spread out on reclaimed area and reseeded with a BLM approved seed mixture.
Soil treatment: Interim reclamation as identified during on-site.

Existing Vegetation at the well pad: Grassland area with sandy topsoil. Vegetation is moderately sparse with Native prairie grasses, some mesquite and shinnery oak.
Existing Vegetation at the well pad attachment:

Existing Vegetation Community at the road: Grassland area with sandy topsoil. Vegetation is moderately sparse with Native prairie grasses, some mesquite and shinnery oak.
Existing Vegetation Community at the road attachment:

Existing Vegetation Community at the pipeline: Grassland area with sandy topsoil. Vegetation is moderately sparse with Native prairie grasses, some mesquite and shinnery oak.
Existing Vegetation Community at the pipeline attachment:

Existing Vegetation Community at other disturbances: Grassland area with sandy topsoil. Vegetation is moderately sparse with Native prairie grasses, some mesquite and shinnery oak.
Existing Vegetation Community at other disturbances attachment:

Non native seed used? NO

Non native seed description:

Seedling transplant description:

Will seedlings be transplanted for this project? NO

Seedling transplant description attachment:

Will seed be harvested for use in site reclamation? NO

Seed harvest description:

Seed harvest description attachment:

Operator Name: COG OPERATING LLC

Well Name: BURCH KEELY UNIT **Well Number:** 951H

Seed Management

Seed Table

Seed type: **Seed source:**

Seed name:

Source name: **Source address:**

Source phone:

Seed cultivar:

Seed use location:

PLS pounds per acre: **Proposed seeding season:**

Seed Summary

Total pounds/Acre:

Seed Type	Pounds/Acre

Seed reclamation attachment:

Operator Contact/Responsible Official Contact Info

First Name: **Last Name:**

Phone: **Email:**

Seedbed prep:

Seed BMP:

Seed method:

Existing invasive species? NO

Existing invasive species treatment description:

Existing invasive species treatment attachment:

Weed treatment plan description: Approved EPA and BLM requirements and policies for weed control methods will be followed.

Weed treatment plan attachment:

Monitoring plan description: Evaluation of growth will be made after the completion of one full growing season after seeding. -OR- BLM representative will be contacted prior to commencing construction of well pad and road. BLM representative will also be contacted prior to commencing reclamation work.

Monitoring plan attachment:

Success standards: 80% coverage be 2nd growing season of Native species with less than 5% invasive species.

Pit closure description: N/A

Pit closure attachment:

Operator Name: COG OPERATING LLC

Well Name: BURCH KEELY UNIT **Well Number:** 951H

Section 11 - Surface Ownership

Disturbance type: WELL PAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

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

Disturbance type: EXISTING ACCESS ROAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

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

Disturbance type: PIPELINE

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

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

Disturbance type: NEW ACCESS ROAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

Operator Name: COG OPERATING LLC

Well Name: BURCH KEELY UNIT **Well Number:** 951H

USFWS Local Office:

Other Local Office:

USFS Region:

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

Section 12 - Other Information

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

ROW Type(s):

ROW Applications

SUPO Additional Information: 1. It will be necessary to run electric power if this well is productive. Power will be provided by CVE. There will be no necessary electric line construction for this well. CVE operates an existing primary line parallel to the well pad; therefor no poles will be set off the well pad disturbance. There is no permanent or live water in the immediate area. 2. There are no dwellings within 2 miles of this location. 3. If needed, a Cultural Resources Examination is being prepared by Boone Arch Services of New Mexico, LLC. Carlsbad, NM, 88220. 506 E Chapman Rd., phone # 575.887.7667 and the results will be forwarded to your office in the near future. Otherwise, COG will be participating in the Permian Basin MOA Program.

Use a previously conducted onsite? YES

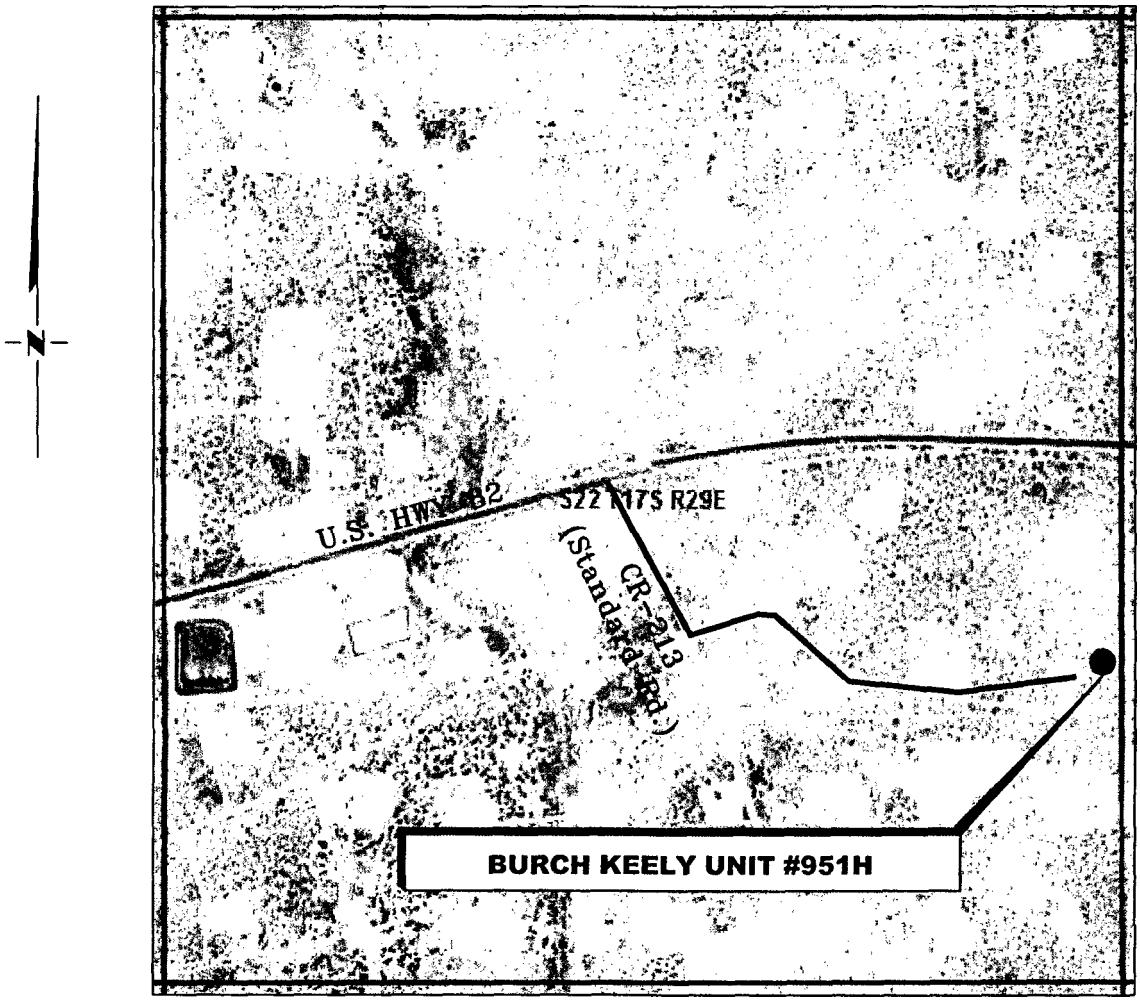
Previous Onsite information: On-site conducted on 12/12/2016 by Nick Franke(BLM), Curtis Griffin(COG), Jason Morgan(RRC), Cassandra Brooks(BLM)

Other SUPO Attachment

Burch_Keely_Unit_951H_Flowlines_Map_03-10-2017.pdf

VICINITY MAP

NOT TO SCALE



SECTION 22, TWP. 17 SOUTH, RGE. 29 EAST, N. M. P. M., EDDY COUNTY, NEW MEXICO

OPERATOR: COG Operating, LLC
LEASE: Burch Keely Unit
WELL NO.: 951H

LOCATION: 1720' FSL & 90' FEL
ELEVATION: 3584'

NO.	REVISION	DATE

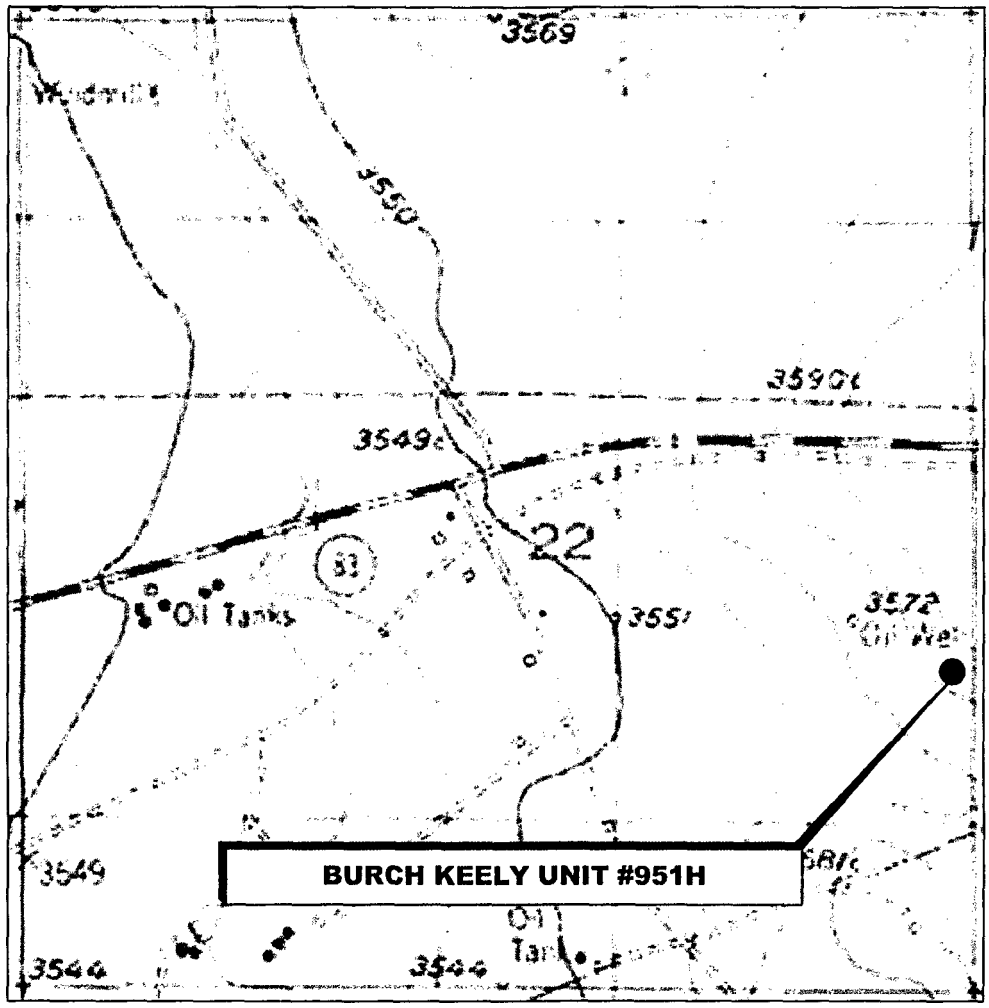
JOB NO.: LS130146R2
DWG. NO.: 130146VM

RRC

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

SCALE: 1" = 1000'
DATE: 3-15-2017
SURVEYED BY: JM/EF
DRAWN BY: CMJ
APPROVED BY: RMH
SHEET: 1 OF 1

LOCATION VERIFICATION MAP



SECTION 22, TWP. 17 SOUTH, RGE. 29 EAST,
N. M. P. M., EDDY COUNTY, NEW MEXICO

OPERATOR: COG Operating, LLC
LEASE: Burch Keely Unit
WELL NO.: 951H
ELEVATION: 3584'

LOCATION: 1720' FSL & 90' FEL
CONTOUR INTERVAL: 10'
USGS TOPO. SOURCE MAP:
Red Lake SE, NM (1955)

Firm No.: TX 10193838 NM 4655451

NO.	REVISION	DATE

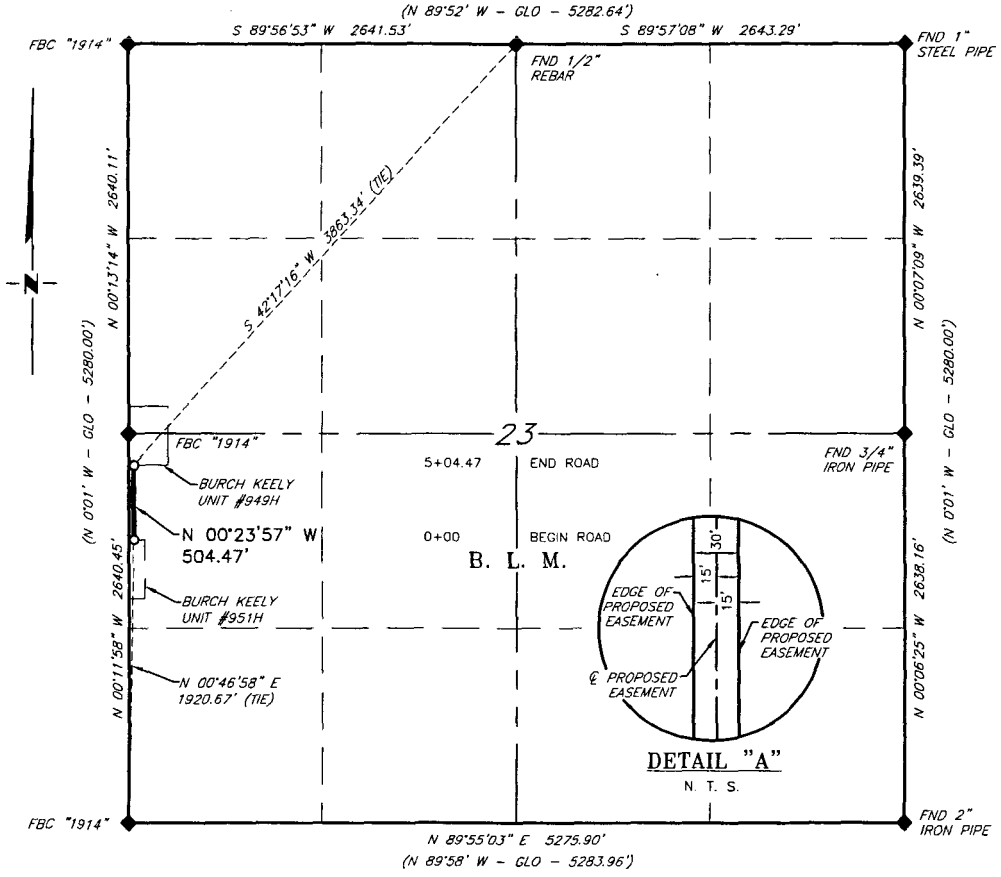
JOB NO.: LS130146R2
DWG. NO.: 130146LVM

RRC

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

SCALE: 1" = 1000'
DATE: 3-15-2017
SURVEYED BY: JM/EF
DRAWN BY: CMJ
APPROVED BY: RMH
SHEET: 1 OF 1

COG OPERATING, LLC
PROPOSED ACCESS ROAD FOR THE
BURCH KEELY UNIT #949 & BURCH KEELY UNIT #951
WELL LOCATIONS
SECTION 23, T17S, R29E
N. M. P. M., EDDY COUNTY, NEW MEXICO



DESCRIPTION

A strip of land 30 feet wide, being 504.47 feet or 30.574 rods in length, lying in Section 23, Township 17 South, Range 29 East, N. M. P. M., Eddy County, New Mexico, being 15 feet left and 15 feet right of the following described survey of a centerline across B. L. M. land:

BEGINNING at Engr. Sta. 0+00, a point in the Southwest quarter of Section 23, which bears, N 00°46'58" E, 1,920.67 feet from a brass cap, stamped "1914", found for the Southwest corner of Section 23;

Thence N 00°23'57" W, 504.47 feet, to Engr. Sta. 5+04.47, the End of Survey, a point in the Southwest quarter of Section 23, which bears, S 42°17'16" W, 3,863.34 feet from a 1/2" rebar, found for the North quarter corner of Section 23.

Said strip of land contains 0.347 acres, more or less, and is allocated by forties as follows:

NW 1/4 SW 1/4	30.574 Rods	0.347 Acres

SCALE: 1" = 1000'
0 500' 1000'

BEARINGS ARE GRID NAD 27 NM EAST
DISTANCES ARE HORIZ. GROUND.

LEGEND
( ) RECORD DATA - GLO
◆ FOUND MONUMENT AS NOTED
PROPOSED ROAD

I, R. M. Howett, a N. M. Professional Surveyor, hereby certify that I prepared this plat from an actual survey made on the ground under my direct supervision, said survey and plat meet the Min. Stds. for Land Surveying in the State of N. M. and are true and correct to the best of my knowledge and belief.

Robert M. Howett
Robert M. Howett NM PS 19680

ROBERT M. HOWETT NEW MEXICO 19680 3/21/17 PROFESSIONAL SURVEYOR

Firm No.: TX 10193838 NM 4655451

NO.	REVISION	DATE

JOB NO.: LS130145R2
DWG. NO.: 130145R2RD

RRC

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

SCALE: 1" = 1000'
DATE: 3-15-2017
SURVEYED BY: JM/EF
DRAWN BY: CMJ
APPROVED BY: RMH
SHEET: 1 OF 1

NEW ACCESS ROAD PLAN

1. Proposed Access Road:

The Access Road Plat shows the footage of new access road will be required for this location. The new access road will be constructed as follows:

A. The maximum width of the running surface will be 20'. The road will be crowned, ditched and constructed of 6" rolled and compacted caliche. Ditches will be at 3:1 slope and 4 feet wide. Water will be diverted where necessary to avoid ponding, prevent erosion, maintain good drainage, and to be consistent with local drainage patterns.

B. The average grade will be less than 1%.

C. No turnouts are planned.

D. No culverts, cattleguard, gates, low water crossings or fence cuts are necessary.

E. Surfacing material will consist of native caliche. Caliche will be obtained from the actual well site if available. Secondary and Tertiary candidate sources are identified the "Offsite topsoil source description" in Section 2 of the SUPO.

2. Source of Construction Materials and Location "Turn-Over" Procedure:

Obtaining caliche: The primary way of obtaining caliche to build locations and roads will be by "turning over" the location. This means, caliche will be obtained from the actual well sight. A caliche permit will be obtained from BLM prior to pushing up any caliche. 2400 cu. Yards is max amount of caliche needed for pad and roads. Amount will vary for each pad. The procedure below has been approved by BLM personnel:

A. The top 6 inches of topsoil is pushed off and stockpiled along the side of the location.

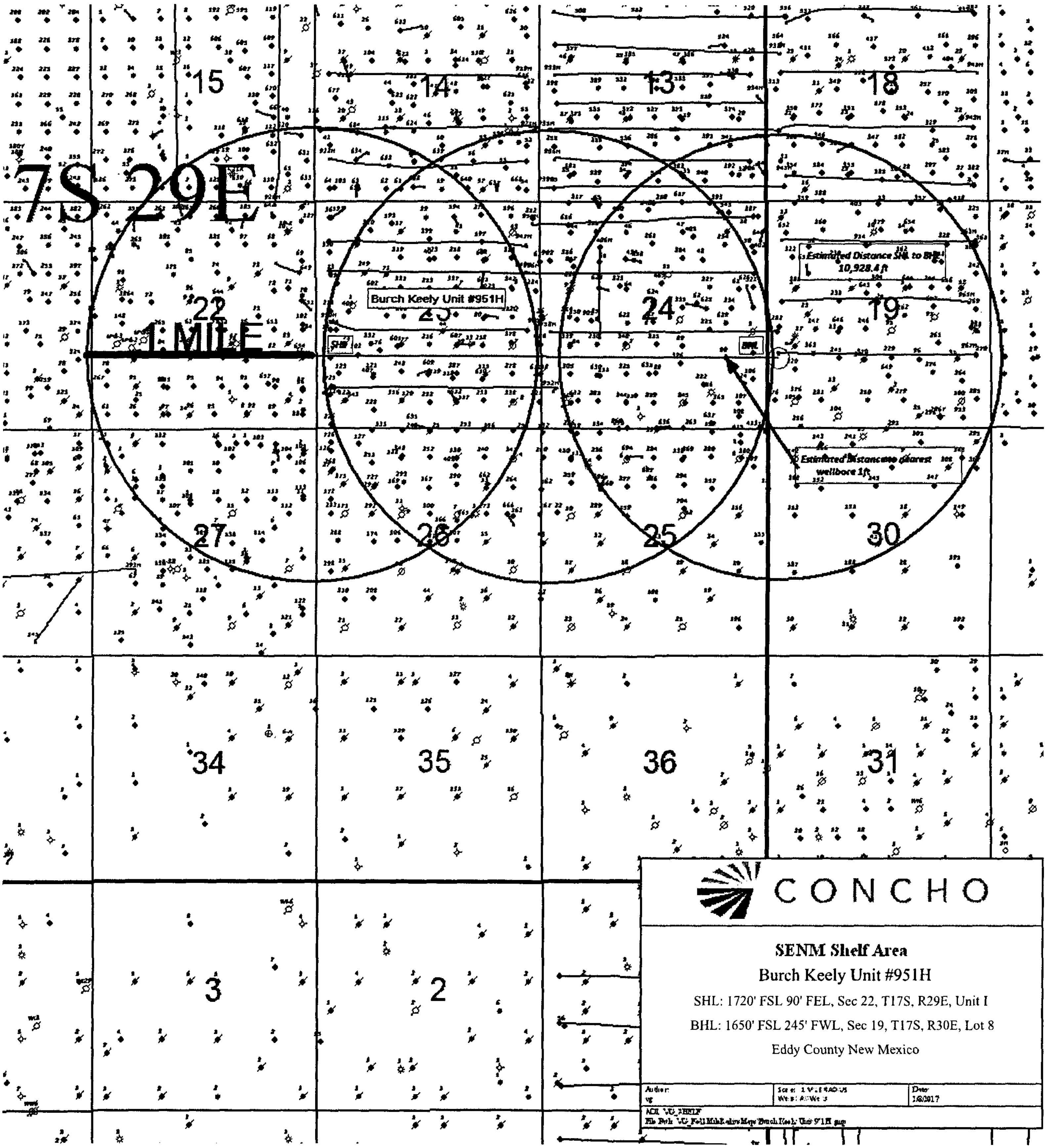
B. An approximate 120' X 120' area is used within the proposed well site to remove caliche.

C. Subsoil is removed and piled alongside the 120' by 120' area within the pad site.

D. When caliche is found, material will be stock piled within the pad site to build the location and road.

E. Then subsoil is pushed back in the hole and caliche is spread accordingly across entire location and road.

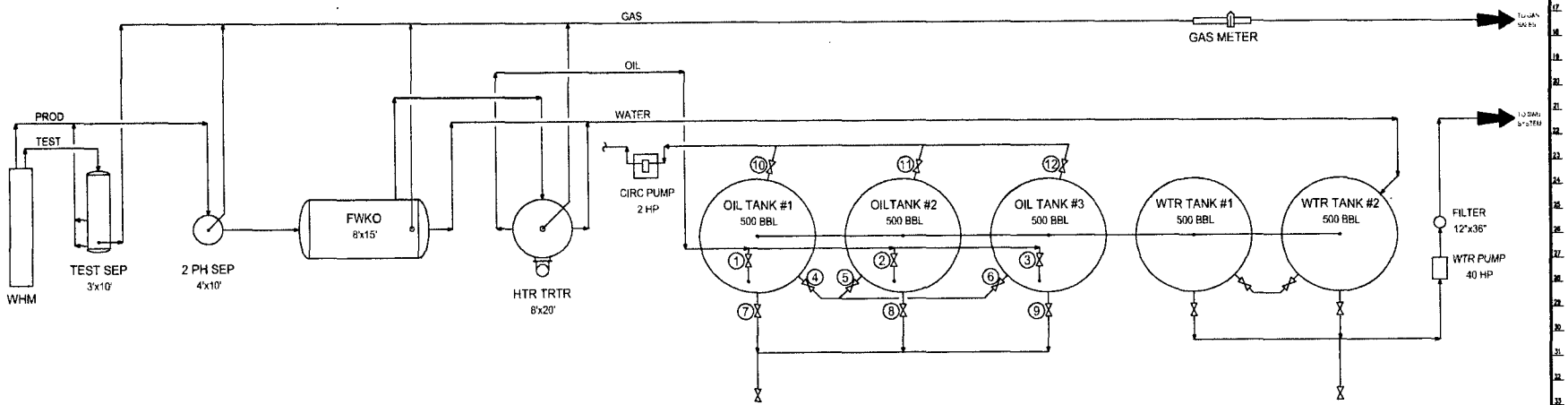
F. Once well is drilled, the stock piled top soil will be used for interim reclamation and spread along areas where caliche is picked up and the location size is reduced. Neither caliche nor subsoil will be stock piled outside of the well pad. Topsoil will be stockpiled along the edge of the pad as depicted in attached plat.


7S 29E
15
14
13
18
22
23
24
19
27
26
25
30
34
35
36
31
3
2
1 MILE
Burch Keely Unit #951H
SHL
BHL
Estimated Distance SHL to BHL
10,928.4 ft
Estimated Distance to nearest wellbore 1ft
CONCHO
SENM Shelf Area
Burch Keely Unit #951H
SHL: 1720' FSL 90' FEL, Sec 22, T17S, R29E, Unit I
BHL: 1650' FSL 245' FWL, Sec 19, T17S, R30E, Lot 8
Eddy County New Mexico

Production Phase - Oil Tank #1
- Valve 1 open
- Valves 2 and 3 closed
- Valves 4, 5, and 6 open
- Valves 7, 8, and 9 closed
- Valves 10, 11, and 12 closed

Sales Phase - Oil Tank #1
- Valve 1 closed
- Valves 2 or 3 open
- Valve 4 closed
- Valves 5 and 6 open
- Valve 7 open
- Valves 8 and 9 closed
- Valves 10, 11, and 12 closed

North



NOTES:

Burch Keely Unit 23A Tank Battery

CONFIDENTIALITY NOTICE

THIS DRAWING IS PROPERTY OF COG OPERATING LLC AND IS LENT TO THE BORROWER FOR CONFIDENTIAL USE ONLY AND IS SUBJECT TO RETURN UPON REQUEST AND SHALL NOT BE REPRODUCED, COPIED, LENT OR OTHERWISE DISPOSED OF DIRECTLY OR INDIRECTLY, NOR USED FOR ANY PURPOSE OTHER THAN THAT WHICH IT IS SPECIFICALLY FURNISHED.

REFERENCE DRAWINGS

NO.	TITLE

COG OPERATING LLC
600 WEST ILLINOIS AVENUE
MIDLAND, TEXAS 79701

REVISIONS

NO.	DATE	DESCRIPTION	BY	CHK.	APP.
A	06/01/12	ISSUE FOR SITE PERMITTING	CRB		

ENGINEERING RECORD

	BY	DATE
DRN:	CRB	06/01/12
DES:	CRB	06/01/12
CHK:		
APP:		
AFE NO:		
FACIL ENGR:	C. BLEDSOE	
OPER ENGR:	VARIES	
SCALE:	NONE	

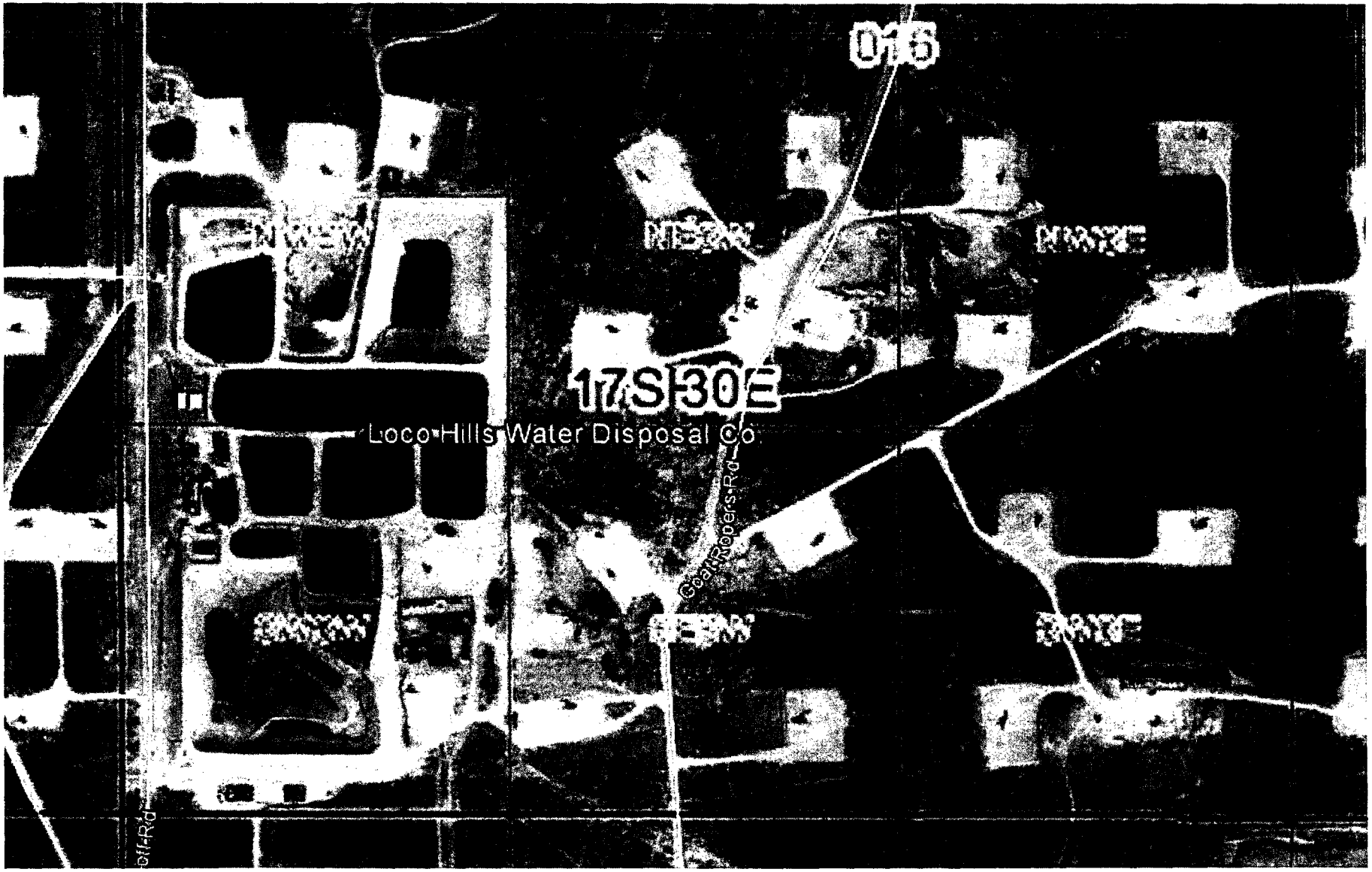
CONCHO

NEW MEXICO SHELF ASSET
PRODUCTION FACILITIES
SITE FACILITY DIAGRAM
STANDARD TANK BATTERY "A"

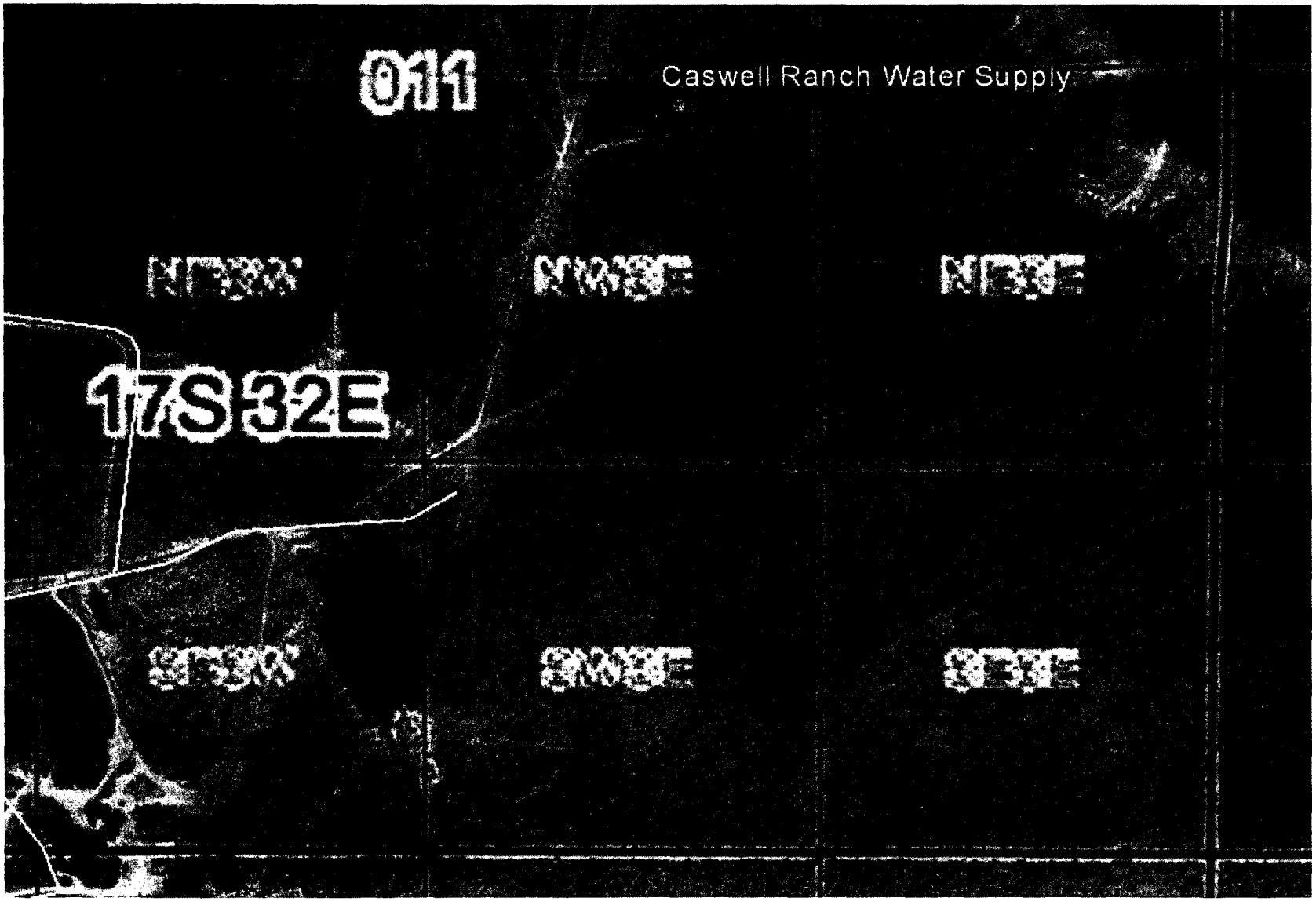
EDDY COUNTY NEW MEXICO

TWNSHP/RANGE	DWG NO.	REV
MULTIPLE	D-1700-81-005	A

Loco Hills Water Disposal Co. Water Well Map

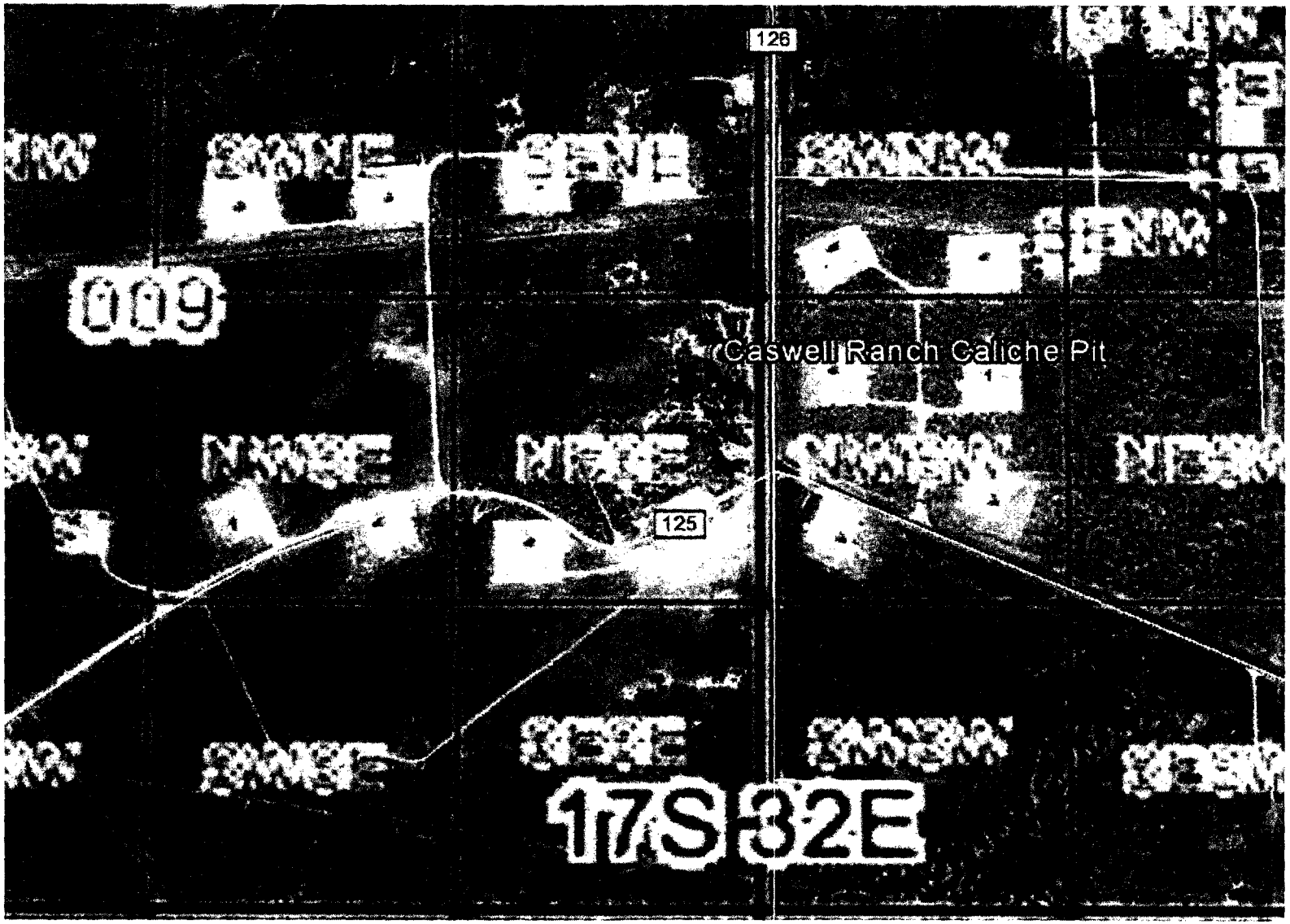


Caswell Ranch Water Supply Map



NMSLO Caliche Pit

Caswell Ranch Caliche Pit Map



WELL SITE AND ROAD CONSTRUCTION

1. Source of Construction Materials and Location "Turn-Over" Procedure:

Obtaining caliche: The primary way of obtaining caliche to build locations and roads will be by "turning over" the location. This means, caliche will be obtained from the actual well sight. A caliche permit will be obtained from BLM prior to pushing up any caliche. 2400 cu. Yards is max amount of caliche needed for pad and roads. Amount will vary for each pad. The procedure below has been approved by BLM personnel:

A. The top 6 inches of topsoil is pushed off and stockpiled along the side of the location.

B. An approximate 120' X 120' area is used within the proposed well site to remove caliche.

C. Subsoil is removed and piled alongside the 120' by 120' area within the pad site.

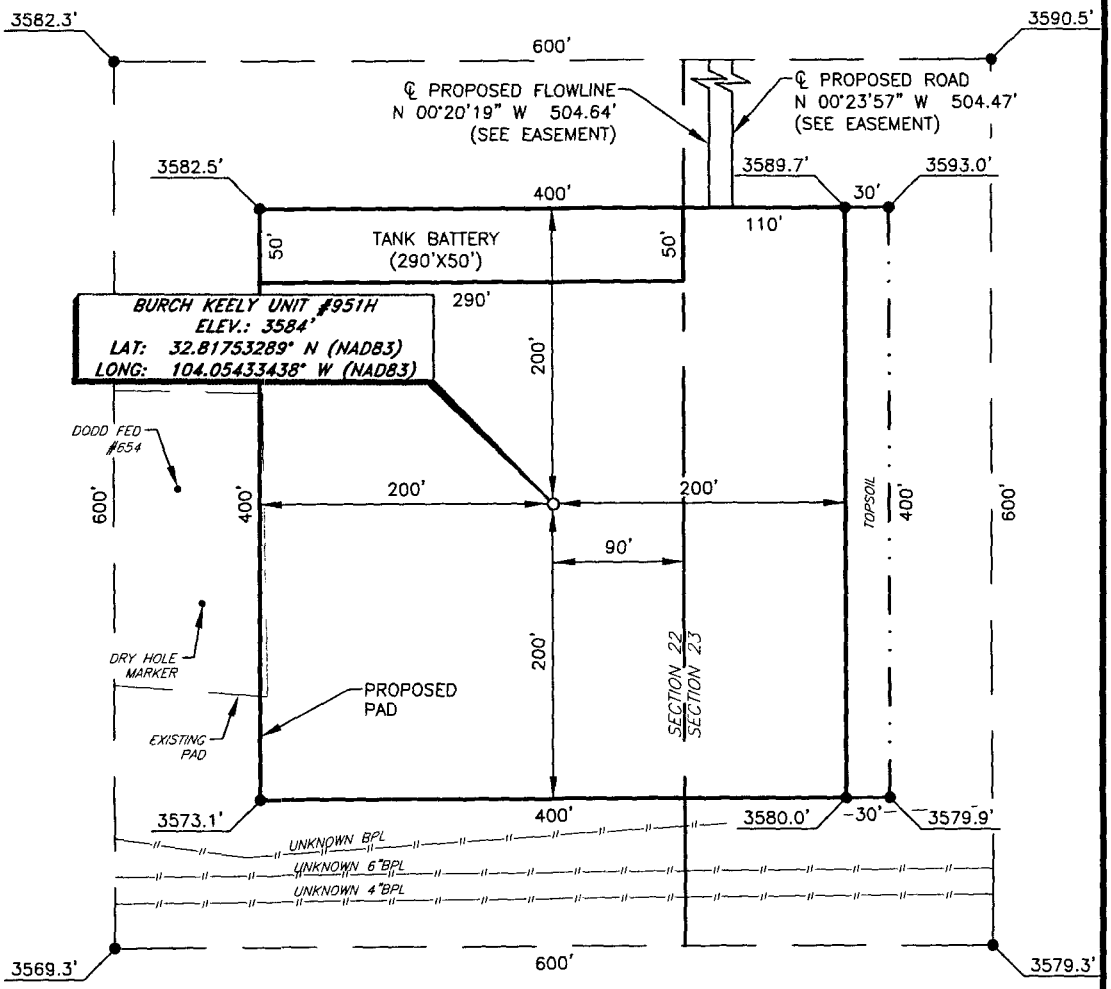
D. When caliche is found, material will be stock piled within the pad site to build the location and road.

E. Then subsoil is pushed back in the hole and caliche is spread accordingly across entire location and road.

F. Once well is drilled, the stock piled top soil will be used for interim reclamation and spread along areas where caliche is picked up and the location size is reduced. Neither caliche nor subsoil will be stock piled outside of the well pad. Topsoil will be stockpiled along the edge of the pad as depicted in attached plat.

- In the event that no caliche is found onsite, caliche will be hauled in from a BLM approved caliche pit.

COG OPERATING, LLC
BURCH KEELY UNIT #951H
(1720' FSL & 90' FEL)
SECTION 22, T17S, R29E
N. M. P. M., EDDY COUNTY, NEW MEXICO



DIRECTIONS TO LOCATION

From the intersection of US HWY-82 and CR-213 (Standard Rd.);

Go South approx. 0.2 miles to a lease road on the left;

Turn left and go East approx. 0.4 miles to location.

N

SCALE: 1" = 100'
0 50 100

BEARINGS ARE NAD 83 GRID - NM EAST
DISTANCES ARE GROUND

THIS IS NOT A BOUNDARY SURVEY, APPARENT PROPERTY CORNERS AND PROPERTY LINES ARE SHOWN FOR INFORMATION ONLY. BOUNDARY DATA IS SHOWN FROM A PREVIOUS SURVEY REFERENCED HEREON.

I, R. M. Howett, a N. M. Professional Surveyor, hereby certify that I prepared this unclassified survey of a well location from an actual survey made on the ground under my direct supervision, said survey and plat meet the Min. Stds. for Land Surveying in the State of N. M. and are true and correct to the best of my knowledge and belief.

Robert M. Howett
Robert M. Howett NM PS 19680

ROBERT M. HOWETT
NEW MEXICO
19680
3/21/17
PROFESSIONAL SURVEYOR

Firm No.: TX 10193838 NM 4655451

NO.	REVISION	DATE
2	RESTAKE	3/15/17
1	ADD BATTERY	2/23/17

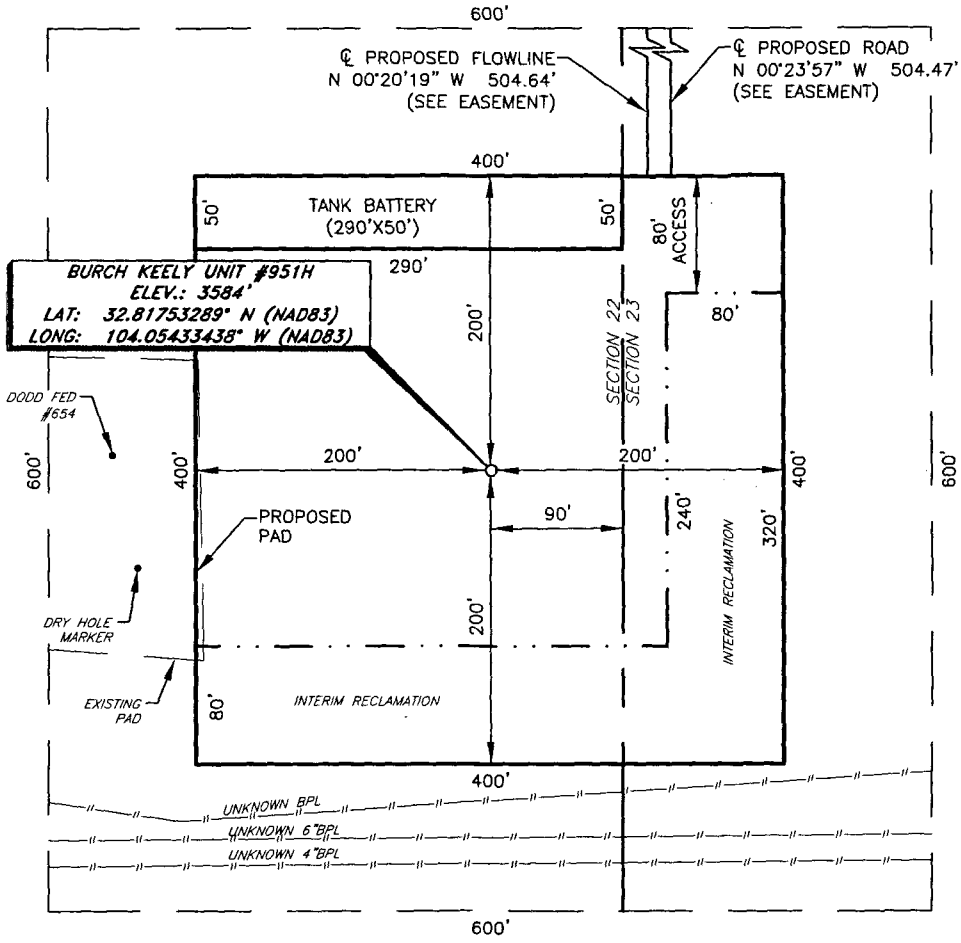
JOB NO.: LS130146R2
DWG. NO.: 130146PAD

RRC

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

SCALE: 1" = 100'
DATE: 3-15-2017
SURVEYED BY: JM/EF
DRAWN BY: CMJ
APPROVED BY: RMH
SHEET: 1 OF 1

COG OPERATING, LLC
INTERIM RECLAMATION
BURCH KEELY UNIT #951H
(1720' FSL & 90' FEL)
SECTION 22, T17S, R29E
N. M. P. M., EDDY COUNTY, NEW MEXICO



DIRECTIONS TO LOCATION

From the intersection of US HWY-82 and CR-213 (Standard Rd.);

Go South approx. 0.2 miles to a lease road on the left;

Turn left and go East approx. 0.4 miles to location.

SCALE: 1" = 100'

0 50 100

BEARINGS ARE NAD 83 GRID - NM EAST
DISTANCES ARE GROUND

Firm No.: TX 10193838 NM 4655451

NO.	REVISION	DATE
2	RESTAKE	3/15/17
1	ADD BATTERY	2/23/17

JOB NO.: LS130146R2

DWG. NO.: 130146REC

RRC

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

SCALE: 1" = 100'

DATE: 3-15-2017

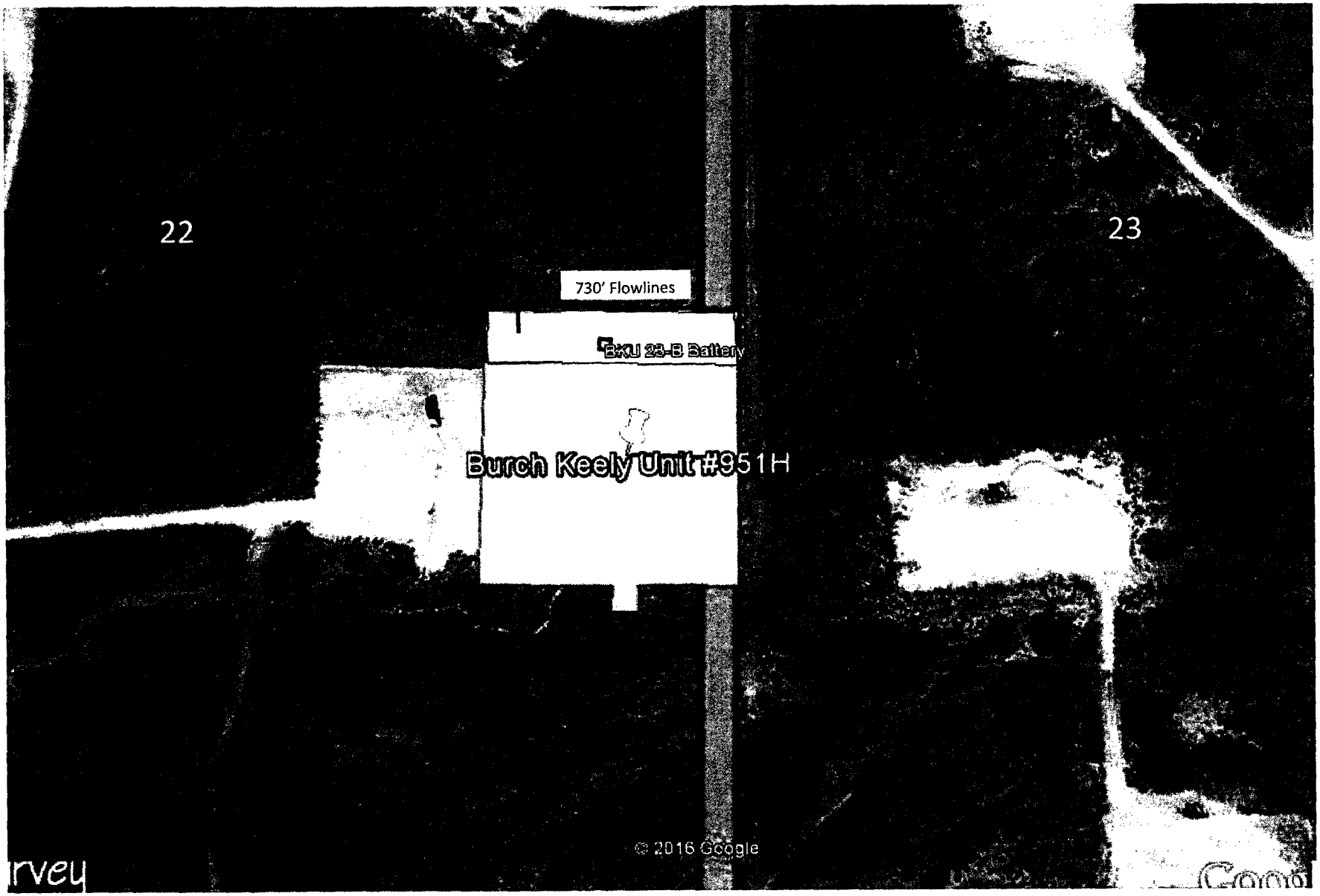
SURVEYED BY: JM/EF

DRAWN BY: CMJ

APPROVED BY: RMH

SHEET: 1 OF 1

Burch Keely Unit #951H Surface Flowlines Map



Section 1 - General

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

Section 2 - Lined Pits

Would you like to utilize Lined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit specifications:

Pit liner description:

Pit liner manufacturers information:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule attachment:

Lined pit reclamation description:

Lined pit reclamation attachment:

Leak detection system description:

Leak detection system attachment:

Lined pit Monitor description:

Lined pit Monitor attachment:

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

Is the reclamation bond a rider under the BLM bond?

Lined pit bond number:

Lined pit bond amount:

Additional bond information attachment:

Section 3 - Unlined Pits

Would you like to utilize Unlined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

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

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit specifications:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

Unlined pit Monitor attachment:

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

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

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

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

Unlined Produced Water Pit Estimated percolation:

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

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Additional bond information attachment:

Section 4 - Injection

Would you like to utilize Injection PWD options? NO

Produced Water Disposal (PWD) Location:

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

Injection PWD discharge volume (bbl/day):

Injection well mineral owner:

Injection well type:

Injection well number: **Injection well name:**

Assigned injection well API number? **Injection well API number:**

Injection well new surface disturbance (acres):

Minerals protection information:

Mineral protection attachment:

Underground Injection Control (UIC) Permit?

UIC Permit attachment:

Section 5 - Surface Discharge

Would you like to utilize Surface Discharge PWD options? NO

Produced Water Disposal (PWD) Location:

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

Surface discharge PWD discharge volume (bbl/day):

Surface Discharge NPDES Permit?

Surface Discharge NPDES Permit attachment:

Surface Discharge site facilities information:

Surface discharge site facilities map:

Section 6 - Other

Would you like to utilize Other PWD options? NO

Produced Water Disposal (PWD) Location:

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

Other PWD discharge volume (bbl/day):

Other PWD type description:

Other PWD type attachment:

Have other regulatory requirements been met?

Other regulatory requirements attachment:

AFMSS

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

Bond Info Data Report

01/30/2018

Bond Information

Federal/Indian APD: FED

BLM Bond number: NMB000215

BIA Bond number:

Do you have a reclamation bond? NO

Is the reclamation bond a rider under the BLM bond?

Is the reclamation bond BLM or Forest Service?

BLM reclamation bond number:

Forest Service reclamation bond number:

Forest Service reclamation bond attachment:

Reclamation bond number:

Reclamation bond amount:

Reclamation bond rider amount:

Additional reclamation bond information attachment: