Carlsbad Field Office
OCD Artesia

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. NMLC065928A

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☑ DRILL ☐ REENTER

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

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

8. Lease Name and Well No. Com 322243
LITTLEFIELD 33 FEDERAL C 706H

2. Name of Operator COG OPERATING LLC 229137

9. API Well No. 30-015-45163

3a. Address 600 West Illinois Ave Midland TX 79701

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

10. Field and Pool, or Exploratory WILDCAT / PURPLE SAGE WOLFCAMP

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

At surface SESW / 300 FSL / 2361 FWL / LAT 32.0009267 / LONG -103.990579

At proposed prod. zone NENW / 200 FNL / 1554 FWL / LAT 32.0205367 / LONG -103.9929008

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 33 / T26S / R29E / NMP

14. Distance in miles and direction from nearest town or post office*
15 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) 200 feet

16. No. of acres in lease 419.41

17. Spacing Unit dedicated to this well 463.13

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 790 feet

19. Proposed Depth 10062 feet / 16944 feet

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

21. Elevations (Show whether DF, KDB, RT, GL, etc.) 2858 feet

22. Approximate date work will start* 07/01/2018

23. Estimated duration 30 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)	Mayte Reyes / Ph: (575)748-6945	03/30/2018

Title: Regulatory Analyst

Approved by (Signature)	Name (Printed/Typed)	Date
(Electronic Submission)	Cody Layton / Ph: (575)234-5959	08/02/2018

Title	Office
Assistant Field Manager Lands & Minerals	CARLSBAD

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

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

(Continued on page 2)

*(Instructions on page 2)

APPROVED WITH CONDITIONS

Approval Date: 08/02/2018

NM OIL CONSERVATION
ARTESIA DISTRICT
AUG 10 2018

RECEIVED

RJP 8-13-18.

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: SESW / 300 FSL / 2361 FWL / TWSP: 26S / RANGE: 29E / SECTION: 33 / LAT: 32.0009267 / LONG: -103.990579 (TVD: 0 feet, MD: 0 feet)
   PPP: NESW / 2580 FSL / 1554 FWL / TWSP: 26S / RANGE: 29E / SECTION: 28 / LAT: 32.0134436 / LONG: -103.9930013 (TVD: 10043 feet, MD: 14700 feet)
   PPP: LOT 10 / 330 FSL / 1554 FWL / TWSP: 26S / RANGE: 29E / SECTION: 33 / LAT: 32.0010127 / LONG: -103.9931825 (TVD: 10011 feet, MD: 10200 feet)
   BHL: NENW / 200 FNL / 1554 FWL / TWSP: 26S / RANGE: 29E / SECTION: 28 / LAT: 32.0205367 / LONG: -103.9929008 (TVD: 10062 feet, MD: 16944 feet)

BLM Point of Contact

Name: Judith Yeager
Title: Legal Instruments Examiner
Phone: 5752345936
Email: jyeager@blm.gov

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 CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG Operating LLC
LEASE NO.:	NMLC0065928A
WELL NAME & NO.:	Littlefield 33 Federal Com 706H
SURFACE HOLE FOOTAGE:	300'/S & 2361'/W
BOTTOM HOLE FOOTAGE	200'/N & 1554'/W
LOCATION:	Section 33, T.26 S., R.29 E., NMPM
COUNTY:	Eddy County, New Mexico

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

A. Hydrogen Sulfide

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

B. CASING

1. The **10 3/4** inch surface casing shall be set at approximately **400** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.

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

    b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)

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

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

2. The minimum required fill of cement behind the **7 5/8** inch intermediate casing is:

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

   ❖ In **Medium Cave/Karst Areas** if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface

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

   - Cement should tie-back at least **200** feet into previous casing string. Operator shall provide method of verification.

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).

2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **3000 (3M)** psi

3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **7 5/8** inch intermediate casing shoe shall be **5000 (5M)** psi.

D. SPECIAL REQUIREMENT(S)

Communitization Agreement

- The operator will submit a Communitization Agreement to the Carlsbad Field Office, 620 E Greene St. Carlsbad, New Mexico 88220, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.

- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

Waste Minimization Plan (WMP)

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

MHH 07212018

GENERAL REQUIREMENTS

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

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

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

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

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

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.

   a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
   b. When the operator proposes to set surface casing with Spudder Rig
      - Notify the BLM when moving in and removing the Spudder Rig.
      - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
      - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.

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

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

A. CASING

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

2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log.

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

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

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

6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.

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

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

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.

2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.

3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.

4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:

    a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
    b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
    c. Manufacturer representative shall install the test plug for the initial BOP test.
    d. Operator shall perform the intermediate casing integrity test to 70% of the casing burst. This will test the multi-bowl seals.
    e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.

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

    a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the

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

b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time.

c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).

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

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

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

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

h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

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

D. WASTE MATERIAL AND FLUIDS

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

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

COG Operating, LLC - Littlefield 33 Federal Com 706H

1. Geologic Formations

TVD of target	10,062' EOL	Pilot hole depth	NA
MD at TD:	16,944'	Deepest expected fresh water:	200'

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Quaternary Fill	Surface	Water	
Rustler	488	Water	
Top of Salt	631	Salt	
Base of Salt	2642	Salt	
Lamar	2820	Salt Water	
Delaware	2860	Salt Water	
Bone Spring	6519	Oil/Gas	
1st Bone Spring	7436	Oil/Gas	
2nd Bone Spring	8585	Oil/Gas	
3rd Bone Spring	9300	Oil/Gas	
Wolfcamp	9659	Target Oil/Gas	
Wolfcamp B	10138	Not Penetrated	
Wolfcamp C	10432	Not Penetrated	
Wolfcamp D	10749	Not Penetrated	
-	-	Not Penetrated	

2. Casing Program – SEE COA

Hole Size	Casing Interval From	Casing Interval To	Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Body
13.5"	0	600	10.75"	45.5	N80	BTC	9.00	1.50	38.10
9.875"	0	9465	~~7.875"~~ 7⅝"	29.7	P110	BTC	1.60	1.45	3.86
6.75"	0	8965	5.5"	23	P110	BTC	2.52	2.66	4.03
6.75"	8965	16,944	5"	18	P110	BTC	2.52	2.66	4.03
			BLM Minimum Safety Factor				1.125	1	1.6 Dry 1.8 Wet

Intermediate casing will be kept at least 1/3 full while running casing.to mitigate collapse. Surface burst based on 0.7 frac gradient at the shoe with Gas Gradient 0.1 psi/ft to surface and
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

The 5" casing will be run back 500' into the intermediate casing to ensure the coupling OD clearance is greater than .422" for the cement bond tie in.

PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG Operating LLC
LEASE NO.:	NMLC0065928A
WELL NAME & NO.:	Littlefield 33 Federal Com 706H
SURFACE HOLE FOOTAGE:	300'/S & 2361'/W
BOTTOM HOLE FOOTAGE	200'/N & 1554'/W
LOCATION:	Section 33, T.26 S., R.29 E., NMPM
COUNTY:	Eddy County, New Mexico

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

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)

Cave and Karst Conditions of Approval for APDs
** 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.)
- Following a rain event, all fluids will vacuumed off of the pad and hauled off-site and disposed at a proper disposal facility.

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, or equivalent, 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 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:
The operator will perform annual pressure monitoring 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.

Hydrology
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.

Tank battery locations will be lined and bermed. A 20 mil permanent liner will be installed with a 4 oz. felt backing to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank or 24 hour production, whichever is greater. Automatic shut off, check valves, or similar systems will be installed for tanks to minimize the effects of catastrophic line failures used in production or drilling.

A leak detection plan will be submitted to the BLM Carlsbad Field Office for approval prior to pipeline installation. The method could incorporate gauges to detect pressure drops, situating values and lines so they can be visually inspected periodically or installing electronic sensors to alarm when a leak is present. The leak detection plan will incorporate an automatic shut off system that will be installed for proposed pipelines to minimize the effects of an undesirable event.

VI. CONSTRUCTION

A. NOTIFICATION

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

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

B. TOPSOIL

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

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

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

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

D. FEDERAL MINERAL MATERIALS PIT

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

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

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

F. EXCLOSURE FENCING (CELLARS & PITS)

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

G. ON LEASE ACCESS ROADS

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

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

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

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

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

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

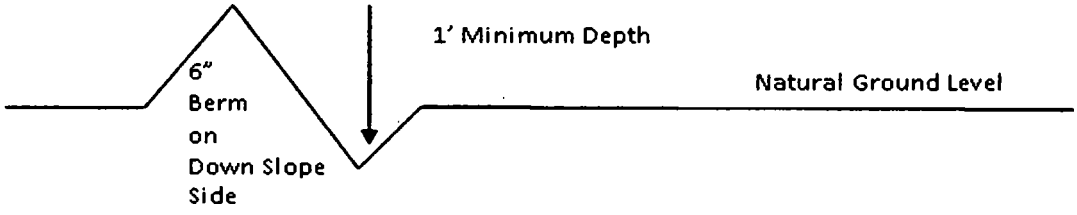
Turnouts
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage

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

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

Cross Section of a Typical Lead-off Ditch



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

Formula for Spacing Interval of Lead-off Ditches

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

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

Cattle guards

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

Fence Requirement

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

Public Access

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

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

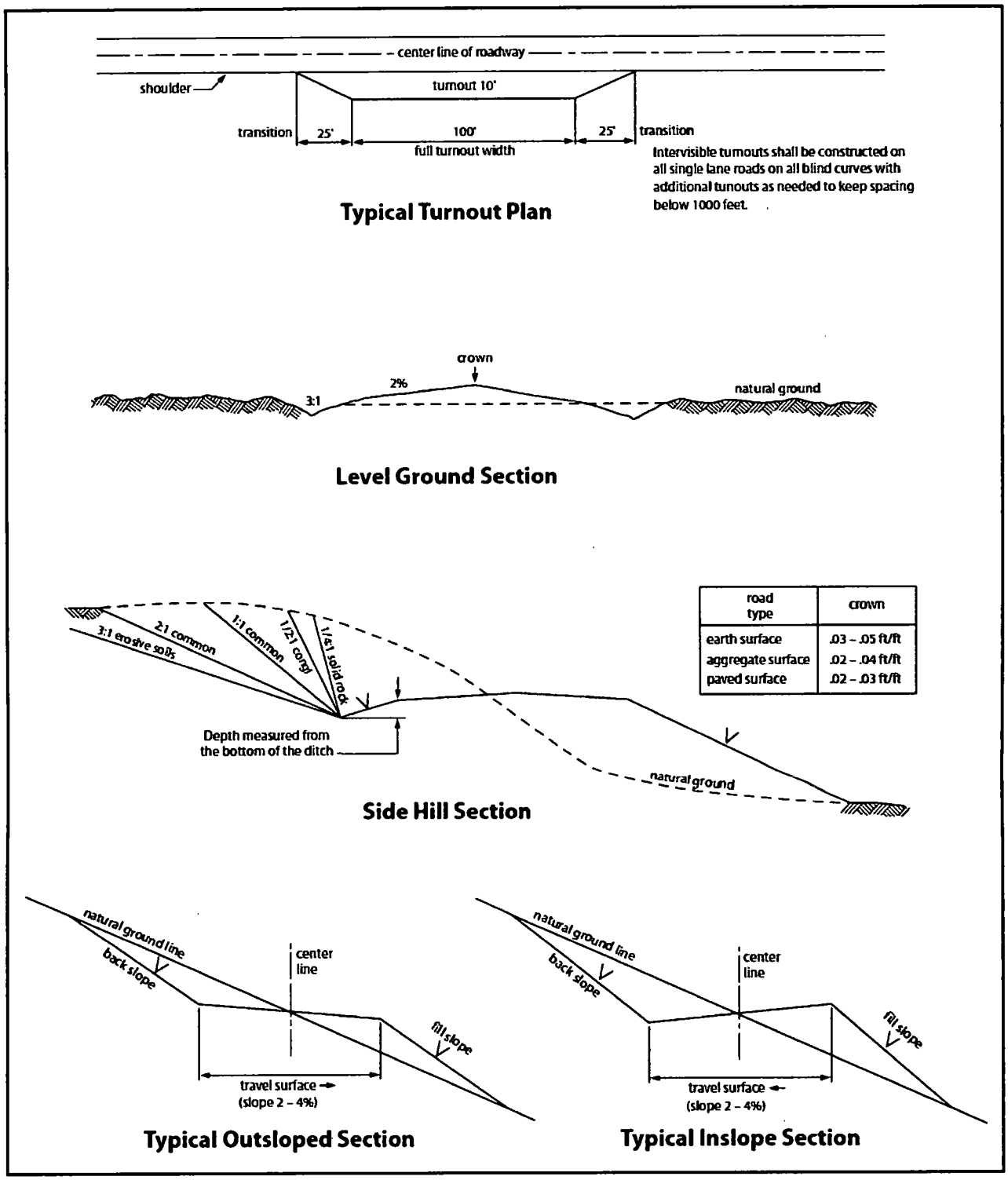


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

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

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

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

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

Containment Structures

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

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

VIII. INTERIM RECLAMATION

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

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

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

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

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

IX. FINAL ABANDONMENT & RECLAMATION

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

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

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

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

Seed Mixture 3, for Shallow Sites

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

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

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

Species	lb/acre
Plains Bristlegrass (*Setaria macrostachya*)	1.0
Green Sprangletop (*Leptochloa dubia*)	2.0
Sideoats Grama (*Bouteloua curtipendula)*	5.0

*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

Operator Certification Data Report

08/02/2018

Operator Certification

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

NAME: Mayte Reyes **Signed on:** 03/28/2018

Title: Regulatory Analyst

Street Address: 2208 W Main Street

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

Phone: (575)748-6945

Email address: Mreyes1@concho.com

Field Representative

Representative Name: Rand French

Street Address: 2208 West Main Street

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

Phone: (575)748-6940

Email address: rfrench@concho.com

AFMSS

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

Application Data Report

08/02/2018

APD ID: 10400028924
Submission Date: 03/30/2018
Operator Name: COG OPERATING LLC
Well Name: LITTLEFIELD 33 FEDERAL COM
Well Number: 706H
Well Type: OIL WELL
Well Work Type: Drill

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - General

APD ID: 10400028924
Tie to previous NOS?
Submission Date: 03/30/2018
BLM Office: CARLSBAD
User: Mayte Reyes
Title: Regulatory Analyst
Federal/Indian APD: FED
Is the first lease penetrated for production Federal or Indian? FED
Lease number: NMLC0065928A
Lease Acres: 419.41
Surface access agreement in place?
Allotted?
Reservation:
Agreement in place? NO
Federal or Indian agreement:
Agreement number:
Agreement name:
Keep application confidential? YES
Permitting Agent? NO
APD Operator: COG OPERATING LLC
Operator letter of designation:

Operator Info

Operator Organization Name: COG OPERATING LLC
Operator Address: 600 West Illinois Ave
Zip: 79701
Operator PO Box:
Operator City: Midland
State: TX
Operator Phone: (432)683-7443
Operator Internet Address: RODOM@CONCHO.COM

Section 2 - Well Information

Well in Master Development Plan? NO
Mater Development Plan name:
Well in Master SUPO? NO
Master SUPO name:
Well in Master Drilling Plan? NO
Master Drilling Plan name:
Well Name: LITTLEFIELD 33 FEDERAL COM
Well Number: 706H
Well API Number:
Field/Pool or Exploratory? Field and Pool
Field Name: WILDCAT
Pool Name: PURPLE SAGE WOLFCAMP GAS
Is the proposed well in an area containing other mineral resources? USEABLE WATER,OIL

Operator Name: COG OPERATING LLC

Well Name: LITTLEFIELD 33 FEDERAL COM **Well Number:** 706H

Describe other minerals:

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

Type of Well Pad: MULTIPLE WELL **Multiple Well Pad Name:** LITTLEFIELD 33 FEDERAL COM **Number:** 705H, 706H, 805H AND 806H

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

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: EXPLORATORY (WILDCAT)

Describe sub-type:

Distance to town: 15 Miles **Distance to nearest well:** 790 FT **Distance to lease line:** 200 FT

Reservoir well spacing assigned acres Measurement: 463.13 Acres

Well plat: COG_Littlefield_706H_C102_20180601081307.pdf

Well work start Date: 07/01/2018 **Duration:** 30 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	300	FSL	2361	FWL	26S	29E	33	Aliquot SESW	32.0009267	-103.990579	EDDY	NEW MEXICO	NEW MEXICO	F	NMLC065928A	2858	0	0
KOP Leg #1	300	FSL	2361	FWL	26S	29E	33	Lot 10	32.0009267	-103.990579	EDDY	NEW MEXICO	NEW MEXICO	F	NMLC065928A	2858	0	0
PPP Leg #1	330	FSL	1554	FWL	26S	29E	33	Lot 10	32.0010127	-103.9931825	EDDY	NEW MEXICO	NEW MEXICO	F	NMLC065928A	-7153	10200	10011

Operator Name: COG OPERATING LLC

Well Name: LITTLEFIELD 33 FEDERAL COM **Well Number:** 706H

	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	2580	FSL	1554	FWL	26S	29E	28	Aliquot NESW	32.0134436	-103.9930013	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 071599	-7185	14700	10043
EXIT Leg #1	330	FNL	1554	FWL	26S	29E	28	Aliquot NENW	32.0201794	-103.9929073	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 038636	-7193	16900	10051
BHL Leg #1	200	FNL	1554	FWL	26S	29E	28	Aliquot NENW	32.0205367	-103.9929008	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 038636	-7204	16944	10062

Pressure Rating (PSI): 3M **Rating Depth:** 9465

Equipment: Annular. Accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold.
Requesting Variance? YES

Variance request: A variance is requested for the use of a flexible choke line from the BOP to the choke manifold. See attached for specs and hydrostatic test chart.
Testing Procedure: BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested. Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets.

Choke Diagram Attachment:

COG_Littlefield_706H_3M_Choke_20180328133024.pdf

BOP Diagram Attachment:

COG_Littlefield_706H_3M_BOP_20180328133030.pdf

COG_Littlefield_706H_Flex_Hose_20180717151950.pdf

Pressure Rating (PSI): 5M **Rating Depth:** 10062

Equipment: Annular, Blind Ram, Pipe Ram. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold
Requesting Variance? YES

Variance request: A variance is requested for the use of a flexible choke line from the BOP to the choke manifold. See attached for specs and hydrostatic test chart.
Testing Procedure: BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested. Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets.

Choke Diagram Attachment:

COG_Littlefield_706H_5M_Choke_20180328133056.pdf

BOP Diagram Attachment:

COG_Littlefield_706H_5M_BOP_20180328133104.pdf

COG_Littlefield_706H_Flex_Hose_20180717152005.pdf

Operator Name: COG OPERATING LLC

Well Name: LITTLEFIELD 33 FEDERAL COM **Well Number:** 706H

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	13.5	10.75	NEW	API	N	0	600	0	600	-6999	-7974	600	N-80	45.5	OTHER - BTC	9	1.5	DRY	38.1	DRY	38.1
2	INTERMEDIATE	9.875	7.875	NEW	API	Y	0	9465	0	9465	-6999	-18749	9465	P-110	29.7	OTHER - BTC	1.6	1.45	DRY	3.86	DRY	3.86
3	PRODUCTION	6.75	5.0	NEW	API	N	0	16944	0	16944	-6999	-24211	16944	P-110	18	OTHER - BTC	2.52	2.66	DRY	4.03	DRY	4.03

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

COG_Littlefield_706H_Casing_Rpt_20180328134744.pdf

Operator Name: COG OPERATING LLC

Well Name: LITTLEFIELD 33 FEDERAL COM **Well Number:** 706H

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

COG_Littlefield_706H_Casing_Rpt_20180328134752.pdf

Casing Design Assumptions and Worksheet(s):

COG_Littlefield_706H_Casing_Rpt_20180328134759.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

COG_Littlefield_706H_Casing_Rpt_20180328134847.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	600	30	1.75	13.5	52	75	Class C	4% Gel + 1% CaCl2
SURFACE	Tail		0	600	250	1.34	14.8	335	75	Class C	2% CaCl2
INTERMEDIATE	Lead		0	9465	770	3.6	10.3	2772	50	Tuned Light Blend	As needed
INTERMEDIATE	Tail		0	9465	250	1.08	16.4	270	50	Tail: Class H	As needed
PRODUCTION	Lead		0	16944	130	2.5	11.9	325	35	50:50:10 H Blend	As needed

Operator Name: COG OPERATING LLC

Well Name: LITTLEFIELD 33 FEDERAL COM **Well Number:** 706H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
PRODUCTION	Tail		0	16944	900	1.24	14.4	1116	35	50:50:2 Class H Blend	As needed

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

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

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

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

Describe the mud monitoring system utilized: PVT/Pason/Visual Monitoring

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
600	9465	OTHER : Brine Diesel Emulsion	8.4	9							Brine Diesel Emulsion
0	600	OTHER : FW Gel	8.6	8.8							FW Gel
9465	16944	OIL-BASED MUD	9.6	11							OBM

Section 6 - Test, Logging, Coring

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

None planned

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

CNL,GR

Coring operation description for the well:

None planned

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 5760 **Anticipated Surface Pressure:** 3546.36

Anticipated Bottom Hole Temperature(F): 160

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:

COG_Littlefield_706H_H2S_Schem_20180328135055.pdf
COG_Littlefield_706H_H2S_SUP_20180328135102.pdf

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

COG_Littlefield_706H_AC_20180328135128.PDF
COG_Littlefield_706H_Direct_Rpt_20180328135139.pdf

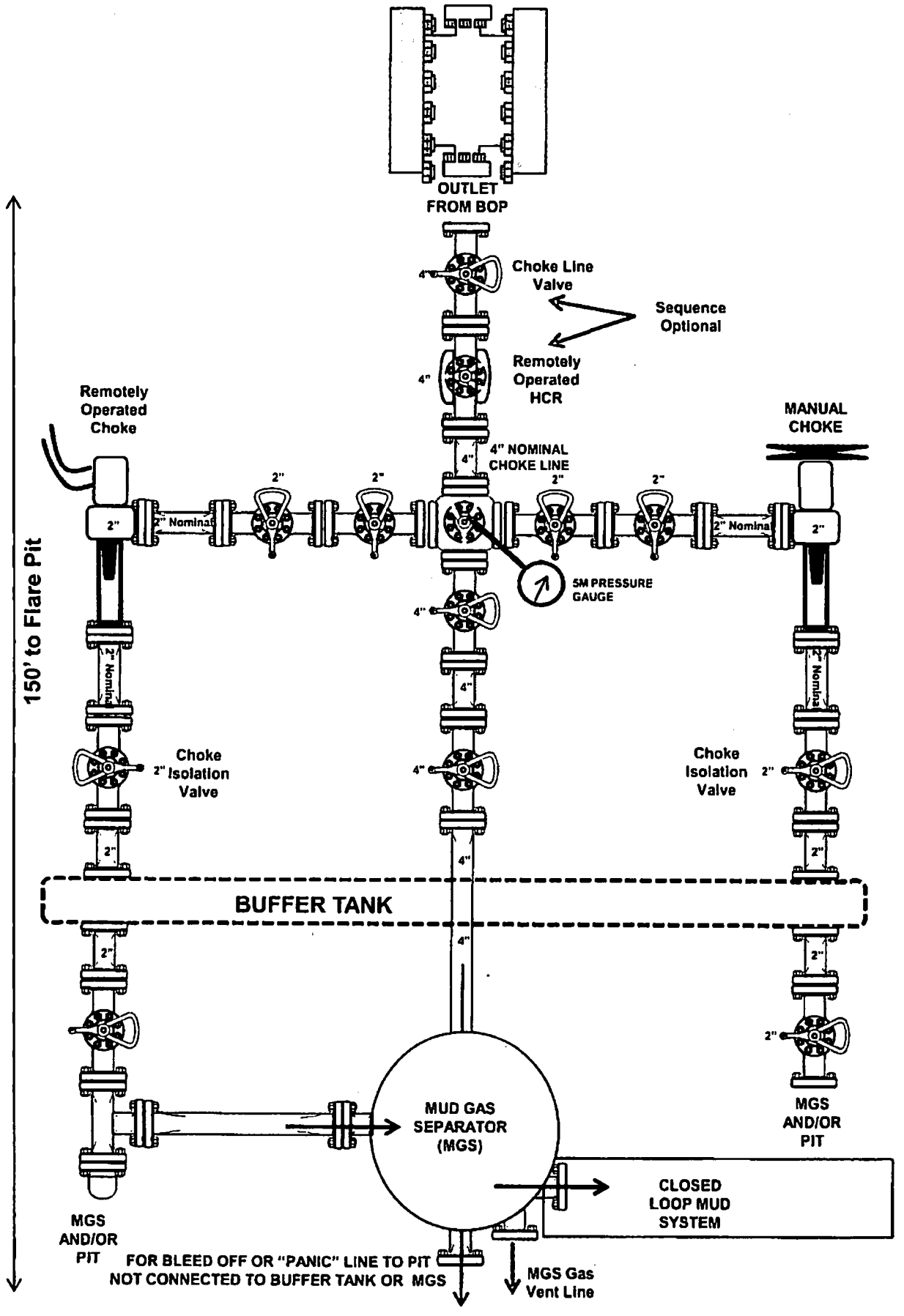
Other proposed operations facets description:

Other proposed operations facets attachment:

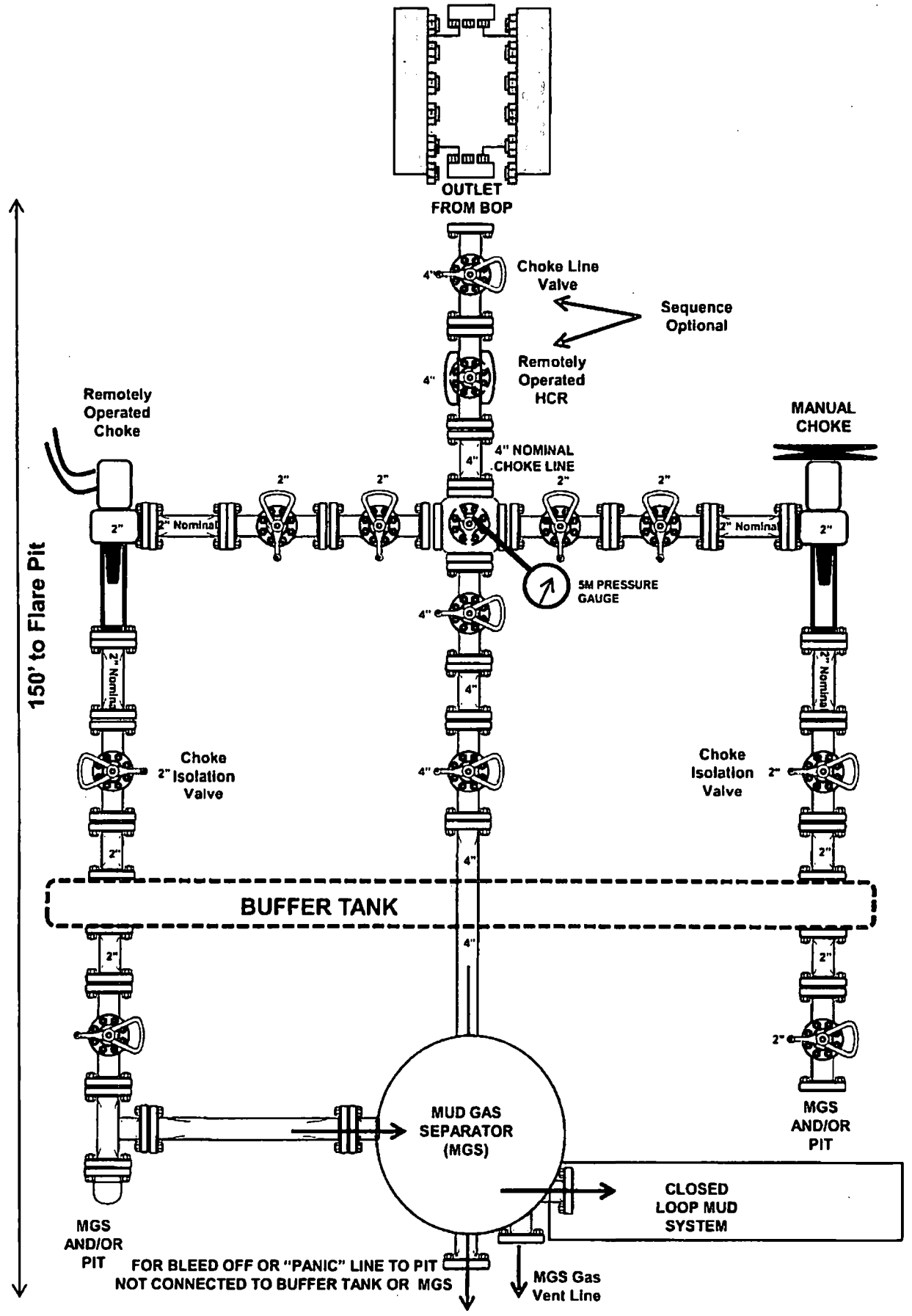
COG_Littlefield_706H_Drill_Prog_20180717152039.pdf
COG_Littlefield_706H_GCP_20180717152046.pdf

Other Variance attachment:

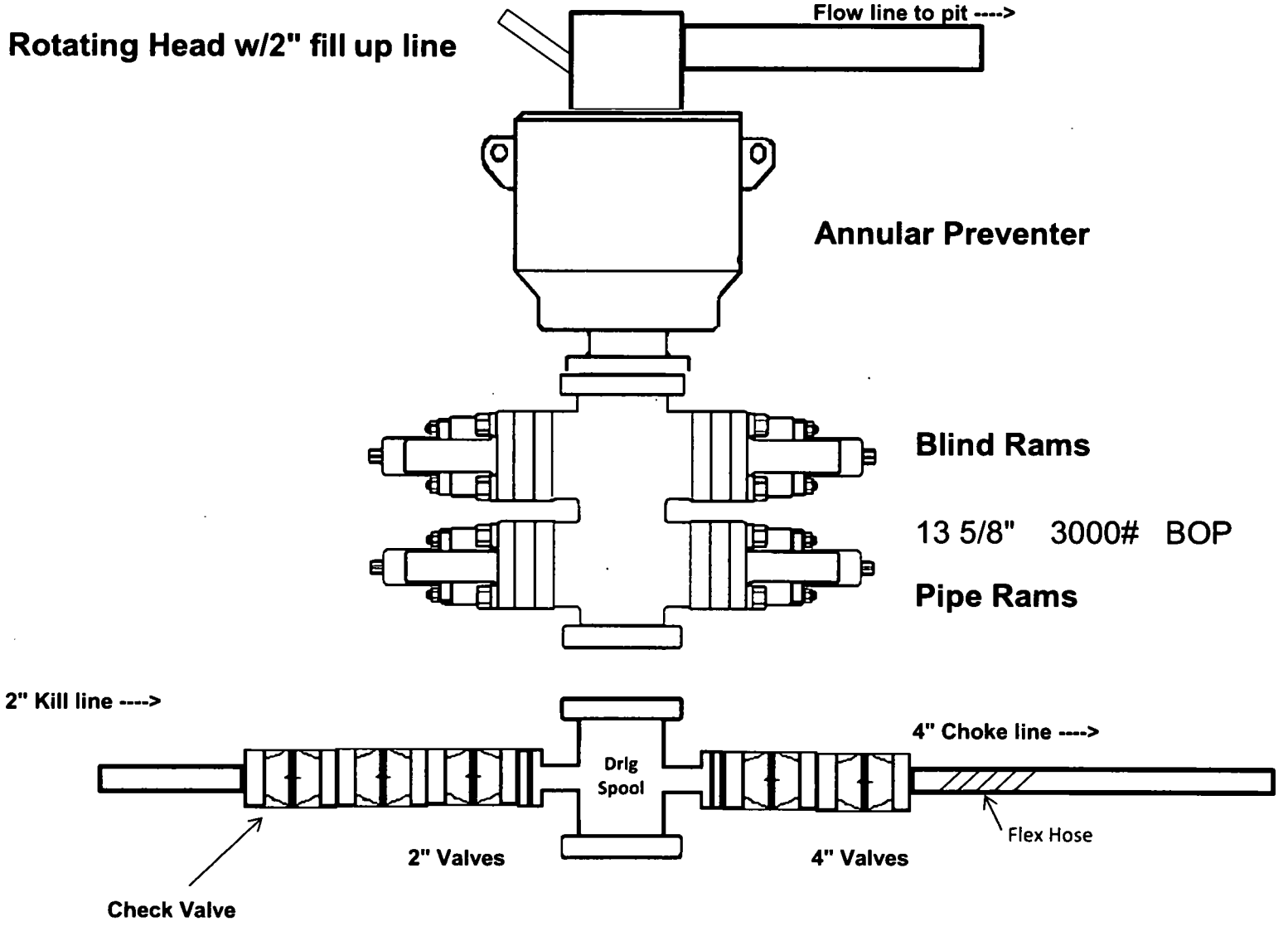
3M Choke Manifold Equipment (WITH MGS + CLOSED LOOP)



5M Choke Manifold Equipment (WITH MGS + CLOSED LOOP)



3,000 psi BOP Schematic



POWERING PROGRESS™

MTR DATA BOOK

CUSTOMER: AUSTIN DISTRIBUTING
DATE: 11/20/2014
Purchase Order: PENDING
Sales Order #: 205663
Product Description: 10K3.566.0CK4.1/1610KFLGE/E L/E
Hose S/N: D-112014-10

CONTENTS INCLUDED

1	**GMCO FITTINGS**	
	14-177-1	INSERT STEM
	14-245-1	INSERT HEAD
	14-242-1	FERRULE
2	**EDWARDS FABRICATION LIFT EYE CLAMPS**	
	19351, 19356 Individual Test Certificates for Each Clamp	
3	**4 1/16 10K FLANGES**	
	R20834 Heat Numbers	
4	**WELDING SPECIFICATIONS**	
	Certification and Procedure for welding	
5	**NDE RESULTS**	
	1921 Ultrasonic Test Results and Imaging	
6	**TEST CHART**	
	Chart Recording of Hydrostatic Test	
7	**TEST CERTIFICATE**	
	Document Product Details & Positive Results of Hydrostatic Testing	
8	**CERTIFICATE OF CONFORMANCE**	
	A Declaration of the conformity with the type approval	
9	**IMAGES**	
	Images of the product prior to shipping.	
10	**PACKING LIST**	
	Details of Shipping Contents, Dimensions and Weights	

PLYMOUTH TUBE CO USA®

672 W State Road 14, Winamac, Indiana 46996
Phone: (574) 946-3125 Fax-Cold Draw: (574) 946-3850 Fax-Hot Mill: (574) 946-7220

PRODUCT CERTIFICATION

SALES ORDER - LINE / RLS
119679 - 1 / 1

WORK ORDER 006409
HEAT NUMBER 486597
MELT SOURCE TMK IPSCO Koppel-USA Mfg/Melt

SOLD TO
J P Steel
6811 FM 362
Brookshire, TX 77423
USA

956HXXX +64-15

14-177-1

ISO 9001: 2008 Registered

CUSTOMER P.O.	CUSTOMER PART	QUANTITY	LADING NO	CERT ID / REV	CERT DATE
17554	JP 3.562X.531	9,736.34 Lb	00071757	01	06/18/2014

PART DESCRIPTION **EJ35620531DR1724-00**
Spec: ASTM A-519 Seamless Mech.
Alloy Smls Mechanical, HF [D/E] Smls Q&T
Grade: 4130
OD: 3.5625" Tol+.0360" Tol-.0360"
Wall: 0.5310" Tol+.0530" Tol-.0530" AW
Lgth Type: Random
Lgth: 17.00' / 24.00'
End Finish: Debur ID & OD
Finish Type: Quench & Temper L80/N80
Oil: Light Oil

CERTIFICATION REQUIREMENTS
ASTM A-519-06 / API 5CT
Quench & Tempered. Induction heated, water quenched and infrared pyrometer monitored.
Tensiles tested were 1" STRIP specimens per A370.
Ultrasonic tested and passed.
Tubes UT inspected to ASTM E213/API 5CT 10.15 and SR2 requirements w/ 5% notches. Test covered 100% full length of OD & ID surfaces both longitudinal & transverse.

Chemical Analysis

C	Mn	P	S	Si	Al	Cr	Mo	Ni	Pb	Cu	V	Ti	Sn
.31	.51	.011	.003	.27	.015	.97	.21	.13	-------	.16	.006	-------	.008

Cb	Ca	N	As	Sb	H
.001	.0017	.0095	.0039	.0014	-------

Product Checks

	C	Mn	P	S	Si	Al	Cr	Mo	Ni	Pb	Cu	V	Ti
CHK01	.317	.52	.012	.005	.275	.016	.96	.211	.123		.148	.0034	
CHK02	.31	.52	.011	.0043	.275	.016	.96	.211	.123		.147	.0035	

	Sn	Cb	Ca	N	As	Sb	H
CHK01	.0091	.000	.0017	.0000	.0095	.0000	
CHK02	.0091	.000	.0016	.0000	.0099	.0000	

Physical Properties

I certify that the described material has been manufactured, inspected, and tested in accordance with the above specification(s) and satisfies the requirements.

David Jenkins
Quality Assurance

Date Printed: 06/18/2014

PLYMOUTH TUBE CO USA®
572 W State Road 14, Winamac, Indiana 46996
Phone: (574) 946-3125 Fax-Cold Draw: (574) 946-3860 Fax-Hot Mill: (574) 946-7220

PRODUCT CERTIFICATION

SALES ORDER - LINE / RLS
119679 - 1 / 1

WORK ORDER 006409
HEAT NUMBER 486597
MELT SOURCE TMK IPSCO Koppel-USA Mfg/Melt

SOLD TO

J P Steel
6811 FM 362
Brookshire, TX 77423
USA

ISO 9001: 2008
Registered

CUSTOMER P.O.	CUSTOMER PART	QUANTITY	LADING NO	CERT ID / REV	CERT DATE
17554	JP 3.562X.531	9,736.34 Lb	00071757	01	06/18/2014

PART DESCRIPTION **EJ35620531DR1724-00**

Grain Size	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12	C	R	S	AH	AT	BH	BT	CH	CT	DH	DT	SAM 'B'
7	50	49	48	45	42	38	35	33	33	33	33	32	--	--	--	0.0	0.5	1.0	1.0	0.0	0.0	1.0	1.5	-------

SAM 'D'	Freq.	Severity
-------	.000	.000

Methods of Manufacturing

Method of Mfg 1	Method of Mfg 2	Method of Mfg 3
Electric Arc Furnace Melted	Aircraft Quality	Continuous Cast

Method of Mfg 4	Method of Mfg 5
Mfg.Using Clean Steel Practice	Ladle Refined

Mechanical Properties

	Rc-High	Rc-Low	Tensile	Yield .2%	Yield .5%	Elong%	Reduction	Aust TempF	Aust Time	TemperTmpF
1	20	19	107000	91800	91800	28	59	1640	6.17	1315

	TemperTime
1	79

Charpy Impact Tests

	Temp 1	Size 1	Orient 1	FtLb-T1-Pc 1	LExp-T1-Pc 1	%Shr-T1-Pc 1	FtLb-T1-Pc 2	LExp-T1-Pc 2
1	-30C	10X10	Long	126	.073	100	128	.068

	%Shr-T1-Pc 2	FtLb-T1-Pc 3	LExp-T1-Pc 3	%Shr-T1-Pc 3
1	100	125	.073	100

This test report data is for the heat Chemistry Stated above.

The material in this test report is:

1) **Manufactured in the USA.**
2) **Free from Polybrominated Biphenyls (PBB), Polybrominated Diphenyl Ethers (PBDE), and Mercury contamination.**

I certify that the described material has been manufactured, inspected, and tested in accordance with the above specification(s) and satisfies the requirements.

David Jenkins
Quality Assurance

Date Printed: 06/18/2014

PLYMOUTH TUBE CO USA®
572 W State Road 14, Winamac, Indiana 46996
Phone: (574) 946-3125 Fax-Cold Draw: (574) 946-3860 Fax-Hot Mill: (574) 946-7220

PRODUCT CERTIFICATION

SALES ORDER - LINE / RLS
119679 - 1 / 1

WORK ORDER 006409
HEAT NUMBER 486597
MELT SOURCE TMK IPSCO Koppel-USA Mfg/Melt

SOLD TO

J P Steel
6811 FM 362
Brookshire, TX 77423
USA

ISO 9001: 2008
Registered

CUSTOMER P.O.	CUSTOMER PART	QUANTITY	LADING NO	CERT ID / REV	CERT DATE
17554	JP 3.562X.531	9,736.34 Lb	00071757	01	06/18/2014

PART DESCRIPTION **EJ35620531DR1724-00**

3) No Repairs by welding

End of Certification

I certify that the described material has been manufactured, inspected, and tested in accordance with the above specification(s) and satisfies the requirements.

Quality Assurance

Date Printed: 06/18/2014

956HXXX+64wB-1H
14-245-1

Benteler Steel/Tube GmbH
Postfach 13 40
33043 Paderborn
Deutschland
Tel.: +49.5254.81-0 Fax: +49.5254.13666

Ersetzt / replace

Dok. Nr. / Doc. No. 65-716081/001/E vom / dated 26.09.2012

BENTELER Steel/Tube

ABNAHMEPRÜFZEUGNIS EN 10204-3.1
INSPECTION CERTIFICATE EN 10204-3.1
CERTIFICAT DE RECEPTION EN 10204-3.1
EN 10204:2005-01

Benteler Steel/Tube GmbH · Postfach 1340 · 33043 Paderborn · Deutschland

JP Steel
PO Box 592
BROOKSHIRE TX 77492
USA

Dokument-Nr.: Document No.: No. du document: 65-716081/002/P

Kunden-Bestell-Nr.: Purchase Order No.: No. de commande du client: BST 12-12036 / JP 11459

Benteler Auftrags-Nr.: Benteler Order No.: No. de commande Benteler: 1578593

Versandanzeigen-Nr.: Dispatch Note No.: No. d'avis d'expédition: 6571039

Produkt: NAHTLOSE STAHLROHRE
Product: SEAMLESS STEEL TUBES
Produit: TUBES D' ACIER SANS SOUDURE

Prüf-Nr.: Inspection No.: No. du certificat:

Blatt: 1 / 4
Page:
Page:

Hersteller: Manufacturer: Producteur: Warmrohrwerk Dinslaken (DIN EN ISO 9001, ISO/TS-16949 CERTIFIED BY TUEV NORD CERT) (PED 97/23/EC CERTIFIED BY TUEV NORD SYSTEMS)

Herstellerzeichen: Manufacturer's brand: Marque du producteur:

Stempel des Abnahmebeauftragten: WA
Stamp of the inspection representative:
Poinçon du contrôleur:

Stahlerschmelzungsverfahren: ELEKTROSTAHL
Steelmaking process: ELECTRIC FURNACE
Procédé d'élaboration de l'acier: FOUR ELECTRIQUE

Lieferbedingungen: Terms of delivery: Conditions de livraison:	ASTM-A 519-2006
Maße - Toleranzen: Dimensions-tolerances: Dimensions-tolérances:	outside diameter acc. to customer request, wall thickness acc. to customer request, ASTM-A 519-2006
Stahlsorte: Steel grade: Nuance d'acier:	GRADE 4130
Lieferzustand: Delivery condition: État de livraison:	QT
Produktkennzeichnung: Product marking: Marquage du produit:	PKE: BENTELER SIGN BENTELER DIMENSIONS GRADE 4130 BST 12-12036 / JP 11459 ASTM-A 519 WA

ÄEZ = Ätzinterbezeichnung, Etching ink marking, Gravure à l'encre . FK = Farbkennzeichnung, colour marking, marquage par couleur . FS = Farbschablonierung, paint stencilling, marquage par peinture . FSD = Farbsprühdrucker, Colour jet printer, imprimante à jet d'encre de couleur . LK = Laserkennzeichnung, Laser marking, Marquage laser . PKE = Etikettenkennzeichnung, tag marking, marquage sur étiquette . PS = Prägestempel, die stamp, marquage par poinçonnage . TS = Tintenstrahlkennzeichnung, Ink jet spray marking, Imprimante à jet d'encre .

Benteler Steel/Tube GmbH
Postfach 13 40
33043 Paderborn
Deutschland
Tel.: +49.5254.81-0 Fax: +49.5254.13666

Ersetzt / replace

Dok. Nr. / Doc. No. 65-716081/001/E vom / dated 26.09.2012

BENTELER Steel/Tube

ABNAHMEPRÜFZEUGNIS EN 10204-3.1
INSPECTION CERTIFICATE EN 10204-3.1
CERTIFICAT DE RECEPTION EN 10204-3.1

Dokument-Nr.: / Document No.: / No. du document: 65-716081/002/P

Prüf-Nr.: / Inspection No.: / No. du certificat:

Pos. Item Poste	Stück Number Nombre	Maße Dimensions Dimensions	Länge Length Longueur feet	Gewicht Weight Poids lbs	Schmelzen-Nr. Heat No. No. de coulée	Prüfdruck Test pressure Pression d'épreuve	Rohr-Nr.-Gruppe Tube number group Série de no. des tubes	Vielfachlängen Multiple lengths Longueurs multiples
0002	34	4.500" O.D. * 0.625" 17 FT - 24 FT	748,36	19326	573599			

Schmelzenanalyse [%] / Heat analysis [%] / Analyse sur coulée [%]

Pos. Item Poste	Schmelzen-Nr. Heat No. No. de coulée	C	SI	MN	P	S	CR	MO	NI
0002	573599	0,310	0,220	0,53	0,007	0,002	0,89	0,17	0,09

Prüfergebnisse / Test results / Résultats des essais

Die Rohre wurden zerstörungsfrei geprüft: The tubes are non destructive tested: Les tubes ont passé un essai non destructif:	UT-long.imperfections: acc. to API 5CT, SR 2; UT-long. Test method: acc. to ASTM-E 213; Outside notch depth: 5,0 %; Inside notch depth: 5,0 %; UT-transv. imperfections: acc. to API 5CT, SR2; acc. to ASTM-E 213; Outside notch depth: 5,0 %; Inside notch depth: 5,0 %; UT-lamination detection: acc. to EN 10246-14, table 1	PASSED			
Augensichtkontrolle: Visual inspection: Examen visuel:	PASSED	Materialverwechslungsprüfung: Material conformity test: Vérification de la nuance:	PASSED	Maßkontrolle: Dimensions examination: Vérification des dimensions:	PASSED

Ergebnisse der mechanischen Prüfung / Results of mechanical testing / Résultats des essais mécaniques

Die Probennahme erfolgte an Vielfachlängen.
The sampling was carried out on multiple lengths.
L'echantillonage etait realise aux longueurs multiples.

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Ersetzt / replace

Dok. Nr. / Doc. No. 65-716081/001/E vom / dated 26.09.2012

BENTELER Steel/Tube

ABNAHMEPRÜFZEUGNIS EN 10204-3.1
INSPECTION CERTIFICATE EN 10204-3.1
CERTIFICAT DE RECEPTION EN 10204-3.1

Dokument-Nr.: 65-716081/002/P
Document No.:
No. du document:

Prüf-Nr.:
Inspection No.:
No. du certificat:

Zugversuch längs Streifenprobe / Tensile test longitudinal Strip test specimen / Essai de traction longitudinale Bande decoupee sur tube

Pos. / Item / Poste	Proben-Nr. / Specimen No. / No. de l'éprouvette	Schmelzen-Nr. / Heat No. / No. de coulée	Probenabmessung / Specimen dimensions / Dimensions de l'éprouv.	Streckgrenze / Yield strength / Limite élastique	Zugfestigkeit / Tensile strength / Résistance à la traction	Dehnung / Elongation / Allongement		Einschnürung / Area reduction / Coefficient de striction
Anforderungen / Requirements / Exigences			mm	RT 0,5 % / MPa / 552-655	Rm / MPa / MIN 655	A2" / % / MIN 14	1. Formel / 1. Formula / 1. Formule	
0002	000001	573599	25,40 X 15,40	637	758	36		
0002	000002	573599	25,40 X 15,70	635	769	36		

Härteprüfung / Hardness test / Essai de dureté

Pos. / Item / Poste	Proben-Nr. / Specimen No. / No. de l'éprouv.	Schmelzen-Nr. / Heat No. / No. de coulée	Härte / Hardness / Dureté				
Anforderungen / Requirements / Exigences			HRC MAX 22,0	HB	HV	HRB	HBW
0002	000001	573599	020				

Kerbschlagbiegeversuch Notched bar impact test / Essai de flexion par choc (résilience) [1 CHARPY_V]

Pos. / Item / Poste	Proben-Nr. / Specimen No. / No. de l'éprouv.	Schmelzen-Nr. / Heat No. / No. de coulée	Probenabmessung / Specimen dimensions / Dimensions de l'éprouvette			Probenlage / Specimen position / Position de l'éprouvette	Prüftemperatur / Test temperature / Température d'essai	Kerbschlagarbeit / Absorbed energy / Energie absorbée		Kerbschlagzähigkeit / Impact strength / Résistance au choc		Verf.-Bruchanteil / Shear fracture / Rupture ductile
Anforderungen / Requirements / Exigences			Länge / Length / Longueur	Breite / Width / Largeur	Höhe / Height / Hauteur	längs (L) / longitudinal (L) / longitudinal (L)		einzel / single / individuelle	mittel / average / moyenne	einzel / single / individuelle	mittel / average / moyenne	
						quer (Q)	GRAD					
			mm	mm	mm	transversal (Q)	°C	ft-lbf	ft-lbf		J/cm²	
			55	10,00	10,00	transversal (Q)	-30		MIN 020			
0002	000001	573599	55	10,00	10,00	L	-30	116				
				10,00	10,00			110				
				10,00	10,00			111	112			

Benteler Steel/Tube GmbH
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33043 Paderborn
Deutschland
Tel.: +49.5254.81-0 Fax: +49.5254.13666

Ersetzt / replace

Dok. Nr. / Doc. No. 65-716081/001/E vom / dated 26.09.2012

BENTELER Steel/Tube

ABNAHMEPRÜFZEUGNIS EN 10204-3.1

INSPECTION CERTIFICATE EN 10204-3.1
CERTIFICAT DE RECEPTION EN 10204-3.1

Dokument-Nr.: / Document No.: / No. du document: 65-716081/002/P

Prüf-Nr.: / Inspection No.: / No. du certificat:

Wärmebehandlung / Heat treatment / Traitement thermique

Hardening temperature: 850°C, Holding time: 1 min, Cooling: water / Tempering temperature: 735°C, Holding time: 6 min, Cooling: air

Vermerk / Remark / Remarque

Certificate remarks: Steel is manufactured to fine grain practice, The tubes comply with the requirements of NACE MR0175-03., hardness max. 22 HRC, No mercury, mercury compounds or mercury bearing instruments and / or equipment has been used in any manner which might cause contamination in manufacture assembly, or test of material. No weld repair has been carried out.; Certificate-Remark: The steel will be produced by an electric arc furnace, ladle furnace and contionuous casting machine, stirring by argon. The mode of operation in this process is commonly referred to as "clean steel process". The products are fully killed.

Verkäufer(in) / Salesman/ woman in charge / Personne chargée : Mr Storm, Tel.: 05254/81-4274, Fax: 4289

Dinslaken, 26.10.2012, TEL.: 02064.623-5370 FAX: 02064.623-5390

Abnahmebeauftragter
Inspection representative
Contrôleur
DR. BASEL KEITA / Thei

Es wird bestätigt, daß die gelieferten Erzeugnisse den techn. Lieferbedingungen des Auftrages entsprechen.Dieses Dokument wurde mittels EDV erstellt und ist ohne Unterschrift rechtsgültig.
We certify that the supplied products comply with the order specification.This document was prepared by means of electronic data processing and is valid without signature.
Nous attestons que les produits livrés sont conformes aux stipulations de la commande.Ce document a été établi par traitement électronique de l'information et est valide sans signature.

P.O. BOX 924469
HOUSTON, TX 77292
PHONE: (713) 290-8490

P&B TESTING INC

6645 W. TIDWELL
HOUSTON,TX 77092
FAX: (713) 290-8627

Report Date: 10/18/13
Report No: **250944.0**
Rev.: A
Cust Acct: JPS10050

To: J.P. STEEL, LLC
PO BOX 592
KATY, TX 77492-0592

PO#: 15484
Material: 4.50" OD X .625" WALL 4130 Q & T ALLOY
ID/Heat: HT# 573599
Job Info:

Tensile Test Results

No./Location	Size (in.)	Area (in^2)	Ult. Load (lbs.)	Yield (psi)	Tensile (psi)	Elong. (%)	R. of A. (%)	Hardness
1	.495	.1924		90,200	112,300	26	73	

Unless otherwise stated, yield stress is 0.2% offset, gage length is 2 in. for 1/2 in. bars or 1 in. for 1/4 in. bars.

Signed: _____

MIKE MASON

ArcelorMittal

ARCELORMITTAL TUBULAR PRODUCTS
SHELBY LLC.
132 WEST MAIN STREET
SHELBY, OHIO 44875-1471
Telephone 419/342-1200 FAX: 419/342-1437

MATERIAL TEST REPORT

ISO/TS 16949:2009 ISO 9001:2008 14-242-C 956HXXX469A-F

SHELBY ORDER NO. 447180

CUSTOMER	SPECIFICATION	CUSTOMER ORDER
MARMON KEYSTONE CORPORATION 6441 BINGLE ROAD HOUSTON TX 77092 ATTN: EARTHA JILES	ASTM A513 GMCO A513 DOM 1 01-10 FAX: (713)460-5414	35-057810-03

GRADE	SIZE(O.D x ID x WALL)	QUANTITY	SHIPPED	DATE
520	7.250 X 6.000 X .625	17509 LB 396.00 FT	09/02/14	09/02/14

CONDITION	PART NO.	
ASTM 513 Type 5 Produced to OD/ID Ref: WALL EW TUFFDOM STRESS RELIEVE ANNEAL	REV.	S#00335344 50064541

CHEMICAL ANALYSIS

HEAT NO.	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	Al	OTHER	GRAIN SIZE
4131797	.16	1.41	.012	.003	.220	.010	.040	.010	.040	.002	.040	CA .0030 TI .0010 Cb .0020	

MECHANICAL PROPERTIES

HEAT NO.	LOAD NO.	YIELD PSI	TENSILE PSI	ELONG %	RED AREA %	HARDNESS BHN	HARDNESS ROCKWELL	IMPACT FT.-LBS	FREQ.	SEVERITY
4131797	T6457128	76900	89400	2.0" 33			RB 92	SIZE 10.0X10.0 TEMP C -20-30 RESULTS 128 57 140 68 133 65		

MAGNAFLUX

JOMINY HARDENABILITY (EXPRESSED IN 16THS)

HEAT NO.	1	2	3	4	5	6	7	8	10	12	14	16	20	24	28	32

J-K RATING

HEAT NO.	A	B	C	D

SLAG-OXIDE RATING

INGOT	OXIDE	SLAG
Q. C. INSPT		

MELT SOURCE

OTHER INSPECTION Melted and Manufactured in USA
EN 10204 3.1

Material under this mtr was not exposed to mercury during processing.

THIS TEST REPORT NOTARIZED WHEN REQUIRED
SWORN AND SUBSCRIBED BEFORE ME
THIS _____ DAY OF _____

NOTARY PUBLIC

Frank Simeone

Frank Simeone, Chief Metallurgist
Frank.Simeone@Arcelormittal.com

Form 89702-04 Revision 05-09-06

Edwards Fabrication

1385 Hwy. 35 Bypass S.
P.O. Box 2350
Rockport, TX 78381

O: (361) 790-7910
F: (361) 790-7927

tedwards@edwardsfabrication.com
www.edwardsfabrication.com

CERTIFICATE OF TEST

Client:
Gates E & S North America
134 44th Street
Corpus Christi, TX 78405

Purchase Order: 16522

Certificate Number				Date of Examination
19351				09/11/14
ID#	Part Number	Description	SWL*	Proofload
19351	7361-0864	4.0" Lift-Eye Clamp 2 Bolt	4205 lbs.	8410 lbs.

DO NOT WELD, CUT, ADD-TO, TAKE AWAY ANY COMPONENTS OR MAKE ANY MODIFICATION TO THIS CLAMP UNIT. Doing so voids this test certificate.

** Safe Work Load*

THIS PRODUCT IS MANUFACTURED IN THE U.S.A.

We hereby verify that the above information is correct
as contained in the records of Edwards Fabrication L.L.C.

Michael White
Test Operator

ISO 9001:2008
BUREAU VERITAS
Certification

Thomas F. Edwards
President
Edwards Fabrication L.L.C.

Edwards Fabrication

1385 Hwy. 35 Bypass S.
P.O. Box 2350
Rockport, TX 78381

O: (361) 790-7910
F: (361) 790-7927

tedwards@edwardsfabrication.com
www.edwardsfabrication.com

CERTIFICATE OF TEST

Client:
Gates E & S North America
134 44th Street
Corpus Christi, TX 78405

Purchase Order: 16522

Certificate Number				Date of Examination
19356				09/11/14
ID#	Part Number	Description	SWL*	Proofload
19356	7361-0864	4.0" Lift-Eye Clamp 2 Bolt	4208 lbs.	8416 lbs.

DO NOT WELD, CUT, ADD-TO, TAKE AWAY ANY COMPONENTS OR MAKE ANY MODIFICATION TO THIS CLAMP UNIT. Doing so voids this test certificate.

** Safe Work Load*

THIS PRODUCT IS MANUFACTURED IN THE U.S.A.

We hereby verify that the above information is correct
as contained in the records of Edwards Fabrication L.L.C.

Michael White
Test Operator

ISO 9001:2008
BUREAU VERITAS
Certification

Thomas F. Edwards
President
Edwards Fabrication L.L.C.

API Monogram Licensee
ISO 9001-2008 Certified
PED 97/23/EC
AD 2000-Merkblatt W0

MARS FORGE PVT. LTD.

Rajkot Gondal Nh. 8-B, Village : Shapar - 360024 Dist. Rajkot (Guj.) India.
Tel. No. : 91 - 2827 - 252190, 252191, Fax No. : 91 - 2827 - 252119
E-mail : info@marsforge.com, Web. : www.marsforge.com

MATERIAL TEST REPORT

The certificate of Material as per EN 10204 3.1

Customer : R& S OILFILED INC.USA

Doc.No.F-P-21-12/

TC Ref No : 21/K/2014-20

DATE	Purchase Order Ref.No. :	Invoice No. :	MF Drawing No. :
25.08.2014	520 Dated 31.07.2014	21	MF 0294-01F
Chemical Analysis Ref:	**Physical Analysis Ref**	**Test Certificate Ref**	**Mode of Shipping :**
54/270714	MFT-644, MFI-147	025396	SEA
Quantity :	**Part Description:**	**PSL LEVEL**	**Raw Material Spec No**
27 PCS	Weld Neck Flange, 4-1/16" 10M X 4" SCH XXH AISI 4130 N.Q.T	2	MARS 6A -001 REV.03
Heat Code Punch :	**R & S Part Number :**		**Melting Practice :**
R 20834	RSMFW410X...		EAF→LRF→VD→CCM
Heat Number:	**Grade/Condition:**	**Reduction Ratio:**	
R 20834	SAE4130	Raw Material Reduction Ratio : 1:3.02	

CHEMICAL ANALYSIS RESULTS

Elements	C.	Mn.	Si.	Cr.	Ni.	Mo.	S.	P.	V.	Cu.
Minimum %	0.28	0.40	0.15	0.80	---	0.15	---	---	---	---
Maximum %	0.33	0.60	0.35	1.10	0.25	0.25	0.025	0.025	0.10	0.30
Heat Analysis %	0.32	0.55	0.19	1.07	0.21	0.22	0.005	0.008	0.003	0.05

MECHANICAL PROPERTIES(QTC SIZE: 4"x 4")

(ASTM A 370)	Requirement	Actual
0.2% Yield Strength (PSI)	75,000 PSI MIN	78798 PSI
Tensile Strength (PSI)	95,000 PSI MIN	104814 PSI
% Elongation	18.0% MIN	25.20%
% Reduction Of Area	35.0% MIN	70.30%
Hardness (HBW)	207-235 HBW	207 TO 229 HBW

CHARPY IMPACT PROPERTIES

Size	10 x 10 x 55mm	DIRN	L
Impact	20 Ft-Lbs Min @ -75° F		
Energy (ft-lbs)	51.63	57.53	50.15
Average	53.10 Ft Lbs		
L.E. (inch)	0.026	0.029	0.024

HEAT TREATMENT

CYCLE	TEMPERATURE(C)	TEMPERATURE (F)	TIME@TEMP	QUENCH MEDIA
Normalized	910 °C	1670 °F	150 Minutes	AIR COOLED
Austenitized	880 °C	1616 °F	150 Minutes	WATER QUENCHED
Tempered	695 °C	1283 °F	150 Minutes	AIR COOLED

Water Temperature IN AT 35°C AND OUT AT 45°C

NON DESTRUCTIVE EXAM (NDE)

	Yes/No	Spec Number
Ultrasonic Testing (UT)	NO	---
Magnetic Particle Inspection (MPI)	YES	ASME Section-V,Article -7

*Country of origin - India

* We hereby declare that the material herein described is in accordance with specifications of the order.

MARS FORGE PVT. LTD. INDIA RAJKOT

Quality Control

API Monogram Licensee
ISO 9001-2008 Certified
PED 97/23/EC
AD 2000-Merkblatt W0

MARS FORGE PVT. LTD.

Rajkot Gondal Nh. 8-B, Village : Shapar - 360024 Dist. Rajkot (Guj.) India.
Tel. No. : 91 - 2827 - 252190, 252191, Fax No. : 91 - 2827 - 252119
E-mail : info@marsforge.com, Web. : www.marsforge.com

Doc No : F-P-21-17

MAGNETIC PARTICLE EXAMINATION REPORT

PART No.	:	RSMFW410X	DATE	:	25.08.2014
PART NAME	:	Weld Neck Flange, 4-1/16" 10M X 4" SCH XXH AISI 4130 N.Q.T	INSPECTOR/ LEVEL	:	ASNT L-II
HEAT NO	:	R 20834	QUANTITY	:	27 PCS
PROC No	:	W-P-21-09	REJECT	:	None
ACCEPT	:	Acceptable			
WO/PO No.	:	R&S PO#520 Dated 31.07.2014			

TEST PROCEDURE

EQUIPMENT	:	"Magnafield "Make , Electromagnetic Crack Detector
DETECTING MEDIA	:	Fluorescent Powder
METHOD	:	Wet fluorescent method
CURRENT APPLY	:	H.W.D.C./A.C. Current used
LOCATION	:	Cover 100% (Assessable) area of the job
MAGNETIZATION	:	Longitudinal
TYPE OF MAGNETIZATION	:	Continuous
EXAMINATION	:	Surface & sub surface defect.
REFERENCE STANDARD	:	ASME Section V, Article 7, SE709
TESTED BY	:	HITESH MAHETA
DATE OF TEST	:	02.08.2014

OBSERVATION :*No relevant indication found*

RESULT : Jobs are found satisfactory in MPT.

For,MARS FORGE PVT.LTD.

MARS FORGE PVT. LTD. INDIA RAJKOT

[AUTHORIZED SIGNATORY]

BANK OF INDIA

TÜV Rheinland
ISO 9001 : 2008
PED 97/23/EC
AD 2000-Merkblatt WO

MARS FORGE PVT. LTD.

"Shraddha House" M-170, Gujarat Housing Board
Akshar Marg, Rajkot - 360 001. Gujarat (India
Tel. No. : 91 - 281 - 244 83 83, 247 90 88, Fax : 91- 281 - 245533

Works : Rajkot Gondal Nh. 8-B, Village : Shapar, Dist. Rajkot (Guj.)Ind
Tel. No. : 91 - 2827 - 252190, 252191, Fax No. : 91 - 2827 - 2521
E-mail : info@marsforge.com, Web. : www.marsforge.co

TEST CERTIFICATE

TC Ref : 12/A/2011-2012

Date : 27-05-2012

Our Drawing No.	:	MF 0285 P1
Heat No. Code	:	R 15965
Quantity	:	159 Nos.
Sample Qty.	:	01 Nos.
Chemical Analysis Ref.	:	111/07052012
Physical Analysis Ref.	:	AI-277
Test Certificate Ref.	:	1111

Customer : R & S OILFIELD INC. HOUSTON – USA.		
Customer's Part No.	:	4 – 1500 WN
Purchase Order Ref.	:	172 / Dt.19-03-2012
Delivery Challan No.	:	12/ DT : 27.05.2011
Vehicle No.	:	BY SEA

CHEMICAL ANALYSIS RESULTS :

Material	Heat No.	C.	Mn.	Si.	Cr.	Ni.	Mo.	S.	P.	V.
Specified A350 LF2	SPECN.	---	0.60	0.10	--	---	---	---	--	---
		0.35	1.05	0.35	0.30	0.40	0.12	0.050	0.040	0.08
Actual	R 15965	0.20	0.93	0.20	0.058	0.076	0.021	0.008	0.009	0.002

Hardness Reqd. Range	Hardness Actual	ASTM Grain Size	Heat Treatment	Jominy Value	INCLUSION RATING			
					A	B	C	D
187 BHN MAX.	143 - 174 BHN	6-7	Normalised	---	1.0 0.5	0.5 ---	--- ---	1.0 ---

* NORMALISED AT 930° C, SOAK FOR 120 MINUTES, AIR COOL.

PHYSICAL TEST RESULTS :

Heat Code On Forgings	Yield PSI.	UTS PSI.	%E	%RA.	Impact (dirn. – L,Size- 10x10x55 mm) 27 Joules min. at -50° F			
---	45000	70000	22.00	30.00	I	II	III	Avg.
PUNCH R 15965	50235	76393	33.80	67.10	67 1.40	65 2.30	63 1.31	65.16 J.

MARS FORGE PVT. LTD. * INDIA * RAJKOT *

QUALITY CONTROL

STATE BANK OF INDIA 60060 FOSC/

MORRIS INSPECTIONS

Mailing Address:
2316 Memorial Pkwy.
Portland, TX 78374-3206

Business Telephone
(361) 643-7066
Cellular Telephone
(361) 877-0776

QW-484 SUGGESTED FORMAT FOR MANUFACTURER'S RECORD OF WELDER OR WELDING OPERATOR QUALIFICATION TESTS
(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's Name JEFFREY CHARLES TOWNSEND S. S. No.
Welding Process(es) Shielded Metal Arc Welding Type Manual Position (QW-405.1) 6-6
Welding Procedure Specification No. SM-4130 PQR No. SM-4130 Backing (QW-402.7) None
Material Spec. (QW-403) No. HF-4130 Grade LN80 P-No. - - Group - -
To
Material Spec (QW403) No. HF-4130 Grade LN80 P-No. - - Group - -
Test Thickness .531" Range Up to 1.062" Test Dia. 4.00" Range 2 7/8" O.D. over

Process(es)	SMAW	SMAW	
Filler Metal (QW-404) Spec.	SFA 5.1	SFA 5.5	SFA
	Class No. E-6010	Class No. E-8018	Class No.
	F No. 3 A No. 1	F No. 4 A No. 3	F No. A No.
Filler Diameter (QW-404.6)	1/8"	5/32"	
Weld Deposit Thickness	.125"	.406"	
Consumable Insert (QW-404.22)	N/A	N/A	
Gas (QW-408) Shielding	N/A	N/A	
Flow Rate	N/A	N/A	
Gas (QW-408) Purge	N/A	N/A	
Flow Rate	N/A	N/A	
Elec. (QW-409) AC-DC	Direct	Direct	
Polarity	Reverse	Reverse	
Volt Range	22-26	23-27	
Amp Range	80-120	150-210	
Progression (QW-405.3) Root	Up	Hot Pass Up	Filler Up Cap Up
Transfer Mode (QW-409.2) GMAW	N/A		

Other Preheat 70° F. PWHT. N/A

For Information Only
Material 4130 IS NOT listed in ASME Section IX
Submerged Arc Flux Trade Name but acceptable.

Guided Bend Test Results (QW-462.2(a), QW-462.3(a), QW-462.3(b))

Specimen No.	Type	Figure No.	Results	Specimen No.	Type	Figure No.	Results
			Radiographic Results in lieu of Sidebends				

Radiographic Test Results (QW-304 & QW-305)
For alternative qualification of groove welds by radiography

Radiographic Results: Satisfactory

Test Conducted by J. Morris - MORRIS INSPECTIONS Laboratory—Test No. 09-019

We certify that the statements in this record are correct and that the test welds prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code.

Joe Morris

Date March 23, 2009 By Organization DU-TEX, INC.

(Details of record of tests are illustrative only and may be modified to conform to the type and number of test required by the Code.)
NOTE: Any essential variables in addition to those above shall be recorded. This form modified for information and typing purposes. (QW-301.4).

MORRIS INSPECTIONS

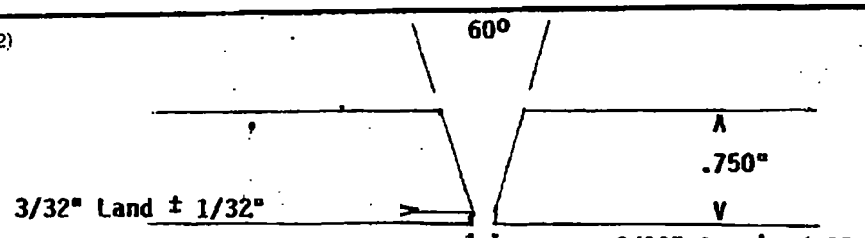
Mailing Address:
2316 Memorial Pkwy.
Portland, TX 78374-3206

Business Telephone
(361) 643-7066
Cellular Telephone
(361) 877-0776

QW-483 SUGGESTED FORMAT FOR PROCEDURE QUALIFICATION RECORD (PQR)
(See QW-201.2, Section IX, ASME Boiler and Pressure Vessel Code)

Company Name DU-TEX, INC.
Procedure Qualification Record No. SM-4130 Date March 24, 2009
WPS No. SM-4130 Transfer Mode GMAW N/A
Welding Process(es) Shielded Metal Arc Welding
Types (Manual, Automatic, Semi-Auto.) Manual

JOINTS (QW-402)



Groove Design Used

BASE METALS (QW-403)
Material Spec. HF-4130 To HF-4130
Type or Grade LN 80 To LN 80
P-No. - - Grp. - - to P-No - - Grp. - -
Thickness Tested .750" Range: .1875" - 1.500"
Diameter Tested 4.500" Range: Proc. unlimited
No Pass Greater than ½" in thickness No
Backing: Yes ___ No XX Material Weld Metal only
Other Material 4130 IS NOT listed in ASME Section IX but is acceptable.

POSTWELD HEAT TREATMENT (QW-407)
Temperature None applied
Time
Other

GAS (QW-408)

Process(es)	SMAW-N/A	
Shielding		
Flow Rate		
Purge		
Flow Rate		
Other		

FILLER METALS (QW404)

Process(es)	SMAW	SMAW
Weld Metal Analysis A-No.	1	3
Weld Bead Number	1 & 2	Balance
Dia of Electrode	1/8"	5/32"
Filler Metal F-No.	3	4
SFA Specification	5.1	5.5
AWS Classification	E-6010	E-8018
Weld Deposit Range	.250"	1.250"
Weld Deposit Thickness	.125"	.625"

Tungsten: Size N/A Type: Class:
Flux Trade Name: N/A Designation:
Other

ELECTRICAL CHARACTERISTICS (QW-409)

Process(es)	SMAW	SMAW
Current	Direct	Direct
Polarity	Reverse	Reverse
Volts Range	22-26	23-27
AMPS Range	80-120	150-210

Other

POSITION (QW-405)
Position of Test Groove 6-G
Weld Progression (Up, Down, Flat)
Root Up Hot Pass Up Filler Up Cap Up

TECHNIQUE (QW-410)

Process(es)	SMAW	SMAW
Travel Speed	Variable	Variable
String or Weave Bead	String	String
Oscillation	None	None
Multi or Single Pass (per side)	Multiple	Multiple
Single or Multi Electrodes	Single	Single
Peening	None	None

Other

PREHEAT (QW-406)
Preheat Temp. 70° F.
Interpass Temp. Min. Max.
Other

QW-483 (Back)

Tensile Test (QW-150) **NOTE: MATERIAL SPECS**
Electrode Tensile Strenth is 80,000 PSI

Specimen No.	Width	Thickness	Area	Ultimate Total Load lbs.	Ultimate Unit Stress psi	Character of Failure & Location
T - 1	.751"	.743"	.558"	45,000	80,645	Satisfactory-Broke in Weld Area
T - 2	.748"	.748"	.554"	44,400	80,144	Satisfactory-Broke in Weld Area

Guided Bend Test (QW-160)

Specimen No.	Type	Figure No.	Results	Specimen No.	Type	Figure	Results
6G - SB1	SBend	QW462.2	Satisfactory				
6G - SB2	SBend	QW462.2	Satisfactory				
6G - SB3	SBend	QW462.2	Satisfactory				
6G - SB4	SBend	QW462.2	Satisfactory				

Toughness Tests (QW-170)

Speciman No.	Notch Location	Speciman Size	Test Temp.	Impact Values	Lateral Exp.		Drop Weight	
					% Shear	Mils	Break	No Break

Average ft/lb for this size _____ Minimum ft/lb for this size _____

Fillet Weld Test (QW-180)

Pos.	Spec. No.	Contour	Leg No. 1	Leg No. 2	Throat	Bend Defects	Macro-Pent.	Results

Other Tests

Type of Test _____

Deposit Analysis _____

Other _____

Welder's Name Jeffrey Charles Townsend S.S.# _____ Stamp No. N/A

Test conducted by: J. Morris-MORRIS INSPECTIONS Laboratory Test No. 09-022

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code.

Joe Morris

Manufacturer DU-TEX, INC.

Date March 25, 2009 By _____

Details of record of tests are illustrative only and may be modified to conform to the type and number of tests required by the Code. This form modified for information and typing purposes (QW200.2(D)

NQS INSPECTION, LTD

Invoice # 06972

Non-Destructive Testing Report

Report # _____

Customer: Gates **Date:** 11/20/14

Project: 192114

METHOD

Ultrasonic	✓	Procedure #	NQS-PA-UT/2013/Rev0
Magnetic Particle		Standard #	ASME
Liquid Penetrant		Section # Level	V

TECHNIQUE

Shear wave	✓	Angle	AC		DC		Dwell Time	
Straight Beam	✓	60 ✓	Wet		Dry		Penetrant #	
Unit Type	Prism	70 ✓	Continuous				Developer #	
Ref Standard	I.D/OD	45 ✓	Residual				Cleaner #	
Range	5"	0 ✓	Background					

RESULTS

ITEM	LOCATION AND IDENTIFICATION	ACC / REJ	COMMENTS
	3½ x 4 x 4 1/16 10K.	Acc	Qty 2
	Fig. 1-2		

Inspector: Joe Baldenegro **SNT Level** III **PG #** _____ **of** _____

Customer Representative: _____ **Hours** 2 **Mileage** ____

PO BOX 23036 CORPUS CHRISTI, TEXAS 78403
PHONE # 361-533-4563 / FAX # 361-884-1984 / E-MAIL emanahan@nqsltd.com (Eric) / lray@nqsltd.com (Bud)

60 MIN.
5
10
15
20
25
30
CHART POOL USA Inc.
PORTAGE, INDIANA
GATES ENGINEERING & SERVICES NA
APPROVED
2000
4000
6000
8000
10000
12000
14000
16000
18000

GATES E & S NORTH AMERICA, INC.
134 44TH STREET
CORPUS CHRISTI, TEXAS 78405

PHONE: 361-887-9807
FAX: 361-887-0812
EMAIL: Tim.Cantu@gates.com
WEB: www.gates.com

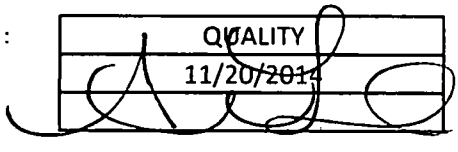
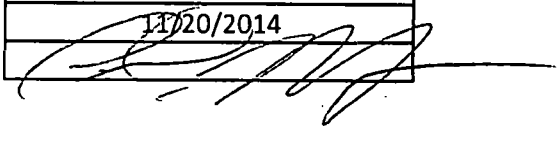
10K CHOKE AND KILL ASSEMBLY PRESSURE TEST CERTIFICATE

Customer :	AUSTIN DISTRIBUTING	Test Date:	11/20/2014
Customer Ref. :	PENDING	Hose Serial No.:	D-112014-10
Invoice No. :	205663	Created By:	NORMA MATA

Product Description:	10K3.566.0CK4.1/1610KFLGE/E L/E

End Fitting 1 :	4 1/16 10K FLG	End Fitting 2 :	4 1/16 10K FLG
Gates Part No. :	4773-6291	Assembly Code :	L34116080813D-112014-10
Working Pressure :	10,000 PSI	Test Pressure :	15,000 PSI

Gates E & S North America, Inc. certifies that the following hose assembly has been tested to the Gates Oilfield Roughneck Agreement/Specification requirements and passed the 15 minute hydrostatic test per API Spec 7K/Q1, Fifth Edition, June 2010, Test pressure 9.6.7 and per Table 9 to 15,000 psi in accordance with this product number. Hose burst pressure 9.6.7.2 exceeds the minimum of 2.5 times the working pressure per Table 9.

Quality Manager :	QUALITY	Technical Supervisor :	PRODUCTION
Date :	11/20/2014	Date :	11/20/2014
Signature :		Signature :	

POWERING PROGRESS™

Gates E&S North America, Inc.
134 - 44th St.
CORPUS CHRISTI, TEXAS 78405
PHONE : (361) 887-9807
FAX: (361) 887-0812
Tim.Cantu@gates.com

CERTIFICATE OF CONFORMANCE

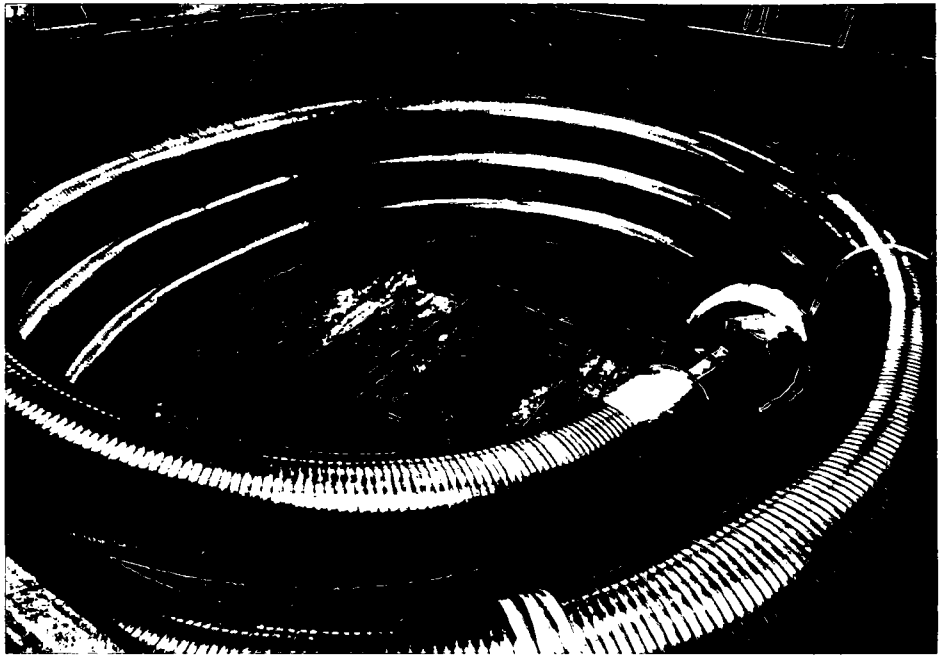
This is to verify that all Parts and/or Materials included in this shipment have been manufactured and/or processed in Conformance with applicable drawings and specifications, and that Records of Required Tests are on file and subject to examination. The following items were assembled at Gates E & S, North America Inc., facilities in Corpus Christi, TX, USA. This hose assembly was designed and manufactured to meet all the requirements of API Spec 7K.

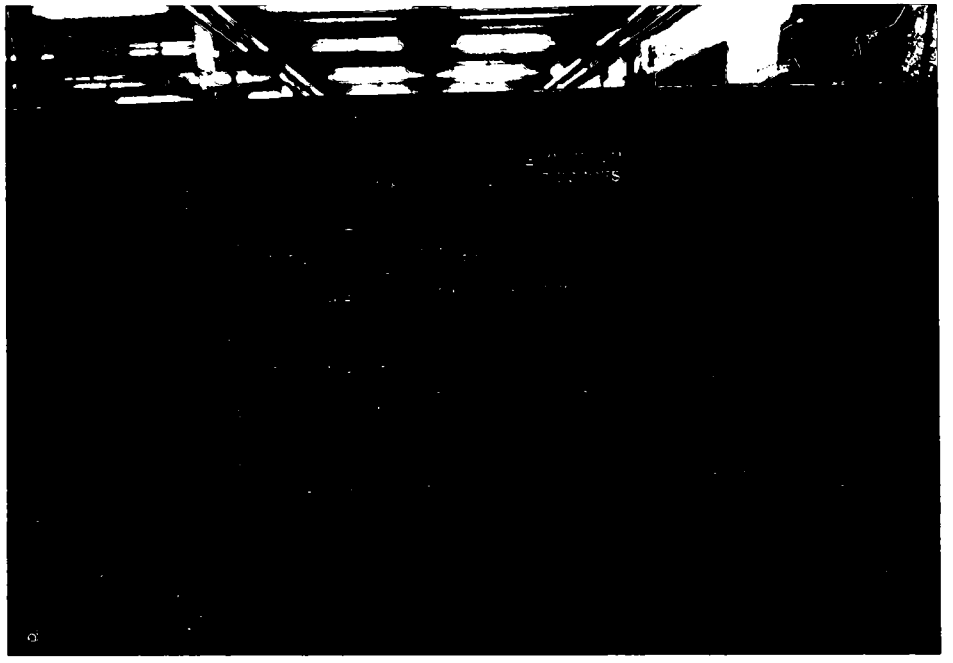
CUSTOMER: AUSTIN DISTRIBUTING
CUSTOMERS P.O.#: PENDING
PART DESCRIPTION: 10K3.566.0CK4.1/1610KFLGE/E L/E
SALES ORDER #: 205663
QUANTITY: 1
SERIAL #: D-112014-10

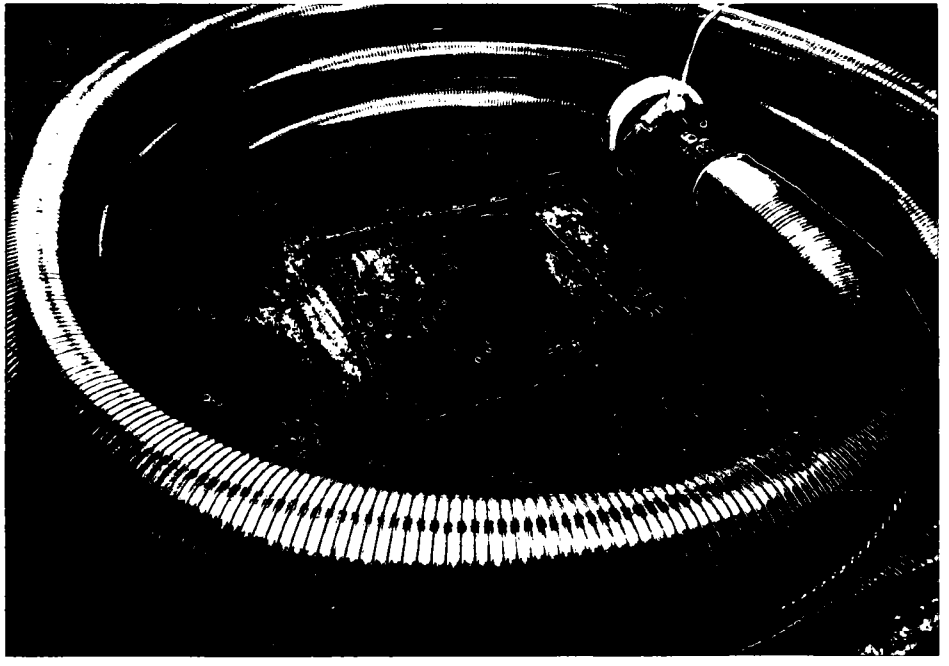
SIGNATURE: _____

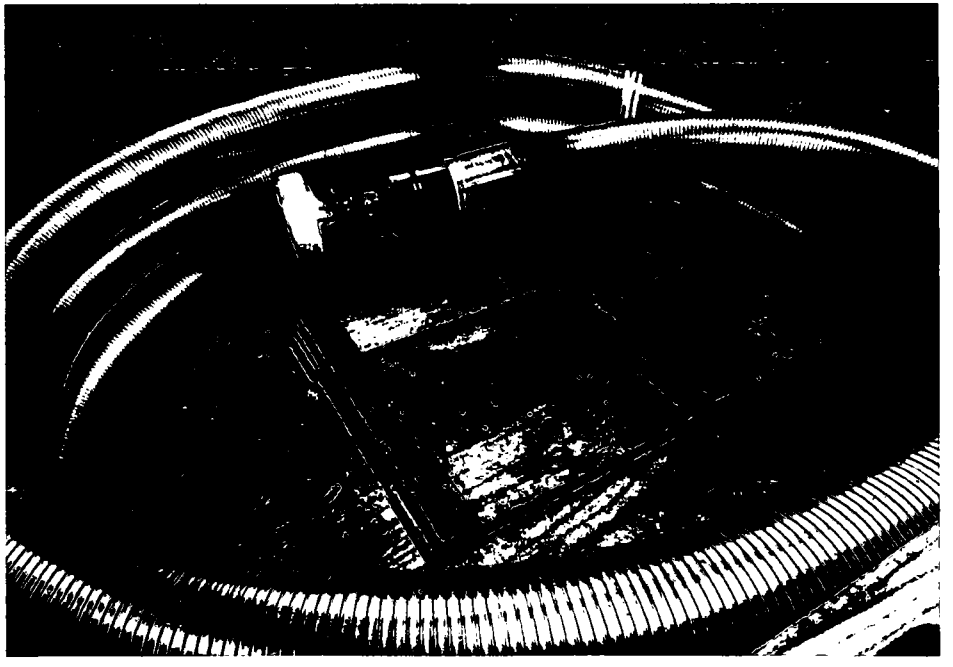
TITLE: QUALITY

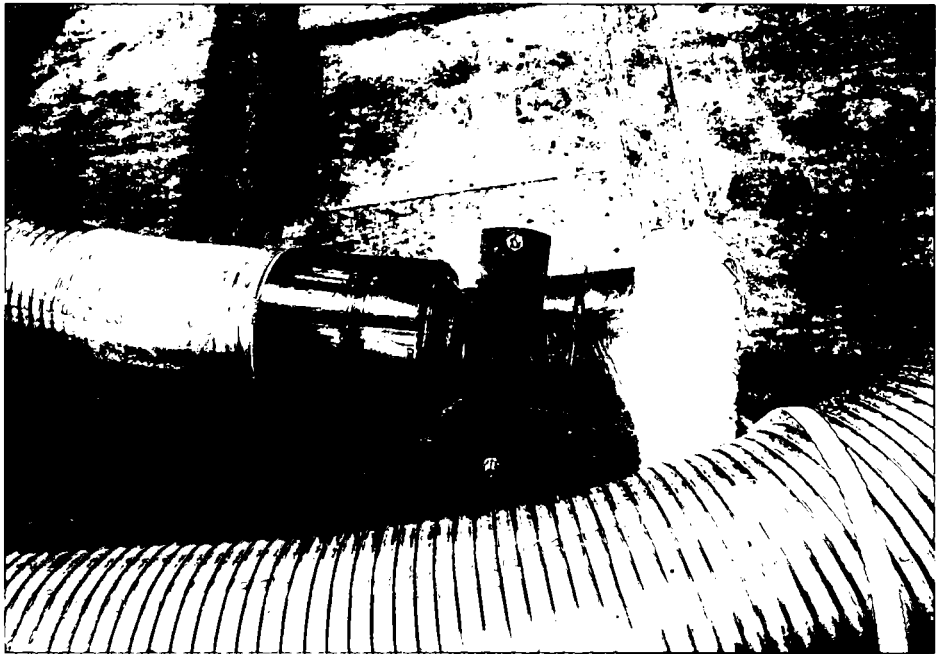
DATE: 11/20/2014











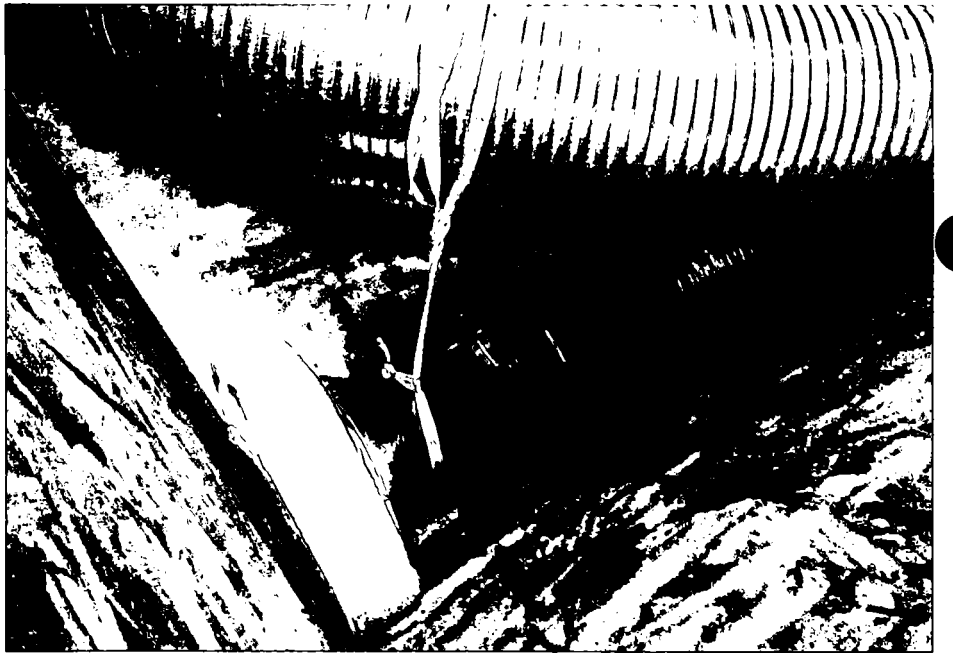
ILL ASSEMBLY PRESSURE TEST CERTIFICATE

AUSTIN DISTRIBUTING	Test-Date:	11/20/2014
PENDING	Hose Serial No.:	D 112014-10
205663	Created By:	NORMA MATA

10K3.566.0CK4.1/1610KFLGE/E L/E

4 1/16 10K FLG	End Fitting 2 :	4 1/16 10K FLG
4773-6291	Assembly Code :	L341160808130-112014-10
10,000 PSI	Test Pressure :	15,000 PSI

The following hose assembly has been tested to the



POWERING PROGRESS™

PACKING LIST

Gates E&S North America
134 - 44th St.
CORPUS CHRISTI, TEXAS 78405
PHONE : (361) 887-9807
FAX: (361) 887-0812
Tim.Cantu@gates.com

CUSTOMER. : AUSTIN DISTRIBUTING
PURCHASE ORDER # : PENDING
DATE : 11/20/2014
SALES ORDER #: 205663

SOLD TO: AUSTIN DISTRIBUTING
P.O. BOX 7890
AMARILLO, TEXAS
79114

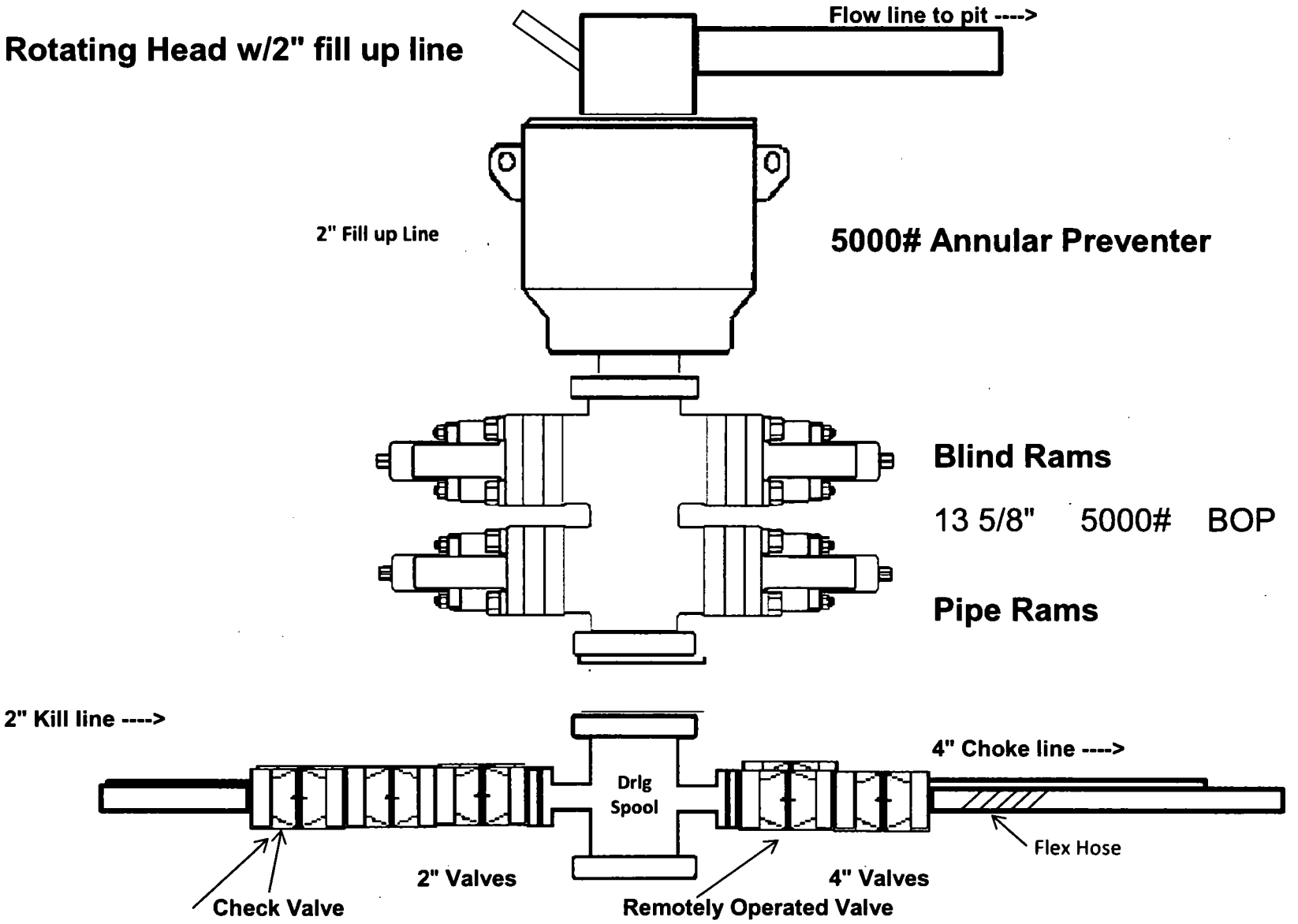
SHIP TO: 0
0
0
0

PACKAGING: ENCLOSED CRATE

PRODUCT DESCRIPTION:

ITEM	QTY	DESCRIPTION	ID	LENGTH	WORKING	TEST	END CONNECTION	SAFETY CLAMPS / LIFT EYES
1	1	10K3.566.0CK4.1/1610KFLGE/E L/E	3.5 in.	66 ft.	10,000 PSI	15,000 PSI	4 1/16 10K FLG E/E	LE
COMMENTS:		CRATE DIMENSIONS:						
		HOSE WEIGHT: CRATE WEIGHT:						
		TOTAL WEIGHT:						

5,000 psi BOP Schematic



POWERING PROGRESS™

MTR DATA BOOK

CUSTOMER: AUSTIN DISTRIBUTING
DATE: 11/20/2014
Purchase Order: PENDING
Sales Order #: 205663
Product Description: 10K3.566.0CK4.1/1610KFLGE/E L/E
Hose S/N: D-112014-10

CONTENTS INCLUDED

1	**GMCO FITTINGS**	
	14-177-1	INSERT STEM
	14-245-1	INSERT HEAD
	14-242-1	FERRULE
2	**EDWARDS FABRICATION LIFT EYE CLAMPS**	
	19351, 19356 Individual Test Certificates for Each Clamp	
3	**4 1/16 10K FLANGES**	
	R20834 Heat Numbers	
4	**WELDING SPECIFICATIONS**	
	Certification and Procedure for welding	
5	**NDE RESULTS**	
	1921 Ultrasonic Test Results and Imaging	
6	**TEST CHART**	
	Chart Recording of Hydrostatic Test	
7	**TEST CERTIFICATE**	
	Document Product Details & Positive Results of Hydrostatic Testing	
8	**CERTIFICATE OF CONFORMANCE**	
	A Declaration of the conformity with the type approval	
9	**IMAGES**	
	Images of the product prior to shipping.	
10	**PACKING LIST**	
	Details of Shipping Contents, Dimensions and Weights	

PLYMOUTH TUBE CO USA®
572 W State Road 14, Winamac, Indiana 46996
Phone: (574) 946-3125 Fax-Cold Draw: (574) 946-3850 Fax-Hot Mill: (574) 946-7220

PRODUCT CERTIFICATION

SALES ORDER - LINE / RLS
119679 - 1 / 1

WORK ORDER 006409
HEAT NUMBER 486597
MELT SOURCE TMK IPSCO Koppel-USA Mfg/Melt

SOLD TO
J P Steel
6811 FM 362
Brookshire, TX 77423
USA

936HXX+64-15

14-177-1

ISO 9001: 2008
Registered

CUSTOMER P.O.	CUSTOMER PART	QUANTITY	LADING NO	CERT ID / REV	CERT DATE
17554	JP 3.562X.531	9,736.34 Lb	00071757	01	06/18/2014

PART DESCRIPTION **EJ35620531DR1724-00**
Spec: ASTM A-519 Seamless Mech.
Alloy Smls Mechanical, HF [D/E] Smls Q&T
Grade: 4130
OD: 3.5625" Tol+.0360" Tol-.0360"
Wall: 0.5310" Tol+.0530" Tol-.0530" AW
Lgth Type: Random
Lgth: 17.00' / 24.00'
End Finish: Debur ID & OD
Finish Type: Quench & Temper L80/N80
Oil: Light Oil

CERTIFICATION REQUIREMENTS
ASTM A-519-06 / API 5CT
Quench & Tempered. Induction heated, water quenched and infrared pyrometer monitored.
Tensiles tested were 1" STRIP specimens per A370.
Ultrasonic tested and passed.
Tubes UT inspected to ASTM E213/API 5CT 10.15 and SR2 requirements w/ 5% notches. Test covered 100% full length of OD & ID surfaces both longitudinal & transverse.

Chemical Analysis

C	Mn	P	S	Si	Al	Cr	Mo	Ni	Pb	Cu	V	Ti	Sn
.31	.51	.011	.003	.27	.015	.97	.21	.13	-------	.16	.006	-------	.008

Cb	Ca	N	As	Sb	H
.001	.0017	.0095	.0039	.0014	-------

Product Checks

	C	Mn	P	S	Si	Al	Cr	Mo	Ni	Pb	Cu	V	Ti
CHK01	.317	.52	.012	.005	.275	.016	.96	.211	.123		.148	.0034	
CHK02	.31	.52	.011	.0043	.275	.016	.96	.211	.123		.147	.0035	

	Sn	Cb	Ca	N	As	Sb	H
CHK01	.0091	.000	.0017	.0000	.0095	.0000	
CHK02	.0091	.000	.0016	.0000	.0099	.0000	

Physical Properties

I certify that the described material has been manufactured, inspected, and tested in accordance with the above specification(s) and satisfies the requirements.

David Jenkins
Quality Assurance

Date Printed: 06/18/2014

PLYMOUTH TUBE CO USA®
572 W State Road 14, Winamac, Indiana 46996
Phone: (574) 946-3125 Fax-Cold Draw: (574) 946-3860 Fax-Hot Mill: (574) 946-7220

PRODUCT CERTIFICATION

SALES ORDER - LINE / RLS
119679 - 1 / 1

WORK ORDER 006409
HEAT NUMBER 486597
MELT SOURCE TMK IPSCO Koppel-USA Mfg/Melt

SOLD TO

J P Steel
6811 FM 362
Brookshire, TX 77423
USA

ISO 9001: 2008
Registered

CUSTOMER P.O.	CUSTOMER PART	QUANTITY	LADING NO	CERT ID / REV	CERT DATE
17554	JP 3.562X.531	9,736.34 Lb	00071757	01	06/18/2014

PART DESCRIPTION **EJ35620531DR1724-00**

Grain Size	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12	C	R	S	AH	AT	BH	BT	CH	CT	DH	DT	SAM 'B'
7	50	49	48	45	42	38	35	33	33	33	33	32	--	--	--	0.0	0.5	1.0	1.0	0.0	0.0	1.0	1.5	-------

SAM 'D'	Freq.	Severity
-------	.000	.000

Methods of Manufacturing

Method of Mfg 1	Method of Mfg 2	Method of Mfg 3
Electric Arc Furnace Melted	Aircraft Quality	Continuous Cast

Method of Mfg 4	Method of Mfg 5
Mfg.Using Clean Steel Practice	Ladle Refined

Mechanical Properties

	Rc-High	Rc-Low	Tensile	Yield .2%	Yield .5%	Elong%	Reduction	Aust TempF	Aust Time	TemperTmpF
1	20	19	107000	91800	91800	28	59	1640	6.17	1315

	TemperTime
1	79

Charpy Impact Tests

	Temp 1	Size 1	Orient 1	PtLb-T1-Pc 1	LExp-T1-Pc 1	%Shr-T1-Pc 1	PtLb-T1-Pc 2	LExp-T1-Pc 2
1	-30C	10X10	Long	126	.073	100	128	.068

	%Shr-T1-Pc 2	PtLb-T1-Pc 3	LExp-T1-Pc 3	%Shr-T1-Pc 3
1	100	125	.073	100

This test report data is for the heat Chemistry Stated above.

The material in this test report is:

1) **Manufactured in the USA.**
2) **Free from Polybrominated Biphenyls (PBB), Polybrominated Diphenyl Ethers (PBDE), and Mercury contamination.**

I certify that the described material has been manufactured, inspected, and tested in accordance with the above specification(s) and satisfies the requirements.

David Conklin
Quality Assurance

Date Printed: 06/18/2014

PLYMOUTH TUBE CO USA®
572 W State Road 14, Winamac, Indiana 46996
Phone: (574) 946-3125 Fax-Cold Draw: (574) 946-3850 Fax-Hot Mill: (574) 946-7220

PRODUCT CERTIFICATION

SALES ORDER - LINE / RLS
119679 - 1 / 1

WORK ORDER 006409
HEAT NUMBER 486597
MELT SOURCE TMK IPSCO Koppel-USA Mfg/Melt

SOLD TO

J P Steel
6811 FM 362
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ISO 9001: 2008
Registered

CUSTOMER P.O.	CUSTOMER PART	QUANTITY	LADING NO	CERT ID / REV	CERT DATE
17554	JP 3.562X.531	9,736.34 Lb	00071757	01	06/18/2014

PART DESCRIPTION **EJ35620531DR1724-00**

3) No Repairs by welding

End of Certification

I certify that the described material has been manufactured, inspected, and tested in accordance with the above specification(s) and satisfies the requirements.

David Jenkins
Quality Assurance

Date Printed: 06/18/2014

956HXXX+64WB-1H
14-245-1

Benteler Steel/Tube GmbH
Postfach 13 40
33043 Paderborn
Deutschland
Tel.: +49.5254.81-0 Fax: +49.5254.13666

Ersetzt / replace

Dok. Nr. / Doc. No. 65-716081/001/E vom / dated 26.09.2012

BENTELER Steel/Tube

ABNAHMEPRÜFZEUGNIS EN 10204-3.1
INSPECTION CERTIFICATE EN 10204-3.1
CERTIFICAT DE RECEPTION EN 10204-3.1
EN 10204:2005-01

Benteler Steel/Tube GmbH - Postfach 1340 - 33043 Paderborn - Deutschland

JP Steel
PO Box 592
BROOKSHIRE TX 77492
USA

Dokument-Nr.: Document No.: No. du document:	65-716081/002/P	Prüf-Nr.: Inspection No.: No. du certificat:	Blatt: 1 / 4 Page: Page:
Kunden-Bestell-Nr.: Purchase Order No.: No. de commande du client:	BST 12-12036 / JP 11459	Hersteller: Manufacturer: Producteur:	Warmrohrwerk Dinslaken DIN EN ISO 9001, ISO/TS-16949 CERTIFIED BY TUEV NORD CERT PED 97/23/EC CERTIFIED BY TUEV NORD SYSTEMS
Benteler Auftrags-Nr.: Benteler Order No.: No. de commande Benteler:	1578593	Herstellerzeichen: Manufacturer's brand: Marque du producteur:	
Versandanzeigen-Nr.: Dispatch Note No.: No. d'avis d'expédition:	6571039	Stempel des Abnahmebeauftragten: Stamp of the inspection representative: Poinçon du contrôleur:	WA
Produkt: NAHTLOSE STAHLROHRE Product: SEAMLESS STEEL TUBES Produit: TUBES D' ACIER SANS SOUDURE		Stahlerschmelzungsverfahren: Steelmaking process: Procédé d'élaboration de l'acier:	ELEKTROSTAHL ELECTRIC FURNACE FOUR ELECTRIQUE

Lieferbedingungen: Terms of delivery: Conditions de livraison:	ASTM-A 519-2006
Maße - Toleranzen: Dimensions-tolerances: Dimensions-tolérances:	outside diameter acc. to customer request, wall thickness acc. to customer request, ASTM-A 519-2006
Stahlsorte: Steel grade: Nuance d'acier:	GRADE 4130
Lieferzustand: Delivery condition: État de livraison:	QT
Produktkennzeichnung: Product marking: Marquage du produit:	PKE: BENTELER SIGN BENTELER DIMENSIONS GRADE 4130 BST 12-12036 / JP 11459 ASTM-A 519 WA

ÄIZ = Ätzinitenbeschriftung, Etching ink marking, Gravure à l'encre . FK = Farbkennzeichnung, colour marking, marquage par couleur . FS = Farbschablonierung, paint stencilling, marquage par pochoirs . FSD = Farbsprühdrucker, Colour jet printer, imprimante à jet d'encre de couleur . LK = Laserkennzeichnung, Laser marking, Marquage laser . PKE = Etikettenkennzeichnung, tag marking, marquage sur étiquettes . PS = Prägestempel, die stamp, marquage par poinçonnage . TS = Tintenstrahlkennzeichnung, Ink jet spray marking, imprimante à jet d'encre .

Benteler Steel/Tube GmbH
Postfach 13 40
33043 Paderborn
Deutschland
Tel.: +49.5254.81-0 Fax: +49.5254.13666

Ersetzt / replace

Dok. Nr. / Doc. No. 65-716081/001/E vom / dated 26.09.2012

BENTELER Steel/Tube

ABNAHMEPRÜFZEUGNIS EN 10204-3.1
INSPECTION CERTIFICATE EN 10204-3.1
CERTIFICAT DE RECEPTION EN 10204-3.1

Dokument-Nr.: / Document No.: / No. du document: 65-716081/002/P

Prüf-Nr.: / Inspection No.: / No. du certificat:

Pos. Item Poste	Stück Number Nombre	Maße Dimensions Dimensions	Länge Length Longueur feet	Gewicht Weight Poids lbs	Schmelzen-Nr. Heat No. No. de coulée	Prüfdruck Test pressure Pression d'épreuve	Rohr-Nr.-Gruppe Tube number group Série de no. des tubes	Vielfachlängen Multiple lengths Longueurs multiples
0002	34	4.500" O.D. * 0.625" 17 FT - 24 FT	748,36	19326	573599			

Schmelzenanalyse [%] / Heat analysis [%] / Analyse sur coulée [%]

Pos. Item Poste	Schmelzen-Nr. Heat No. No. de coulée	C	SI	MN	P	S	CR	MO	NI
0002	573599	0,310	0,220	0,53	0,007	0,002	0,89	0,17	0,09

Prüfergebnisse / Test results / Résultats des essais

Die Rohre wurden zerstörungsfrei geprüft:
The tubes are non destructive tested:
Les tubes ont passé un essai non destructif:

UT-long.imperfections: acc. to API 5CT, SR 2; UT-long. Test method: acc. to ASTM-E 213; Outside notch depth: 5,0 %; Inside notch depth: 5,0 %; UT-transv. imperfections: acc. to API 5CT, SR2; acc. to ASTM-E 213; Outside notch depth: 5,0 %; Inside notch depth: 5,0 %; UT-lamination detection: acc. to EN 10246-14, table 1 — PASSED

Augensichtkontrolle: / Visual inspection: / Examen visuel: PASSED

Materialverwechslungsprüfung: / Material conformity test: / Vérification de la nuance: PASSED

Maßkontrolle: / Dimensions examination: / Vérification des dimensions: PASSED

Ergebnisse der mechanischen Prüfung / Results of mechanical testing / Résultats des essais mécaniques

Die Probennahme erfolgte an Vielfachlängen.
The sampling was carried out on multiple lengths.
L'echantillonage etait realise aux longueurs multiples.

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BENTELER Steel/Tube

ABNAHMEPRÜFZEUGNIS EN 10204-3.1
INSPECTION CERTIFICATE EN 10204-3.1
CERTIFICAT DE RECEPTION EN 10204-3.1

Dokument-Nr.: / Document No.: / No. du document: 65-716081/002/P

Prüf-Nr.: / Inspection No.: / No. du certificat:

Zugversuch längs Streifenprobe / Tensile test longitudinal Strip test specimen / Essai de traction longitudinale Bande decoupee sur tube

Pos. / Item / Poste	Proben-Nr. / Specimen No. / No. de l'éprouvette	Schmelzen-Nr. / Heat No. / No. de coulée	Probenabmessung / Specimen dimensions / Dimensions de l'éprouv.	Streckgrenze / Yield strength / Limite élastique	Zugfestigkeit / Tensile strength / Résistance à la traction	Dehnung / Elongation / Allongement		Einschnürung / Area reduction / Coefficient de striction
Anforderungen / Requirements / Exigences			mm	RT 0,5 % / MPa / 552-655	Rm / MPa / MIN 655	A2" / % / MIN 14	1. Formel / 1. Formula / 1. Formule	
0002	000001	573599	25,40 X 15,40	637	758	36		
0002	000002	573599	25,40 X 15,70	635	769	36		

Härteprüfung / Hardness test / Essai de dureté

Pos. / Item / Poste	Proben-Nr. / Specimen No. / No. de l'éprouv.	Schmelzen-Nr. / Heat No. / No. de coulée	Härte / Hardness / Dureté				
Anforderungen / Requirements / Exigences			HRC MAX 22,0	HB	HV	HRB	HBW
0002	000001	573599	020				

Kerbschlagbiegeversuch Notched bar impact test / Essai de flexion par choc (résilience) [1 CHARPY_V]

Pos. / Item / Poste	Proben-Nr. / Specimen No. / No. de l'éprouv.	Schmelzen-Nr. / Heat No. / No. de coulée	Probenabmessung / Specimen dimensions / Dimensions de l'éprouvette			Probenlage / Specimen position / Position de l'éprouvette	Prüftemperatur / Test temperature / Température d'essai	Kerbschlagarbeit / Absorbed energy / Energie absorbée		Kerbschlagzähigkeit / Impact strength / Résistance au choc		Verf.-Bruchanteil / Shear fracture / Rupture ductile
Anforderungen / Requirements / Exigences			Länge / Length / Longueur	Breite / Width / Largeur	Höhe / Height / Hauteur	längs (L) / longitudinal (L) / longitudinal (L)		einzel / single / individuelle	mittel / average / moyenne	einzel / single / individuelle	mittel / average / moyenne	
						quer (Q)	GRAD					
			mm	mm	mm	transversal (Q)	°C	ft-lbf	ft-lbf		J/cm²	
			55	10,00	10,00	transversal (Q)	-30		MIN 020			
0002	000001	573599	55	10,00	10,00	L	-30	116				
				10,00	10,00			110				
				10,00	10,00			111	112			

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Ersetzt / replace

Dok. Nr. / Doc. No. 65-716081/001/E vom / dated 26.09.2012

BENTELER Steel/Tube

ABNAHMEPRÜFZEUGNIS EN 10204-3.1
INSPECTION CERTIFICATE EN 10204-3.1
CERTIFICAT DE RECEPTION EN 10204-3.1

Dokument-Nr.: / Document No.: / No. du document: 65-716081/002/P

Prüf-Nr.: / Inspection No.: / No. du certificat:

Wärmebehandlung / Heat treatment / Traitement thermique

Hardening temperature: 850°C, Holding time: 1 min, Cooling: water / Tempering temperature: 735°C, Holding time: 6 min, Cooling: air

Vermerk / Remark / Remarque

Certificate remarks: Steel is manufactured to fine grain practice. The tubes comply with the requirements of NACE MR0175-03., hardness max. 22 HRC, No mercury, mercury compounds or mercury bearing instruments and / or equipment has been used in any manner which might cause contamination in manufacture assembly, or test of material. No weld repair has been carried out.:
Certificate-Remark: The steel will be produced by an electric arc furnace, ladle furnace and contionuous casting machine, stirring by argon. The mode of operation in this process is commonly referred to as "clean steel process". The products are fully killed.

Verkäufer(in) / Selesman/ woman in charge / Personne chargée : Mr Storm, Tel.: 05254/81-4274, Fax: 4289

Dinslaken, 26.10.2012, TEL.: 02064.623-5370 FAX: 02064.623-5390

Abnahmebeauftragter
Inspection representative
Contrôleur
DR. BASEL KEITA / Thei

Es wird bestätigt, daß die gelieferten Erzeugnisse den techn. Lieferbedingungen des Auftrages entsprechen.Dieses Dokument wurde mittels EDV erstellt und ist ohne Unterschrift rechtsgültig.
We certify that the supplied products comply with the order specification.This document was prepared by means of electronic data processing and is valid without signature.
Nous attestons que les produits livrés sont conformes aux stipulations de la commande.Ce document a été établi par traitement électronique de l'information et est valide sans signature.

P.O. BOX 924469
HOUSTON, TX 77292
PHONE: (713) 290-8490

P&B TESTING INC

6645 W. TIDWELL
HOUSTON,TX 77092
FAX: (713) 290-8627

Report Date: 10/18/13
Report No: **250944.0**
Rev.: A
Cust Acct: JPS10050

To: J.P. STEEL, LLC
PO BOX 592
KATY, TX 77492-0592

PO#: 15484
Material: 4.50" OD X .625" WALL 4130 Q & T ALLOY
ID/Heat: HT# 573599
Job Info:

Tensile Test Results

No./Location	Size (in.)	Area (in^2)	Ult. Load (lbs.)	Yield (psi)	Tensile (psi)	Elong. (%)	R. of A. (%)	Hardness
1	.495	.1924		90,200	112,300	26	73	

Unless otherwise stated, yield stress is 0.2% offset, gage length is 2 in. for 1/2 in. bars or 1 in. for 1/4 in. bars.

Signed: Mike Mason

MIKE MASON

ArcelorMittal

ARCELORMITTAL TUBULAR PRODUCTS
SHELBY LLC.
132 WEST MAIN STREET
SHELBY, OHIO 44875-1471
Telephone 419/342-1200 FAX: 419/342-1437

MATERIAL TEST REPORT

ISO/TS 16949:2009 ISO 9001:2008 14-242-C 956HXXX469A-F

SHELBY ORDER NO. 447180

CUSTOMER	SPECIFICATION	CUSTOMER ORDER
MARMON KEYSTONE CORPORATION 6441 BINGLE ROAD HOUSTON TX 77092 ATTN: EARTHA JILES	ASTM A513 GMCO A513 DOM 1 01-10 FAX: (713)460-5414	35-057810-03

GRADE	SIZE(O.D x ID x WALL)	QUANTITY	SHIPPED	DATE
520	7.250 X 6.000 X .625	17509 LB 396.00 FT	09/02/14	09/02/14

CONDITION: ASTM 513 Type 5 Produced to OD/ID Ref: WALL
EW TUFFDOM STRESS RELIEVE ANNEAL

PART NO.: S#00335344
REV.: 50064541

CHEMICAL ANALYSIS

HEAT NO.	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	Al	OTHER	GRAIN SIZE
4131797	.16	1.41	.012	.003	.220	.010	.040	.010	.040	.002	.040	CA .0030 TI .0010 Cb .0020	

MECHANICAL PROPERTIES

HEAT NO.	LOAD NO.	YIELD PSI	TENSILE PSI	ELONG %	RED AREA %	HARDNESS BHN	HARDNESS ROCKWELL	IMPACT FT.-LBS	FREQ.	SEVERITY
4131797	T6457128	76900	89400	2.0" 33			RB 92	SIZE 10.0X10.0 TEMP C -20-30 RESULTS 128 57 140 68 133 65		

MAGNAFLUX

JOMINY HARDENABILITY (EXPRESSED IN 16THS)

HEAT NO.	1	2	3	4	5	6	7	8	10	12	14	16	20	24	28	32

J-K RATING

SLAG-OXIDE RATING

HEAT NO.	A	B	C	D	INGOT	OXIDE	SLAG
					Q. C. INSPT		

MELT SOURCE

OTHER INSPECTION: Melted and Manufactured in USA
EN 10204 3.1

Material under this mtr was not exposed to mercury during processing.

THIS TEST REPORT NOTARIZED WHEN REQUIRED
SWORN AND SUBSCRIBED BEFORE ME
THIS _____ DAY OF _____

NOTARY PUBLIC

Frank Simeone

Frank Simeone, Chief Metallurgist
Frank.Simeone@Arcelormittal.com

Form 89702-04 Revision 05-09-06

Edwards Fabrication

1385 Hwy. 35 Bypass S.
P.O. Box 2350
Rockport, TX 78381

O: (361) 790-7910
F: (361) 790-7927

tedwards@edwardsfabrication.com
www.edwardsfabrication.com

CERTIFICATE OF TEST

Client:
Gates E & S North America
134 44th Street
Corpus Christi, TX 78405

Purchase Order: 16522

Certificate Number				Date of Examination
19351				09/11/14
ID#	Part Number	Description	SWL*	Proofload
19351	7361-0864	4.0" Lift-Eye Clamp 2 Bolt	4205 lbs.	8410 lbs.

DO NOT WELD, CUT, ADD-TO, TAKE AWAY ANY COMPONENTS OR MAKE ANY MODIFICATION TO THIS CLAMP UNIT. Doing so voids this test certificate.

** Safe Work Load*

THIS PRODUCT IS MANUFACTURED IN THE U.S.A.

We hereby verify that the above information is correct
as contained in the records of Edwards Fabrication L.L.C.

Michael White
Test Operator

ISO 9001:2008
BUREAU VERITAS
Certification

Thomas F. Edwards
President
Edwards Fabrication L.L.C.

Edwards Fabrication

1385 Hwy. 35 Bypass S.
P.O. Box 2350
Rockport, TX 78381

O: (361) 790-7910
F: (361) 790-7927

tedwards@edwardsfabrication.com
www.edwardsfabrication.com

CERTIFICATE OF TEST

Client:
Gates E & S North America
134 44th Street
Corpus Christi, TX 78405

Purchase Order: 16522

Certificate Number				Date of Examination
19356				09/11/14
ID#	Part Number	Description	SWL*	Proofload
19356	7361-0864	4.0" Lift-Eye Clamp 2 Bolt	4208 lbs.	8416 lbs.

DO NOT WELD, CUT, ADD-TO, TAKE AWAY ANY COMPONENTS OR MAKE ANY MODIFICATION TO THIS CLAMP UNIT. Doing so voids this test certificate.

** Safe Work Load*

THIS PRODUCT IS MANUFACTURED IN THE U.S.A.

We hereby verify that the above information is correct
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Michael White
Test Operator

ISO 9001:2008
BUREAU VERITAS
Certification

Thomas F. Edwards
President
Edwards Fabrication L.L.C.

API Monogram Licensee
ISO 9001-2008 Certified
PED 97/23/EC
AD 2000-Merkblatt W0

MARS FORGE PVT. LTD.

Rajkot Gondal Nh. 8-B, Village : Shapar - 360024 Dist. Rajkot (Guj.) India.
Tel. No. : 91 - 2827 - 252190, 252191, Fax No. : 91 - 2827 - 252119
E-mail : info@marsforge.com, Web. : www.marsforge.com

MATERIAL TEST REPORT

The certificate of Material as per EN 10204 3.1

Customer : R& S OILFILED INC.USA

Doc.No.F-P-21-12/

TC Ref No : 21/K/2014-20

DATE	Purchase Order Ref.No. :	Invoice No. :	MF Drawing No. :
25.08.2014	520 Dated 31.07.2014	21	MF 0294-01F
Chemical Analysis Ref:	**Physical Analysis Ref**	**Test Certificate Ref**	**Mode of Shipping :**
54/270714	MFT-644, MFI-147	025396	SEA
Quantity :	**Part Description:**	**PSL LEVEL**	**Raw Material Spec No**
27 PCS	Weld Neck Flange, 4-1/16" 10M X 4" SCH XXH AISI 4130 N.Q.T	2	MARS 6A -001 REV.03
Heat Code Punch :	**R & S Part Number :**		
R 20834	RSMFW410X...		**Melting Practice :** EAF→LRF→VD→CCM
Heat Number:	**Grade/Condition:**	**Reduction Ratio:**	
R 20834	SAE4130	Raw Material Reduction Ratio : 1:3.02	

CHEMICAL ANALYSIS RESULTS

Elements	C.	Mn.	Si.	Cr.	Ni.	Mo.	S.	P.	V.	Cu.
Minimum %	0.28	0.40	0.15	0.80	---	0.15	---	---	---	---
Maximum %	0.33	0.60	0.35	1.10	0.25	0.25	0.025	0.025	0.10	0.30
Heat Analysis %	0.32	0.55	0.19	1.07	0.21	0.22	0.005	0.008	0.003	0.05

MECHANICAL PROPERTIES(QTC SIZE: 4"x 4")

(ASTM A 370)	Requirement	Actual
0.2% Yield Strength (PSI)	75,000 PSI MIN	78798 PSI
Tonsile Strength (PSI)	95,000 PSI MIN	104814 PSI
% Elongation	18.0% MIN	25.20%
% Reduction Of Area	35.0% MIN	70.30%
Hardness (HBW)	207-235 HBW	207 TO 229 HBW

CHARPY IMPACT PROPERTIES

Size	10 x 10 x 55mm	DIRN	L
Impact Energy (ft-lbs)	20 Ft-Lbs Min @ -75° F		
	51.63	57.53	50.15
Average	53.10 Ft Lbs		
L.E. (inch)	0.026	0.029	0.024

HEAT TREATMENT

CYCLE	TEMPERATURE(C)	TEMPERATURE (F)	TIME@TEMP	QUENCH MEDIA
Normalized	910 °C	1670 °F	150 Minutes	AIR COOLED
Austenitized	880 °C	1616 °F	150 Minutes	WATER QUENCHED
Tempered	695 °C	1283 °F	150 Minutes	AIR COOLED
Water Temperature IN AT 35°C AND OUT AT 45°C				

NON DESTRUCTIVE EXAM (NDE)

	Yes/No	Spec Number
Ultrasonic Testing (UT)	NO	---
Magnetic Particle Inspection (MPI)	YES	ASME Section-V,Article -7

*Country of origin - India

* We hereby declare that the material herein described is in accordance with specifications of the order.

MARS FORGE PVT. LTD. INDIA RAJKOT

Quality Control

API Monogram Licensee
ISO 9001-2008 Certified
PED 97/23/EC
AD 2000-Merkblatt W0

MARS FORGE PVT. LTD.

Rajkot Gondal Nh. 8-B, Village : Shapar - 360024 Dist. Rajkot (Guj.) India.
Tel. No. : 91 - 2827 - 252190, 252191, Fax No. : 91 - 2827 - 252119
E-mail : info@marsforge.com, Web. : www.marsforge.com

Doc No : F-P-21-17

MAGNETIC PARTICLE EXAMINATION REPORT

PART No.	:	RSMFW410X	DATE	:	25.08.2014
PART NAME	:	Weld Neck Flange, 4-1/16" 10M X 4" SCH XXH AISI 4130 N.Q.T	INSPECTOR/ LEVEL	:	ASNT L-II
HEAT NO	:	R 20834	QUANTITY	:	27 PCS
PROC No	:	W-P-21-09	REJECT	:	None
ACCEPT	:	Acceptable			
WO/PO No.	:	R&S PO#520 Dated 31.07.2014			

TEST PROCEDURE

EQUIPMENT	:	"Magnafield "Make , Electromagnetic Crack Detector
DETECTING MEDIA	:	Fluorescent Powder
METHOD	:	Wet fluorescent method
CURRENT APPLY	:	H.W.D.C./A.C. Current used
LOCATION	:	Cover 100% (Assessable) area of the job
MAGNETIZATION	:	Longitudinal
TYPE OF MAGNETIZATION	:	Continuous
EXAMINATION	:	Surface & sub surface defect.
REFERENCE STANDARD	:	ASME Section V, Article 7, SE709
TESTED BY	:	HITESH MAHETA
DATE OF TEST	:	02.08.2014

OBSERVATION :*No relevant indication found*

RESULT : Jobs are found satisfactory in MPT.

For,MARS FORGE PVT.LTD.

MARS FORGE PVT. LTD. INDIA RAJKOT

[AUTHORIZED SIGNATORY]

BANK OF INDIA 60068

TÜV Rheinland
ISO 9001 : 2008
PED 97/23/EC
AD 2000-Merkblatt WO

MARS FORGE PVT. LTD.

"Shraddha House" M-170, Gujarat Housing Board
Akshar Marg, Rajkot - 360 001. Gujarat (India
Tel. No. : 91 - 281 - 244 83 83, 247 90 88, Fax : 91- 281 - 245533

Works : Rajkot Gondal Nh. 8-B, Village : Shapar, Dist. Rajkot (Guj.)Ind
Tel. No. : 91 - 2827 - 252190, 252191, Fax No. : 91 - 2827 - 2521
E-mail : info@marsforge.com, Web. : www.marsforge.co

TEST CERTIFICATE

TC Ref : 12/A/2011-2012

Date : 27-05-2012

Our Drawing No.	:	MF 0285 P1
Heat No. Code	:	R 15965
Quantity	:	159 Nos.
Sample Qty.	:	01 Nos.
Chemical Analysis Ref.	:	111/07052012
Physical Analysis Ref.	:	AI-277
Test Certificate Ref.	:	1111

Customer : R & S OILFIELD INC. HOUSTON – USA.		
Customer's Part No.	:	4 – 1500 WN
Purchase Order Ref.	:	172 / Dt.19-03-2012
Delivery Challan No.	:	12/ DT : 27.05.2011
Vehicle No.	:	BY SEA

CHEMICAL ANALYSIS RESULTS :

Material	Heat No.	C.	Mn.	Si.	Cr.	Ni.	Mo.	S.	P.	V.
Specified A350 LF2	SPECN.	---	0.60	0.10	--	---	---	---	--	---
		0.35	1.05	0.35	0.30	0.40	0.12	0.050	0.040	0.08
Actual	R 15965	0.20	0.93	0.20	0.058	0.076	0.021	0.008	0.009	0.002

Hardness Reqd. Range	Hardness Actual	ASTM Grain Size	Heat Treatment	Jominy Value	INCLUSION RATING			
					A	B	C	D
187 BHN MAX.	143 - 174 BHN	6-7	Normalised	---	1.0 / 0.5	0.5 / ---	--- / ---	1.0 / ---

* NORMALISED AT 930° C, SOAK FOR 120 MINUTES, AIR COOL.

PHYSICAL TEST RESULTS :

Heat Code On Forgings	Yield PSI.	UTS PSI.	%E	%RA.	Impact (dirn. – L,Size- 10x10x55 mm) 27 Joules min. at -50° F			
					I	II	III	Avg.
---	45000	70000	22.00	30.00				
PUNCH R 15965	50235	76393	33.80	67.10	67 / 1.40	65 / 2.30	63 / 1.31	65.16 J.

MARS FORGE PVT. LTD. INDIA RAJKOT

QUALITY CONTROL

STATE BANK OF INDIA 60068 FC30/

MORRIS INSPECTIONS

Mailing Address:
2316 Memorial Pkwy.
Portland, TX 78374-3206

Business Telephone
(361) 643-7066
Cellular Telephone
(361) 877-0776

QW-484 SUGGESTED FORMAT FOR MANUFACTURER'S RECORD OF WELDER OR WELDING OPERATOR QUALIFICATION TESTS
(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's Name: JEFFREY CHARLES TOWNSEND S. S. No.:
Welding Process(es): Shielded Metal Arc Welding Type: Manual Position (QW-405.1): 6-6
Welding Procedure Specification No.: SM-4130 PQR No.: SM-4130 Backing (QW-402.7): None
Material Spec. (QW-403) No.: HF-4130 Grade: LN80 P-No.: - - Group: - -
To
Material Spec (QW403) No.: HF-4130 Grade: LN80 P-No.: - - Group: - -
Test Thickness: .531" Range: Up to 1.062" Test Dia.: 4.00" Range: 2 7/8" O.D. over

Process(es)	SMAW	SMAW	
Filler Metal (QW-404) Spec.	SFA 5.1	SFA 5.5	SFA
	Class No. E-6010	Class No. E-8018	Class No.
	F No. 3 A No. 1	F No. 4 A No. 3	F No. A No.
Filler Diameter (QW-404.6)	1/8"	5/32"	
Weld Deposit Thickness	.125"	.406"	
Consumable Insert (QW-404.22)	N/A	N/A	
Gas (QW-408) Shielding	N/A	N/A	
Flow Rate	N/A	N/A	
Gas (QW-408) Purge	N/A	N/A	
Flow Rate	N/A	N/A	
Elec. (QW-409) AC-DC	Direct	Direct	
Polarity	Reverse	Reverse	
Volt Range	22-26	23-27	
Amp Range	80-120	150-210	

Progression (QW-405.3) Root: Up Hot Pass: Up Filler: Up Cap: Up
Transfer Mode (QW-409.2) GMAW: N/A
Other: Preheat: 70° F. PWHT.: N/A

For Information Only
Material 4130 IS NOT listed in ASME Section IX but acceptable.

Submerged Arc Flux Trade Name:

Guided Bend Test Results (QW-462.2(a), QW-462.3(a), QW-462.3(b))

Specimen No.	Type	Figure No.	Results	Specimen No.	Type	Figure No.	Results
			Radiographic Results in leiu of Sidebends				

Radiographic Test Results (QW-304 & QW-305)
For alternative qualification of groove welds by radiography

Radiographic Results: Satisfactory

Test Conducted by: J. Morris - MORRIS INSPECTIONS Laboratory—Test No.: 09-019

We certify that the statements in this record are correct and that the test welds prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code.

Joe Morris

Organization: DU-TEX, INC.

Date: March 23, 2009 By:

(Details of record of tests are illustrative only and may be modified to conform to the type and number of test required by the Code.)
NOTE: Any essential variables in addition to those above shall be recorded. This form modified for information and typing purposes. (QW-301.4).

MORRIS INSPECTIONS

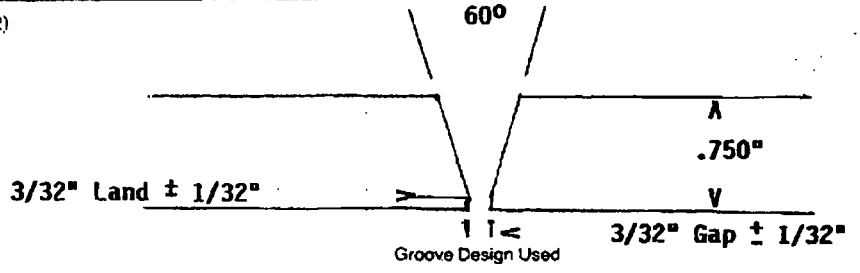
Mailing Address:
2316 Memorial Pkwy.
Portland, TX 78374-3206

Business Telephone
(361) 643-7066
Cellular Telephone
(361) 877-0776

QW-483 SUGGESTED FORMAT FOR PROCEDURE QUALIFICATION RECORD (PQR)
(See QW-201.2, Section IX, ASME Boiler and Pressure Vessel Code)

Company Name: DU-TEX, INC.
Procedure Qualification Record No.: SM-4130 Date: March 24, 2009
WPS No.: SM-4130 Transfer Mode GMAW: N/A
Welding Process(es): Shielded Metal Arc Welding
Types (Manual, Automatic, Semi-Auto.): Manual

JOINTS (QW-402)



Groove Design Used

BASE METALS (QW-403)
Material Spec. HF-4130 To HF-4130
Type or Grade LN 80 To LN 80
P-No. - - Grp. - - to P-No - - Grp. - -
Thickness Tested .750" Range: .1875" - 1.500"
Diameter Tested 4.500" Range: Proc. unlimited
No Pass Greater than ½" in thickness No
Backing: Yes ____ No XX Material Weld Metal only
Other Material 4130 IS NOT listed in ASME Section IX but is acceptable.

FILLER METALS (QW404)

Process(es)	SMAW	SMAW
Weld Metal Analysis A-No.	1	3
Weld Bead Number	1 & 2	Balance
Dia of Electrode	1/8"	5/32"
Filler Metal F-No.	3	4
SFA Specification	5.1	5.5
AWS Classification	E-6010	E-8018
Weld Deposit Range	.250"	1.250"
Weld Deposit Thickness	.125"	.625"

Tungsten: Size N/A Type: ____ Class: ____
Flux Trade Name: N/A Designation: ____
Other ____

POSITION (QW-405)
Position of Test Groove 6-G
Weld Progression (Up, Down, Flat)
Root Up Hot Pass Up Filler Up Cap Up

PREHEAT (QW-406)
Preheat Temp. 70° F.
Interpass Temp. Min. ____ Max. ____
Other ____

POSTWELD HEAT TREATMENT (QW-407)
Temperature None applied
Time ____
Other ____

GAS (QW-408)

Process(es)	SMAW-N/A	
Shielding		
Flow Rate		
Purge		
Flow Rate		
Other		

ELECTRICAL CHARACTERISTICS (QW-409)

Process(es)	SMAW	SMAW
Current	Direct	Direct
Polarity	Reverse	Reverse
Volts Range	22-26	23-27
AMPS Range	80-120	150-210

Other ____

TECHNIQUE (QW-410)

Process(es)	SMAW	SMAW
Travel Speed	Variable	Variable
String or Weave Bead	String	String
Oscillation	None	None
Multi or Single Pass (per side)	Multiple	Multiple
Single or Multi Electrodes	Single	Single
Peening	None	None

Other ____

QW-483 (Back)

Tensile Test (QW-150) **NOTE: MATERIAL SPECS**
Electrode Tensile Strenth is 80,000 PSI

Specimen No.	Width	Thickness	Area	Ultimate Total Load lbs.	Ultimate Unit Stress psi	Character of Failure & Location
T - 1	.751"	.743"	.558"	45,000	80,645	Satisfactory-Broke in Weld Area
T - 2	.748"	.748"	.554"	44,400	80,144	Satisfactory-Broke in Weld Area

Guided Bend Test (QW-160)

Specimen No.	Type	Figure No.	Results	Specimen No.	Type	Figure	Results
6G - SB1	SBend	QW462.2	Satisfactory				
6G - SB2	SBend	QW462.2	Satisfactory				
6G - SB3	SBend	QW462.2	Satisfactory				
6G - SB4	SBend	QW462.2	Satisfactory				

Toughness Tests (QW-170)

Speciman No.	Notch Location	Speciman Size	Test Temp.	Impact Values	Lateral Exp.		Drop Weight	
					% Shear	Mils	Break	No Break

Average ft/lb for this size _____ Minimum ft/lb for this size _____

Fillet Weld Test (QW-180)

Pos.	Spec. No.	Contour	Leg No. 1	Leg No. 2	Throat	Bend Defects	Macro-Pent.	Results

Other Tests

Type of Test _____
Deposit Analysis _____
Other _____

Welder's Name Jeffrey Charles Townsend S.S.# _____ Stamp No. N/A
Test conducted by: J. Morris-MORRIS INSPECTIONS Laboratory Test No. 09-022

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code.

Joe Morris

Manufacturer DU-TEX, INC.

Date March 25, 2009 By _____

Details of record of tests are illustrative only and may be modified to conform to the type and number of tests required by the Code. This form modified for information and typing purposes (QW200.2(D)

NQS INSPECTION, LTD

Invoice # 06972

Non-Destructive Testing Report

Report # _____

Customer: Estes **Date:** 11/20/14

Project: 192114

METHOD

Ultrasonic	✓	Procedure #	NRS-PA-UT/2013/Rev0
Magnetic Particle		Standard #	ASME
Liquid Penetrant		Section # Level	V

TECHNIQUE

Shear wave	✓	Angle	AC		DC	Dwell Time	
Straight Beam	✓	60 ✓	Wet		Dry	Penetrant #	
Unit Type	Prism A	70 ✓	Continuous			Developer #	
Ref Standard	T.D/Rev	45 ✓	Residual			Cleaner #	
Range	5"	0 ✓	Background				

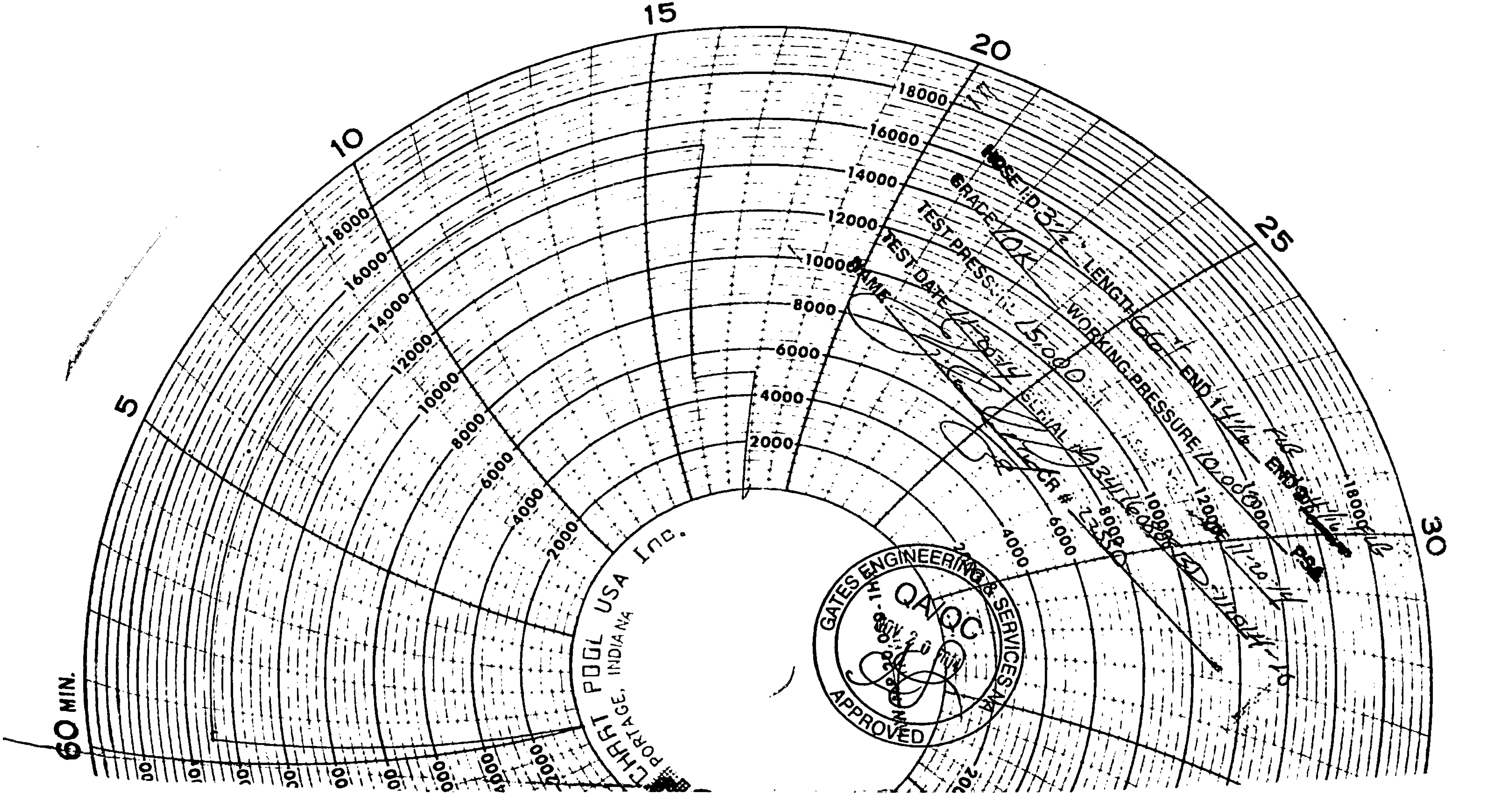
RESULTS

ITEM	LOCATION AND IDENTIFICATION	ACC / REJ	COMMENTS
	3½ x 4 x 4 7/16 10K.	Acc	Qty 2
	Fig. 1-2		

Inspector: Joe Baldwin **SNT Level** III **PG #** _____ **of** _____

Customer Representative: _____ **Hours** 2 **Mileage** ____

PO BOX 23036 CORPUS CHRISTI, TEXAS 78403
PHONE # 361-533-4563 / FAX # 361-884-1984 / E-MAIL emanahan@nqsltd.com (Eric) / lray@nqsltd.com (Bud)



60 MIN.
5
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15
20
25
30
CHART POOL USA Inc.
PORTAGE, INDIANA
HOSE I.D.
GRADE
TEST PRESS.
TEST DATE
NAME
LENGTH
WORKING PRESSURE
END
END
SERIAL #
CR #
PSI
GATES ENGINEERING & SERVICES NA
QA/QC
APPROVED

GATES E & S NORTH AMERICA, INC.
134 44TH STREET
CORPUS CHRISTI, TEXAS 78405

PHONE: 361-887-9807
FAX: 361-887-0812
EMAIL: Tim.Cantu@gates.com
WEB: www.gates.com

10K CHOKE AND KILL ASSEMBLY PRESSURE TEST CERTIFICATE

Customer :	AUSTIN DISTRIBUTING	Test Date:	11/20/2014
Customer Ref. :	PENDING	Hose Serial No.:	D-112014-10
Invoice No. :	205663	Created By:	NORMA MATA

Product Description:	10K3.566.0CK4.1/1610KFLGE/E L/E

End Fitting 1 :	4 1/16 10K FLG	End Fitting 2 :	4 1/16 10K FLG
Gates Part No. :	4773-6291	Assembly Code :	L34116080813D-112014-10
Working Pressure :	10,000 PSI	Test Pressure :	15,000 PSI

Gates E & S North America, Inc. certifies that the following hose assembly has been tested to the Gates Oilfield Roughneck Agreement/Specification requirements and passed the 15 minute hydrostatic test per API Spec 7K/Q1, Fifth Edition, June 2010, Test pressure 9.6.7 and per Table 9 to 15,000 psi in accordance with this product number. Hose burst pressure 9.6.7.2 exceeds the minimum of 2.5 times the working pressure per Table 9.

Quality Manager :	QUALITY	Technical Supervisor :	PRODUCTION
Date :	11/20/2014	Date :	11/20/2014
Signature :		Signature :	

POWERING PROGRESS™

Gates E&S North America, Inc.
134 - 44th St.
CORPUS CHRISTI, TEXAS 78405
PHONE : (361) 887-9807
FAX: (361) 887-0812
Tim.Cantu@gates.com

CERTIFICATE OF CONFORMANCE

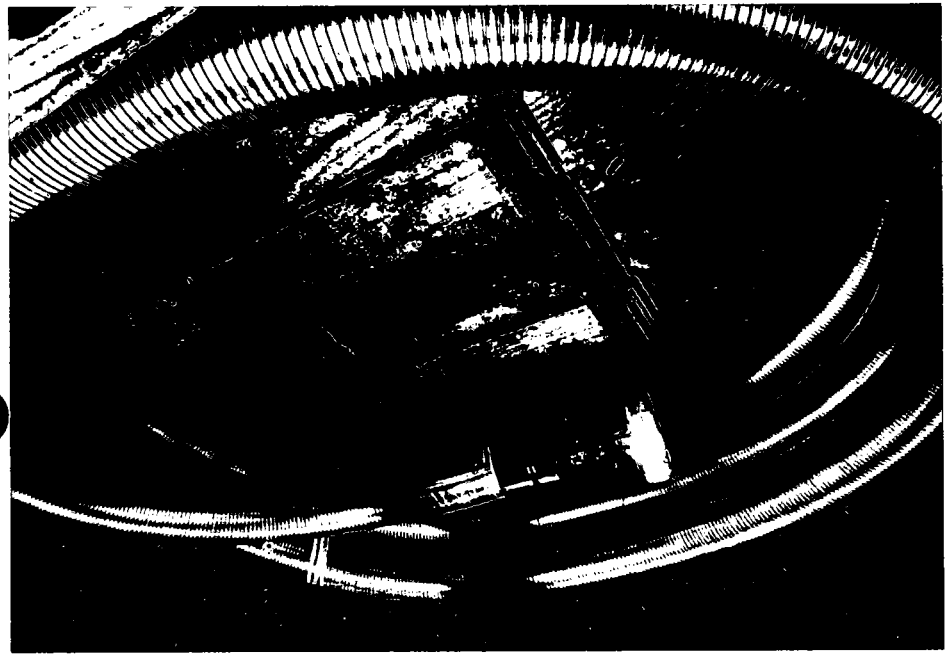
This is to verify that all Parts and/or Materials included in this shipment have been manufactured and/or processed in Conformance with applicable drawings and specifications, and that Records of Required Tests are on file and subject to examination. The following items were assembled at Gates E & S, North America Inc., facilities in Corpus Christi, TX, USA. This hose assembly was designed and manufactured to meet all the requirements of API Spec 7K.

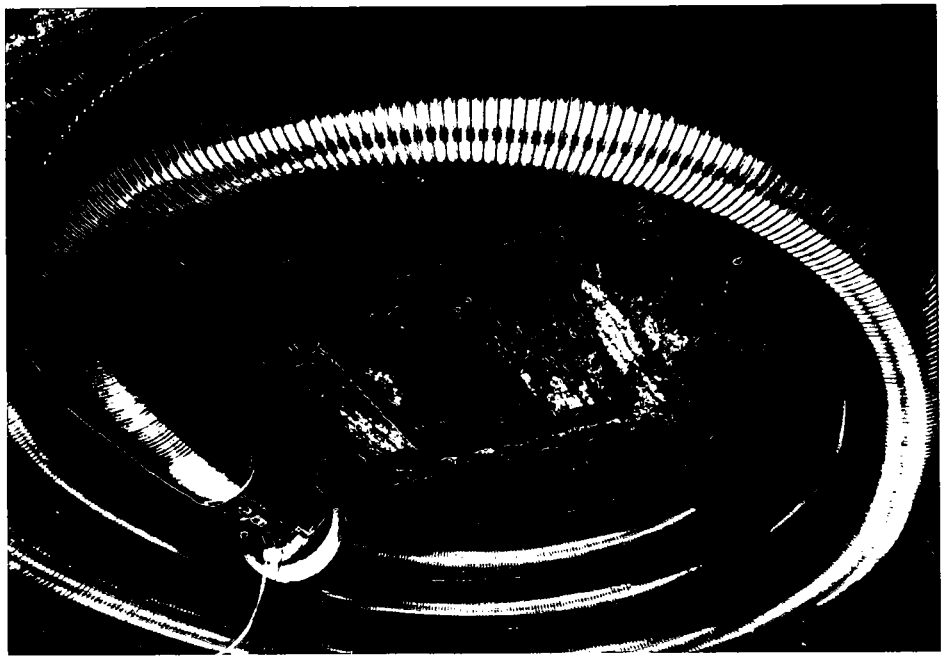
CUSTOMER: AUSTIN DISTRIBUTING
CUSTOMERS P.O.#: PENDING
PART DESCRIPTION: 10K3.566.0CK4.1/1610KFLGE/E L/E
SALES ORDER #: 205663
QUANTITY: 1
SERIAL #: D-112014-10

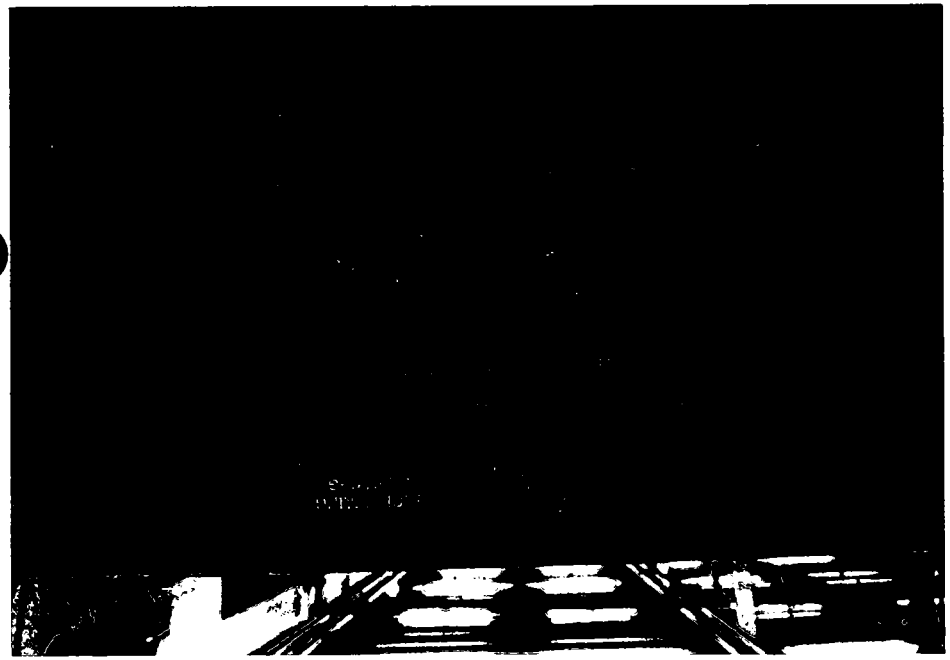
SIGNATURE: _____

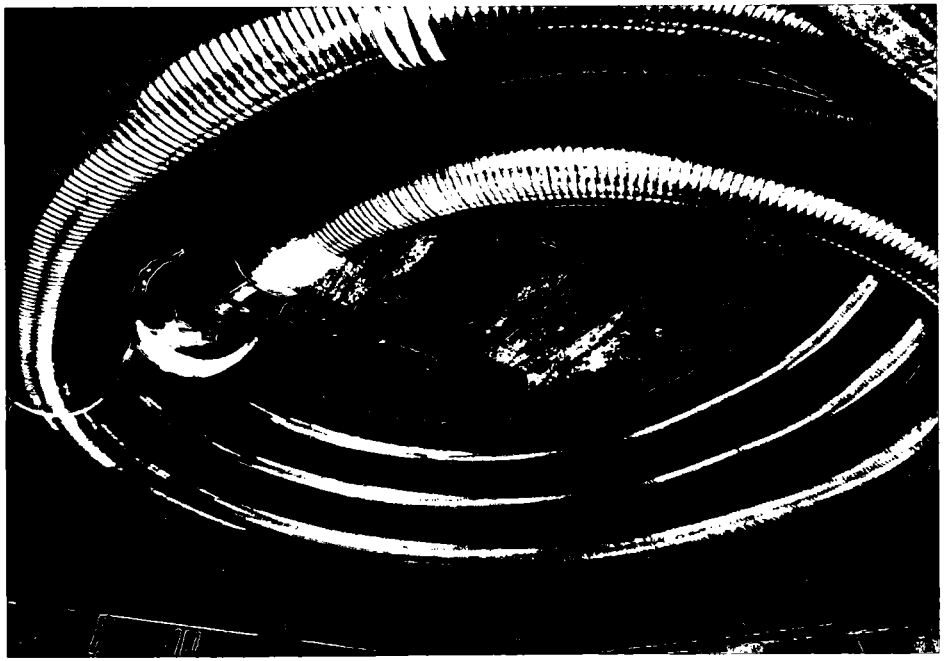
TITLE: QUALITY

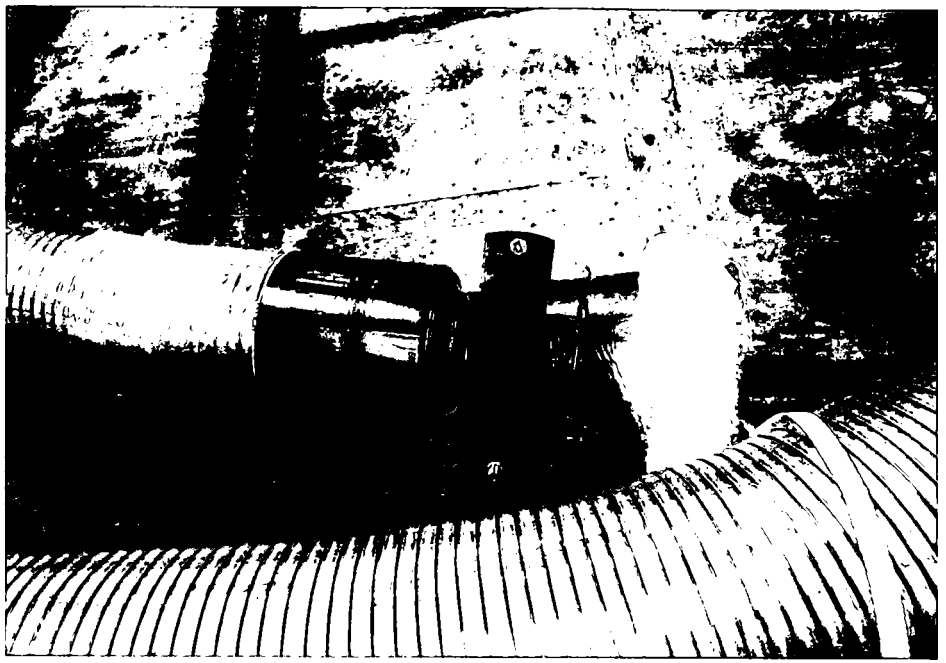
DATE: 11/20/2014











ILL ASSEMBLY PRESSURE TEST CERTIFICATE

AUSTIN DISTRIBUTING	Test Date:	11/20/2014
PENDING	Hose Serial No.:	D-112014-10
205663	Created By:	NORMA MATA

10K3.566.0CK4.1/1610KFLGE/E L/E

4 1/16 10K FLG	End Fitting 2:	4 1/16 10K FLG
4773-6291	Assembly Code:	L34116080813D-112014-10
10,000 PSI	Test Pressure:	15,000 PSI

The following hose assembly has been tested to the

POWERING PROGRESS™

PACKING LIST

Gates E&S North America
134 - 44th St.
CORPUS CHRISTI, TEXAS 78405
PHONE : (361) 887-9807
FAX: (361) 887-0812
Tim.Cantu@gates.com

CUSTOMER. : AUSTIN DISTRIBUTING
PURCHASE ORDER # : PENDING
DATE : 11/20/2014
SALES ORDER #: 205663

SOLD TO: AUSTIN DISTRIBUTING
P.O. BOX 7890
AMARILLO, TEXAS
79114

SHIP TO: 0
0
0
0

PACKAGING: ENCLOSED CRATE

PRODUCT DESCRIPTION:

ITEM	QTY	DESCRIPTION	ID	LENGTH	WORKING	TEST	END CONNECTION	SAFETY CLAMPS / LIFT EYES
1	1	10K3.566.0CK4.1/1610KFLGE/E L/E	3.5 in.	66 ft.	10,000 PSI	15,000 PSI	4 1/16 10K FLG E/E	LE
COMMENTS:		CRATE DIMENSIONS:						
		HOSE WEIGHT: CRATE WEIGHT:						
		TOTAL WEIGHT:						

Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Body
	From	To							
13.5"	0	975	10.75"	45.5	N80	BTC	5.54	1.20	23.44
9.875"	0	11750	7.625"	29.7	P110	BTC	1.29	1.11	3.11
6.75"	0	11250	5.5"	23	P110	BTC	1.95	2.04	3.25
6.75"	11250	17,212	5"	18	P110	BTC	1.95	2.04	3.25
			BLM Minimum Safety Factor				1.125	1	1.6 Dry 1.8 Wet

Intermediate casing will be kept at least 1/3 full while running casing.to mitigate collapse. Surface burst based on 0.7 frac gradient at the shoe with Gas Gradient 0.1 psi/ft to surface and
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

The 5" casing will be run back 500' into the intermediate casing to ensure the coupling OD clearance is greater than .422" for the cement bond tie in.

Casing Program

Hole Size	Casing From	Casing To	Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17.5"	0	875	13.375"	54.5	J55	STC	2.82	1.27	10.78
12.25"	0	4000	9.625"	40	J55	LTC	1.22	1.00	3.25
12.25"	4000	4875	9.625"	40	L80	LTC	1.21	1.45	5.73
8.75"	0	14,768	5.5"	17	P110	LTC	1.50	2.69	2.54
			BLM Minimum Safety Factor				1.125	1	1.6 Dry 1.8 Wet

Intermediate casing will be kept at least 1/3 full while running casing.to mitigate collapse. Intermediate burst based on 0.7 frac gradient at the shoe with Gas Gradient 0.1 psi/ft to surface.
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Body
	From	To							
13.5"	0	600	10.75"	45.5	N80	BTC	9.00	1.50	38.10
9.875"	0	9465	7.875"	29.7	P110	BTC	1.60	1.45	3.86
6.75"	0	8965	5.5"	23	P110	BTC	2.52	2.66	4.03
6.75"	8965	16,944	5"	18	P110	BTC	2.52	2.66	4.03
				BLM Minimum Safety Factor			1.125	1	1.6 Dry 1.8 Wet

Intermediate casing will be kept at least 1/3 full while running casing.to mitigate collapse. Surface burst based on 0.7 frac gradient at the shoe with Gas Gradient 0.1 psi/ft to surface and
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

The 5" casing will be run back 500' into the intermediate casing to ensure the coupling OD clearance is greater than .422" for the cement bond tie in.

Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Body
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9.875"	0	9465	7.875"	29.7	P110	BTC	1.60	1.45	3.86
6.75"	0	8965	5.5"	23	P110	BTC	2.52	2.66	4.03
6.75"	8965	16,944	5"	18	P110	BTC	2.52	2.66	4.03
				BLM Minimum Safety Factor			1.125	1	1.6 Dry 1.8 Wet

Intermediate casing will be kept at least 1/3 full while running casing.to mitigate collapse. Surface burst based on 0.7 frac gradient at the shoe with Gas Gradient 0.1 psi/ft to surface and
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

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Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Body
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6.75"	8965	16,944	5"	18	P110	BTC	2.52	2.66	4.03
				BLM Minimum Safety Factor			1.125	1	1.6 Dry 1.8 Wet

Intermediate casing will be kept at least 1/3 full while running casing.to mitigate collapse. Surface burst based on 0.7 frac gradient at the shoe with Gas Gradient 0.1 psi/ft to surface and
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

The 5" casing will be run back 500' into the intermediate casing to ensure the coupling OD clearance is greater than .422" for the cement bond tie in.

Casing Program

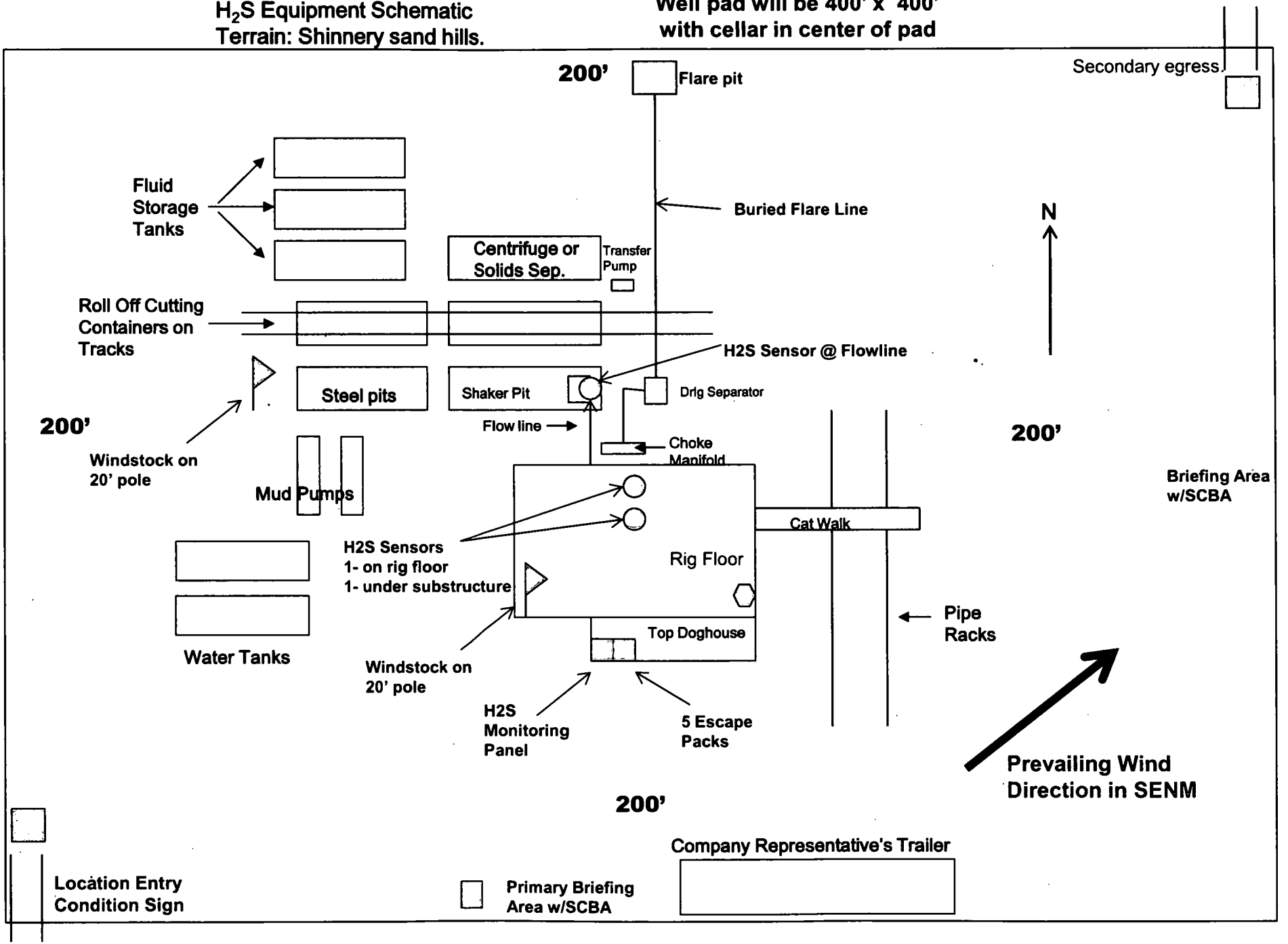
Hole Size	Casing Interval		Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Body
	From	To							
13.5"	0	600	10.75"	45.5	N80	BTC	9.00	1.50	38.10
9.875"	0	9465	7.875"	29.7	P110	BTC	1.60	1.45	3.86
6.75"	0	8965	5.5"	23	P110	BTC	2.52	2.66	4.03
6.75"	8965	16,944	5"	18	P110	BTC	2.52	2.66	4.03
				BLM Minimum Safety Factor			1.125	1	1.6 Dry 1.8 Wet

Intermediate casing will be kept at least 1/3 full while running casing.to mitigate collapse. Surface burst based on 0.7 frac gradient at the shoe with Gas Gradient 0.1 psi/ft to surface and
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

The 5" casing will be run back 500' into the intermediate casing to ensure the coupling OD clearance is greater than .422" for the cement bond tie in.

COG Operating LLC
H_2S Equipment Schematic
Terrain: Shinnery sand hills.

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



COG OPERATING LLC
HYDROGEN SULFIDE DRILLING OPERATIONS PLAN

1. HYDROGEN SULFIDE TRAINING

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

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

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

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

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

2. H_2S SAFETY EQUIPMENT AND SYSTEMS

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

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

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

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

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

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

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

g. Communication:
Company vehicles equipped with cellular telephone.

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

WARNING

YOU ARE ENTERING AN H_2S AREA
AUTHORIZED PERSONNEL ONLY

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

COG OPERATING LLC

1-575-748-6940

EMERGENCY CALL LIST

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

EMERGENCY RESPONSE NUMBERS

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

COG OPERATING, LLC

Eddy County, NM (NAD27) NMZ
Littlefield 33 Fed COM
#706H

OH
Plan #1 - IP

Anticollision Report

12 March, 2018

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #706H
Project:	Eddy County, NM (NAD27) NMZ	**TVD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Reference Site:	Littlefield 33 Fed COM	**MD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#706H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

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

Survey Tool Program **Date** 03/12/18

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	17,076.23	Plan #1 - IP (OH)	MWD	MWD v3:standard declination

Summary

Site Name / Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Littlefield 33 Fed COM						
#705H - OH - Plan #1 - IP	1,571.81	1,574.05	89.99	83.22	13.298	CC
#705H - OH - Plan #1 - IP	9,507.34	9,507.84	90.02	48.28	2.156	ES, SF
#805H - OH - Plan #1 - IP	1,500.00	1,501.00	134.98	128.52	20.881	CC, ES
#805H - OH - Plan #1 - IP	17,076.23	17,760.69	1,278.85	1,067.51	6.051	SF
#806H - OH - Plan #1 - IP	1,503.29	1,503.63	45.01	38.53	6.950	CC
#806H - OH - Plan #1 - IP	4,500.00	4,500.93	54.43	35.14	2.821	ES
#806H - OH - Plan #1 - IP	9,507.34	9,507.64	82.36	40.52	1.968	SF

Offset Design Littlefield 33 Fed COM - #705H - OH - Plan #1 - IP — Offset Site Error: 0.00 usft

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

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.50	0.50	0.00	0.00	89.91	0.14	90.02	90.02				
100.00	100.00	100.50	100.50	0.08	0.09	89.91	0.14	90.02	90.02	89.85	.170	530.471	
200.00	200.00	200.50	200.50	0.31	0.31	89.91	0.14	90.02	90.02	89.40	.619	145.374	
300.00	300.00	300.50	300.50	0.53	0.53	89.91	0.14	90.02	90.02	88.95	1.069	84.228	
400.00	400.00	400.50	400.50	0.76	0.76	89.91	0.14	90.02	90.02	88.50	1.518	59.290	
500.00	500.00	500.50	500.50	0.98	0.98	89.91	0.14	90.02	90.02	88.05	1.968	45.746	
600.00	600.00	600.50	600.50	1.21	1.21	89.91	0.14	90.02	90.02	87.60	2.417	37.239	
700.00	700.00	700.50	700.50	1.43	1.43	89.91	0.14	90.02	90.02	87.15	2.867	31.400	
800.00	800.00	800.50	800.50	1.66	1.66	89.91	0.14	90.02	90.02	86.70	3.316	27.144	
900.00	900.00	900.50	900.50	1.88	1.88	89.91	0.14	90.02	90.02	86.25	3.766	23.904	
1,000.00	1,000.00	1,000.50	1,000.50	2.11	2.11	89.91	0.14	90.02	90.02	85.80	4.215	21.355	
1,100.00	1,100.00	1,100.50	1,100.50	2.33	2.33	89.91	0.14	90.02	90.02	85.36	4.665	19.297	
1,200.00	1,200.00	1,200.50	1,200.50	2.56	2.56	89.91	0.14	90.02	90.02	84.91	5.115	17.601	
1,300.00	1,300.00	1,300.50	1,300.50	2.78	2.78	89.91	0.14	90.02	90.02	84.46	5.564	16.179	
1,400.00	1,400.00	1,400.50	1,400.50	3.01	3.01	89.91	0.14	90.02	90.02	84.01	6.014	14.969	
1,500.00	1,500.00	1,500.51	1,500.51	3.23	3.23	89.91	0.14	90.02	90.02	83.56	6.463	13.928	
1,566.67	1,566.66	1,568.79	1,568.78	3.37	3.38	179.91	0.14	89.40	90.00	83.25	6.746	13.340	
1,571.81	1,571.80	1,574.05	1,574.05	3.38	3.39	179.91	0.14	89.30	89.99	83.22	6.767	13.298	CC
1,600.00	1,599.99	1,602.07	1,602.06	3.44	3.44	179.91	0.14	88.82	90.00	83.12	6.877	13.086	
1,700.00	1,699.98	1,702.07	1,702.05	3.64	3.64	179.91	0.14	87.08	90.00	82.72	7.276	12.370	
1,800.00	1,799.96	1,802.07	1,802.03	3.84	3.85	179.91	0.14	85.33	90.00	82.32	7.680	11.719	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #706H
Project:	Eddy County, NM (NAD27) NMZ	**TVD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Reference Site:	Littlefield 33 Fed COM	**MD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#706H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Littlefield 33 Fed COM - #705H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

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

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
1,900.00	1,899.95	1,902.07	1,902.02	4.05	4.05	179.91	0.14	83.58	90.00	81.91	8.089	11.127	
2,000.00	1,999.93	2,002.07	2,002.00	4.25	4.26	179.91	0.14	81.84	90.00	81.50	8.502	10.586	
2,100.00	2,099.92	2,102.07	2,101.99	4.46	4.47	179.91	0.14	80.09	90.00	81.08	8.918	10.091	
2,200.00	2,199.90	2,202.07	2,201.97	4.68	4.68	179.91	0.14	78.35	90.00	80.66	9.338	9.638	
2,300.00	2,299.88	2,302.07	2,301.96	4.89	4.89	179.91	0.14	76.60	90.00	80.24	9.761	9.221	
2,400.00	2,399.87	2,402.07	2,401.94	5.10	5.11	179.91	0.14	74.86	90.00	79.81	10.185	8.836	
2,500.00	2,499.85	2,502.07	2,501.93	5.32	5.32	179.91	0.14	73.11	90.00	79.39	10.612	8.480	
2,600.00	2,599.84	2,602.07	2,601.91	5.53	5.54	179.91	0.14	71.37	90.00	78.96	11.041	8.151	
2,700.00	2,699.82	2,702.07	2,701.89	5.75	5.76	179.91	0.14	69.62	90.00	78.53	11.472	7.845	
2,800.00	2,799.81	2,802.07	2,801.88	5.97	5.97	179.91	0.14	67.88	90.00	78.09	11.904	7.561	
2,900.00	2,899.79	2,902.07	2,901.86	6.19	6.19	179.91	0.14	66.13	90.00	77.66	12.337	7.295	
3,000.00	2,999.78	3,002.07	3,001.85	6.41	6.41	179.91	0.14	64.39	90.00	77.23	12.771	7.047	
3,100.00	3,099.76	3,102.07	3,101.83	6.63	6.63	179.91	0.14	62.64	90.00	76.79	13.207	6.815	
3,200.00	3,199.75	3,202.07	3,201.82	6.85	6.85	179.91	0.14	60.90	90.00	76.35	13.643	6.597	
3,300.00	3,299.73	3,302.07	3,301.80	7.07	7.07	179.91	0.14	59.15	90.00	75.92	14.080	6.392	
3,400.00	3,399.72	3,402.07	3,401.79	7.29	7.29	179.91	0.14	57.41	90.00	75.48	14.518	6.199	
3,500.00	3,499.70	3,502.07	3,501.77	7.51	7.51	179.91	0.14	55.66	90.00	75.04	14.957	6.017	
3,600.00	3,599.69	3,602.07	3,601.76	7.73	7.73	179.91	0.14	53.92	90.00	74.60	15.397	5.845	
3,700.00	3,699.67	3,702.07	3,701.74	7.95	7.96	179.91	0.14	52.17	90.00	74.16	15.837	5.683	
3,800.00	3,799.66	3,802.07	3,801.73	8.17	8.18	179.91	0.14	50.43	90.00	73.72	16.277	5.529	
3,900.00	3,899.64	3,902.07	3,901.71	8.40	8.40	179.91	0.14	48.68	90.00	73.28	16.719	5.383	
4,000.00	3,999.63	4,002.07	4,001.70	8.62	8.62	179.91	0.14	46.93	90.00	72.84	17.160	5.245	
4,100.00	4,099.61	4,102.07	4,101.68	8.84	8.85	179.91	0.14	45.19	90.00	72.40	17.602	5.113	
4,131.13	4,130.74	4,133.20	4,132.81	8.91	8.92	179.91	0.14	44.65	90.00	72.26	17.740	5.073	
4,200.00	4,199.60	4,202.07	4,201.67	9.06	9.07	179.91	0.14	43.44	90.00	71.95	18.045	4.988	
4,205.43	4,205.03	4,207.50	4,207.10	9.08	9.08	179.91	0.14	43.35	90.00	71.93	18.069	4.981	
4,300.00	4,299.58	4,302.07	4,301.65	9.29	9.29	179.91	0.14	41.70	90.00	71.51	18.487	4.868	
4,301.13	4,300.71	4,303.20	4,302.78	9.29	9.30	179.91	0.14	41.68	90.00	71.51	18.492	4.867	
4,400.00	4,399.57	4,402.07	4,401.64	9.51	9.52	179.91	0.14	39.95	90.00	71.07	18.931	4.754	
4,421.13	4,420.69	4,423.20	4,422.77	9.56	9.56	179.91	0.14	39.58	90.00	70.97	19.024	4.731	
4,500.00	4,499.55	4,502.07	4,501.62	9.74	9.74	179.91	0.14	38.21	90.00	70.62	19.374	4.645	
4,521.13	4,520.68	4,523.20	4,522.75	9.78	9.79	179.91	0.14	37.84	90.00	70.53	19.468	4.623	
4,600.00	4,599.53	4,602.07	4,601.61	9.96	9.96	179.91	0.14	36.46	90.00	70.18	19.818	4.541	
4,631.13	4,630.66	4,633.20	4,632.73	10.03	10.03	179.91	0.14	35.92	90.00	70.04	19.956	4.510	
4,700.00	4,699.52	4,702.07	4,701.59	10.18	10.19	179.91	0.14	34.72	90.00	69.74	20.262	4.442	
4,753.15	4,752.66	4,755.22	4,754.73	10.30	10.31	179.91	0.14	33.79	90.00	69.50	20.498	4.391	
4,800.00	4,799.50	4,802.07	4,801.57	10.41	10.41	179.91	0.14	32.97	90.00	69.29	20.706	4.346	
4,878.87	4,878.36	4,880.94	4,880.43	10.58	10.59	179.91	0.14	31.60	90.00	68.94	21.057	4.274	
4,900.00	4,899.49	4,902.07	4,901.56	10.63	10.64	179.91	0.14	31.23	90.00	68.85	21.151	4.255	
5,000.00	4,999.47	5,002.07	5,001.54	10.86	10.86	179.91	0.14	29.48	90.00	68.40	21.596	4.167	
5,022.01	5,021.48	5,024.08	5,023.55	10.91	10.91	179.91	0.14	29.10	90.00	68.30	21.694	4.149	
5,100.00	5,099.46	5,102.07	5,101.53	11.08	11.09	179.91	0.14	27.74	90.00	67.96	22.041	4.083	
5,121.13	5,120.59	5,123.20	5,122.66	11.13	11.13	179.91	0.14	27.37	90.00	67.86	22.135	4.066	
5,200.00	5,199.44	5,202.07	5,201.51	11.31	11.31	179.91	0.14	25.99	90.00	67.51	22.486	4.002	
5,255.18	5,254.62	5,257.25	5,256.69	11.43	11.43	179.91	0.14	25.03	90.00	67.27	22.732	3.959	
5,300.00	5,299.43	5,302.07	5,301.50	11.53	11.53	179.91	0.14	24.25	90.00	67.07	22.931	3.925	
5,325.19	5,324.62	5,327.26	5,326.69	11.59	11.59	179.91	0.14	23.81	90.00	66.95	23.044	3.906	
5,400.00	5,399.41	5,402.07	5,401.48	11.75	11.76	179.91	0.14	22.50	90.00	66.62	23.377	3.850	
5,500.00	5,499.40	5,502.07	5,501.47	11.98	11.98	179.91	0.14	20.76	90.00	66.17	23.823	3.778	
5,522.01	5,521.41	5,524.08	5,523.48	12.03	12.03	179.91	0.14	20.37	90.00	66.08	23.921	3.762	
5,600.00	5,599.38	5,602.07	5,601.45	12.20	12.21	179.91	0.14	19.01	90.00	65.73	24.269	3.708	
5,653.15	5,652.53	5,655.22	5,654.60	12.32	12.33	179.91	0.14	18.08	90.00	65.49	24.506	3.672	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #706H
Project:	Eddy County, NM (NAD27) NMZ	**TVD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Reference Site:	Littlefield 33 Fed COM	**MD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#706H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Littlefield 33 Fed COM - #705H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

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

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,700.00	5,699.37	5,702.07	5,701.44	12.43	12.43	179.91	0.14	17.27	90.00	65.28	24.715	3.641	
5,779.61	5,778.96	5,781.68	5,781.03	12.61	12.61	179.91	0.14	15.88	90.00	64.93	25.070	3.590	
5,800.00	5,799.35	5,802.07	5,801.42	12.65	12.66	179.91	0.14	15.52	90.00	64.84	25.161	3.577	
5,825.19	5,824.54	5,827.26	5,826.61	12.71	12.72	179.91	0.14	15.08	90.00	64.72	25.274	3.561	
5,900.00	5,899.34	5,902.07	5,901.41	12.88	12.88	179.91	0.14	13.78	90.00	64.39	25.608	3.514	
6,000.00	5,999.32	6,002.07	6,001.39	13.11	13.11	179.91	0.14	12.03	90.00	63.94	26.054	3.454	
6,022.97	6,022.29	6,025.05	6,024.36	13.16	13.16	179.91	0.14	11.63	90.00	63.84	26.157	3.441	
6,100.00	6,099.31	6,102.07	6,101.38	13.33	13.34	179.91	0.14	10.28	90.00	63.50	26.501	3.396	
6,151.09	6,150.38	6,153.16	6,152.45	13.45	13.45	179.91	0.14	9.39	90.00	63.27	26.729	3.367	
6,200.00	6,199.29	6,202.07	6,201.36	13.56	13.56	179.91	0.14	8.54	90.00	63.05	26.948	3.340	
6,279.61	6,278.89	6,281.68	6,280.96	13.74	13.74	179.91	0.14	7.15	90.00	62.69	27.303	3.296	
6,300.00	6,299.28	6,302.07	6,301.35	13.78	13.79	179.91	0.14	6.79	90.00	62.60	27.394	3.285	
6,325.19	6,324.46	6,327.26	6,326.54	13.84	13.84	179.91	0.14	6.35	90.00	62.49	27.507	3.272	
6,400.00	6,399.26	6,402.07	6,401.33	14.01	14.01	179.91	0.14	5.05	90.00	62.16	27.841	3.233	
6,500.00	6,499.25	6,502.07	6,501.32	14.23	14.24	179.91	0.14	3.30	90.00	61.71	28.289	3.181	
6,561.13	6,560.37	6,563.20	6,562.44	14.37	14.38	179.91	0.14	2.24	90.00	61.44	28.562	3.151	
6,600.00	6,599.23	6,602.07	6,601.30	14.46	14.46	179.91	0.14	1.56	90.00	61.26	28.736	3.132	
6,622.01	6,621.24	6,624.08	6,623.31	14.51	14.51	179.91	0.14	1.17	90.00	61.16	28.834	3.121	
6,700.00	6,699.21	6,702.07	6,701.29	14.68	14.69	179.91	0.14	-0.19	90.00	60.81	29.183	3.084	
6,755.18	6,754.39	6,757.25	6,756.46	14.81	14.81	179.91	0.14	-1.15	90.00	60.57	29.430	3.058	
6,800.00	6,799.20	6,802.07	6,801.27	14.91	14.91	179.91	0.14	-1.93	90.00	60.37	29.630	3.037	
6,825.19	6,824.39	6,827.26	6,826.46	14.97	14.97	179.91	0.14	-2.37	90.00	60.25	29.743	3.026	
6,900.00	6,899.18	6,902.07	6,901.26	15.14	15.14	179.91	0.14	-3.68	90.00	59.92	30.078	2.992	
7,000.00	6,999.17	7,002.07	7,001.24	15.36	15.37	179.91	0.14	-5.42	90.00	59.47	30.525	2.948	
7,022.01	7,021.18	7,024.08	7,023.25	15.41	15.42	179.91	0.14	-5.81	90.00	59.37	30.624	2.939	
7,100.00	7,099.15	7,102.07	7,101.22	15.59	15.59	179.91	0.14	-7.17	90.00	59.02	30.973	2.906	
7,153.15	7,152.30	7,155.22	7,154.37	15.71	15.71	179.91	0.14	-8.10	90.00	58.79	31.211	2.884	
7,200.00	7,199.14	7,202.07	7,201.21	15.81	15.82	179.91	0.14	-8.91	90.00	58.58	31.421	2.864	
7,300.00	7,299.12	7,302.07	7,301.19	16.04	16.04	179.91	0.14	-10.66	90.00	58.13	31.868	2.824	
7,355.18	7,354.30	7,357.25	7,356.37	16.16	16.17	179.91	0.14	-11.62	90.00	57.88	32.116	2.802	
7,400.00	7,399.11	7,402.07	7,401.18	16.26	16.27	179.91	0.14	-12.40	90.00	57.68	32.316	2.785	
7,425.19	7,424.30	7,427.26	7,426.37	16.32	16.33	179.91	0.14	-12.84	90.00	57.57	32.429	2.775	
7,500.00	7,499.09	7,502.07	7,501.16	16.49	16.50	179.91	0.14	-14.15	90.00	57.23	32.764	2.747	
7,600.00	7,599.08	7,602.07	7,601.15	16.72	16.72	179.91	0.14	-15.89	90.00	56.79	33.212	2.710	
7,622.01	7,621.09	7,624.08	7,623.16	16.77	16.77	179.91	0.14	-16.28	90.00	56.69	33.311	2.702	
7,700.00	7,699.06	7,702.07	7,701.13	16.94	16.95	179.91	0.14	-17.64	90.00	56.34	33.660	2.674	
7,722.01	7,721.07	7,724.08	7,723.14	16.99	17.00	179.91	0.14	-18.02	90.00	56.24	33.759	2.666	
7,800.00	7,799.05	7,802.07	7,801.12	17.17	17.17	179.91	0.14	-19.38	90.00	55.89	34.108	2.639	
7,851.09	7,850.13	7,853.16	7,852.20	17.28	17.29	179.91	0.14	-20.28	90.00	55.66	34.337	2.621	
7,900.00	7,899.03	7,902.07	7,901.10	17.39	17.40	179.91	0.14	-21.13	90.00	55.44	34.556	2.604	
8,000.00	7,999.02	8,002.07	8,001.09	17.62	17.63	179.91	0.14	-22.88	90.00	54.99	35.005	2.571	
8,022.01	8,021.02	8,024.08	8,023.10	17.67	17.68	179.91	0.14	-23.26	90.00	54.89	35.103	2.564	
8,100.00	8,099.00	8,102.07	8,101.07	17.85	17.85	179.91	0.14	-24.62	90.00	54.54	35.453	2.539	
8,155.18	8,154.17	8,157.25	8,156.25	17.97	17.98	179.91	0.14	-25.58	90.00	54.30	35.700	2.521	
8,200.00	8,198.99	8,202.07	8,201.06	18.07	18.08	179.91	0.14	-26.37	90.00	54.10	35.901	2.507	
8,279.61	8,278.58	8,281.68	8,280.65	18.25	18.26	179.91	0.14	-27.75	90.00	53.74	36.258	2.482	
8,300.00	8,298.97	8,302.07	8,301.04	18.30	18.30	179.91	0.14	-28.11	90.00	53.65	36.349	2.476	
8,356.24	8,355.20	8,358.31	8,357.27	18.43	18.43	179.91	0.14	-29.09	90.00	53.40	36.602	2.459	
8,400.00	8,398.96	8,402.07	8,401.03	18.53	18.53	179.91	0.14	-29.86	90.00	53.20	36.798	2.446	
8,480.29	8,479.24	8,482.37	8,481.31	18.71	18.71	179.91	0.14	-31.26	90.00	52.84	37.158	2.422	
8,500.00	8,498.94	8,502.07	8,501.01	18.75	18.76	179.91	0.14	-31.60	90.00	52.75	37.246	2.416	
8,587.19	8,586.12	8,589.26	8,588.19	18.95	18.95	179.91	0.14	-33.12	90.00	52.36	37.637	2.391	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #706H
Project:	Eddy County, NM (NAD27) NMZ	**TVD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Reference Site:	Littlefield 33 Fed COM	**MD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#706H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Littlefield 33 Fed COM - #705H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

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

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
8,600.00	8,598.93	8,602.07	8,601.00	18.98	18.98	179.91	0.14	-33.35	90.00	52.30	37.695	2.388	
8,680.29	8,679.21	8,682.37	8,681.28	19.16	19.16	179.91	0.14	-34.75	90.00	51.94	38.055	2.365	
8,700.00	8,698.91	8,702.07	8,700.98	19.20	19.21	179.91	0.14	-35.09	90.00	51.85	38.143	2.359	
8,800.00	8,798.90	8,802.07	8,800.97	19.43	19.44	179.91	0.14	-36.84	90.00	51.41	38.592	2.332	
8,829.37	8,828.26	8,831.44	8,830.33	19.50	19.50	179.91	0.14	-37.35	90.00	51.27	38.723	2.324	
8,847.19	8,846.08	8,849.26	8,848.15	19.54	19.54	179.91	0.14	-37.66	90.00	51.19	38.803	2.319	
8,900.00	8,898.88	8,902.07	8,900.95	19.66	19.66	179.91	0.14	-38.58	90.00	50.96	39.040	2.305	
8,959.61	8,958.48	8,961.68	8,960.55	19.79	19.80	179.91	0.14	-39.62	90.00	50.69	39.308	2.290	
9,000.00	8,998.86	9,002.07	9,000.94	19.88	19.89	179.91	0.14	-40.33	90.00	50.51	39.489	2.279	
9,059.61	9,058.46	9,061.68	9,060.53	20.02	20.02	179.91	0.14	-41.37	90.00	50.24	39.756	2.264	
9,100.00	9,098.85	9,102.07	9,100.92	20.11	20.11	179.91	0.14	-42.07	90.00	50.06	39.938	2.253	
9,138.07	9,136.91	9,140.14	9,138.98	20.20	20.20	179.91	0.14	-42.74	90.00	49.89	40.108	2.244	
9,200.00	9,198.83	9,202.07	9,200.90	20.34	20.34	179.91	0.14	-43.82	90.00	49.61	40.386	2.228	
9,268.07	9,266.89	9,270.14	9,268.96	20.49	20.49	179.91	0.14	-45.01	90.00	49.31	40.692	2.212	
9,300.00	9,298.82	9,302.07	9,300.89	20.56	20.57	179.91	0.14	-45.56	90.00	49.16	40.835	2.204	
9,400.00	9,398.80	9,402.07	9,400.87	20.79	20.79	179.91	0.14	-47.31	90.00	48.71	41.284	2.180	
9,427.17	9,425.97	9,429.24	9,428.04	20.85	20.86	179.91	0.14	-47.78	90.00	48.59	41.406	2.174	
9,434.54	9,433.34	9,436.61	9,435.41	20.87	20.87	179.91	0.14	-47.91	90.00	48.56	41.439	2.172	
9,435.92	9,434.72	9,438.00	9,436.79	20.87	20.87	179.91	0.14	-47.94	90.00	48.55	41.445	2.171	
9,501.21	9,500.00	9,501.71	9,500.50	21.01	21.01	89.91	0.14	-48.46	90.02	48.30	41.719	2.158	
9,507.34	9,506.13	9,507.84	9,506.63	21.02	21.02	89.91	0.14	-48.46	90.02	48.28	41.744	2.156	ES, SF
9,550.00	9,548.75	9,551.55	9,550.32	21.11	21.11	120.40	1.25	-48.66	90.71	48.78	41.924	2.164	
9,600.00	9,598.31	9,603.14	9,601.55	21.23	21.22	120.15	7.08	-49.71	92.95	50.82	42.135	2.206	
9,650.00	9,647.02	9,654.65	9,651.86	21.34	21.33	119.32	17.85	-51.65	96.72	54.38	42.340	2.284	
9,700.00	9,694.43	9,705.97	9,700.67	21.46	21.44	117.99	33.39	-54.45	101.99	59.44	42.547	2.397	
9,750.00	9,740.11	9,757.03	9,747.45	21.58	21.54	116.29	53.46	-58.07	108.74	65.98	42.762	2.543	
9,800.00	9,783.64	9,807.75	9,791.73	21.71	21.65	114.32	77.77	-62.45	116.95	73.96	42.995	2.720	
9,850.00	9,824.61	9,858.09	9,833.09	21.85	21.76	112.19	105.97	-67.54	126.57	83.31	43.253	2.926	
9,900.00	9,862.65	9,908.01	9,871.19	22.00	21.88	109.96	137.69	-73.26	137.51	93.96	43.545	3.158	
9,950.00	9,897.40	9,957.51	9,905.75	22.19	22.03	107.70	172.54	-79.54	149.68	105.81	43.878	3.411	
10,000.00	9,928.55	10,006.60	9,936.55	22.41	22.20	105.45	210.14	-86.32	162.98	118.72	44.260	3.682	
10,050.00	9,955.82	10,055.30	9,963.43	22.67	22.40	103.24	250.09	-93.52	177.27	132.58	44.695	3.966	
10,100.00	9,978.94	10,103.66	9,986.25	22.97	22.63	101.07	292.03	-101.08	192.42	147.22	45.197	4.257	
10,150.00	9,997.71	10,151.75	10,004.92	23.31	22.89	98.96	335.62	-108.94	208.27	162.51	45.761	4.551	
10,200.00	10,011.95	10,199.63	10,019.37	23.70	23.18	96.92	380.52	-117.04	224.69	178.30	46.393	4.843	
10,250.00	10,021.54	10,247.39	10,029.56	24.14	23.50	94.94	426.43	-125.31	241.51	194.42	47.093	5.128	
10,300.00	10,026.38	10,295.12	10,035.43	24.61	23.85	93.05	473.03	-133.71	258.59	210.73	47.857	5.403	
10,323.61	10,027.00	10,317.67	10,036.70	24.85	24.02	92.18	495.19	-137.71	266.70	218.46	48.239	5.529	
10,400.00	10,027.28	10,384.83	10,037.19	25.67	24.57	92.03	561.35	-149.17	292.43	242.98	49.445	5.914	
10,500.00	10,027.65	10,469.97	10,037.52	26.84	25.33	91.82	645.59	-161.52	325.63	274.51	51.121	6.370	
10,600.00	10,028.02	10,554.39	10,037.84	28.11	26.16	91.65	729.44	-171.29	358.33	305.42	52.909	6.773	
10,700.00	10,028.40	10,638.12	10,038.17	29.46	27.03	91.51	812.86	-178.54	390.51	335.73	54.785	7.128	
10,800.00	10,028.78	10,721.21	10,038.48	30.86	27.94	91.39	895.80	-183.32	422.14	365.42	56.721	7.442	
10,900.00	10,029.16	10,803.66	10,038.80	32.31	28.88	91.28	978.21	-185.68	453.21	394.51	58.697	7.721	
11,000.00	10,029.54	10,888.01	10,039.11	33.78	29.89	91.19	1,062.56	-185.69	483.63	422.84	60.792	7.956	
11,100.00	10,029.92	10,984.00	10,039.48	35.28	31.08	91.11	1,158.55	-184.81	511.64	448.25	63.385	8.072	
11,200.00	10,030.30	11,080.91	10,039.84	36.78	32.34	91.04	1,255.45	-183.93	536.28	470.20	66.080	8.116	
11,300.00	10,030.68	11,178.62	10,040.21	38.28	33.66	90.99	1,353.16	-183.03	557.52	488.65	68.867	8.096	
11,400.00	10,031.06	11,277.02	10,040.58	39.78	35.03	90.95	1,451.55	-182.13	575.34	503.61	71.730	8.021	
11,500.00	10,031.44	11,375.97	10,040.96	41.28	36.45	90.91	1,550.50	-181.22	589.72	515.06	74.658	7.899	
11,600.00	10,031.82	11,475.37	10,041.33	42.76	37.90	90.88	1,649.89	-180.31	600.63	522.99	77.639	7.736	
11,700.00	10,032.19	11,575.09	10,041.71	44.23	39.40	90.86	1,749.61	-179.40	608.07	527.41	80.663	7.538	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #706H
Project:	Eddy County, NM (NAD27) NMZ	**TVD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Reference Site:	Littlefield 33 Fed COM	**MD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#706H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Littlefield 33 Fed COM - #705H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

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

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
11,800.00	10,032.56	11,675.01	10,042.09	45.69	40.93	90.85	1,849.52	-178.48	612.03	528.31	83.720	7.310	
11,863.76	10,032.80	11,738.76	10,042.33	46.60	41.91	90.84	1,913.27	-177.90	612.73	527.04	85.683	7.151	
11,900.00	10,032.93	11,775.00	10,042.47	47.12	42.48	90.84	1,949.51	-177.56	612.72	525.92	86.804	7.059	
12,000.00	10,033.30	11,875.00	10,042.84	48.58	44.05	90.85	2,049.50	-176.65	612.71	522.78	89.929	6.813	
12,100.00	10,033.67	11,975.00	10,043.22	50.06	45.65	90.85	2,149.50	-175.73	612.69	519.60	93.095	6.581	
12,200.00	10,034.04	12,075.00	10,043.60	51.56	47.26	90.85	2,249.49	-174.81	612.68	516.38	96.299	6.362	
12,300.00	10,034.40	12,175.00	10,043.98	53.09	48.90	90.85	2,349.49	-173.90	612.66	513.13	99.536	6.155	
12,400.00	10,034.77	12,275.00	10,044.36	54.63	50.54	90.85	2,449.48	-172.98	612.65	509.85	102.804	5.959	
12,500.00	10,035.14	12,375.00	10,044.73	56.20	52.20	90.85	2,549.48	-172.07	612.64	506.53	106.100	5.774	
12,600.00	10,035.51	12,475.00	10,045.11	57.78	53.87	90.85	2,649.47	-171.15	612.62	503.20	109.422	5.599	
12,700.00	10,035.88	12,575.00	10,045.49	59.37	55.55	90.85	2,749.47	-170.23	612.61	499.84	112.766	5.433	
12,800.00	10,036.25	12,675.00	10,045.87	60.98	57.25	90.85	2,849.46	-169.32	612.59	496.46	116.132	5.275	
12,900.00	10,036.61	12,775.00	10,046.25	62.61	58.95	90.85	2,949.46	-168.40	612.58	493.06	119.517	5.125	
13,000.00	10,036.98	12,875.00	10,046.62	64.24	60.66	90.85	3,049.45	-167.48	612.56	489.65	122.919	4.983	
13,100.00	10,037.35	12,975.00	10,047.00	65.89	62.38	90.86	3,149.45	-166.57	612.55	486.21	126.338	4.849	
13,200.00	10,037.72	13,075.00	10,047.38	67.54	64.10	90.86	3,249.44	-165.65	612.54	482.76	129.772	4.720	
13,300.00	10,038.09	13,175.00	10,047.76	69.21	65.83	90.86	3,349.44	-164.73	612.52	479.30	133.220	4.598	
13,400.00	10,038.46	13,275.00	10,048.14	70.88	67.57	90.86	3,449.43	-163.82	612.51	475.83	136.680	4.481	
13,500.00	10,038.83	13,375.00	10,048.51	72.57	69.31	90.86	3,549.43	-162.90	612.49	472.34	140.152	4.370	
13,600.00	10,039.19	13,475.00	10,048.89	74.26	71.06	90.86	3,649.42	-161.98	612.48	468.84	143.636	4.264	
13,700.00	10,039.56	13,575.00	10,049.27	75.96	72.82	90.86	3,749.42	-161.07	612.47	465.34	147.129	4.163	
13,800.00	10,039.93	13,675.00	10,049.65	77.66	74.57	90.86	3,849.41	-160.15	612.45	461.82	150.632	4.066	
13,900.00	10,040.30	13,775.00	10,050.02	79.38	76.34	90.86	3,949.41	-159.23	612.44	458.29	154.144	3.973	
14,000.00	10,040.67	13,875.00	10,050.40	81.09	78.10	90.86	4,049.40	-158.32	612.42	454.76	157.664	3.884	
14,100.00	10,041.04	13,975.00	10,050.78	82.82	79.87	90.86	4,149.40	-157.40	612.41	451.22	161.192	3.799	
14,200.00	10,041.40	14,075.00	10,051.16	84.55	81.65	90.87	4,249.39	-156.48	612.39	447.67	164.727	3.718	
14,300.00	10,041.77	14,175.00	10,051.54	86.28	83.42	90.87	4,349.39	-155.57	612.38	444.11	168.269	3.639	
14,400.00	10,042.14	14,275.00	10,051.91	88.02	85.20	90.87	4,449.38	-154.65	612.37	440.55	171.817	3.564	
14,500.00	10,042.51	14,375.00	10,052.29	89.76	86.98	90.87	4,549.38	-153.74	612.35	436.98	175.372	3.492	
14,600.00	10,042.88	14,475.00	10,052.67	91.51	88.77	90.87	4,649.37	-152.82	612.34	433.41	178.931	3.422	
14,700.00	10,043.25	14,575.00	10,053.05	93.26	90.56	90.87	4,749.37	-151.90	612.32	429.83	182.496	3.355	
14,800.00	10,043.61	14,675.00	10,053.43	95.01	92.35	90.87	4,849.36	-150.99	612.31	426.24	186.066	3.291	
14,900.00	10,043.98	14,775.00	10,053.80	96.77	94.14	90.87	4,949.36	-150.07	612.29	422.65	189.641	3.229	
15,000.00	10,044.35	14,875.00	10,054.18	98.53	95.93	90.87	5,049.35	-149.15	612.28	419.06	193.220	3.169	
15,100.00	10,044.72	14,975.00	10,054.56	100.30	97.73	90.87	5,149.35	-148.24	612.27	415.46	196.804	3.111	
15,200.00	10,045.09	15,075.00	10,054.94	102.06	99.52	90.87	5,249.34	-147.32	612.25	411.86	200.391	3.055	
15,300.00	10,045.46	15,175.00	10,055.32	103.83	101.32	90.88	5,349.34	-146.40	612.24	408.26	203.982	3.001	
15,400.00	10,045.82	15,275.00	10,055.69	105.61	103.13	90.88	5,449.34	-145.49	612.22	404.65	207.577	2.949	
15,500.00	10,046.19	15,375.00	10,056.07	107.38	104.93	90.88	5,549.33	-144.57	612.21	401.03	211.175	2.899	
15,600.00	10,046.56	15,475.00	10,056.45	109.16	106.73	90.88	5,649.33	-143.65	612.20	397.42	214.776	2.850	
15,700.00	10,046.93	15,575.00	10,056.83	110.94	108.54	90.88	5,749.32	-142.74	612.18	393.80	218.381	2.803	
15,800.00	10,047.30	15,675.00	10,057.20	112.72	110.35	90.88	5,849.32	-141.82	612.17	390.18	221.988	2.758	
15,900.00	10,047.67	15,775.00	10,057.58	114.51	112.15	90.88	5,949.31	-140.90	612.15	386.56	225.598	2.713	
16,000.00	10,048.04	15,875.00	10,057.96	116.29	113.96	90.88	6,049.31	-139.99	612.14	382.93	229.211	2.671	
16,100.00	10,048.40	15,975.00	10,058.34	118.08	115.77	90.88	6,149.30	-139.07	612.12	379.30	232.826	2.629	
16,200.00	10,048.77	16,075.00	10,058.72	119.87	117.59	90.88	6,249.30	-138.15	612.11	375.67	236.443	2.589	
16,300.00	10,049.14	16,175.00	10,059.09	121.66	119.40	90.88	6,349.29	-137.24	612.10	372.03	240.063	2.550	
16,400.00	10,049.51	16,275.00	10,059.47	123.46	121.21	90.89	6,449.29	-136.32	612.08	368.40	243.685	2.512	
16,500.00	10,049.88	16,375.00	10,059.85	125.25	123.03	90.89	6,549.28	-135.41	612.07	364.76	247.309	2.475	
16,600.00	10,050.25	16,475.00	10,060.23	127.05	124.84	90.89	6,649.28	-134.49	612.05	361.12	250.935	2.439	
16,700.00	10,050.61	16,575.00	10,060.61	128.84	126.66	90.89	6,749.27	-133.57	612.04	357.48	254.564	2.404	
16,800.00	10,050.98	16,675.00	10,060.98	130.64	128.48	90.89	6,849.27	-132.66	612.03	353.83	258.193	2.370	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #706H
Project:	Eddy County, NM (NAD27) NMZ	**TVD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Reference Site:	Littlefield 33 Fed COM	**MD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#706H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Littlefield 33 Fed COM - #705H - OH - Plan #1 - IP

Offset Site Error: 0.00 usft

Survey Program: 0-MWD

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
16,900.00	10,051.35	16,775.00	10,061.36	132.44	130.30	90.89	6,949.26	-131.74	612.01	350.19	261.825	2.337	
17,000.00	10,051.72	16,875.00	10,061.74	134.25	132.12	90.89	7,049.26	-130.82	612.00	346.54	265.458	2.305	
17,071.88	10,051.98	16,946.88	10,062.01	135.54	133.42	90.89	7,121.13	-130.16	611.99	343.92	268.071	2.283	
17,076.23	10,052.00	16,944.04	10,062.00	135.62	133.37	90.89	7,118.29	-130.19	612.03	344.17	267.859	2.285	

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #706H
Project:	Eddy County, NM (NAD27) NMZ	**TVD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Reference Site:	Littlefield 33 Fed COM	**MD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#706H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Littlefield 33 Fed COM - #805H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

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

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	1.00	1.00	0.00	0.00	89.90	0.24	134.98	134.98				
100.00	100.00	101.00	101.00	0.08	0.09	89.90	0.24	134.98	134.98	134.81	.171	790.179	
200.00	200.00	201.00	201.00	0.31	0.31	89.90	0.24	134.98	134.98	134.36	.620	217.586	
300.00	300.00	301.00	301.00	0.53	0.54	89.90	0.24	134.98	134.98	133.91	1.070	126.163	
400.00	400.00	401.00	401.00	0.76	0.76	89.90	0.24	134.98	134.98	133.46	1.519	88.837	
500.00	500.00	501.00	501.00	0.98	0.99	89.90	0.24	134.98	134.98	133.01	1.969	68.554	
600.00	600.00	601.00	601.00	1.21	1.21	89.90	0.24	134.98	134.98	132.56	2.418	55.812	
700.00	700.00	701.00	701.00	1.43	1.44	89.90	0.24	134.98	134.98	132.11	2.868	47.064	
800.00	800.00	801.00	801.00	1.66	1.66	89.90	0.24	134.98	134.98	131.66	3.318	40.687	
900.00	900.00	901.00	901.00	1.88	1.88	89.90	0.24	134.98	134.98	131.21	3.767	35.832	
1,000.00	1,000.00	1,001.00	1,001.00	2.11	2.11	89.90	0.24	134.98	134.98	130.76	4.217	32.012	
1,100.00	1,100.00	1,101.00	1,101.00	2.33	2.33	89.90	0.24	134.98	134.98	130.31	4.666	28.928	
1,200.00	1,200.00	1,201.00	1,201.00	2.56	2.56	89.90	0.24	134.98	134.98	129.86	5.116	26.386	
1,300.00	1,300.00	1,301.00	1,301.00	2.78	2.78	89.90	0.24	134.98	134.98	129.42	5.565	24.254	
1,400.00	1,400.00	1,401.00	1,401.00	3.01	3.01	89.90	0.24	134.98	134.98	128.97	6.015	22.442	
1,500.00	1,500.00	1,501.00	1,501.00	3.23	3.23	89.90	0.24	134.98	134.98	128.52	6.464	20.881	CC, ES
1,566.67	1,566.66	1,567.66	1,567.66	3.37	3.38	179.90	0.24	134.98	135.56	128.81	6.754	20.070	
1,600.00	1,599.99	1,600.99	1,600.99	3.44	3.46	179.90	0.24	134.98	136.14	129.25	6.895	19.745	
1,700.00	1,699.98	1,700.98	1,700.98	3.64	3.68	179.90	0.24	134.98	137.89	130.57	7.319	18.840	
1,800.00	1,799.96	1,800.96	1,800.96	3.84	3.91	179.90	0.24	134.98	139.63	131.89	7.746	18.027	
1,900.00	1,899.95	1,900.95	1,900.95	4.05	4.13	179.90	0.24	134.98	141.38	133.20	8.175	17.295	
2,000.00	1,999.93	2,000.93	2,000.93	4.25	4.36	179.90	0.24	134.98	143.12	134.52	8.606	16.631	
2,100.00	2,099.92	2,100.92	2,100.92	4.46	4.58	179.91	0.24	134.98	144.87	135.83	9.039	16.027	
2,200.00	2,199.90	2,200.90	2,200.90	4.68	4.81	179.91	0.24	134.98	146.62	137.14	9.474	15.476	
2,300.00	2,299.88	2,300.88	2,300.88	4.89	5.03	179.91	0.24	134.98	148.36	138.45	9.910	14.971	
2,400.00	2,399.87	2,400.87	2,400.87	5.10	5.26	179.91	0.24	134.98	150.11	139.76	10.347	14.508	
2,500.00	2,499.85	2,500.85	2,500.85	5.32	5.48	179.91	0.24	134.98	151.85	141.07	10.785	14.080	
2,600.00	2,599.84	2,600.84	2,600.84	5.53	5.71	179.91	0.24	134.98	153.60	142.37	11.224	13.685	
2,700.00	2,699.82	2,700.82	2,700.82	5.75	5.93	179.91	0.24	134.98	155.34	143.68	11.664	13.318	
2,800.00	2,799.81	2,800.81	2,800.81	5.97	6.15	179.91	0.24	134.98	157.09	144.98	12.105	12.977	
2,900.00	2,899.79	2,900.79	2,900.79	6.19	6.38	179.91	0.24	134.98	158.83	146.29	12.546	12.660	
3,000.00	2,999.78	3,000.78	3,000.78	6.41	6.60	179.91	0.24	134.98	160.58	147.59	12.988	12.364	
3,100.00	3,099.76	3,100.76	3,100.76	6.63	6.83	179.92	0.24	134.98	162.32	148.89	13.430	12.086	
3,200.00	3,199.75	3,200.75	3,200.75	6.85	7.05	179.92	0.24	134.98	164.07	150.19	13.873	11.826	
3,300.00	3,299.73	3,300.73	3,300.73	7.07	7.28	179.92	0.24	134.98	165.81	151.50	14.316	11.582	
3,400.00	3,399.72	3,400.72	3,400.72	7.29	7.50	179.92	0.24	134.98	167.56	152.80	14.760	11.352	
3,500.00	3,499.70	3,500.70	3,500.70	7.51	7.73	179.92	0.24	134.98	169.30	154.10	15.204	11.135	
3,600.00	3,599.69	3,600.69	3,600.69	7.73	7.95	179.92	0.24	134.98	171.05	155.40	15.649	10.931	
3,700.00	3,699.67	3,700.67	3,700.67	7.95	8.18	179.92	0.24	134.98	172.79	156.70	16.093	10.737	
3,800.00	3,799.66	3,800.66	3,800.66	8.17	8.40	179.92	0.24	134.98	174.54	158.00	16.538	10.554	
3,900.00	3,899.64	3,900.64	3,900.64	8.40	8.63	179.92	0.24	134.98	176.28	159.30	16.984	10.380	
4,000.00	3,999.63	4,000.63	4,000.63	8.62	8.85	179.92	0.24	134.98	178.03	160.60	17.429	10.214	
4,100.00	4,099.61	4,100.61	4,100.61	8.84	9.08	179.92	0.24	134.98	179.77	161.90	17.875	10.057	
4,200.00	4,199.60	4,200.60	4,200.60	9.06	9.30	179.92	0.24	134.98	181.52	163.20	18.321	9.908	
4,300.00	4,299.58	4,300.58	4,300.58	9.29	9.53	179.92	0.24	134.98	183.27	164.50	18.767	9.765	
4,400.00	4,399.57	4,400.57	4,400.57	9.51	9.75	179.93	0.24	134.98	185.01	165.80	19.213	9.629	
4,500.00	4,499.55	4,500.55	4,500.55	9.74	9.98	179.93	0.24	134.98	186.76	167.10	19.660	9.499	
4,600.00	4,599.53	4,600.53	4,600.53	9.96	10.20	179.93	0.24	134.98	188.50	168.39	20.106	9.375	
4,700.00	4,699.52	4,700.52	4,700.52	10.18	10.42	179.93	0.24	134.98	190.25	169.69	20.553	9.256	
4,800.00	4,799.50	4,800.50	4,800.50	10.41	10.65	179.93	0.24	134.98	191.99	170.99	21.000	9.142	
4,900.00	4,899.49	4,900.49	4,900.49	10.63	10.87	179.93	0.24	134.98	193.74	172.29	21.447	9.033	
5,000.00	4,999.47	5,000.47	5,000.47	10.86	11.10	179.93	0.24	134.98	195.48	173.59	21.894	8.928	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #706H
Project:	Eddy County, NM (NAD27) NMZ	**TVD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Reference Site:	Littlefield 33 Fed COM	**MD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#706H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Littlefield 33 Fed COM - #805H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

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

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,100.00	5,099.46	5,100.46	5,100.46	11.08	11.32	179.93	0.24	134.98	197.23	174.89	22.341	8.828	
5,200.00	5,199.44	5,200.44	5,200.44	11.31	11.55	179.93	0.24	134.98	198.97	176.18	22.789	8.731	
5,300.00	5,299.43	5,300.43	5,300.43	11.53	11.77	179.93	0.24	134.98	200.72	177.48	23.236	8.638	
5,400.00	5,399.41	5,400.41	5,400.41	11.75	12.00	179.93	0.24	134.98	202.46	178.78	23.684	8.549	
5,500.00	5,499.40	5,500.40	5,500.40	11.98	12.22	179.93	0.24	134.98	204.21	180.08	24.131	8.462	
5,600.00	5,599.38	5,600.38	5,600.38	12.20	12.45	179.93	0.24	134.98	205.95	181.37	24.579	8.379	
5,700.00	5,699.37	5,700.37	5,700.37	12.43	12.67	179.93	0.24	134.98	207.70	182.67	25.027	8.299	
5,800.00	5,799.35	5,800.35	5,800.35	12.65	12.90	179.93	0.24	134.98	209.44	183.97	25.475	8.222	
5,900.00	5,899.34	5,900.34	5,900.34	12.88	13.12	179.93	0.24	134.98	211.19	185.27	25.923	8.147	
6,000.00	5,999.32	6,000.32	6,000.32	13.11	13.35	179.94	0.24	134.98	212.93	186.56	26.371	8.075	
6,100.00	6,099.31	6,100.31	6,100.31	13.33	13.57	179.94	0.24	134.98	214.68	187.86	26.819	8.005	
6,200.00	6,199.29	6,200.29	6,200.29	13.56	13.80	179.94	0.24	134.98	216.42	189.16	27.267	7.937	
6,300.00	6,299.28	6,300.28	6,300.28	13.78	14.02	179.94	0.24	134.98	218.17	190.46	27.715	7.872	
6,400.00	6,399.26	6,400.26	6,400.26	14.01	14.25	179.94	0.24	134.98	219.92	191.75	28.163	7.809	
6,500.00	6,499.25	6,500.25	6,500.25	14.23	14.47	179.94	0.24	134.98	221.66	193.05	28.611	7.747	
6,600.00	6,599.23	6,600.23	6,600.23	14.46	14.69	179.94	0.24	134.98	223.41	194.35	29.060	7.688	
6,700.00	6,699.21	6,700.21	6,700.21	14.68	14.92	179.94	0.24	134.98	225.15	195.64	29.508	7.630	
6,800.00	6,799.20	6,800.20	6,800.20	14.91	15.14	179.94	0.24	134.98	226.90	196.94	29.956	7.574	
6,900.00	6,899.18	6,900.18	6,900.18	15.14	15.37	179.94	0.24	134.98	228.64	198.24	30.405	7.520	
7,000.00	6,999.17	7,000.17	7,000.17	15.36	15.59	179.94	0.24	134.98	230.39	199.53	30.853	7.467	
7,100.00	7,099.15	7,100.15	7,100.15	15.59	15.82	179.94	0.24	134.98	232.13	200.83	31.302	7.416	
7,200.00	7,199.14	7,200.14	7,200.14	15.81	16.04	179.94	0.24	134.98	233.88	202.13	31.751	7.366	
7,300.00	7,299.12	7,300.12	7,300.12	16.04	16.27	179.94	0.24	134.98	235.62	203.42	32.199	7.318	
7,400.00	7,399.11	7,400.11	7,400.11	16.26	16.49	179.94	0.24	134.98	237.37	204.72	32.648	7.271	
7,500.00	7,499.09	7,500.09	7,500.09	16.49	16.72	179.94	0.24	134.98	239.11	206.02	33.096	7.225	
7,600.00	7,599.08	7,600.08	7,600.08	16.72	16.94	179.94	0.24	134.98	240.86	207.31	33.545	7.180	
7,700.00	7,699.06	7,700.06	7,700.06	16.94	17.17	179.94	0.24	134.98	242.60	208.61	33.994	7.137	
7,800.00	7,799.05	7,800.05	7,800.05	17.17	17.39	179.94	0.24	134.98	244.35	209.91	34.443	7.094	
7,900.00	7,899.03	7,900.03	7,900.03	17.39	17.62	179.94	0.24	134.98	246.09	211.20	34.891	7.053	
8,000.00	7,999.02	8,000.02	8,000.02	17.62	17.84	179.94	0.24	134.98	247.84	212.50	35.340	7.013	
8,100.00	8,099.00	8,100.00	8,100.00	17.85	18.07	179.94	0.24	134.98	249.58	213.80	35.789	6.974	
8,200.00	8,198.99	8,200.01	8,199.99	18.07	18.29	179.95	0.24	134.98	251.33	215.09	36.238	6.936	
8,300.00	8,298.97	8,300.03	8,299.97	18.30	18.52	179.95	0.24	134.98	253.07	216.39	36.687	6.898	
8,400.00	8,398.96	8,400.04	8,399.96	18.53	18.74	179.95	0.24	134.98	254.82	217.68	37.136	6.862	
8,500.00	8,498.94	8,500.06	8,499.94	18.75	18.96	179.95	0.24	134.98	256.57	218.98	37.585	6.826	
8,600.00	8,598.93	8,600.07	8,599.93	18.98	19.19	179.95	0.24	134.98	258.31	220.28	38.034	6.792	
8,700.00	8,698.91	8,700.09	8,699.91	19.20	19.41	179.95	0.24	134.98	260.06	221.57	38.483	6.758	
8,800.00	8,798.90	8,800.11	8,799.90	19.43	19.64	179.95	0.24	134.98	261.80	222.87	38.932	6.725	
8,900.00	8,898.88	8,900.12	8,899.88	19.66	19.86	179.95	0.24	134.98	263.55	224.16	39.381	6.692	
9,000.00	8,998.86	9,000.14	8,999.86	19.88	20.09	179.95	0.24	134.98	265.29	225.46	39.831	6.661	
9,100.00	9,098.85	9,100.15	9,099.85	20.11	20.31	179.95	0.24	134.98	267.04	226.76	40.280	6.630	
9,200.00	9,198.83	9,200.17	9,199.83	20.34	20.54	179.95	0.24	134.98	268.78	228.05	40.729	6.599	
9,300.00	9,298.82	9,300.18	9,299.82	20.56	20.76	179.95	0.24	134.98	270.53	229.35	41.178	6.570	
9,400.00	9,398.80	9,400.20	9,399.80	20.79	20.99	179.95	0.24	134.98	272.27	230.65	41.627	6.541	
9,434.54	9,433.34	9,434.34	9,434.34	20.87	21.06	179.95	0.24	134.98	272.88	231.09	41.781	6.531	
9,501.21	9,500.00	9,501.00	9,501.00	21.01	21.21	89.95	0.24	134.98	273.46	231.38	42.074	6.499	
9,507.34	9,506.13	9,507.13	9,507.13	21.02	21.23	89.95	0.24	134.98	273.46	231.36	42.100	6.495	
9,550.00	9,548.75	9,549.75	9,549.75	21.11	21.32	120.45	0.24	134.98	274.34	232.05	42.285	6.488	
9,600.00	9,598.31	9,600.69	9,599.31	21.23	21.44	121.28	0.24	134.98	277.69	235.18	42.508	6.533	
9,650.00	9,647.02	9,648.02	9,648.02	21.34	21.54	122.61	0.24	134.98	283.73	241.00	42.722	6.641	
9,700.00	9,694.43	9,704.57	9,695.43	21.46	21.67	124.30	0.24	134.98	292.77	249.82	42.957	6.816	
9,750.00	9,740.11	9,741.11	9,741.11	21.58	21.75	126.14	0.24	134.98	305.19	262.04	43.146	7.073	

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

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #706H
Project:	Eddy County, NM (NAD27) NMZ	**TVD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Reference Site:	Littlefield 33 Fed COM	**MD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#706H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Littlefield 33 Fed COM - #805H - OH - Plan #1 - IP

Offset Site Error: 0.00 usft

Survey Program: 0-MWD

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
9,800.00	9,783.64	9,784.64	9,784.64	21.71	21.85	127.94	0.24	134.98	321.30	277.95	43.350	7.412	
9,850.00	9,824.61	9,825.61	9,825.61	21.85	21.94	129.52	0.24	134.98	341.35	297.80	43.547	7.839	
9,900.00	9,862.65	9,863.65	9,863.65	22.00	22.03	130.70	0.24	134.98	365.44	321.70	43.735	8.356	
9,950.00	9,897.40	9,901.60	9,898.40	22.19	22.11	131.32	0.24	134.98	393.52	349.61	43.917	8.961	
10,000.00	9,928.55	9,929.55	9,929.55	22.41	22.18	131.22	0.24	134.98	425.43	381.36	44.071	9.653	
10,050.00	9,955.82	9,956.82	9,956.82	22.67	22.24	130.20	0.24	134.98	460.85	416.63	44.215	10.423	
10,100.00	9,978.94	9,979.94	9,979.94	22.97	22.29	128.00	0.24	134.98	499.41	455.07	44.340	11.263	
10,150.00	9,997.71	10,001.29	9,998.71	23.31	22.34	124.23	0.24	134.98	540.66	496.21	44.451	12.163	
10,200.00	10,011.95	10,012.95	10,012.95	23.70	22.37	118.35	0.24	134.98	584.13	539.60	44.529	13.118	
10,250.00	10,021.54	10,022.54	10,022.54	24.14	22.39	109.63	0.24	134.98	629.30	584.71	44.592	14.112	
10,300.00	10,026.38	10,027.38	10,027.38	24.61	22.40	97.47	0.24	134.98	675.67	631.03	44.635	15.138	
10,323.61	10,027.00	10,028.00	10,028.00	24.85	22.40	90.58	0.24	134.98	697.82	653.17	44.648	15.629	
10,400.00	10,027.28	10,028.28	10,028.28	25.67	22.40	90.60	0.24	134.98	769.81	725.13	44.680	17.229	
10,500.00	10,027.65	10,028.65	10,028.65	26.84	22.40	90.62	0.24	134.98	864.28	819.56	44.719	19.327	
10,600.00	10,028.02	10,029.02	10,029.02	28.11	22.40	90.62	0.24	134.98	958.84	914.09	44.755	21.424	
10,700.00	10,028.40	10,029.40	10,029.40	29.46	22.40	90.62	0.24	134.98	1,053.38	1,008.59	44.789	23.519	
10,800.00	10,028.78	11,508.74	10,870.63	30.86	28.63	140.47	864.49	142.85	1,125.36	1,075.90	49.459	22.754	
10,900.00	10,029.16	11,602.55	10,871.34	32.31	29.58	138.83	958.29	143.70	1,148.91	1,097.74	51.179	22.449	
11,000.00	10,029.54	11,697.51	10,872.06	33.78	30.61	137.38	1,053.24	144.57	1,170.73	1,117.69	53.034	22.075	
11,100.00	10,029.92	11,793.50	10,872.79	35.28	31.73	136.12	1,149.22	145.44	1,190.61	1,135.60	55.007	21.645	
11,200.00	10,030.30	11,909.59	10,873.52	36.78	33.15	135.04	1,246.13	146.32	1,208.40	1,151.16	57.241	21.111	
11,300.00	10,030.68	11,988.12	10,874.26	38.28	34.15	134.13	1,343.83	147.21	1,223.97	1,164.74	59.231	20.664	
11,400.00	10,031.06	12,086.52	10,875.01	39.78	35.45	133.38	1,442.22	148.11	1,237.21	1,175.76	61.446	20.135	
11,500.00	10,031.44	12,185.47	10,875.76	41.28	36.81	132.78	1,541.17	149.01	1,248.01	1,184.31	63.706	19.590	
11,600.00	10,031.82	12,284.87	10,876.51	42.76	38.20	132.34	1,640.56	149.91	1,256.33	1,190.34	65.993	19.037	
11,700.00	10,032.19	12,384.59	10,877.27	44.23	39.64	132.04	1,740.27	150.82	1,262.10	1,193.81	68.290	18.481	
11,800.00	10,032.56	12,484.50	10,878.03	45.69	41.12	131.88	1,840.18	151.73	1,265.30	1,194.72	70.581	17.927	
11,863.76	10,032.80	12,548.26	10,878.51	46.60	42.07	131.86	1,903.93	152.31	1,265.98	1,193.95	72.031	17.575	
11,900.00	10,032.93	12,584.50	10,878.79	47.12	42.62	131.86	1,940.17	152.64	1,266.07	1,193.22	72.853	17.378	
12,000.00	10,033.30	12,684.50	10,879.55	48.58	44.15	131.87	2,040.16	153.55	1,266.32	1,191.16	75.153	16.850	
12,100.00	10,033.67	12,784.50	10,880.30	50.06	45.70	131.89	2,140.15	154.46	1,266.56	1,189.07	77.494	16.344	
12,200.00	10,034.04	12,884.50	10,881.06	51.56	47.28	131.90	2,240.14	155.37	1,266.81	1,186.94	79.872	15.861	
12,300.00	10,034.40	12,984.50	10,881.82	53.09	48.87	131.92	2,340.13	156.28	1,267.05	1,184.77	82.282	15.399	
12,400.00	10,034.77	13,084.49	10,882.58	54.63	50.48	131.93	2,440.13	157.19	1,267.30	1,182.58	84.723	14.958	
12,500.00	10,035.14	13,184.49	10,883.34	56.20	52.11	131.94	2,540.12	158.10	1,267.54	1,180.35	87.192	14.537	
12,600.00	10,035.51	13,284.49	10,884.09	57.78	53.75	131.96	2,640.11	159.01	1,267.79	1,178.10	89.686	14.136	
12,700.00	10,035.88	13,384.49	10,884.85	59.37	55.40	131.97	2,740.10	159.92	1,268.03	1,175.83	92.203	13.753	
12,800.00	10,036.25	13,484.49	10,885.61	60.98	57.07	131.98	2,840.10	160.83	1,268.28	1,173.54	94.741	13.387	
12,900.00	10,036.61	13,584.49	10,886.37	62.61	58.74	132.00	2,940.09	161.74	1,268.53	1,171.23	97.299	13.037	
13,000.00	10,036.98	13,684.49	10,887.13	64.24	60.43	132.01	3,040.08	162.65	1,268.77	1,168.90	99.875	12.704	
13,100.00	10,037.35	13,784.49	10,887.89	65.89	62.13	132.03	3,140.07	163.57	1,269.02	1,166.55	102.467	12.385	
13,200.00	10,037.72	13,884.49	10,888.64	67.54	63.83	132.04	3,240.06	164.48	1,269.26	1,164.19	105.074	12.080	
13,300.00	10,038.09	13,984.49	10,889.40	69.21	65.54	132.05	3,340.06	165.39	1,269.51	1,161.81	107.696	11.788	
13,400.00	10,038.46	14,084.49	10,890.16	70.88	67.26	132.07	3,440.05	166.30	1,269.76	1,159.42	110.330	11.509	
13,500.00	10,038.83	14,184.49	10,890.92	72.57	68.98	132.08	3,540.04	167.21	1,270.00	1,157.02	112.976	11.241	
13,600.00	10,039.19	14,284.49	10,891.68	74.26	70.72	132.09	3,640.03	168.12	1,270.25	1,154.61	115.634	10.985	
13,700.00	10,039.56	14,384.48	10,892.44	75.96	72.45	132.11	3,740.03	169.03	1,270.49	1,152.19	118.301	10.739	
13,800.00	10,039.93	14,484.48	10,893.19	77.66	74.20	132.12	3,840.02	169.94	1,270.74	1,149.76	120.979	10.504	
13,900.00	10,040.30	14,584.48	10,893.95	79.38	75.94	132.13	3,940.01	170.85	1,270.99	1,147.32	123.665	10.278	
14,000.00	10,040.67	14,684.48	10,894.71	81.09	77.69	132.15	4,040.00	171.76	1,271.23	1,144.87	126.359	10.061	
14,100.00	10,041.04	14,784.48	10,895.47	82.82	79.45	132.16	4,139.99	172.67	1,271.48	1,142.42	129.060	9.852	
14,200.00	10,041.40	14,884.48	10,896.23	84.55	81.21	132.18	4,239.99	173.58	1,271.73	1,139.96	131.769	9.651	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #706H
Project:	Eddy County, NM (NAD27) NMZ	**TVD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Reference Site:	Littlefield 33 Fed COM	**MD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#706H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Littlefield 33 Fed COM - #805H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

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

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
14,300.00	10,041.77	14,984.48	10,896.98	86.28	82.97	132.19	4,339.98	174.49	1,271.97	1,137.49	134.485	9.458	
14,400.00	10,042.14	15,084.48	10,897.74	88.02	84.74	132.20	4,439.97	175.40	1,272.22	1,135.01	137.207	9.272	
14,500.00	10,042.51	15,184.48	10,898.50	89.76	86.51	132.22	4,539.96	176.31	1,272.47	1,132.53	139.934	9.093	
14,600.00	10,042.88	15,284.48	10,899.26	91.51	88.29	132.23	4,639.96	177.22	1,272.71	1,130.05	142.667	8.921	
14,700.00	10,043.25	15,384.48	10,900.02	93.26	90.06	132.24	4,739.95	178.13	1,272.96	1,127.55	145.404	8.755	
14,800.00	10,043.61	15,484.48	10,900.78	95.01	91.84	132.26	4,839.94	179.04	1,273.21	1,125.06	148.147	8.594	
14,900.00	10,043.98	15,584.48	10,901.53	96.77	93.62	132.27	4,939.93	179.95	1,273.45	1,122.56	150.893	8.439	
15,000.00	10,044.35	15,684.48	10,902.29	98.53	95.41	132.28	5,039.92	180.86	1,273.70	1,120.06	153.644	8.290	
15,100.00	10,044.72	15,784.47	10,903.05	100.30	97.20	132.30	5,139.92	181.77	1,273.95	1,117.55	156.399	8.146	
15,200.00	10,045.09	15,884.47	10,903.81	102.06	98.99	132.31	5,239.91	182.68	1,274.19	1,115.04	159.157	8.006	
15,300.00	10,045.46	15,984.47	10,904.57	103.83	100.78	132.33	5,339.90	183.59	1,274.44	1,112.52	161.918	7.871	
15,400.00	10,045.82	16,084.47	10,905.33	105.61	102.57	132.34	5,439.89	184.50	1,274.69	1,110.01	164.683	7.740	
15,500.00	10,046.19	16,184.47	10,906.08	107.38	104.36	132.35	5,539.89	185.41	1,274.94	1,107.49	167.451	7.614	
15,600.00	10,046.56	16,284.47	10,906.84	109.16	106.16	132.37	5,639.88	186.32	1,275.18	1,104.96	170.221	7.491	
15,700.00	10,046.93	16,384.47	10,907.60	110.94	107.96	132.38	5,739.87	187.23	1,275.43	1,102.44	172.993	7.373	
15,800.00	10,047.30	16,484.47	10,908.36	112.72	109.76	132.39	5,839.86	188.14	1,275.68	1,099.91	175.769	7.258	
15,900.00	10,047.67	16,584.47	10,909.12	114.51	111.56	132.41	5,939.85	189.05	1,275.93	1,097.38	178.546	7.146	
16,000.00	10,048.04	16,684.47	10,909.87	116.29	113.36	132.42	6,039.85	189.96	1,276.18	1,094.85	181.325	7.038	
16,100.00	10,048.40	16,784.47	10,910.63	118.08	115.17	132.43	6,139.84	190.88	1,276.42	1,092.32	184.107	6.933	
16,200.00	10,048.77	16,884.47	10,911.39	119.87	116.97	132.45	6,239.83	191.79	1,276.67	1,089.78	186.890	6.831	
16,300.00	10,049.14	16,984.47	10,912.15	121.66	118.78	132.46	6,339.82	192.70	1,276.92	1,087.24	189.675	6.732	
16,400.00	10,049.51	17,084.46	10,912.91	123.46	120.59	132.47	6,439.82	193.61	1,277.17	1,084.71	192.461	6.636	
16,500.00	10,049.88	17,184.46	10,913.67	125.25	122.40	132.49	6,539.81	194.52	1,277.42	1,082.17	195.249	6.542	
16,600.00	10,050.25	17,284.46	10,914.42	127.05	124.21	132.50	6,639.80	195.43	1,277.66	1,079.63	198.038	6.452	
16,700.00	10,050.61	17,384.46	10,915.18	128.84	126.02	132.51	6,739.79	196.34	1,277.91	1,077.08	200.829	6.363	
16,800.00	10,050.98	17,484.46	10,915.94	130.64	127.83	132.53	6,839.78	197.25	1,278.16	1,074.54	203.620	6.277	
16,900.00	10,051.35	17,584.46	10,916.70	132.44	129.65	132.54	6,939.78	198.16	1,278.41	1,072.00	206.413	6.193	
17,000.00	10,051.72	17,684.46	10,917.46	134.25	131.46	132.56	7,039.77	199.07	1,278.66	1,069.45	209.207	6.112	
17,076.23	10,052.00	17,760.69	10,918.04	135.62	132.84	132.57	7,116.00	199.76	1,278.85	1,067.51	211.337	6.051 SF	

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #706H
Project:	Eddy County, NM (NAD27) NMZ	**TVD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Reference Site:	Littlefield 33 Fed COM	**MD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#706H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Littlefield 33 Fed COM - #806H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

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

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.30	0.30	0.00	0.00	89.96	0.03	45.01	45.01				
100.00	100.00	100.30	100.30	0.08	0.08	89.96	0.03	45.01	45.01	44.84	.169	265.940	
200.00	200.00	200.30	200.30	0.31	0.31	89.96	0.03	45.01	45.01	44.39	.619	72.740	
300.00	300.00	300.30	300.30	0.53	0.53	89.96	0.03	45.01	45.01	43.94	1.068	42.132	
400.00	400.00	400.30	400.30	0.76	0.76	89.96	0.03	45.01	45.01	43.49	1.518	29.654	
500.00	500.00	500.30	500.30	0.98	0.98	89.96	0.03	45.01	45.01	43.04	1.967	22.878	
600.00	600.00	600.30	600.30	1.21	1.21	89.96	0.03	45.01	45.01	42.59	2.417	18.623	
700.00	700.00	700.30	700.30	1.43	1.43	89.96	0.03	45.01	45.01	42.14	2.866	15.702	
800.00	800.00	800.30	800.30	1.66	1.66	89.96	0.03	45.01	45.01	41.69	3.316	13.574	
900.00	900.00	900.30	900.30	1.88	1.88	89.96	0.03	45.01	45.01	41.24	3.766	11.953	
1,000.00	1,000.00	1,000.30	1,000.30	2.11	2.11	89.96	0.03	45.01	45.01	40.79	4.215	10.678	
1,100.00	1,100.00	1,100.30	1,100.30	2.33	2.33	89.96	0.03	45.01	45.01	40.35	4.665	9.649	
1,200.00	1,200.00	1,200.30	1,200.30	2.56	2.56	89.96	0.03	45.01	45.01	39.90	5.114	8.801	
1,300.00	1,300.00	1,300.30	1,300.30	2.78	2.78	89.96	0.03	45.01	45.01	39.45	5.564	8.090	
1,400.00	1,400.00	1,400.30	1,400.30	3.01	3.01	89.96	0.03	45.01	45.01	39.00	6.013	7.485	
1,500.00	1,500.00	1,500.30	1,500.30	3.23	3.23	89.96	0.03	45.01	45.01	38.55	6.463	6.965	
1,503.29	1,503.29	1,503.63	1,503.63	3.24	3.24	179.96	0.03	45.01	45.01	38.53	6.476	6.950 CC	
1,566.67	1,566.66	1,567.69	1,567.69	3.37	3.37	-179.72	-0.22	44.47	45.05	38.31	6.740	6.685	
1,600.00	1,599.99	1,601.01	1,601.00	3.44	3.43	-179.40	-0.47	43.94	45.11	38.24	6.867	6.569	
1,700.00	1,699.98	1,701.01	1,700.98	3.64	3.62	-178.47	-1.21	42.36	45.29	38.03	7.254	6.243	
1,800.00	1,799.96	1,801.00	1,800.97	3.84	3.81	-177.55	-1.94	40.78	45.48	37.83	7.649	5.946	
1,900.00	1,899.95	1,901.00	1,900.95	4.05	4.01	-176.63	-2.68	39.19	45.68	37.63	8.049	5.675	
2,000.00	1,999.93	2,001.00	2,000.93	4.25	4.21	-175.73	-3.42	37.61	45.89	37.44	8.454	5.428	
2,100.00	2,099.92	2,101.00	2,100.91	4.46	4.41	-174.83	-4.16	36.03	46.11	37.25	8.864	5.202	
2,200.00	2,199.90	2,200.99	2,200.89	4.68	4.62	-173.94	-4.89	34.45	46.35	37.07	9.278	4.996	
2,300.00	2,299.88	2,300.99	2,300.88	4.89	4.82	-173.06	-5.63	32.87	46.59	36.90	9.695	4.806	
2,400.00	2,399.87	2,400.99	2,400.86	5.10	5.03	-172.19	-6.37	31.29	46.85	36.74	10.115	4.632	
2,500.00	2,499.85	2,500.98	2,500.84	5.32	5.24	-171.32	-7.11	29.70	47.12	36.58	10.538	4.471	
2,600.00	2,599.84	2,600.98	2,600.82	5.53	5.45	-170.47	-7.84	28.12	47.40	36.43	10.963	4.323	
2,700.00	2,699.82	2,700.98	2,700.80	5.75	5.67	-169.63	-8.58	26.54	47.69	36.29	11.391	4.186	
2,800.00	2,799.81	2,800.98	2,800.78	5.97	5.88	-168.80	-9.32	24.96	47.98	36.16	11.820	4.060	
2,900.00	2,899.79	2,900.97	2,900.77	6.19	6.10	-167.98	-10.06	23.38	48.29	36.04	12.251	3.942	
3,000.00	2,999.78	3,000.97	3,000.75	6.41	6.31	-167.17	-10.79	21.80	48.61	35.93	12.684	3.833	
3,100.00	3,099.76	3,100.97	3,100.73	6.63	6.53	-166.37	-11.53	20.21	48.94	35.82	13.118	3.731	
3,200.00	3,199.75	3,200.96	3,200.71	6.85	6.75	-165.58	-12.27	18.63	49.28	35.72	13.553	3.636	
3,300.00	3,299.73	3,300.96	3,300.69	7.07	6.96	-164.80	-13.01	17.05	49.62	35.63	13.990	3.547	
3,400.00	3,399.72	3,400.96	3,400.68	7.29	7.18	-164.04	-13.75	15.47	49.98	35.55	14.427	3.464	
3,500.00	3,499.70	3,500.96	3,500.66	7.51	7.40	-163.28	-14.48	13.89	50.34	35.48	14.866	3.386	
3,600.00	3,599.69	3,600.95	3,600.64	7.73	7.62	-162.54	-15.22	12.31	50.72	35.41	15.305	3.314	
3,700.00	3,699.67	3,700.95	3,700.62	7.95	7.84	-161.80	-15.96	10.72	51.10	35.35	15.746	3.245	
3,800.00	3,799.66	3,800.95	3,800.60	8.17	8.06	-161.08	-16.70	9.14	51.49	35.30	16.187	3.181	
3,900.00	3,899.64	3,900.94	3,900.59	8.40	8.28	-160.37	-17.43	7.56	51.89	35.26	16.629	3.120	
4,000.00	3,999.63	4,000.94	4,000.57	8.62	8.50	-159.67	-18.17	5.98	52.29	35.22	17.071	3.063	
4,100.00	4,099.61	4,100.94	4,100.55	8.84	8.72	-158.98	-18.91	4.40	52.70	35.19	17.514	3.009	
4,200.00	4,199.60	4,200.94	4,200.53	9.06	8.95	-158.30	-19.65	2.82	53.13	35.17	17.958	2.958	
4,300.00	4,299.58	4,300.93	4,300.51	9.29	9.17	-157.63	-20.38	1.23	53.55	35.15	18.402	2.910	
4,400.00	4,399.57	4,400.93	4,400.50	9.51	9.39	-156.97	-21.12	-0.35	53.99	35.14	18.847	2.865	
4,500.00	4,499.55	4,500.93	4,500.48	9.74	9.61	-156.32	-21.86	-1.93	54.43	35.14	19.293	2.821 ES	
4,600.00	4,599.53	4,600.92	4,600.46	9.96	9.84	-155.69	-22.60	-3.51	54.88	35.14	19.738	2.780	
4,700.00	4,699.52	4,700.92	4,700.44	10.18	10.06	-155.06	-23.33	-5.09	55.34	35.15	20.184	2.742	
4,800.00	4,799.50	4,800.92	4,800.42	10.41	10.28	-154.44	-24.07	-6.67	55.80	35.17	20.631	2.705	
4,900.00	4,899.49	4,900.92	4,900.40	10.63	10.51	-153.84	-24.81	-8.26	56.27	35.19	21.078	2.670	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #706H
Project:	Eddy County, NM (NAD27) NMZ	**TVD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Reference Site:	Littlefield 33 Fed COM	**MD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#706H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Littlefield 33 Fed COM - #806H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

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

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,000.00	4,999.47	5,000.91	5,000.39	10.86	10.73	-153.24	-25.55	-9.84	56.74	35.22	21.525	2.636	
5,100.00	5,099.46	5,100.91	5,100.37	11.08	10.95	-152.66	-26.28	-11.42	57.22	35.25	21.973	2.604	
5,200.00	5,199.44	5,200.91	5,200.35	11.31	11.18	-152.08	-27.02	-13.00	57.71	35.29	22.421	2.574	
5,300.00	5,299.43	5,300.90	5,300.33	11.53	11.40	-151.52	-27.76	-14.58	58.20	35.34	22.869	2.545	
5,400.00	5,399.41	5,400.90	5,400.31	11.75	11.62	-150.96	-28.50	-16.16	58.70	35.38	23.318	2.518	
5,500.00	5,499.40	5,500.90	5,500.30	11.98	11.85	-150.41	-29.23	-17.75	59.21	35.44	23.766	2.491	
5,600.00	5,599.38	5,600.90	5,600.28	12.20	12.07	-149.87	-29.97	-19.33	59.71	35.50	24.215	2.466	
5,700.00	5,699.37	5,700.89	5,700.26	12.43	12.30	-149.34	-30.71	-20.91	60.23	35.56	24.665	2.442	
5,800.00	5,799.35	5,800.89	5,800.24	12.65	12.52	-148.82	-31.45	-22.49	60.75	35.63	25.114	2.419	
5,900.00	5,899.34	5,900.89	5,900.22	12.88	12.75	-148.31	-32.18	-24.07	61.27	35.71	25.564	2.397	
6,000.00	5,999.32	6,000.88	6,000.21	13.11	12.97	-147.81	-32.92	-25.65	61.80	35.79	26.014	2.376	
6,100.00	6,099.31	6,100.88	6,100.19	13.33	13.20	-147.32	-33.66	-27.24	62.34	35.87	26.464	2.355	
6,200.00	6,199.29	6,200.88	6,200.17	13.56	13.42	-146.83	-34.40	-28.82	62.87	35.96	26.914	2.336	
6,300.00	6,299.28	6,300.88	6,300.15	13.78	13.65	-146.36	-35.13	-30.40	63.42	36.05	27.365	2.317	
6,400.00	6,399.26	6,400.87	6,400.13	14.01	13.87	-145.89	-35.87	-31.98	63.96	36.15	27.815	2.300	
6,500.00	6,499.25	6,500.87	6,500.12	14.23	14.10	-145.43	-36.61	-33.56	64.51	36.25	28.266	2.282	
6,600.00	6,599.23	6,600.87	6,600.10	14.46	14.32	-144.97	-37.35	-35.14	65.07	36.35	28.717	2.266	
6,700.00	6,699.21	6,700.86	6,700.08	14.68	14.55	-144.53	-38.08	-36.73	65.63	36.46	29.168	2.250	
6,800.00	6,799.20	6,800.86	6,800.06	14.91	14.77	-144.09	-38.82	-38.31	66.19	36.57	29.619	2.235	
6,900.00	6,899.18	6,900.86	6,900.04	15.14	15.00	-143.66	-39.56	-39.89	66.76	36.69	30.071	2.220	
7,000.00	6,999.17	7,000.86	7,000.03	15.36	15.22	-143.24	-40.30	-41.47	67.33	36.81	30.522	2.206	
7,100.00	7,099.15	7,100.85	7,100.01	15.59	15.45	-142.82	-41.03	-43.05	67.90	36.93	30.974	2.192	
7,200.00	7,199.14	7,200.85	7,199.99	15.81	15.68	-142.41	-41.77	-44.63	68.48	37.06	31.425	2.179	
7,300.00	7,299.12	7,300.85	7,299.97	16.04	15.90	-142.01	-42.51	-46.22	69.06	37.18	31.877	2.167	
7,400.00	7,399.11	7,400.84	7,399.95	16.26	16.13	-141.61	-43.25	-47.80	69.65	37.32	32.329	2.154	
7,500.00	7,499.09	7,500.84	7,499.93	16.49	16.35	-141.22	-43.98	-49.38	70.23	37.45	32.781	2.143	
7,600.00	7,599.08	7,600.84	7,599.92	16.72	16.58	-140.84	-44.72	-50.96	70.83	37.59	33.233	2.131	
7,700.00	7,699.06	7,700.84	7,699.90	16.94	16.80	-140.47	-45.46	-52.54	71.42	37.73	33.685	2.120	
7,800.00	7,799.05	7,800.83	7,799.88	17.17	17.03	-140.10	-46.20	-54.12	72.02	37.88	34.137	2.110	
7,900.00	7,899.03	7,900.83	7,899.86	17.39	17.26	-139.73	-46.93	-55.71	72.62	38.03	34.590	2.099	
8,000.00	7,999.02	8,000.83	7,999.84	17.62	17.48	-139.38	-47.67	-57.29	73.22	38.18	35.042	2.089	
8,100.00	8,099.00	8,100.82	8,099.83	17.85	17.71	-139.02	-48.41	-58.87	73.82	38.33	35.495	2.080	
8,200.00	8,198.99	8,200.82	8,199.81	18.07	17.93	-138.68	-49.15	-60.45	74.43	38.49	35.947	2.071	
8,300.00	8,298.97	8,300.82	8,299.79	18.30	18.16	-138.34	-49.88	-62.03	75.04	38.64	36.400	2.062	
8,400.00	8,398.96	8,400.82	8,399.77	18.53	18.39	-138.00	-50.62	-63.61	75.66	38.81	36.852	2.053	
8,500.00	8,498.94	8,500.81	8,499.75	18.75	18.61	-137.67	-51.36	-65.20	76.27	38.97	37.305	2.045	
8,600.00	8,598.93	8,600.81	8,599.74	18.98	18.84	-137.35	-52.10	-66.78	76.89	39.14	37.758	2.036	
8,700.00	8,698.91	8,700.81	8,699.72	19.20	19.07	-137.03	-52.84	-68.36	77.51	39.30	38.211	2.029	
8,800.00	8,798.90	8,800.80	8,799.70	19.43	19.29	-136.71	-53.57	-69.94	78.14	39.47	38.664	2.021	
8,900.00	8,898.88	8,900.80	8,899.68	19.66	19.52	-136.41	-54.31	-71.52	78.76	39.65	39.117	2.014	
9,000.00	8,998.86	9,000.80	8,999.66	19.88	19.74	-136.10	-55.05	-73.10	79.39	39.82	39.570	2.006	
9,100.00	9,098.85	9,100.80	9,099.65	20.11	19.97	-135.80	-55.79	-74.69	80.02	40.00	40.023	1.999	
9,200.00	9,198.83	9,200.79	9,199.63	20.34	20.20	-135.51	-56.52	-76.27	80.65	40.18	40.476	1.993	
9,300.00	9,298.82	9,300.79	9,299.61	20.56	20.42	-135.22	-57.26	-77.85	81.29	40.36	40.929	1.986	
9,400.00	9,398.80	9,400.79	9,399.59	20.79	20.65	-134.93	-58.00	-79.43	81.93	40.54	41.382	1.980	
9,434.54	9,433.34	9,435.33	9,434.13	20.87	20.73	-134.83	-58.25	-79.98	82.15	40.61	41.539	1.978	
9,501.21	9,500.00	9,501.51	9,500.30	21.01	20.87	135.25	-58.49	-80.49	82.36	40.54	41.820	1.969	
9,507.34	9,506.13	9,507.64	9,506.43	21.02	20.88	135.25	-58.49	-80.49	82.36	40.52	41.844	1.968	SF
9,550.00	9,548.75	9,550.25	9,549.05	21.11	20.96	165.77	-58.49	-80.49	84.05	42.04	42.017	2.000	
9,600.00	9,598.31	9,600.19	9,598.61	21.23	21.06	166.62	-58.49	-80.49	90.35	48.12	42.225	2.140	
9,650.00	9,647.02	9,648.52	9,647.32	21.34	21.15	167.83	-58.49	-80.49	101.28	58.85	42.431	2.387	
9,700.00	9,694.43	9,704.06	9,694.73	21.46	21.26	169.13	-58.49	-80.49	116.80	74.16	42.649	2.739	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #706H
Project:	Eddy County, NM (NAD27) NMZ	**TVD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Reference Site:	Littlefield 33 Fed COM	**MD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#706H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Littlefield 33 Fed COM - #806H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

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

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
9,750.00	9,740.11	9,741.62	9,740.41	21.58	21.33	170.33	-58.49	-80.49	136.82	93.99	42.828	3.195	
9,800.00	9,783.64	9,785.14	9,783.94	21.71	21.42	171.34	-58.49	-80.49	161.15	118.13	43.014	3.746	
9,850.00	9,824.61	9,826.11	9,824.91	21.85	21.50	172.14	-58.49	-80.49	189.58	146.39	43.189	4.389	
9,900.00	9,862.65	9,864.15	9,862.95	22.00	21.57	172.71	-58.49	-80.49	221.83	178.48	43.352	5.117	
9,950.00	9,897.40	9,901.09	9,897.70	22.19	21.64	173.07	-58.49	-80.49	257.62	214.12	43.504	5.922	
10,000.00	9,928.55	9,930.06	9,928.85	22.41	21.70	173.22	-58.49	-80.49	296.59	252.96	43.631	6.798	
10,050.00	9,955.82	9,957.32	9,956.12	22.67	21.75	173.11	-58.49	-80.49	338.40	294.65	43.747	7.735	
10,100.00	9,978.94	9,980.44	9,979.24	22.97	21.80	172.68	-58.49	-80.49	382.63	338.79	43.844	8.727	
10,150.00	9,997.71	10,000.79	9,998.01	23.31	21.84	171.73	-58.49	-80.49	428.90	384.97	43.925	9.764	
10,200.00	10,011.95	10,013.46	10,012.25	23.70	21.86	169.73	-58.49	-80.49	476.76	432.77	43.982	10.840	
10,250.00	10,021.54	10,023.04	10,021.84	24.14	21.88	164.82	-58.49	-80.49	525.77	481.74	44.024	11.943	
10,300.00	10,026.38	10,027.88	10,026.68	24.61	21.89	143.82	-58.49	-80.49	575.48	531.43	44.048	13.065	
10,323.61	10,027.00	10,028.50	10,027.30	24.85	21.89	96.08	-58.49	-80.49	599.06	555.01	44.054	13.598	
10,400.00	10,027.28	10,028.78	10,027.58	25.67	21.89	93.79	-58.49	-80.49	675.37	631.31	44.065	15.327	
10,500.00	10,027.65	10,029.15	10,027.95	26.84	21.89	92.62	-58.49	-80.49	775.14	731.06	44.080	17.585	
10,600.00	10,028.02	11,479.84	10,863.93	28.11	28.68	169.16	730.24	-368.56	851.43	808.95	42.475	20.045	
10,700.00	10,028.40	11,572.79	10,864.49	29.46	29.76	168.04	820.45	-390.92	855.08	811.98	43.093	19.842	
10,800.00	10,028.78	11,665.26	10,865.05	30.86	30.89	166.95	910.88	-410.25	858.99	815.19	43.804	19.610	
10,900.00	10,029.16	11,757.27	10,865.61	32.31	32.04	165.88	1,001.42	-426.58	863.16	818.55	44.606	19.351	
11,000.00	10,029.54	11,848.84	10,866.16	33.78	33.22	164.83	1,092.00	-439.94	867.54	822.05	45.497	19.068	
11,100.00	10,029.92	11,939.97	10,866.71	35.28	34.41	163.82	1,182.54	-450.35	872.13	825.65	46.473	18.766	
11,200.00	10,030.30	12,030.70	10,867.26	36.78	35.62	162.83	1,272.94	-457.85	876.89	829.36	47.529	18.450	
11,300.00	10,030.68	12,121.01	10,867.80	38.28	36.83	161.87	1,363.14	-462.47	881.80	833.14	48.656	18.123	
11,400.00	10,031.06	12,210.95	10,868.33	39.78	38.05	160.95	1,453.05	-464.24	886.83	836.98	49.848	17.791	
11,500.00	10,031.44	12,306.03	10,868.90	41.28	39.35	160.03	1,548.13	-463.61	891.79	840.59	51.196	17.419	
11,600.00	10,031.82	12,405.43	10,869.49	42.76	40.74	159.30	1,647.52	-462.69	895.81	843.18	52.633	17.020	
11,700.00	10,032.19	12,505.15	10,870.08	44.23	42.16	158.80	1,747.23	-461.77	898.69	844.63	54.058	16.624	
11,800.00	10,032.56	12,605.06	10,870.67	45.69	43.62	158.54	1,847.14	-460.85	900.34	844.90	55.439	16.240	
11,863.76	10,032.80	12,668.82	10,871.05	46.60	44.57	158.49	1,910.90	-460.26	900.73	844.44	56.289	16.002	
11,900.00	10,032.93	12,705.06	10,871.27	47.12	45.11	158.49	1,947.13	-459.93	900.80	844.04	56.762	15.870	
12,000.00	10,033.30	12,805.06	10,871.86	48.58	46.63	158.49	2,047.13	-459.00	901.01	842.92	58.094	15.509	
12,100.00	10,033.67	12,905.06	10,872.45	50.06	48.17	158.50	2,147.12	-458.08	901.22	841.76	59.457	15.157	
12,200.00	10,034.04	13,005.06	10,873.05	51.56	49.73	158.50	2,247.11	-457.16	901.42	840.57	60.852	14.813	
12,300.00	10,034.40	13,105.06	10,873.64	53.09	51.31	158.51	2,347.11	-456.23	901.63	839.36	62.272	14.479	
12,400.00	10,034.77	13,205.06	10,874.24	54.63	52.90	158.52	2,447.10	-455.31	901.84	838.12	63.719	14.153	
12,500.00	10,035.14	13,305.06	10,874.83	56.20	54.51	158.52	2,547.09	-454.39	902.04	836.85	65.189	13.837	
12,600.00	10,035.51	13,405.06	10,875.42	57.78	56.14	158.53	2,647.09	-453.46	902.25	835.57	66.682	13.531	
12,700.00	10,035.88	13,505.06	10,876.02	59.37	57.78	158.53	2,747.08	-452.54	902.46	834.26	68.195	13.233	
12,800.00	10,036.25	13,605.06	10,876.61	60.98	59.43	158.54	2,847.08	-451.62	902.66	832.94	69.727	12.946	
12,900.00	10,036.61	13,705.06	10,877.20	62.61	61.09	158.54	2,947.07	-450.69	902.87	831.59	71.279	12.667	
13,000.00	10,036.98	13,805.06	10,877.80	64.24	62.77	158.55	3,047.06	-449.77	903.08	830.23	72.846	12.397	
13,100.00	10,037.35	13,905.06	10,878.39	65.89	64.45	158.56	3,147.06	-448.85	903.28	828.85	74.430	12.136	
13,200.00	10,037.72	14,005.05	10,878.98	67.54	66.14	158.56	3,247.05	-447.92	903.49	827.46	76.028	11.884	
13,300.00	10,038.09	14,105.05	10,879.58	69.21	67.84	158.57	3,347.04	-447.00	903.70	826.06	77.640	11.640	
13,400.00	10,038.46	14,205.05	10,880.17	70.88	69.55	158.57	3,447.04	-446.08	903.91	824.64	79.265	11.404	
13,500.00	10,038.83	14,305.05	10,880.76	72.57	71.26	158.58	3,547.03	-445.15	904.11	823.21	80.902	11.175	
13,600.00	10,039.19	14,405.05	10,881.36	74.26	72.98	158.58	3,647.02	-444.23	904.32	821.77	82.551	10.955	
13,700.00	10,039.56	14,505.05	10,881.95	75.96	74.71	158.59	3,747.02	-443.31	904.53	820.32	84.210	10.741	
13,800.00	10,039.93	14,605.05	10,882.55	77.66	76.44	158.60	3,847.01	-442.38	904.73	818.85	85.880	10.535	
13,900.00	10,040.30	14,705.05	10,883.14	79.38	78.18	158.60	3,947.01	-441.46	904.94	817.38	87.559	10.335	
14,000.00	10,040.67	14,805.05	10,883.73	81.09	79.92	158.61	4,047.00	-440.54	905.15	815.90	89.247	10.142	
14,100.00	10,041.04	14,905.05	10,884.33	82.82	81.67	158.61	4,146.99	-439.61	905.35	814.41	90.943	9.955	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #706H
Project:	Eddy County, NM (NAD27) NMZ	**TVD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Reference Site:	Littlefield 33 Fed COM	**MD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#706H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

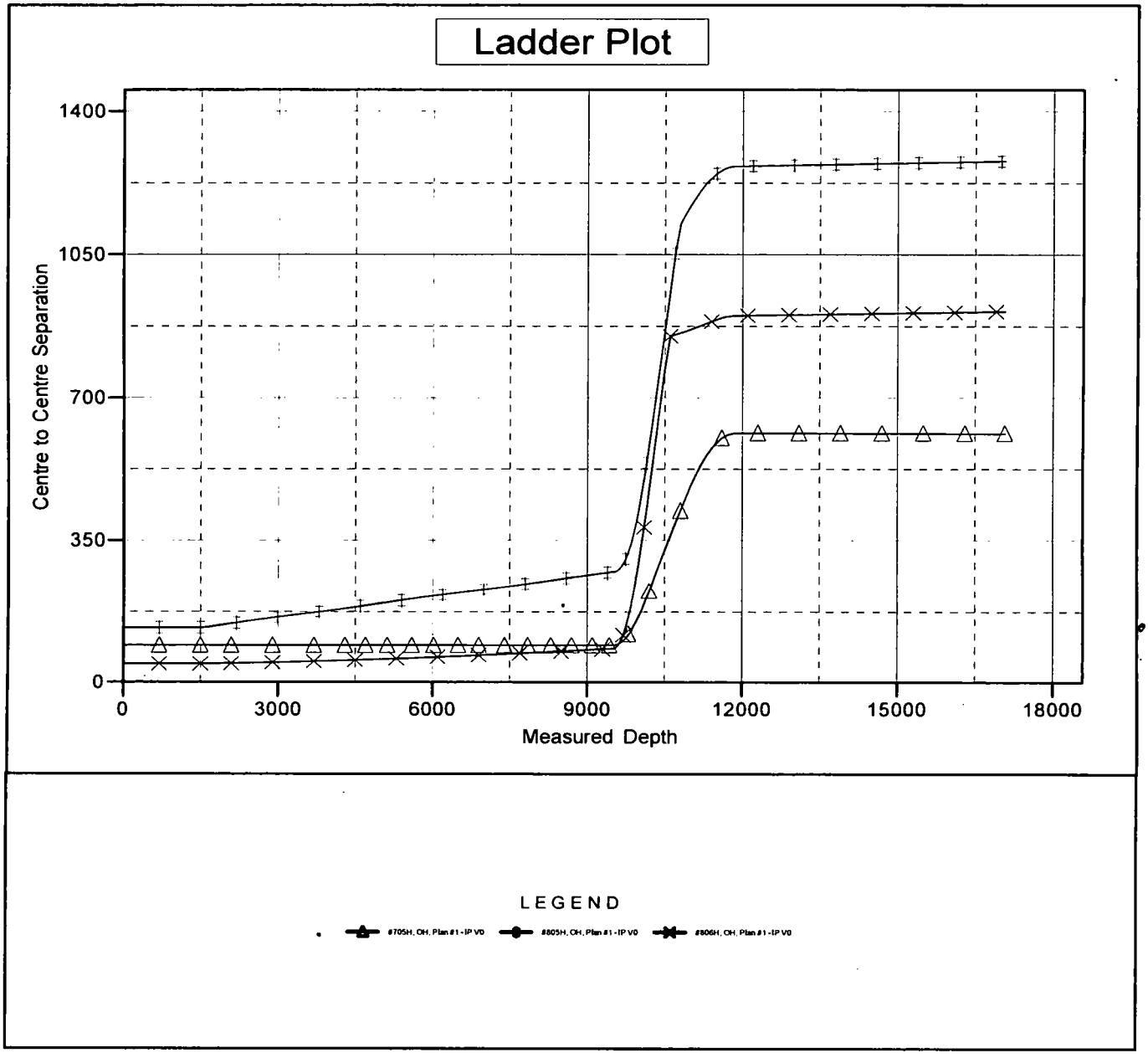
Offset Design Littlefield 33 Fed COM - #806H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

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

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
14,200.00	10,041.40	15,005.05	10,884.92	84.55	83.42	158.62	4,246.99	-438.69	905.56	812.91	92.647	9.774	
14,300.00	10,041.77	15,105.05	10,885.51	86.28	85.17	158.62	4,346.98	-437.77	905.77	811.41	94.359	9.599	
14,400.00	10,042.14	15,205.05	10,886.11	88.02	86.93	158.63	4,446.97	-436.84	905.97	809.90	96.078	9.430	
14,500.00	10,042.51	15,305.05	10,886.70	89.76	88.70	158.63	4,546.97	-435.92	906.18	808.38	97.803	9.265	
14,600.00	10,042.88	15,405.05	10,887.29	91.51	90.46	158.64	4,646.96	-435.00	906.39	806.85	99.535	9.106	
14,700.00	10,043.25	15,505.05	10,887.89	93.26	92.23	158.65	4,746.96	-434.07	906.60	805.32	101.272	8.952	
14,800.00	10,043.61	15,605.05	10,888.48	95.01	94.00	158.65	4,846.95	-433.15	906.80	803.79	103.015	8.803	
14,900.00	10,043.98	15,705.05	10,889.08	96.77	95.78	158.66	4,946.94	-432.23	907.01	802.25	104.764	8.658	
15,000.00	10,044.35	15,805.05	10,889.67	98.53	97.56	158.66	5,046.94	-431.30	907.22	800.70	106.517	8.517	
15,100.00	10,044.72	15,905.05	10,890.26	100.30	99.34	158.67	5,146.93	-430.38	907.42	799.15	108.276	8.381	
15,200.00	10,045.09	16,005.05	10,890.86	102.06	101.12	158.67	5,246.92	-429.46	907.63	797.59	110.038	8.248	
15,300.00	10,045.46	16,105.05	10,891.45	103.83	102.90	158.68	5,346.92	-428.53	907.84	796.03	111.805	8.120	
15,400.00	10,045.82	16,205.05	10,892.04	105.61	104.69	158.69	5,446.91	-427.61	908.05	794.47	113.576	7.995	
15,500.00	10,046.19	16,305.05	10,892.64	107.38	106.48	158.69	5,546.91	-426.68	908.25	792.90	115.352	7.874	
15,600.00	10,046.56	16,405.05	10,893.23	109.16	108.27	158.70	5,646.90	-425.76	908.46	791.33	117.130	7.756	
15,700.00	10,046.93	16,505.05	10,893.82	110.94	110.06	158.70	5,746.89	-424.84	908.67	789.75	118.912	7.641	
15,800.00	10,047.30	16,605.05	10,894.42	112.72	111.86	158.71	5,846.89	-423.91	908.87	788.18	120.698	7.530	
15,900.00	10,047.67	16,705.05	10,895.01	114.51	113.65	158.71	5,946.88	-422.99	909.08	786.59	122.486	7.422	
16,000.00	10,048.04	16,805.05	10,895.60	116.29	115.45	158.72	6,046.87	-422.07	909.29	785.01	124.278	7.317	
16,100.00	10,048.40	16,905.05	10,896.20	118.08	117.25	158.72	6,146.87	-421.14	909.49	783.42	126.072	7.214	
16,200.00	10,048.77	17,005.05	10,896.79	119.87	119.05	158.73	6,246.86	-420.22	909.70	781.83	127.870	7.114	
16,300.00	10,049.14	17,105.05	10,897.39	121.66	120.85	158.74	6,346.86	-419.30	909.91	780.24	129.669	7.017	
16,400.00	10,049.51	17,205.05	10,897.98	123.46	122.66	158.74	6,446.85	-418.37	910.12	778.64	131.472	6.923	
16,500.00	10,049.88	17,305.05	10,898.57	125.25	124.46	158.75	6,546.84	-417.45	910.32	777.05	133.276	6.830	
16,600.00	10,050.25	17,405.05	10,899.17	127.05	126.27	158.75	6,646.84	-416.53	910.53	775.45	135.083	6.741	
16,700.00	10,050.61	17,505.05	10,899.76	128.84	128.08	158.76	6,746.83	-415.60	910.74	773.85	136.892	6.653	
16,800.00	10,050.98	17,605.05	10,900.35	130.64	129.88	158.76	6,846.82	-414.68	910.95	772.24	138.703	6.568	
16,900.00	10,051.35	17,705.05	10,900.95	132.44	131.69	158.77	6,946.82	-413.76	911.15	770.64	140.516	6.484	
17,000.00	10,051.72	17,805.05	10,901.54	134.25	133.50	158.77	7,046.81	-412.83	911.36	769.03	142.330	6.403	
17,076.23	10,052.00	17,881.28	10,901.99	135.62	134.88	158.78	7,123.04	-412.13	911.52	767.80	143.715	6.343	

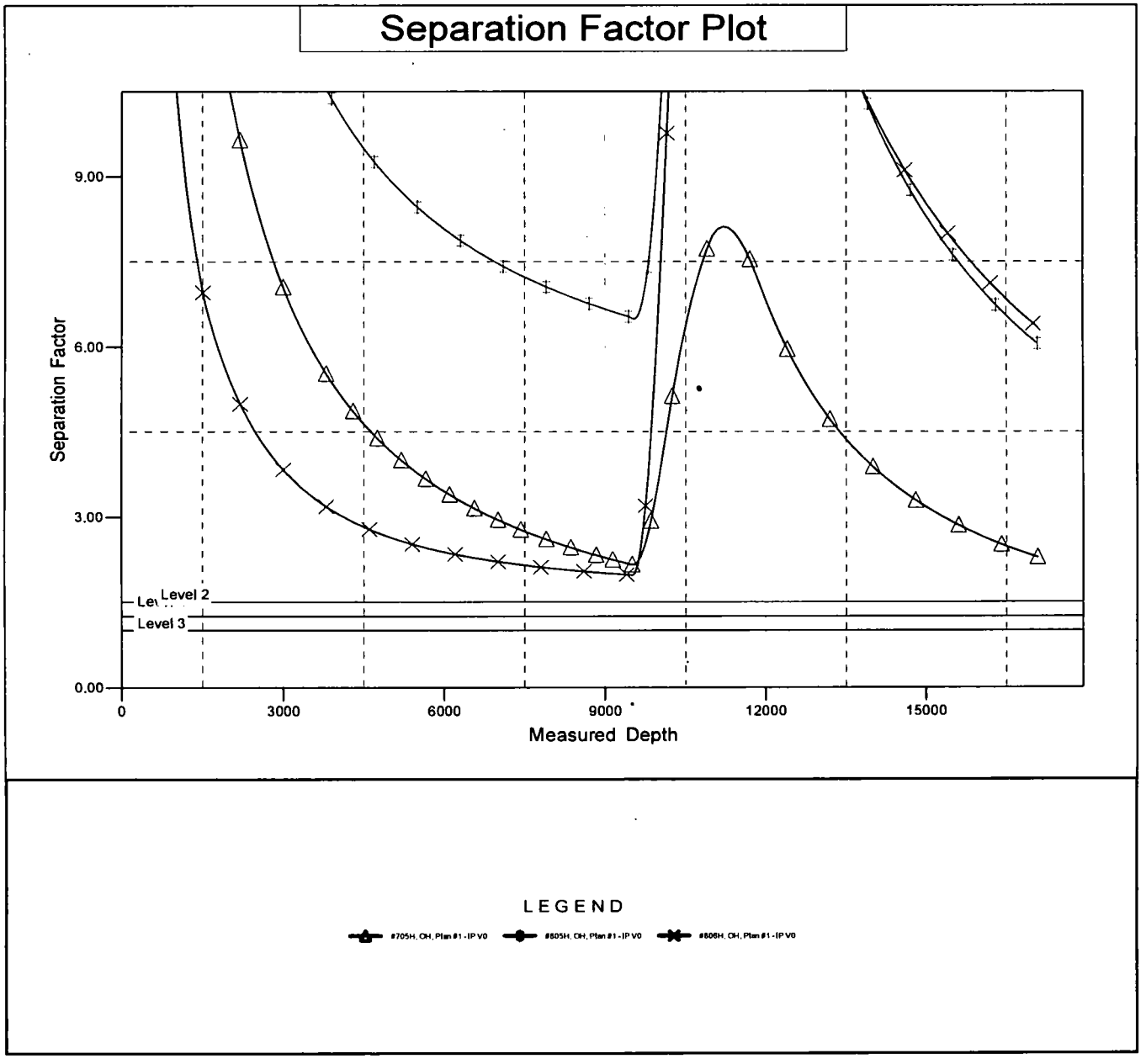
Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #706H
Project:	Eddy County, NM (NAD27) NMZ	**TVD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Reference Site:	Littlefield 33 Fed COM	**MD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#706H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to RKB @ 2882.70usft (Latshaw 44 - KB	Coordinates are relative to: #706H
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: 0.18°



Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #706H
Project:	Eddy County, NM (NAD27) NMZ	**TVD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Reference Site:	Littlefield 33 Fed COM	**MD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#706H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to RKB @ 2882.70usft (Latshaw 44 - KB	Coordinates are relative to: #706H
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: 0.18°



COG OPERATING, LLC

Eddy County, NM (NAD27) NMZ
Littlefield 33 Fed COM
#706H

OH

Plan: Plan #1 - IP

Standard Planning Report

12 March, 2018

Database:	EDM 5000.14 Single User Db	**Local Co-ordinate Reference:**	Well #706H
Company:	COG OPERATING, LLC	**TVD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Project:	Eddy County, NM (NAD27) NMZ	**MD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Site:	Littlefield 33 Fed COM	**North Reference:**	Grid
Well:	#706H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - IP		

Project	Eddy County, NM (NAD27) NMZ		
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	Littlefield 33 Fed COM				
Site Position:		**Northing:**	364,187.75 usft	**Latitude:**	32° 0' 2.885 N
From:	Map	**Easting:**	606,400.58 usft	**Longitude:**	103° 59' 24.352 W
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.18 °

Well	#706H					
Well Position	**+N/-S**	0.00 usft	**Northing:**	364,187.75 usft	**Latitude:**	32° 0' 2.885 N
	+E/-W	0.00 usft	**Easting:**	606,400.58 usft	**Longitude:**	103° 59' 24.352 W
Position Uncertainty		0.00 usft	**Wellhead Elevation:**		**Ground Level:**	2,857.70 usft

Wellbore	OH				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	03/12/18	7.05	59.78	47,689.66951784

Design	Plan #1 - IP				
Audit Notes:					
Version:		**Phase:**	PLAN	**Tie On Depth:**	0.00
Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**	
	0.00	0.00	0.00	0.53	

Plan Survey Tool Program **Date** 03/12/18

	Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	17,076.23	Plan #1 - IP (OH)	MWD	
				MWD v3:standard declination	

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,566.67	1.00	270.00	1,566.66	0.00	-0.58	1.50	1.50	0.00	270.00	
9,434.54	1.00	270.00	9,433.34	0.00	-137.90	0.00	0.00	0.00	0.00	
9,501.21	0.00	0.00	9,500.00	0.00	-138.48	1.50	-1.50	0.00	180.00	
9,507.34	0.00	0.00	9,506.13	0.00	-138.48	0.00	0.00	0.00	0.00	
10,323.61	89.79	329.73	10,027.00	448.21	-400.07	11.00	11.00	0.00	329.73	
11,863.76	89.79	0.53	10,032.80	1,918.92	-790.53	2.00	0.00	2.00	90.06	
17,076.23	89.79	0.53	10,052.00	7,131.13	-742.01	0.00	0.00	0.00	0.00	PBHL(L33FC#706H)

Database:	EDM 5000.14 Single User Db	**Local Co-ordinate Reference:**	Well #706H
Company:	COG OPERATING, LLC	**TVD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Project:	Eddy County, NM (NAD27) NMZ	**MD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Site:	Littlefield 33 Fed COM	**North Reference:**	Grid
Well:	#706H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - IP		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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
1,566.67	1.00	270.00	1,566.66	0.00	-0.58	-0.01	1.50	1.50	0.00
1,600.00	1.00	270.00	1,599.99	0.00	-1.16	-0.01	0.00	0.00	0.00
1,700.00	1.00	270.00	1,699.98	0.00	-2.91	-0.03	0.00	0.00	0.00
1,800.00	1.00	270.00	1,799.96	0.00	-4.65	-0.04	0.00	0.00	0.00
1,900.00	1.00	270.00	1,899.95	0.00	-6.40	-0.06	0.00	0.00	0.00
2,000.00	1.00	270.00	1,999.93	0.00	-8.14	-0.08	0.00	0.00	0.00
2,100.00	1.00	270.00	2,099.92	0.00	-9.89	-0.09	0.00	0.00	0.00
2,200.00	1.00	270.00	2,199.90	0.00	-11.63	-0.11	0.00	0.00	0.00
2,300.00	1.00	270.00	2,299.88	0.00	-13.38	-0.12	0.00	0.00	0.00
2,400.00	1.00	270.00	2,399.87	0.00	-15.13	-0.14	0.00	0.00	0.00
2,500.00	1.00	270.00	2,499.85	0.00	-16.87	-0.16	0.00	0.00	0.00
2,600.00	1.00	270.00	2,599.84	0.00	-18.62	-0.17	0.00	0.00	0.00
2,700.00	1.00	270.00	2,699.82	0.00	-20.36	-0.19	0.00	0.00	0.00
2,800.00	1.00	270.00	2,799.81	0.00	-22.11	-0.20	0.00	0.00	0.00
2,900.00	1.00	270.00	2,899.79	0.00	-23.85	-0.22	0.00	0.00	0.00
3,000.00	1.00	270.00	2,999.78	0.00	-25.60	-0.24	0.00	0.00	0.00
3,100.00	1.00	270.00	3,099.76	0.00	-27.34	-0.25	0.00	0.00	0.00
3,200.00	1.00	270.00	3,199.75	0.00	-29.09	-0.27	0.00	0.00	0.00
3,300.00	1.00	270.00	3,299.73	0.00	-30.83	-0.29	0.00	0.00	0.00
3,400.00	1.00	270.00	3,399.72	0.00	-32.58	-0.30	0.00	0.00	0.00
3,500.00	1.00	270.00	3,499.70	0.00	-34.32	-0.32	0.00	0.00	0.00
3,600.00	1.00	270.00	3,599.69	0.00	-36.07	-0.33	0.00	0.00	0.00
3,700.00	1.00	270.00	3,699.67	0.00	-37.81	-0.35	0.00	0.00	0.00
3,800.00	1.00	270.00	3,799.66	0.00	-39.56	-0.37	0.00	0.00	0.00
3,900.00	1.00	270.00	3,899.64	0.00	-41.30	-0.38	0.00	0.00	0.00
4,000.00	1.00	270.00	3,999.63	0.00	-43.05	-0.40	0.00	0.00	0.00
4,100.00	1.00	270.00	4,099.61	0.00	-44.79	-0.41	0.00	0.00	0.00
4,200.00	1.00	270.00	4,199.60	0.00	-46.54	-0.43	0.00	0.00	0.00
4,300.00	1.00	270.00	4,299.58	0.00	-48.29	-0.45	0.00	0.00	0.00
4,400.00	1.00	270.00	4,399.57	0.00	-50.03	-0.46	0.00	0.00	0.00
4,500.00	1.00	270.00	4,499.55	0.00	-51.78	-0.48	0.00	0.00	0.00
4,600.00	1.00	270.00	4,599.53	0.00	-53.52	-0.50	0.00	0.00	0.00
4,700.00	1.00	270.00	4,699.52	0.00	-55.27	-0.51	0.00	0.00	0.00
4,800.00	1.00	270.00	4,799.50	0.00	-57.01	-0.53	0.00	0.00	0.00
4,900.00	1.00	270.00	4,899.49	0.00	-58.76	-0.54	0.00	0.00	0.00
5,000.00	1.00	270.00	4,999.47	0.00	-60.50	-0.56	0.00	0.00	0.00
5,100.00	1.00	270.00	5,099.46	0.00	-62.25	-0.58	0.00	0.00	0.00
5,200.00	1.00	270.00	5,199.44	0.00	-63.99	-0.59	0.00	0.00	0.00

Database:	EDM 5000.14 Single User Db	**Local Co-ordinate Reference:**	Well #706H
Company:	COG OPERATING, LLC	**TVD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Project:	Eddy County, NM (NAD27) NMZ	**MD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Site:	Littlefield 33 Fed COM	**North Reference:**	Grid
Well:	#706H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - IP		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,300.00	1.00	270.00	5,299.43	0.00	-65.74	-0.61	0.00	0.00	0.00
5,400.00	1.00	270.00	5,399.41	0.00	-67.48	-0.62	0.00	0.00	0.00
5,500.00	1.00	270.00	5,499.40	0.00	-69.23	-0.64	0.00	0.00	0.00
5,600.00	1.00	270.00	5,599.38	0.00	-70.97	-0.66	0.00	0.00	0.00
5,700.00	1.00	270.00	5,699.37	0.00	-72.72	-0.67	0.00	0.00	0.00
5,800.00	1.00	270.00	5,799.35	0.00	-74.46	-0.69	0.00	0.00	0.00
5,900.00	1.00	270.00	5,899.34	0.00	-76.21	-0.70	0.00	0.00	0.00
6,000.00	1.00	270.00	5,999.32	0.00	-77.95	-0.72	0.00	0.00	0.00
6,100.00	1.00	270.00	6,099.31	0.00	-79.70	-0.74	0.00	0.00	0.00
6,200.00	1.00	270.00	6,199.29	0.00	-81.44	-0.75	0.00	0.00	0.00
6,300.00	1.00	270.00	6,299.28	0.00	-83.19	-0.77	0.00	0.00	0.00
6,400.00	1.00	270.00	6,399.26	0.00	-84.94	-0.79	0.00	0.00	0.00
6,500.00	1.00	270.00	6,499.25	0.00	-86.68	-0.80	0.00	0.00	0.00
6,600.00	1.00	270.00	6,599.23	0.00	-88.43	-0.82	0.00	0.00	0.00
6,700.00	1.00	270.00	6,699.21	0.00	-90.17	-0.83	0.00	0.00	0.00
6,800.00	1.00	270.00	6,799.20	0.00	-91.92	-0.85	0.00	0.00	0.00
6,900.00	1.00	270.00	6,899.18	0.00	-93.66	-0.87	0.00	0.00	0.00
7,000.00	1.00	270.00	6,999.17	0.00	-95.41	-0.88	0.00	0.00	0.00
7,100.00	1.00	270.00	7,099.15	0.00	-97.15	-0.90	0.00	0.00	0.00
7,200.00	1.00	270.00	7,199.14	0.00	-98.90	-0.91	0.00	0.00	0.00
7,300.00	1.00	270.00	7,299.12	0.00	-100.64	-0.93	0.00	0.00	0.00
7,400.00	1.00	270.00	7,399.11	0.00	-102.39	-0.95	0.00	0.00	0.00
7,500.00	1.00	270.00	7,499.09	0.00	-104.13	-0.96	0.00	0.00	0.00
7,600.00	1.00	270.00	7,599.08	0.00	-105.88	-0.98	0.00	0.00	0.00
7,700.00	1.00	270.00	7,699.06	0.00	-107.62	-1.00	0.00	0.00	0.00
7,800.00	1.00	270.00	7,799.05	0.00	-109.37	-1.01	0.00	0.00	0.00
7,900.00	1.00	270.00	7,899.03	0.00	-111.11	-1.03	0.00	0.00	0.00
8,000.00	1.00	270.00	7,999.02	0.00	-112.86	-1.04	0.00	0.00	0.00
8,100.00	1.00	270.00	8,099.00	0.00	-114.60	-1.06	0.00	0.00	0.00
8,200.00	1.00	270.00	8,198.99	0.00	-116.35	-1.08	0.00	0.00	0.00
8,300.00	1.00	270.00	8,298.97	0.00	-118.09	-1.09	0.00	0.00	0.00
8,400.00	1.00	270.00	8,398.96	0.00	-119.84	-1.11	0.00	0.00	0.00
8,500.00	1.00	270.00	8,498.94	0.00	-121.59	-1.12	0.00	0.00	0.00
8,600.00	1.00	270.00	8,598.93	0.00	-123.33	-1.14	0.00	0.00	0.00
8,700.00	1.00	270.00	8,698.91	0.00	-125.08	-1.16	0.00	0.00	0.00
8,800.00	1.00	270.00	8,798.90	0.00	-126.82	-1.17	0.00	0.00	0.00
8,900.00	1.00	270.00	8,898.88	0.00	-128.57	-1.19	0.00	0.00	0.00
9,000.00	1.00	270.00	8,998.86	0.00	-130.31	-1.21	0.00	0.00	0.00
9,100.00	1.00	270.00	9,098.85	0.00	-132.06	-1.22	0.00	0.00	0.00
9,200.00	1.00	270.00	9,198.83	0.00	-133.80	-1.24	0.00	0.00	0.00
9,300.00	1.00	270.00	9,298.82	0.00	-135.55	-1.25	0.00	0.00	0.00
9,400.00	1.00	270.00	9,398.80	0.00	-137.29	-1.27	0.00	0.00	0.00
9,434.54	1.00	270.00	9,433.34	0.00	-137.90	-1.28	0.00	0.00	0.00
9,501.21	0.00	0.00	9,500.00	0.00	-138.48	-1.28	1.50	-1.50	0.00
9,507.34	0.00	0.00	9,506.14	0.00	-138.48	-1.28	0.00	0.00	0.00
KOP: 9507.34' MD, 9506.13' TVD									
9,550.00	4.69	329.73	9,548.75	1.51	-139.36	0.22	11.00	11.00	0.00
9,600.00	10.19	329.73	9,598.31	7.10	-142.62	5.78	11.00	11.00	0.00
9,650.00	15.69	329.73	9,647.02	16.77	-148.26	15.40	11.00	11.00	0.00
9,700.00	21.19	329.73	9,694.43	30.43	-156.23	28.98	11.00	11.00	0.00
9,750.00	26.69	329.73	9,740.11	47.94	-166.46	46.40	11.00	11.00	0.00
9,800.00	32.19	329.73	9,783.64	69.16	-178.84	67.50	11.00	11.00	0.00
9,850.00	37.69	329.73	9,824.61	93.89	-193.27	92.09	11.00	11.00	0.00

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Company:	COG OPERATING, LLC	**TVD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Project:	Eddy County, NM (NAD27) NMZ	**MD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Site:	Littlefield 33 Fed COM	**North Reference:**	Grid
Well:	#706H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - IP		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,900.00	43.19	329.73	9,862.65	121.89	-209.62	119.94	11.00	11.00	0.00
9,950.00	48.69	329.73	9,897.40	152.91	-227.72	150.80	11.00	11.00	0.00
10,000.00	54.19	329.73	9,928.55	186.67	-247.42	184.37	11.00	11.00	0.00
10,050.00	59.69	329.73	9,955.82	222.84	-268.54	220.35	11.00	11.00	0.00
10,100.00	65.19	329.73	9,978.94	261.11	-290.88	258.41	11.00	11.00	0.00
10,150.00	70.69	329.73	9,997.71	301.12	-314.23	298.20	11.00	11.00	0.00
10,171.03	73.01	329.73	10,004.26	318.38	-324.30	315.37	11.00	11.00	0.00
FTP(L33FC#706H)									
10,200.00	76.19	329.73	10,011.95	342.50	-338.38	339.35	11.00	11.00	0.00
10,250.00	81.69	329.73	10,021.54	384.86	-363.10	381.49	11.00	11.00	0.00
10,300.00	87.19	329.73	10,026.38	427.83	-388.18	424.22	11.00	11.00	0.00
10,323.61	89.79	329.73	10,027.00	448.21	-400.07	444.49	11.00	11.00	0.00
EOC: 10323.61' MD, 10027.00' TVD, 89.79° INC, 329.73° AZ, 444.49' VS									
10,400.00	89.79	331.26	10,027.28	514.69	-437.70	510.62	2.00	0.00	2.00
10,500.00	89.79	333.26	10,027.65	603.19	-484.24	598.68	2.00	0.00	2.00
10,600.00	89.79	335.26	10,028.02	693.26	-527.67	688.35	2.00	0.00	2.00
10,700.00	89.78	337.26	10,028.40	784.79	-567.93	779.50	2.00	0.00	2.00
10,800.00	89.78	339.26	10,028.78	877.67	-604.97	872.04	2.00	0.00	2.00
10,900.00	89.78	341.26	10,029.16	971.79	-638.75	965.84	2.00	0.00	2.00
11,000.00	89.78	343.26	10,029.54	1,067.03	-669.22	1,060.79	2.00	0.00	2.00
11,100.00	89.78	345.26	10,029.92	1,163.27	-696.35	1,156.78	2.00	0.00	2.00
11,200.00	89.78	347.26	10,030.30	1,260.40	-720.10	1,253.69	2.00	0.00	2.00
11,300.00	89.78	349.26	10,030.68	1,358.30	-740.45	1,351.40	2.00	0.00	2.00
11,400.00	89.78	351.26	10,031.06	1,456.86	-757.37	1,449.79	2.00	0.00	2.00
11,500.00	89.78	353.26	10,031.44	1,555.94	-770.84	1,548.74	2.00	0.00	2.00
11,600.00	89.78	355.26	10,031.82	1,655.43	-780.85	1,648.14	2.00	0.00	2.00
11,700.00	89.79	357.26	10,032.19	1,755.21	-787.37	1,747.85	2.00	0.00	2.00
11,800.00	89.79	359.26	10,032.56	1,855.16	-790.41	1,847.77	2.00	0.00	2.00
11,863.76	89.79	0.53	10,032.80	1,918.92	-790.53	1,911.53	2.00	0.00	2.00
11,900.00	89.79	0.53	10,032.93	1,955.16	-790.19	1,947.76	0.00	0.00	0.00
12,000.00	89.79	0.53	10,033.30	2,055.15	-789.26	2,047.76	0.00	0.00	0.00
12,100.00	89.79	0.53	10,033.67	2,155.15	-788.33	2,147.76	0.00	0.00	0.00
12,200.00	89.79	0.53	10,034.04	2,255.14	-787.40	2,247.76	0.00	0.00	0.00
12,300.00	89.79	0.53	10,034.40	2,355.14	-786.47	2,347.76	0.00	0.00	0.00
12,400.00	89.79	0.53	10,034.77	2,455.13	-785.54	2,447.76	0.00	0.00	0.00
12,500.00	89.79	0.53	10,035.14	2,555.13	-784.61	2,547.76	0.00	0.00	0.00
12,600.00	89.79	0.53	10,035.51	2,655.12	-783.68	2,647.76	0.00	0.00	0.00
12,700.00	89.79	0.53	10,035.88	2,755.12	-782.75	2,747.76	0.00	0.00	0.00
12,800.00	89.79	0.53	10,036.25	2,855.11	-781.81	2,847.76	0.00	0.00	0.00
12,900.00	89.79	0.53	10,036.61	2,955.11	-780.88	2,947.76	0.00	0.00	0.00
13,000.00	89.79	0.53	10,036.98	3,055.10	-779.95	3,047.76	0.00	0.00	0.00
13,100.00	89.79	0.53	10,037.35	3,155.10	-779.02	3,147.76	0.00	0.00	0.00
13,200.00	89.79	0.53	10,037.72	3,255.09	-778.09	3,247.75	0.00	0.00	0.00
13,300.00	89.79	0.53	10,038.09	3,355.09	-777.16	3,347.75	0.00	0.00	0.00
13,400.00	89.79	0.53	10,038.46	3,455.08	-776.23	3,447.75	0.00	0.00	0.00
13,500.00	89.79	0.53	10,038.83	3,555.08	-775.30	3,547.75	0.00	0.00	0.00
13,600.00	89.79	0.53	10,039.19	3,655.07	-774.37	3,647.75	0.00	0.00	0.00
13,700.00	89.79	0.53	10,039.56	3,755.07	-773.44	3,747.75	0.00	0.00	0.00
13,800.00	89.79	0.53	10,039.93	3,855.06	-772.51	3,847.75	0.00	0.00	0.00
13,900.00	89.79	0.53	10,040.30	3,955.06	-771.58	3,947.75	0.00	0.00	0.00
14,000.00	89.79	0.53	10,040.67	4,055.05	-770.64	4,047.75	0.00	0.00	0.00
14,100.00	89.79	0.53	10,041.04	4,155.05	-769.71	4,147.75	0.00	0.00	0.00
14,200.00	89.79	0.53	10,041.40	4,255.04	-768.78	4,247.75	0.00	0.00	0.00
14,300.00	89.79	0.53	10,041.77	4,355.04	-767.85	4,347.75	0.00	0.00	0.00

Database:	EDM 5000.14 Single User Db	**Local Co-ordinate Reference:**	Well #706H
Company:	COG OPERATING, LLC	**TVD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Project:	Eddy County, NM (NAD27) NMZ	**MD Reference:**	RKB @ 2882.70usft (Latshaw 44 - KB=25')
Site:	Littlefield 33 Fed COM	**North Reference:**	Grid
Well:	#706H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - IP		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
14,400.00	89.79	0.53	10,042.14	4,455.03	-766.92	4,447.75	0.00	0.00	0.00
14,500.00	89.79	0.53	10,042.51	4,555.03	-765.99	4,547.75	0.00	0.00	0.00
14,600.00	89.79	0.53	10,042.88	4,655.02	-765.06	4,647.74	0.00	0.00	0.00
14,700.00	89.79	0.53	10,043.25	4,755.02	-764.13	4,747.74	0.00	0.00	0.00
14,800.00	89.79	0.53	10,043.61	4,855.01	-763.20	4,847.74	0.00	0.00	0.00
14,900.00	89.79	0.53	10,043.98	4,955.01	-762.27	4,947.74	0.00	0.00	0.00
15,000.00	89.79	0.53	10,044.35	5,055.00	-761.34	5,047.74	0.00	0.00	0.00
15,100.00	89.79	0.53	10,044.72	5,155.00	-760.41	5,147.74	0.00	0.00	0.00
15,200.00	89.79	0.53	10,045.09	5,254.99	-759.47	5,247.74	0.00	0.00	0.00
15,300.00	89.79	0.53	10,045.46	5,354.99	-758.54	5,347.74	0.00	0.00	0.00
15,400.00	89.79	0.53	10,045.82	5,454.98	-757.61	5,447.74	0.00	0.00	0.00
15,500.00	89.79	0.53	10,046.19	5,554.98	-756.68	5,547.74	0.00	0.00	0.00
15,600.00	89.79	0.53	10,046.56	5,654.97	-755.75	5,647.74	0.00	0.00	0.00
15,700.00	89.79	0.53	10,046.93	5,754.97	-754.82	5,747.74	0.00	0.00	0.00
15,800.00	89.79	0.53	10,047.30	5,854.96	-753.89	5,847.74	0.00	0.00	0.00
15,900.00	89.79	0.53	10,047.67	5,954.96	-752.96	5,947.74	0.00	0.00	0.00
16,000.00	89.79	0.53	10,048.04	6,054.95	-752.03	6,047.74	0.00	0.00	0.00
16,100.00	89.79	0.53	10,048.40	6,154.95	-751.10	6,147.73	0.00	0.00	0.00
16,200.00	89.79	0.53	10,048.77	6,254.94	-750.17	6,247.73	0.00	0.00	0.00
16,300.00	89.79	0.53	10,049.14	6,354.94	-749.24	6,347.73	0.00	0.00	0.00
16,400.00	89.79	0.53	10,049.51	6,454.93	-748.30	6,447.73	0.00	0.00	0.00
16,500.00	89.79	0.53	10,049.88	6,554.93	-747.37	6,547.73	0.00	0.00	0.00
16,600.00	89.79	0.53	10,050.25	6,654.92	-746.44	6,647.73	0.00	0.00	0.00
16,700.00	89.79	0.53	10,050.61	6,754.92	-745.51	6,747.73	0.00	0.00	0.00
16,800.00	89.79	0.53	10,050.98	6,854.91	-744.58	6,847.73	0.00	0.00	0.00
16,900.00	89.79	0.53	10,051.35	6,954.91	-743.65	6,947.73	0.00	0.00	0.00
17,000.00	89.79	0.53	10,051.72	7,054.90	-742.72	7,047.73	0.00	0.00	0.00
17,076.23	89.79	0.53	10,052.00	7,131.13	-742.01	7,123.96	0.00	0.00	0.00

TD: 17076.23' MD, 10052.00' TVD - PBHL(L33FC#706H)

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
FTP(L33FC#706H)	0.00	0.00	10,027.00	28.72	-807.17	364,216.47	605,593.41	32° 0' 3.194 N	103° 59' 33.724 W
- plan misses target center by 563.55usft at 10171.03usft MD (10004.26 TVD, 318.38 N, -324.30 E)									
- Point									
PBHL(L33FC#706H)	0.00	0.00	10,052.00	7,131.13	-742.01	371,318.88	605,658.57	32° 1' 13.482 N	103° 59' 32.707 W
- plan hits target center									
- Point									

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
9,507.34	9,506.14	0.00	-138.48	KOP: 9507.34' MD, 9506.13' TVD
10,323.61	10,027.00	448.21	-400.07	EOC: 10323.61' MD, 10027.00' TVD, 89.79° INC, 329.73° AZ, 444.49' VS
17,076.23	10,052.00	7,131.13	-742.01	TD: 17076.23' MD, 10052.00' TVD

Azimuths to Grid North
True North: -0.18°
Magnetic North: 6.87°

Magnetic Field
Strength: 47689.7snT
Dip Angle: 59.78°
Date: 03/12/2018
Model: IGRF2015

CONCHO

VEN ENERGY SERVICES, LLC.

COG OPERATING, LLC
#706H
Eddy County, NM (NAD27) NMZ
Plan #1 - IP

PROJECT DETAILS: Eddy County, NM (NAD27) NMZ	
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

Ground Elev: 2857.70 RKB @ 2882.70usft (Latshaw 44 - KB=25')

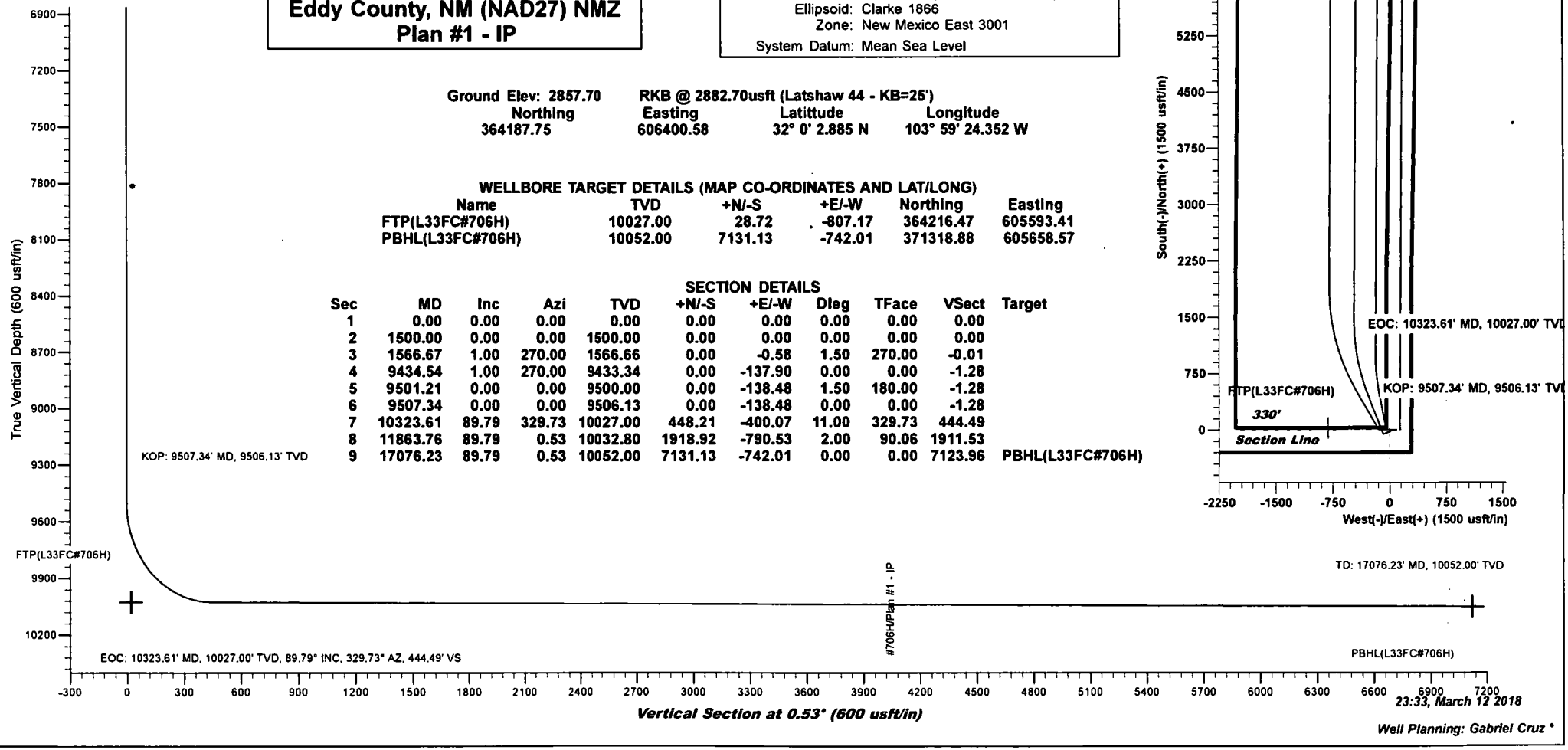
Northing	Easting	Latitude	Longitude
364187.75	606400.58	32° 0' 2.885 N	103° 59' 24.352 W

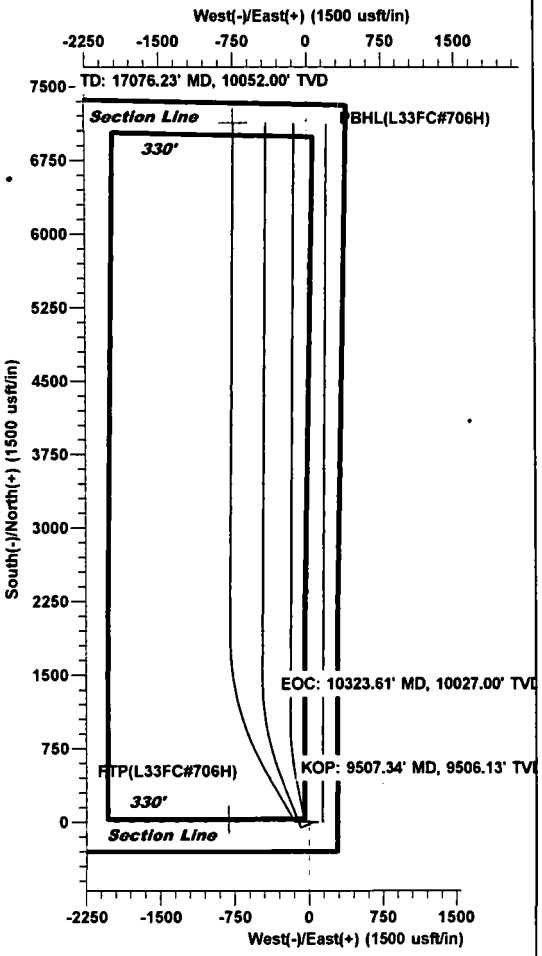
WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/-S	+E/-W	Northing	Easting
FTP(L33FC#706H)	10027.00	28.72	-807.17	364216.47	605593.41
PBHL(L33FC#706H)	10052.00	7131.13	-742.01	371318.88	605658.57

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	1500.00	0.00	0.00	1500.00	0.00	0.00	0.00	0.00	0.00	
3	1566.67	1.00	270.00	1566.66	0.00	-0.58	1.50	270.00	-0.01	
4	9434.54	1.00	270.00	9433.34	0.00	-137.90	0.00	0.00	-1.28	
5	9501.21	0.00	0.00	9500.00	0.00	-138.48	1.50	180.00	-1.28	
6	9507.34	0.00	0.00	9506.13	0.00	-138.48	0.00	0.00	-1.28	
7	10323.61	89.79	329.73	10027.00	448.21	-400.07	11.00	329.73	444.49	
8	11863.76	89.79	0.53	10032.80	1918.92	-790.53	2.00	90.06	1911.53	
9	17076.23	89.79	0.53	10052.00	7131.13	-742.01	0.00	0.00	7123.96	PBHL(L33FC#706H)





23:33, March 12 2018

Well Planning: Gabriel Cruz

COG Operating, LLC - Littlefield 33 Federal Com 706H

1. Geologic Formations

TVD of target	10,062' EOL	Pilot hole depth	NA
MD at TD:	16,944'	Deepest expected fresh water:	200'

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Quaternary Fill	Surface	Water	
Rustler	488	Water	
Top of Salt	631	Salt	
Base of Salt	2642	Salt	
Lamar	2820	Salt Water	
Delaware	2860	Salt Water	
Bone Spring	6519	Oil/Gas	
1st Bone Spring	7436	Oil/Gas	
2nd Bone Spring	8585	Oil/Gas	
3rd Bone Spring	9300	Oil/Gas	
Wolfcamp	9659	Target Oil/Gas	
Wolfcamp B	10138	Not Penetrated	
Wolfcamp C	10432	Not Penetrated	
Wolfcamp D	10749	Not Penetrated	
-	-	Not Penetrated	

2. Casing Program

Hole Size	Casing Interval From	Casing Interval To	Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Body
13.5"	0	600	10.75"	45.5	N80	BTC	9.00	1.50	38.10
9.875"	0	9465	7.875"	29.7	P110	BTC	1.60	1.45	3.86
6.75"	0	8965	5.5"	23	P110	BTC	2.52	2.66	4.03
6.75"	8965	16,944	5"	18	P110	BTC	2.52	2.66	4.03
			BLM Minimum Safety Factor				1.125	1	1.6 Dry 1.8 Wet

Intermediate casing will be kept at least 1/3 full while running casing.to mitigate collapse. Surface burst based on 0.7 frac gradient at the shoe with Gas Gradient 0.1 psi/ft to surface and
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

The 5" casing will be run back 500' into the intermediate casing to ensure the coupling OD clearance is greater than .422" for the cement bond tie in.

COG Operating, LLC - Littlefield 33 Federal Com 706H

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	N
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	
Is well within the designated 4 string boundary?	
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3rd string cement tied back 500' into previous casing?	
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	
Is 2nd string set 100' to 600' below the base of salt?	
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

3. Cementing Program

Casing	# Sks	Wt. lb/ gal	Yld ft3/ sack	H_20 gal/sk	500# Comp. Strength (hours)	Slurry Description
Surf.	30	13.5	1.75	9	12	Lead: Class C + 4% Gel + 1% CaCl2
	250	14.8	1.34	6.34	8	Tail: Class C + 2% CaCl2
Inter.	770	10.3	3.6	21.48	16	Tuned Light Blend
	250	16.4	1.08	4.32	8	Tail: Class H
Prod	130	11.9	2.5	19	72	Lead: 50:50:10 H Blend
	900	14.4	1.24	5.7	19	Tail: 50:50:2 Class H Blend

Volumes Subject to Observed Hole Conditions and/or Fluid Caliper Results
Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.

Casing String	TOC	% Excess
Surface	0'	75%
1st Intermediate	0'	50%
Production	8,965'	35% OH in Lateral (KOP to EOL)

4. Pressure Control Equipment

N	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	x	Tested to:
9-7/8"	13-5/8"	3M	Annular	x	3000 psi
			Blind Ram	x	3M
			Pipe Ram	x	
			Double Ram		
			Other*		
6-3/4"	13-5/8"	5M	Annular	x	50% testing pressure
			Blind Ram	x	5M
			Pipe Ram	x	
			Double Ram		
			Other*		

BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

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

X	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.
Y	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.
	N Are anchors required by manufacturer?
N	A multibowl wellhead is being used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested.

5. Mud Program

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From	To				
0	Surf. Shoe	FW Gel	8.6 - 8.8	28-34	N/C
Surf csg	9-5/8" Int shoe	Brine Diesel Emulsion	8.4 - 9	28-34	N/C
7-5/8" Int shoe	Lateral TD	OBM	9.6 - 11	35-45	<20

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

What will be used to monitor the loss or gain of fluid?	PVT/Pason/Visual Monitoring

6. Logging and Testing Procedures

Logging, Coring and Testing.	
Y	Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
Y	No Logs are planned based on well control or offset log information.
N	Drill stem test? If yes, explain.
N	Coring? If yes, explain.

Additional logs planned		Interval
N	Resistivity	Pilot Hole TD to ICP
N	Density	Pilot Hole TD to ICP
Y	CBL	Production casing (If cement not circulated to surface)
Y	Mud log	Intermediate shoe to TD
N	PEX	

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	5760 psi at 10062' TVD
Abnormal Temperature	NO 160 Deg. F.

No abnormal pressure or temperature conditions are anticipated. Sufficient mud materials to maintain mud properties and weight increase requirements will be kept on location at all times.

Sufficient supplies of Paper/LCM for periodic sweeps to control seepage and losses will be maintained on location.

Hydrogen Sulfide (H2S) monitors will be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.	
N	H2S is present
Y	H2S Plan attached

8. Other Facets of Operation

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

x	H2S Plan.
x	BOP & Choke Schematics.
x	Directional Plan

Access surfacing type: OTHER

Access topsoil source: ONSITE

Access surfacing type description: Caliche

Access onsite topsoil source depth: 6

Offsite topsoil source description:

Onsite topsoil removal process: Blading

Access other construction information: No turnouts are planned. Re-routing access road around proposed well location.

Access miscellaneous information:

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

Drainage Control

New road drainage crossing: OTHER

Drainage Control comments: None necessary.

Road Drainage Control Structures (DCS) description: None needed.

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:

COG_Littlefield_706H_1Mile_Data_20180328135254.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: Production will be sent to the proposed Littlefield 33 CTB 1. A tank battery and facilities will be constructed adjacent to the north side of the Littlefield 33 Federal Com 705H, 706H, 805H and 806H as shown on the production facility layout. The tank battery and facilities will be installed according to API specifications. No flow lines are anticipated at this time.

Production Facilities map:

COG_Littlefield_CTB_1_20180328100744.pdf

COG_Littlefield_706H_Prod_Facility_20180328135320.pdf

Section 5 - Location and Types of Water Supply

Water Source Table

Water source use type: INTERMEDIATE/PRODUCTION CASING **Water source type:** OTHER

Describe type: Brine H2O

Source latitude: **Source longitude:**

Source datum:

Water source permit type: PRIVATE CONTRACT

Source land ownership: COMMERCIAL

Water source transport method: TRUCKING

Source transportation land ownership: COMMERCIAL

Water source volume (barrels): 22500 **Source volume (acre-feet):** 2.9000947

Source volume (gal): 945000

Water source use type: STIMULATION, SURFACE CASING **Water source type:** OTHER

Describe type: Fresh H2O

Source latitude: **Source longitude:**

Source datum:

Water source permit type: PRIVATE CONTRACT

Source land ownership: PRIVATE

Water source transport method: PIPELINE

Source transportation land ownership: PRIVATE

Water source volume (barrels): 337500 **Source volume (acre-feet):** 43.50142

Source volume (gal): 14175000

Water source and transportation map:

COG_Littlefield_706H_BrineH2O_20180328135344.pdf
COG_Littlefield_706H_FreshH2O_20180328135356.pdf

Water source comments: Fresh water will be obtained from High Roller Wells, LLC CP-417610 water well located in Section 1. 58 T1. Brine water will be obtained from the Malaga I Brine station in Section 2. T21S. R25E., and will be provided by Malaga Brine Station.
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:**

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: Caliche will be obtained from the actual well site if available. If not available onsite, caliche will be obtained from Brantley caliche pit located in Section 14, T26S, R28E.
Construction Materials source location attachment:

Section 7 - Methods for Handling Waste

Waste type: DRILLING

Waste content description: Drilling fluids and produced oil and water during drilling and completion operations

Amount of waste: 6000 barrels

Waste disposal frequency : One Time Only

Safe containment description: All drilling waste will be stored safely and disposed of properly

Safe containmant attachment:

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

Disposal location description: Trucked to an approved disposal facility

Waste type: SEWAGE

Waste content description: Human waste and gray water

Amount of waste: 250 gallons

Waste disposal frequency : Weekly

Safe containment description: Waste will be properly contained and disposed of properly at a state approved disposal facility
Safe containmant attachment:

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

Disposal location description: Trucked to an approved disposal facility

Waste type: GARBAGE

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

Amount of waste: 125 pounds

Waste disposal frequency : Weekly

Safe containment description: Garbage and trash produced during drilling and completion operations will be collected in a trash container and disposed of properly at a state approved disposal facility
Safe containmant attachment:

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

Disposal location description: Trucked to an approved 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

Cuttings Area

Cuttings Area being used? NO

Are you storing cuttings on location? YES

Description of cuttings location Roll off cuttings containers on tracks

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?: YES

Ancillary Facilities attachment:

COG_Littlefield_706H_GCP_20180328135500.pdf

Comments: GCP attached.

Section 9 - Well Site Layout

Well Site Layout Diagram:

COG_Littlefield_CTB_1_20180328102237.pdf

COG_Littlefield_706H_Prod_Facility_20180328135518.pdf

Comments: Production will be sent to the proposed Littlefield 33 CTB 1. A tank battery and facilities will be constructed adjacent to the north side of the Littlefield 33 Federal Com 705H, 706H, 805H and 806H as shown on the production facility layout. The tank battery and facilities will be installed according to API specifications. No flow lines are anticipated at this time.

Section 10 - Plans for Surface Reclamation

Type of disturbance: New Surface Disturbance

Multiple Well Pad Name: LITTLEFIELD 33 FEDERAL COM

Multiple Well Pad Number: 705H, 706H, 805H AND 806H

Recontouring attachment:

Drainage/Erosion control construction: No waddles will be needed for this location, since the surface runoff will be controlled by the access road that is located on the west side of the pad.
Drainage/Erosion control reclamation: Reclaim east side 80'

Well pad proposed disturbance (acres): 3.67
Road proposed disturbance (acres): 0.03
Powerline proposed disturbance (acres): 0
Pipeline proposed disturbance (acres): 0
Other proposed disturbance (acres): 0

Total proposed disturbance: 3.7

Well pad interim reclamation (acres): 0.01
Road interim reclamation (acres): 0.03
Powerline interim reclamation (acres): 0
Pipeline interim reclamation (acres): 0
Other interim reclamation (acres): 0

Total interim reclamation: 0.04

Well pad long term disturbance (acres): 2.94
Road long term disturbance (acres): 0.03
Powerline long term disturbance (acres): 0
Pipeline long term disturbance (acres): 0
Other long term disturbance (acres): 0

Total long term disturbance: 2.97

Disturbance Comments:

Reconstruction method: New construction of pad.

Topsoil redistribution: East 80'

Soil treatment: None

Existing Vegetation at the well pad: Shinnery Oak/Mesquite grassland

Existing Vegetation at the well pad attachment:

Existing Vegetation Community at the road: Shinnery Oak/Mesquite grassland

Existing Vegetation Community at the road attachment:

Existing Vegetation Community at the pipeline: Shinnery Oak/Mesquite grassland

Existing Vegetation Community at the pipeline attachment:

Existing Vegetation Community at other disturbances: N/A

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:

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	
Seed Type	**Pounds/Acre**

Total pounds/Acre:

Seed reclamation attachment:

Operator Contact/Responsible Official Contact Info

First Name: Rand **Last Name:** French

Phone: (432)254-5556 **Email:** rfrench@concho.com

Seedbed prep:

Seed BMP:

Seed method:

Existing invasive species? NO

Existing invasive species treatment description:

Existing invasive species treatment attachment:

Weed treatment plan description: N/A

Weed treatment plan attachment:

Monitoring plan description: N/A

Monitoring plan attachment:

Success standards: N/A

Pit closure description: N/A

Pit closure attachment:

COG_Littlefield_706H_Closed_Loop_20180328135539.pdf

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:

Operator Name: COG OPERATING LLC

Well Name: LITTLEFIELD 33 FEDERAL COM **Well Number:** 706H

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:

Use a previously conducted onsite? YES

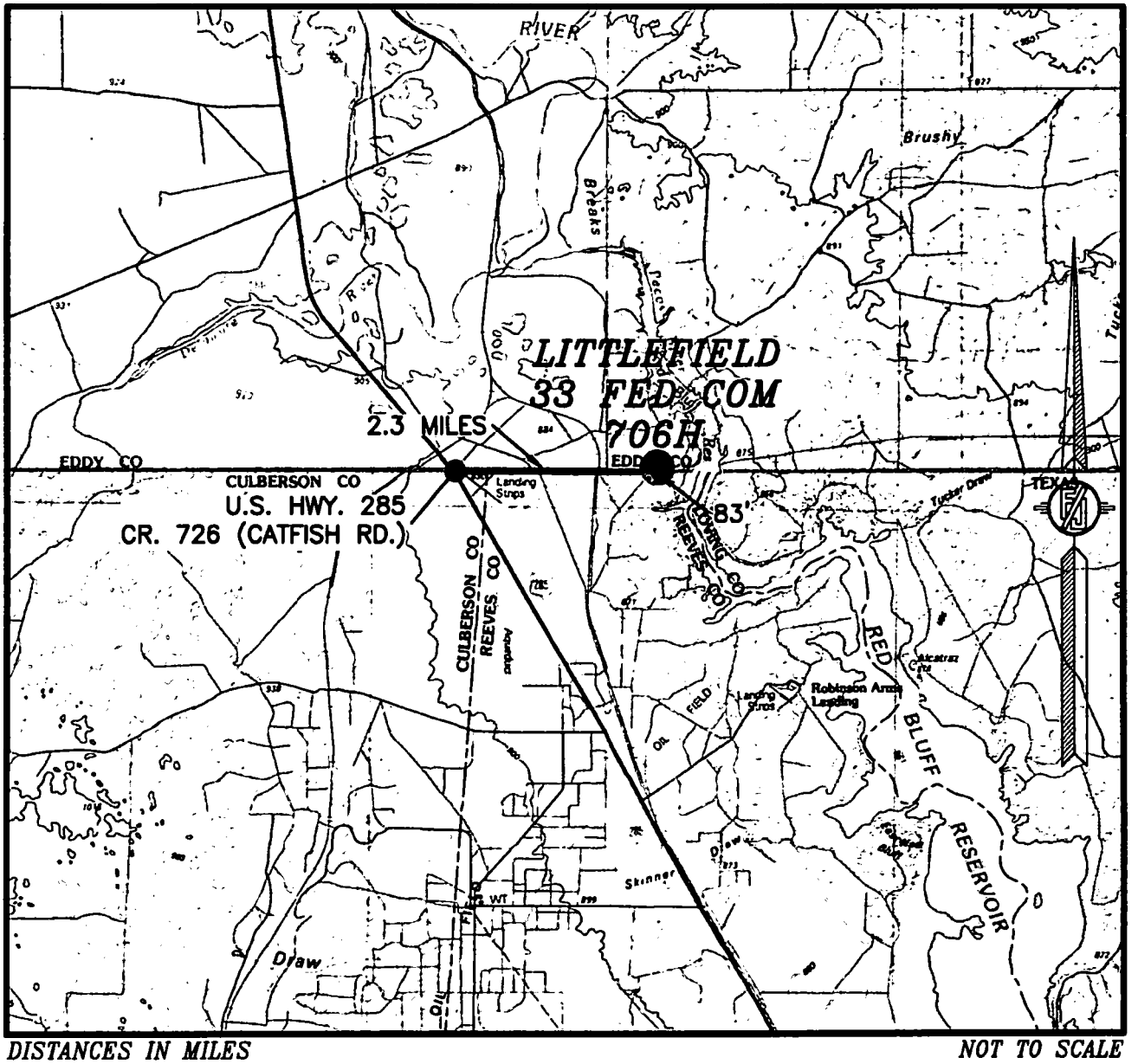
Previous Onsite information: Onsite completed on 1/16/2018 by Rand French (COG) and Jeff Robertson (BLM).

Other SUPO Attachment

COG_Littlefield_706H_Certification_20180328135555.pdf

SECTION 33, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

VICINITY MAP



DISTANCES IN MILES *NOT TO SCALE*

DIRECTIONS TO LOCATION
FROM U.S. HWY 285 AND CALICHE CR. 726 (CATFISH RD.) GO EAST ON CR. 726 2.3 MILES TO A ROAD SURVEY AND FOLLOW FLAGS NORTH 83' TO THE SOUTHWEST PAD CORNER FOR THIS LOCATION.

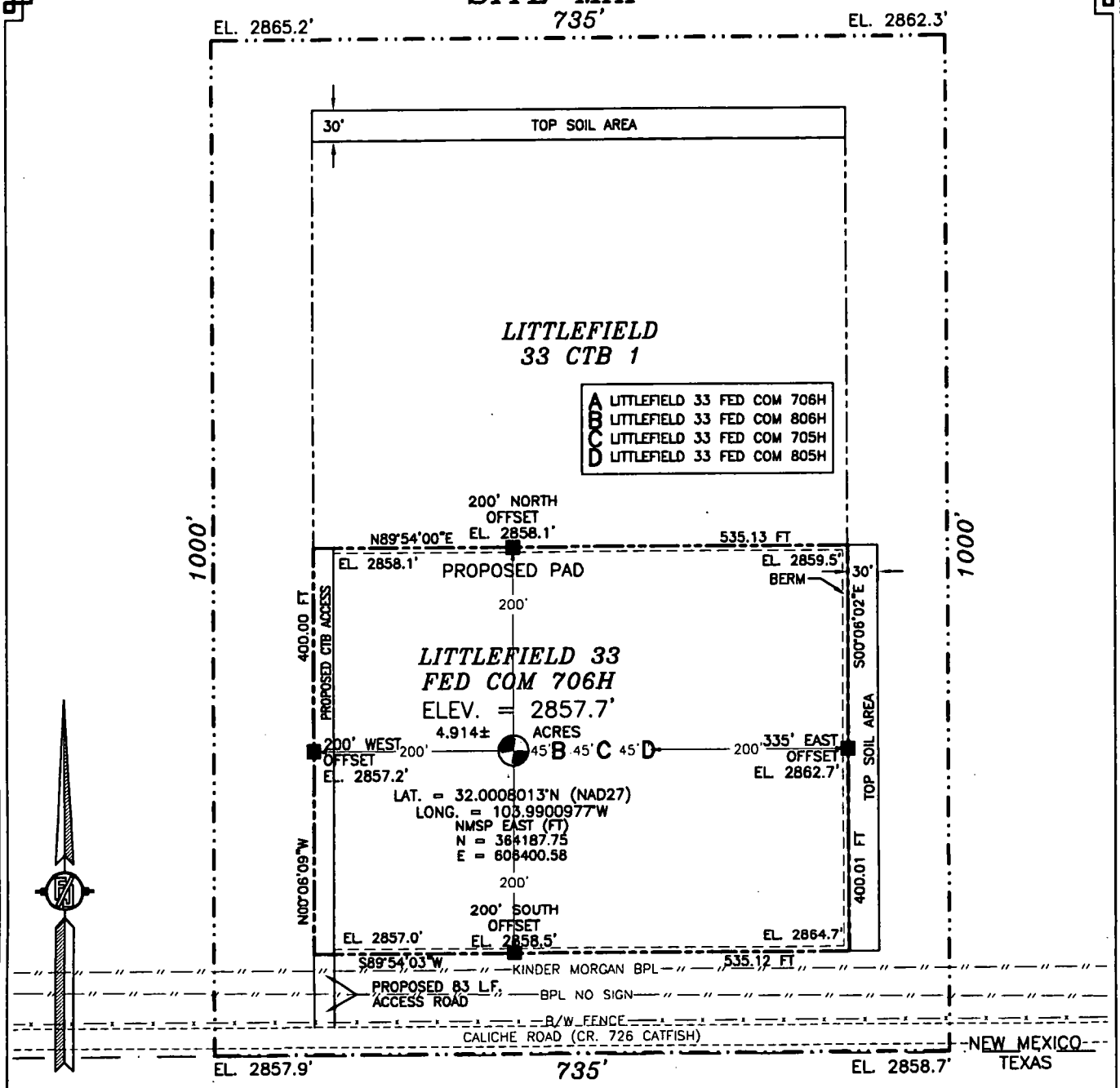
COG OPERATING, LLC
LITTLEFIELD 33 FED COM 706H
LOCATED 300 FT. FROM THE SOUTH LINE AND 2361 FT. FROM THE WEST LINE OF SECTION 33, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JANUARY 17, 2018

SURVEY NO. 5786

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 *CARLSBAD, NEW MEXICO*

SITE MAP



015 75 150 300

SCALE 1" = 150'

DIRECTIONS TO LOCATION

FROM U.S. HWY 285 AND CALICHE CR. 726 (CATFISH RD.) GO EAST ON CR. 726 2.3 MILES TO A ROAD SURVEY AND FOLLOW FLAGS NORTH 83° TO THE SOUTHWEST PAD CORNER FOR THIS LOCATION.

I, FILIMON F. JARAMILLO, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO.

FILIMON F. JARAMILLO NEW MEXICO NO. 12797 PROFESSIONAL SURVEYOR — DATE

COG OPERATING, LLC

LITTLEFIELD 33 FED COM 706H

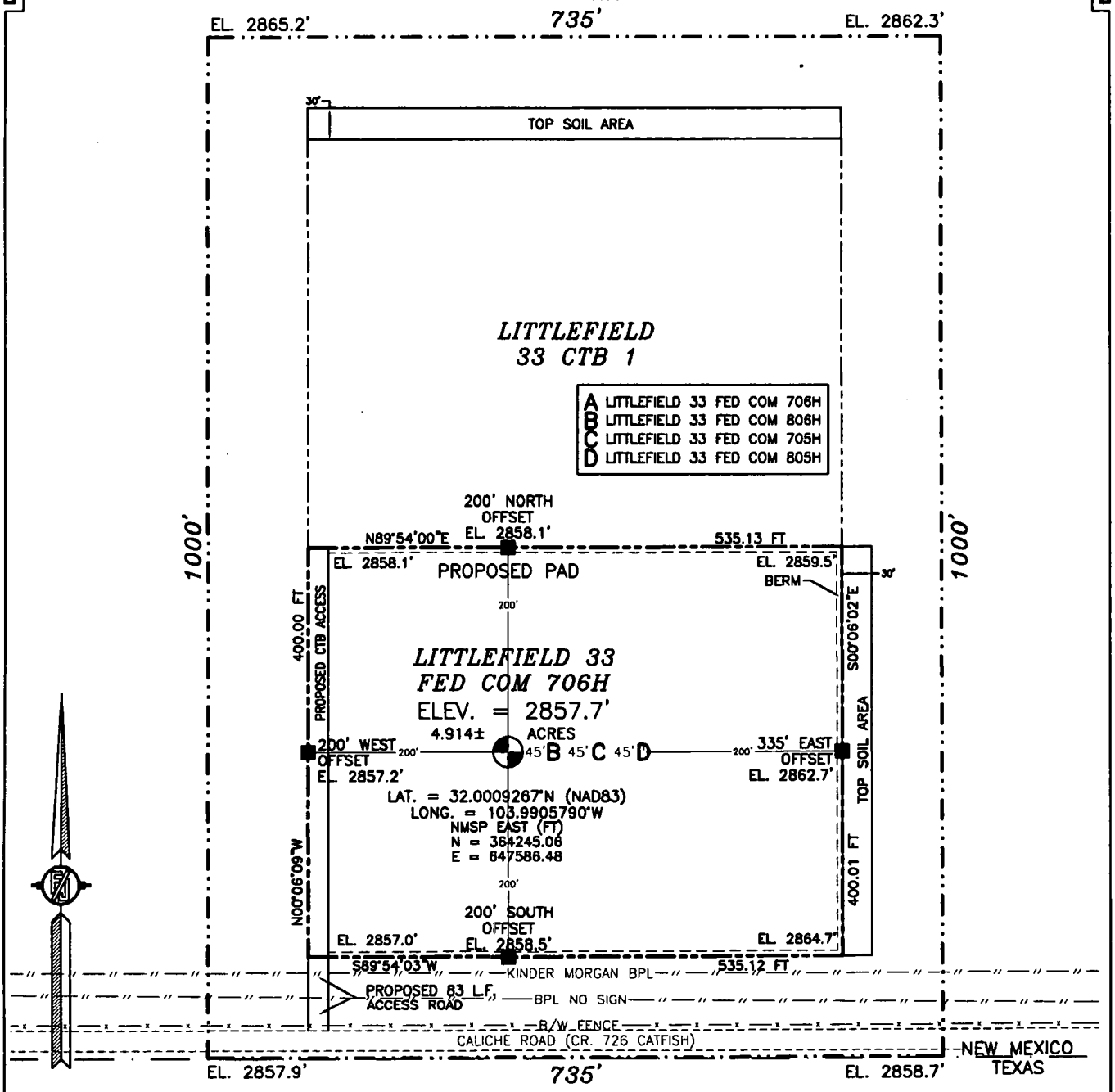
LOCATED 300 FT. FROM THE SOUTH LINE AND 2361 FT. FROM THE WEST LINE OF SECTION 33, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M. EDDY COUNTY, STATE OF NEW MEXICO

JANUARY 17, 2018

SURVEY NO. 5786

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SITE MAP



015 75 150 300

SCALE 1" = 150'

DIRECTIONS TO LOCATION

FROM U.S. HWY 285 AND CALICHE CR. 726 (CATFISH RD.) GO EAST ON CR. 726 2.3 MILES TO A ROAD SURVEY AND FOLLOW FLAGS NORTH 83' TO THE SOUTHWEST PAD CORNER FOR THIS LOCATION.

I, FILIMON F. JARAMILLO, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO.

FILIMON F. JARAMILLO, PLS NO. 27 REGISTERED PROFESSIONAL SURVEYOR — DATE

COG OPERATING, LLC

LITTLEFIELD 33 FED COM 706H

LOCATED 300 FT. FROM THE SOUTH LINE AND 2361 FT. FROM THE WEST LINE OF SECTION 33, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M. EDDY COUNTY, STATE OF NEW MEXICO

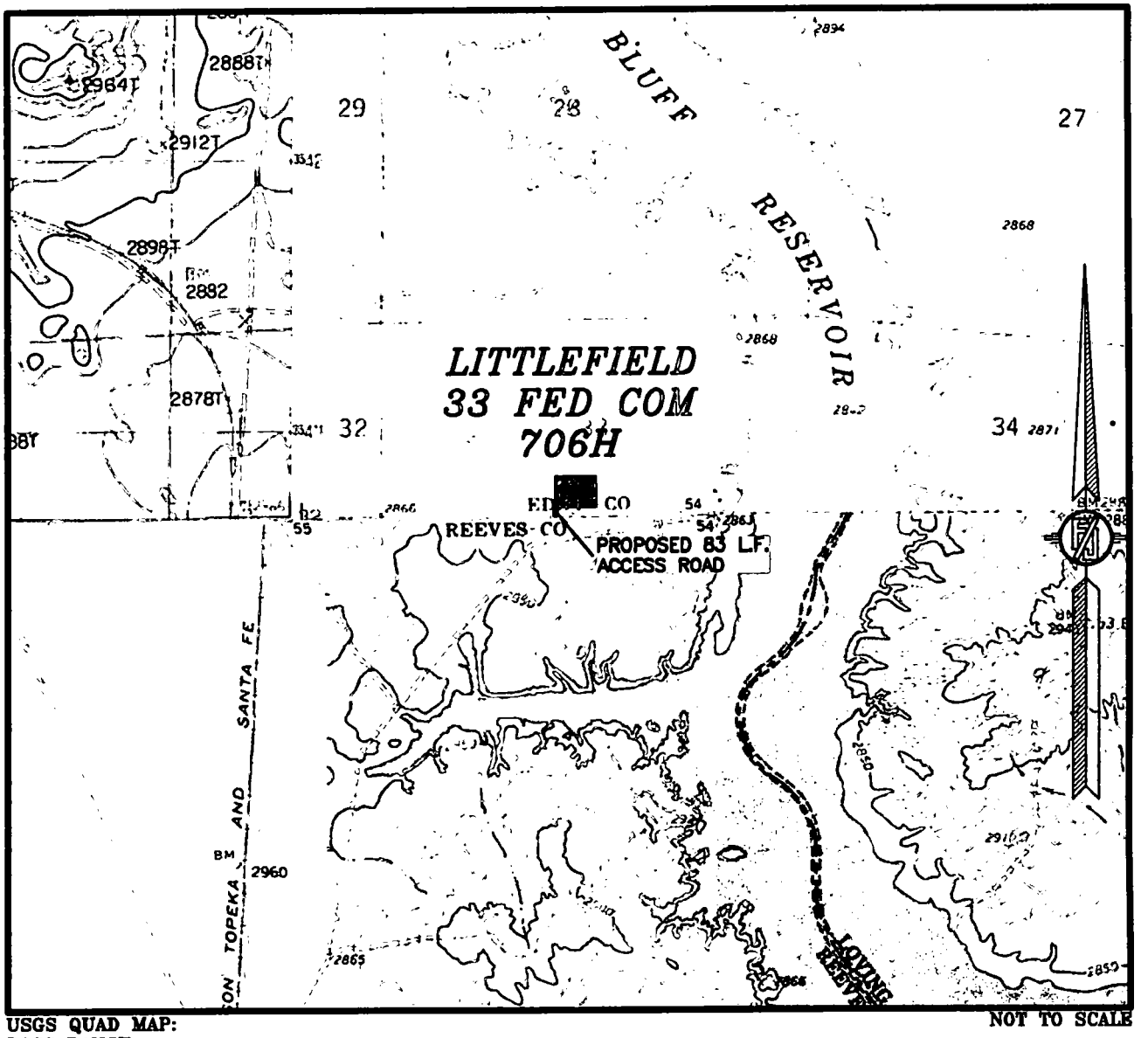
JANUARY 17, 2018

SURVEY NO. 5786

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SECTION 33, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

LOCATION VERIFICATION MAP



USGS QUAD MAP:
ROSS RANCH
RED BLUFF

NOT TO SCALE

COG OPERATING, LLC
LITTLEFIELD 33 FED COM 706H
LOCATED 300 FT. FROM THE SOUTH LINE
AND 2361 FT. FROM THE WEST LINE OF
SECTION 33, TOWNSHIP 26 SOUTH,
RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

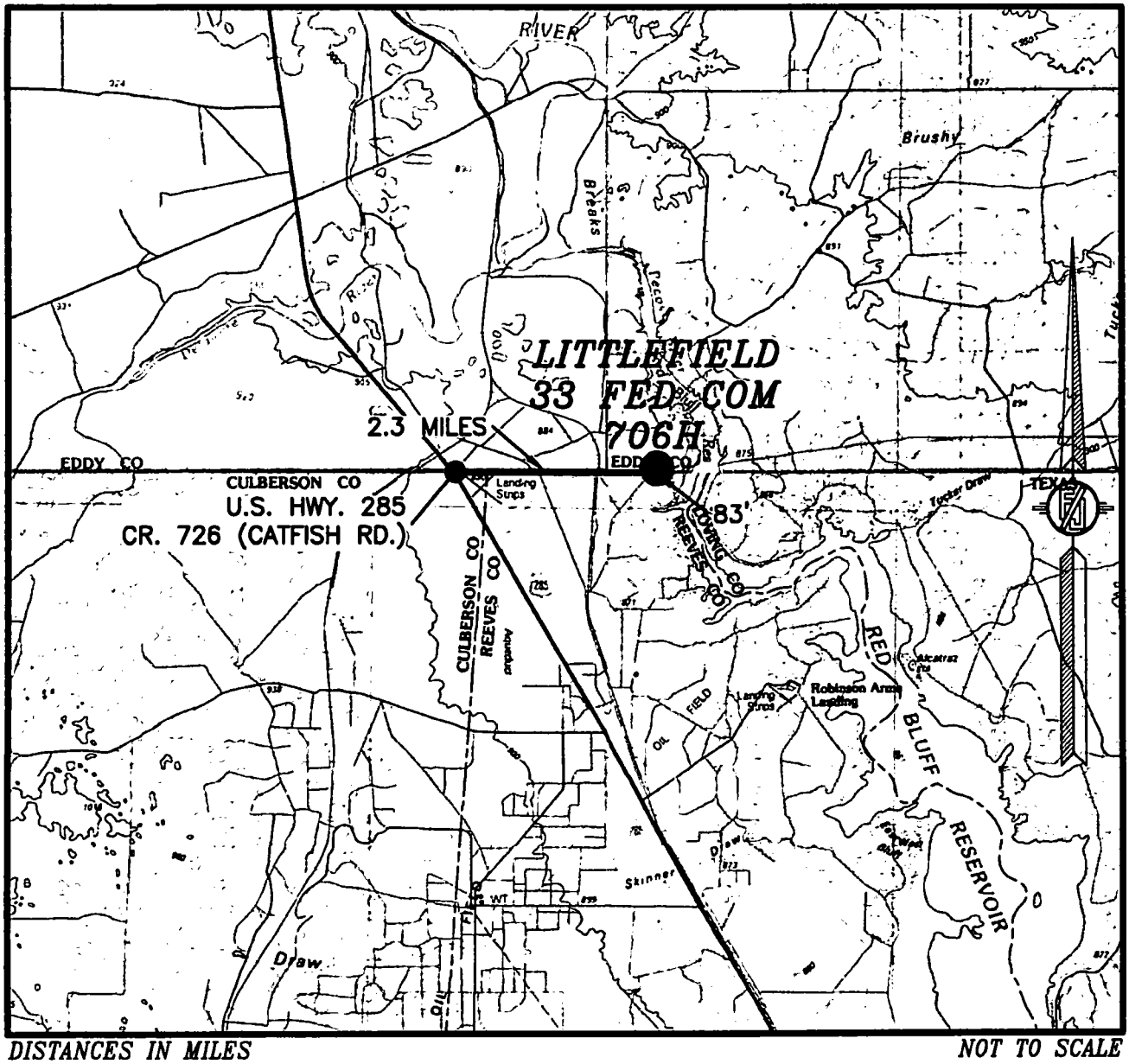
JANUARY 17, 2018

SURVEY NO. 5786

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SECTION 33, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

VICINITY MAP



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EDDY COUNTY, STATE OF NEW MEXICO

JANUARY 17, 2018

SURVEY NO. 5786

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 *CARLSBAD, NEW MEXICO*

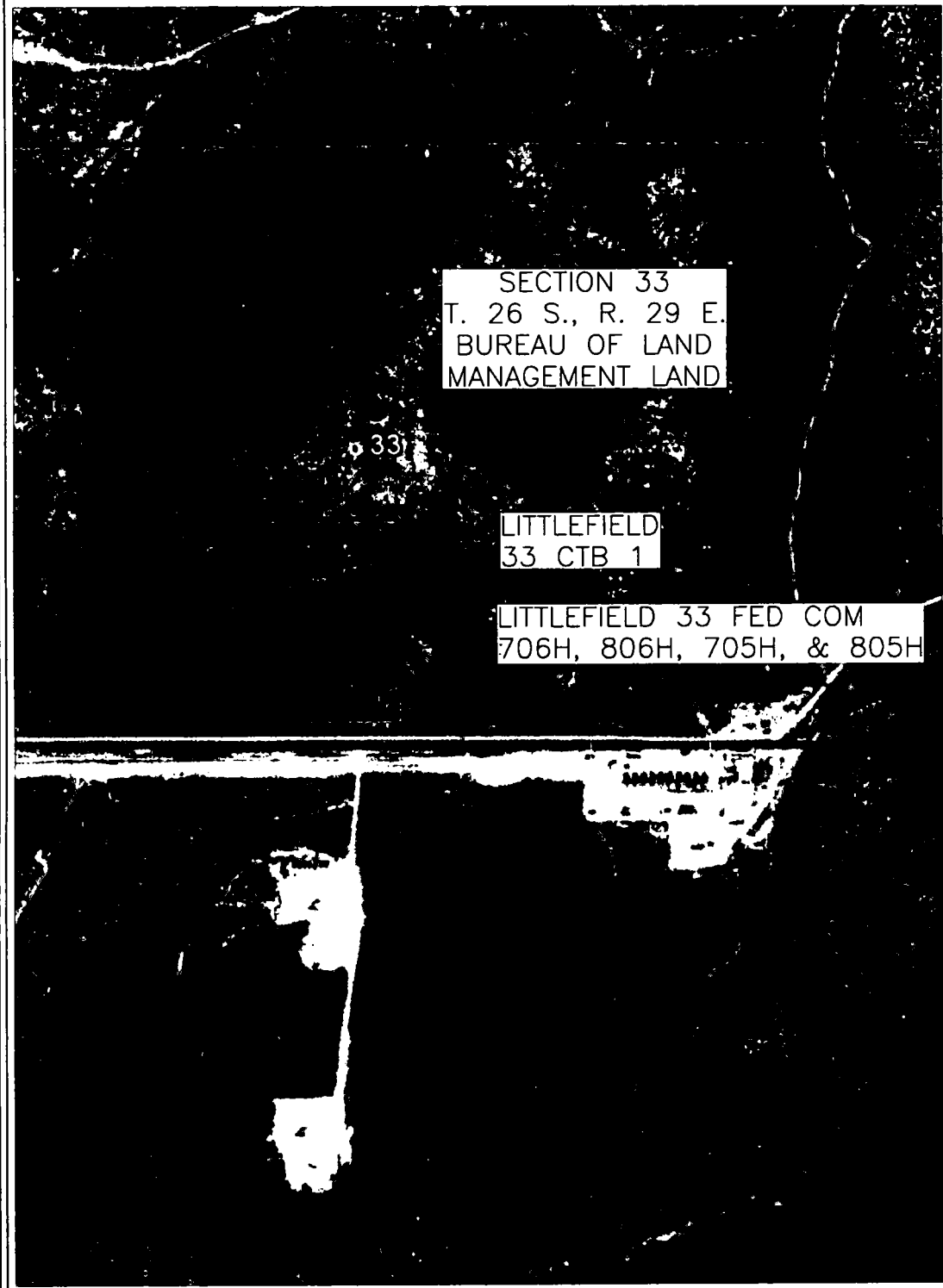
LITTLEFIELD 33 CTB 1

COG OPERATING, LLC

IN THE SW/4 LOT 6, SE/7 LOT 7, NE/4 LOT 10, & NW/4 LOT 11 OF SECTION 33, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M. EDDY COUNTY, STATE OF NEW MEXICO

JANUARY 17, 2018

AERIAL PHOTO

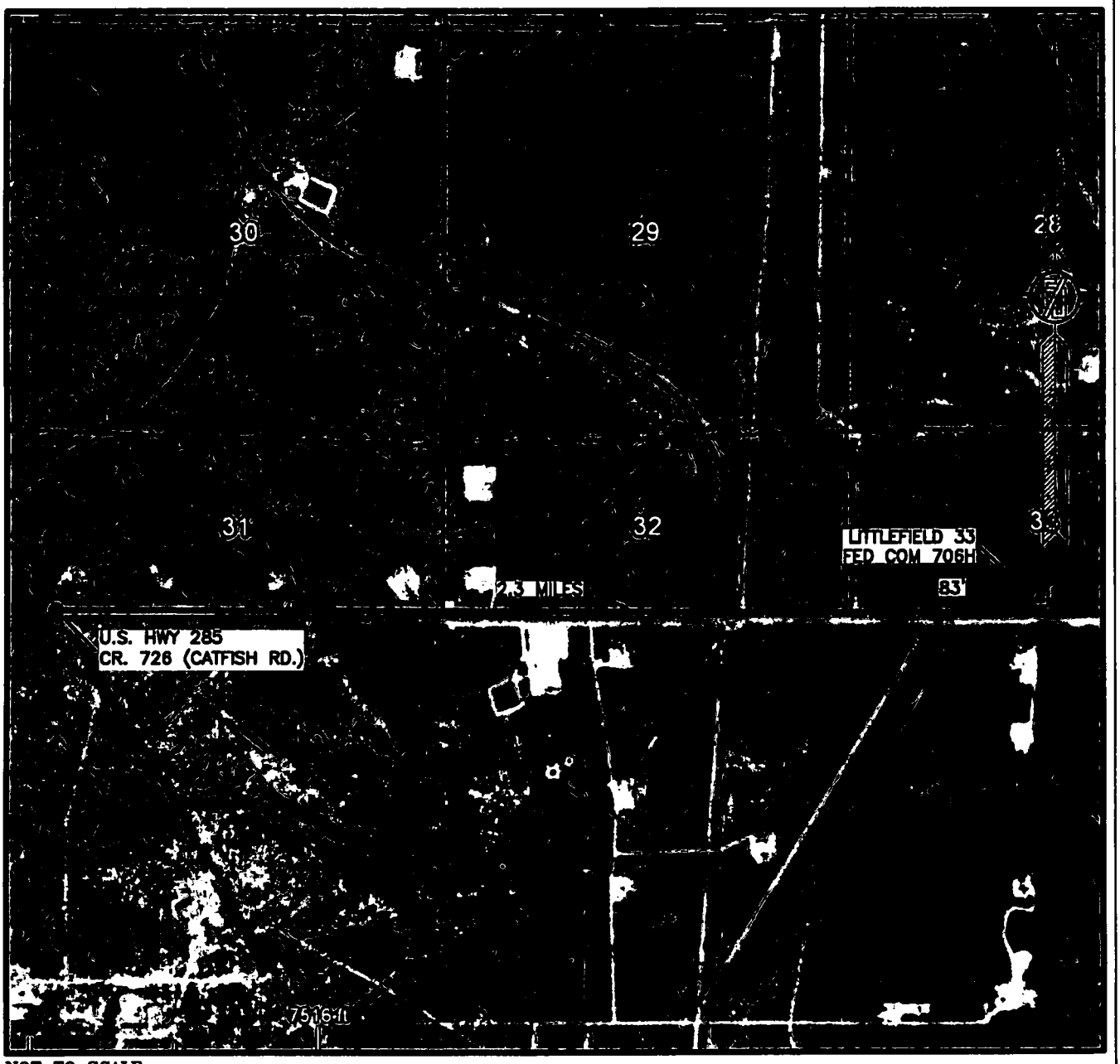


SHEET: 3-3 *SURVEY NO. 5959*

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 *CARLSBAD, NEW MEXICO*

SECTION 33, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

AERIAL ACCESS ROUTE MAP



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
NOV. 2015

COG OPERATING, LLC

LITTLEFIELD 33 FED COM 706H

LOCATED 300 FT. FROM THE SOUTH LINE
AND 2361 FT. FROM THE WEST LINE OF
SECTION 33, TOWNSHIP 26 SOUTH,
RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JANUARY 17, 2018

SURVEY NO. 5786

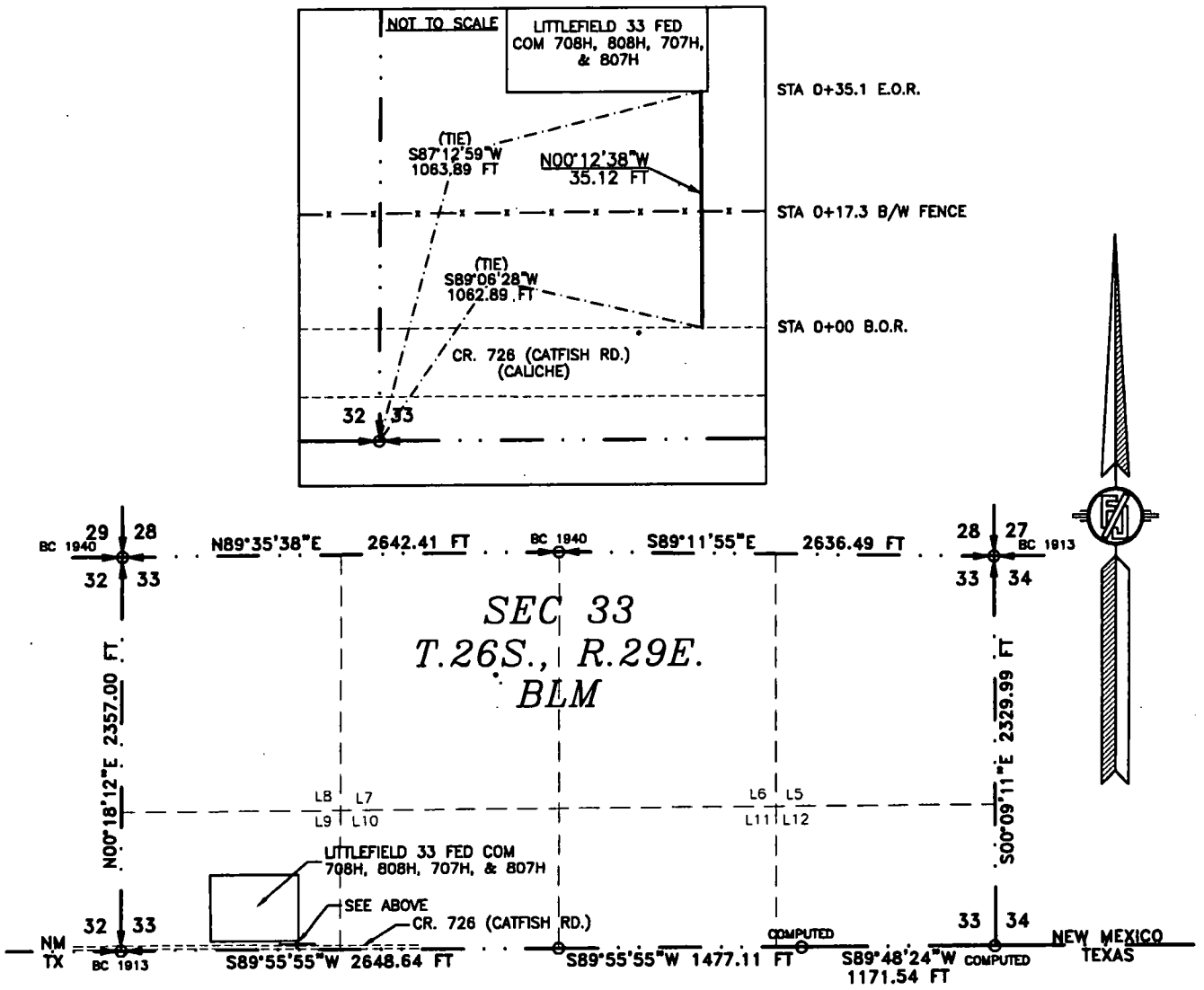
MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 · CARLSBAD, NEW MEXICO

ACCESS ROAD PLAT

ACCESS ROAD FROM CR. 726 (CATFISH RD.) TO LITTLEFIELD 33 FED COM 708H, 808H, 707H, & 807H

COG OPERATING, LLC

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 33, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
MARCH 28, 2018



SEE NEXT SHEET (2-5) FOR DESCRIPTION

1000 0 1000

Scale: 1" = 1000'

GENERAL NOTES

1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.

2.) BASIS OF BEARING AND DISTANCE IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY.

SURVEYOR CERTIFICATE

I, FILIMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO.

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 28TH DAY OF MARCH 2018

FILIMON F. JARAMILLO, PLS - 12797

MADRON SURVEYING, INC.
301 SOUTH CANAL
CARLSBAD, NEW MEXICO 88220
Phone (575) 234-3341

ACCESS ROAD PLAT

ACCESS ROAD FROM CR. 726 (CATFISH RD.) TO LITTLEFIELD 33 FED COM 708H, 808H, 707H, & 807H

COG OPERATING, LLC

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 33, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
MARCH 28, 2018

DESCRIPTION

A STRIP OF LAND 30 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 33, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M., EDDY COUNTY, STATE OF NEW MEXICO AND BEING 15 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY:

BEGINNING AT A POINT WITHIN LOT 9 OF SAID SECTION 33, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M., WHENCE THE SOUTHWEST CLOSING CORNER OF SAID SECTION 33, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M. BEARS S89°06'28"W, A DISTANCE OF 1062.89 FEET;
THENCE N00°12'38"W A DISTANCE OF 35.12 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE SOUTHWEST CLOSING CORNER OF SAID SECTION 33, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M. BEARS S87°12'59"W, A DISTANCE OF 1063.89 FEET;

SAID STRIP OF LAND BEING 35.12 FEET OR 2.13 RODS IN LENGTH, CONTAINING 0.024 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

LOT 9	35.12 L.F.	2.13 RODS	0.024 ACRES

GENERAL NOTES

1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.

2.) BASIS OF BEARING AND DISTANCE IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY.

SURVEYOR CERTIFICATE

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IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 27TH DAY OF MARCH 2018.

FILIMON F. JARAMILLO 12797 REGISTERED PROFESSIONAL SURVEYOR NEW MEXICO

FILIMON F. JARAMILLO PLS 12797

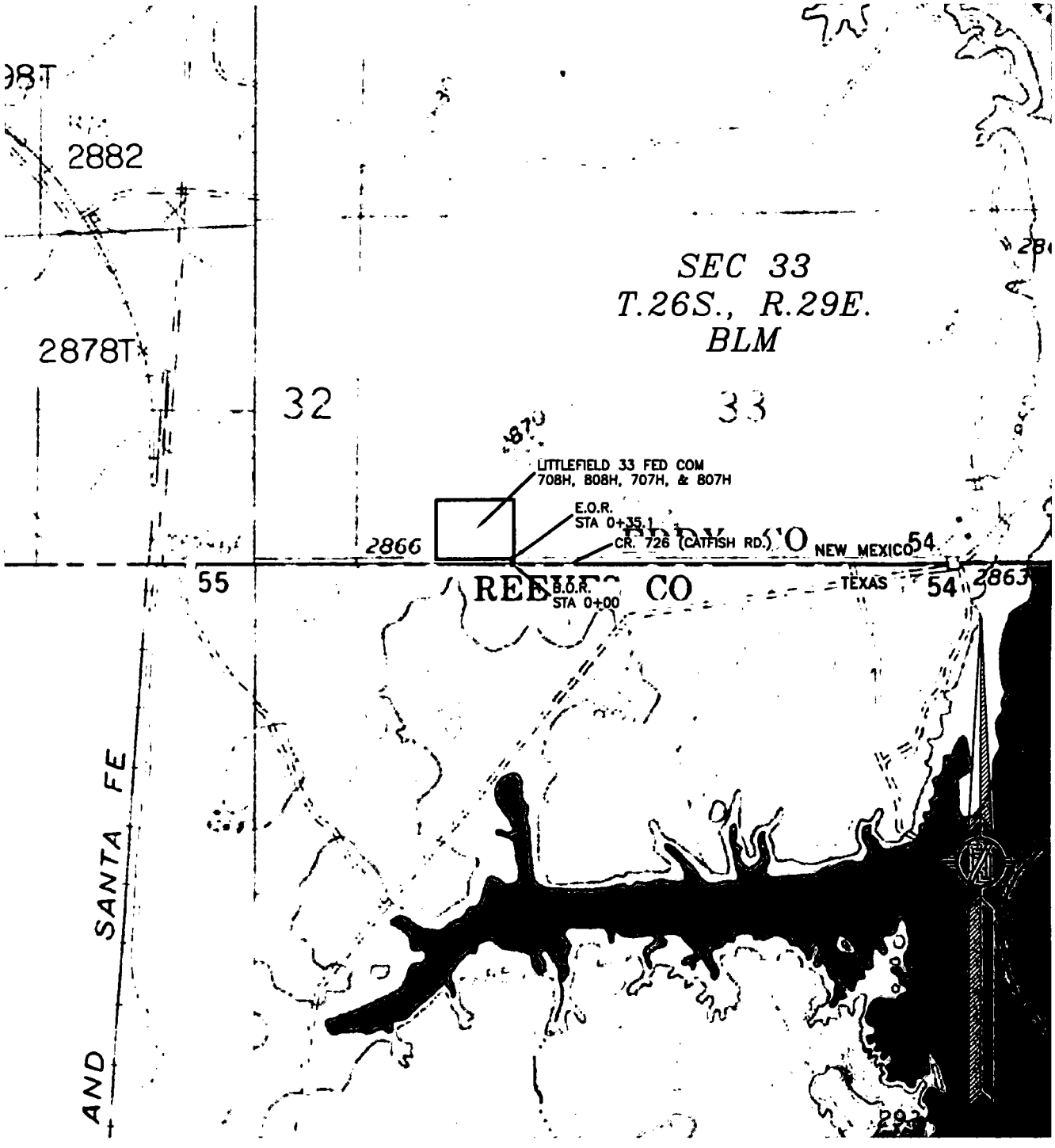
MADRON SURVEYING, INC.
301 SOUTH CANAL
CARLSBAD, NEW MEXICO 88220
Phone (575) 234-3341

ACCESS ROAD PLAT

ACCESS ROAD FROM CR. 726 (CATFISH RD.) TO LITTLEFIELD 33 FED COM 708H, 808H, 707H, & 807H

COG OPERATING, LLC

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 33, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
MARCH 28, 2018



SHEET: 3-5 SURVEY NO. 6134

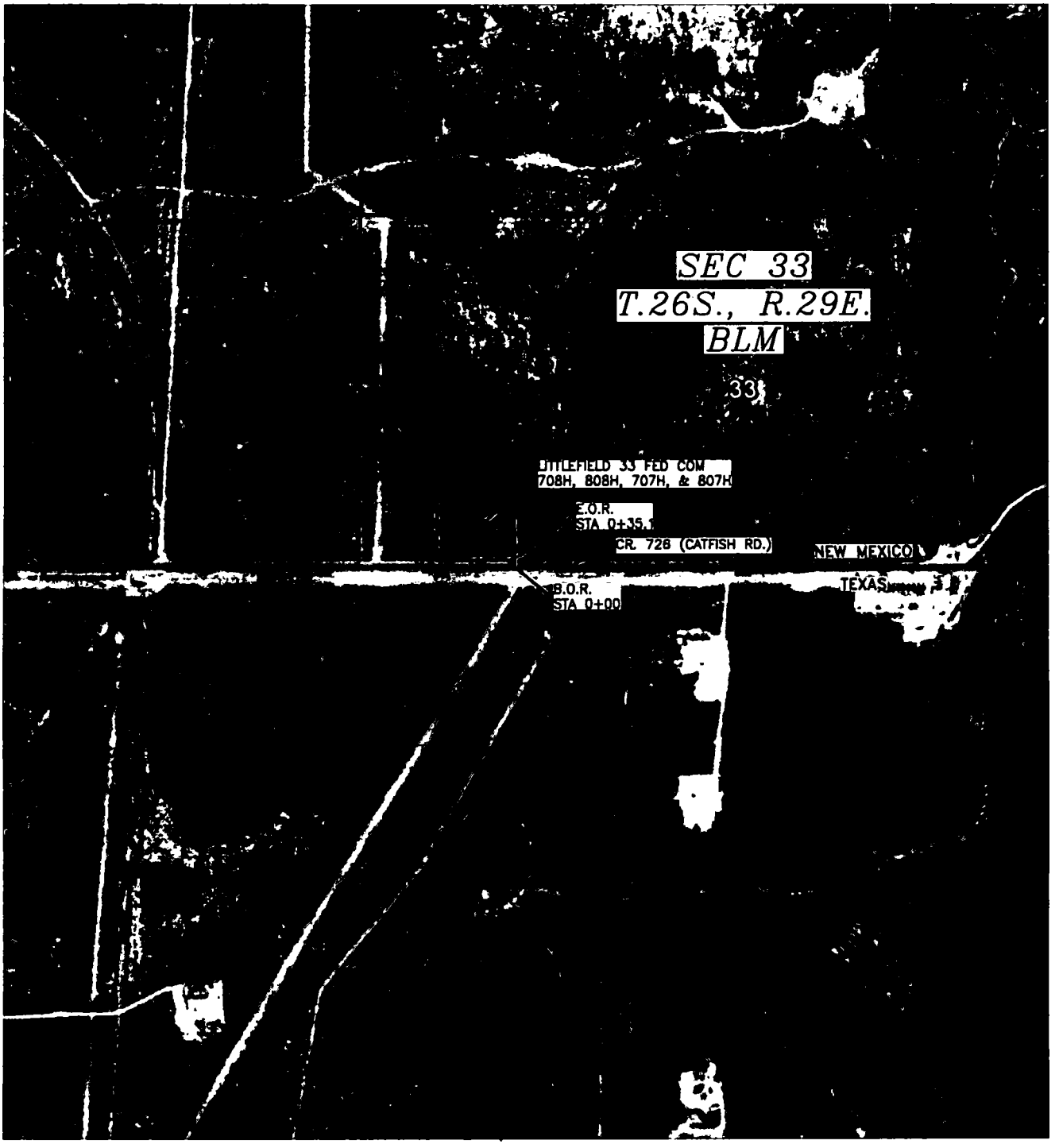
MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

ACCESS ROAD PLAT

ACCESS ROAD FROM CR. 726 (CATFISH RD.) TO LITTLEFIELD 33 FED COM 708H, 808H, 707H, & 807H

COG OPERATING, LLC

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 33, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
MARCH 28, 2018



SHEET: 4-5

SURVEY NO. 6134

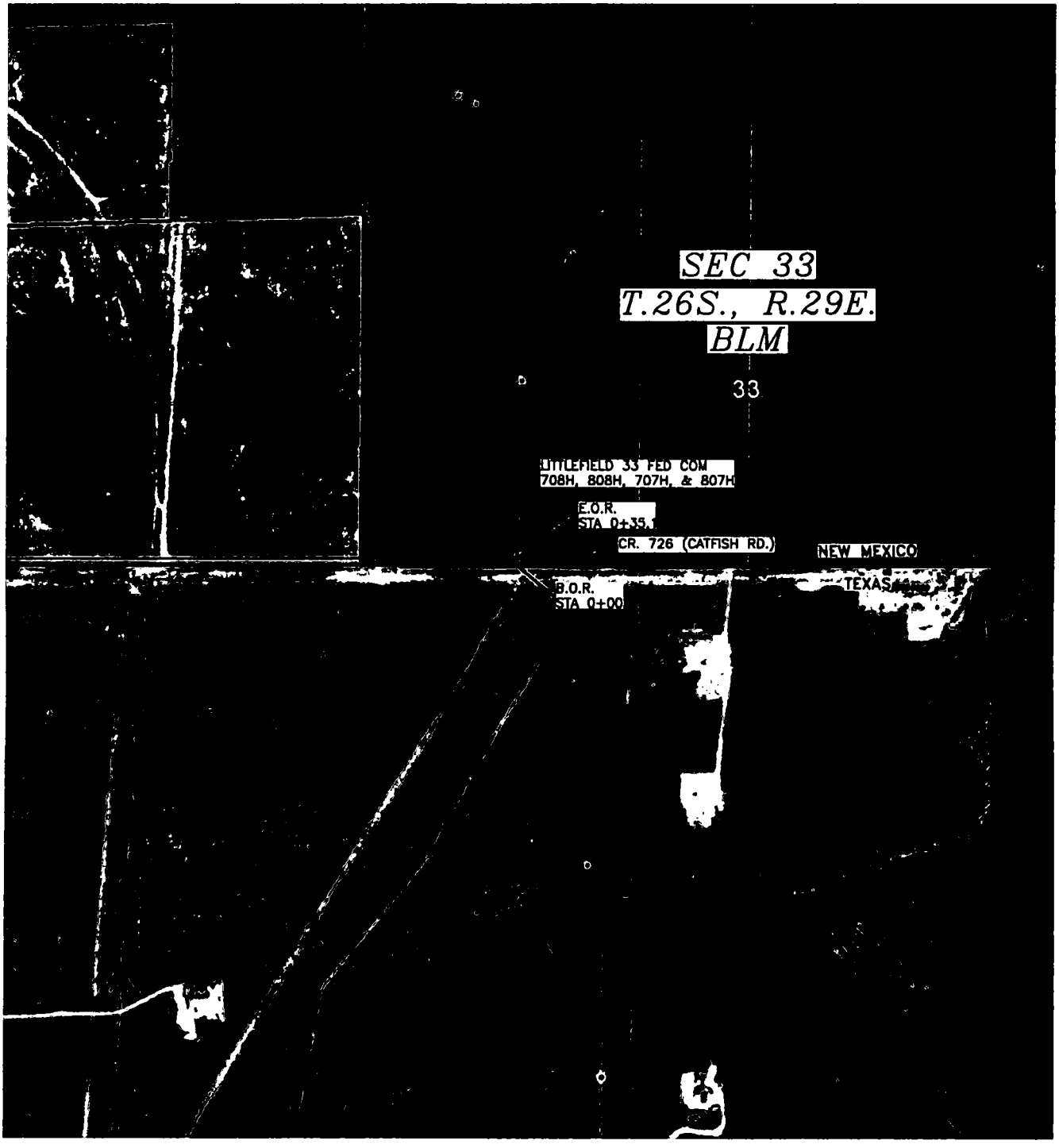
MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

ACCESS ROAD PLAT

ACCESS ROAD FROM CR. 726 (CATFISH RD.) TO LITTLEFIELD 33 FED COM 708H, 808H, 707H, & 807H

COG OPERATING, LLC

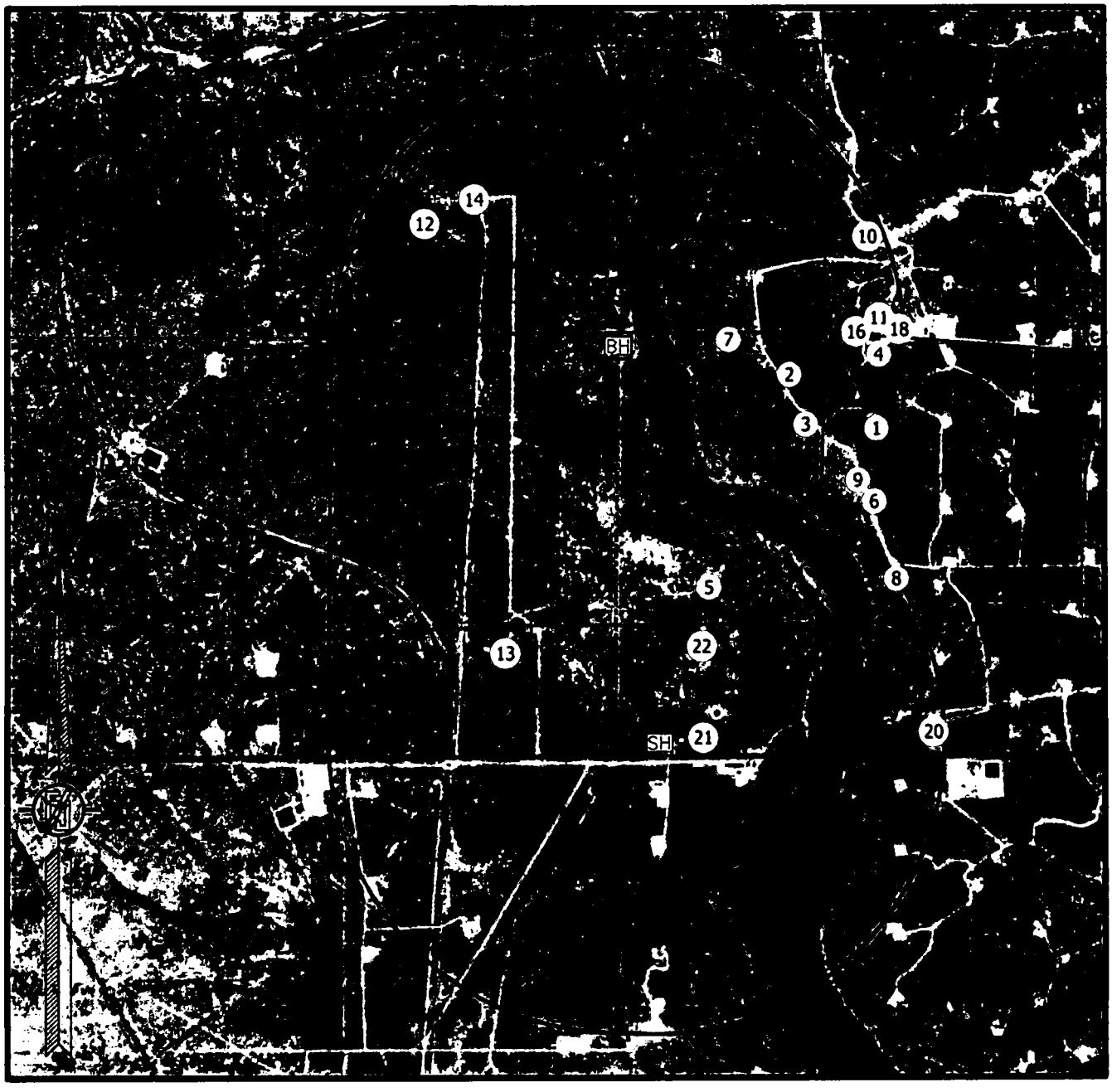
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 33, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
MARCH 28, 2018



SHEET: 5-5 SURVEY NO. 6134

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-8341 CARLSBAD, NEW MEXICO

1 – MILE MAP



SH SURFACE LOCATION

BH BOTTOM OF HOLE

XX WELLS WITHIN 1 MILE

COG OPERATING, LLC

LITTLEFIELD 33 FED COM 706H

LOCATED 300 FT. FROM THE SOUTH LINE AND 2361 FT. FROM THE WEST LINE OF SECTION 33, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M. EDDY COUNTY, STATE OF NEW MEXICO

JANUARY 17, 2018

SURVEY NO. 5786

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 *CARLSBAD, NEW MEXICO*

ID	API	wellname	well_type	ulstr	ogrid_cde	ogrid_name	status	dir_status	elevation	meas_depth	tot_depth	spud_date	plug_date	eff_date	apr_date	latitude	longitude	district	pool_id_li	symbology	URL
1	30-015-25720	AMOCO FEDERAL #010	O	E-27-26S-29E	162683	CIMAREX ENERGY CO. OF COLORADO	P	V	0	5071	5071	12/31/9999	4/28/2014	9/1/2001	2/1/1987	32.0162659	-103.9773238	2	[8080] BRUSHY DRAW, DELAWARE	OP	https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/WellDetails.aspx?api=30-015-25720
2	30-015-25810	AMOCO FEDERAL #013	O	A-28-26S-29E	162683	CIMAREX ENERGY CO. OF COLORADO	P	V	0	3100	3100	10/3/1987	4/22/2014	9/1/2001	12/1/1987	32.0189285	-103.9827433	2	[8080] BRUSHY DRAW, DELAWARE	OP	https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/WellDetails.aspx?api=30-015-25810
3	30-015-29171	MALLON PECOS RIVER 28 FEDERAL #007	O	P-28-26S-29E	162683	CIMAREX ENERGY CO. OF COLORADO	P	V	2890	6452	6452	3/19/1997	2/16/2010	9/1/2001	2/1/1997	32.0164795	-103.9817734	2	[8080] BRUSHY DRAW, DELAWARE	OP	https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/WellDetails.aspx?api=30-015-29171
4	30-015-25666	AMOCO FEDERAL #011	O	D-27-26S-29E	162683	CIMAREX ENERGY CO. OF COLORADO	P	V	0	6200	6200	12/31/9999	10/30/2014	9/1/2001	12/1/1986	32.0188536	-103.9773748	2	[8080] BRUSHY DRAW, DELAWARE	OP	https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/WellDetails.aspx?api=30-015-25666
5	30-015-25858	AMOCO FEDERAL #014	O	O-28-26S-29E	162683	CIMAREX ENERGY CO. OF COLORADO	P	V	0	6130	6130	12/31/9999	12/14/2014	9/1/2001	4/1/1986	32.0084372	-103.987367	2	[8080] BRUSHY DRAW, DELAWARE	OP	https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/WellDetails.aspx?api=30-015-25858
6	30-015-25786	AMOCO RED BLUFF FEDERAL #001	O	L-27-26S-29E	162683	CIMAREX ENERGY CO. OF COLORADO	P	V	0	6173	6173	12/31/9999	3/1/2014	9/1/2001	4/1/1989	32.0126648	-103.9776764	2	[8080] BRUSHY DRAW, DELAWARE	OP	https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/WellDetails.aspx?api=30-015-25786
7	30-015-26244	AMOCO RED BLUFF FEDERAL #005	O	B-28-26S-29E	162683	CIMAREX ENERGY CO. OF COLORADO	P	V	0	3100	3100	1/7/1990	12/2/2014	9/1/2001	4/1/1990	32.0206757	-103.9863643	2	[8080] BRUSHY DRAW, DELAWARE	OP	https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/WellDetails.aspx?api=30-015-26244
8	30-015-26800	COYOTE FEDERAL 27 #001	O	M-27-26S-29E	19581	ROBERT H FORREST JR OIL LLC	A	V	0	5087	5087	8/7/1991	12/31/9999	6/17/2010	10/1/1991	32.0088425	-103.9763718	2	[8080] BRUSHY DRAW, DELAWARE	OA	https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/WellDetails.aspx?api=30-015-26800
9	30-015-26892	SHAW FEDERAL 27 #001	O	I-27-26S-29E	19581	ROBERT H FORREST JR OIL LLC	A	V	0	0	9999	1/6/1992	12/31/9999	6/17/2010	2/1/1992	32.0137213	-103.9706458	2	[8080] BRUSHY DRAW, DELAWARE	OA	https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/WellDetails.aspx?api=30-015-26892
10	30-015-25996	MOBIL 22 FEDERAL #010	I	L-22-26S-29E	19958	STEPHENS & JOHNSON OP CO	A	V	2876	6182	6182	6/21/1988	12/31/9999	10/23/1990	8/1/1988	32.0257225	-103.9780273	2	[8080] BRUSHY DRAW, DELAWARE	IA	https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/WellDetails.aspx?api=30-015-25996
11	30-015-25588	MOBIL 22 FEDERAL #009	O	M-22-26S-29E	19958	STEPHENS & JOHNSON OP CO	A	V	0	6128	6128	4/24/1986	12/31/9999	4/1/1988	7/1/1986	32.0217696	-103.9771483	2	[8080] BRUSHY DRAW, DELAWARE	OA	https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/WellDetails.aspx?api=30-015-25588
12	30-015-27274	NEZ PERCE FED #001	O	J-20-26S-29E	20847	SIETE OIL & GAS CORP	P	D	2856	6382	6382	12/31/9999	8/11/1995	4/21/1994	3/12/1993	32.0264397	-104.004425	2	[96054] WILDCAT, GROUP 5	OP	https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/WellDetails.aspx?api=30-015-27274
13	30-015-38301	SIDEWINDER #002H	O	O-32-26S-29E	227933	COG PRODUCTION, LLC	P	H	2994	11200	7028	11/6/2011	7/30/2015	2/24/2011	2/24/2011	32.0052414	-103.9999872	2	[97876] WC-015 G-08 S263132E, BONE SPRING	OP	https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/WellDetails.aspx?api=30-015-38301
14	30-015-41327	RIVERWALK FEDERAL COM #001H	O	I-20-26S-29E	229137	COG OPERATING LLC	N	H	2890	0	0	12/31/9999	12/31/9999	7/5/2013	7/5/2013	32.0276299	-104.0074372	2	[97801] WILDCAT G-04 S262908A, BONE SPRING	ON	https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/WellDetails.aspx?api=30-015-41327
15	30-015-42285	EAST PECOS FEDERAL 22 #002H	O	M-22-26S-29E	246289	RKI EXPLORATION & PRODUCTION, LLC	A	H	2876	13125	0	11/10/2014	12/31/9999	4/8/2014	4/2/2014	32.0210342	-103.9748200	2	[13354] CORRAL CANYON, BONE SPRING, SOUTH	OA	https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/WellDetails.aspx?api=30-015-42285
16	30-015-42286	EAST PECOS FEDERAL 22 #008H	O	M-22-26S-29E	246289	RKI EXPLORATION & PRODUCTION, LLC	N	H	2876	0	0	12/31/9999	12/31/9999	4/8/2014	4/2/2014	32.021201	-103.9767825	2	[13354] CORRAL CANYON, BONE SPRING, SOUTH	ON	https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/WellDetails.aspx?api=30-015-42286
17	30-015-43349	EAST PECOS FEDERAL 22 #009H	G	M-22-26S-29E	246289	RKI EXPLORATION & PRODUCTION, LLC	A	H	2879	15560	10840	1/21/2017	12/31/9999	3/1/2017	8/31/2015	32.0214143	-103.9761585	2	[72897] BRUSHY DRAW, WOLFCAMP (GAS)ABOLISH, [98220] PURPLE SAGE, WOLFCAMP (GAS)	GA	https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/WellDetails.aspx?api=30-015-43349
18	30-015-43416	EAST PECOS FEDERAL 22 #010H	G	N-22-26S-29E	246289	RKI EXPLORATION & PRODUCTION, LLC	N	H	2879	0	0	12/31/9999	12/31/9999	10/8/2015	8/31/2015	32.02113745	-103.9761305	2	[72897] BRUSHY DRAW, WOLFCAMP (GAS)ABOLISH, [98220] PURPLE SAGE, WOLFCAMP (GAS)	GN	https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/WellDetails.aspx?api=30-015-43416
19	30-015-43415	EAST PECOS FEDERAL 22 #011H	G	N-22-26S-29E	246289	RKI EXPLORATION & PRODUCTION, LLC	N	H	3079	0	0	12/31/9999	12/31/9999	10/8/2015	8/31/2015	32.02118225	-103.9760682	2	[72897] BRUSHY DRAW, WOLFCAMP (GAS)ABOLISH, [98220] PURPLE SAGE, WOLFCAMP (GAS)	GN	https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/WellDetails.aspx?api=30-015-43415
20	30-015-35174	LITTLEFIELD BO FEDERAL #006	O	10-34-26S-29E	172182	OLIVER BROWN DBA OLIVER BROWN OIL	A	V	2858	6521	6521	11/10/2006	12/31/9999	6/27/2017	9/29/2006	32.0012836	-103.9741888	2	[8080] BRUSHY DRAW, DELAWARE	OA	https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/WellDetails.aspx?api=30-015-35174
21	30-015-43818	LITTLEFIELD 33 FEDERAL #003H	G	11-33-26S-29E	172182	OLIVER BROWN DBA OLIVER BROWN OIL	N	H	2872	0	0	12/31/9999	12/31/9999	6/27/2017	6/7/2016	32.0010451	-103.98793	2	[72897] BRUSHY DRAW, WOLFCAMP (GAS)ABOLISH, [98180] WC-015 G-06 S262911H, UPR WC (ABOL), [98220] PURPLE SAGE, WOLFCAMP (GAS)	GN	https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/WellDetails.aspx?api=30-015-43818
22	30-015-35489	LITTLEFIELD BO FEDERAL #008	O	6-33-26S-29E	6339	GP II ENERGY INC	N	V	2883	0	0	12/31/9999	12/31/9999	8/22/2007	5/22/2007	32.0015428	-103.9880219	2	[8080] BRUSHY DRAW, DELAWARE	ON	https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/WellDetails.aspx?api=30-015-35489

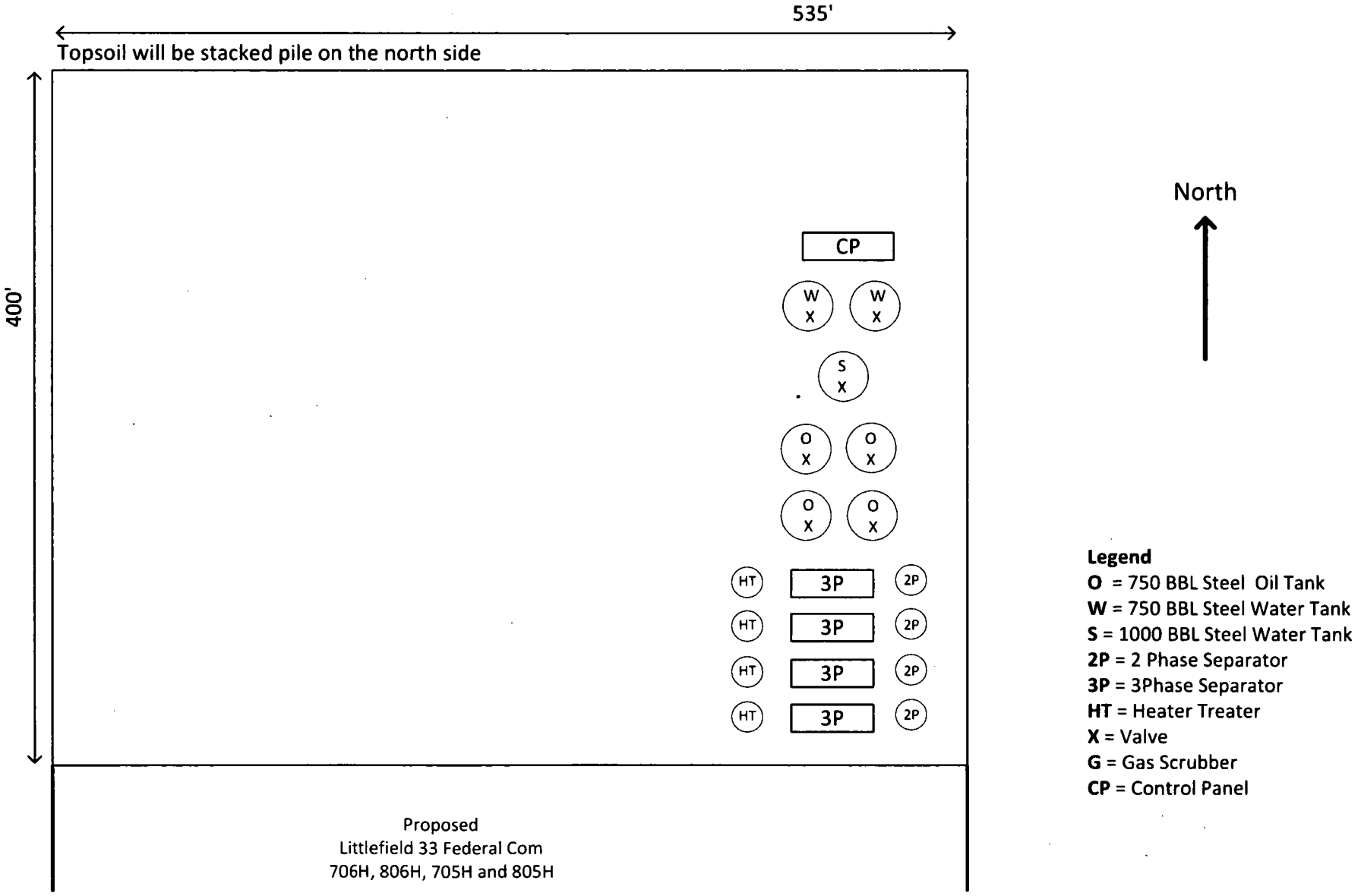
CONCHO
COG Operating LLC
2208 West Main Street
Artesia, NM 88210

Well Site Layout

Production Facility Layout

Littlefield 33 CTB 1
Section 33- T26S- R29E

Exhibit 3



North

Legend

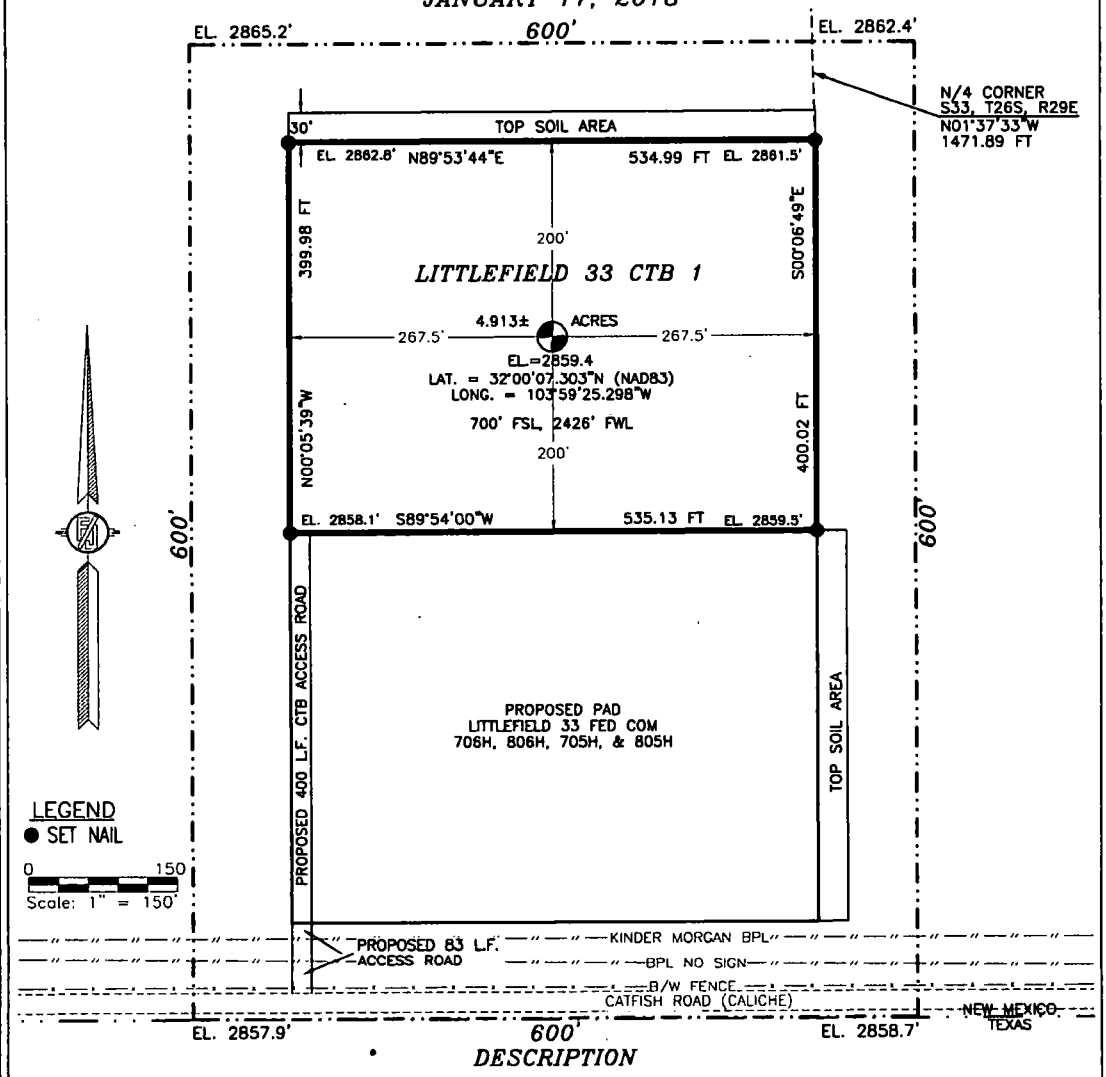
O = 750 BBL Steel Oil Tank
W = 750 BBL Steel Water Tank
S = 1000 BBL Steel Water Tank
2P = 2 Phase Separator
3P = 3Phase Separator
HT = Heater Treater
X = Valve
G = Gas Scrubber
CP = Control Panel

LITTLEFIELD 33 CTB 1

COG OPERATING, LLC

IN THE SW/4 LOT 6, SE/7 LOT 7, NE/4 LOT 10, & NW/4 LOT 11 OF SECTION 33, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M. EDDY COUNTY, STATE OF NEW MEXICO

JANUARY 17, 2018



DESCRIPTION

A CERTAIN PIECE OR PARCEL OF LAND AND REAL ESTATE LYING IN BUREAU OF LAND MANAGEMENT LAND IN THE SW/4 LOT 6, SE/7 LOT 7, NE/4 LOT 10, & NW/4 LOT 11 OF SECTION 33, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.

BEGINNING AT THE NORTHEAST CORNER OF THE PARCEL, WHENCE THE NORTH QUARTER CORNER OF SECTION 33, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M. BEARS N01°37'33"W, A DISTANCE OF 1471.89 FEET;
THENCE S00°06'49"E A DISTANCE OF 400.02 FEET TO THE SOUTHEAST CORNER OF THE PARCEL;
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THENCE N00°05'39"W A DISTANCE OF 399.98 FEET TO THE NORTHWEST CORNER OF THE PARCEL;
THENCE N89°53'44"E A DISTANCE OF 534.99 FEET TO THE NORTHEAST CORNER OF THE PARCEL, THE POINT OF BEGINNING;
CONTAINING 4.913 ACRES MORE OR LESS.

GENERAL NOTES

1.) THE INTENT OF THIS SURVEY IS TO ACQUIRE A BUSINESS LEASE FOR THE PURPOSE OF BUILDING A CENTRAL TANK BATTERY

2.) BASIS OF BEARING IS NEW MEXICO STATE PLANE EAST ZONE MODIFIED TO THE SURFACE (NAD83). COORDINATES ARE NAD 83. ELEVATIONS ARE NAVD 88

DRIVING DIRECTIONS: FROM U.S. HWY 285 AND CALICHE CR. 726 (CATFISH RD.) GO EAST ON CR. 726 2.3 MILES TO A ROAD SURVEY AND FOLLOW FLAGS NORTH 483' TO THE SOUTHWEST PAD CORNER FOR THIS LOCATION.

SURVEYOR CERTIFICATE

I, FILIMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO.

IN WITNESS WHEREOF THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 31ST DAY OF JANUARY 2018

FILIMON F. JARAMILLO PLS. 12797

MADRON SURVEYING, INC.
301 SOUTH CANAL
CARLSBAD, NEW MEXICO 88220
Phone (575) 234-3341

SHEET: 1-3

SURVEY NO. 5959

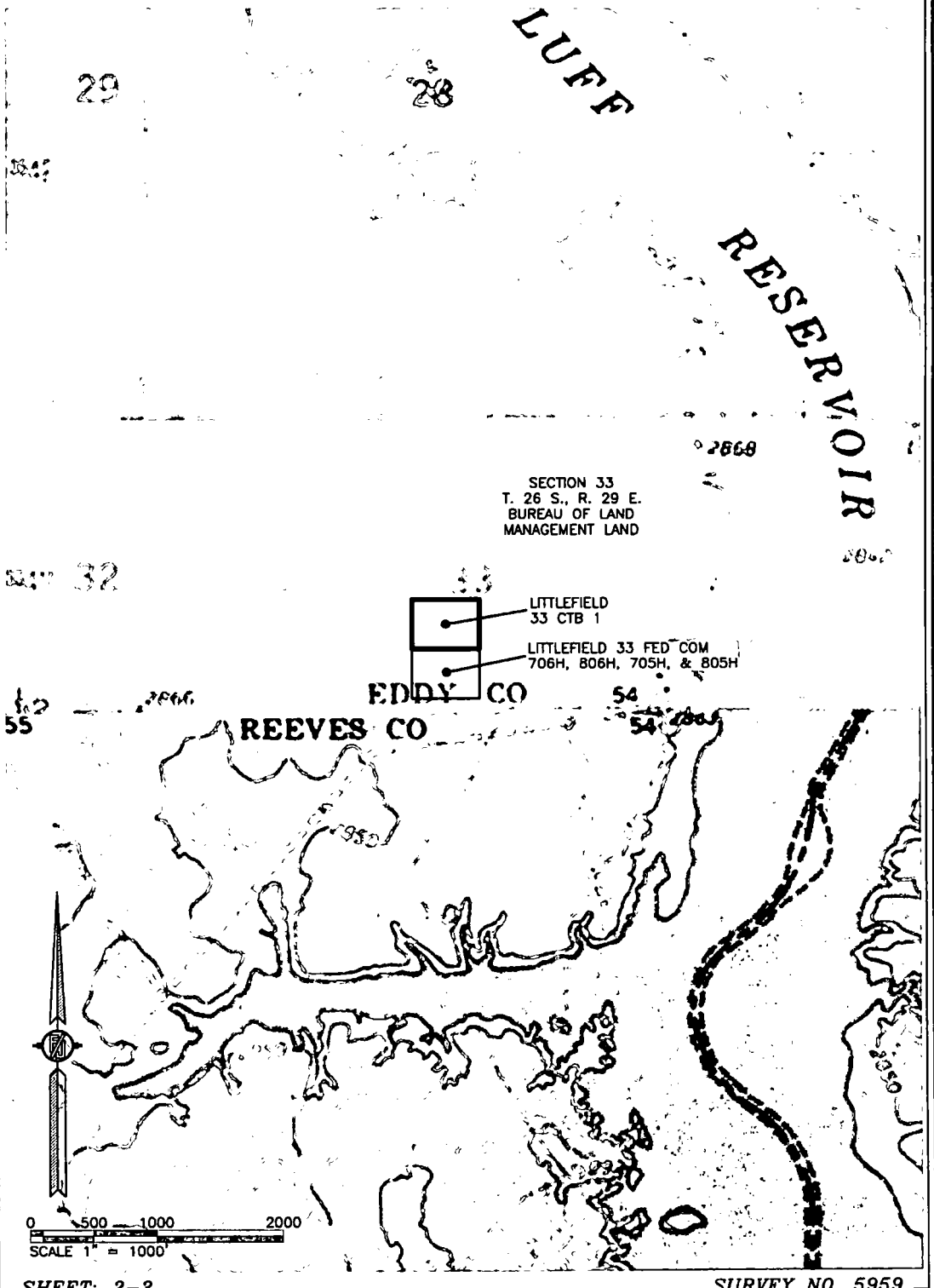
LITTLEFIELD 33 CTB 1

COG OPERATING, LLC

IN THE SW/4 LOT 6, SE/7 LOT 7, NE/4 LOT 10, & NW/4 LOT 11 OF SECTION 33, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JANUARY 17, 2018

QUAD MAP



SHEET: 2-3

SURVEY NO. 5959

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

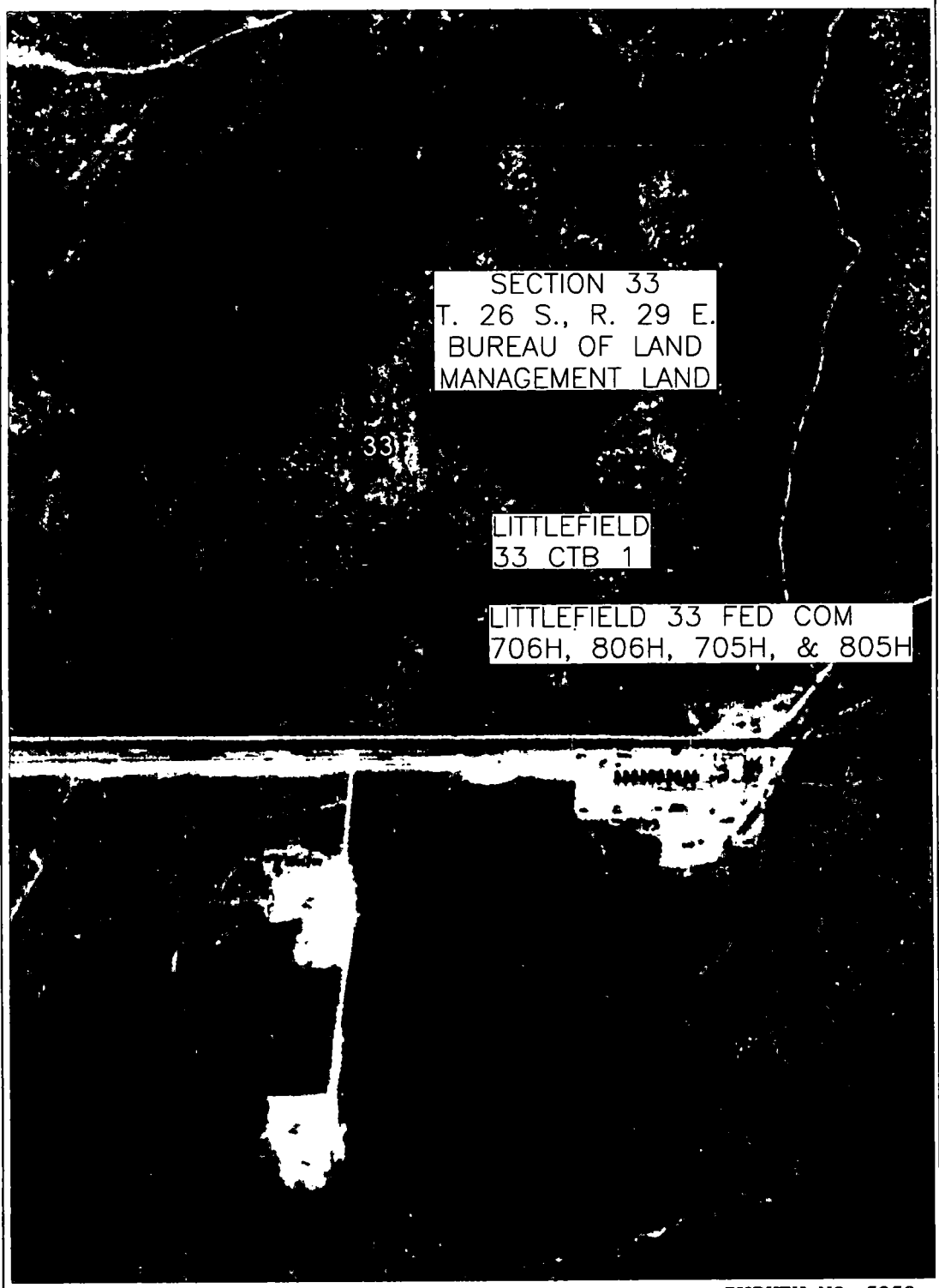
LITTLEFIELD 33 CTB 1

COG OPERATING, LLC

IN THE SW/4 LOT 6, SE/7 LOT 7, NE/4 LOT 10, & NW/4 LOT 11 OF SECTION 33, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JANUARY 17, 2018

AERIAL PHOTO



MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

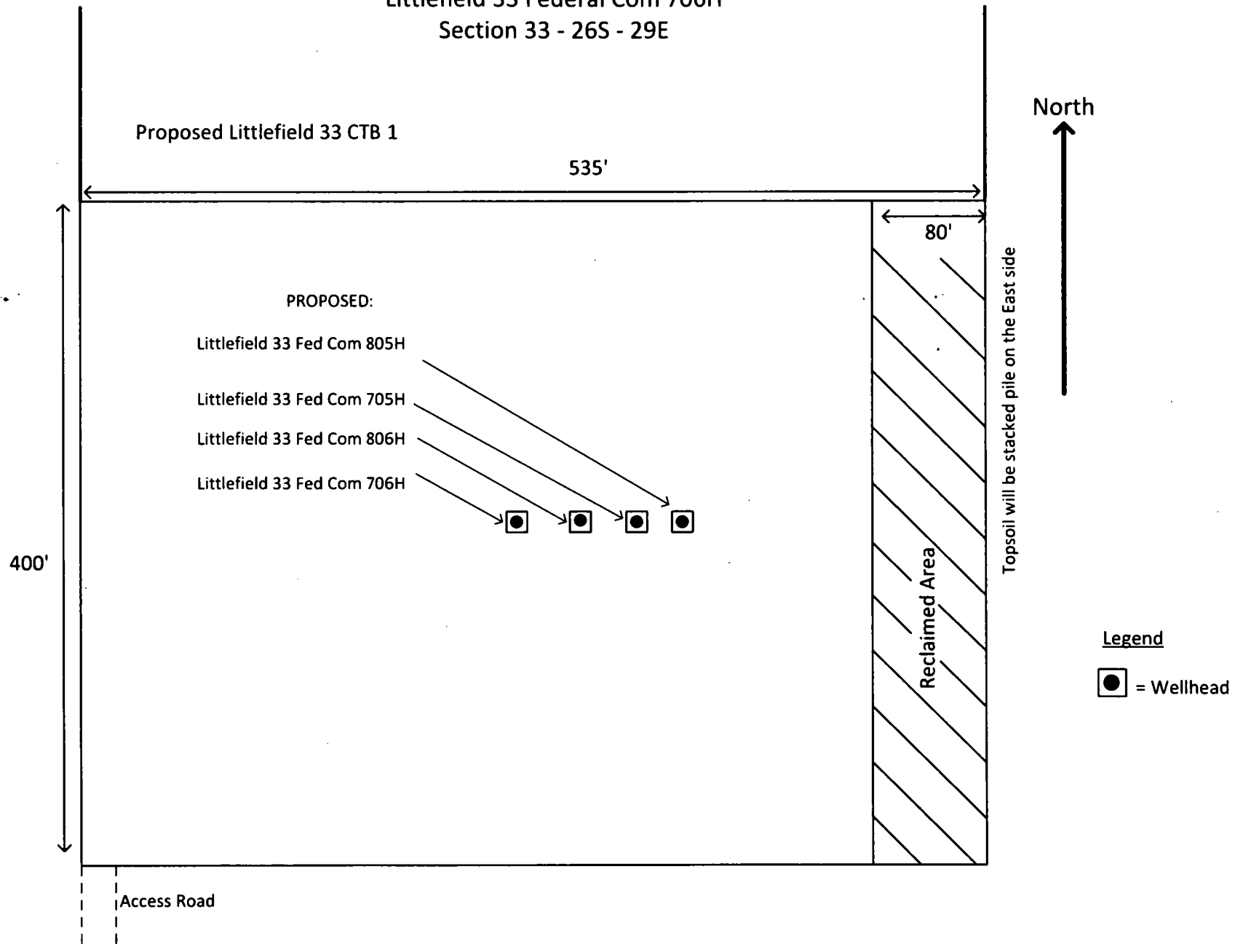
CONCHO
COG Operating LLC
2208 West Main Street
Artesia, NM 88210

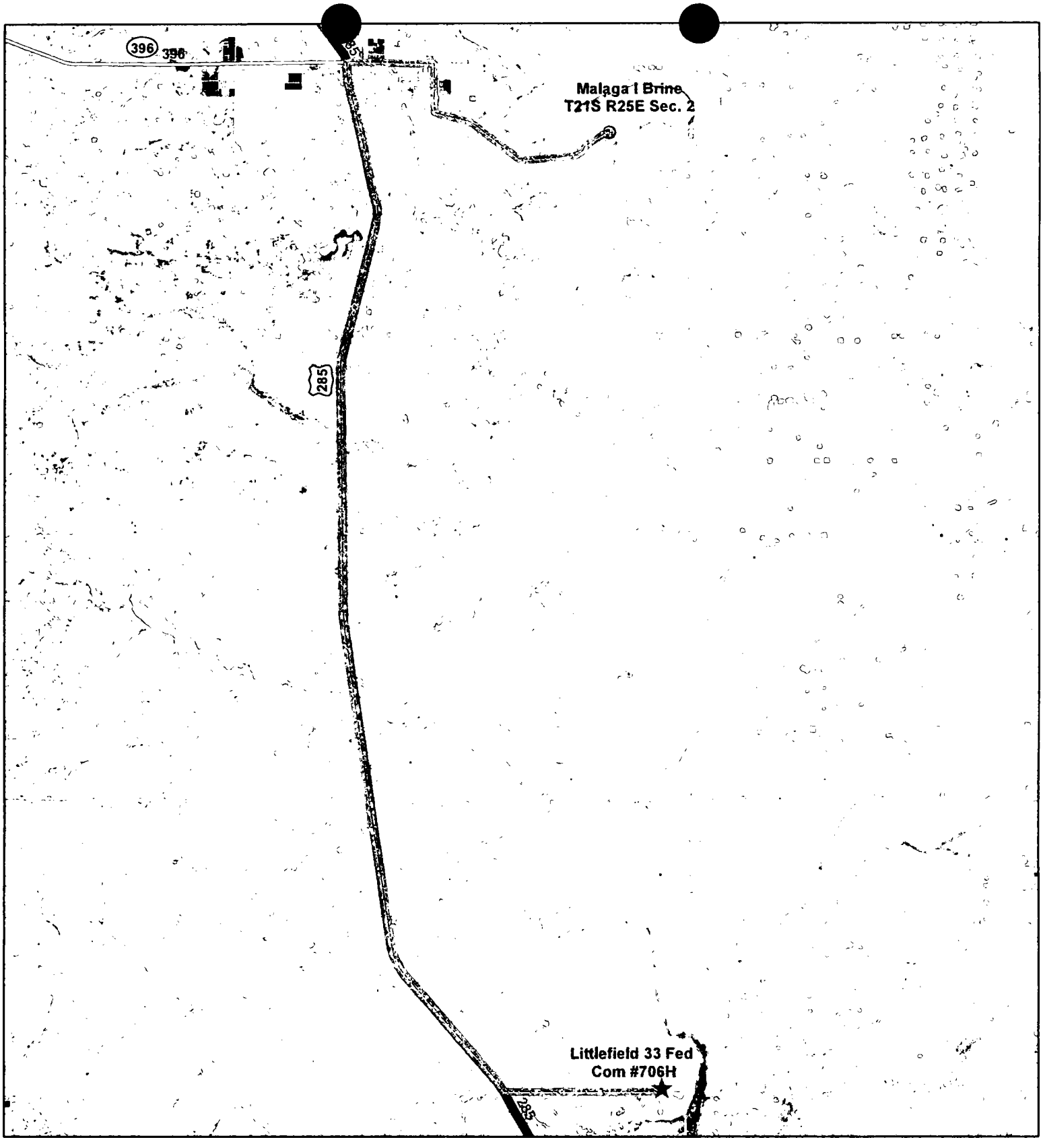
Well Site Layout

Production Facility Layout

Littlefield 33 Federal Com 706H
Section 33 - 26S - 29E

Exhibit 3





CONCHO

Littlefield 33 Fed Com #706H
To Malaga I Brine

Date: 3/22/2018
Author: Whitnie McDonald
State: New Mexico
County: Eddy

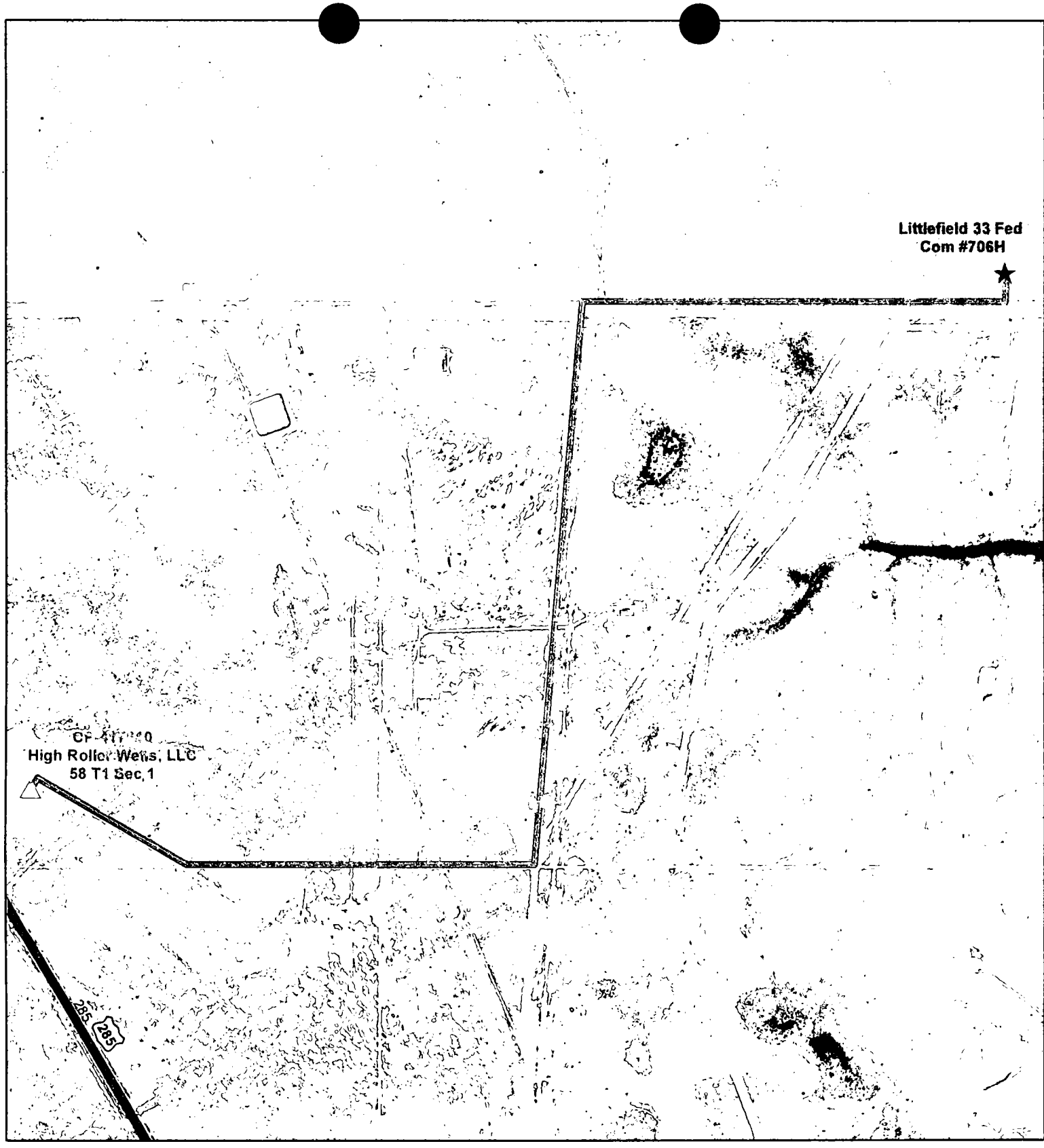
Disclaimer: This is not a legal survey document

Map Legend

Route

N
W E
S

0 0.75 1.5 3 4.5 6
Miles



CONCHO

Littlefield 33 Fed Com #706H
Water transfer Route

Date 3/22/2018
Author Whystan McDonald
State New Mexico
County Eddy

Disclaimer This is not a legal survey document

Map Legend

Route

0 0.075 0.15 0.3 0.45 0.6
Miles

N
W E
S

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

State of New Mexico
Energy, Minerals and Natural Resources Department

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Submit Original to Appropriate District Office

GAS CAPTURE PLAN

Date: **3/21/2018**

☒ Original

Operator & OGRID No.: **COG Operating LLC, OGRID 229137**

☐ Amended - Reason for Amendment:_____

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

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

Well(s)/Production Facility – Name of facility

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

Well Name	API	Well Location (ULSTR)	Footages	Expected MCF/D	Flared or Vented	Comments
Littlefield 33 Fed Com 706H	**30-015-**	**10-33-26S-29E**	**300' FSL & 2361' FWL**	**2,637 MCF**		**Gas will connect on proposed CTB.**

Gathering System and Pipeline Notification

Well(s) will be connected to a production facility after flowback operations are complete, if gas transporter system is in place. The gas produced from production facility is dedicated to **DBM**, and will be connected to **Ramsey** low/high pressure gathering system located in **Reeves** County, Texas. It will require **0' to an undetermined amount of feet** of pipeline to connect the facility to low/high pressure gathering system. **COG Operating LLC** provides (periodically) to **DBM** a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, **COG Operating LLC** and **DBM** have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at **Ramsey** Processing Plant located in **Sec 36, Blk 58-T1-T&P, Reeves** County, Texas. The actual flow of the gas will be based on compression operating parameters and gathering system pressures.

Flowback Strategy

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

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

Alternatives to Reduce Flaring

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

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

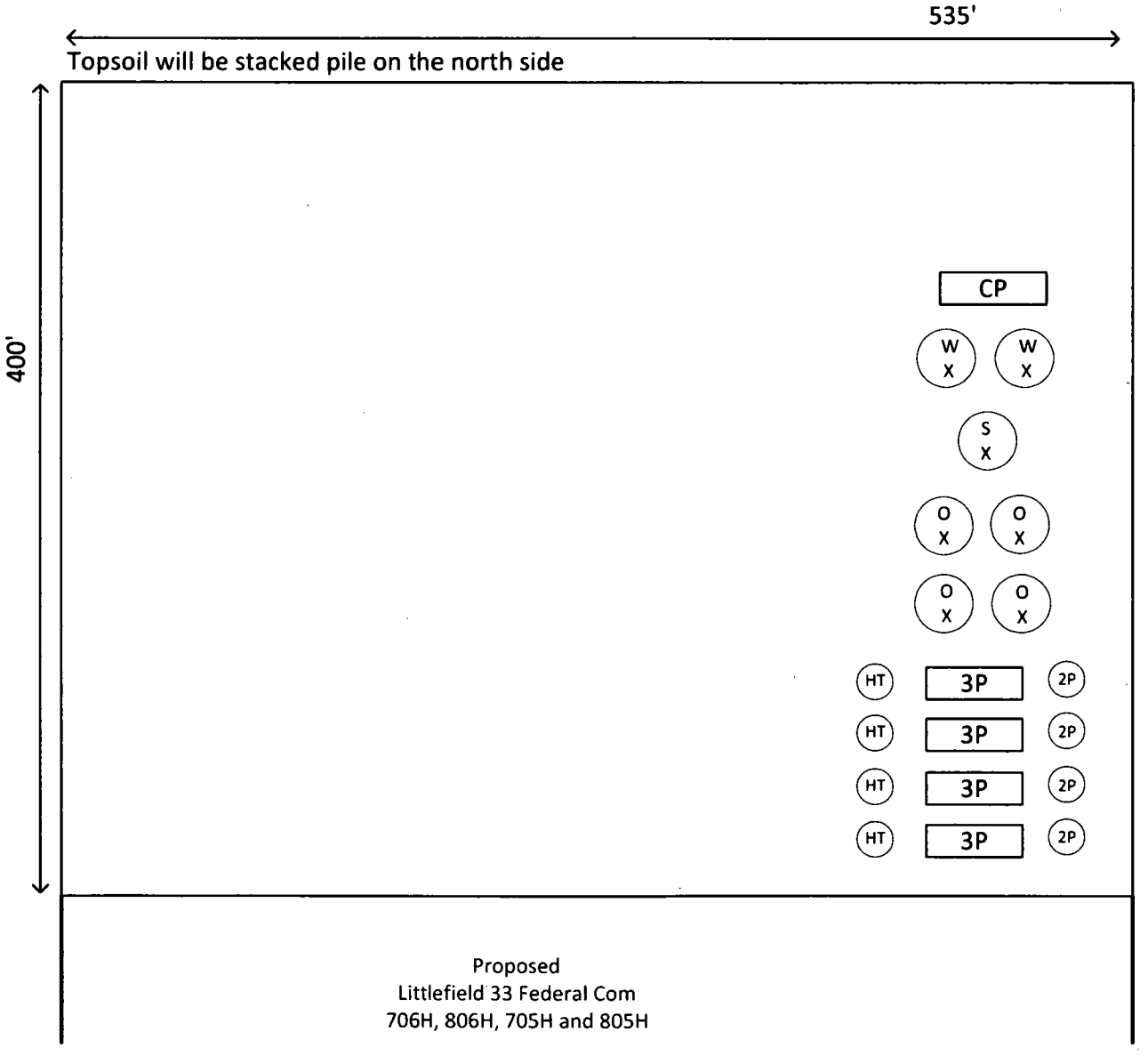
CONCHO
COG Operating LLC
2208 West Main Street
Artesia, NM 88210

Well Site Layout

Production Facility Layout

Littlefield 33 CTB 1
Section 33- T26S- R29E

Exhibit 3



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W = 750 BBL Steel Water Tank
S = 1000 BBL Steel Water Tank
2P = 2 Phase Separator
3P = 3Phase Separator
HT = Heater Treater
X = Valve
G = Gas Scrubber
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LITTLEFIELD 33 CTB 1

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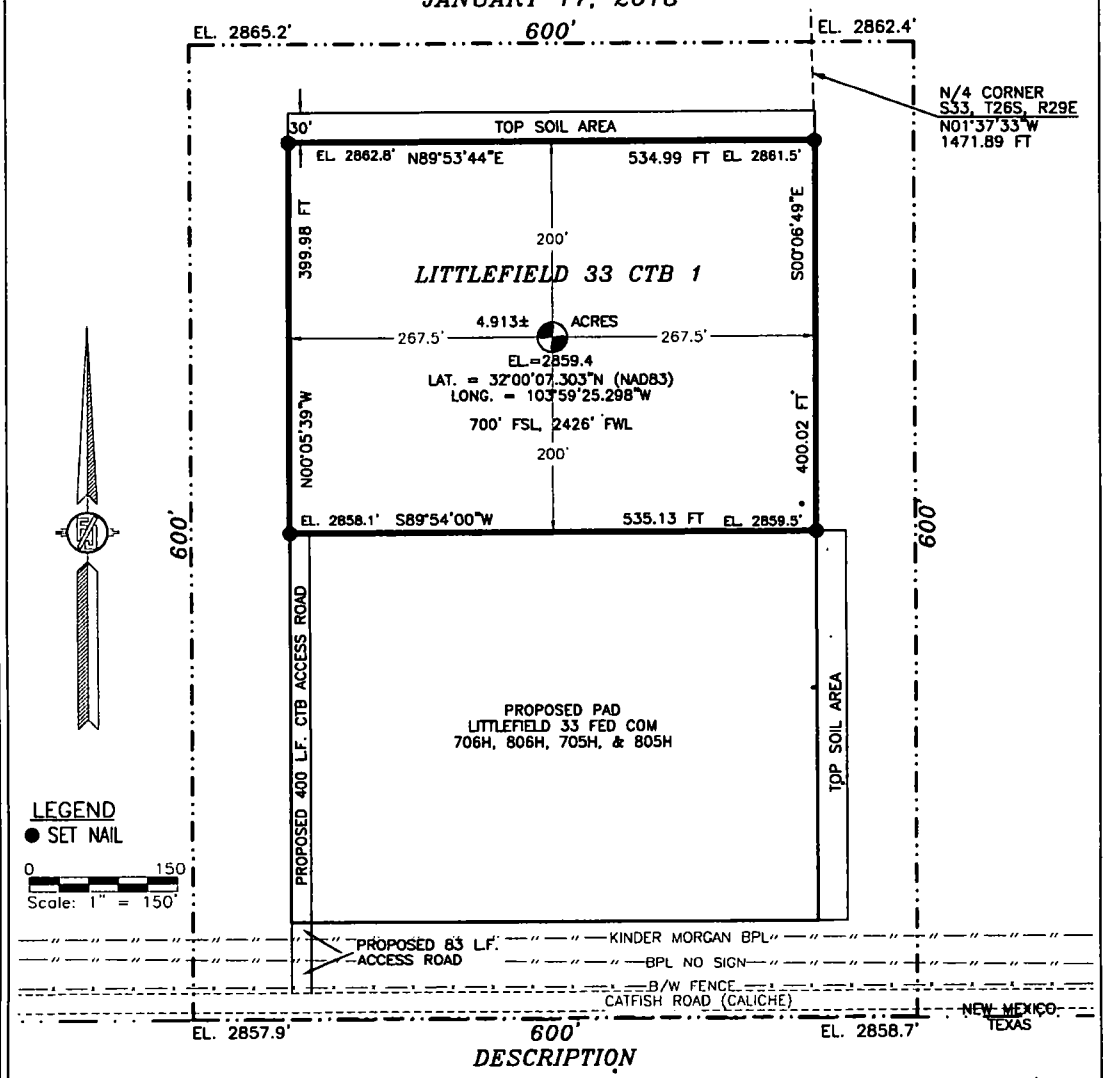
JANUARY 17, 2018



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CONTAINING 4.913 ACRES MORE OR LESS.

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SURVEYOR CERTIFICATE

I, FILIMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO.

IN WITNESS WHEREOF THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 17TH DAY OF JANUARY 2018

FILIMON F. JARAMILLO, P.L.S. 12797

MADRON SURVEYING, INC.
301 SOUTH CANAL
CARLSBAD, NEW MEXICO 88220
Phone (575) 234-3341

SHEET: 1-3

SURVEY NO. 5959

MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO

LITTLEFIELD 33 CTB 1

COG OPERATING, LLC

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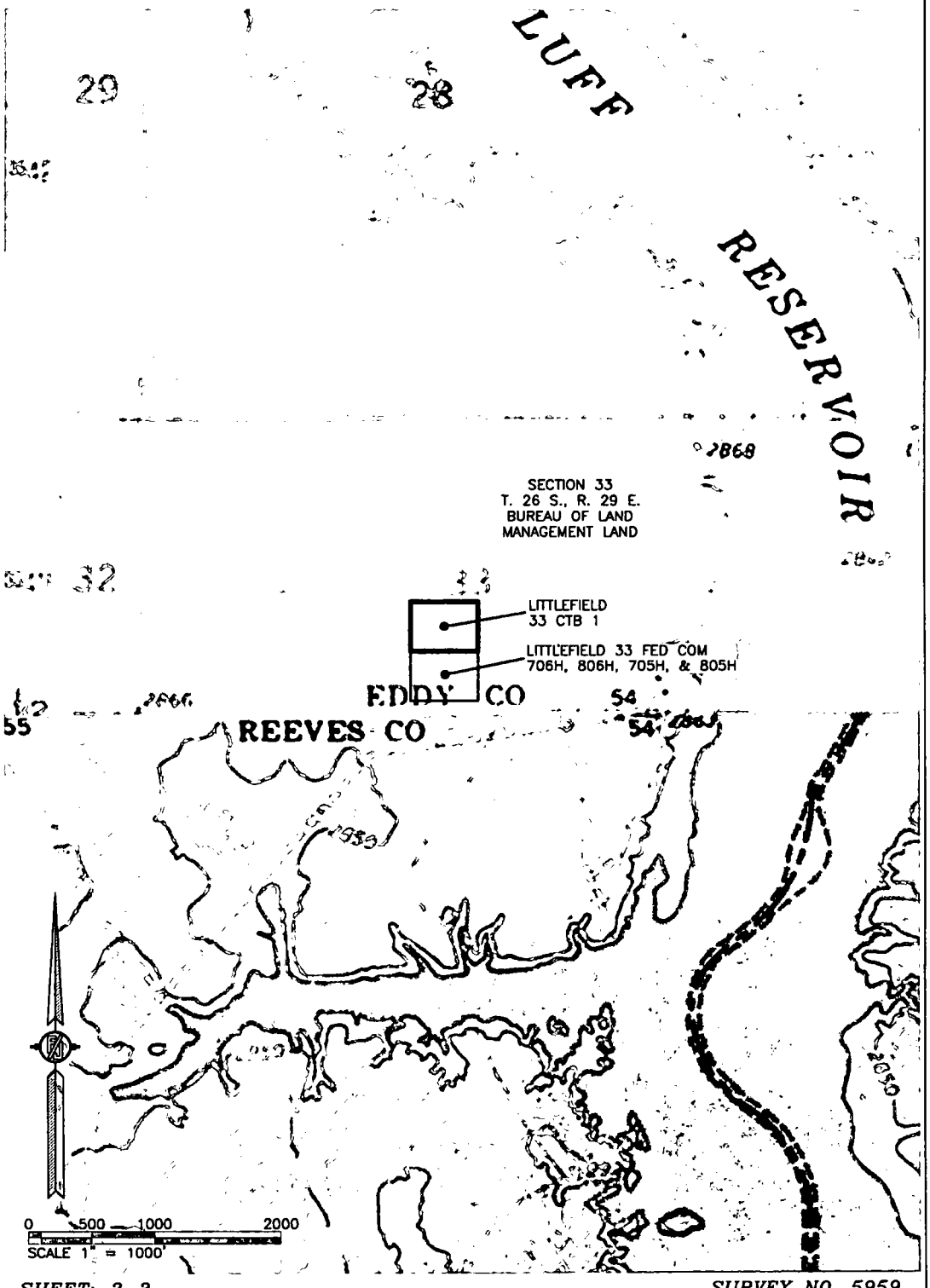
JANUARY 17, 2018

QUAD MAP



SHEET: 2-3

SURVEY NO. 5959

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

LITTLEFIELD 33 CTB 1

COG OPERATING, LLC

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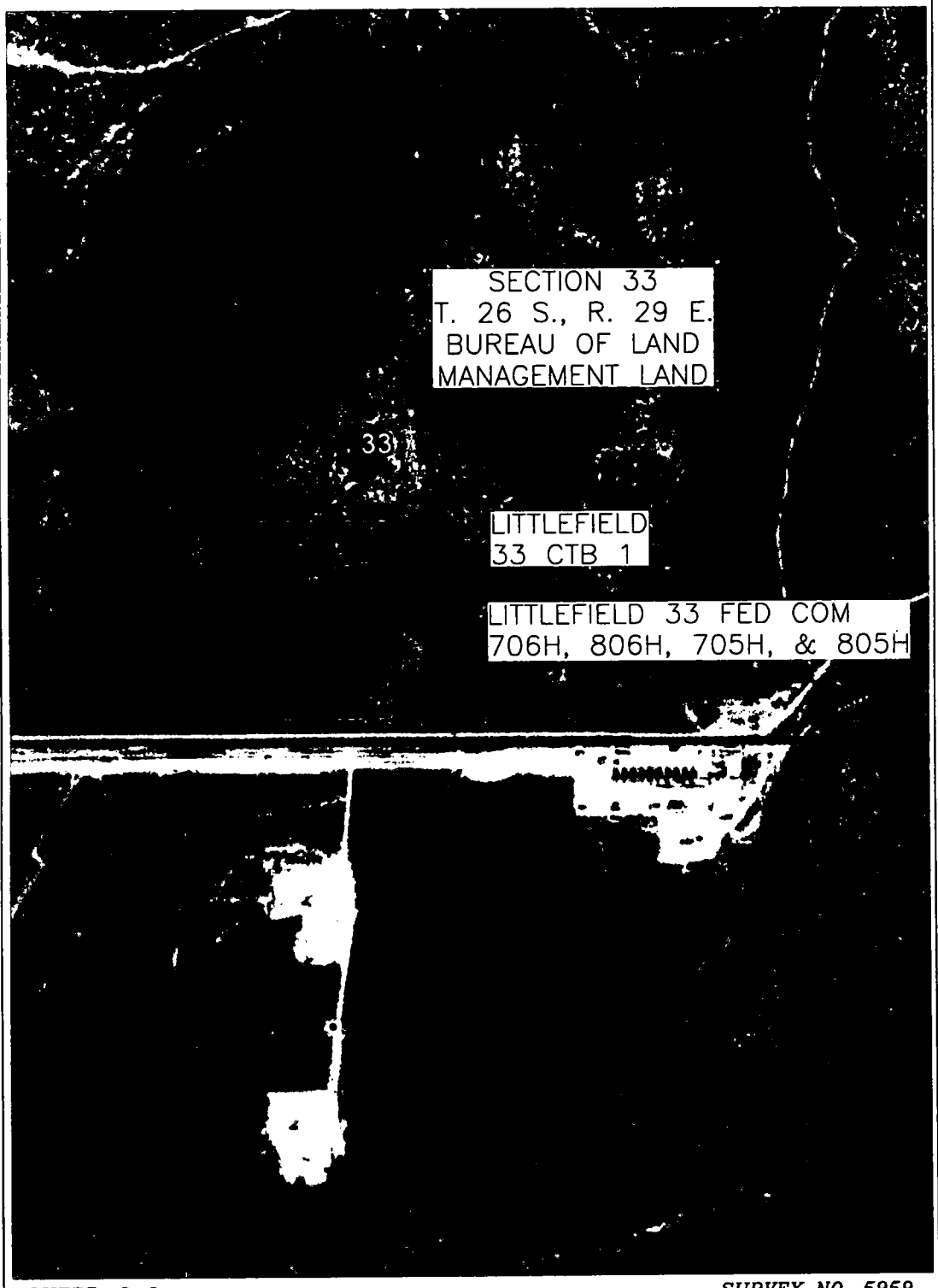
JANUARY 17, 2018

AERIAL PHOTO



MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

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2208 West Main Street
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Littlefield 33 Federal Com 706H
Section 33 - 26S - 29E

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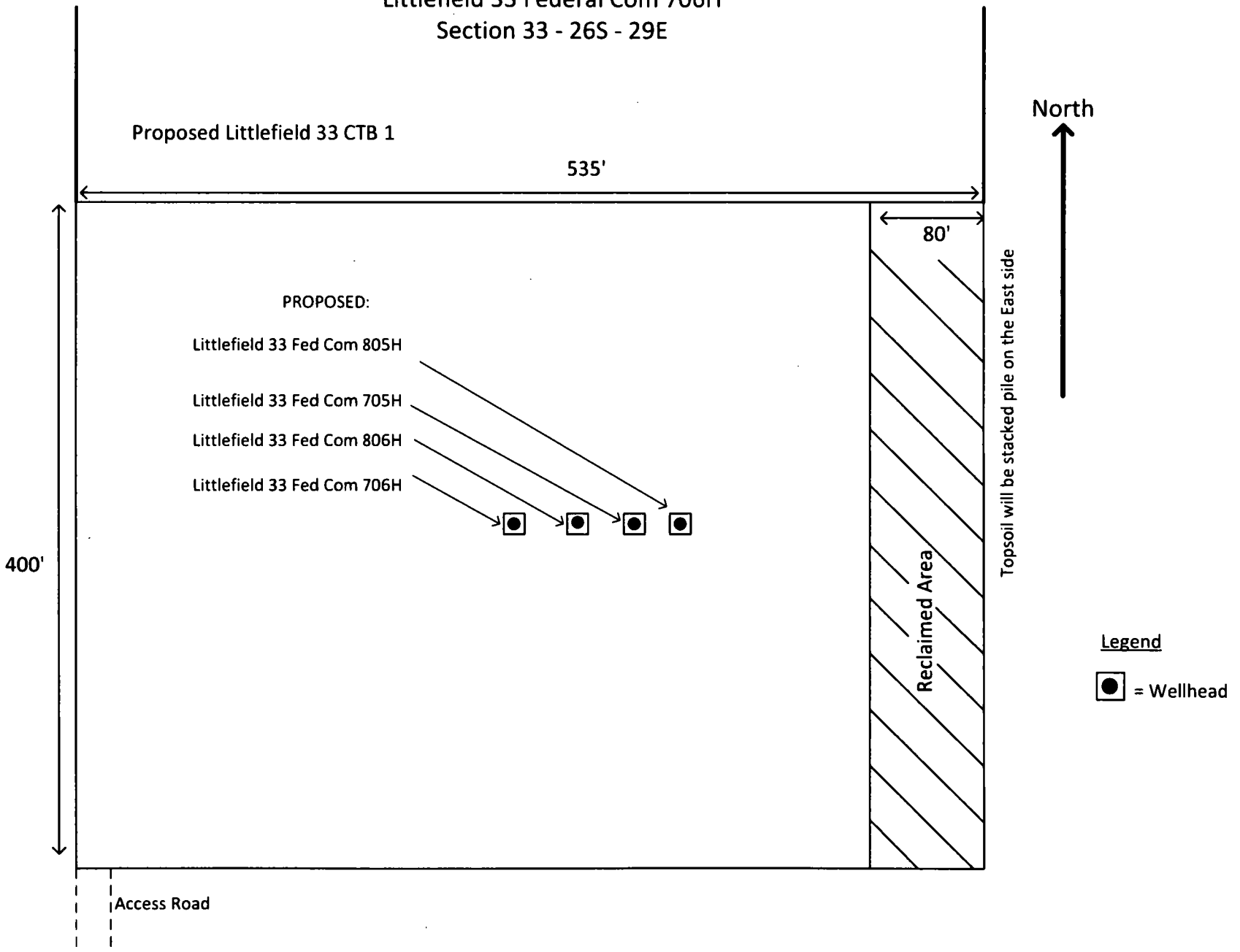

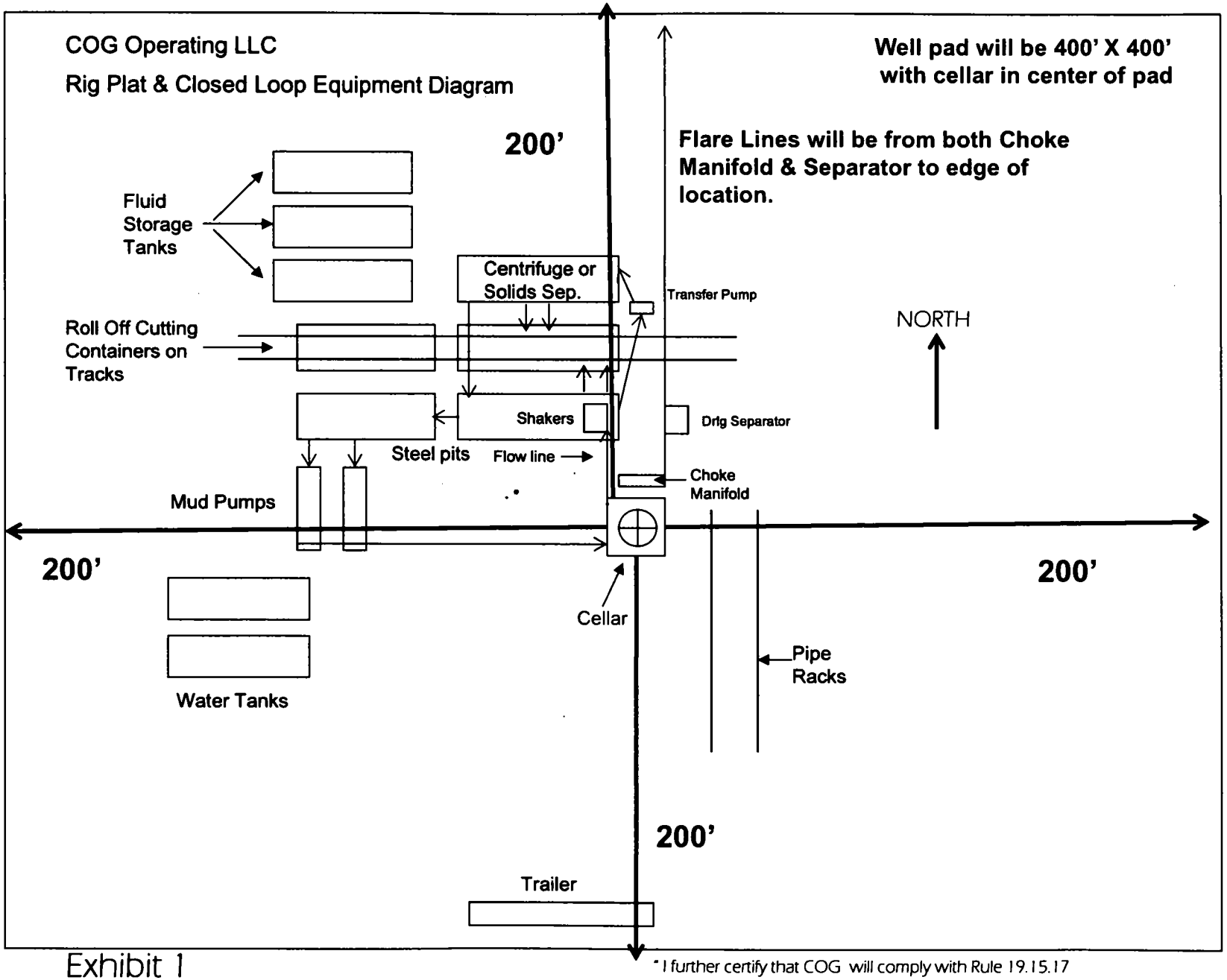

Exhibit 1

"I further certify that COG will comply with Rule 19.15.17 NMAC by using a Closed Loop System."

OPERATOR CERTIFICATION

I hereby certify that I, or persons under my direct supervision, have inspected the drill site and access road proposed herein; that I am familiar with the conditions that presently 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 COG Operating LLC, 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. Executed this 22ND day of MARCH, 2018.

Signed: Mayte Reyes

Printed Name: Mayte Reyes
Position: Senior Regulatory Analyst
Address: 2208 W. Main Street, Artesia, NM 88210
Telephone: (575) 748-6945
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Field Representative (if not above signatory): Rand French
Telephone: (575) 748-6940. E-mail: rfrench@concho.com

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

08/02/2018

Bond Information

Federal/Indian APD: FED

M 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?

Bl 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: