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Form 3160-3
(June 2015)

FORM APPROVED
OMB No. 1004-0137
Expires: January 31, 2018

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
NMNM091071

6. If Indian, Allotee or Tribe Name

1a. Type of work: [✓] DRILL [ ] REENTER

1b. Type of Well: [ ] Oil Well [✓] Gas Well [ ] Other

1c. Type of Completion: [ ] Hydraulic Fracturing [✓] Single Zone [ ] Multiple Zone

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

8. Lease Name and Well No.
OLD CHUB FED COM
207H
327085

2. Name of Operator
TAP ROCK OPERATING LLC

9. API Well No.
30-015-46685

3a. Address	3b. Phone No. *(include area code)*	10. Field and Pool, or Exploratory
602 Park Point Drive Suite 200 Golden CO 80401	(720)460-3316	PURPLE SAGE WOLFCAMP

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

At surface SENE / 1815 FNL / 360 FEL / LAT 32.3217353 / LONG -104.204797

At proposed prod. zone LOT 2 / 2325 FNL / 200 FWL / LAT 32.3201835 / LONG -104.2370482

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 8 / T23S / R27E / NMP

14. Distance in miles and direction from nearest town or post office*	12. County or Parish	13. State
5 miles	EDDY	NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)	16. No of acres in lease	17. Spacing Unit dedicated to this well
601 feet	157.06	638.76

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	19. Proposed Depth	20. BLM/BIA Bond No. in file
30 feet	8856 feet / 19103 feet	FED: NMB001443

21. Elevations (Show whether DF, KDB, RT, GL, etc.)	22. Approximate date work will start*	23. Estimated duration
3162 feet	01/01/2019	90 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)

1. Well plat certified by a registered surveyor.
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 requested by the BLM.

25. Signature	Name *(Printed/Typed)*	Date
(Electronic Submission)	Brian Wood / Ph: (505)466-8120	11/13/2018

Title
President

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
(Electronic Submission)	Cody Layton / Ph: (575)234-5959	01/29/2020

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.

APPROVED WITH CONDITIONS

Approval Date: 01/29/2020

KS 2-10-20

(Continued on page 2)

*(Instructions on page 2)

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Tap Rock Operating LLC
LEASE NO.:	NMNM091071
WELL NAME & NO.:	Old Chub Fed Com 207H
SURFACE HOLE FOOTAGE:	1785'/N & 360'/E
BOTTOM HOLE FOOTAGE	1668'/N & 200'/W
LOCATION:	Section 8, T.23 S., R.27 E., NMPM
COUNTY:	Eddy County, New Mexico

COA

H2S	○ Yes	◉ No	
Potash	◉ None	○ Secretary	○ R-111-P
Cave/Karst Potential	○ Low	◉ Medium	○ High
Cave/Karst Potential	○ Critical		
Variance	○ None	◉ Flex Hose	○ Other
Wellhead	○ Conventional	○ Multibowl	◉ Both
Other	☐ 4 String Area	☐ Capitan Reef	☐ WIPP
Other	☐ Fluid Filled	☐ Cement Squeeze	☐ Pilot Hole
Special Requirements	☐ Water Disposal	☑ COM	☐ Unit

A. HYDROGEN SULFIDE

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

B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately 350 feet (a minimum of 70 feet (Eddy County) into the Rustler Anhydrite and above the salt) and cemented to the surface.

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

hours or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)

c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
d. If cement falls back, remedial cementing will be done prior to drilling out that string.

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

   ❖ 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 **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 or potash.**

   ❖ 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.

4. The minimum required fill of cement behind the **5-1/2** inch production casing is:
   - Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).
2. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M)** psi. **Variance is approved to use a 10,000 (10M) Annular which shall be tested to 5000 (5M) psi.**
   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. 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.

e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

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.

GENERAL REQUIREMENTS

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

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

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

☒ 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. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

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. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

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: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.

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

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. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
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, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).

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.

EXHIBIT NO. 1

Date of Issue:
July 30, 2019

Bureau of Land Management, Carlsbad Field Office
620 E. Greene Street Carlsbad, NM 88220

Cultural and Archaeological Resources

IT4RM NEPA Log
2019-1161-EA

NOTICE OF STIPULATIONS

Historic properties in the vicinity of this project are protected by federal law. In order to ensure that they are not damaged or destroyed by construction activities, the project proponent and construction supervisors shall ensure that the following stipulations are implemented.

Project Name:	
	1). A 3-day preconstruction call-in notification. Contact BLM Inspection and Enforcement at
Required	***2. Professional archaeological monitoring***. Contact your BLM project archaeologist at (575) 234-2361 for assistance.
A. ☒	These stipulations must be given to your monitor at least **5 days** prior to the start of construction.
B. ☒	No construction, including vegetation removal or other site prep may begin prior to the arrival of the monitor.
	3. Cultural site barrier fencing. (Your monitor will assist you).
A. ☐	A temporary site protection barrier(s) shall be erected prior to all ground-disturbing activities. The minimum barrier(s) shall consist of upright wooden survey lath spaced no more than ten (10) feet apart and marked with blue ribbon flagging or blue paint. There shall be no construction activities or vehicular traffic past the barrier(s) at any time.
B. ☐	A permanent, 4-strand barbed wire fence strung on standard "T-posts" shall be erected prior to all ground-disturbing activities. No construction activities or vehicle traffic are allowed past the fence.
Required	***4. The archaeological monitor shall:***
A. ☐	
B. ☒	Observe all ground-disturbing activities within 100 feet of cultural site (LA 179383).
C. ☐	Ensure that the proposed
D. ☐	Ensure the proposed reroute for the .
E. ☒	Submit a brief monitoring report within 30 days of completion of monitoring.
Other:	If any human skeletal remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered at any time during construction, all construction activities shall halt and the BLM will be notified as soon as possible within 24 hours. Work shall not resume until a Notice to Proceed is issued by the BLM. **IF THE CONTRACT ARCHAEOLOGIST DOES NOT KNOW WHERE THE SITE(S) ARE LOCATED, PLEASE COME BY THE CARLSBAD BLM AND MAPS AND OTHER DATA WILL BE PROVIDED, UPON REQUEST, TO THE CONTRACT ARCHAEOLOGIST.**

Site Protection and Employee Education: It is the responsibility of the project proponent and his construction supervisor to inform all employees and subcontractors that cultural and archaeological sites are to be avoided by all personnel, vehicles, and equipment; and that it is illegal to collect, damage, or disturb cultural resources on Public Lands.

For assistance contact:
Elia Perez (575) 234-6231
Aaron Whaley (575) 234-5986

Approval Date: 01/29/2020

PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Tap Rock Operating LLC
WELL NAME & NO.:	Old Chub Fed Com 207H
SURFACE HOLE FOOTAGE:	1815'/N & 360'/E
BOTTOM HOLE FOOTAGE	2325'/N & 200'/W
LOCATION:	Section 8, T.23 S., R.27 E., NMPM
COUNTY:	Eddy County, New Mexico

TABLE OF CONTENTS

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

I. GENERAL PROVISIONS

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

II. PERMIT EXPIRATION

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

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

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

IV. NOXIOUS WEEDS

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

V. SPECIAL REQUIREMENT(S)

Cave Karst

Construction Mitigation

In order to mitigate the impacts from construction activities on cave and karst resources, the following Conditions of Approval will apply to this APD or project:

General Construction:

- No blasting
- The BLM, Carlsbad Field Office, will be informed immediately if any subsurface drainage channels, cave passages, or voids are penetrated during construction, and no additional construction shall occur until clearance has been issued by the Authorized Officer.
- All linear surface disturbance activities will avoid sinkholes and other karst features to lessen the possibility of encountering near surface voids during construction, minimize changes to runoff, and prevent untimely leaks and spills from entering the karst drainage system.
- All spills or leaks will be reported to the BLM immediately for their immediate and proper treatment.

Pad Construction:

- The pad will be constructed and leveled by adding the necessary fill and caliche – no blasting.
- 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 (i.e. an 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.

Road Construction:

- Turnout ditches and drainage leadoffs will not be constructed in such a manner as to alter the natural flow of water into or out of cave or karst features.
- Special restoration stipulations or realignment may be required if subsurface features are discovered during construction.

Buried Pipeline/Cable Construction:

- Rerouting of the buried line(s) may be required if a subsurface void is encountered during construction to minimize the potential subsidence/collapse of the feature(s) as well as the possibility of leaks/spills entering the karst drainage system.

Powerline Construction:

- Smaller powerlines will be routed around sinkholes and other karst features to avoid or lessen the possibility of encountering near surface voids and to minimize changes to runoff or possible leaks and spills from entering karst systems.
- Larger powerlines will adjust their pole spacing to avoid cave and karst features.
- Special restoration stipulations or realignment may be required if subsurface voids are encountered.

Surface Flowlines Installation:

- Flowlines will be routed around sinkholes and other karst features to minimize the possibility of leaks/spills from entering the karst drainage system.

Drilling Mitigation

Federal regulations and standard Conditions of Approval applied to all APDs require that adequate measures are taken to prevent contamination to the environment. Due to the extreme sensitivity of the cave and karst resources in this project area, the following additional Conditions of Approval will be added to this APD.

To prevent cave and karst resource contamination the following will be required:

- Closed loop system using steel tanks - all fluids and cuttings will be hauled off-site and disposed of properly at an authorized site
- Rotary drilling with fresh water where cave or karst features are expected to prevent contamination of freshwater aquifers.
- Directional drilling is only allowed at depths greater than 100 feet below the cave occurrence zone to prevent additional impacts resulting from directional drilling.
- Lost circulation zones will be logged and reported in the drilling report so BLM can assess the situation and work with the operator on corrective actions.
- Additional drilling, casing, and cementing procedures to protect cave zones and fresh water aquifers. See drilling COAs.

Production Mitigation
In order to mitigate the impacts from production activities and due to the nature of karst terrane, the following Conditions of Approval will apply to this APD:

- Tank battery locations and facilities will be bermed and lined with a 20 mil thick permanent liner that has 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.
- Development and implementation of a leak detection system to provide an early alert to operators when a leak has occurred.
- 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.

Residual and Cumulative Mitigation
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 taken to correct the problem to the BLM's approval.

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

Cultural

An arch monitor must be present. Please see attached stipulation for more information.

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

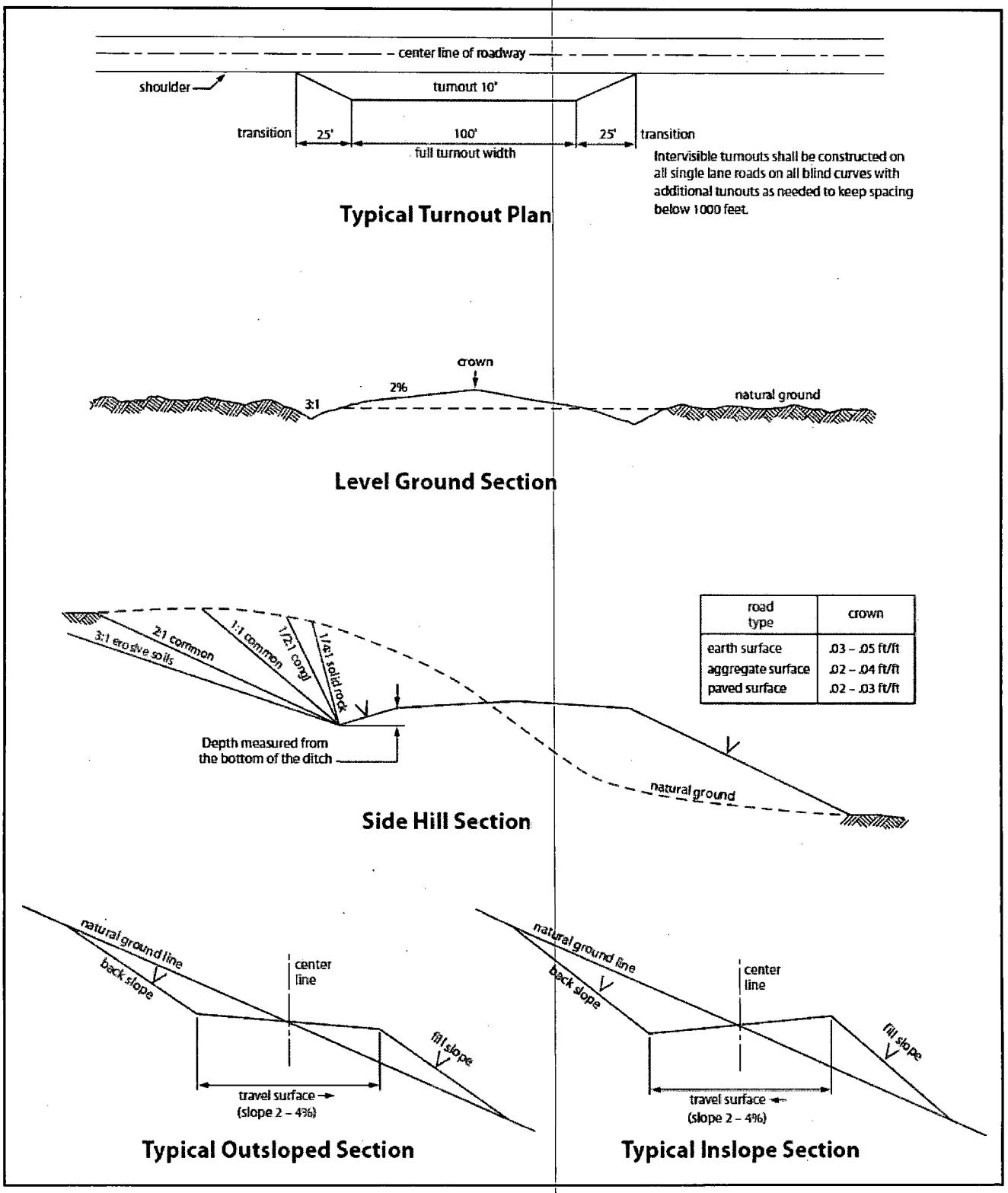


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

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).

B. PIPELINES

BURIED PIPELINE STIPULATIONS

A copy of the application (Grant, APD, or Sundry Notice) and attachments, including conditions of approval, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.

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

1. The Holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.

2. The Holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C.6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of

the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

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

5. All construction and maintenance activity will be confined to the authorized right-of-way.

6. The pipeline will be buried with a minimum cover of **36** inches between the top of the pipe and ground level.

7. The maximum allowable disturbance for construction in this right-of-way will be **30** feet:

- Blading of vegetation within the right-of-way will be allowed: maximum width of blading operations will not exceed **20** feet. The trench is included in this area. (*Blading is defined as the complete removal of brush and ground vegetation.*)

- Clearing of brush species within the right-of-way will be allowed: maximum width of clearing operations will not exceed **30** feet. The trench and bladed area are included in this area. (*Clearing is defined as the removal of brush while leaving ground vegetation (grasses, weeds, etc.) intact. Clearing is best accomplished by holding the blade 4 to 6 inches above the ground surface.*)

- The remaining area of the right-of-way (if any) shall only be disturbed by compressing the vegetation. (*Compressing can be caused by vehicle tires, placement of equipment, etc.*)

8. The holder shall stockpile an adequate amount of topsoil where blading is allowed. The topsoil to be stripped is approximately 6 inches in depth. The topsoil will be

segregated from other spoil piles from trench construction. The topsoil will be evenly distributed over the bladed area for the preparation of seeding.

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

10. Vegetation, soil, and rocks left as a result of construction or maintenance activity will be randomly scattered on this right-of-way and will not be left in rows, piles, or berms, unless otherwise approved by the Authorized Officer. The entire right-of-way shall be recontoured to match the surrounding landscape. The backfilled soil shall be compacted and a 6 inch berm will be left over the ditch line to allow for settling back to grade.

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

12. The holder will reseed all disturbed areas. Seeding will be done according to the attached seeding requirements, using the following seed mix.

(X) seed mixture 1	( ) seed mixture 3
() seed mixture 2	( ) seed mixture 4
( ) seed mixture 2/LPC	( ) Aplomado Falcon Mixture

13. All above-ground structures not subject to safety requirements shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2.

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

15. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder before maintenance begins. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway. As determined necessary during the life of the pipeline, the Authorized Officer may ask the holder to construct temporary deterrence structures.

16. Any cultural and/or paleontological resources (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

17. 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 associated roads, 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.

18. Escape Ramps - The operator will construct and maintain pipeline/utility trenches [that are not otherwise fenced, screened, or netted] to prevent livestock, wildlife, and humans from becoming entrapped. At a minimum, the operator will construct and maintain escape ramps, ladders, or other methods of avian and terrestrial wildlife escape in the trenches according to the following criteria:

a. Any trench left open for eight (8) hours or less is not required to have escape ramps; however, before the trench is backfilled, the contractor/operator shall inspect the trench for wildlife, remove all trapped wildlife, and release them at least 100 yards from the trench.
b. For trenches left open for eight (8) hours or more, earthen escape ramps (built at no more than a 30 degree slope and spaced no more than 500 feet apart) shall be placed in the trench.

C. ELECTRIC LINES

STANDARD STIPULATIONS FOR OVERHEAD ELECTRIC DISTRIBUTION LINES

A copy of the grant and attachments, including stipulations, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.

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

1. The holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.

2. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. There will be no clearing or blading of the right-of-way unless otherwise agreed to in writing by the Authorized Officer.

5. Power lines shall be constructed and designed in accordance to standards outlined in "Suggested Practices for Avian Protection on Power lines: The State of the Art in 2006" Edison Electric Institute, APLIC, and the California Energy Commission 2006 . The holder shall assume the burden and expense of proving that pole designs not shown in the above publication deter raptor perching, roosting, and nesting. Such proof shall be provided by a raptor expert approved by the Authorized Officer. The BLM reserves the right to require modification or additions to all powerline structures placed on this right-of-way, should they be necessary to ensure the safety of large perching birds. Such modifications and/or additions shall be made by the holder without liability or expense to the United States.

Raptor deterrence will consist of but not limited to the following: triangle perch discouragers shall be placed on each side of the cross arms and a nonconductive perching deterrence shall be placed on all vertical poles that extend past the cross arms.

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

7. The BLM serial number assigned to this authorization shall be posted in a permanent, conspicuous manner where the power line crosses roads and at all serviced facilities. Numbers will be at least two inches high and will be affixed to the pole nearest the road crossing and at the facilities served.

8. Upon cancellation, relinquishment, or expiration of this grant, the holder shall comply with those abandonment procedures as prescribed by the Authorized Officer.

9. All surface structures (poles, lines, transformers, etc.) shall be removed within 180 days of abandonment, relinquishment, or termination of use of the serviced facility or facilities or within 180 days of abandonment, relinquishment, cancellation, or expiration of this grant, whichever comes first. This will not apply where the power line extends service to an active, adjoining facility or facilities.

10. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

11. Special Stipulations:
- For reclamation remove poles, lines, transformer, etc. and dispose of properly.
- Fill in any holes from the poles removed.

VIII. INTERIM RECLAMATION

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

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

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

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

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

IX. FINAL ABANDONMENT & RECLAMATION

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

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

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

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

Seed Mixture 1 for Loamy Sites

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

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

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

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

*Pounds of pure live seed:

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

AFMSS

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

Operator Certification Data Report

01/29/2020

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: Brian Wood

Signed on: 11/13/2018

Title: President

Street Address: 37 Verano Looop

City: Santa Fe **State:** NM **Zip:** 87508

Phone: (505)466-8120

Email address: afmss@permitswest.com

Field Representative

Representative Name:

Street Address:

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

Phone:

Email address:

AFMSS

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

Application Data Report

01/29/2020

APD ID: 10400036297 **Submission Date:** 11/13/2018

Operator Name: TAP ROCK OPERATING LLC

Well Name: OLD CHUB FED COM **Well Number:** 207H

Well Type: CONVENTIONAL GAS WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - General

APD ID: 10400036297 **Tie to previous NOS?** N **Submission Date:** 11/13/2018

BLM Office: CARLSBAD **User:** Brian Wood **Title:** President

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

Lease number: NMNM091071 **Lease Acres:** 157.06

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

Agreement in place? NO **Federal or Indian agreement:**

Agreement number:

Agreement name:

Keep application confidential? NO

Permitting Agent? YES **APD Operator:** TAP ROCK OPERATING LLC

Operator letter of designation:

Operator Info

Operator Organization Name: TAP ROCK OPERATING LLC

Operator Address: 602 Park Point Drive Suite 200 **Zip:** 80401

Operator PO Box:

Operator City: Golden **State:** CO

Operator Phone: (720)460-3316

Operator Internet Address:

Section 2 - Well Information

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

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

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

Well Name: OLD CHUB FED COM **Well Number:** 207H **Well API Number:**

Field/Pool or Exploratory? Field and Pool **Field Name:** PURPLE SAGE WOLFCAMP **Pool Name:**

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

Operator Name: TAP ROCK OPERATING LLC

Well Name: OLD CHUB FED COM **Well Number:** 207H

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

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:** OLD CHUB FED COM **Number:** 132H

Well Class: HORIZONTAL **Number of Legs:** 1

Well Work Type: Drill

Well Type: CONVENTIONAL GAS WELL

Describe Well Type:

Well sub-Type: INFILL

Describe sub-type:

Distance to town: 5 Miles **Distance to nearest well:** 30 FT **Distance to lease line:** 601 FT

Reservoir well spacing assigned acres Measurement: 638.76 Acres

Well plat: Chub_207H_C102_etal_103118_20190422115830.pdf

Well work start Date: 01/01/2019 **Duration:** 90 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NAVD88

Survey number: 19642 **Reference Datum:**

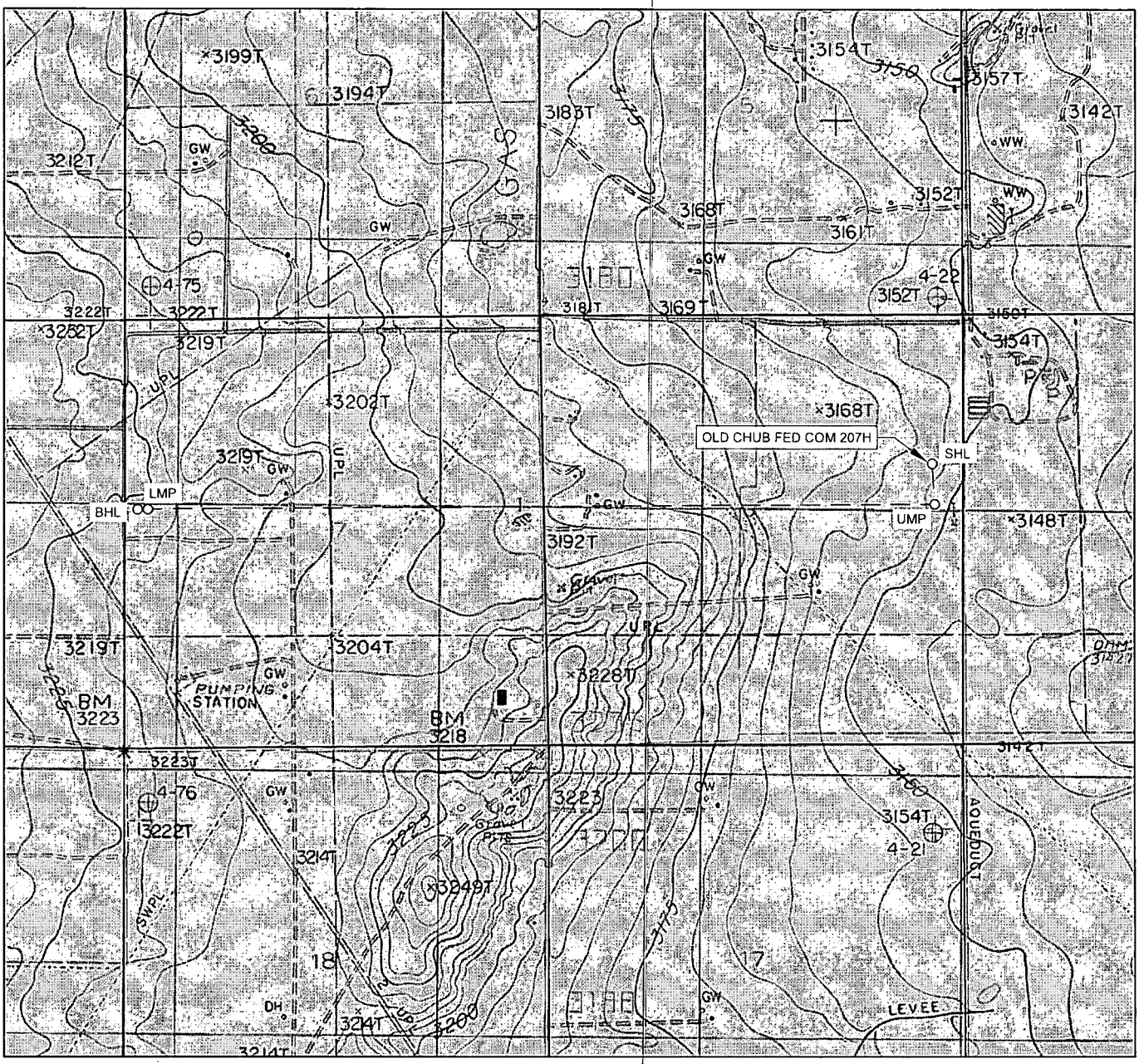
Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this lease?
SHL Leg #1	1815	FNL	360	FEL	23S	27E	8	Aliquot SENE	32.321753	-104.204797	EDDY	NEW MEXICO	NEW MEXICO	F	FEE	3162	0	0	
KOP Leg #1	2318	FNL	48	FEL	23S	27E	8	Aliquot SENE	32.320381	-104.203872	EDDY	NEW MEXICO	NEW MEXICO	F	FEE	-5290	8501	8452	
PPP Leg #1-1	2316	FNL	393	FEL	23S	27E	8	Aliquot SENE	32.320369	-104.204926	EDDY	NEW MEXICO	NEW MEXICO	F	FEE	-5863	9411	9025	

Operator Name: TAP ROCK OPERATING LLC

Well Name: OLD CHUB FED COM **Well Number:** 207H

Wellbore	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	Will this well produce from this lease?
EXIT Leg #1	2325	FNL	200	FWL	23S	27E	7	Lot 2	32.3201835	-104.2370482	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 091071	-5694	19103	8856	
BHL Leg #1	2325	FNL	200	FWL	23S	27E	7	Lot 2	32.3201835	-104.2370482	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 091071	-5694	19103	8856	

LOCATION & ELEVATION VERIFICATION MAP



TAP ROCK

LEASE NAME & WELL NO.: OLD CHUB FED COM 207H

SECTION 8 TWP 23-S RGE 27-E SURVEY N.M.P.M.
COUNTY EDDY STATE NM ELEVATION 3162'
DESCRIPTION 1815' FNL & 360' FEL

LATITUDE N 32.3217353 LONGITUDE W 104.2047970

-N-

SCALE: 1" = 2000'
0' 1000' 2000'

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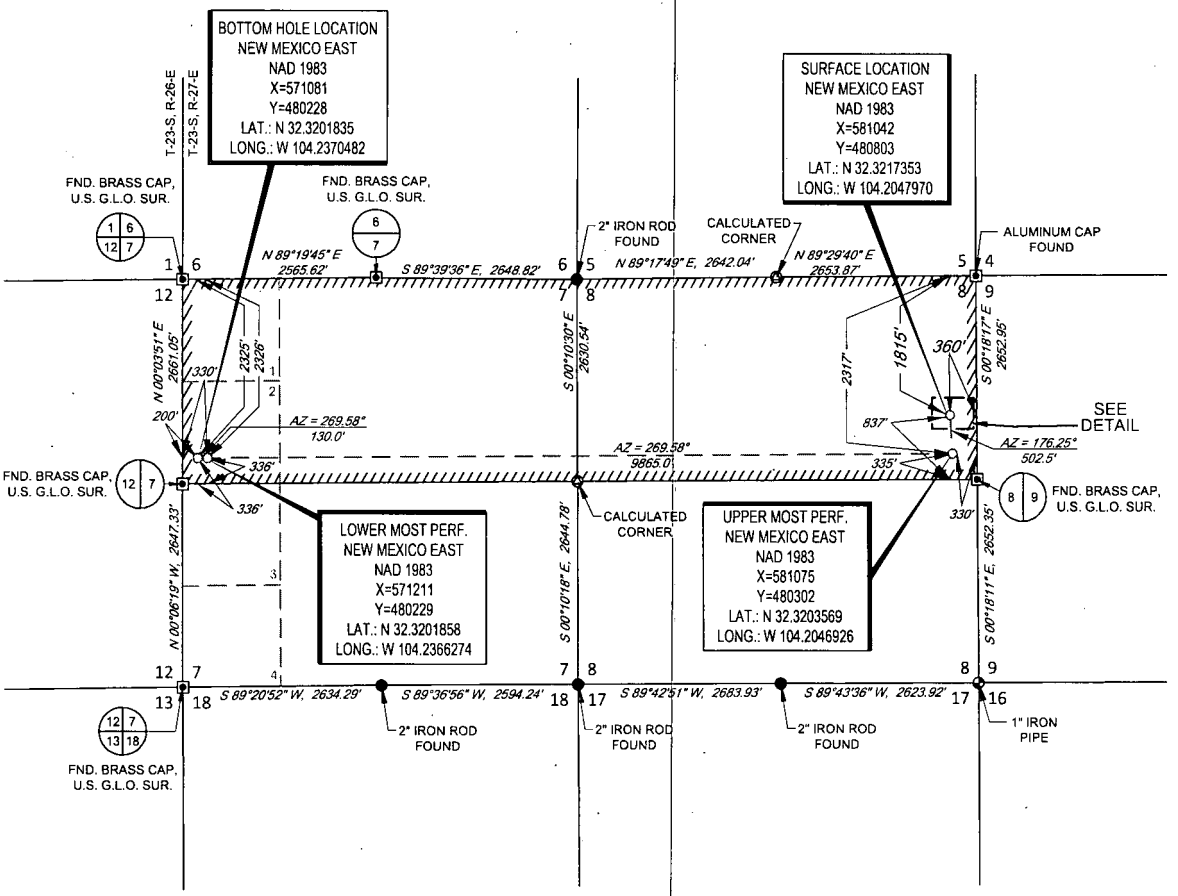
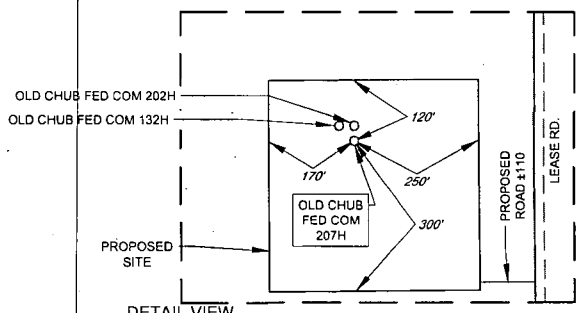
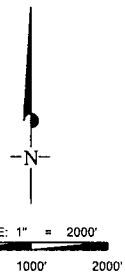
TAP ROCK

EXHIBIT 2A

SECTION 8, TOWNSHIP 23-S, RANGE 27-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO







LEASE NAME & WELL NO.: OLD CHUB FED COM 207H

SECTION 8 TWP 23-S RGE 27-E SURVEY N.M.P.M.
COUNTY EDDY STATE NM
DESCRIPTION 1815' FNL & 360' FEL

DISTANCE & DIRECTION
FROM INT. OF GRANDI RD. & US-285, GO SOUTH ON GRANDI RD. ±0.6 MILES, THENCE WEST (RIGHT) ON E DERRICK RD. ±2.0 MILES, THENCE SOUTH (LEFT) ON S THOMASON RD. ±1.0 MILE, THENCE CONTINUE SOUTH ON A LEASE RD. ±0.4 MILES, THENCE WEST (RIGHT) ON A PROPOSED RD. ±110 FEET TO A POINT ±378 FEET SOUTHEAST OF THE LOCATION.

ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREON ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET.

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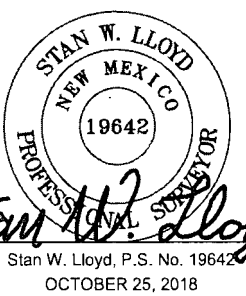

Stan W. Lloyd, P.S. No. 19642
OCTOBER 25, 2018

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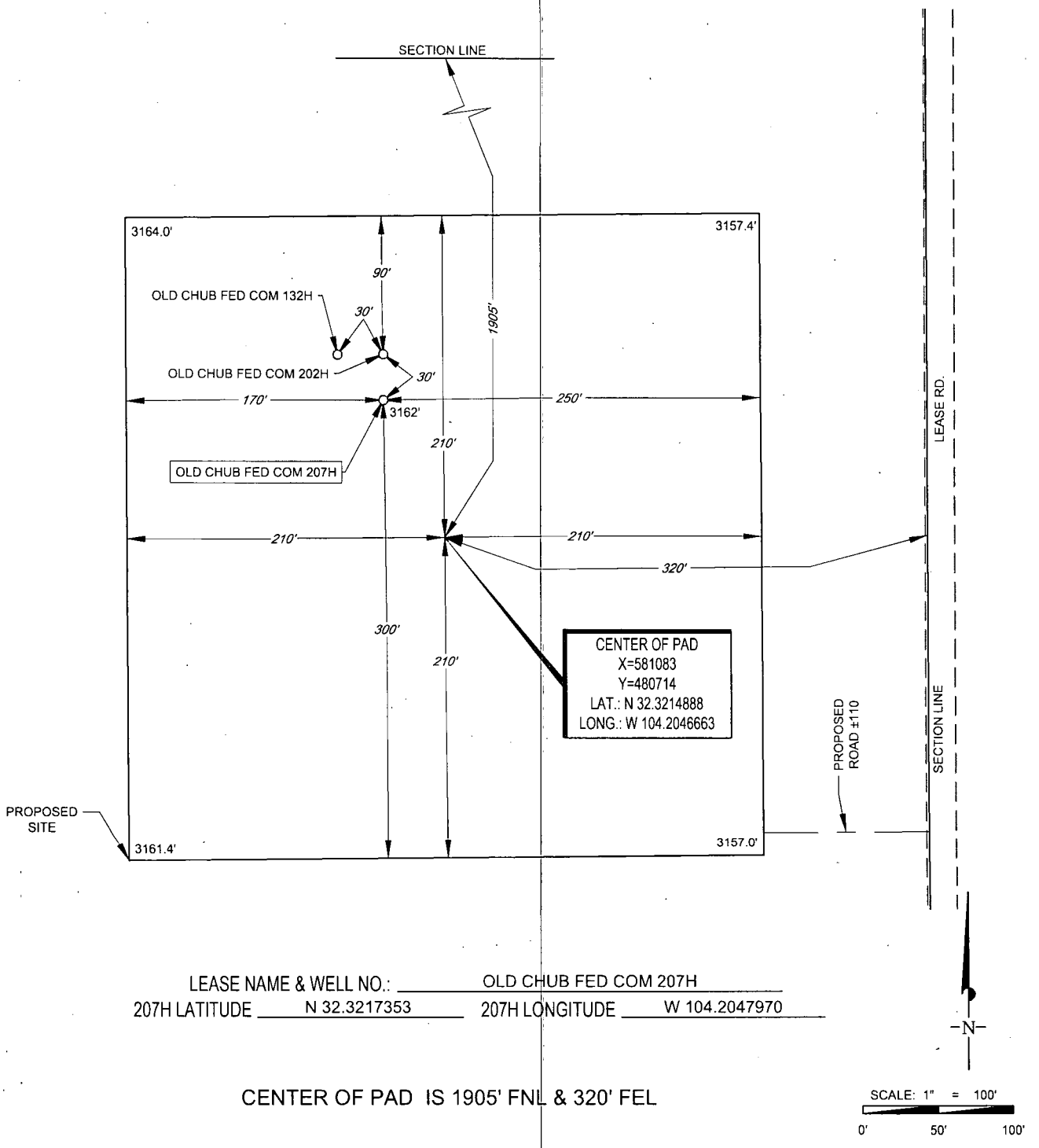
TAP ROCK

SECTION 8, TOWNSHIP 23-S, RANGE 27-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

DETAIL VIEW
SCALE: 1" = 100'



LEASE NAME & WELL NO.: OLD CHUB FED COM 207H

207H LATITUDE N 32.3217353 207H LONGITUDE W 104.2047970

CENTER OF PAD IS 1905' FNL & 320' FEL

SCALE: 1" = 100'

0' 50' 100'

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ORIGINAL DOCUMENT SIZE: 8.5" X 11"

S:\SURVEY\TAPROCK\OLD_CHUB_UNIT\FINAL_PRODUCTS\LO_OLD_CHUB_23S27E0807_207H_REV6.DWG 10/25/2018 8:20:22 AM nwheat

APD ID: 10400036297 **Submission Date:** 11/13/2018

Operator Name: TAP ROCK OPERATING LLC

Well Name: OLD CHUB FED COM **Well Number:** 207H

Well Type: CONVENTIONAL GAS WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
341988	QUATERNARY	3162	0	0	OTHER : Caliche	OTHER, USEABLE WATER : Salt	N
341989	RUSTLER ANHYDRITE	3047	115	115		OTHER, USEABLE WATER : Salt	N
341990	SALADO	2707	455	455	SALT	OTHER : Salt	N
341983	BASE OF SALT	1306	1856	1864		OTHER, USEABLE WATER : Salt	N
341991	DELAWARE	1259	1903	1912	OTHER : Mountain Group	NATURAL GAS, OIL	N
455783	LAMAR	1249	1913	1922		NATURAL GAS, OIL	N
341984	BELL CANYON	1109	2053	2064	SANDSTONE	NATURAL GAS, OIL	N
341992	BRUSHY CANYON	-810	3972	4013	SANDSTONE	NATURAL GAS, OIL	N
341985	BONE SPRING	-2256	5418	5468	LIMESTONE	NATURAL GAS, OIL	N
341993	BONE SPRING 1ST	-3311	6473	6523	SANDSTONE	NATURAL GAS, OIL	N
341986	BONE SPRING 2ND	-3831	6993	7043	SANDSTONE	NATURAL GAS, OIL	N
341987	BONE SPRING 3RD	-5391	8553	8603	SANDSTONE	NATURAL GAS, OIL	N
341994	BONE SPRING 3RD	-5659	8821	8902	OTHER, SANDSTONE : W	NATURAL GAS, OIL	N
341981	WOLFCAMP	-5728	8890	9000	OTHER : A	NATURAL GAS, OIL	N
341982	WOLFCAMP	-5815	8977	9166	OTHER : A Y	NATURAL GAS, OIL	Y

Section 2 - Blowout Prevention

Operator Name: TAP ROCK OPERATING LLC

Well Name: OLD CHUB FED COM **Well Number:** 207H

Pressure Rating (PSI): 5M **Rating Depth:** 13000

Equipment: A 13,000' 10,000-psi BOP stack consisting of 3 rams with 2 pipe rams, 1 blind ram, and 1 annular preventer will be used below surface casing to TD. The BOP will be utilized below surface casing to TD. Also present will be an accumulator that meets the requirements of Onshore Order #2 for the pressure rating of the BOP stack. A rotating head will also be installed as needed. BOP will be inspected and operated as recommended in Onshore Order #2. A top drive check valve and sub equipped with a full opening valve sized to fit the drill pipe and collars will be available on the rig floor in the open position. The wellhead will be a multi-bowl speed head.

Requesting Variance? YES

Variance request: Tap Rock requests a variance to drill this well using a co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached. The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used.

Testing Procedure: BOP Test procedure will be as follows: After surface casing is set and the BOP is nippled up, the BOP pressure tests will be made with a third party tester to 250 psi low, 5000 psi high, and the annular preventer will be tested to 3,500 psi. The BOP will be tested in this manner after any breaks, nipple ups, or passage of allotted time. Casing Test procedure: Casing will be tested to .22 psi per foot of casing length or 1500 psi, whichever is greater, but not to exceed 70% of minimum internal yield.

Choke Diagram Attachment:

Chub_207H_10M_Choke_100418_20190422120017.pdf

BOP Diagram Attachment:

Chub_207H_BOP_5M_Annular_REVISED_20190513161136.pdf

Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	SURFACE	17.5	13.375	NEW	API	N	0	350	0	350	3162		350	J-55	54.5	BUTT	1.13	1.15	DRY	1.51	DRY	1.51
2	INTERMEDIATE	8.75	7.625	NEW	API	Y	0	1900	0	1891	3162		1900	P-110	29.7	BUTT	1.13	1.15	DRY	1.51	DRY	1.51
3	INTERMEDIATE	12.25	9.625	NEW	API	N	0	2100	0	2088	3162		2100	J-55	40	BUTT	1.13	1.15	DRY	1.51	DRY	1.51
4	PRODUCTION	6.75	5.5	NEW	API	Y	0	8200	0	8151	3162		8200	P-110	20	BUTT	1.13	1.15	DRY	1.51	DRY	1.51
5	INTERMEDIATE	8.75	7.625	NEW	API	Y	1900	8400	1891	8351			6500	P-110	29.7	OTHER - Wedge 513	1.13	1.15	DRY	1.51	DRY	1.51
6	PRODUCTION	6.75	5.0	NEW	API	Y	8200	19103	8151	8856			10903	P-110	18	OTHER - Wedge 521	1.13	1.15	DRY	1.51	DRY	1.51

Operator Name: TAP ROCK OPERATING LLC

Well Name: OLD CHUB FED COM **Well Number:** 207H

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Chub_207H_Casing_Design_Assumptions_20190422120452.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Chub_207H_7.625_BTC_Casing_Spec_20190422120441.PDF

Casing Design Assumptions and Worksheet(s):

Chub_207H_Casing_Design_Assumptions_20190422120424.pdf

Casing ID: 3 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Chub_207H_Casing_Design_Assumptions_20190422120357.pdf

Operator Name: TAP ROCK OPERATING LLC

Well Name: OLD CHUB FED COM **Well Number:** 207H

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Chub_207H_5.5in_Casing_Spec_20190422120311.PDF

Casing Design Assumptions and Worksheet(s):

Chub_207H_Casing_Design_Assumptions_20190422120235.pdf

Casing ID: 5 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Chub_207H_7.625_P110_Casing_Spec_20190422120341.pdf

Casing Design Assumptions and Worksheet(s):

Chub_207H_Casing_Design_Assumptions_20190422120327.pdf

Casing ID: 6 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Chub_207H_5in_Casing_Spec_20190513161253.pdf

Casing Design Assumptions and Worksheet(s):

Chub_207H_Casing_Design_Assumptions_20190422120223.pdf

Section 4 - Cement

Operator Name: TAP ROCK OPERATING LLC

Well Name: OLD CHUB FED COM **Well Number:** 207H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
INTERMEDIATE	Lead		0	0	0	0	0	0	0	None	None
INTERMEDIATE	Tail		0	0	0	0	0	0	0	None	None
SURFACE	Lead		0	350	270	1.8	13.5	486	100	Class C	5% Bentonite + 2% CaCl + LCM
INTERMEDIATE	Lead		0	2100	480	2.19	12.7	1051	100	Class C	bentonite + 1% CaCl2 + 8% NaCl + LCM
INTERMEDIATE	Tail		0	2100	198	1.33	14.8	263	100	Class C	5% NaCl + LCM
PRODUCTION	Lead		0	8400	0	0	0	0	0	None	None
PRODUCTION	Tail		0	0	0	0	0	0	0	None	None
INTERMEDIATE	Lead		1100	8400	227	3.36	11.5	763	35	TXI	fluid loss + dispersant + retarder + LCM
INTERMEDIATE	Tail		1100	8400	164	1.39	13.2	228	35	TXI	fluid loss + dispersant + retarder + LCM
PRODUCTION	Lead		7400	19103	0	0	0	0	0	None	None
PRODUCTION	Tail		7400	19103	950	1.24	14.2	1178	10	Class H	fluid loss + dispersant + retarder + LCM

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: All necessary mud products (e. g., barite, cedar bark) for weight addition and fluid loss control will always be on site. Mud program is subject to change due to hole conditions.

Describe the mud monitoring system utilized: Electronic Pason mud monitor system complying with Onshore Order 1 will be used.

Circulating Medium Table

Operator Name: TAP ROCK OPERATING LLC

Well Name: OLD CHUB FED COM **Well Number:** 207H

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
8400	19103	OIL-BASED MUD	12.5	12.5							
2100	8400	OTHER : Fresh water and cut brine	9	9							
0	350	OTHER : Fresh water spud mud	8.3	8.3							
350	2100	OTHER : Brine water	10	10							

Section 6 - Test, Logging, Coring

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

Electric Logging Program: No open-hole logs are planned at this time for the pilot hole. GR will be collected while drilling through the MWD tools from intermediate casing to TD.

CBL w/ CCL from as far as gravity will let it fall to TOC.

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

CBL,GR

Coring operation description for the well:

No DSTs or cores are planned at this time.

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 5310 **Anticipated Surface Pressure:** 3324.5

Anticipated Bottom Hole Temperature(F): 130

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:

Chub_207H_H2S_Plan_102218_20190422120536.pdf

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Chub_207H_Horizontal_Plan_20190422120558.pdf

Other proposed operations facets description:

Other proposed operations facets attachment:

Chub_207H_Speedhead_Specs_100918_20190422120623.pdf
Coflex_Certs_20190513161548.pdf
Chub_207H_Drill_Plan_051319_REVISED_20190513161555.pdf

Other Variance attachment:

Chub_207H_Casing_Cementing_Variance_20190513161603.pdf

Hydrogen Sulfide Drilling

Operations Plan

Tap Rock Resources

1 H2S safety instructions to the following:

- Characteristics of H2S
- Physical effects and hazards
- Principal and operation of H2S detectors, warning system and briefing areas
- Evacuation procedures, routes and first aid
- Proper use of safety equipment & life support systems
- Essential personnel meeting medical evaluation criteria will receive additional training on the proper use of 30min pressure demand air packs

2 H2S Detection and Alarm Systems:

- H2S sensor/detectors to be located on the drilling rig floor, in the base of the sub structure / cellar area, on the mud pits in the shale shaker area. Additional H2S detectors may be placed as deemed necessary
- An audio alarm system will be installed on the derrick floor and in the doghouse

3 Windsocks and / Wind Streamers:

- Windsocks at mud pit area should be high enough to be visible
- Windsock on the rig floor and / top of doghouse should be high enough to be visible

4 Condition Flags and Signs:

- Warning sign on access road to location
- Flags to be displayed on sign at entrance to location
    - Green Flag – Normal Safe Operation Condition
    - Yellow Flag – Potential Pressure and Danger
    - Red Flag – Danger (H2S present in dangerous concentrations) Only H2S trained personnel admitted on location

5 Well Control Equipment:

- See Drilling Operations Plan Schematics

6 Communication:

- While working under masks chalkboards will be used for communications
- Hand signals will be used where chalk board is inappropriate
- Two way radio will be used to communicate off location in case of emergency help is required. In most cases cellular telephones will be available at most drilling foreman's trailer or living quarters.

7 Drilling Stem Testing:

- No DST cores are planned at this time

8 Drilling contractor supervisor will be required to be familiar with the effects H2S has on tubulars good and other mechanical equipment

9 If H2S is encountered, mud system will be altered if necessary to maintain control of formation. A mud gas separator will be brought into service along with H2S scavengers if necessary

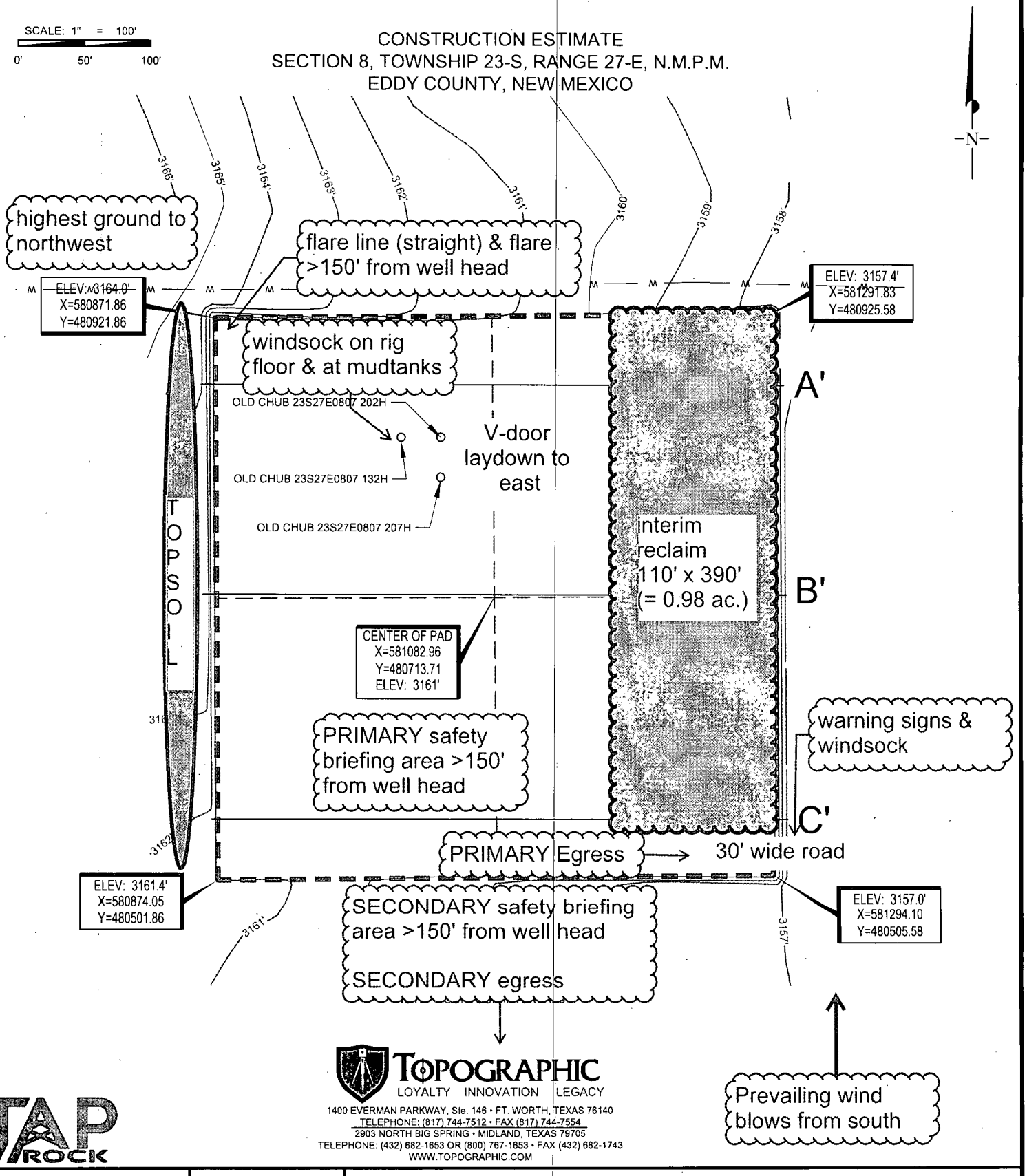
11 Emergency Contacts

Emergency Contacts		
Carlsbad Police Department	575.887.7551	911
Carlsbad Medical Center	575.887.4100	911
Eddy County Fire Service	575.628.5450	911
Eddy County Sherriff	575.887.7551	911
Lea County Fire Service	575.391.2983	911
Lea County Sherriff	575.396.3611	911
Jal Police Department	575.395.2121	911
Jal Fire Department	575.395.2221	911
Tap Rock - Doug Sproul - Drilling	303-653-3518	

SCALE: 1" = 100'

0' 50' 100'

CONSTRUCTION ESTIMATE
SECTION 8, TOWNSHIP 23-S, RANGE 27-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO



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TAP ROCK

OLD CHUB 23S27E0807 202H & 207H PAD SITE	REVISION:	
	JLS	06/05/2018
	MML	07/19/2018
DATE: 01/17/2018	MML	08/14/2018
FILE: CD_OLD_CHUB_23S27E0807_202H_207H_PAD_SITE_REV3		
DRAWN BY: MML		
SHEET : 1 OF 3		

NOTES:
1. ORIGINAL DOCUMENT SIZE: 8.5" X 11"
2. ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREIN ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET.

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SCALE: 1" = 100'

0' 50' 100'

CONSTRUCTION ESTIMATE
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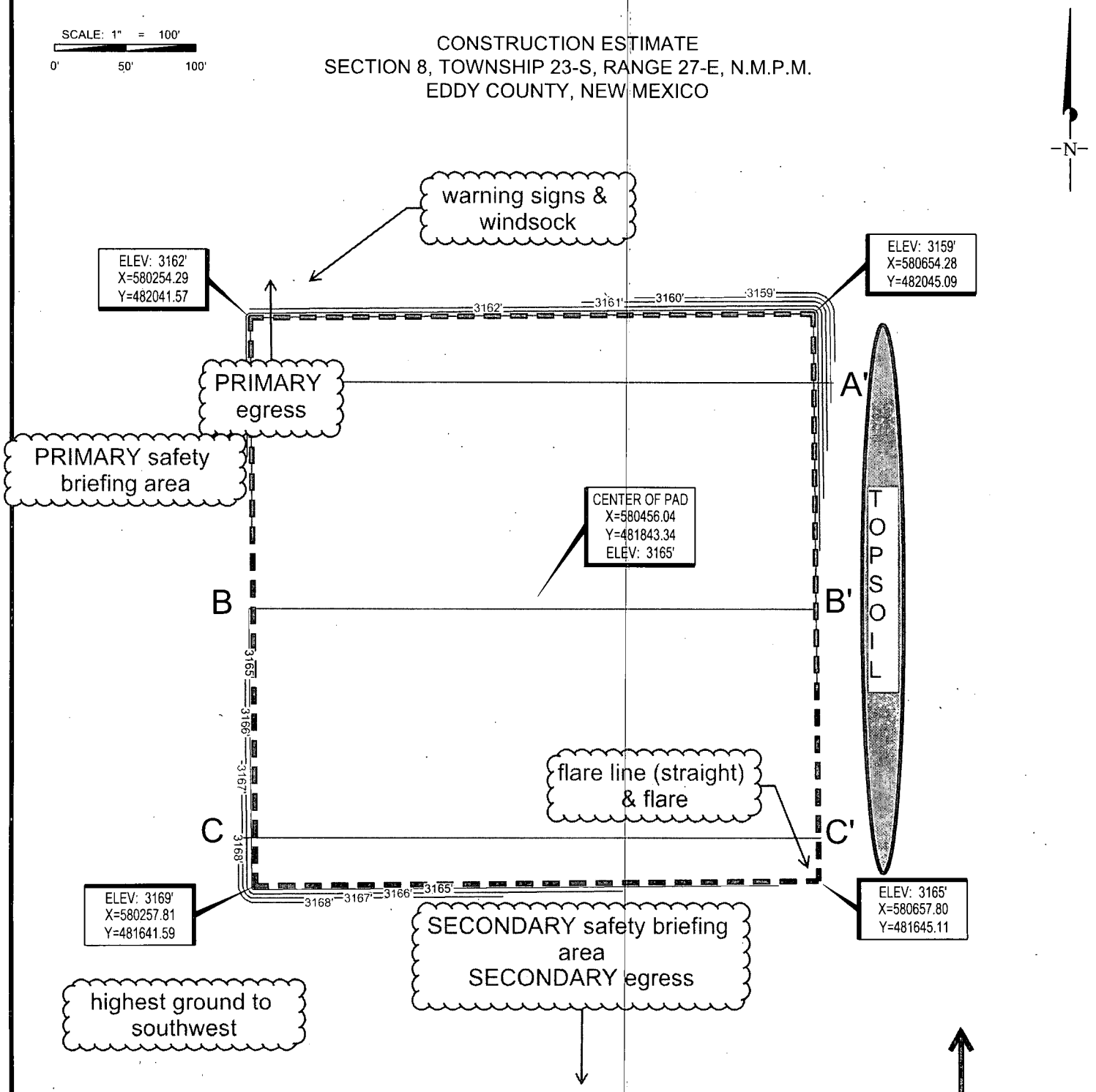
EDDY COUNTY, NEW MEXICO



NOTE: 1 FOOT CONTOUR INTERVAL

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TAP ROCK

OLD CHUB FACILITY SITE	REVISION: INT	DATE
DATE: 07/31/18		
FILE: CD_OLD_CHUB_FACILITY_SITE		
DRAWN BY: MML		
SHEET :		

NOTES:
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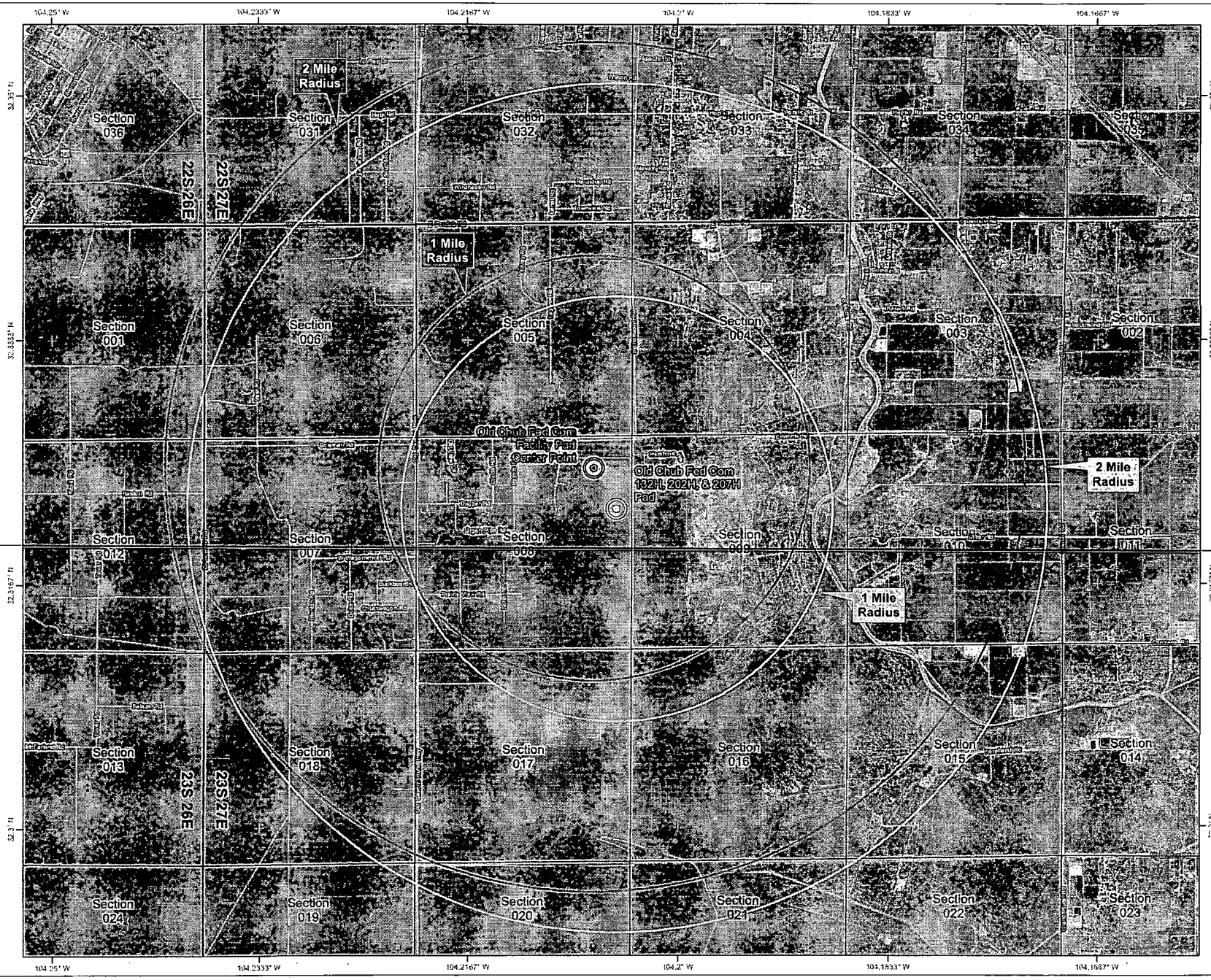
Tap Rock Operating, LLC

Old Chub Fed Com
132H, 202H, & 207H
H2S Contingency Plan:
Radius Map

Section 8, Township 23S, Range 27E
Eddy County, New Mexico



Old Chub Facility Pad

Old Chub Fed Com Slot 2 Pad

1:27,000

0 0.25 0.5 1

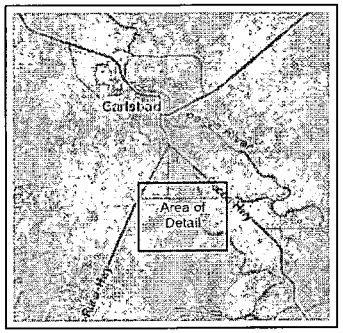
Miles

N

NAD 1983 New Mexico State Plane East
FIPS 3001 Feet

PERMITS WEST, inc.

Prepared by Permits West, Inc., October 22, 2018
for Tap Rock Operating, LLC



Tap Rock Operating, LLC
Eddy County, NM (NAD 83)
Old Chub
207H
Plan 1

US State Plane 1983
North American Datum 1983
GRS 1980
New Mexico Eastern Zone
Mean Sea Level

PRODIRECTIONAL

**Note: Pro Directional is not responsible for any collision issues against unknown offset wells. The offset well information shown in this drawing was obtained from a public site and are INC only surveys; which could be missing or have inaccurate data. Radius Target Circles represent largest displacement distances which means that the vertical wells can be drifting anywhere within this area.*

RKB Elevation: Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')

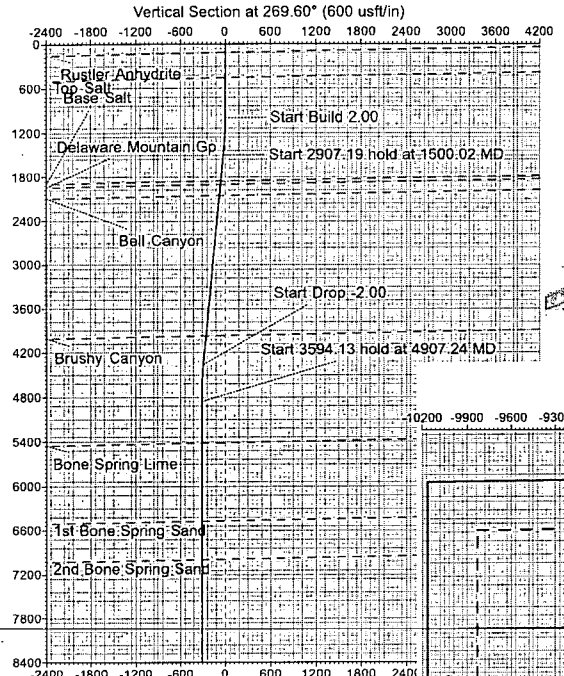
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	480803.00	581042.00	32.321734	-104.204799	

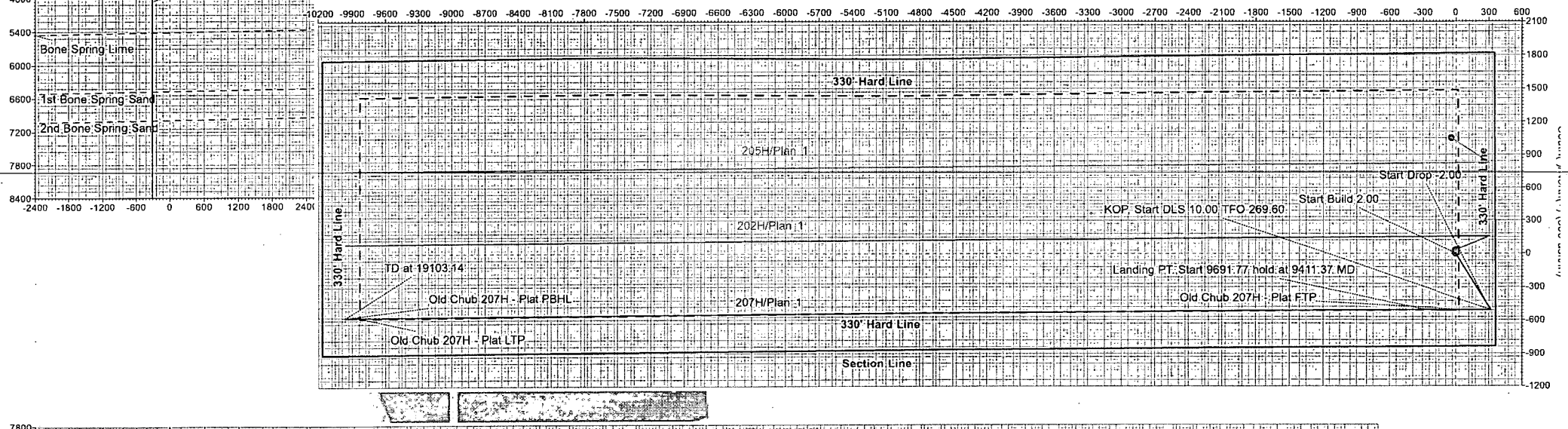
SECTION DETAILS

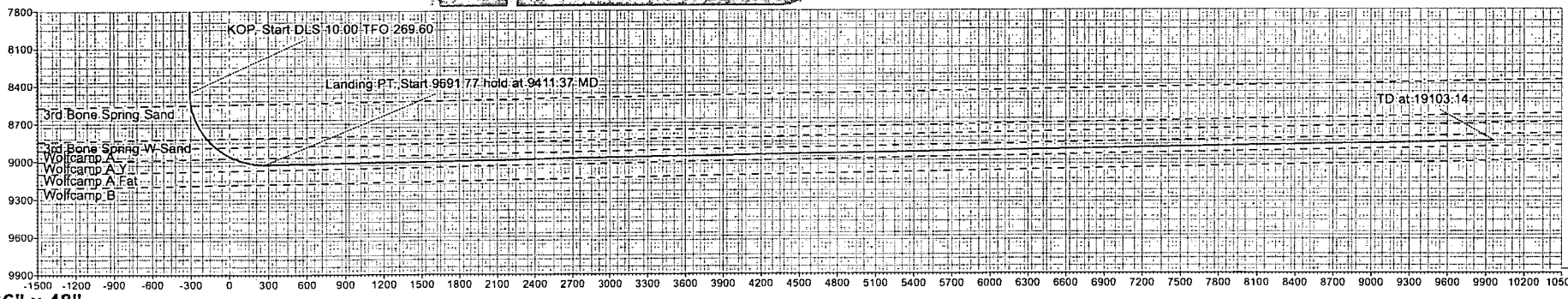
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	1000.00	0.00	0.00	1000.00	0.00	0.00	0.00	0.00
3	1500.02	10.00	148.19	1497.49	-36.99	22.94	2.00	-22.68
4	4407.22	10.00	148.19	4360.51	-466.01	289.06	0.00	-285.80
5	4907.24	0.00	0.00	4858.00	-503.00	312.00	2.00	-308.48
6	8501.37	0.00	0.00	8452.13	-503.00	312.00	0.00	-308.48
7	9411.37	91.00	269.60	9025.00	-507.09	-270.94	10.00	274.47
8	19103.14	91.00	269.60	8855.93	-575.00	-9961.00	0.00	9964.77

TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
Old Chub 207H - Plat FTP	0.00	-501.00	33.00	480302.00	581075.00	Point
Old Chub 207H - Plat LTP	0.00	-574.00	-9831.00	480229.00	571211.00	Point
Old Chub 207H - KOP	8452.13	-503.00	312.00	480300.00	581354.00	Point
Old Chub 207H - Plat PBHL	8855.93	-575.00	-9961.00	480228.00	571081.00	Point







Azimuths to Grid N
True North: -0.
Magnetic North: 7.

Magnetic F
Strength: 47948.3
Dip Angle: 60.
Date: 10/18/2
Model: HD

Azimuth Corrections

Total Magnetic Corr. (M to G): 7.

Declination (M to T): 7.30° Eas

6" x 48"

Tap Rock Operating, LLC

Eddy County, NM (NAD 83)
Old Chub
207H

OH

Plan: Plan 1

Standard Survey Report

18 October, 2018

PRODIRECTIONAL

Company:	Tap Rock Operating, LLC	**Local Co-ordinate Reference:**	Well 207H
Project:	Eddy County, NM (NAD 83)	**TVD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Site:	Old Chub	**MD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Well:	207H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan 1	**Database:**	WellPlanner1

Project Eddy County, NM (NAD 83)

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site Old Chub

Site Position:		**Northing:**	480,833.00 usft	**Latitude:**	32.321817
From:	Map	**Easting:**	581,042.00 usft	**Longitude:**	-104.204799
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.07 °

Well 207H

Well Position	**+N/-S**	0.00 usft	**Northing:**	480,803.00 usft	**Latitude:**	32.321734
	+E/-W	0.00 usft	**Easting:**	581,042.00 usft	**Longitude:**	-104.204799
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	usft	**Ground Level:**	3,162.00 usft

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	10/18/2018	7.30	60.03	47,948.30

Design Plan 1

Audit Notes:			
Version:	**Phase:**	PROTOTYPE	**Tie On Depth:** 0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	269.60

Survey Tool Program **Date** 10/18/2018

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	4,800.00	Plan 1 (OH)	MWD+HDGM	OWSG MWD + HRGM
4,800.00	8,400.00	Plan 1 (OH)	MWD+HDGM	OWSG MWD + HRGM
8,400.00	19,103.14	Plan 1 (OH)	MWD+HDGM	OWSG MWD + HRGM

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
115.00	0.00	0.00	115.00	0.00	0.00	0.00	0.00	0.00	0.00
Rustler Anhydrite									
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
455.00	0.00	0.00	455.00	0.00	0.00	0.00	0.00	0.00	0.00

Company:	Tap Rock Operating, LLC	**Local Co-ordinate Reference:**	Well 207H
Project:	Eddy County, NM (NAD 83)	**TVD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Site:	Old Chub	**MD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Well:	207H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan 1	**Database:**	WellPlanner1

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)
Top Salt									
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
Start Build 2.00									
1,100.00	2.00	148.19	1,099.98	-1.48	0.92	-0.91	2.00	2.00	0.00
1,200.00	4.00	148.19	1,199.84	-5.93	3.68	-3.64	2.00	2.00	0.00
1,300.00	6.00	148.19	1,299.45	-13.34	8.27	-8.18	2.00	2.00	0.00
1,400.00	8.00	148.19	1,398.70	-23.69	14.70	-14.53	2.00	2.00	0.00
1,500.02	10.00	148.19	1,497.49	-36.99	22.94	-22.68	2.00	2.00	0.00
Start 2907.19 hold at 1500.02 MD									
1,600.00	10.00	148.19	1,595.95	-51.74	32.09	-31.73	0.00	0.00	0.00
1,700.00	10.00	148.19	1,694.43	-66.50	41.25	-40.78	0.00	0.00	0.00
1,800.00	10.00	148.19	1,792.91	-81.26	50.40	-49.83	0.00	0.00	0.00
1,864.04	10.00	148.19	1,855.97	-90.71	56.26	-55.63	0.00	0.00	0.00
Base Salt									
1,900.00	10.00	148.19	1,891.39	-96.01	59.56	-58.88	0.00	0.00	0.00
1,911.84	10.00	148.19	1,903.05	-97.76	60.64	-59.96	0.00	0.00	0.00
Delaware Mountain Gp									
2,000.00	10.00	148.19	1,989.87	-110.77	68.71	-67.93	0.00	0.00	0.00
2,064.40	10.00	148.19	2,053.29	-120.27	74.60	-73.76	0.00	0.00	0.00
Bell Canyon									
2,100.00	10.00	148.19	2,088.35	-125.53	77.86	-76.98	0.00	0.00	0.00
2,200.00	10.00	148.19	2,186.83	-140.29	87.02	-86.04	0.00	0.00	0.00
2,300.00	10.00	148.19	2,285.31	-155.04	96.17	-95.09	0.00	0.00	0.00
2,400.00	10.00	148.19	2,383.79	-169.80	105.32	-104.14	0.00	0.00	0.00
2,500.00	10.00	148.19	2,482.27	-184.56	114.48	-113.19	0.00	0.00	0.00
2,600.00	10.00	148.19	2,580.75	-199.32	123.63	-122.24	0.00	0.00	0.00
2,700.00	10.00	148.19	2,679.23	-214.07	132.78	-131.29	0.00	0.00	0.00
2,800.00	10.00	148.19	2,777.71	-228.83	141.94	-140.34	0.00	0.00	0.00
2,900.00	10.00	148.19	2,876.19	-243.59	151.09	-149.39	0.00	0.00	0.00
3,000.00	10.00	148.19	2,974.67	-258.34	160.25	-158.44	0.00	0.00	0.00
3,100.00	10.00	148.19	3,073.16	-273.10	169.40	-167.49	0.00	0.00	0.00
3,200.00	10.00	148.19	3,171.64	-287.86	178.55	-176.54	0.00	0.00	0.00
3,300.00	10.00	148.19	3,270.12	-302.62	187.71	-185.59	0.00	0.00	0.00
3,400.00	10.00	148.19	3,368.60	-317.37	196.86	-194.64	0.00	0.00	0.00
3,500.00	10.00	148.19	3,467.08	-332.13	206.01	-203.69	0.00	0.00	0.00
3,600.00	10.00	148.19	3,565.56	-346.89	215.17	-212.74	0.00	0.00	0.00
3,700.00	10.00	148.19	3,664.04	-361.65	224.32	-221.79	0.00	0.00	0.00
3,800.00	10.00	148.19	3,762.52	-376.40	233.47	-230.84	0.00	0.00	0.00
3,900.00	10.00	148.19	3,861.00	-391.16	242.63	-239.89	0.00	0.00	0.00

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Site:	Old Chub	**MD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Well:	207H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan 1	**Database:**	WellPlanner1

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,000.00	10.00	148.19	3,959.48	-405.92	251.78	-248.94	0.00	0.00	0.00
4,013.08	10.00	148.19	3,972.37	-407.85	252.98	-250.13	0.00	0.00	0.00
Brushy Canyon									
4,100.00	10.00	148.19	4,057.96	-420.67	260.94	-257.99	0.00	0.00	0.00
4,200.00	10.00	148.19	4,156.44	-435.43	270.09	-267.04	0.00	0.00	0.00
4,300.00	10.00	148.19	4,254.92	-450.19	279.24	-276.09	0.00	0.00	0.00
4,407.22	10.00	148.19	4,360.51	-466.01	289.06	-285.80	0.00	0.00	0.00
Start Drop -2.00									
4,500.00	8.14	148.19	4,452.13	-478.44	296.77	-293.42	2.00	-2.00	0.00
4,600.00	6.14	148.19	4,551.35	-489.01	303.32	-299.90	2.00	-2.00	0.00
4,700.00	4.14	148.19	4,650.94	-496.63	308.05	-304.58	2.00	-2.00	0.00
4,800.00	2.14	148.19	4,750.78	-501.29	310.94	-307.43	2.00	-2.00	0.00
4,907.24	0.00	0.00	4,858.00	-503.00	312.00	-308.48	2.00	-2.00	0.00
Start 3594.13 hold at 4907.24 MD									
5,000.00	0.00	0.00	4,950.76	-503.00	312.00	-308.48	0.00	0.00	0.00
5,100.00	0.00	0.00	5,050.76	-503.00	312.00	-308.48	0.00	0.00	0.00
5,200.00	0.00	0.00	5,150.76	-503.00	312.00	-308.48	0.00	0.00	0.00
5,300.00	0.00	0.00	5,250.76	-503.00	312.00	-308.48	0.00	0.00	0.00
5,400.00	0.00	0.00	5,350.76	-503.00	312.00	-308.48	0.00	0.00	0.00
5,467.63	0.00	0.00	5,418.38	-503.00	312.00	-308.48	0.00	0.00	0.00
Bone Spring Lime									
5,500.00	0.00	0.00	5,450.76	-503.00	312.00	-308.48	0.00	0.00	0.00
5,600.00	0.00	0.00	5,550.76	-503.00	312.00	-308.48	0.00	0.00	0.00
5,700.00	0.00	0.00	5,650.76	-503.00	312.00	-308.48	0.00	0.00	0.00
5,800.00	0.00	0.00	5,750.76	-503.00	312.00	-308.48	0.00	0.00	0.00
5,900.00	0.00	0.00	5,850.76	-503.00	312.00	-308.48	0.00	0.00	0.00
6,000.00	0.00	0.00	5,950.76	-503.00	312.00	-308.48	0.00	0.00	0.00
6,100.00	0.00	0.00	6,050.76	-503.00	312.00	-308.48	0.00	0.00	0.00
6,200.00	0.00	0.00	6,150.76	-503.00	312.00	-308.48	0.00	0.00	0.00
6,300.00	0.00	0.00	6,250.76	-503.00	312.00	-308.48	0.00	0.00	0.00
6,400.00	0.00	0.00	6,350.76	-503.00	312.00	-308.48	0.00	0.00	0.00
6,500.00	0.00	0.00	6,450.76	-503.00	312.00	-308.48	0.00	0.00	0.00
6,522.63	0.00	0.00	6,473.38	-503.00	312.00	-308.48	0.00	0.00	0.00
1st Bone Spring Sand									
6,600.00	0.00	0.00	6,550.76	-503.00	312.00	-308.48	0.00	0.00	0.00
6,700.00	0.00	0.00	6,650.76	-503.00	312.00	-308.48	0.00	0.00	0.00
6,800.00	0.00	0.00	6,750.76	-503.00	312.00	-308.48	0.00	0.00	0.00
6,900.00	0.00	0.00	6,850.76	-503.00	312.00	-308.48	0.00	0.00	0.00
7,000.00	0.00	0.00	6,950.76	-503.00	312.00	-308.48	0.00	0.00	0.00
7,042.63	0.00	0.00	6,993.38	-503.00	312.00	-308.48	0.00	0.00	0.00
2nd Bone Spring Sand									
7,100.00	0.00	0.00	7,050.76	-503.00	312.00	-308.48	0.00	0.00	0.00
7,200.00	0.00	0.00	7,150.76	-503.00	312.00	-308.48	0.00	0.00	0.00
7,300.00	0.00	0.00	7,250.76	-503.00	312.00	-308.48	0.00	0.00	0.00
7,400.00	0.00	0.00	7,350.76	-503.00	312.00	-308.48	0.00	0.00	0.00

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Well:	207H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan 1	**Database:**	WellPlanner1

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)
7,500.00	0.00	0.00	7,450.76	-503.00	312.00	-308.48	0.00	0.00	0.00
7,600.00	0.00	0.00	7,550.76	-503.00	312.00	-308.48	0.00	0.00	0.00
7,700.00	0.00	0.00	7,650.76	-503.00	312.00	-308.48	0.00	0.00	0.00
7,800.00	0.00	0.00	7,750.76	-503.00	312.00	-308.48	0.00	0.00	0.00
7,900.00	0.00	0.00	7,850.76	-503.00	312.00	-308.48	0.00	0.00	0.00
8,000.00	0.00	0.00	7,950.76	-503.00	312.00	-308.48	0.00	0.00	0.00
8,100.00	0.00	0.00	8,050.76	-503.00	312.00	-308.48	0.00	0.00	0.00
8,200.00	0.00	0.00	8,150.76	-503.00	312.00	-308.48	0.00	0.00	0.00
8,300.00	0.00	0.00	8,250.76	-503.00	312.00	-308.48	0.00	0.00	0.00
8,400.00	0.00	0.00	8,350.76	-503.00	312.00	-308.48	0.00	0.00	0.00
8,501.37	0.00	0.00	8,452.13	-503.00	312.00	-308.48	0.00	0.00	0.00
KOP, Start DLS 10.00 TFO 269.60									
8,550.00	4.86	269.60	8,500.70	-503.01	309.94	-306.42	10.00	10.00	0.00
8,600.00	9.86	269.60	8,550.27	-503.06	303.53	-300.01	10.00	10.00	0.00
8,603.00	10.16	269.60	8,553.23	-503.06	303.01	-299.49	10.00	10.00	0.00
3rd Bone Spring Sand									
8,650.00	14.86	269.60	8,599.10	-503.13	292.83	-289.31	10.00	10.00	0.00
8,700.00	19.86	269.60	8,646.80	-503.24	277.91	-274.39	10.00	10.00	0.00
8,750.00	24.86	269.60	8,693.03	-503.37	258.90	-255.38	10.00	10.00	0.00
8,800.00	29.86	269.60	8,737.42	-503.53	235.92	-232.40	10.00	10.00	0.00
8,850.00	34.86	269.60	8,779.64	-503.72	209.17	-205.65	10.00	10.00	0.00
8,900.00	39.86	269.60	8,819.37	-503.93	178.84	-175.31	10.00	10.00	0.00
8,902.18	40.08	269.60	8,821.04	-503.94	177.44	-173.92	10.00	10.00	0.00
3rd Bone Spring W Sand									
8,950.00	44.86	269.60	8,856.30	-504.17	145.16	-141.63	10.00	10.00	0.00
8,999.50	49.81	269.60	8,889.84	-504.42	108.77	-105.24	10.00	10.00	0.00
Wolfcamp A									
9,000.00	49.86	269.60	8,890.16	-504.43	108.39	-104.86	10.00	10.00	0.00
9,050.00	54.86	269.60	8,920.68	-504.70	68.81	-65.28	10.00	10.00	0.00
9,100.00	59.86	269.60	8,947.64	-505.00	26.71	-23.19	10.00	10.00	0.00
9,150.00	64.86	269.60	8,970.83	-505.31	-17.57	21.09	10.00	10.00	0.00
9,165.90	66.45	269.60	8,977.38	-505.41	-32.05	35.58	10.00	10.00	0.00
Wolfcamp A Y									
9,200.00	69.86	269.60	8,990.06	-505.63	-63.70	67.23	10.00	10.00	0.00
9,250.00	74.86	269.60	9,005.21	-505.97	-111.33	114.86	10.00	10.00	0.00
9,300.00	79.86	269.60	9,016.14	-506.31	-160.10	163.63	10.00	10.00	0.00
9,350.00	84.86	269.60	9,022.79	-506.66	-209.64	213.17	10.00	10.00	0.00
9,400.00	89.86	269.60	9,025.09	-507.01	-259.57	263.11	10.00	10.00	0.00
9,411.37	91.00	269.60	9,025.00	-507.09	-270.94	274.47	10.00	10.00	0.00
Landing PT, Start 9691.77 hold at 9411.37 MD									
9,500.00	91.00	269.60	9,023.45	-507.71	-359.56	363.09	0.00	0.00	0.00
9,600.00	91.00	269.60	9,021.71	-508.41	-459.54	463.08	0.00	0.00	0.00
9,700.00	91.00	269.60	9,019.97	-509.11	-559.52	563.06	0.00	0.00	0.00
9,800.00	91.00	269.60	9,018.22	-509.81	-659.50	663.05	0.00	0.00	0.00

Company:	Tap Rock Operating, LLC	**Local Co-ordinate Reference:**	Well 207H
Project:	Eddy County, NM (NAD 83)	**TVD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Site:	Old Chub	**MD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Well:	207H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan 1	**Database:**	WellPlanner1

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	91.00	269.60	9,016.48	-510.51	-759.49	763.03	0.00	0.00	0.00
10,000.00	91.00	269.60	9,014.73	-511.21	-859.47	863.02	0.00	0.00	0.00
10,100.00	91.00	269.60	9,012.99	-511.91	-959.45	963.00	0.00	0.00	0.00
10,200.00	91.00	269.60	9,011.24	-512.61	-1,059.43	1,062.99	0.00	0.00	0.00
10,300.00	91.00	269.60	9,009.50	-513.31	-1,159.41	1,162.97	0.00	0.00	0.00
10,400.00	91.00	269.60	9,007.75	-514.01	-1,259.40	1,262.95	0.00	0.00	0.00
10,500.00	91.00	269.60	9,006.01	-514.71	-1,359.38	1,362.94	0.00	0.00	0.00
10,600.00	91.00	269.60	9,004.27	-515.41	-1,459.36	1,462.92	0.00	0.00	0.00
10,700.00	91.00	269.60	9,002.52	-516.12	-1,559.34	1,562.91	0.00	0.00	0.00
10,800.00	91.00	269.60	9,000.78	-516.82	-1,659.33	1,662.89	0.00	0.00	0.00
10,900.00	91.00	269.60	8,999.03	-517.52	-1,759.31	1,762.88	0.00	0.00	0.00
11,000.00	91.00	269.60	8,997.29	-518.22	-1,859.29	1,862.86	0.00	0.00	0.00
11,100.00	91.00	269.60	8,995.54	-518.92	-1,959.27	1,962.85	0.00	0.00	0.00
11,200.00	91.00	269.60	8,993.80	-519.62	-2,059.26	2,062.83	0.00	0.00	0.00
11,300.00	91.00	269.60	8,992.05	-520.32	-2,159.24	2,162.82	0.00	0.00	0.00
11,400.00	91.00	269.60	8,990.31	-521.02	-2,259.22	2,262.80	0.00	0.00	0.00
11,500.00	91.00	269.60	8,988.57	-521.72	-2,359.20	2,362.79	0.00	0.00	0.00
11,600.00	91.00	269.60	8,986.82	-522.42	-2,459.19	2,462.77	0.00	0.00	0.00
11,700.00	91.00	269.60	8,985.08	-523.12	-2,559.17	2,562.76	0.00	0.00	0.00
11,800.00	91.00	269.60	8,983.33	-523.82	-2,659.15	2,662.74	0.00	0.00	0.00
11,900.00	91.00	269.60	8,981.59	-524.52	-2,759.13	2,762.73	0.00	0.00	0.00
12,000.00	91.00	269.60	8,979.84	-525.23	-2,859.11	2,862.71	0.00	0.00	0.00
12,100.00	91.00	269.60	8,978.10	-525.93	-2,959.10	2,962.70	0.00	0.00	0.00
12,200.00	91.00	269.60	8,976.35	-526.63	-3,059.08	3,062.68	0.00	0.00	0.00
12,300.00	91.00	269.60	8,974.61	-527.33	-3,159.06	3,162.67	0.00	0.00	0.00
12,400.00	91.00	269.60	8,972.86	-528.03	-3,259.04	3,262.65	0.00	0.00	0.00
12,500.00	91.00	269.60	8,971.12	-528.73	-3,359.03	3,362.64	0.00	0.00	0.00
12,600.00	91.00	269.60	8,969.38	-529.43	-3,459.01	3,462.62	0.00	0.00	0.00
12,700.00	91.00	269.60	8,967.63	-530.13	-3,558.99	3,562.61	0.00	0.00	0.00
12,800.00	91.00	269.60	8,965.89	-530.83	-3,658.97	3,662.59	0.00	0.00	0.00
12,900.00	91.00	269.60	8,964.14	-531.53	-3,758.96	3,762.57	0.00	0.00	0.00
13,000.00	91.00	269.60	8,962.40	-532.23	-3,858.94	3,862.56	0.00	0.00	0.00
13,100.00	91.00	269.60	8,960.65	-532.93	-3,958.92	3,962.54	0.00	0.00	0.00
13,200.00	91.00	269.60	8,958.91	-533.63	-4,058.90	4,062.53	0.00	0.00	0.00
13,300.00	91.00	269.60	8,957.16	-534.33	-4,158.88	4,162.51	0.00	0.00	0.00
13,400.00	91.00	269.60	8,955.42	-535.04	-4,258.87	4,262.50	0.00	0.00	0.00
13,500.00	91.00	269.60	8,953.68	-535.74	-4,358.85	4,362.48	0.00	0.00	0.00
13,600.00	91.00	269.60	8,951.93	-536.44	-4,458.83	4,462.47	0.00	0.00	0.00
13,700.00	91.00	269.60	8,950.19	-537.14	-4,558.81	4,562.45	0.00	0.00	0.00
13,800.00	91.00	269.60	8,948.44	-537.84	-4,658.80	4,662.44	0.00	0.00	0.00
13,900.00	91.00	269.60	8,946.70	-538.54	-4,758.78	4,762.42	0.00	0.00	0.00
14,000.00	91.00	269.60	8,944.95	-539.24	-4,858.76	4,862.41	0.00	0.00	0.00
14,100.00	91.00	269.60	8,943.21	-539.94	-4,958.74	4,962.39	0.00	0.00	0.00

Company:	Tap Rock Operating, LLC	**Local Co-ordinate Reference:**	Well 207H
Project:	Eddy County, NM (NAD 83)	**TVD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Site:	Old Chub	**MD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Well:	207H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan 1	**Database:**	WellPlanner1

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)
14,200.00	91.00	269.60	8,941.46	-540.64	-5,058.73	5,062.38	0.00	0.00	0.00
14,300.00	91.00	269.60	8,939.72	-541.34	-5,158.71	5,162.36	0.00	0.00	0.00
14,400.00	91.00	269.60	8,937.98	-542.04	-5,258.69	5,262.35	0.00	0.00	0.00
14,500.00	91.00	269.60	8,936.23	-542.74	-5,358.67	5,362.33	0.00	0.00	0.00
14,600.00	91.00	269.60	8,934.49	-543.44	-5,458.66	5,462.32	0.00	0.00	0.00
14,700.00	91.00	269.60	8,932.74	-544.15	-5,558.64	5,562.30	0.00	0.00	0.00
14,800.00	91.00	269.60	8,931.00	-544.85	-5,658.62	5,662.29	0.00	0.00	0.00
14,900.00	91.00	269.60	8,929.25	-545.55	-5,758.60	5,762.27	0.00	0.00	0.00
15,000.00	91.00	269.60	8,927.51	-546.25	-5,858.58	5,862.26	0.00	0.00	0.00
15,100.00	91.00	269.60	8,925.76	-546.95	-5,958.57	5,962.24	0.00	0.00	0.00
15,200.00	91.00	269.60	8,924.02	-547.65	-6,058.55	6,062.22	0.00	0.00	0.00
15,300.00	91.00	269.60	8,922.28	-548.35	-6,158.53	6,162.21	0.00	0.00	0.00
15,400.00	91.00	269.60	8,920.53	-549.05	-6,258.51	6,262.19	0.00	0.00	0.00
15,500.00	91.00	269.60	8,918.79	-549.75	-6,358.50	6,362.18	0.00	0.00	0.00
15,600.00	91.00	269.60	8,917.04	-550.45	-6,458.48	6,462.16	0.00	0.00	0.00
15,700.00	91.00	269.60	8,915.30	-551.15	-6,558.46	6,562.15	0.00	0.00	0.00
15,800.00	91.00	269.60	8,913.55	-551.85	-6,658.44	6,662.13	0.00	0.00	0.00
15,900.00	91.00	269.60	8,911.81	-552.55	-6,758.43	6,762.12	0.00	0.00	0.00
16,000.00	91.00	269.60	8,910.06	-553.25	-6,858.41	6,862.10	0.00	0.00	0.00
16,100.00	91.00	269.60	8,908.32	-553.96	-6,958.39	6,962.09	0.00	0.00	0.00
16,200.00	91.00	269.60	8,906.57	-554.66	-7,058.37	7,062.07	0.00	0.00	0.00
16,300.00	91.00	269.60	8,904.83	-555.36	-7,158.35	7,162.06	0.00	0.00	0.00
16,400.00	91.00	269.60	8,903.09	-556.06	-7,258.34	7,262.04	0.00	0.00	0.00
16,500.00	91.00	269.60	8,901.34	-556.76	-7,358.32	7,362.03	0.00	0.00	0.00
16,600.00	91.00	269.60	8,899.60	-557.46	-7,458.30	7,462.01	0.00	0.00	0.00
16,700.00	91.00	269.60	8,897.85	-558.16	-7,558.28	7,562.00	0.00	0.00	0.00
16,800.00	91.00	269.60	8,896.11	-558.86	-7,658.27	7,661.98	0.00	0.00	0.00
16,900.00	91.00	269.60	8,894.36	-559.56	-7,758.25	7,761.97	0.00	0.00	0.00
17,000.00	91.00	269.60	8,892.62	-560.26	-7,858.23	7,861.95	0.00	0.00	0.00
17,100.00	91.00	269.60	8,890.87	-560.96	-7,958.21	7,961.94	0.00	0.00	0.00
17,200.00	91.00	269.60	8,889.13	-561.66	-8,058.20	8,061.92	0.00	0.00	0.00
17,300.00	91.00	269.60	8,887.39	-562.36	-8,158.18	8,161.91	0.00	0.00	0.00
17,400.00	91.00	269.60	8,885.64	-563.07	-8,258.16	8,261.89	0.00	0.00	0.00
17,500.00	91.00	269.60	8,883.90	-563.77	-8,358.14	8,361.87	0.00	0.00	0.00
17,600.00	91.00	269.60	8,882.15	-564.47	-8,458.12	8,461.86	0.00	0.00	0.00
17,700.00	91.00	269.60	8,880.41	-565.17	-8,558.11	8,561.84	0.00	0.00	0.00
17,800.00	91.00	269.60	8,878.66	-565.87	-8,658.09	8,661.83	0.00	0.00	0.00
17,900.00	91.00	269.60	8,876.92	-566.57	-8,758.07	8,761.81	0.00	0.00	0.00
18,000.00	91.00	269.60	8,875.17	-567.27	-8,858.05	8,861.80	0.00	0.00	0.00
18,100.00	91.00	269.60	8,873.43	-567.97	-8,958.04	8,961.78	0.00	0.00	0.00
18,200.00	91.00	269.60	8,871.69	-568.67	-9,058.02	9,061.77	0.00	0.00	0.00
18,300.00	91.00	269.60	8,869.94	-569.37	-9,158.00	9,161.75	0.00	0.00	0.00
18,400.00	91.00	269.60	8,868.20	-570.07	-9,257.98	9,261.74	0.00	0.00	0.00
18,500.00	91.00	269.60	8,866.45	-570.77	-9,357.97	9,361.72	0.00	0.00	0.00

Company:	Tap Rock Operating, LLC	**Local Co-ordinate Reference:**	Well 207H
Project:	Eddy County, NM (NAD 83)	**TVD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Site:	Old Chub	**MD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Well:	207H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan 1	**Database:**	WellPlanner1

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
18,600.00	91.00	269.60	8,864.71	-571.47	-9,457.95	9,461.71	0.00	0.00	0.00
18,700.00	91.00	269.60	8,862.96	-572.18	-9,557.93	9,561.69	0.00	0.00	0.00
18,800.00	91.00	269.60	8,861.22	-572.88	-9,657.91	9,661.68	0.00	0.00	0.00
18,900.00	91.00	269.60	8,859.47	-573.58	-9,757.90	9,761.66	0.00	0.00	0.00
19,000.00	91.00	269.60	8,857.73	-574.28	-9,857.88	9,861.65	0.00	0.00	0.00
19,103.14	91.00	269.60	8,855.93	-575.00	-9,961.00	9,964.77	0.00	0.00	0.00
TD at 19103.14									

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
Old Chub 207H - Plat FT - plan misses target center by 502.09usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Point	0.00	0.00	0.00	-501.00	33.00	480,302.00	581,075.00	32.320357	-104.204694
Old Chub 207H - Plat LT - plan misses target center by 8856.88usft at 19103.14usft MD (8855.93 TVD, -575.00 N, -9961.00 E) - Point	0.00	0.00	0.00	-574.00	-9,831.00	480,229.00	571,211.00	32.320185	-104.236626
Old Chub 207H - KOP - plan hits target center - Point	0.00	0.00	8,452.13	-503.00	312.00	480,300.00	581,354.00	32.320351	-104.203791
Old Chub 207H - Plat PE - plan hits target center - Point	0.00	0.00	8,855.93	-575.00	-9,961.00	480,228.00	571,081.00	32.320183	-104.237047

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
115.00	115.00	Rustler Anhydrite		-1.00	269.60
455.00	455.00	Top Salt		-1.00	269.60
1,864.04	1,855.97	Base Salt		-1.00	269.60
1,911.84	1,903.05	Delaware Mountain Gp		-1.00	269.60
2,064.40	2,053.29	Bell Canyon		-1.00	269.60
4,013.08	3,972.37	Brushy Canyon		-1.00	269.60
5,467.63	5,418.38	Bone Spring Lime		-1.00	269.60
6,522.63	6,473.38	1st Bone Spring Sand		-1.00	269.60
7,042.63	6,993.38	2nd Bone Spring Sand		-1.00	269.60
8,603.00	8,553.23	3rd Bone Spring Sand		-1.00	269.60
8,902.18	8,821.04	3rd Bone Spring W Sand		-1.00	269.60
8,999.50	8,889.84	Wolfcamp A		-1.00	269.60
9,165.90	8,977.38	Wolfcamp A Y		-1.00	269.60

Company:	Tap Rock Operating, LLC	**Local Co-ordinate Reference:**	Well 207H
Project:	Eddy County, NM (NAD 83)	**TVD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Site:	Old Chub	**MD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Well:	207H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan 1	**Database:**	WellPlanner1

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
1000	1000	0	0	Start Build 2.00
1500	1497	-37	23	Start 2907.19 hold at 1500.02 MD
4407	4361	-466	289	Start Drop -2.00
4907	4858	-503	312	Start 3594.13 hold at 4907.24 MD
8501	8452	-503	312	KOP, Start DLS 10.00 TFO 269.60
9411	9025	-507	-271	Landing PT.,Start 9691.77 hold at 9411.37 MD
19,103	8856	-575	-9961	TD at 19103.14

Checked By: _____ Approved By: _____ Date: _____

Tap Rock Operating, LLC

Eddy County, NM (NAD 83)
Old Chub
207H

OH
Plan 1

Anticollision Report

18 October, 2018

PRODIRECTIONAL

Company:	Tap Rock Operating, LLC	**Local Co-ordinate Reference:**	Well 207H
Project:	Eddy County, NM (NAD 83)	**TVD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Reference Site:	Old Chub	**MD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	207H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	OH	**Database:**	WellPlanner1
Reference Design:	Plan 1	**Offset TVD Reference:**	Offset Datum

Reference Plan 1

Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	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:	3.00 **Sigma**	**Casing Method:**	Not applied

Survey Tool Program **Date** 10/18/2018

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	4,800.00	Plan 1 (OH)	MWD+HDGM	OWSG MWD + HRGM
4,800.00	8,400.00	Plan 1 (OH)	MWD+HDGM	OWSG MWD + HRGM
8,400.00	19,103.14	Plan 1 (OH)	MWD+HDGM	OWSG MWD + HRGM

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
Old Chub						
202H - OH - Plan 1	1,000.00	1,000.00	30.00	19.93	2.978	CC
202H - OH - Plan 1	19,103.14	19,076.37	657.98	-40.25	0.942	Level 1, ES, SF
205H - OH - Plan 1	1,000.00	997.00	1,049.80	1,039.74	104.377	CC
205H - OH - Plan 1	19,096.47	19,077.98	1,325.96	628.35	1.901	ES
205H - OH - Plan 1	19,103.14	19,074.39	1,326.00	628.35	1.901	SF

Offset Design Old Chub - 202H - OH - Plan 1 — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD+HDGM, 3700-MWD+HDGM, 8400-MWD+HDGM — **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	0.00	0.00	0.00	0.00	0.00	30.00	0.00	30.00				
100.00	100.00	100.00	100.00	0.20	0.20	0.00	30.00	0.00	30.00	29.60	0.40	75.908	
200.00	200.00	200.00	200.00	0.74	0.74	0.00	30.00	0.00	30.00	28.53	1.47	20.399	
300.00	300.00	300.00	300.00	1.27	1.27	0.00	30.00	0.00	30.00	27.45	2.55	11.783	
400.00	400.00	400.00	400.00	1.81	1.81	0.00	30.00	0.00	30.00	26.38	3.62	8.284	
500.00	500.00	500.00	500.00	2.35	2.35	0.00	30.00	0.00	30.00	25.30	4.70	6.387	
600.00	600.00	600.00	600.00	2.89	2.89	0.00	30.00	0.00	30.00	24.23	5.77	5.197	
700.00	700.00	700.00	700.00	3.42	3.42	0.00	30.00	0.00	30.00	23.15	6.85	4.381	
800.00	800.00	800.00	800.00	3.96	3.96	0.00	30.00	0.00	30.00	22.08	7.92	3.786	
900.00	900.00	900.00	900.00	4.50	4.50	0.00	30.00	0.00	30.00	21.00	9.00	3.334	
1,000.00	1,000.00	1,000.00	1,000.00	5.04	5.04	0.00	30.00	0.00	30.00	19.93	10.07	2.978	CC
1,100.00	1,099.98	1,099.56	1,099.54	5.55	5.56	-146.94	30.65	1.60	32.14	21.02	11.12	2.892	
1,200.00	1,199.84	1,198.82	1,198.66	6.05	6.09	-144.01	32.58	6.40	38.62	26.49	12.13	3.183	
1,300.00	1,299.45	1,297.49	1,296.96	6.55	6.61	-140.83	35.76	14.32	49.53	36.37	13.16	3.764	
1,400.00	1,398.70	1,405.23	1,393.97	7.07	7.20	-138.14	40.16	25.25	64.89	50.65	14.24	4.556	
1,500.02	1,497.49	1,506.58	1,491.21	7.61	7.76	-136.91	45.27	37.93	83.85	68.53	15.32	5.472	
1,600.00	1,595.95	1,608.66	1,588.17	8.17	8.33	-136.98	50.36	50.58	104.06	87.64	16.42	6.337	
1,700.00	1,694.43	1,689.27	1,685.15	8.74	8.78	-137.02	55.46	63.23	124.27	106.86	17.41	7.139	

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

Company:	Tap Rock Operating, LLC	**Local Co-ordinate Reference:**	Well 207H
Project:	Eddy County, NM (NAD 83)	**TVD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Reference Site:	Old Chub	**MD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	207H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	OH	**Database:**	WellPlanner1
Reference Design:	Plan 1	**Offset TVD Reference:**	Offset Datum

Offset Design Old Chub - 202H - OH - Plan 1 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD+HDGM, 3700-MWD+HDGM, 8400-MWD+HDGM — 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
1,800.00	1,792.91	1,787.21	1,782.14	9.32	9.34	-137.06	60.55	75.88	144.48	125.98	18.50	7.809	
1,900.00	1,891.39	1,885.14	1,879.12	9.91	9.91	-137.08	65.64	88.53	164.69	145.08	19.61	8.400	
2,000.00	1,989.87	1,983.08	1,976.10	10.50	10.47	-137.10	70.74	101.18	184.90	164.18	20.72	8.924	
2,100.00	2,088.35	2,081.02	2,073.08	11.11	11.04	-137.12	75.83	113.83	205.11	183.28	21.84	9.392	
2,200.00	2,186.83	2,178.95	2,170.06	11.71	11.62	-137.13	80.92	126.48	225.33	202.36	22.96	9.812	
2,300.00	2,285.31	2,276.89	2,267.05	12.33	12.19	-137.14	86.02	139.14	245.54	221.44	24.10	10.190	
2,400.00	2,383.79	2,374.82	2,364.03	12.94	12.77	-137.15	91.11	151.79	265.75	240.52	25.23	10.533	
2,500.00	2,482.27	2,472.76	2,461.01	13.56	13.34	-137.15	96.20	164.44	285.96	259.59	26.37	10.845	
2,600.00	2,580.75	2,570.70	2,557.99	14.19	13.92	-137.16	101.30	177.09	306.17	278.66	27.51	11.129	
2,700.00	2,679.23	2,668.63	2,654.97	14.81	14.50	-137.17	106.39	189.74	326.39	297.73	28.66	11.390	
2,800.00	2,777.71	2,766.57	2,751.96	15.44	15.08	-137.17	111.48	202.39	346.60	316.79	29.80	11.629	
2,900.00	2,876.19	2,864.50	2,848.94	16.07	15.67	-137.18	116.57	215.04	366.81	335.85	30.95	11.850	
3,000.00	2,974.67	2,962.44	2,945.92	16.70	16.25	-137.18	121.67	227.69	387.02	354.91	32.11	12.054	
3,100.00	3,073.16	3,060.38	3,042.90	17.33	16.83	-137.18	126.76	240.34	407.23	373.97	33.26	12.244	
3,200.00	3,171.64	3,158.31	3,139.88	17.96	17.42	-137.19	131.85	252.99	427.44	393.03	34.42	12.420	
3,300.00	3,270.12	3,256.25	3,236.87	18.60	18.00	-137.19	136.95	265.64	447.66	412.08	35.57	12.584	
3,400.00	3,368.60	3,354.19	3,333.85	19.24	18.59	-137.19	142.04	278.30	467.87	431.14	36.73	12.737	
3,500.00	3,467.08	3,458.94	3,437.71	19.87	19.21	-137.30	147.12	290.92	487.60	449.64	37.96	12.844	
3,600.00	3,565.56	3,567.19	3,545.47	20.51	19.82	-137.77	150.94	300.40	505.47	466.27	39.20	12.895	
3,700.00	3,664.04	3,675.82	3,653.91	21.15	20.41	-138.60	153.24	306.11	521.44	481.04	40.39	12.909	
3,800.00	3,762.52	3,784.50	3,762.57	21.79	20.76	-139.76	154.00	308.00	535.61	494.28	41.34	12.957	
3,900.00	3,861.00	3,882.93	3,861.00	22.43	20.77	-140.92	154.00	308.00	549.07	507.15	41.92	13.099	
4,000.00	3,959.48	3,981.41	3,959.48	23.07	20.80	-142.03	154.00	308.00	562.73	520.22	42.51	13.238	
4,100.00	4,057.96	4,079.89	4,057.96	23.71	20.84	-143.09	154.00	308.00	576.60	533.49	43.11	13.375	
4,200.00	4,156.44	4,178.37	4,156.44	24.36	20.89	-144.09	154.00	308.00	590.65	546.92	43.72	13.508	
4,300.00	4,254.92	4,276.85	4,254.92	25.00	20.96	-145.05	154.00	308.00	604.87	560.52	44.35	13.638	
4,407.22	4,360.51	4,382.44	4,360.51	25.69	21.04	-146.03	154.00	308.00	620.30	575.26	45.04	13.773	
4,500.00	4,452.13	4,474.06	4,452.13	26.27	21.13	-146.91	154.00	308.00	632.54	586.91	45.64	13.861	
4,600.00	4,551.35	4,573.27	4,551.35	26.87	21.24	-147.62	154.00	308.00	643.03	596.75	46.28	13.893	
4,700.00	4,650.94	4,672.87	4,650.94	27.43	21.36	-148.13	154.00	308.00	650.63	603.70	46.94	13.862	
4,800.00	4,750.78	4,772.71	4,750.78	27.96	21.49	-148.43	154.00	308.00	655.30	607.71	47.59	13.770	
4,907.24	4,858.00	4,879.93	4,858.00	28.24	21.64	-0.35	154.00	308.00	657.01	608.99	48.02	13.682	
5,000.00	4,950.76	4,972.69	4,950.76	28.25	21.79	-0.35	154.00	308.00	657.01	608.83	48.18	13.637	
5,100.00	5,050.76	5,072.69	5,050.76	28.27	21.96	-0.35	154.00	308.00	657.01	608.64	48.37	13.583	
5,200.00	5,150.76	5,172.69	5,150.76	28.30	22.14	-0.35	154.00	308.00	657.01	608.43	48.58	13.523	
5,300.00	5,250.76	5,272.69	5,250.76	28.34	22.33	-0.35	154.00	308.00	657.01	608.19	48.82	13.458	
5,400.00	5,350.76	5,372.69	5,350.76	28.39	22.54	-0.35	154.00	308.00	657.01	607.93	49.08	13.387	
5,500.00	5,450.76	5,472.69	5,450.76	28.45	22.75	-0.35	154.00	308.00	657.01	607.65	49.36	13.311	
5,600.00	5,550.76	5,572.69	5,550.76	28.52	22.98	-0.35	154.00	308.00	657.01	607.35	49.66	13.230	
5,700.00	5,650.76	5,672.69	5,650.76	28.61	23.21	-0.35	154.00	308.00	657.01	607.03	49.98	13.145	
5,800.00	5,750.76	5,772.69	5,750.76	28.70	23.46	-0.35	154.00	308.00	657.01	606.69	50.32	13.055	
5,900.00	5,850.76	5,872.69	5,850.76	28.80	23.71	-0.35	154.00	308.00	657.01	606.32	50.69	12.962	
6,000.00	5,950.76	5,972.69	5,950.76	28.91	23.98	-0.35	154.00	308.00	657.01	605.94	51.07	12.865	
6,100.00	6,050.76	6,072.69	6,050.76	29.03	24.25	-0.35	154.00	308.00	657.01	605.54	51.47	12.765	
6,200.00	6,150.76	6,172.69	6,150.76	29.15	24.53	-0.35	154.00	308.00	657.01	605.12	51.89	12.661	
6,300.00	6,250.76	6,272.69	6,250.76	29.29	24.82	-0.35	154.00	308.00	657.01	604.68	52.33	12.555	
6,400.00	6,350.76	6,372.69	6,350.76	29.44	25.12	-0.35	154.00	308.00	657.01	604.23	52.79	12.447	
6,500.00	6,450.76	6,472.69	6,450.76	29.60	25.43	-0.35	154.00	308.00	657.01	603.75	53.26	12.336	
6,600.00	6,550.76	6,572.69	6,550.76	29.76	25.74	-0.35	154.00	308.00	657.01	603.26	53.75	12.224	
6,700.00	6,650.76	6,672.69	6,650.76	29.94	26.06	-0.35	154.00	308.00	657.01	602.76	54.26	12.110	
6,800.00	6,750.76	6,772.69	6,750.76	30.12	26.39	-0.35	154.00	308.00	657.01	602.23	54.78	11.994	

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

Company:	Tap Rock Operating, LLC	**Local Co-ordinate Reference:**	Well 207H
Project:	Eddy County, NM (NAD 83)	**TVD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Reference Site:	Old Chub	**MD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	207H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	OH	**Database:**	WellPlanner1
Reference Design:	Plan 1	**Offset TVD Reference:**	Offset Datum

Offset Design Old Chub - 202H - OH - Plan 1 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD+HDGM, 3700-MWD+HDGM, 8400-MWD+HDGM — 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
6,900.00	6,850.76	6,872.69	6,850.76	30.31	26.73	-0.35	154.00	308.00	657.01	601.70	55.32	11.877	
7,000.00	6,950.76	6,972.69	6,950.76	30.51	27.07	-0.35	154.00	308.00	657.01	601.14	55.87	11.760	
7,100.00	7,050.76	7,072.69	7,050.76	30.72	27.42	-0.35	154.00	308.00	657.01	600.57	56.44	11.641	
7,200.00	7,150.76	7,172.69	7,150.76	30.93	27.77	-0.35	154.00	308.00	657.01	599.99	57.02	11.522	
7,300.00	7,250.76	7,272.69	7,250.76	31.15	28.13	-0.35	154.00	308.00	657.01	599.40	57.62	11.403	
7,400.00	7,350.76	7,372.69	7,350.76	31.39	28.50	-0.35	154.00	308.00	657.01	598.79	58.23	11.284	
7,500.00	7,450.76	7,472.69	7,450.76	31.62	28.87	-0.35	154.00	308.00	657.01	598.16	58.85	11.164	
7,600.00	7,550.76	7,572.69	7,550.76	31.87	29.24	-0.35	154.00	308.00	657.01	597.53	59.48	11.045	
7,700.00	7,650.76	7,672.69	7,650.76	32.12	29.63	-0.35	154.00	308.00	657.01	596.88	60.13	10.926	
7,800.00	7,750.76	7,772.69	7,750.76	32.38	30.01	-0.35	154.00	308.00	657.01	596.22	60.79	10.808	
7,900.00	7,850.76	7,872.69	7,850.76	32.65	30.40	-0.35	154.00	308.00	657.01	595.55	61.46	10.690	
8,000.00	7,950.76	7,972.69	7,950.76	32.92	30.80	-0.35	154.00	308.00	657.01	594.87	62.14	10.572	
8,100.00	8,050.76	8,072.69	8,050.76	33.20	31.20	-0.35	154.00	308.00	657.01	594.17	62.84	10.456	
8,200.00	8,150.76	8,172.69	8,150.76	33.49	31.60	-0.35	154.00	308.00	657.01	593.47	63.54	10.340	
8,300.00	8,250.76	8,272.69	8,250.76	33.78	32.01	-0.35	154.00	308.00	657.01	592.76	64.25	10.225	
8,400.00	8,350.76	8,372.69	8,350.76	33.93	32.27	-0.35	154.00	308.00	657.01	592.34	64.67	10.159	
8,501.37	8,452.13	8,474.06	8,452.13	33.94	32.33	-0.35	154.00	308.00	657.01	592.27	64.74	10.148	
8,550.00	8,500.70	8,522.73	8,500.75	33.94	32.33	90.05	153.99	305.93	657.01	592.27	64.74	10.148	
8,600.00	8,550.27	8,572.78	8,550.36	33.93	32.32	90.05	153.94	299.52	657.01	592.29	64.72	10.151	
8,650.00	8,599.10	8,622.82	8,599.23	33.92	32.30	90.05	153.87	288.79	657.01	592.33	64.68	10.157	
8,700.00	8,646.80	8,672.87	8,646.98	33.90	32.27	90.05	153.76	273.85	657.02	592.39	64.63	10.166	
8,750.00	8,693.03	8,722.91	8,693.24	33.88	32.24	90.05	153.63	254.80	657.02	592.45	64.57	10.176	
8,800.00	8,737.42	8,772.96	8,737.66	33.86	32.21	90.05	153.47	231.79	657.02	592.51	64.51	10.185	
8,850.00	8,779.64	8,823.00	8,779.90	33.84	32.19	90.04	153.29	204.99	657.02	592.55	64.47	10.191	
8,900.00	8,819.37	8,873.03	8,819.64	33.82	32.18	90.04	153.08	174.61	657.02	592.56	64.46	10.193	
8,950.00	8,856.30	8,923.07	8,856.57	33.81	32.19	90.04	152.84	140.89	657.03	592.52	64.51	10.185	
9,000.00	8,890.16	8,973.10	8,890.43	33.81	32.23	90.03	152.59	104.07	657.03	592.40	64.63	10.166	
9,050.00	8,920.68	9,023.13	8,920.94	33.81	32.33	90.03	152.32	64.44	657.04	592.19	64.85	10.132	
9,100.00	8,947.64	9,073.15	8,947.87	33.83	32.50	90.03	152.02	22.31	657.04	591.85	65.19	10.079	
9,150.00	8,970.83	9,123.18	8,971.03	33.85	32.74	90.02	151.72	-22.01	657.04	591.37	65.67	10.005	
9,200.00	8,990.06	9,173.19	8,990.24	33.89	33.07	90.02	151.40	-68.18	657.05	590.74	66.31	9.909	
9,250.00	9,005.21	9,223.21	9,005.35	34.01	33.47	90.01	151.07	-115.84	657.05	589.94	67.11	9.790	
9,300.00	9,016.14	9,273.22	9,016.24	34.35	33.96	90.01	150.73	-164.63	657.06	588.97	68.08	9.651	
9,350.00	9,022.79	9,323.23	9,022.83	34.88	34.53	90.00	150.39	-214.18	657.06	587.85	69.21	9.493	
9,400.00	9,025.09	9,373.23	9,025.09	35.51	35.16	90.00	150.04	-264.12	657.07	586.58	70.48	9.322	
9,411.37	9,025.00	9,384.59	9,024.99	35.66	35.32	90.00	149.97	-275.48	657.07	586.28	70.79	9.282	
9,500.00	9,023.45	9,473.23	9,023.44	36.99	36.67	90.00	149.35	-364.10	657.08	583.60	73.47	8.943	
9,600.00	9,021.71	9,573.23	9,021.70	38.73	38.41	90.00	148.66	-464.08	657.08	580.14	76.94	8.540	
9,700.00	9,019.97	9,673.23	9,019.95	40.68	40.37	90.00	147.97	-564.06	657.09	576.24	80.85	8.127	
9,800.00	9,018.22	9,773.23	9,018.21	42.82	42.52	90.00	147.28	-664.05	657.10	571.97	85.14	7.718	
9,900.00	9,016.48	9,873.23	9,016.46	45.11	44.82	90.00	146.59	-764.03	657.11	567.37	89.75	7.322	
10,000.00	9,014.73	9,973.23	9,014.72	47.55	47.27	90.00	145.90	-864.01	657.12	562.49	94.63	6.944	
10,100.00	9,012.99	10,073.23	9,012.97	50.10	49.83	90.00	145.21	-963.99	657.13	557.38	99.75	6.588	
10,200.00	9,011.24	10,173.23	9,011.23	52.76	52.50	90.00	144.51	-1,063.98	657.14	552.07	105.08	6.254	
10,300.00	9,009.50	10,273.23	9,009.48	55.50	55.25	90.00	143.82	-1,163.96	657.15	546.58	110.57	5.943	
10,400.00	9,007.75	10,373.23	9,007.74	58.31	58.07	90.00	143.13	-1,263.94	657.16	540.95	116.21	5.655	
10,500.00	9,006.01	10,473.23	9,005.99	61.19	60.96	90.00	142.44	-1,363.92	657.17	535.19	121.98	5.387	
10,600.00	9,004.27	10,573.23	9,004.25	64.12	63.90	90.00	141.75	-1,463.91	657.18	529.32	127.86	5.140	
10,700.00	9,002.52	10,673.23	9,002.50	67.10	66.89	90.00	141.06	-1,563.89	657.19	523.35	133.83	4.910	
10,800.00	9,000.78	10,773.23	9,000.76	70.12	69.92	90.00	140.37	-1,663.87	657.20	517.31	139.89	4.698	

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

Company:	Tap Rock Operating, LLC	**Local Co-ordinate Reference:**	Well 207H
Project:	Eddy County, NM (NAD 83)	**TVD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Reference Site:	Old Chub	**MD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	207H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	OH	**Database:**	WellPlanner1
Reference Design:	Plan 1	**Offset TVD Reference:**	Offset Datum

Offset Design Old Chub - 202H - OH - Plan 1 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD+HDGM, 3700-MWD+HDGM, 8400-MWD+HDGM — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
10,900.00	8,999.03	10,873.23	8,999.01	73.18	72.98	90.00	139.68	-1,763.85	657.21	511.18	146.02	4.501	
11,000.00	8,997.29	10,973.23	8,997.27	76.27	76.08	90.00	138.98	-1,863.83	657.22	505.00	152.22	4.318	
11,100.00	8,995.54	11,073.23	8,995.52	79.39	79.21	90.00	138.29	-1,963.82	657.23	498.76	158.47	4.147	
11,200.00	8,993.80	11,173.23	8,993.78	82.54	82.36	90.00	137.60	-2,063.80	657.24	492.46	164.77	3.989	
11,300.00	8,992.05	11,273.23	8,992.03	85.71	85.54	90.00	136.91	-2,163.78	657.25	486.13	171.12	3.841	
11,400.00	8,990.31	11,373.23	8,990.29	88.89	88.73	90.00	136.22	-2,263.76	657.26	479.75	177.50	3.703	
11,500.00	8,988.57	11,473.23	8,988.54	92.10	91.94	90.00	135.53	-2,363.75	657.26	473.34	183.93	3.574	
11,600.00	8,986.82	11,573.23	8,986.80	95.32	95.17	90.00	134.84	-2,463.73	657.27	466.89	190.38	3.452	
11,700.00	8,985.08	11,673.23	8,985.05	98.56	98.41	90.00	134.14	-2,563.71	657.28	460.42	196.86	3.339	
11,800.00	8,983.33	11,773.23	8,983.30	101.81	101.67	90.00	133.45	-2,663.69	657.29	453.92	203.37	3.232	
11,900.00	8,981.59	11,873.23	8,981.56	105.07	104.93	90.00	132.76	-2,763.68	657.30	447.40	209.90	3.131	
12,000.00	8,979.84	11,973.23	8,979.81	108.35	108.21	90.00	132.07	-2,863.66	657.31	440.86	216.46	3.037	
12,100.00	8,978.10	12,073.23	8,978.07	111.63	111.50	90.00	131.38	-2,963.64	657.32	434.29	223.03	2.947	
12,200.00	8,976.35	12,173.23	8,976.32	114.92	114.80	90.00	130.69	-3,063.62	657.33	427.71	229.62	2.863	
12,300.00	8,974.61	12,273.23	8,974.58	118.22	118.10	90.00	130.00	-3,163.61	657.34	421.11	236.23	2.783	
12,400.00	8,972.86	12,373.23	8,972.83	121.53	121.41	90.00	129.31	-3,263.59	657.35	414.50	242.85	2.707	
12,500.00	8,971.12	12,473.23	8,971.09	124.85	124.73	90.00	128.61	-3,363.57	657.36	407.87	249.49	2.635	
12,600.00	8,969.38	12,573.23	8,969.34	128.17	128.06	90.00	127.92	-3,463.55	657.37	401.23	256.14	2.566	
12,700.00	8,967.63	12,673.23	8,967.60	131.50	131.39	90.00	127.23	-3,563.54	657.38	394.58	262.80	2.501	
12,800.00	8,965.89	12,773.23	8,965.85	134.83	134.73	90.00	126.54	-3,663.52	657.39	387.91	269.47	2.440	
12,900.00	8,964.14	12,873.23	8,964.11	138.17	138.07	90.00	125.85	-3,763.50	657.40	381.24	276.16	2.381	
13,000.00	8,962.40	12,973.23	8,962.36	141.51	141.41	90.00	125.16	-3,863.48	657.41	374.56	282.85	2.324	
13,100.00	8,960.65	13,073.23	8,960.62	144.86	144.77	90.00	124.47	-3,963.46	657.42	367.87	289.55	2.270	
13,200.00	8,958.91	13,173.23	8,958.87	148.22	148.12	90.00	123.78	-4,063.45	657.43	361.17	296.26	2.219	
13,300.00	8,957.16	13,273.23	8,957.13	151.57	151.48	90.00	123.08	-4,163.43	657.44	354.46	302.98	2.170	
13,400.00	8,955.42	13,373.23	8,955.38	154.93	154.84	90.00	122.39	-4,263.41	657.44	347.74	309.70	2.123	
13,500.00	8,953.68	13,473.23	8,953.64	158.30	158.21	90.00	121.70	-4,363.39	657.45	341.02	316.43	2.078	
13,600.00	8,951.93	13,573.23	8,951.89	161.66	161.58	90.00	121.01	-4,463.38	657.46	334.29	323.17	2.034	
13,700.00	8,950.19	13,673.23	8,950.15	165.03	164.95	90.00	120.32	-4,563.36	657.47	327.56	329.91	1.993	
13,800.00	8,948.44	13,773.23	8,948.40	168.41	168.32	90.00	119.63	-4,663.34	657.48	320.82	336.66	1.953	
13,900.00	8,946.70	13,873.23	8,946.66	171.78	171.70	90.00	118.94	-4,763.32	657.49	314.08	343.41	1.915	
14,000.00	8,944.95	13,973.23	8,944.91	175.16	175.08	90.00	118.25	-4,863.31	657.50	307.33	350.17	1.878	
14,100.00	8,943.21	14,073.23	8,943.17	178.54	178.46	90.00	117.55	-4,963.29	657.51	300.57	356.94	1.842	
14,200.00	8,941.46	14,173.23	8,941.42	181.92	181.85	90.00	116.86	-5,063.27	657.52	293.82	363.70	1.808	
14,300.00	8,939.72	14,273.23	8,939.68	185.31	185.23	90.00	116.17	-5,163.25	657.53	287.05	370.48	1.775	
14,400.00	8,937.98	14,373.23	8,937.93	188.69	188.62	90.00	115.48	-5,263.24	657.54	280.29	377.25	1.743	
14,500.00	8,936.23	14,473.23	8,936.18	192.08	192.01	90.00	114.79	-5,363.22	657.55	273.52	384.03	1.712	
14,600.00	8,934.49	14,573.23	8,934.44	195.47	195.40	90.00	114.10	-5,463.20	657.56	266.74	390.81	1.683	
14,700.00	8,932.74	14,673.23	8,932.69	198.86	198.80	90.00	113.41	-5,563.18	657.57	259.97	397.60	1.654	
14,800.00	8,931.00	14,773.23	8,930.95	202.26	202.19	90.00	112.72	-5,663.17	657.58	253.19	404.39	1.626	
14,900.00	8,929.25	14,873.23	8,929.20	205.65	205.59	90.00	112.02	-5,763.15	657.59	246.40	411.18	1.599	
15,000.00	8,927.51	14,973.23	8,927.46	209.05	208.98	90.00	111.33	-5,863.13	657.60	239.62	417.98	1.573	
15,100.00	8,925.76	15,073.23	8,925.71	212.45	212.38	90.00	110.64	-5,963.11	657.61	232.83	424.78	1.548	
15,200.00	8,924.02	15,173.23	8,923.97	215.85	215.78	90.00	109.95	-6,063.09	657.61	226.04	431.58	1.524	
15,300.00	8,922.28	15,273.23	8,922.22	219.25	219.19	90.00	109.26	-6,163.08	657.62	219.24	438.38	1.500	
15,400.00	8,920.53	15,373.23	8,920.48	222.65	222.59	90.00	108.57	-6,263.06	657.63	212.45	445.19	1.477	Level 3
15,500.00	8,918.79	15,473.23	8,918.73	226.05	225.99	90.00	107.88	-6,363.04	657.64	205.65	451.99	1.455	Level 3
15,600.00	8,917.04	15,573.23	8,916.99	229.46	229.40	90.00	107.19	-6,463.02	657.65	198.85	458.80	1.433	Level 3
15,700.00	8,915.30	15,673.23	8,915.24	232.86	232.80	90.00	106.49	-6,563.01	657.66	192.05	465.62	1.412	Level 3
15,800.00	8,913.55	15,773.23	8,913.50	236.27	236.21	90.00	105.80	-6,662.99	657.67	185.24	472.43	1.392	Level 3
15,900.00	8,911.81	15,873.23	8,911.75	239.67	239.62	90.00	105.11	-6,762.97	657.68	178.44	479.25	1.372	Level 3

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

Company:	Tap Rock Operating, LLC	**Local Co-ordinate Reference:**	Well 207H
Project:	Eddy County, NM (NAD 83)	**TVD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Reference Site:	Old Chub	**MD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	207H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	OH	**Database:**	WellPlanner1
Reference Design:	Plan 1	**Offset TVD Reference:**	Offset Datum

Offset Design Old Chub - 202H - OH - Plan 1 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD+HDGM, 3700-MWD+HDGM, 8400-MWD+HDGM — 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
16,000.00	8,910.06	15,973.23	8,910.01	243.08	243.03	89.99	104.42	-6,862.95	657.69	171.63	486.06	1.353	Level 3
16,100.00	8,908.32	16,073.23	8,908.26	246.49	246.44	89.99	103.73	-6,962.94	657.70	164.82	492.88	1.334	Level 3
16,200.00	8,906.57	16,173.23	8,906.52	249.90	249.85	89.99	103.04	-7,062.92	657.71	158.01	499.70	1.316	Level 3
16,300.00	8,904.83	16,273.23	8,904.77	253.31	253.26	89.99	102.35	-7,162.90	657.72	151.19	506.53	1.298	Level 3
16,400.00	8,903.09	16,373.23	8,903.03	256.72	256.67	89.99	101.65	-7,262.88	657.73	144.38	513.35	1.281	Level 3
16,500.00	8,901.34	16,473.23	8,901.28	260.13	260.09	89.99	100.96	-7,362.87	657.74	137.56	520.18	1.264	Level 3
16,600.00	8,899.60	16,573.23	8,899.54	263.55	263.50	89.99	100.27	-7,462.85	657.75	130.74	527.00	1.248	Level 2
16,700.00	8,897.85	16,673.23	8,897.79	266.96	266.91	89.99	99.58	-7,562.83	657.76	123.93	533.83	1.232	Level 2
16,800.00	8,896.11	16,773.23	8,896.05	270.38	270.33	89.99	98.89	-7,662.81	657.77	117.11	540.66	1.217	Level 2
16,900.00	8,894.36	16,873.23	8,894.30	273.79	273.75	89.99	98.20	-7,762.80	657.78	110.28	547.49	1.201	Level 2
17,000.00	8,892.62	16,973.23	8,892.55	277.21	277.16	89.99	97.51	-7,862.78	657.79	103.46	554.32	1.187	Level 2
17,100.00	8,890.87	17,073.23	8,890.81	280.62	280.58	89.99	96.82	-7,962.76	657.79	96.64	561.16	1.172	Level 2
17,200.00	8,889.13	17,173.23	8,889.06	284.04	284.00	89.99	96.12	-8,062.74	657.80	89.81	567.99	1.158	Level 2
17,300.00	8,887.39	17,273.23	8,887.32	287.46	287.41	89.99	95.43	-8,162.72	657.81	82.99	574.83	1.144	Level 2
17,400.00	8,885.64	17,373.23	8,885.57	290.87	290.83	89.99	94.74	-8,262.71	657.82	76.16	581.66	1.131	Level 2
17,500.00	8,883.90	17,473.23	8,883.83	294.29	294.25	89.99	94.05	-8,362.69	657.83	69.33	588.50	1.118	Level 2
17,600.00	8,882.15	17,573.23	8,882.08	297.71	297.67	89.99	93.36	-8,462.67	657.84	62.50	595.34	1.105	Level 2
17,700.00	8,880.41	17,673.23	8,880.34	301.13	301.09	89.99	92.67	-8,562.65	657.85	55.67	602.18	1.092	Level 2
17,800.00	8,878.66	17,773.23	8,878.59	304.55	304.51	89.99	91.98	-8,662.64	657.86	48.84	609.02	1.080	Level 2
17,900.00	8,876.92	17,873.23	8,876.85	307.97	307.93	89.99	91.29	-8,762.62	657.87	42.01	615.86	1.068	Level 2
18,000.00	8,875.17	17,973.23	8,875.10	311.39	311.35	89.99	90.59	-8,862.60	657.88	35.18	622.70	1.056	Level 2
18,100.00	8,873.43	18,073.23	8,873.36	314.81	314.77	89.99	89.90	-8,962.58	657.89	28.34	629.55	1.045	Level 2
18,200.00	8,871.69	18,173.23	8,871.61	318.23	318.20	89.99	89.21	-9,062.57	657.90	21.51	636.39	1.034	Level 2
18,300.00	8,869.94	18,273.23	8,869.87	321.65	321.62	89.99	88.52	-9,162.55	657.91	14.67	643.24	1.023	Level 2
18,400.00	8,868.20	18,373.23	8,868.12	325.08	325.04	89.99	87.83	-9,262.53	657.92	7.84	650.08	1.012	Level 2
18,500.00	8,866.45	18,473.23	8,866.38	328.50	328.46	89.99	87.14	-9,362.51	657.93	1.00	656.93	1.002	Level 2
18,600.00	8,864.71	18,573.23	8,864.63	331.92	331.89	89.99	86.45	-9,462.50	657.94	-5.84	663.77	0.991	Level 1
18,700.00	8,862.96	18,673.23	8,862.89	335.35	335.31	89.99	85.76	-9,562.48	657.95	-12.68	670.62	0.981	Level 1
18,800.00	8,861.22	18,773.23	8,861.14	338.77	338.74	89.99	85.06	-9,662.46	657.96	-19.51	677.47	0.971	Level 1
18,900.00	8,859.47	18,873.23	8,859.40	342.19	342.16	89.99	84.37	-9,762.44	657.97	-26.35	684.32	0.961	Level 1
19,000.00	8,857.73	18,973.23	8,857.65	345.62	345.59	89.99	83.68	-9,862.43	657.97	-33.19	691.17	0.952	Level 1
19,103.14	8,855.93	19,076.37	8,855.85	349.15	349.12	89.99	82.97	-9,965.55	657.98	-40.25	698.23	0.942	Level 1, ES, SF

Company:	Tap Rock Operating, LLC	**Local Co-ordinate Reference:**	Well 207H
Project:	Eddy County, NM (NAD 83)	**TVD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Reference Site:	Old Chub	**MD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	207H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	OH	**Database:**	WellPlanner1
Reference Design:	Plan 1	**Offset TVD Reference:**	Offset Datum

Offset Design Old Chub - 205H - OH - Plan 1 — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD+HDGM, 3800-MWD+HDGM, 8400-MWD+HDGM — **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	3.00	-3.00	0.00	0.01	-2.24	1,049.00	-41.00	1,049.80				
100.00	100.00	103.00	97.00	0.20	0.21	-2.24	1,049.00	-41.00	1,049.80	1,049.39	0.41	2,552.108	
200.00	200.00	203.00	197.00	0.74	0.75	-2.24	1,049.00	-41.00	1,049.80	1,048.31	1.49	706.099	
300.00	300.00	303.00	297.00	1.27	1.29	-2.24	1,049.00	-41.00	1,049.80	1,047.24	2.56	409.730	
400.00	400.00	403.00	397.00	1.81	1.83	-2.24	1,049.00	-41.00	1,049.80	1,046.16	3.64	288.598	
500.00	500.00	503.00	497.00	2.35	2.36	-2.24	1,049.00	-41.00	1,049.80	1,045.09	4.71	222.746	
600.00	600.00	603.00	597.00	2.89	2.90	-2.24	1,049.00	-41.00	1,049.80	1,044.01	5.79	181.362	
700.00	700.00	703.00	697.00	3.42	3.44	-2.24	1,049.00	-41.00	1,049.80	1,042.94	6.86	152.947	
800.00	800.00	803.00	797.00	3.96	3.98	-2.24	1,049.00	-41.00	1,049.80	1,041.86	7.94	132.229	
900.00	900.00	903.00	897.00	4.50	4.52	-2.24	1,049.00	-41.00	1,049.80	1,040.79	9.01	116.455	
1,000.00	1,000.00	997.00	997.00	5.04	5.02	-2.24	1,049.00	-41.00	1,049.80	1,039.74	10.06	104.377	CC
1,100.00	1,099.98	1,123.12	1,123.09	5.55	5.67	-150.37	1,047.55	-38.79	1,050.11	1,038.89	11.22	93.598	
1,200.00	1,199.84	1,249.95	1,249.63	6.05	6.32	-150.17	1,043.04	-31.88	1,050.90	1,038.55	12.35	85.089	
1,300.00	1,299.45	1,376.54	1,375.46	6.55	6.98	-149.84	1,035.48	-20.31	1,052.18	1,038.68	13.50	77.956	
1,400.00	1,398.70	1,502.79	1,500.21	7.07	7.66	-149.38	1,024.93	-4.16	1,053.98	1,039.32	14.66	71.880	
1,500.02	1,497.49	1,601.93	1,597.85	7.61	8.22	-149.00	1,015.51	10.25	1,057.64	1,041.91	15.73	67.218	
1,600.00	1,595.95	1,701.62	1,696.03	8.17	8.79	-148.71	1,006.05	24.74	1,062.83	1,046.00	16.83	63.163	
1,700.00	1,694.43	1,801.34	1,794.23	8.74	9.38	-148.41	996.58	39.23	1,068.04	1,050.11	17.93	59.553	
1,800.00	1,792.91	1,901.06	1,892.43	9.32	9.97	-148.13	987.11	53.72	1,073.28	1,054.23	19.06	56.324	
1,900.00	1,891.39	2,000.77	1,990.63	9.91	10.57	-147.84	977.64	68.21	1,078.55	1,058.36	20.19	53.423	
2,000.00	1,989.87	2,100.49	2,088.84	10.50	11.17	-147.56	968.17	82.71	1,083.84	1,062.51	21.33	50.808	
2,100.00	2,088.35	2,200.21	2,187.04	11.11	11.78	-147.28	958.70	97.20	1,089.16	1,066.68	22.48	48.442	
2,200.00	2,186.83	2,300.08	2,285.24	11.71	12.40	-147.00	949.23	111.69	1,094.51	1,070.86	23.64	46.290	
2,300.00	2,285.31	2,400.36	2,383.45	12.33	13.02	-146.72	939.77	126.18	1,099.88	1,075.07	24.81	44.324	
2,400.00	2,383.79	2,500.64	2,481.65	12.94	13.64	-146.45	930.30	140.67	1,105.28	1,079.29	25.99	42.526	
2,500.00	2,482.27	2,600.93	2,579.85	13.56	14.27	-146.18	920.83	155.17	1,110.70	1,083.53	27.17	40.877	
2,600.00	2,580.75	2,701.21	2,678.05	14.19	14.90	-145.92	911.36	169.66	1,116.14	1,087.78	28.36	39.358	
2,700.00	2,679.23	2,801.49	2,776.26	14.81	15.53	-145.65	901.89	184.15	1,121.61	1,092.06	29.55	37.957	
2,800.00	2,777.71	2,901.77	2,874.46	15.44	16.16	-145.39	892.42	198.64	1,127.11	1,096.36	30.74	36.660	
2,900.00	2,876.19	3,002.06	2,972.66	16.07	16.79	-145.13	882.95	213.13	1,132.62	1,100.68	31.94	35.457	
3,000.00	2,974.67	3,102.34	3,070.86	16.70	17.43	-144.87	873.48	227.63	1,138.16	1,105.02	33.15	34.338	
3,100.00	3,073.16	3,202.62	3,169.07	17.33	18.07	-144.62	864.01	242.12	1,143.72	1,109.37	34.35	33.294	
3,200.00	3,171.64	3,302.91	3,267.27	17.96	18.71	-144.37	854.55	256.61	1,149.31	1,113.75	35.56	32.320	
3,300.00	3,270.12	3,393.82	3,362.54	18.60	19.28	-144.13	845.38	270.64	1,154.94	1,118.22	36.71	31.457	
3,400.00	3,368.60	3,477.08	3,444.80	19.24	19.80	-143.99	838.37	281.37	1,161.53	1,123.72	37.81	30.724	
3,500.00	3,467.08	3,560.25	3,527.31	19.87	20.29	-143.96	832.66	290.10	1,169.54	1,130.67	38.87	30.090	
3,600.00	3,565.56	3,643.20	3,609.87	20.51	20.77	-144.04	828.29	296.80	1,178.96	1,139.05	39.90	29.547	
3,700.00	3,664.04	3,725.78	3,692.25	21.15	21.22	-144.21	825.23	301.48	1,189.79	1,148.89	40.90	29.088	
3,800.00	3,762.52	3,807.86	3,774.27	21.79	21.63	-144.48	823.48	304.16	1,202.05	1,160.20	41.85	28.720	
3,900.00	3,861.00	3,908.40	3,858.00	22.43	21.81	-144.84	823.00	304.89	1,215.76	1,173.19	42.57	28.560	
4,000.00	3,959.48	4,009.92	3,956.48	23.07	21.83	-145.31	823.00	304.89	1,230.06	1,186.92	43.14	28.513	
4,100.00	4,057.96	4,088.56	4,054.96	23.71	21.85	-145.76	823.00	304.89	1,244.45	1,200.73	43.72	28.464	
4,200.00	4,156.44	4,187.04	4,153.44	24.36	21.89	-146.20	823.00	304.89	1,258.91	1,214.60	44.31	28.408	
4,300.00	4,254.92	4,285.52	4,251.92	25.00	21.94	-146.63	823.00	304.89	1,273.45	1,228.52	44.92	28.347	
4,407.22	4,360.51	4,408.89	4,357.51	25.69	22.02	-147.09	823.00	304.89	1,289.11	1,243.51	45.60	28.268	
4,500.00	4,452.13	4,482.72	4,449.13	26.27	22.08	-147.57	823.00	304.89	1,301.47	1,255.30	46.17	28.186	
4,600.00	4,551.35	4,581.94	4,548.35	26.87	22.17	-147.97	823.00	304.89	1,312.01	1,265.21	46.81	28.031	
4,700.00	4,650.94	4,681.53	4,647.94	27.43	22.27	-148.26	823.00	304.89	1,319.64	1,272.19	47.44	27.815	
4,800.00	4,750.78	4,781.38	4,747.78	27.96	22.39	-148.43	823.00	304.89	1,324.31	1,276.23	48.08	27.543	
4,907.24	4,858.00	4,888.60	4,855.00	28.24	22.53	-0.31	823.00	304.89	1,326.02	1,277.52	48.50	27.343	
5,000.00	4,950.76	4,981.35	4,947.76	28.25	22.66	-0.31	823.00	304.89	1,326.02	1,277.38	48.64	27.262	

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

Company:	Tap Rock Operating, LLC	**Local Co-ordinate Reference:**	Well 207H
Project:	Eddy County, NM (NAD 83)	**TVD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Reference Site:	Old Chub	**MD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	207H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	OH	**Database:**	WellPlanner1
Reference Design:	Plan 1	**Offset TVD Reference:**	Offset Datum

Offset Design Old Chub - 205H - OH - Plan 1 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD+HDGM, 3800-MWD+HDGM, 8400-MWD+HDGM — 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	5,050.76	5,081.35	5,047.76	28.27	22.81	-0.31	823.00	304.89	1,326.02	1,277.20	48.82	27.164	
5,200.00	5,150.76	5,181.35	5,147.76	28.30	22.97	-0.31	823.00	304.89	1,326.02	1,277.00	49.02	27.053	
5,300.00	5,250.76	5,281.35	5,247.76	28.34	23.15	-0.31	823.00	304.89	1,326.02	1,276.78	49.24	26.932	
5,400.00	5,350.76	5,381.35	5,347.76	28.39	23.33	-0.31	823.00	304.89	1,326.02	1,276.54	49.48	26.799	
5,500.00	5,450.76	5,481.35	5,447.76	28.45	23.53	-0.31	823.00	304.89	1,326.02	1,276.27	49.75	26.656	
5,600.00	5,550.76	5,581.35	5,547.76	28.52	23.73	-0.31	823.00	304.89	1,326.02	1,275.99	50.03	26.504	
5,700.00	5,650.76	5,681.35	5,647.76	28.61	23.95	-0.31	823.00	304.89	1,326.02	1,275.68	50.34	26.342	
5,800.00	5,750.76	5,781.35	5,747.76	28.70	24.18	-0.31	823.00	304.89	1,326.02	1,275.35	50.67	26.171	
5,900.00	5,850.76	5,881.35	5,847.76	28.80	24.42	-0.31	823.00	304.89	1,326.02	1,275.00	51.02	25.993	
6,000.00	5,950.76	5,981.35	5,947.76	28.91	24.66	-0.31	823.00	304.89	1,326.02	1,274.64	51.38	25.806	
6,100.00	6,050.76	6,081.35	6,047.76	29.03	24.92	-0.31	823.00	304.89	1,326.02	1,274.25	51.77	25.613	
6,200.00	6,150.76	6,181.35	6,147.76	29.15	25.18	-0.31	823.00	304.89	1,326.02	1,273.84	52.18	25.414	
6,300.00	6,250.76	6,281.35	6,247.76	29.29	25.46	-0.31	823.00	304.89	1,326.02	1,273.42	52.60	25.209	
6,400.00	6,350.76	6,381.35	6,347.76	29.44	25.74	-0.31	823.00	304.89	1,326.02	1,272.97	53.04	24.998	
6,500.00	6,450.76	6,481.35	6,447.76	29.60	26.03	-0.31	823.00	304.89	1,326.02	1,272.51	53.50	24.783	
6,600.00	6,550.76	6,581.35	6,547.76	29.76	26.32	-0.31	823.00	304.89	1,326.02	1,272.04	53.98	24.564	
6,700.00	6,650.76	6,681.35	6,647.76	29.94	26.63	-0.31	823.00	304.89	1,326.02	1,271.54	54.48	24.341	
6,800.00	6,750.76	6,781.35	6,747.76	30.12	26.94	-0.31	823.00	304.89	1,326.02	1,271.03	54.99	24.115	
6,900.00	6,850.76	6,881.35	6,847.76	30.31	27.26	-0.31	823.00	304.89	1,326.02	1,270.51	55.51	23.887	
7,000.00	6,950.76	6,981.35	6,947.76	30.51	27.59	-0.31	823.00	304.89	1,326.02	1,269.96	56.05	23.656	
7,100.00	7,050.76	7,081.35	7,047.76	30.72	27.92	-0.31	823.00	304.89	1,326.02	1,269.41	56.61	23.423	
7,200.00	7,150.76	7,181.35	7,147.76	30.93	28.26	-0.31	823.00	304.89	1,326.02	1,268.84	57.18	23.189	
7,300.00	7,250.76	7,281.35	7,247.76	31.15	28.60	-0.31	823.00	304.89	1,326.02	1,268.25	57.77	22.955	
7,400.00	7,350.76	7,381.35	7,347.76	31.39	28.95	-0.31	823.00	304.89	1,326.02	1,267.65	58.37	22.719	
7,500.00	7,450.76	7,481.35	7,447.76	31.62	29.31	-0.31	823.00	304.89	1,326.02	1,267.04	58.98	22.483	
7,600.00	7,550.76	7,581.35	7,547.76	31.87	29.67	-0.31	823.00	304.89	1,326.02	1,266.42	59.60	22.248	
7,700.00	7,650.76	7,681.35	7,647.76	32.12	30.04	-0.31	823.00	304.89	1,326.02	1,265.78	60.24	22.012	
7,800.00	7,750.76	7,781.35	7,747.76	32.38	30.41	-0.31	823.00	304.89	1,326.02	1,265.13	60.89	21.777	
7,900.00	7,850.76	7,881.35	7,847.76	32.65	30.79	-0.31	823.00	304.89	1,326.02	1,264.47	61.55	21.543	
8,000.00	7,950.76	7,981.35	7,947.76	32.92	31.17	-0.31	823.00	304.89	1,326.02	1,263.80	62.22	21.310	
8,100.00	8,050.76	8,081.35	8,047.76	33.20	31.56	-0.31	823.00	304.89	1,326.02	1,263.11	62.91	21.079	
8,200.00	8,150.76	8,181.35	8,147.76	33.49	31.95	-0.31	823.00	304.89	1,326.02	1,262.42	63.60	20.849	
8,300.00	8,250.76	8,281.35	8,247.76	33.78	32.34	-0.31	823.00	304.89	1,326.02	1,261.71	64.31	20.620	
8,400.00	8,350.76	8,381.35	8,347.76	33.93	32.58	-0.31	823.00	304.89	1,326.02	1,261.32	64.70	20.494	
8,501.37	8,452.13	8,482.73	8,449.14	33.94	32.62	-0.31	823.00	304.89	1,326.02	1,261.26	64.76	20.477	
8,550.00	8,500.70	8,531.54	8,497.88	33.94	32.62	90.09	822.98	302.64	1,326.02	1,261.26	64.75	20.478	
8,600.00	8,550.27	8,581.71	8,547.59	33.93	32.61	90.08	822.94	296.01	1,326.02	1,261.29	64.73	20.485	
8,650.00	8,599.10	8,631.86	8,596.51	33.92	32.59	90.07	822.86	285.07	1,326.02	1,261.33	64.69	20.499	
8,700.00	8,646.80	8,681.99	8,644.28	33.90	32.56	90.06	822.75	269.90	1,326.02	1,261.39	64.63	20.518	
8,750.00	8,693.03	8,732.10	8,690.51	33.88	32.53	90.05	822.62	250.63	1,326.02	1,261.46	64.56	20.540	
8,800.00	8,737.42	8,782.18	8,734.87	33.86	32.49	90.04	822.46	227.40	1,326.02	1,261.53	64.49	20.561	
8,850.00	8,779.64	8,832.25	8,777.01	33.84	32.46	90.03	822.27	200.40	1,326.02	1,261.58	64.44	20.578	
8,900.00	8,819.37	8,882.30	8,816.62	33.82	32.44	90.02	822.05	169.84	1,326.02	1,261.59	64.42	20.583	
8,950.00	8,856.30	8,932.32	8,853.40	33.81	32.43	90.01	821.82	135.95	1,326.02	1,261.56	64.46	20.572	
9,000.00	8,890.16	8,982.32	8,887.06	33.81	32.44	89.99	821.56	99.01	1,326.02	1,261.45	64.57	20.537	
9,050.00	8,920.68	9,032.29	8,917.37	33.81	32.46	89.98	821.28	59.29	1,326.02	1,261.24	64.78	20.471	
9,100.00	8,947.64	9,082.25	8,944.09	33.83	32.52	89.97	820.98	17.10	1,326.02	1,260.91	65.11	20.367	
9,150.00	8,970.83	9,132.18	8,967.02	33.85	32.68	89.96	820.67	-27.24	1,326.02	1,260.44	65.58	20.221	
9,200.00	8,990.06	9,182.09	8,986.00	33.89	32.96	89.95	820.35	-73.38	1,326.02	1,259.81	66.20	20.030	
9,250.00	9,005.21	9,231.98	9,000.89	34.01	33.35	89.94	820.01	-120.98	1,326.02	1,259.02	66.99	19.794	

Company:	Tap Rock Operating, LLC	**Local Co-ordinate Reference:**	Well 207H
Project:	Eddy County, NM (NAD 83)	**TVD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Reference Site:	Old Chub	**MD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	207H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	OH	**Database:**	WellPlanner1
Reference Design:	Plan 1	**Offset TVD Reference:**	Offset Datum

Offset Design Old Chub - 205H - OH - Plan 1 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD+HDGM, 3800-MWD+HDGM, 8400-MWD+HDGM — 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
9,300.00	9,016.14	9,281.86	9,011.58	34.35	33.83	89.93	819.67	-169.68	1,326.02	1,258.07	67.95	19.515	
9,336.64	9,021.44	9,318.39	9,016.70	34.73	34.23	89.92	819.42	-205.84	1,326.02	1,257.25	68.76	19.284	
9,350.00	9,022.79	9,331.71	9,017.99	34.88	34.39	89.92	819.32	-219.10	1,326.02	1,256.95	69.07	19.199	
9,400.00	9,025.09	9,381.54	9,020.09	35.51	35.01	89.91	818.98	-268.87	1,326.02	1,255.69	70.33	18.855	
9,411.37	9,025.00	9,392.88	9,019.96	35.66	35.16	89.91	818.90	-280.20	1,326.02	1,255.39	70.63	18.774	
9,500.00	9,023.45	9,481.51	9,018.42	36.99	36.51	89.91	818.27	-368.82	1,326.02	1,252.72	73.29	18.092	
9,600.00	9,021.71	9,581.51	9,016.67	38.73	38.23	89.91	817.57	-468.80	1,326.01	1,249.27	76.75	17.278	
9,700.00	9,019.97	9,681.51	9,014.93	40.68	40.18	89.91	816.87	-568.79	1,326.01	1,245.37	80.64	16.443	
9,800.00	9,018.22	9,781.51	9,013.18	42.82	42.32	89.91	816.17	-668.77	1,326.01	1,241.10	84.92	15.615	
9,900.00	9,016.48	9,881.51	9,011.44	45.11	44.62	89.91	815.47	-768.75	1,326.01	1,236.49	89.52	14.813	
10,000.00	9,014.73	9,981.51	9,009.69	47.55	47.06	89.91	814.77	-868.73	1,326.01	1,231.62	94.40	14.047	
10,100.00	9,012.99	10,081.51	9,007.95	50.10	49.61	89.91	814.07	-968.72	1,326.01	1,226.50	99.51	13.325	
10,200.00	9,011.24	10,181.51	9,006.20	52.76	52.27	89.91	813.37	-1,068.70	1,326.01	1,221.18	104.83	12.649	
10,300.00	9,009.50	10,281.51	9,004.45	55.50	55.02	89.91	812.66	-1,168.68	1,326.01	1,215.69	110.32	12.020	
10,400.00	9,007.75	10,381.51	9,002.71	58.31	57.84	89.91	811.96	-1,268.66	1,326.01	1,210.05	115.96	11.435	
10,500.00	9,006.01	10,481.51	9,000.96	61.19	60.72	89.91	811.26	-1,368.64	1,326.01	1,204.28	121.73	10.893	
10,600.00	9,004.27	10,581.51	8,999.22	64.12	63.66	89.91	810.56	-1,468.63	1,326.01	1,198.40	127.61	10.391	
10,700.00	9,002.52	10,681.51	8,997.47	67.10	66.65	89.91	809.86	-1,568.61	1,326.01	1,192.43	133.58	9.927	
10,800.00	9,000.78	10,781.51	8,995.73	70.12	69.68	89.91	809.16	-1,668.59	1,326.01	1,186.37	139.64	9.496	
10,900.00	8,999.03	10,881.51	8,993.98	73.18	72.75	89.91	808.46	-1,768.57	1,326.01	1,180.24	145.77	9.097	
11,000.00	8,997.29	10,981.51	8,992.24	76.27	75.85	89.91	807.76	-1,868.56	1,326.01	1,174.04	151.96	8.726	
11,100.00	8,995.54	11,081.51	8,990.49	79.39	78.97	89.91	807.05	-1,968.54	1,326.01	1,167.79	158.21	8.381	
11,200.00	8,993.80	11,181.51	8,988.75	82.54	82.12	89.91	806.35	-2,068.52	1,326.01	1,161.49	164.52	8.060	
11,300.00	8,992.05	11,281.51	8,987.00	85.71	85.30	89.91	805.65	-2,168.50	1,326.01	1,155.14	170.86	7.761	
11,400.00	8,990.31	11,381.51	8,985.26	88.89	88.49	89.91	804.95	-2,268.49	1,326.00	1,148.75	177.25	7.481	
11,500.00	8,988.57	11,481.51	8,983.51	92.10	91.70	89.91	804.25	-2,368.47	1,326.00	1,142.33	183.67	7.219	
11,600.00	8,986.82	11,581.51	8,981.77	95.32	94.93	89.91	803.55	-2,468.45	1,326.00	1,135.88	190.13	6.974	
11,700.00	8,985.08	11,681.51	8,980.02	98.56	98.18	89.91	802.85	-2,568.43	1,326.00	1,129.39	196.61	6.744	
11,800.00	8,983.33	11,781.51	8,978.28	101.81	101.43	89.91	802.14	-2,668.41	1,326.00	1,122.88	203.12	6.528	
11,900.00	8,981.59	11,881.51	8,976.53	105.07	104.70	89.91	801.44	-2,768.40	1,326.00	1,116.35	209.65	6.325	
12,000.00	8,979.84	11,981.51	8,974.79	108.35	107.98	89.91	800.74	-2,868.38	1,326.00	1,109.79	216.21	6.133	
12,100.00	8,978.10	12,081.51	8,973.04	111.63	111.27	89.91	800.04	-2,968.36	1,326.00	1,103.22	222.78	5.952	
12,200.00	8,976.35	12,181.51	8,971.30	114.92	114.56	89.91	799.34	-3,068.34	1,326.00	1,096.62	229.38	5.781	
12,300.00	8,974.61	12,281.51	8,969.55	118.22	117.87	89.91	798.64	-3,168.33	1,326.00	1,090.02	235.98	5.619	
12,400.00	8,972.86	12,381.51	8,967.81	121.53	121.18	89.91	797.94	-3,268.31	1,326.00	1,083.39	242.61	5.466	
12,500.00	8,971.12	12,481.51	8,966.06	124.85	124.50	89.91	797.24	-3,368.29	1,326.00	1,076.75	249.25	5.320	
12,600.00	8,969.38	12,581.51	8,964.31	128.17	127.83	89.91	796.53	-3,468.27	1,326.00	1,070.10	255.90	5.182	
12,700.00	8,967.63	12,681.51	8,962.57	131.50	131.16	89.91	795.83	-3,568.26	1,326.00	1,063.44	262.56	5.050	
12,800.00	8,965.89	12,781.51	8,960.82	134.83	134.50	89.91	795.13	-3,668.24	1,326.00	1,056.76	269.23	4.925	
12,900.00	8,964.14	12,881.51	8,959.08	138.17	137.84	89.91	794.43	-3,768.22	1,326.00	1,050.08	275.92	4.806	
13,000.00	8,962.40	12,981.51	8,957.33	141.51	141.19	89.91	793.73	-3,868.20	1,326.00	1,043.38	282.61	4.692	
13,100.00	8,960.65	13,081.51	8,955.59	144.86	144.54	89.91	793.03	-3,968.18	1,326.00	1,036.68	289.31	4.583	
13,200.00	8,958.91	13,181.51	8,953.84	148.22	147.90	89.91	792.33	-4,068.17	1,325.99	1,029.97	296.03	4.479	
13,300.00	8,957.16	13,281.51	8,952.10	151.57	151.26	89.91	791.63	-4,168.15	1,325.99	1,023.25	302.74	4.380	
13,400.00	8,955.42	13,381.51	8,950.35	154.93	154.62	89.91	790.92	-4,268.13	1,325.99	1,016.52	309.47	4.285	
13,500.00	8,953.68	13,481.51	8,948.61	158.30	157.99	89.91	790.22	-4,368.11	1,325.99	1,009.79	316.20	4.194	
13,600.00	8,951.93	13,581.51	8,946.86	161.66	161.36	89.91	789.52	-4,468.10	1,325.99	1,003.05	322.94	4.106	
13,700.00	8,950.19	13,681.51	8,945.12	165.03	164.73	89.91	788.82	-4,568.08	1,325.99	996.31	329.68	4.022	
13,800.00	8,948.44	13,781.51	8,943.37	168.41	168.10	89.91	788.12	-4,668.06	1,325.99	989.56	336.43	3.941	
13,900.00	8,946.70	13,881.51	8,941.63	171.78	171.48	89.91	787.42	-4,768.04	1,325.99	982.80	343.19	3.864	
14,000.00	8,944.95	13,981.51	8,939.88	175.16	174.86	89.91	786.72	-4,868.03	1,325.99	976.04	349.95	3.789	

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

Company:	Tap Rock Operating, LLC	**Local Co-ordinate Reference:**	Well 207H
Project:	Eddy County, NM (NAD 83)	**TVD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Reference Site:	Old Chub	**MD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	207H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	OH	**Database:**	WellPlanner1
Reference Design:	Plan 1	**Offset TVD Reference:**	Offset Datum

Offset Design Old Chub - 205H - OH - Plan 1 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD+HDGM, 3800-MWD+HDGM, 8400-MWD+HDGM — 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
14,100.00	8,943.21	14,081.51	8,938.14	178.54	178.25	89.91	786.01	-4,968.01	1,325.99	969.28	356.71	3.717	
14,200.00	8,941.46	14,181.51	8,936.39	181.92	181.63	89.91	785.31	-5,067.99	1,325.99	962.51	363.48	3.648	
14,300.00	8,939.72	14,281.51	8,934.65	185.31	185.02	89.91	784.61	-5,167.97	1,325.99	955.73	370.26	3.581	
14,400.00	8,937.98	14,381.51	8,932.90	188.69	188.41	89.91	783.91	-5,267.95	1,325.99	948.96	377.03	3.517	
14,500.00	8,936.23	14,481.51	8,931.16	192.08	191.80	89.91	783.21	-5,367.94	1,325.99	942.17	383.81	3.455	
14,600.00	8,934.49	14,581.51	8,929.41	195.47	195.19	89.91	782.51	-5,467.92	1,325.99	935.39	390.60	3.395	
14,700.00	8,932.74	14,681.51	8,927.67	198.86	198.59	89.91	781.81	-5,567.90	1,325.99	928.60	397.38	3.337	
14,800.00	8,931.00	14,781.51	8,925.92	202.26	201.98	89.91	781.11	-5,667.88	1,325.99	921.81	404.18	3.281	
14,900.00	8,929.25	14,881.51	8,924.17	205.65	205.38	89.91	780.40	-5,767.87	1,325.99	915.02	410.97	3.226	
15,000.00	8,927.51	14,981.51	8,922.43	209.05	208.78	89.91	779.70	-5,867.85	1,325.98	908.22	417.77	3.174	
15,100.00	8,925.76	15,081.51	8,920.68	212.45	212.18	89.91	779.00	-5,967.83	1,325.98	901.42	424.57	3.123	
15,200.00	8,924.02	15,181.51	8,918.94	215.85	215.58	89.91	778.30	-6,067.81	1,325.98	894.62	431.37	3.074	
15,300.00	8,922.28	15,281.51	8,917.19	219.25	218.98	89.91	777.60	-6,167.80	1,325.98	887.81	438.17	3.026	
15,400.00	8,920.53	15,381.51	8,915.45	222.65	222.39	89.91	776.90	-6,267.78	1,325.98	881.00	444.98	2.980	
15,500.00	8,918.79	15,481.51	8,913.70	226.05	225.79	89.91	776.20	-6,367.76	1,325.98	874.19	451.79	2.935	
15,600.00	8,917.04	15,581.51	8,911.96	229.46	229.20	89.91	775.50	-6,467.74	1,325.98	867.38	458.60	2.891	
15,700.00	8,915.30	15,681.51	8,910.21	232.86	232.61	89.91	774.79	-6,567.72	1,325.98	860.57	465.41	2.849	
15,800.00	8,913.55	15,781.51	8,908.47	236.27	236.02	89.91	774.09	-6,667.71	1,325.98	853.75	472.23	2.808	
15,900.00	8,911.81	15,881.51	8,906.72	239.67	239.43	89.91	773.39	-6,767.69	1,325.98	846.93	479.04	2.768	
16,000.00	8,910.06	15,981.51	8,904.98	243.08	242.84	89.91	772.69	-6,867.67	1,325.98	840.12	485.86	2.729	
16,100.00	8,908.32	16,081.51	8,903.23	246.49	246.25	89.91	771.99	-6,967.65	1,325.98	833.29	492.68	2.691	
16,200.00	8,906.57	16,181.51	8,901.49	249.90	249.66	89.91	771.29	-7,067.64	1,325.98	826.47	499.51	2.655	
16,300.00	8,904.83	16,281.51	8,899.74	253.31	253.07	89.91	770.59	-7,167.62	1,325.98	819.65	506.33	2.619	
16,400.00	8,903.09	16,381.51	8,898.00	256.72	256.48	89.91	769.89	-7,267.60	1,325.98	812.82	513.16	2.584	
16,500.00	8,901.34	16,481.51	8,896.25	260.13	259.90	89.91	769.18	-7,367.58	1,325.98	805.99	519.98	2.550	
16,600.00	8,899.60	16,581.51	8,894.51	263.55	263.31	89.91	768.48	-7,467.57	1,325.98	799.16	526.81	2.517	
16,700.00	8,897.85	16,681.51	8,892.76	266.96	266.73	89.91	767.78	-7,567.55	1,325.98	792.33	533.64	2.485	
16,800.00	8,896.11	16,781.51	8,891.02	270.38	270.15	89.91	767.08	-7,667.53	1,325.97	785.50	540.47	2.453	
16,900.00	8,894.36	16,881.51	8,889.27	273.79	273.56	89.91	766.38	-7,767.51	1,325.97	778.67	547.30	2.423	
17,000.00	8,892.62	16,981.51	8,887.53	277.21	276.98	89.91	765.68	-7,867.49	1,325.97	771.84	554.14	2.393	
17,100.00	8,890.87	17,081.51	8,885.78	280.62	280.40	89.91	764.98	-7,967.48	1,325.97	765.00	560.97	2.364	
17,200.00	8,889.13	17,181.51	8,884.03	284.04	283.82	89.91	764.27	-8,067.46	1,325.97	758.16	567.81	2.335	
17,300.00	8,887.39	17,281.51	8,882.29	287.46	287.24	89.91	763.57	-8,167.44	1,325.97	751.33	574.65	2.307	
17,400.00	8,885.64	17,381.51	8,880.54	290.87	290.65	89.91	762.87	-8,267.42	1,325.97	744.49	581.48	2.280	
17,500.00	8,883.90	17,481.51	8,878.80	294.29	294.08	89.91	762.17	-8,367.41	1,325.97	737.65	588.32	2.254	
17,600.00	8,882.15	17,581.51	8,877.05	297.71	297.50	89.91	761.47	-8,467.39	1,325.97	730.81	595.16	2.228	
17,700.00	8,880.41	17,681.51	8,875.31	301.13	300.92	89.91	760.77	-8,567.37	1,325.97	723.97	602.00	2.203	
17,800.00	8,878.66	17,781.51	8,873.56	304.55	304.34	89.91	760.07	-8,667.35	1,325.97	717.12	608.84	2.178	
17,900.00	8,876.92	17,881.51	8,871.82	307.97	307.76	89.91	759.37	-8,767.34	1,325.97	710.28	615.69	2.154	
18,000.00	8,875.17	17,981.51	8,870.07	311.39	311.18	89.91	758.66	-8,867.32	1,325.97	703.44	622.53	2.130	
18,100.00	8,873.43	18,081.51	8,868.33	314.81	314.61	89.91	757.96	-8,967.30	1,325.97	696.59	629.38	2.107	
18,200.00	8,871.69	18,181.51	8,866.58	318.23	318.03	89.91	757.26	-9,067.28	1,325.97	689.75	636.22	2.084	
18,300.00	8,869.94	18,281.51	8,864.84	321.65	321.45	89.91	756.56	-9,167.26	1,325.97	682.90	643.07	2.062	
18,400.00	8,868.20	18,381.51	8,863.09	325.08	324.88	89.91	755.86	-9,267.25	1,325.97	676.05	649.91	2.040	
18,500.00	8,866.45	18,481.51	8,861.35	328.50	328.30	89.91	755.16	-9,367.23	1,325.97	669.21	656.76	2.019	
18,600.00	8,864.71	18,581.51	8,859.60	331.92	331.73	89.91	754.46	-9,467.21	1,325.96	662.36	663.61	1.998	
18,700.00	8,862.96	18,681.51	8,857.86	335.35	335.15	89.91	753.76	-9,567.19	1,325.96	655.51	670.46	1.978	
18,800.00	8,861.22	18,781.51	8,856.11	338.77	338.58	89.91	753.05	-9,667.18	1,325.96	648.66	677.31	1.958	
18,900.00	8,859.47	18,881.51	8,854.37	342.19	342.00	89.91	752.35	-9,767.16	1,325.96	641.81	684.16	1.938	
19,000.00	8,857.73	18,981.51	8,852.62	345.62	345.43	89.91	751.65	-9,867.14	1,325.96	634.96	691.01	1.919	

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

Company:	Tap Rock Operating, LLC	**Local Co-ordinate Reference:**	Well 207H
Project:	Eddy County, NM (NAD 83)	**TVD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Reference Site:	Old Chub	**MD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	207H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	OH	**Database:**	WellPlanner1
Reference Design:	Plan 1	**Offset TVD Reference:**	Offset Datum

Offset Design Old Chub - 205H - OH - Plan 1 — **Offset Site Error:** 0.00 usft

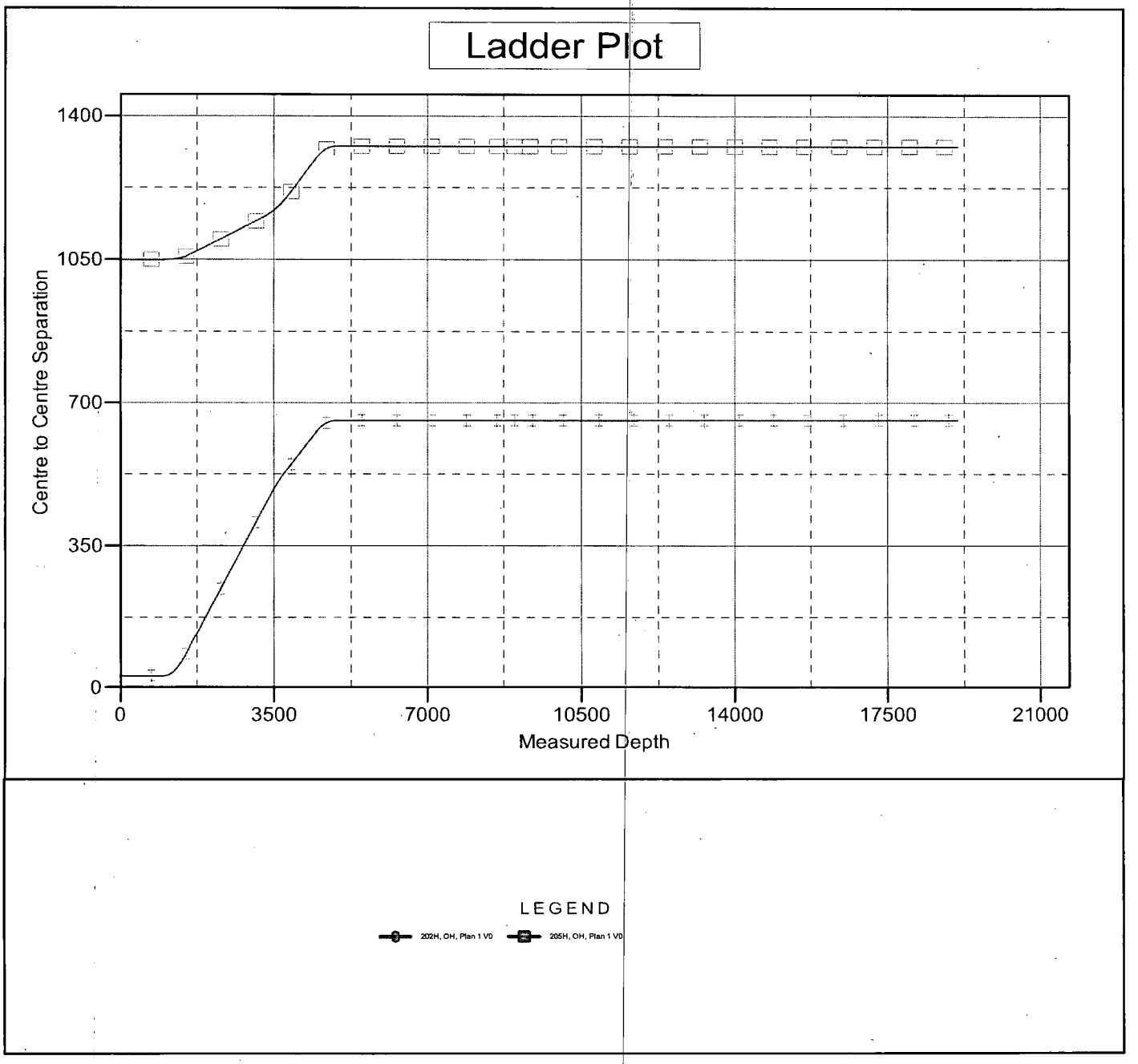
Survey Program: 0-MWD+HDGM, 3800-MWD+HDGM, 8400-MWD+HDGM — **Offset Well Error:** 0.00 usft

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
19,096.47	8,856.05	19,077.98	8,850.94	348.92	348.73	89.91	750.97	-9,963.59	1,325.96	628.35	697.62	1.901 ES	
19,103.14	8,855.93	19,074.39	8,851.00	349.15	348.61	89.91	751.00	-9,960.00	1,326.00	628.35	697.65	1.901 SF	

Company:	Tap Rock Operating, LLC	**Local Co-ordinate Reference:**	Well 207H
Project:	Eddy County, NM (NAD 83)	**TVD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Reference Site:	Old Chub	**MD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	207H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	OH	**Database:**	WellPlanner1
Reference Design:	Plan 1	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to Well @ 3188.50usft (GL: 3162' + Est.
Offset Depths are relative to Offset Datum
Central Meridian is -104.333334

Coordinates are relative to: 207H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.07°



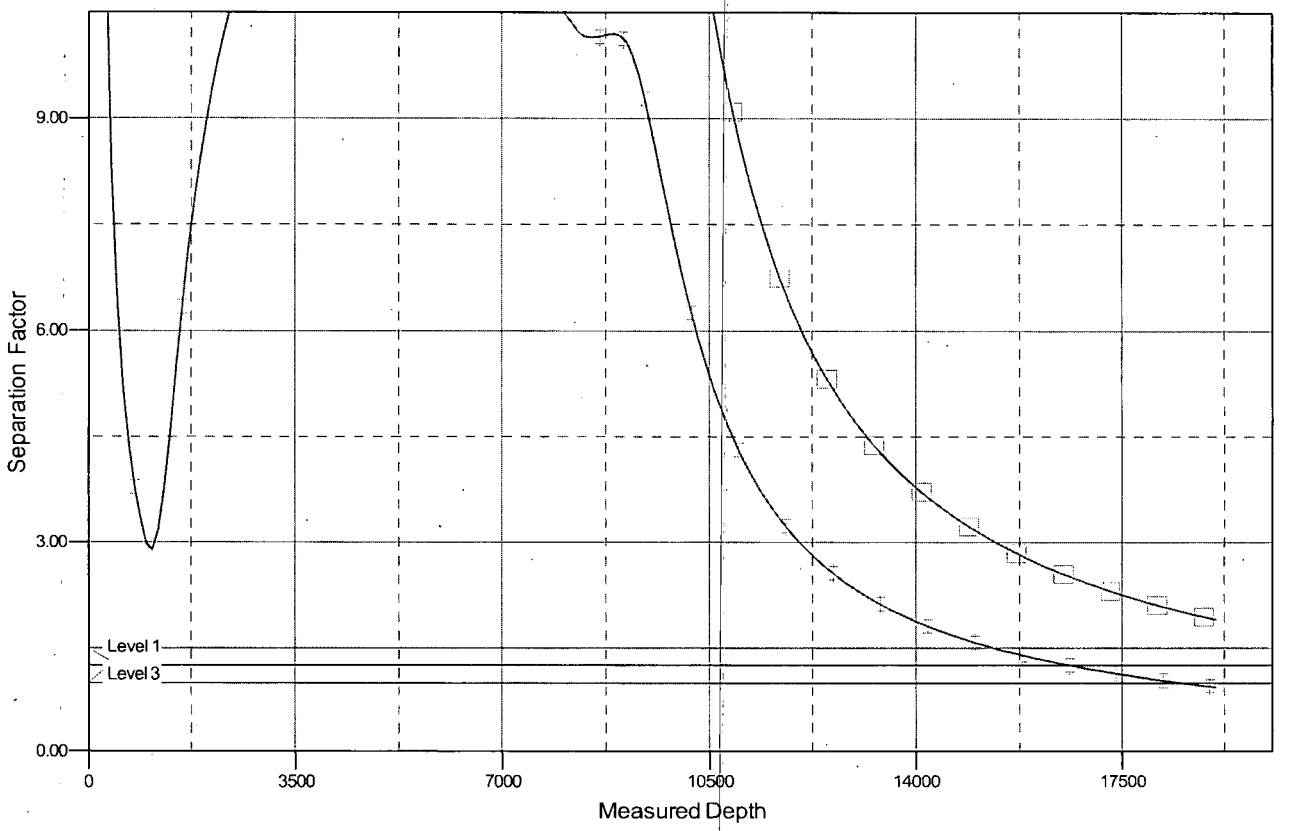
CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Tap Rock Operating, LLC	**Local Co-ordinate Reference:**	Well 207H
Project:	Eddy County, NM (NAD 83)	**TVD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Reference Site:	Old Chub	**MD Reference:**	Well @ 3188.50usft (GL: 3162' + Est. KB:26.5')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	207H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	OH	**Database:**	WellPlanner1
Reference Design:	Plan 1	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to Well @ 3188.50usft (GL: 3162' + Est.
Offset Depths are relative to Offset Datum
Central Meridian is -104.333334

Coordinates are relative to: 207H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.07°

Separation Factor Plot



LEGEND

202H, OH, Plan 1 V0 205H, OH, Plan 1 V0

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