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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

JUN 20 2019

DISTRICT OF ARIZONA

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMNM085891
1b. Type of Well: ☐ Oil Well ☒ Gas Well ☐ Other		6. If Indian, Allottee or Tribe Name
1c. Type of Completion: ☐ Hydraulic Fracturing ☒ Single Zone ☐ Multiple Zone		7. If Unit or CA Agreement, Name and No.
2. Name of Operator TAP ROCK OPERATING LLC		8. Lease Name and Well No. CYPRESS 34 FEDERAL 243H 319943
3a. Address 602 Park Point Drive Suite 200 Golden CO 80401	3b. Phone No. (include area code) (720)460-3316	9. API Well No. 30-015-46120
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface LOT 1 / 241 FNL / 1196 FEL / LAT 32.2533357 / LONG -103.9677571 At proposed prod. zone NWNE / 5 FNL / 2430 FEL / LAT 32.2685782 / LONG -103.9718787		10. Field and Pool, or Exploratory PURPLE SAGE WOLFCAMP
11. Sec., T. R. M. or Blk. and Survey or Area SEC 3 / T24S / R29E / NMP		
14. Distance in miles and direction from nearest town or post office* 6 miles		12. County or Parish EDDY
13. State NM		
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 240 feet	16. No of acres in lease 318.62	17. Spacing Unit dedicated to this well 320
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 25 feet	19. Proposed Depth 11275 feet / 16776 feet	20. BLM/BIA Bond No. in file FED: NMB001443
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3093 feet	22. Approximate date work will start* 01/02/2019	23. Estimated duration 30 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. | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan. | 5. Operator certification. |
| 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). | 6. Such other site specific information and/or plans as may be requested by the BLM. |

25. Signature (Electronic Submission)	Name (Printed/Typed) Brian Wood / Ph: (505)466-8120	Date 10/29/2018
Title President		
Approved by (Signature) (Electronic Submission)	Name (Printed/Typed) Cody Layton / Ph: (575)234-5959	Date 06/11/2019
Title Assistant Field Manager Lands & Minerals		

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

(Continued on page 2)

RWP 6-25-19

Approval Date: 06/11/2019

*(Instructions on page 2)

NSL Required

INSTRUCTIONS

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

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

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

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

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

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

ITEM 24: If the proposal will involve hydraulic fracturing operations, you must comply with 43 CFR 3162.3-3, including providing information about the protection of usable water. Operators should provide the best available information about all formations containing water and their depths. This information could include data and interpretation of resistivity logs run on nearby wells. Information may also be obtained from state or tribal regulatory agencies and from local BLM offices.

NOTICES

The Privacy Act of 1974 and regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.

AUTHORITY: 30 U.S.C. 181 et seq., 25 U.S.C. 396; 43 CFR 3160

PRINCIPAL PURPOSES: The information will be used to: (1) process and evaluate your application for a permit to drill a new oil, gas, or service well or to reenter a plugged and abandoned well; and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered; (b) reviewing procedures and equipment and the projected impact on the land involved; and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impacts.

ROUTINE USE: Information from the record and/or the record will be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities.

EFFECT OF NOT PROVIDING INFORMATION: Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease.

The Paperwork Reduction Act of 1995 requires us to inform you that:

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

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

Additional Operator Remarks

Location of Well

I. SHL: LOT 1 / 241 FNL / 1196 FEL / TWSP: 24S / RANGE: 29E / SECTION: 3 / LAT: 32.2533357 / LONG: -103.9677571 (TVD: 0 feet, MD: 0 feet)
PPP: LOT 1 / 241 FNL / 1196 FEL / TWSP: 24S / RANGE: 29E / SECTION: 3 / LAT: 32.2533357 / LONG: -103.9677571 (TVD: 0 feet, MD: 0 feet)
PPP: SWSE / 0 FSL / 2427 FEL / TWSP: 23S / RANGE: 29E / SECTION: 34 / LAT: 32.254009 / LONG: -103.971743 (TVD: 11217 feet, MD: 11501 feet)
BHL: NWNE / 5 FNL / 2430 FEL / TWSP: 23S / RANGE: 29E / SECTION: 34 / LAT: 32.2685782 / LONG: -103.9718787 (TVD: 11275 feet, MD: 16776 feet)

BLM Point of Contact

Name: Candy Vigil
Title: Admin Support Assistant
Phone: 5752345982
Email: cvigil@blm.gov

Approval Date: 06/11/2019

(Form 3160-3, page 3)

Review and Appeal Rights

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

PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	TAP ROCK OPERATING LLC.
LEASE NO.:	NMNM086024
WELL NAME & NO.:	243H – CYPRESS 34 FEDERAL
SURFACE HOLE FOOTAGE:	241'/N & 1196'/E
BOTTOM HOLE FOOTAGE:	5'/N & 2430'/E
LOCATION:	SECTION 03, T24S, R29E, NMPM
COUNTY:	EDDY

COA

H2S	☐ Yes	☒ No	
Potash	☐ None	☐ Secretary	☒ R-111-P
Cave/Karst Potential	☐ Low	☒ Medium	☐ High
Variance	☐ None	☒ Flex Hose	☐ Other
Wellhead	☐ Conventional	☒ Multibowl	☐ Both
Other	☐ 4 String Area	☐ Capitan Reef	☐ WIPP

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 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 **24 hours in the Potash Area** 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 1st intermediate casing is which setting depth is at **3100ft**:
 - 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 2nd intermediate casing is: Cement to surface. If cement does not circulate, contact the appropriate BLM office.
- Variance for annular spacing between 7 5/8" x 5 1/2" casing is approved.**
4. The minimum required fill of cement behind the **5-1/2 x 5** inch production casing is:
 - Cement should tie-back 200' into the previous casing. Operator shall provide method of verification.

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).
2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M)** psi.

If a Multibowl system is used, Annular preventer will be tested 250 low and 50% of the working pressure for the surface and both intermediate casings. Rams will be tested to per Onshore Order 2.

GENERAL REQUIREMENTS

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

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

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

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

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

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

Waste Minimization Plan (WMP)

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

ZS 051019

**PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL**

OPERATOR'S NAME:	TAP ROCK OPERATING LLC
LEASE NO.:	NMNM
WELL NAME & NO.:	233H – CYPRESS 34 FEDERAL
SURFACE HOLE FOOTAGE:	241'N & 1171'E
BOTTOM HOLE FOOTAGE	5'N & 2010'E
LOCATION:	SECTION 03, T24S, R29E, NMPM
COUNTY:	EDDY
OPERATOR'S NAME:	TAP ROCK OPERATING LLC
LEASE NO.:	NMNM
WELL NAME & NO.:	243H – CYPRESS 34 FEDERAL
SURFACE HOLE FOOTAGE:	241'N & 1196'E
BOTTOM HOLE FOOTAGE	5'N & 2430'E
LOCATION:	SECTION 03, T24S, R29E, NMPM
COUNTY:	EDDY
OPERATOR'S NAME:	TAP ROCK OPERATING LLC
LEASE NO.:	NMNM
WELL NAME & NO.:	246H – CYPRESS 34 FEDERAL
SURFACE HOLE FOOTAGE:	241'N & 1146'E
BOTTOM HOLE FOOTAGE	5'N & 1590'E
LOCATION:	SECTION 03, T24S, R29E, NMPM
COUNTY:	EDDY

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.

- ☐ **General Provisions**
- ☐ **Permit Expiration**
- ☐ **Archaeology, Paleontology, and Historical Sites**
- ☐ **Noxious Weeds**
- ☐ **Special Requirements**
 - SSPS Habitat
 - Hydrology
 - Cave/Karst
 - VRM

- ☐ **Construction**
 - Notification
 - Topsoil
 - Closed Loop System
 - Federal Mineral Material Pits
 - Well Pads
 - Roads
- ☐ **Road Section Diagram**
- ☐ **Production (Post Drilling)**
 - Well Structures & Facilities
 - Pipelines
- ☐ **Interim Reclamation**
- ☐ **Final Abandonment & Reclamation**

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)

Hydrology:

The entire well pad(s) 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 with impermeable mineral material (e.g. caliche). Topsoil shall not be used to construct the berm. No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad. The 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 water erosion that may occur due to the construction of the well pad during the life of the well will be quickly corrected and proper measures will be taken to prevent future erosion. Stockpiling of topsoil is required. The top soil shall be stockpiled in an appropriate location to prevent loss of soil due to water or wind erosion and not used for berming or erosion control. 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.

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

When crossing ephemeral drainages the pipeline(s) will be buried to a minimum depth of 48 inches from the top of pipe to ground level. Erosion control methods such as gabions and/or rock aprons should be placed on both up and downstream sides of the pipeline crossing. In addition, curled (weed free) wood/straw fiber wattles/logs and/or silt fences should be placed on the downstream side for sediment control during construction and maintained until soils and vegetation have stabilized. Water bars should be placed within the ROW to divert and dissipate surface runoff. A pipeline access road is not permitted to cross these ephemeral drainages. Traffic should be diverted to a preexisting route. Additional seeding may be required in floodplains and drainages to restore energy dissipating vegetation.

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

Any water erosion that may occur due to the construction of overhead electric line and during the life of the power line will be quickly corrected and proper measures will be taken to prevent future erosion. A power pole should not be placed in drainages, playas, wetlands, riparian areas, or floodplains and must span across the features at a distance away that would not promote further erosion.

Special Status Plant Species (SSPS) Habitat

Vehicles and equipment will be kept on existing roads and approved surfaces only, and will avoid travel across undisturbed surfaces; workers will be instructed not to park off the roads or ROW in undisturbed areas. Alterations to project design and additions of project components will require SSPS surveys and re-analysis of impacts if those project elements intersect SSPS suitable habitat.

VI. CONSTRUCTION

A. NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the 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 .

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.

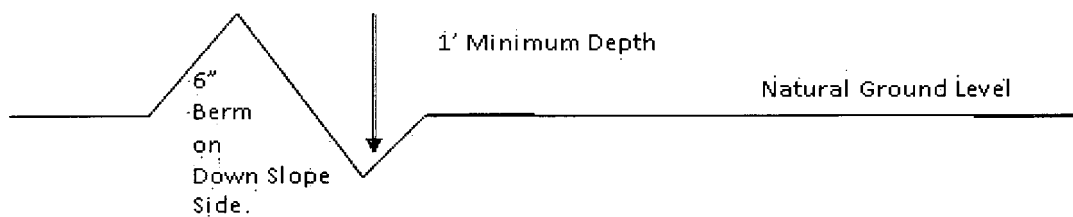
Turnouts

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 out sloping and insloping, leadoff 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.



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 %);

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

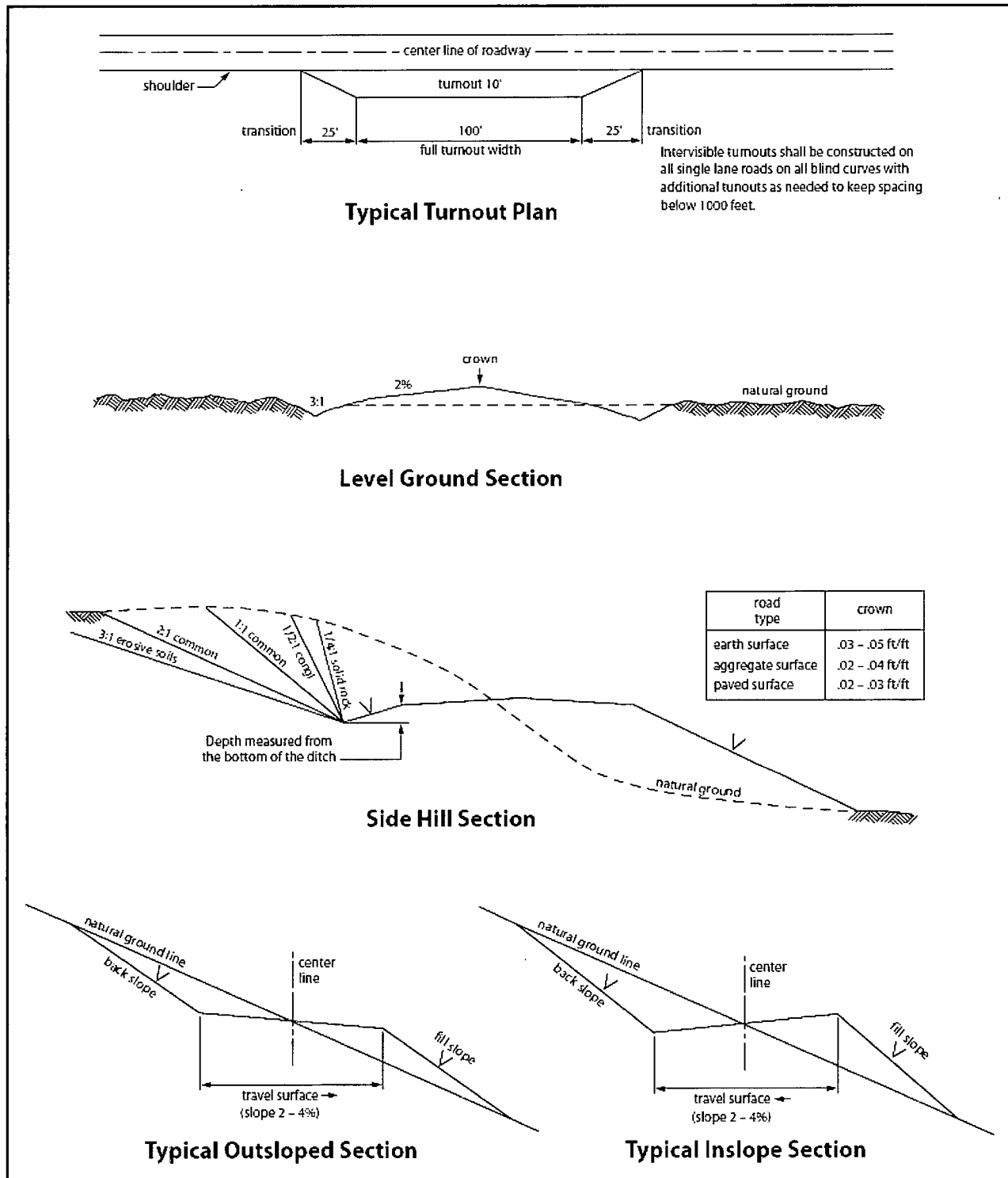


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

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 30 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.

☒ 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.

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:

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

*Pounds of pure live seed:

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



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

Operator Certification Data Report

06/17/2019

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: 10/29/2018

Title: President

Street Address: 37 Verano Loop

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:



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

Application Data Report

06/17/2019

APD ID: 10400035685

Submission Date: 10/29/2018

Highlighted data
reflects the most
recent changes

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 243H

[Show Final Text](#)

Well Type: CONVENTIONAL GAS WELL

Well Work Type: Drill

Section 1 - General

APD ID: 10400035685

Tie to previous NOS?

Submission Date: 10/29/2018

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: NMNM085891

Lease Acres: 318.62

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: CYPRESS 34 FEDERAL

Well Number: 243H

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? POTASH

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 243H

Describe other minerals:

Is the proposed well in a Helium production area? N **Use Existing Well Pad?** YES **New surface disturbance?** Y

Type of Well Pad: MULTIPLE WELL

Multiple Well Pad Name:

Number: 233H

CYPRESS 34 FEDERAL

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: 6 Miles

Distance to nearest well: 25 FT

Distance to lease line: 240 FT

Reservoir well spacing assigned acres Measurement: 320 Acres

Well plat: Cypress_243H_C102_et al_102518_20181029094449.pdf

Well work start Date: 01/02/2019

Duration: 30 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

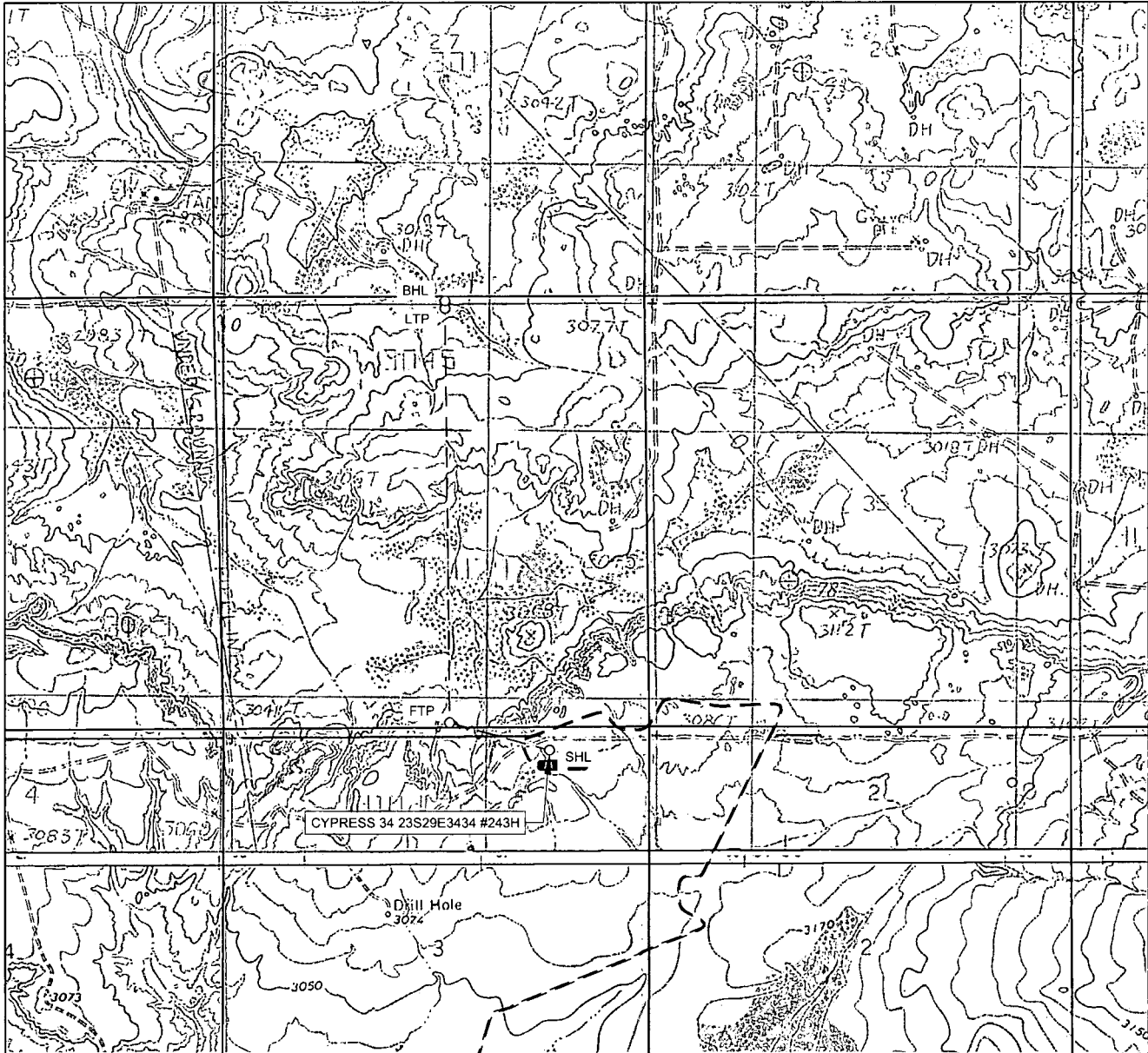
Datum: NAD83

Vertical Datum: NAVD88

Survey number: 19642

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
SHL Leg #1	241	FNL	119 6	FEL	24S	29E	3	Lot 1	32.25333 57	- 103.9677 571	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 085891	309 3	0	0
KOP Leg #1	473	FNL	242 7	FEL	24S	29E	3	Lot 2	32.25270 89	- 103.9717 43	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 085891	- 760 9	108 61	107 02
PPP Leg #1	241	FNL	119 6	FEL	24S	29E	3	Lot 1	32.25333 57	- 103.9677 571	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 085891	309 3	0	0

LOCATION & ELEVATION VERIFICATION MAP



LEASE NAME & WELL NO.: CYPRESS 34 23S29E3434 #243H

SECTION 3 TWP 24-S RGE 29-E SURVEY N.M.P.M.
 COUNTY EDDY STATE NM ELEVATION 3093'
 DESCRIPTION 241' FNL & 1196' FEL

LATITUDE N 32.2533357 LONGITUDE W 103.9677571



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

THIS EASEMENT/SERVITUDE LOCATION SHOWN HEREON HAS BEEN SURVEYED ON THE GROUND UNDER MY SUPERVISION AND PREPARED ACCORDING TO THE EVIDENCE FOUND AT THE TIME OF SURVEY, AND DATA PROVIDED BY TAP ROCK OPERATING, LLC. THIS CERTIFICATION IS MADE AND LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT AND IS NON-TRANSFERABLE. THIS SURVEY IS CERTIFIED FOR THIS TRANSACTION ONLY.

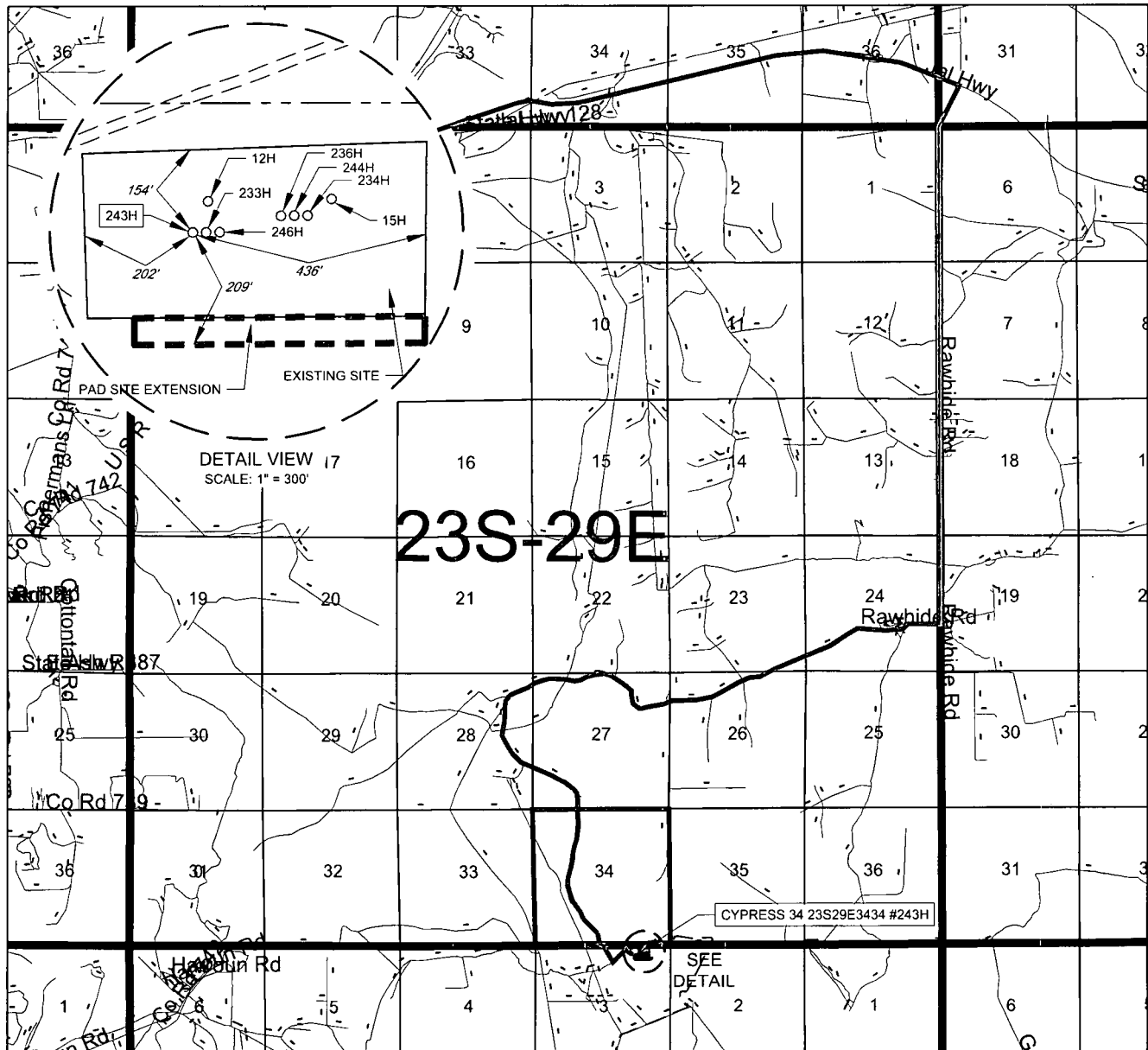
ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREON ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET.



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 TELEPHONE: (432) 682-1653 OR (800) 767-1653 • FAX (432) 682-1743
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EXHIBIT 2
VICINITY MAP



LEASE NAME & WELL NO.: CYPRESS 34 23S29E3434 #243H

SECTION 3 TWP 24-S RGE 29-E SURVEY N.M.P.M.

COUNTY EDDY STATE NM

DESCRIPTION 241' FNL & 1196' FEL

DISTANCE & DIRECTION

FROM INT. OF NM-31, & NM-128-E, HEAD EAST ON NM-128 E ± 4.5
MILES, THENCE SOUTH (RIGHT) ON RAWHIDE ROAD ± 4.1 MILES,
THENCE WEST, (RIGHT) ON MAIN ROAD ± 3.5 MILES, THENCE SOUTH
CONTINUING ON MAIN ROAD ± 2.6 MILES TO A POINT ± 470 FEET
SOUTHWEST OF THE LOCATION.

THIS EASEMENT/SERVITUDE LOCATION SHOWN HEREON HAS BEEN SURVEYED ON THE GROUND UNDER MY SUPERVISION AND PREPARED ACCORDING TO THE EVIDENCE FOUND AT THE TIME OF SURVEY, AND DATA PROVIDED BY TAP ROCK OPERATING, LLC. THIS CERTIFICATION IS MADE AND LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT AND IS NON-TRANSFERABLE. THIS SURVEY IS CERTIFIED FOR THIS TRANSACTION ONLY.

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SCALE: 1" = 10000'
0' 5000' 10000'



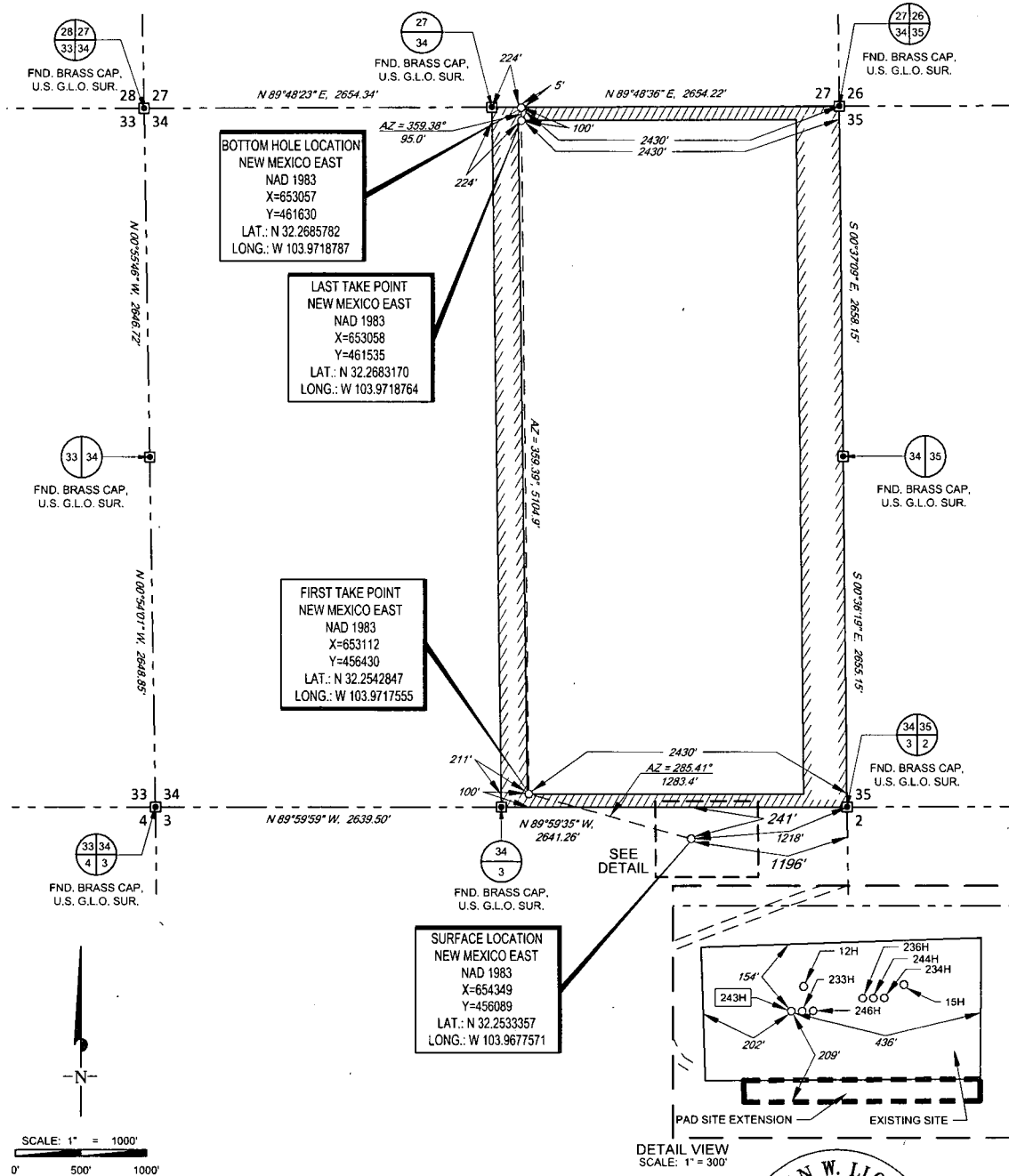
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TAP ROCK EXHIBIT 2A

SECTION 3, TOWNSHIP 24-S, RANGE 29-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO



LEASE NAME & WELL NO.: CYPRESS 34 23S29E3434 #243H

SECTION 3 TWP 24-S RGE 29-E SURVEY N.M.P.M.
COUNTY EDDY STATE NM
DESCRIPTION 241' FNL & 1196' FEL

DISTANCE & DIRECTION
FROM INT. OF NM-31, & NM-128-E, HEAD EAST ON NM-128 E ±4.5
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UNDER MY SUPERVISION AND PREPARED ACCORDING TO THE EVIDENCE FOUND AT THE TIME OF
SURVEY, AND DATA PROVIDED BY TAP ROCK OPERATING, LLC THIS CERTIFICATION IS MADE AND
LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT AND IS
NON-TRANSFERABLE. THIS SURVEY IS CERTIFIED FOR THIS TRANSACTION ONLY.



Stan W. Lloyd, P.S. No. 19642
AUGUST 8, 2018

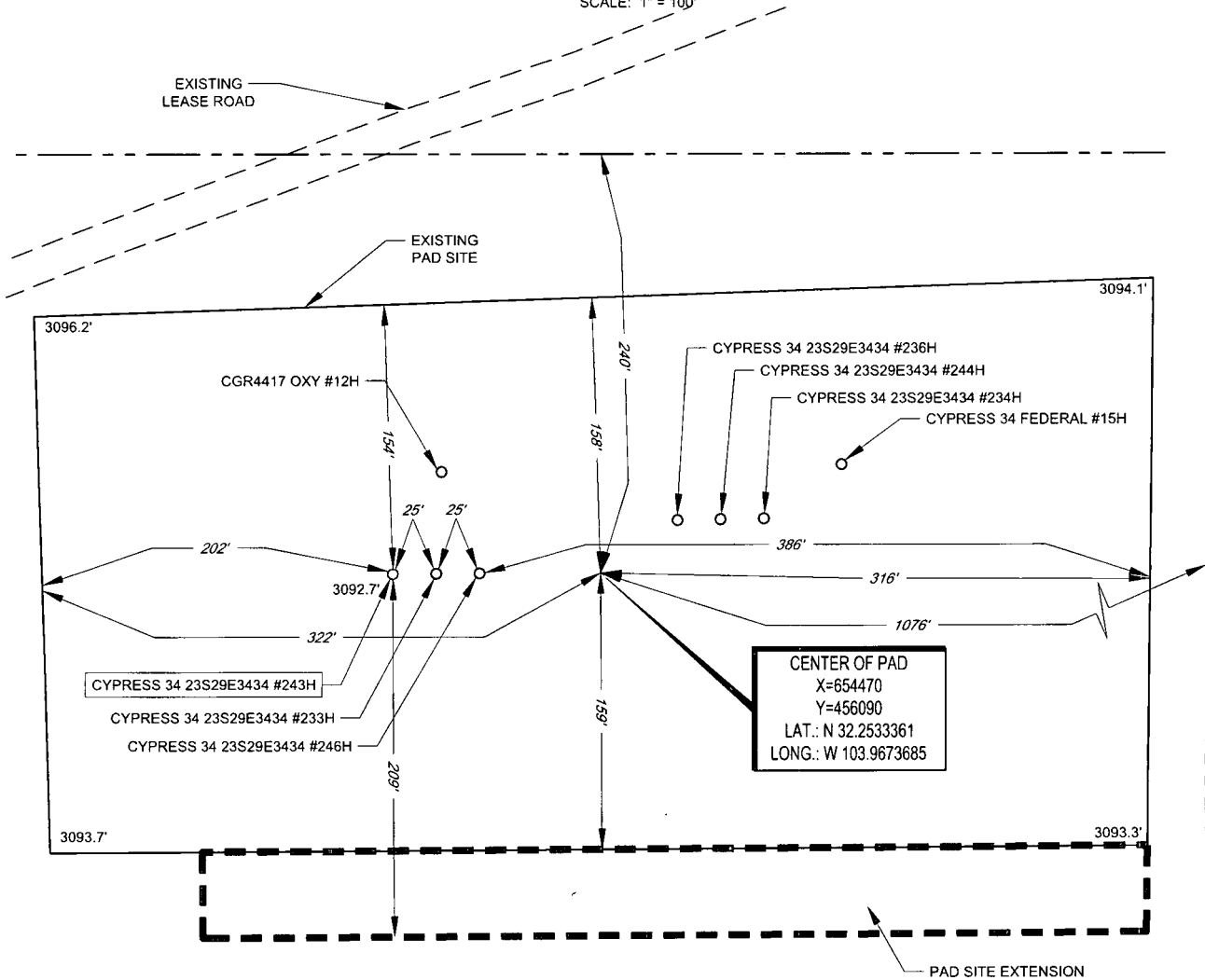
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EXHIBIT 2B



SECTION 3, TOWNSHIP 24-S, RANGE 29-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

DETAIL VIEW
SCALE: 1" = 100'



LEASE NAME & WELL NO.: CYPRESS 34 23S29E3434 #243H
243H LATITUDE N 32.2533357 243H LONGITUDE W 103.9677571
CENTER OF PAD IS 240' FNL & 1076' FEL

SCALE: 1" = 100'
0' 50' 100'

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

THIS PROPOSED PAD SITE LOCATION SHOWN HEREON HAS BEEN SURVEYED ON THE GROUND UNDER MY SUPERVISION AND PREPARED ACCORDING TO THE EVIDENCE FOUND AT THE TIME OF SURVEY, AND DATA PROVIDED BY TAP ROCK OPERATING, LLC. THIS CERTIFICATION IS MADE AND LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT AND IS NON-TRANSFERABLE. THIS SURVEY IS CERTIFIED FOR THIS TRANSACTION ONLY.

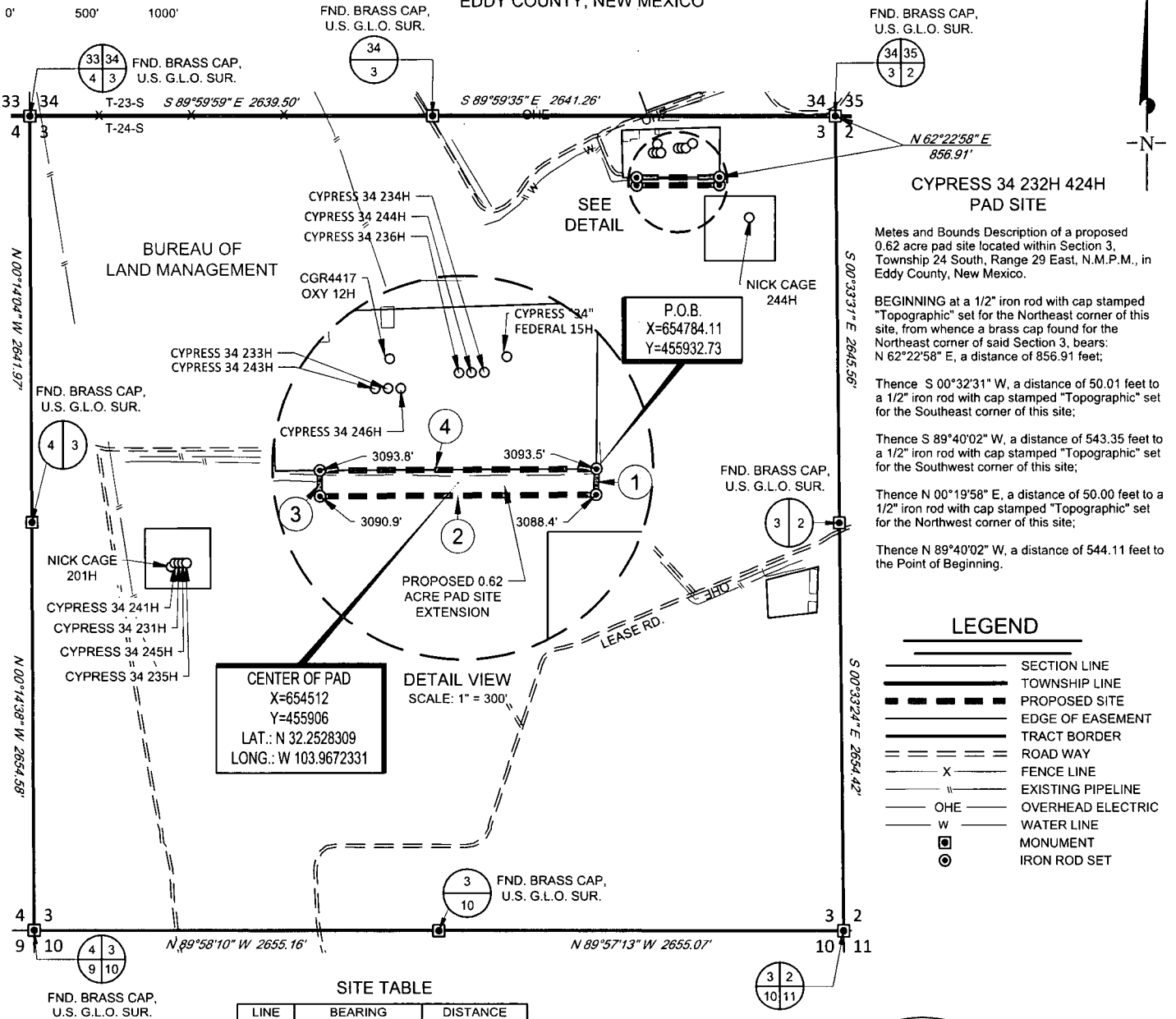


1400 EVERMAN PARKWAY, Ste. 146 • FT. WORTH, TEXAS 76140
TELEPHONE: (817) 744-7512 • FAX (817) 744-7554
2903 NORTH BIG SPRING • MIDLAND, TEXAS 79705
TELEPHONE: (432) 682-1653 OR (800) 767-1653 • FAX (432) 682-1743
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SCALE: 1" = 1000'

0' 500' 1000'

SECTION 3, TOWNSHIP 24-S, RANGE 29-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO



Metes and Bounds Description of a proposed 0.62 acre pad site located within Section 3, Township 24 South, Range 29 East, N.M.P.M., in Eddy County, New Mexico.

BEGINNING at a 1/2" iron rod with cap stamped "Topographic" set for the Northeast corner of this site, from whence a brass cap found for the Northeast corner of said Section 3, bears: N 62°22'58" E, a distance of 856.91 feet;

Thence S 00°32'31" W, a distance of 50.01 feet to a 1/2" iron rod with cap stamped "Topographic" set for the Southeast corner of this site;

Thence S 89°40'02" W, a distance of 543.35 feet to a 1/2" iron rod with cap stamped "Topographic" set for the Southwest corner of this site;

Thence N 00°19'58" E, a distance of 50.00 feet to a 1/2" iron rod with cap stamped "Topographic" set for the Northwest corner of this site;

Thence N 89°40'02" W, a distance of 544.11 feet to the Point of Beginning.

LEGEND

- SECTION LINE
- TOWNSHIP LINE
- PROPOSED SITE
- EDGE OF EASEMENT
- TRACT BORDER
- ROAD WAY
- FENCE LINE
- EXISTING PIPELINE
- OHE OVERHEAD ELECTRIC
- W WATER LINE
- MONUMENT
- IRON ROD SET

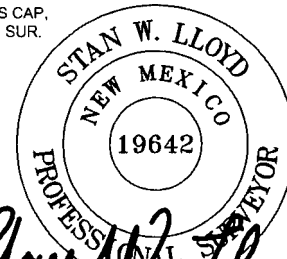
SITE TABLE

LINE	BEARING	DISTANCE
1	S 00°32'31" W	50.01'
2	S 89°40'02" W	543.35'
3	N 00°19'58" W	50.00'
4	N 89°40'02" E	544.11'



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WWW.TOPOGRAPHIC.COM



Stan W. Lloyd, P.S. No. 19642

AUGUST 08, 2018

**TAP
ROCK**

CYPRESS 34 23S29E3434 PAD SITE	REVISION:		NOTES:
	INT	DATE	
DATE: 08/08/18			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. 3. CERTIFICATION IS MADE ONLY TO THE LOCATION OF THIS EASEMENT, IN RELATION TO THE EVIDENCE FOUND DURING A FIELD SURVEY, MADE ON THE GROUND, UNDER MY SUPERVISION, AND USING DOCUMENTATION PROVIDED BY TAP ROCK OPERATING, LLC. ONLY UTILITIES/EASEMENTS THAT WERE VISIBLE ON THE DATE OF THIS SURVEY, WITHIN/ADJOINING THIS EASEMENT, HAVE BEEN LOCATED AS SHOWN HEREON OF WHICH I HAVE KNOWLEDGE. THIS CERTIFICATION IS LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT AND IS NON-TRANSFERABLE, AND MADE FOR THIS TRANSACTION ONLY. 4. P.O.B./B.O.L. = POINT OF BEGINNING/BEGINNING OF LINE 5. P.O.E./E.O.L. = POINT OF EXIT/END OF LINE
FILE: BO_CYPRESS_34_23S29E3434_PAD_SITE			
DRAWN BY: MEH			
SHEET: 1 OF 1			

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources Department
Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Submit Original
to Appropriate
District Office

GAS CAPTURE PLAN

Date: 10/25/2018

☒ Original Operator & OGRID No.: 372043
☐ Amended - Reason for Amendment:

This Gas Capture Plan outlines actions to be taken by the Operator to reduce well/production facility flaring/venting for new completion (new drill, recomplete to new zone, re-frac) activity.

Note: Form C-129 must be submitted and approved prior to exceeding 60 days allowed by Rule (Subsection A of 19.15.18.12 NMAC).

Well(s)/Production Facility – Name of facility

The well(s) that will be located at the production facility are shown in the table below.

Well Name	API	Well Location (ULSTR)	Footages	Expected MCF/D	Flared or Vented	Comments
Cypress 34 Federal #243H		1-3-24S-29E	241' FNL & 1196' FEL	+/- 3,750	21 days	Gas will be flared for ~21 days on flowback before turning into TB. Time est depends on sales connect and well cleanup.

Gathering System and Pipeline Notification

Well(s) will be connected to a production facility after flowback operations are complete, if gas transporter system is in place. The gas produced from production facility is dedicated to Lucid Energy Group, LLC and will be connected to Lucid Energy Group, LLC low/high pressure gathering system located in Eddy County, New Mexico. It will require ~5,000' of pipeline to connect the facility to low/high pressure gathering system. Tap Rock Operating, LLC provides (periodically) to Lucid Energy Group, LLC a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, Tap Rock Operating, LLC and Lucid Energy Group, LLC have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at Lucid Energy Group, LLC's Red Hills Processing Plant located in Lea County, New Mexico. The actual flow of the gas will be based on compression operating parameters and gathering system pressures.

Flowback Strategy

After the fracture treatment/completion operations, well(s) will be produced to temporary production tanks and gas will be flared or vented. During flowback, the fluids and sand content will be monitored. When the produced fluids contain minimal sand, the wells will be turned to production facilities. Gas sales should start as soon as the wells start flowing through the production facilities, unless there are operational issues on the midstream side at that time. Based on current information, it is Tap Rock's belief the system can take this gas upon completion of the well(s).

Safety requirements during cleanout operations from the use of underbalanced air cleanout systems may necessitate that sand and non-pipeline quality gas be vented and/or flared rather than sold on a temporary basis.

Alternatives to Reduce Flaring

Below are alternatives considered from a conceptual standpoint to reduce the amount of gas flared.

- Power Generation – On lease
 - Only a portion of gas is consumed operating the generator, remainder of gas will be flared
- Compressed Natural Gas – On lease
 - Gas flared would be minimal, but might be uneconomical to operate when gas volume declines

- NGL Removal – On lease
 - Plants are expensive, residue gas is still flared, and uneconomical to operate when gas volume declines



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

Drilling Plan Data Report

06/17/2019

APD ID: 10400035685

Submission Date: 10/29/2018

Highlighted data
reflects the most
recent changes

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 243H

[Show Final Text](#)

Well Type: CONVENTIONAL GAS WELL

Well Work Type: Drill

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1	QUATERNARY	3093	0	0	OTHER : Caliche	USEABLE WATER,OTHER : Salt	No
2	RUSTLER ANHYDRITE	2781	312	312		OTHER : Salt	No
3	SALADO	2466	627	627	SALT	OTHER : Salt	No
4	BASE OF SALT	-44	3137	3217		OTHER : Salt	No
5	DELAWARE	-64	3157	3238	OTHER : Mountain Group	NATURAL GAS,OIL	No
6	LAMAR	-74	3167	3248		NATURAL GAS,OIL	No
7	BELL CANYON	-84	3177	3258	SANDSTONE	NATURAL GAS,OIL	No
8	BRUSHY CANYON	-2194	5287	5443	SANDSTONE	NATURAL GAS,OIL	No
9	BONE SPRING	-3789	6882	7041	LIMESTONE	NATURAL GAS,OIL	No
10	BONE SPRING 1ST	-4809	7902	8061	SANDSTONE	NATURAL GAS,OIL	No
11	BONE SPRING 2ND	-5509	8602	8761	SANDSTONE	NATURAL GAS,OIL	No
12	BONE SPRING 3RD	-6734	9827	9986	SANDSTONE	NATURAL GAS,OIL	No
13	WOLFCAMP	-7099	10192	10351	OTHER : A	NATURAL GAS,OIL	No
14	WOLFCAMP	-7279	10372	10531	OTHER : A Fat	NATURAL GAS,OIL	No
15	WOLFCAMP	-7439	10532	10691	OTHER : B	NATURAL GAS,OIL	No
16	WOLFCAMP	-8144	11237	11550	OTHER : B2	NATURAL GAS,OIL	Yes

Section 2 - Blowout Prevention

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 243H

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 nipped 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:

Cypress_243H_Choke_032918_20181029100121.pdf

BOP Diagram Attachment:

Cypress_243H_BOP_20181029100144.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	390	0	390	3093		390	J-55	54.5	BUTT	1.13	1.15	DRY	1.51	DRY	1.51
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	3300	0	3217	3093		3300	J-55	40	BUTT	1.13	1.15	DRY	1.51	DRY	1.51
3	PRODUCTION	6.75	5.5	NEW	API	Y	0	9661	0	9501	3093		9661	P-110	20	BUTT	1.13	1.15	DRY	1.51	DRY	1.51
4	INTERMEDIATE	8.75	7.625	NEW	API	N	0	9861	0	9701	3093		9861	P-110	29.7	OTHER - Wedge 513	1.13	1.15	DRY	1.51	DRY	1.51
5	PRODUCTION	6.75	5.0	NEW	API	Y	9661	16776	9501	11275			7115	P-110	18	OTHER - Wedge 521	1.13	1.15	DRY	1.51	DRY	1.51

Casing Attachments

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 243H

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Cypress_243H_Casing_Design_Assumptions_20181029100243.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Cypress_243H_Casing_Design_Assumptions_20181029100324.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Cypress_243H_5.5in_Casing_Spec_20181029100512.PDF

Casing Design Assumptions and Worksheet(s):

Cypress_243H_Casing_Design_Assumptions_20181029100524.pdf

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 243H

Casing Attachments

Casing ID: 4 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Cypress_243H_Casing_Design_Assumptions_20181029100450.pdf

Cypress_233H_7.625_P110_Casing_Spec_20190508120527.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Cypress_243H_5in_Casing_Spec_20181029100558.pdf

Casing Design Assumptions and Worksheet(s):

Cypress_243H_Casing_Design_Assumptions_20181029100612.pdf

Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
PRODUCTION	Lead		0	0	0	0	0	0	0	None	None
PRODUCTION	Tail		0	0	0	0	0	0	0	None	None
PRODUCTION	Lead		0	0	0	0	0	0	0	None	None
PRODUCTION	Tail		8861	16776	950	1.24	14.2	1178	10	Class H	fluid loss + dispersant + retarder + LCM

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 243H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	390	270	1.8	13.5	486	100	Class C	5% Bentonite + 2% CaCl + LCM

INTERMEDIATE	Lead		0	3300	755	2.19	12.7	1653	100	Class C	bentonite + 1% CaCl2 + 8% NaCl + LCM
INTERMEDIATE	Tail		0	3300	311	1.33	14.8	414	100	Class C	5% NaCl + LCM
INTERMEDIATE	Lead		0	9861	318	3.36	11.5	1069	35	TXI	fluid loss + dispersant + retarder + LCM
INTERMEDIATE	Tail		0	9861	192	1.39	13.2	267	35	TXI	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

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
3300	9861	OTHER : Fresh water & cut brine	9	9							
390	3300	OTHER : Brine water	10	10							
9861	16776	OIL-BASED MUD	12.5	12.5							

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 243H

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
0	390	OTHER : Fresh water spud	8.3	8.3							

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: 6765

Anticipated Surface Pressure: 4284.5

Anticipated Bottom Hole Temperature(F): 160

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

Describe:

Contingency Plans geohazards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

Cypress_243H_H2S_Plan_20181029101057.pdf

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 243H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Cypress_243H_Horizontal_Plan_20181029101111.pdf

Other proposed operations facets description:

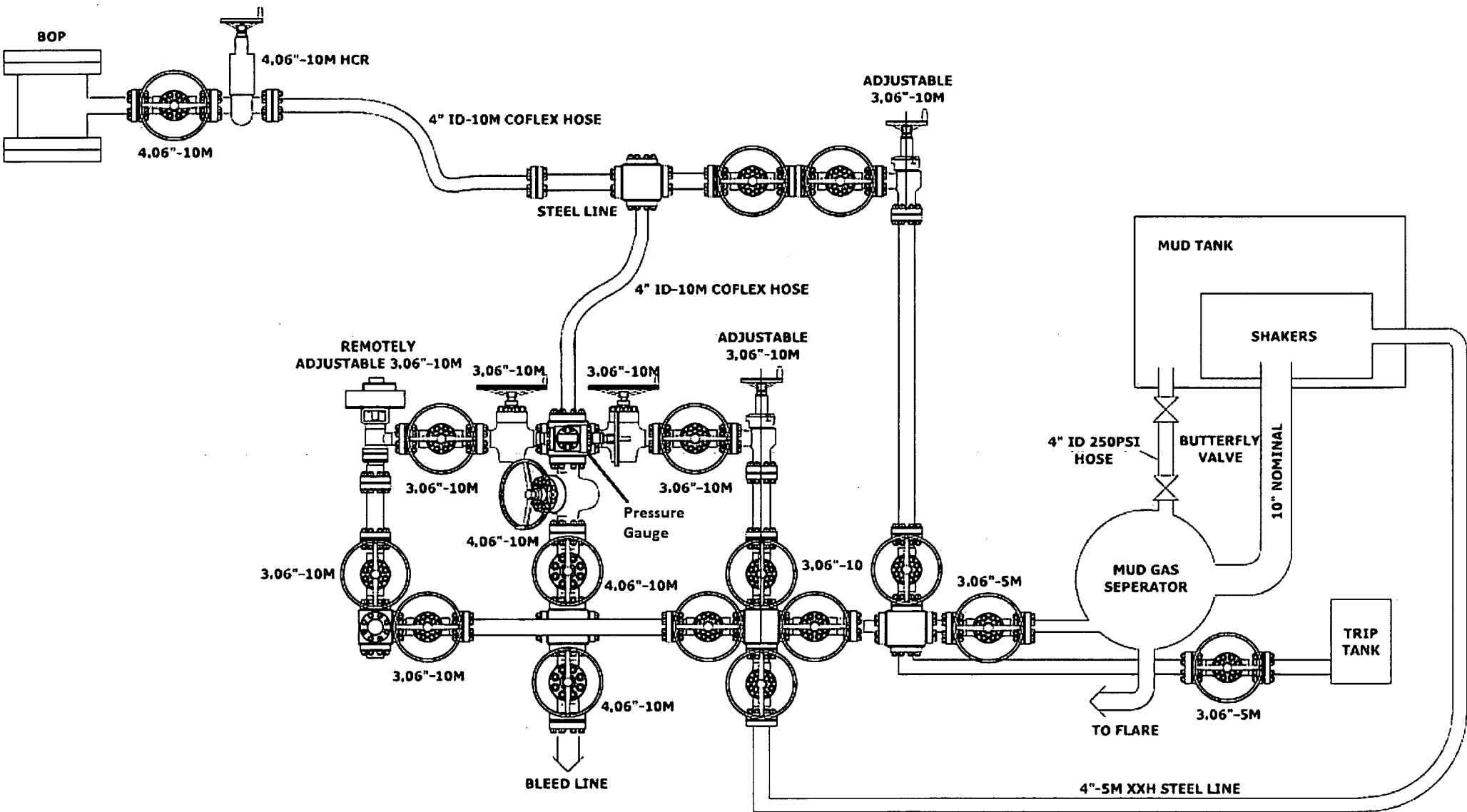
Other proposed operations facets attachment:

Cypress_243H_Speedhead_Specs_033018_20181029101132.pdf

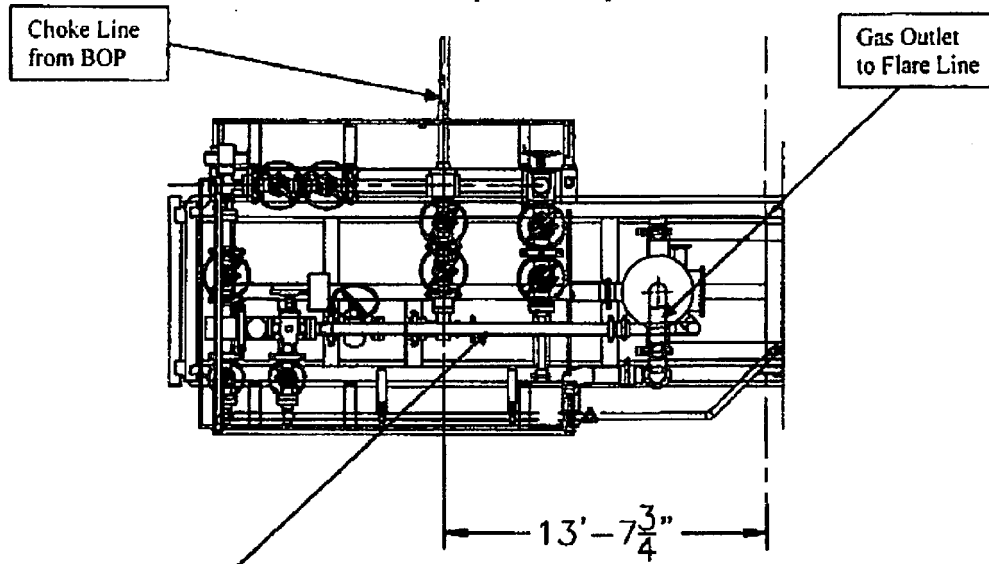
Cypress_243H_Drill_Plan_050819_REVISED_v4_20190508120629.pdf

Other Variance attachment:

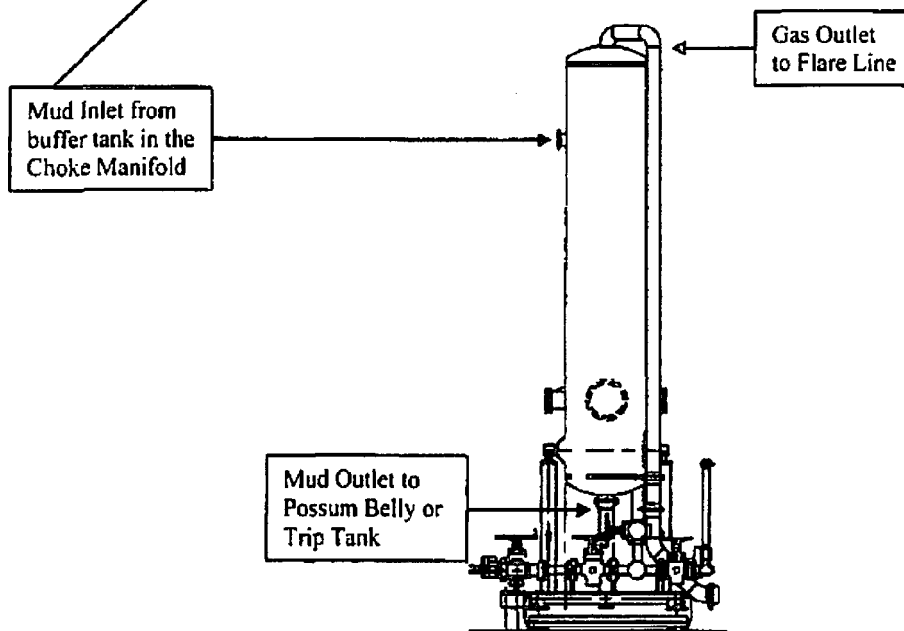
Cypress_243H_Casing_Cementing_Variance_20181029101142.pdf



Choke Manifold – Gas Separator (Top View)



Choke Manifold – Gas Separator (Side View)

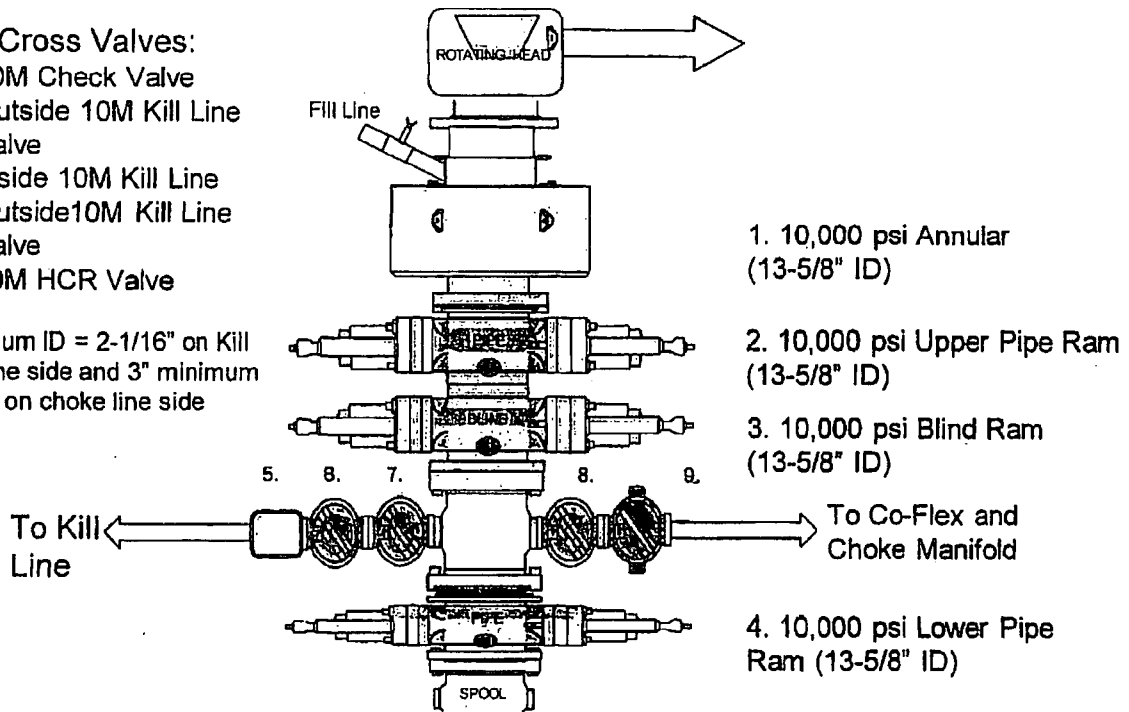


10,000 psi BOP Stack

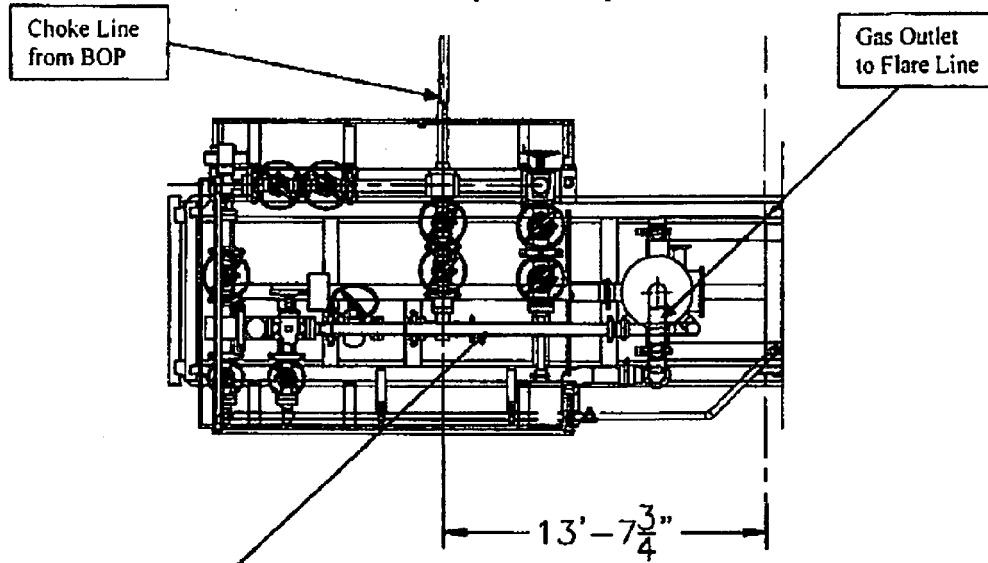
Mud Cross Valves:

- 5. 10M Check Valve
- 6. Outside 10M Kill Line Valve
- 7. Inside 10M Kill Line Valve
- 8. Outside 10M Kill Line Valve
- 9. 10M HCR Valve

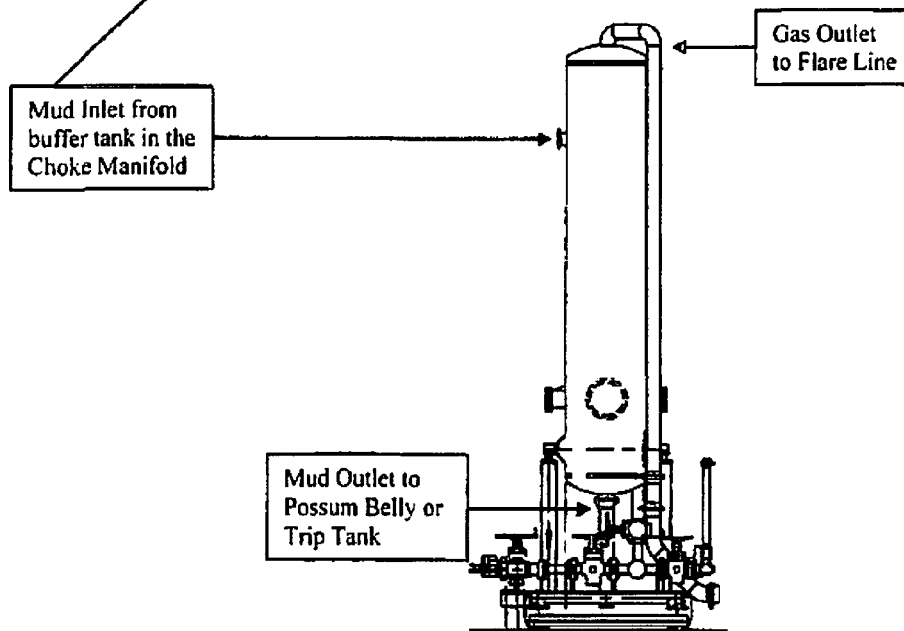
*Minimum ID = 2-1/16" on Kill Line side and 3" minimum ID on choke line side



Choke Manifold – Gas Separator (Top View)



Choke Manifold – Gas Separator (Side View)





Hydrostatic Test Certificate

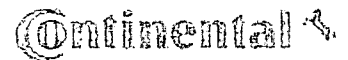
ContiTech

Certificate Number 938562	COM Order Reference 938562	Customer Name & Address HELMERICH & PAYNE DRILLING CO 1434 SOUTH BOULDER AVE TULSA, OK 74119 USA
Customer Purchase Order No: 740043386	Project: HOW	
Test Center Address ContiTech Oil & Marine Corp. 11535 Brittmoore Park Drive Houston, TX 77041 USA	Accepted by COM Inspection Signed: Roger Suarez Date: 3/13/17	Accepted by Client Inspection

We certify that the goods detailed hereon have been inspected as described below by our Quality Management System, and to the best of our knowledge are found to conform the requirements of the above referenced purchase order as issued to ContiTech Oil & Marine Corporation.

Item	Part No.	Description	Qty	Serial Number	Work Press.	Test Press.	Test Time (minutes)
20		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	53631	10,000 psi	15,000 psi	60
30		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	54500	10,000 psi	15,000 psi	60
40		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	58838	10,000 psi	15,000 psi	60
50		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	58489	10,000 psi	15,000 psi	60
60		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	61475	10,000 psi	15,000 psi	60
80		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	60197	10,000 psi	15,000 psi	60
90		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	39474	10,000 psi	15,000 psi	60
100		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	60887	10,000 psi	15,000 psi	60

Certificate of Conformity

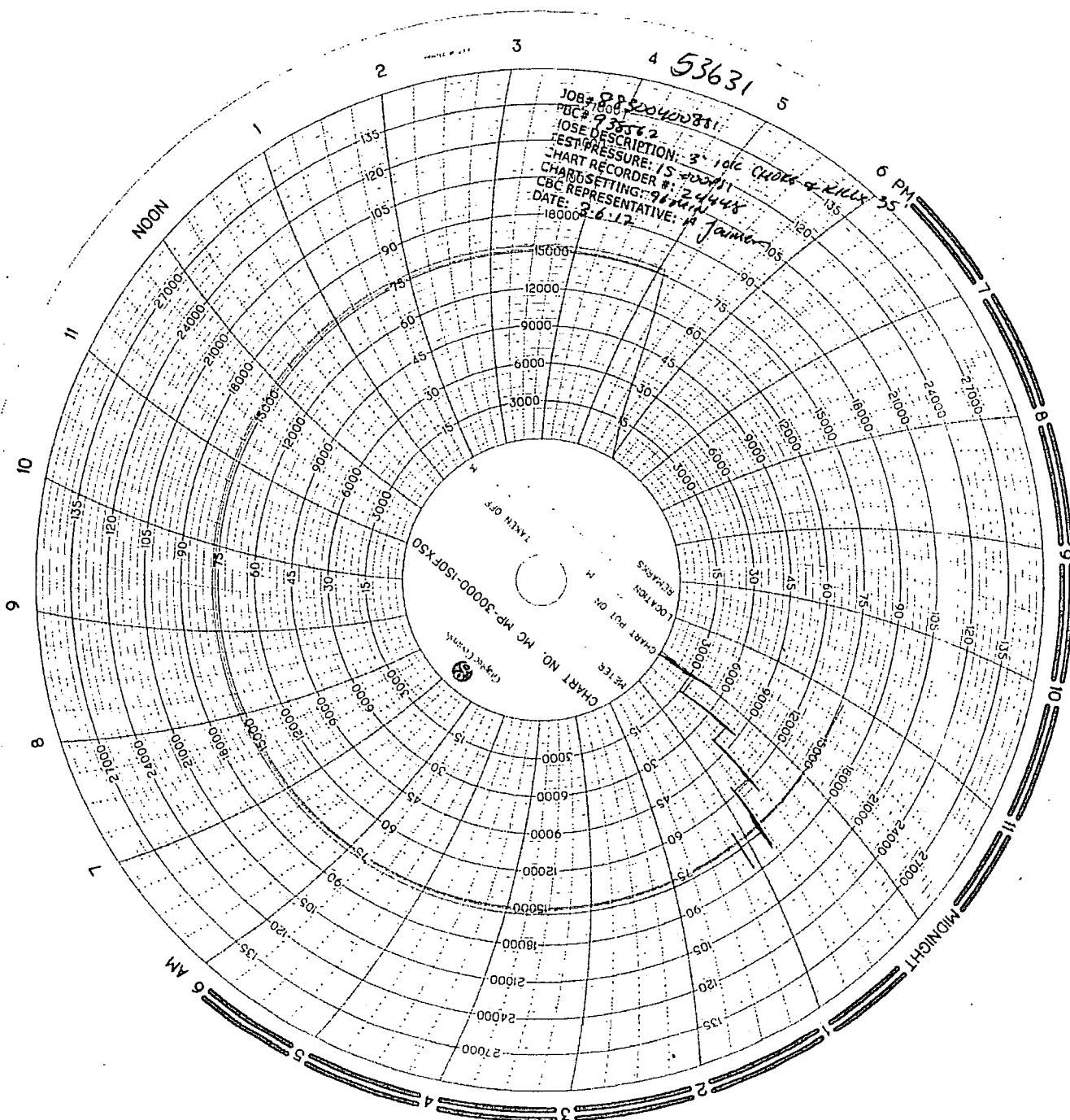


ContiTech

Certificate Number 938562	COM Order Reference 938562	Customer Name & Address HELMERICH & PAYNE DRILLING CO 1434 SOUTH BOULDER AVE TULSA, OK 74119 USA
Customer Purchase Order No: 740043386		
Project: HOW		
Test Center Address ContiTech Oil & Marine Corp. 11535 Brittmoore Park Drive Houston, TX 77041 USA	Accepted by COM Inspection Signed: Date: 8/13/17	Accepted by Client Inspection

We certify that the items detailed below meet the requirements of the customer's Purchase Order referenced above, and are in conformance with the specifications given below.

Item	Part No.	Description	Qty	Serial Number	Specifications
20		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	53631	ContiTech Standard
30		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	54500	ContiTech Standard
40		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	56838	ContiTech Standard
50		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	56489	ContiTech Standard
60		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	61475	ContiTech Standard
80		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	60197	ContiTech Standard
90		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	39474	ContiTech Standard
100		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	60887	ContiTech Standard



JOB: 88-2040081
PDC: 93542
TEST DESCRIPTION: 3-1010 Q400 & 2115 35
CHART RECORDER: 15-1000
CHART SETTING: 91-24448
CBC REPRESENTATIVE: A Jamar
DATE: 2-6-12

CHART NO. MC MP-3000-150FX30
CHART PUT ON
LOCATION
METERS

6 AM

MIDNIGHT

Hose Inspection Report

ContiTech Oil & Marine

Customer	Customer Reference #	CBC Reference #	CBC Inspector	Date of Inspection
H&P Drilling	740043386	COM938562	A. Jaimes	03/06/2017

Hose Manufacturer	Contitech Rubber Industrial
-------------------	-----------------------------

Hose Serial #	53631	Date of Manufacture	08/2008
Hose I.D.	3"	Working Pressure	10000PSI
Hose Type	Choke and Kill	Test Pressure	15000PSI
Manufacturing Standard	API 16C		

Connections

End A: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange	End B: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange
• No damage	• No damage
Material: Carbon Steel	Material: Carbon Steel
Seal Face: BX155	Seal Face: BX155
Length Before Hydro Test: 35'	Length After Hydro test: 35'

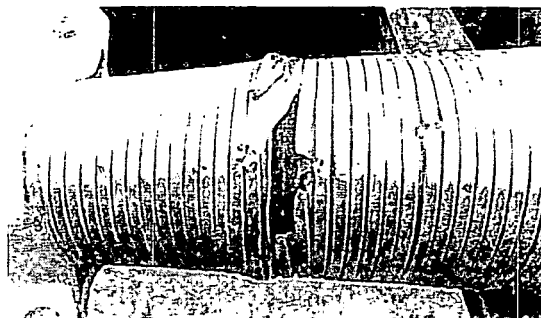
Conclusion: Hose #53631 passed the external inspection with minor damage to the hose armor. Internal borescope showed no damage to the liner. Hose #53631 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes. Hose #53631 is suitable for continued service.

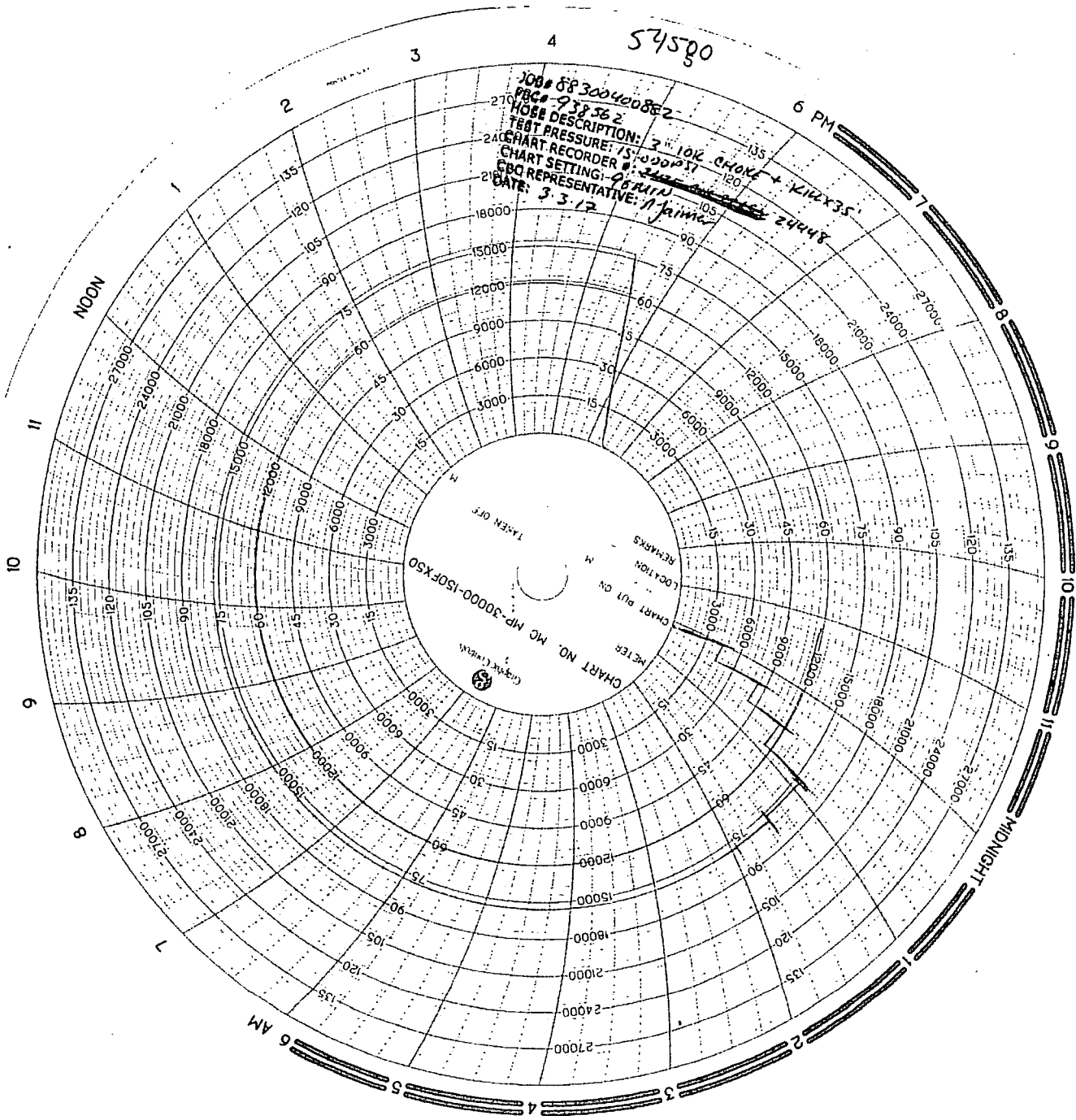
Recommendations: In general the hose should be inspected on a regular on-going basis. The frequency and degree of the inspection should as a minimum follow these guidelines:

Visual inspection: Every 3 to 6 months (or during installation/removal)
 Annual: In-situ pressure test (in addition to the 3 to 6 monthly inspections)
 Initial 5 years service: Major inspection
 2nd Major inspection: Following subsequent 3 year life cycle
 (Detailed description of test regime available upon request, QCP 206-1)

****NOTE:** There are a number of critical elements in the hose that cannot be thoroughly checked through standard inspection techniques. Away from dissecting the hose body, the best way to evaluate the condition of the hose is through review of the operating conditions recorded during the hose service life, in particular maximums and peak conditions.

External Damage Post – Hydro test	
Approx. Distance from End A	3'
Width	8"
Length	3"
Depth	To hose body
Notes	Broken armor





57580
JOB # 88300420882
PBC# 938382
TEST DESCRIPTION: 3" 10K CHOKES + K12X35
CHART RECORDER: 15-000017
CHART SETTING: 9.5 MIN
EBC REPRESENTATIVE: A. JAMES
DATE: 3.3.12

CHART NO. MC MP-30000-150FX50
TAKEN OFF
REMARKS
LOCATION
METER
CHART PUT ON

Hose Inspection Report

ContiTech Oil & Marine

Customer	Customer Reference #	CBC Reference #	CBC Inspector	Date of Inspection
H&P Drilling	740043386	COM938562	A. Jaimes	03/03/2017

Hose Manufacturer	Contitech Rubber Industrial
--------------------------	-----------------------------

Hose Serial #	54500	Date of Manufacture	01/2009
Hose I.D.	3"	Working Pressure	10000PSI
Hose Type	Choke and Kill	Test Pressure	15000PSI
Manufacturing Standard	API 16C		

Connections

End A: 3.1/8" 5Kpsi API Spec 6A Type 6BX Flange	End B: 3.1/8" 5Kpsi API Spec 6A Type 6BX Flange
• No damage	• No damage
Material: Carbon Steel	Material: Carbon Steel
Seal Face: BX155	Seal Face: BX155
Length Before Hydro Test: 35'	Length After Hydro test: 35'

Conclusion: Hose #54500 passed the external inspection with no notable damages to the hose armor. Internal borescope of the hose showed no damage to the liner. Hose #54500 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes. Hose #54500 is suitable for continued service.

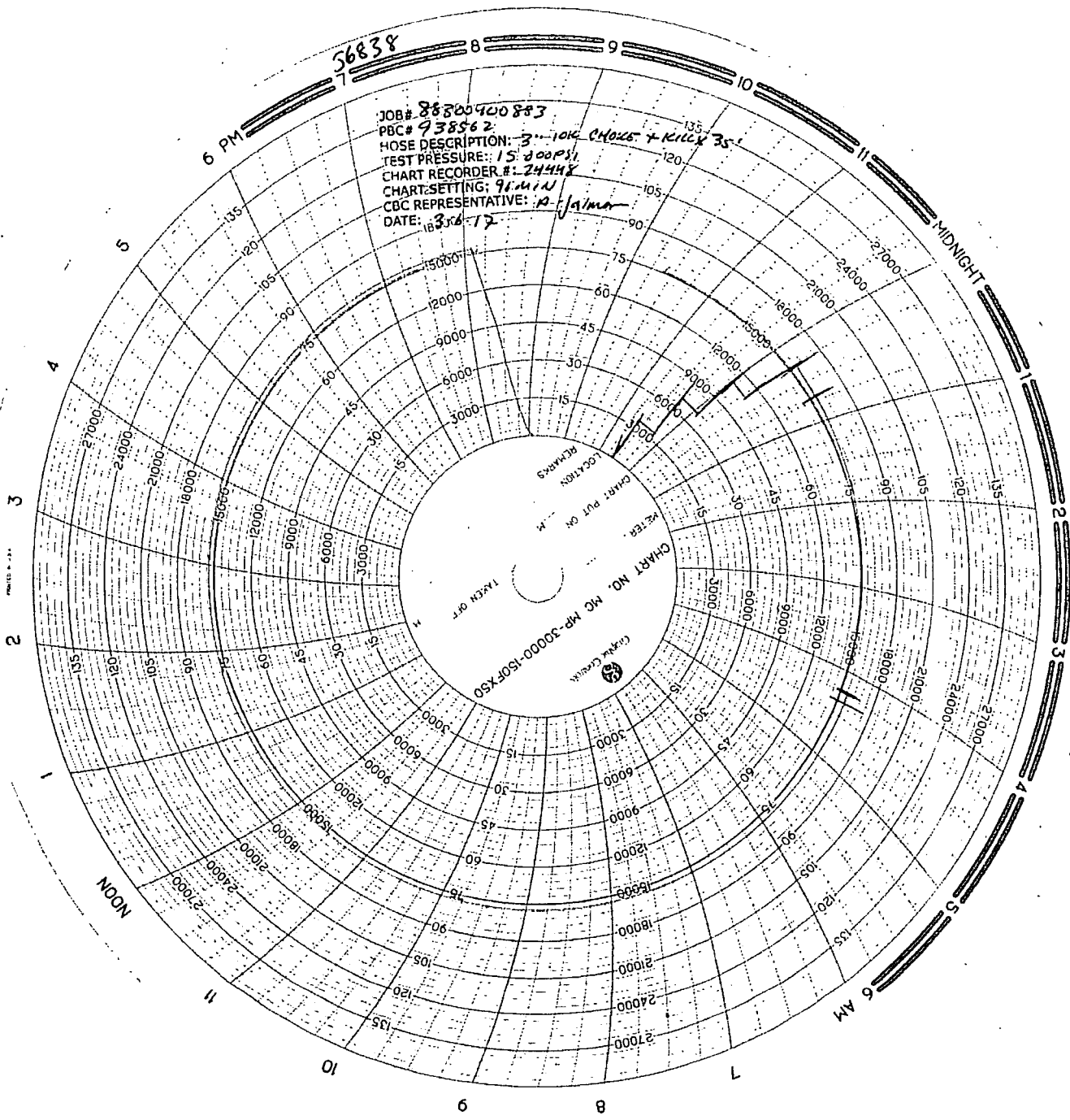
Recommendations: In general the hose should be inspected on a regular on-going basis. The frequency and degree of the inspection should as a minimum follow these guidelines:

Visual inspection: Every 3 to 6 months (or during installation/removal)
Annual: In-situ pressure test (in addition to the 3 to 6 monthly inspections)
Initial 5 years service: Major inspection
2nd Major inspection: Following subsequent 3 year life cycle
(Detailed description of test regime available upon request, QCP 206-1)

****NOTE:** There are a number of critical elements in the hose that cannot be thoroughly checked through standard inspection techniques. Away from dissecting the hose body, the best way to evaluate the condition of the hose is through review of the operating conditions recorded during the hose service life, in particular maximums and peak conditions.

JOB# 88800400883
PBC# 938562
HOSE DESCRIPTION: 3" 100' CHOLEX + KILLY 35'
TEST PRESSURE: 15,000 PSI
CHART RECORDER #: 24444
CHART SETTING: 91 MIN
CBC REPRESENTATIVE: R. J. JAMES
DATE: 3-16-72

CHART NO. MC HP-30000-150FX50
TAKEN AT
LOCATION
REMARKS
CHART PUT ON
M



Hose Inspection Report

ContiTech Oil & Marine

Customer	Customer Reference #	CBC Reference #	CBC Inspector	Date of Inspection
H&P Drilling	740043386	COM938562	A. Jaimes	03/06/2017

Hose Manufacturer	Contitech Rubber Industrial
-------------------	-----------------------------

Hose Serial #	56838	Date of Manufacture	11/2010
Hose I.D.	3"	Working Pressure	10000PSI
Hose Type	Choke and Kill	Test Pressure	15000PSI
Manufacturing Standard	API 16C		

Connections

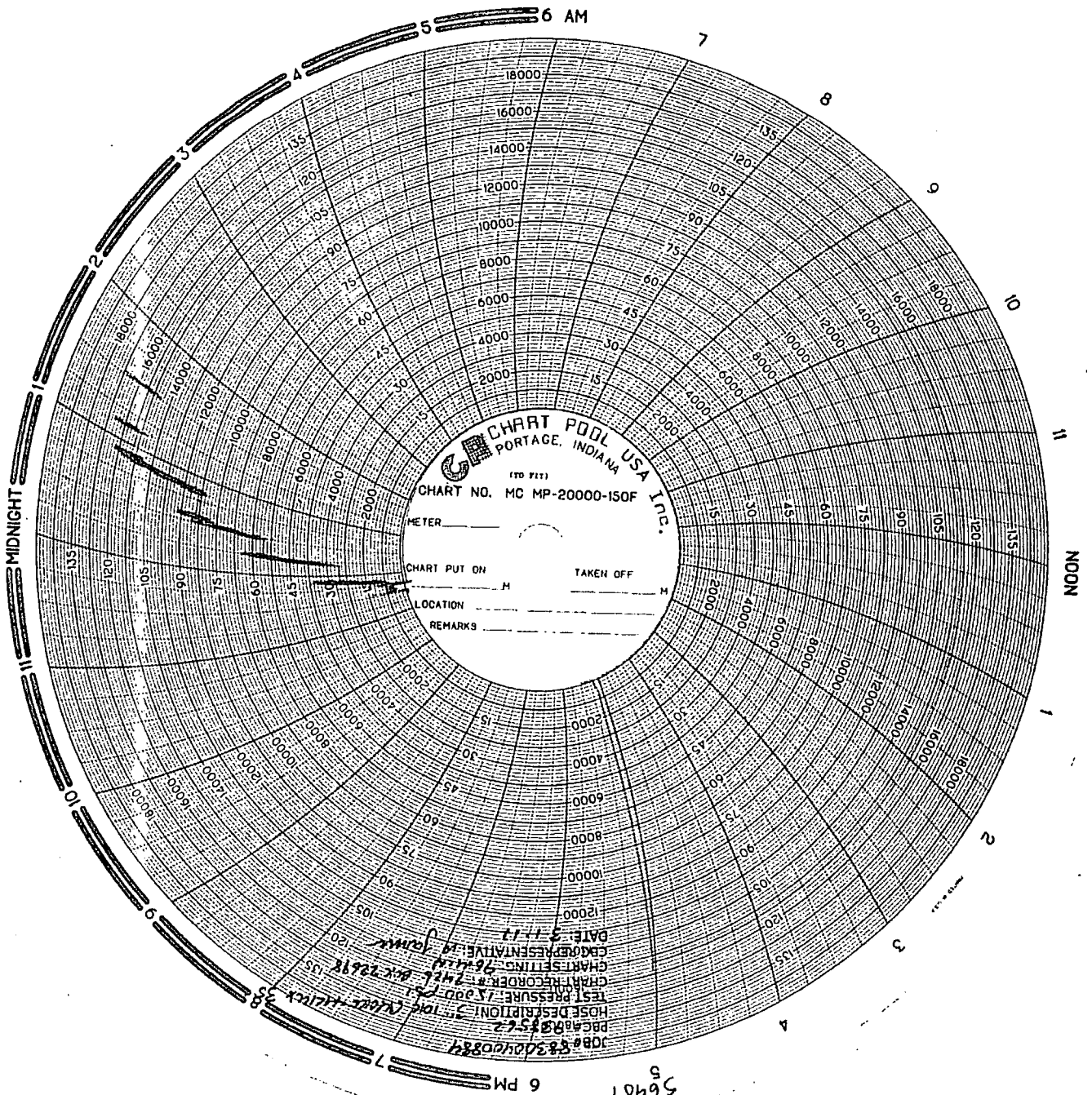
End A: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange	End B: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange
• No damage	• No damage
Material: Carbon Steel	Material: Carbon Steel
Seal Face: BX155	Seal Face: BX155
Length Before Hydro Test: 35'	Length After Hydro test: 35'

Conclusion: Hose #56838 passed the external inspection with no notable damage to the hose armor. Internal borescope of the hose showed no damage to the liner. Hose #56838 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes. Hose #56838 is suitable for continued service.

Recommendations: In general the hose should be inspected on a regular on-going basis. The frequency and degree of the inspection should as a minimum follow these guidelines:

Visual Inspection: Every 3 to 6 months (or during installation/removal)
Annual: In-situ pressure test (in addition to the 3 to 6 monthly inspections)
Initial 5 years service: Major inspection
2nd Major inspection: Following subsequent 3 year life cycle
(Detailed description of test regime available upon request, QCP 206-1)

****NOTE:** There are a number of critical elements in the hose that cannot be thoroughly checked through standard inspection techniques. Away from dissecting the hose body, the best way to evaluate the condition of the hose is through review of the operating conditions recorded during the hose service life, in particular maximums and peak conditions.



Hose Inspection Report

ContiTech Oil & Marine

Customer	Customer Reference #	CBC Reference #	CBC Inspector	Date of Inspection
H&P Drilling	740043386	COM938562	A. Jaimes	03/01/2017

Hose Manufacturer	Contitech Rubber Industrial
-------------------	-----------------------------

Hose Serial #	56489	Date of Manufacture	08/2010
Hose I.D.	3"	Working Pressure	10000PSI
Hose Type	Choke and Kill	Test Pressure	15000PSI
Manufacturing Standard	API 16C		

Connections

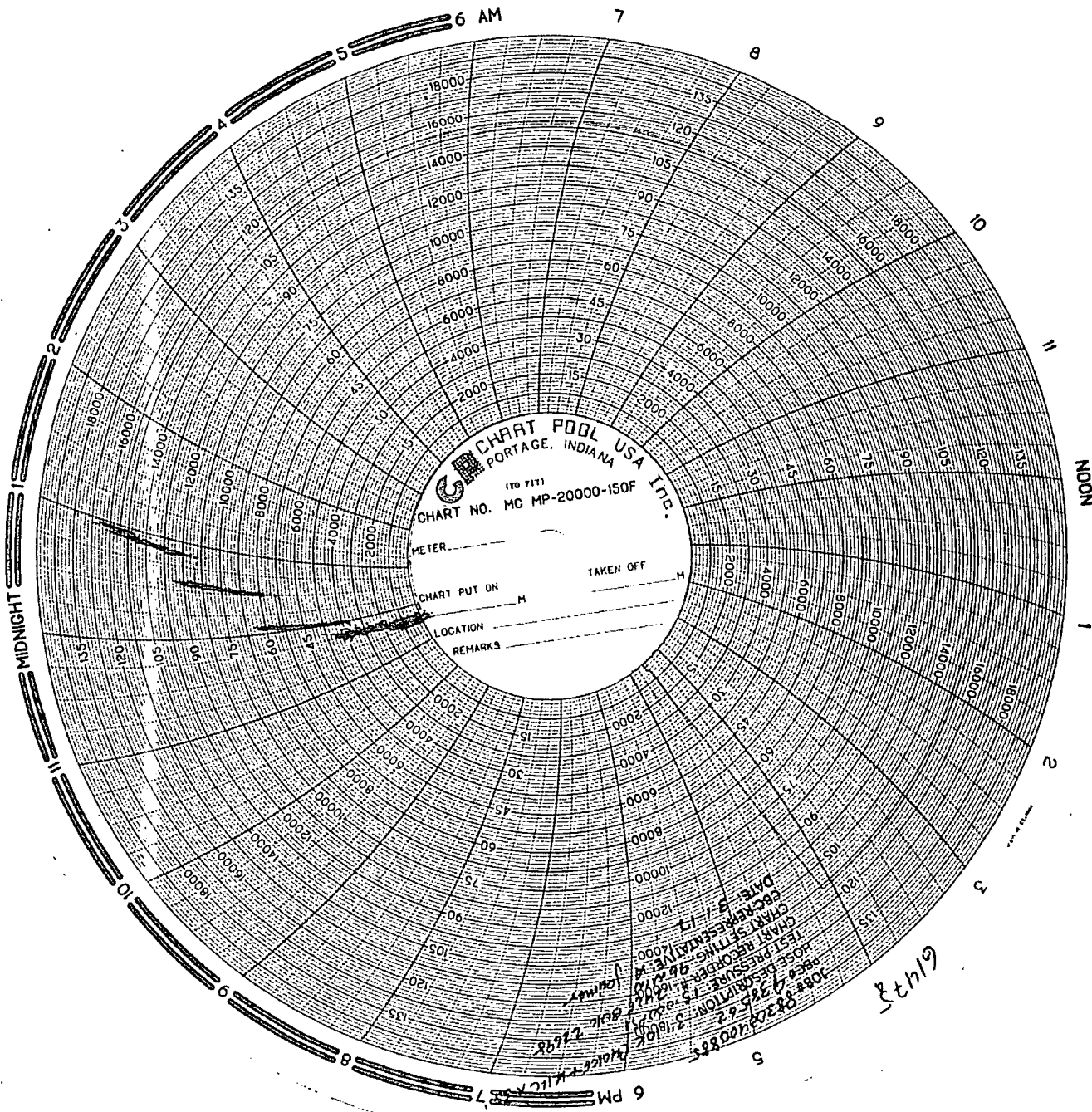
End A: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange	End B: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange
• No damage	• No damage
Material: Carbon Steel	Material: Carbon Steel
Seal Face: BX155	Seal Face: BX155
Length Before Hydro Test: 35'	Length After Hydro test: 35'

Conclusion: Hose #56489 passed the external inspection with no notable damage to the hose armor. Internal borescope of the hose showed no damage to the liner. Hose #56489 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes. Hose #56489 is suitable for continued service.

Recommendations: In general the hose should be inspected on a regular on-going basis. The frequency and degree of the inspection should as a minimum follow these guidelines:

Visual inspection: Every 3 to 6 months (or during installation/removal)
 Annual: In-situ pressure test (in addition to the 3 to 6 monthly inspections)
 Initial 5 years service: Major Inspection
 2nd Major inspection: Following subsequent 3 year life cycle
 (Detailed description of test regime available upon request, QCP 206-1)

****NOTE:** There are a number of critical elements in the hose that cannot be thoroughly checked through standard inspection techniques. Away from dissecting the hose body, the best way to evaluate the condition of the hose is through review of the operating conditions recorded during the hose service life, in particular maximums and peak conditions.



Hose Inspection Report

ContiTech Oil & Marine

Customer	Customer Reference #	CBC Reference #	CBC Inspector	Date of Inspection
H&P Drilling	740043386	COM938562	A. Jaimes	03/01/2017

Hose Manufacturer	Contitech Rubber Industrial
-------------------	-----------------------------

Hose Serial #	61475	Date of Manufacture	01/2012
Hose I.D.	3"	Working Pressure	10000PSI
Hose Type	Choke and Kill	Test Pressure	15000PSI
Manufacturing Standard	API 16C		

Connections

End A: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange	End B: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange
• No damage	• No damage
Material: Carbon Steel	Material: Carbon Steel
Seal Face: BX155	Seal Face: BX155
Length Before Hydro Test: 35'	Length After Hydrotest: 35'

Conclusion: Hose #61475 passed the external inspection with no notable damage to the hose armor. Internal borescope of the hose showed no damage to the liner. Hose #61475 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes. Hose #61475 is suitable for continued service.

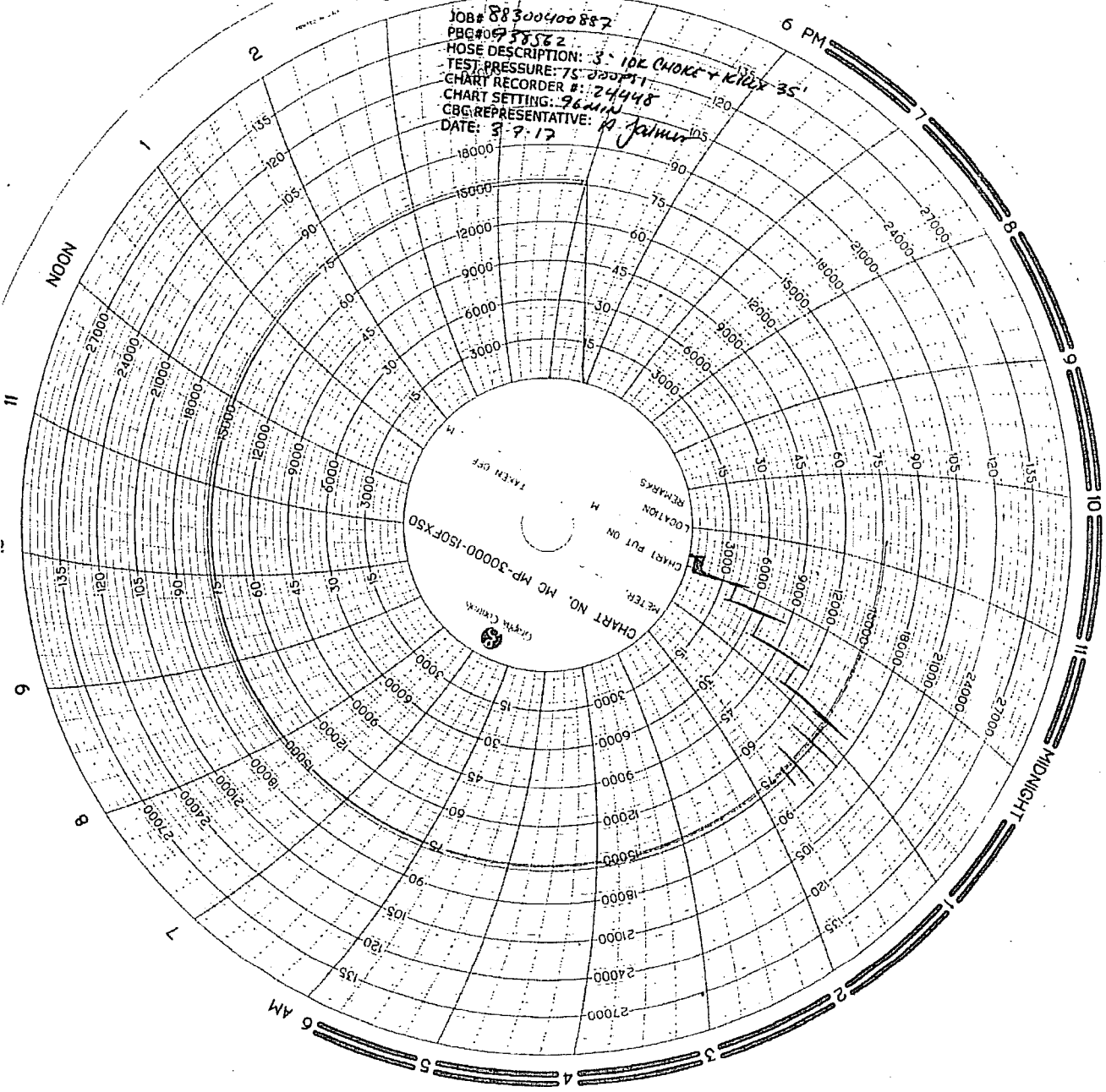
Recommendations: In general the hose should be inspected on a regular on-going basis. The frequency and degree of the inspection should as a minimum follow these guidelines:

Visual inspection: Every 3 to 6 months (or during installation/removal)
Annual: In-situ pressure test (in addition to the 3 to 6 monthly inspections)
Initial 5 years service: Major inspection
2nd Major inspection: Following subsequent 3 year life cycle
(Detailed description of test regime available upon request, QCP 206-1)

****NOTE:** There are a number of critical elements in the hose that cannot be thoroughly checked through standard inspection techniques. Away from dissecting the hose body, the best way to evaluate the condition of the hose is through review of the operating conditions recorded during the hose service life, in particular maximums and peak conditions.

4 60197 5

JOB# 88300400887
PBG# 0938562
HOSE DESCRIPTION: 3" 10K CHOKER + KILLY 35'
TEST PRESSURE: 75 PSI
CHART RECORDER #: 24448
CHART SETTING: 96mm
CBG REPRESENTATIVE: K. J. J. J.
DATE: 3-7-17



Hose Inspection Report

ContiTech Oil & Marine

Customer	Customer Reference #	CBC Reference #	CBC Inspector	Date of Inspection
H&P Drilling	740043386	COM938562	A. Jaimes	03/07/2017

Hose Manufacturer	Contitech Rubber Industrial
-------------------	-----------------------------

Hose Serial #	60197	Date of Manufacture	01/2011
Hose I.D.	3"	Working Pressure	10000PSI
Hose Type	Choke and Kill	Test Pressure	15000PSI
Manufacturing Standard	API 16C		

Connections

End A: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange	End B: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange
• No damage	• No damage
Material: Carbon Steel	Material: Carbon Steel
Seal Face: BX155	Seal Face: BX155
Length Before Hydro Test: 35'	Length After Hydro test: 35'

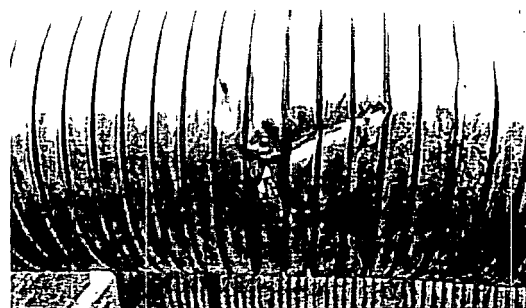
Conclusion: Hose #60197 passed the external inspection with minor damage to the hose armor. Internal borescope showed no damage to the liner. Hose #60197 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes. Hose #60197 is suitable for continued service.

Recommendations: In general the hose should be inspected on a regular on-going basis. The frequency and degree of the inspection should as a minimum follow these guidelines:

Visual inspection: Every 3 to 6 months (or during installation/removal)
 Annual: In-situ pressure test (in addition to the 3 to 6 monthly inspections)
 Initial 5 years service: Major inspection
 2nd Major inspection: Following subsequent 3 year life cycle
 (Detailed description of test regime available upon request, QCP 206-1)

****NOTE:** There are a number of critical elements in the hose that cannot be thoroughly checked through standard inspection techniques. Away from dissecting the hose body, the best way to evaluate the condition of the hose is through review of the operating conditions recorded during the hose service life, in particular maximums and peak conditions.

External Damage Post – Hydro test	
Approx. Distance from End A	6'
Width	1"
Length	1"
Depth	On armor
Notes	Crack on armor

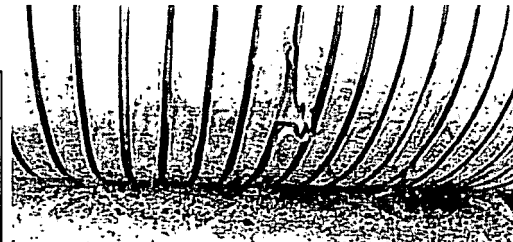


Hose Inspection Report

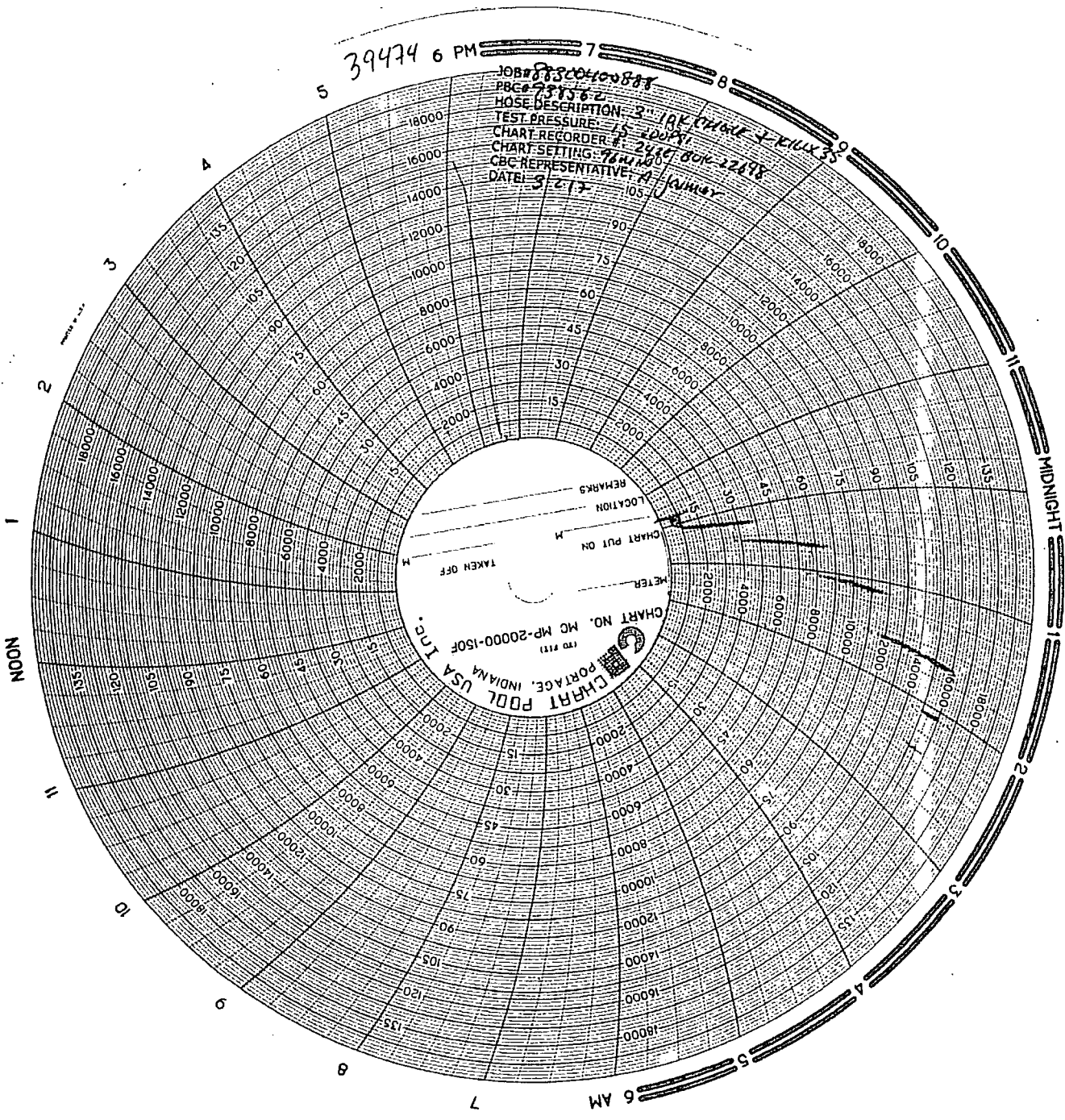
ContiTech Oil & Marine

Customer	Customer Reference #	CBC Reference #	CBC Inspector	Date of Inspection
H&P Drilling	740043386	COM938562	A. Jaimes	03/07/2017

External Damage Post – Hydro test	
Approx. Distance from End A	20'
Width	1"
Length	1"
Depth	On armor
Notes	Crack on armor



PASS



39474 6 PM

JOB # 8830040088
PAGE 231362
HOSE DESCRIPTION: 3" IRK CHAIR 4-KIX35
TEST PRESSURE: 15-100 PSI
CHART RECORDER # 240071
CHART SETTING: 744100-00K-22678
CBC REPRESENTATIVE: J. J. JAMES
DATE: 3-2-73

REMARKS
LOCATION
M
CHART PUT ON
M
TAKEN OFF
M
METER

CHART NO. MC MP-20000-150F
CHART POOL USA INC.
PORTAGE, INDIANA

Hose Inspection Report

ContiTech Oil & Marine

Customer	Customer Reference #	CBC Reference #	CBC Inspector	Date of Inspection
H&P Drilling	740043386	COM938562	A. Jaimes	03/02/2017

Hose Manufacturer	Contitech Rubber Industrial
-------------------	-----------------------------

Hose Serial #	39474	Date of Manufacture	08/2003
Hose I.D.	3"	Working Pressure	10000PSI
Hose Type	Choke and Kill	Test Pressure	15000PSI
Manufacturing Standard	API 16C		

Connections

End A: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange	End B: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange
• No damage	• No damage
Material: Carbon Steel	Material: Carbon Steel
Seal Face: BX155	Seal Face: BX155
Length Before Hydro Test: 35'	Length After Hydro test: 35'

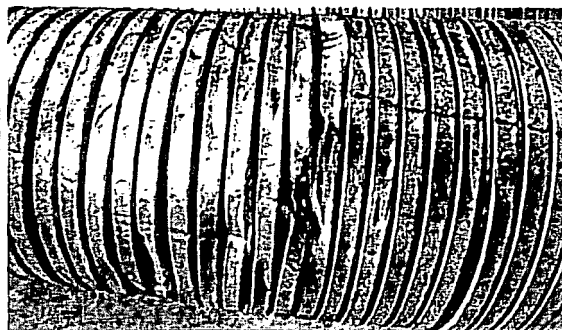
Conclusion: Hose #39474 passed the external inspection with minor damage to the hose armor. Internal borescope showed no damage to the liner. Hose #39474 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes. **Hose #39474 is suitable for continued service.**

Recommendations: In general the hose should be inspected on a regular on-going basis. The frequency and degree of the inspection should as a minimum follow these guidelines:

Visual inspection: Every 3 to 6 months (or during installation/removal)
 Annual: In-situ pressure test (in addition to the 3 to 6 monthly inspections)
 Initial 5 years service: Major inspection
 2nd Major inspection: Following subsequent 3 year life cycle
 (Detailed description of test regime available upon request, QCP 206-1)

****NOTE:** There are a number of critical elements in the hose that cannot be thoroughly checked through standard inspection techniques. Away from dissecting the hose body, the best way to evaluate the condition of the hose is through review of the operating conditions recorded during the hose service life, in particular maximums and peak conditions.

External Damage Post – Hydro test	
Approx. Distance from End A	15'
Width	1"
Length	1"
Depth	To hose body
Notes	Cracked armor



5 60887 6 PM

JOB# 10300400 P89
PBC# 978562
HOSE DESCRIPTION: 5" 10K CHOLE #146x35'
TEST PRESSURE: 15:20 psi
CHART RECORDER #: 24448
CBC REPRESENTATIVE: A. Janner
DATE: 3-7-17

CHART NO. MC MP-30000-150FX50
METER
CHART PUT ON
LOCATION
REMARKS
TAKEN OFF

6 AM

MIDNIGHT

NOON

Hose Inspection Report

ContiTech Oil & Marine

Customer	Customer Reference #	CBC Reference #	CBC Inspector	Date of Inspection
H&P Drilling	740043386	COM938562	A. Jaimes	03/07/2017

Hose Manufacturer	Contitech Rubber Industrial
-------------------	-----------------------------

Hose Serial #	60887	Date of Manufacture	10/2011
Hose I.D.	3"	Working Pressure	10000PSI
Hose Type	Choke and Kill	Test Pressure	15000PSI
Manufacturing Standard	API 16C		

Connections

End A: 4.1/16" 5Kpsi API Spec 6A Type 6BX Flange	End B: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange
• No damage	• No damage
Material: Carbon Steel	Material: Carbon Steel
Seal Face: BX155	Seal Face: BX155
Length Before Hydro Test: 35'	Length After Hydro test: 35'

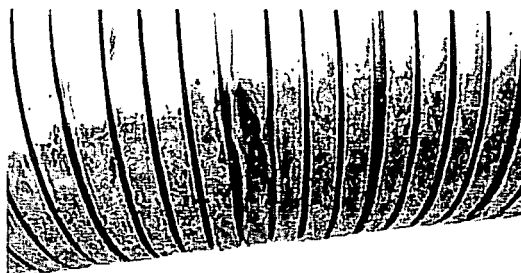
Conclusion: Hose #60887 passed the external inspection with minimal damage to the hose armor. Internal borescope showed no damage to the liner. Hose #60887 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes. Hose #60887 is suitable for continued service.

Recommendations: In general the hose should be inspected on a regular on-going basis. The frequency and degree of the inspection should as a minimum follow these guidelines:

Visual inspection: Every 3 to 6 months (or during installation/removal)
 Annual: In-situ pressure test (in addition to the 3 to 6 monthly inspections)
 Initial 5 years service: Major inspection
 2nd Major inspection: Following subsequent 3 year life cycle
 (Detailed description of test regime available upon request, QCP 206-1)

****NOTE:** There are a number of critical elements in the hose that cannot be thoroughly checked through standard inspection techniques. Away from dissecting the hose body, the best way to evaluate the condition of the hose is through review of the operating conditions recorded during the hose service life, in particular maximums and peak conditions.

External Damage Post – Hydro test	
Approx. Distance from End A	10'
Width	1"
Length	1"
Depth	To hose body
Notes	Crack on armor

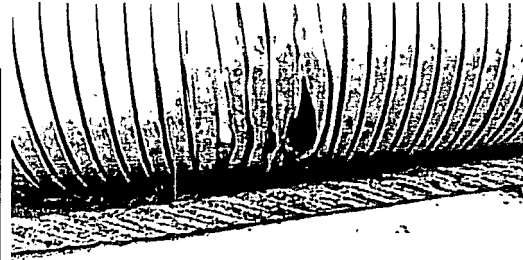


Hose Inspection Report

ContiTech Oil & Marine

Customer	Customer Reference #	CBC Reference #	CBC Inspector	Date of Inspection
H&P Drilling	740043386	COM938562	A. Jaimes	03/07/2017

External Damage Post – Hydro test	
Approx. Distance from End A	4'
Width	4"
Length	4"
Depth	To hose body
Notes	Rubber exposed



PASS

Wedge 521®

Printed on: 05/22/2018



Outside Diameter	5.000 in.	Min. Wall Thickness	87.5%	(*) Grade P110-IC	
Wall Thickness	0.362 in.	Connection OD Option	REGULAR	COUPLING	PIPE BODY
Grade	P110-IC*	Drift	API Standard	Body: White	1st Band: White
		Type	Casing	1st Band: -	2nd Band: Pale Green
				2nd Band: -	3rd Band: -
				3rd Band: -	4th Band: -

GEOMETRY					
Nominal OD	5.000 in.	Nominal Weight	18.00 lbs/ft	Drift	4.151 in.
Nominal ID	4.276 in.	Wall Thickness	0.362 in.	Plain End Weight	17.95 lbs/ft
OD Tolerance	API				
PERFORMANCE					
Body Yield Strength	580 x1000 lbs	Internal Yield	13940 psi	SMYS	110000 psi
Collapse	14840 psi				
GEOMETRY					
Connection OD	5.359 in.	Connection ID	4.226 in.	Make-up Loss	3.620 in.
Threads per in	3.36	Connection OD Option	REGULAR		
PERFORMANCE					
Tension Efficiency	73.8 %	Joint Yield Strength	428,040 x1000 lbs	Internal Pressure Capacity	13940,000 psi
Compression Efficiency	88.7 %	Compression Strength	514,460 x1000 lbs	Max. Allowable Bending	74.5 °/100 ft
External Pressure Capacity	14840,000 psi				
MAKE-UP TORQUES					
Minimum	6100 ft-lbs	Optimum	7300 ft-lbs	Maximum	10700 ft-lbs
OPERATION LIMIT TORQUES					
Operating Torque	17300 ft-lbs	Yield Torque	26000 ft-lbs		

Notes

This connection is fully interchangeable with:

Wedge 521® - 5 in. - 13 / 15 lbs/ft

Connections with Dopeless® Technology are fully compatible with the same connection in its Standard version

For further information on concepts indicated in this datasheet, download the Datasheet Manual from www.tenaris.com

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5.5", 20#, P-110, TXP connection (modified buttress connection that provides a torque rating of nearly 24000ft-lbs)

TXP® BTC

SHARE EXPORT DATA PRINT



Outside Diameter	5.500 in.	Min. Wall Thickness	37.5%
Wall Thickness	0.361 in.	Drift	API Standard
Grade	P110	Type	Casing
		Connection OD Option	REGULAR

Clear Filters
Compare
Request Info

CONNECTION INFORMATION

- > Blanking Dimensions
- > Connection's Page
- > Brochure
- > Datasheet Manual

PIPE BODY DATA

GEOMETRY

Nominal OD	5.500 in.	Nominal Weight	20 lbs/ft	Drift	4.653 in.
Nominal ID	4.778 in.	Wall Thickness	0.361 in.	Plain End Weight	19.83 lbs/ft
OD Tolerance	API				

PERFORMANCE

Body Yield Strength	641 x1000 lbs	Internal Yield	12640 psi	SMYS	110000 psi
Collapse	11100 psi				

CONNECTION DATA

GEOMETRY

Connection OD	6.100 in.	Coupling Length	9.450 in.	Connection ID	4.766 in.
Make-up Loss	4.204 in.	Threads per in	5	Connection OD Option	REGULAR

PERFORMANCE

Tension Efficiency	100.0 %	Joint Yield Strength	641.000 x1000 lbs	Internal Pressure Capacity ^[1]	12640.000 psi
Compression Efficiency	100 %	Compression Strength	641.000 x1000 lbs	Max. Allowable Bending	92 °/100 ft
External Pressure Capacity	11100.000 psi				

MAKE-UP TORQUES

Minimum	11270 ft-lbs	Optimum	12520 ft-lbs	Maximum	13770 ft-lbs
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OPERATION LIMIT TORQUES

Operating Torque	21500 ft-lbs	Yield Torque	23900 ft-lbs
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Casing Design Assumptions

- Gas gravity 0.7
- Pore pressure gradient .468 psi/ft above the Wolfcamp, .676 psi/ft Wolfcamp and below
- .676 psi/ft fracture gradient above the Wolfcamp, .832 psi/ft Wolfcamp and below.
- 60°F average surface temperature and 1.5°/100ft temperature gradient
- Cementing loads based on slurries listed in Cement table, and post cement static loading
- Strings landed at neutral weight
- Gas kicks assumed at each casing shoe
- External pressure calculated with fluid gradients and pore pressure
- Production string load tested with completion fluid density and rate
- Tubing leak tested in production scenario

Casing Design Assumptions

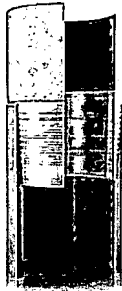
- Gas gravity 0.7
- Pore pressure gradient .468 psi/ft above the Wolfcamp, .676 psi/ft Wolfcamp and below
- .676 psi/ft fracture gradient above the Wolfcamp, .832 psi/ft Wolfcamp and below.
- 60°F average surface temperature and 1.5°/100ft temperature gradient
- Cementing loads based on slurries listed in Cement table, and post cement static loading
- Strings landed at neutral weight
- Gas kicks assumed at each casing shoe
- External pressure calculated with fluid gradients and pore pressure
- Production string load tested with completion fluid density and rate
- Tubing leak tested in production scenario

Casing Design Assumptions

- Gas gravity 0.7
- Pore pressure gradient .468 psi/ft above the Wolfcamp, .676 psi/ft Wolfcamp and below
- .676 psi/ft fracture gradient above the Wolfcamp, .832 psi/ft Wolfcamp and below.
- 60°F average surface temperature and 1.5°/100ft temperature gradient
- Cementing loads based on slurries listed in Cement table, and post cement static loading
- Strings landed at neutral weight
- Gas kicks assumed at each casing shoe
- External pressure calculated with fluid gradients and pore pressure
- Production string load tested with completion fluid density and rate
- Tubing leak tested in production scenario

Wedge 513®

Printed on: 01/30/2018



Outside Diameter	7.625 in.	Min. Wall Thickness	87.5%	(*) Grade P110	
Wall Thickness	0.375 in.	Connection OD Option	REGULAR	COUPLING	PIPE BODY
Grade	P110*	Drift	API Standard	Body: White	1st Band: White
		Type	Casing	1st Band: -	2nd Band: -
				2nd Band: -	3rd Band: -
				3rd Band: -	4th Band: -

GEOMETRY					
Nominal OD	7.625 in.	Nominal Weight	29.70 lbs/ft	Drift	6.75 in.
Nominal ID	6.875 in.	Wall Thickness	0.375 in.	Plain End Weight	29.06 lbs/ft
OD Tolerance	API				

PERFORMANCE					
Body Yield Strength	940 x1000 lbs	Internal Yield	9470 psi	SMYS	110000 psi
Collapse	5350 psi				

GEOMETRY					
Connection OD	7.625 in.	Connection ID	6.800 in.	Make-up Loss	4.420 in.
Threads per in	3.29	Connection OD Option	REGULAR		

PERFORMANCE					
Tension Efficiency	60.0 %	Joint Yield Strength	564.000 x1000 lbs	Internal Pressure Capacity	9470.000 psi
Compression Efficiency	75.2 %	Compression Strength	706.880 x1000 lbs	Max. Allowable Bending	39.6 °/100 ft
External Pressure Capacity	5350.000 psi				

MAKE-UP TORQUES					
Minimum	9000 ft-lbs	Optimum	10800 ft-lbs	Maximum	15800 ft-lbs

OPERATION LIMIT TORQUES					
Operating Torque	47000 ft-lbs	Yield Torque	70000 ft-lbs		

Notes

This connection is fully interchangeable with:

Wedge 523® - 7.625 in. - 29.7 lbs/ft

Connections with Dopeless® Technology are fully compatible with the same connection in its Standard version

For further information on concepts indicated in this datasheet, download the Datasheet Manual from www.tenaris.com

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Casing Design Assumptions

- Gas gravity 0.7
- Pore pressure gradient .468 psi/ft above the Wolfcamp, .676 psi/ft Wolfcamp and below
- .676 psi/ft fracture gradient above the Wolfcamp, .832 psi/ft Wolfcamp and below.
- 60°F average surface temperature and 1.5°/100ft temperature gradient
- Cementing loads based on slurries listed in Cement table, and post cement static loading
- Strings landed at neutral weight
- Gas kicks assumed at each casing shoe
- External pressure calculated with fluid gradients and pore pressure
- Production string load tested with completion fluid density and rate
- Tubing leak tested in production scenario

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- Gas kicks assumed at each casing shoe
- External pressure calculated with fluid gradients and pore pressure
- Production string load tested with completion fluid density and rate
- Tubing leak tested in production scenario



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

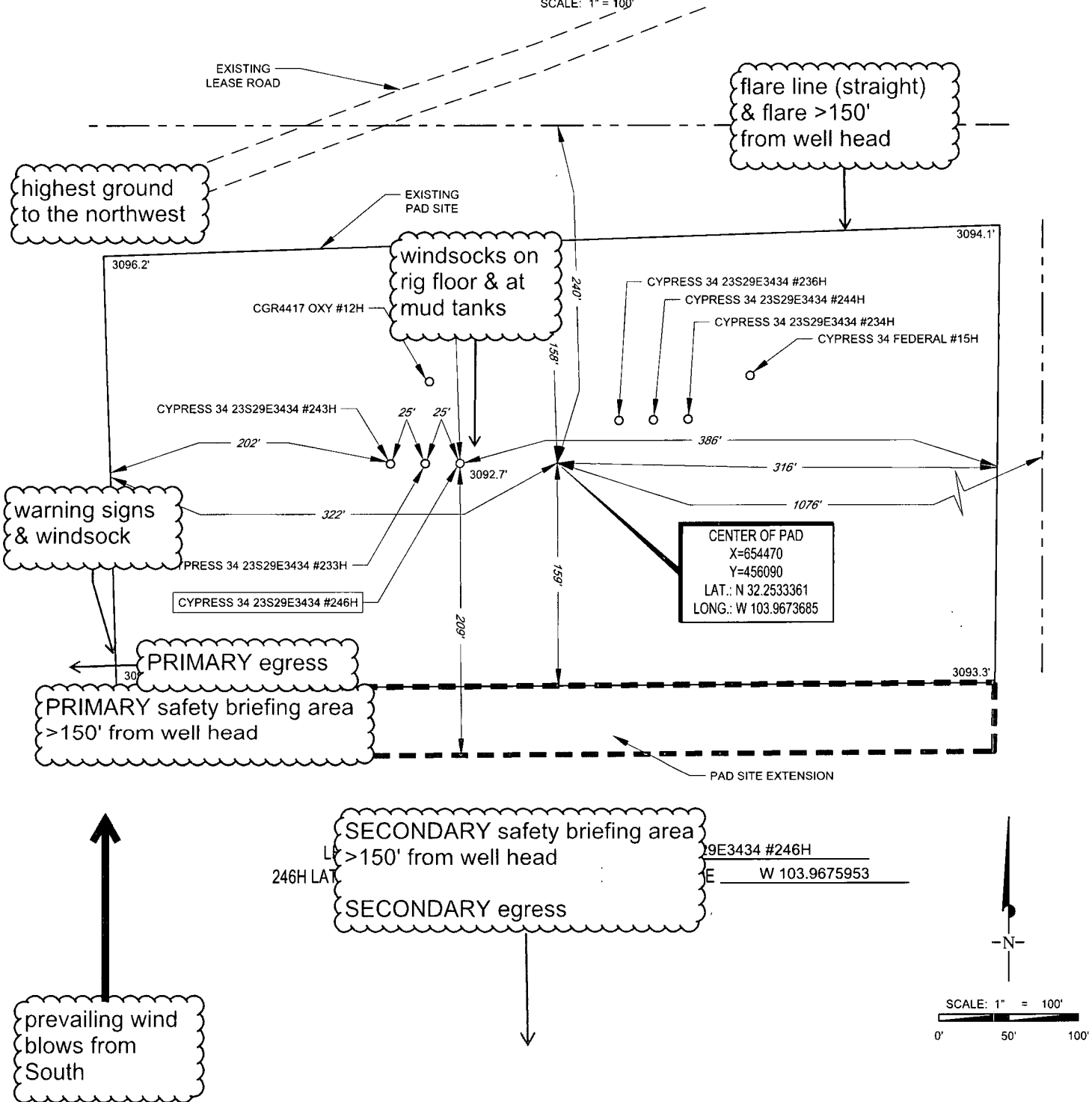
Emergency Contacts		
Carlsbad Police Department	575.887.7551	911
Carlsbad Medical Center	575.887.4100	911
Eddy County Fire Service	575.628.5450	911
Eddy County Sherriff	575.887.7551	911
Lea County Fire Service	575.391.2983	911
Lea County Sherriff	575.396.3611	911
Jal Police Department	575.395.2121	911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

EXHIBIT 2B



SECTION 3, TOWNSHIP 24-S, RANGE 29-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

DETAIL VIEW
SCALE: 1" = 100'



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

THIS PROPOSED PAD SITE LOCATION SHOWN HEREON HAS BEEN SURVEYED ON THE GROUND UNDER MY SUPERVISION AND PREPARED ACCORDING TO THE EVIDENCE FOUND AT THE TIME OF SURVEY, AND DATA PROVIDED BY TAP ROCK OPERATING, LLC. THIS CERTIFICATION IS MADE AND LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT AND IS NON-TRANSFERABLE. THIS SURVEY IS CERTIFIED FOR THIS TRANSACTION ONLY.

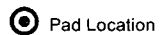
TOPOGRAPHIC
LOYALTY INNOVATION LEGACY

1400 EVERMAN PARKWAY, Ste. 146 • FT. WORTH, TEXAS 76140
TELEPHONE: (817) 744-7512 • FAX (817) 744-7554
2903 NORTH BIG SPRING • MIDLAND, TEXAS 79705
TELEPHONE: (432) 682-1653 OR (800) 767-1653 • FAX (432) 682-1743
WWW.TOPOGRAPHIC.COM

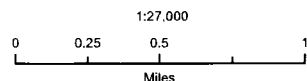
Tap Rock Operating LLC

Cypress 34 Federal Well Pad
H₂S Contingency Plan:
2 Mile Radius Map

Sec. 3, Township 24S, Range 29E
Eddy County, New Mexico



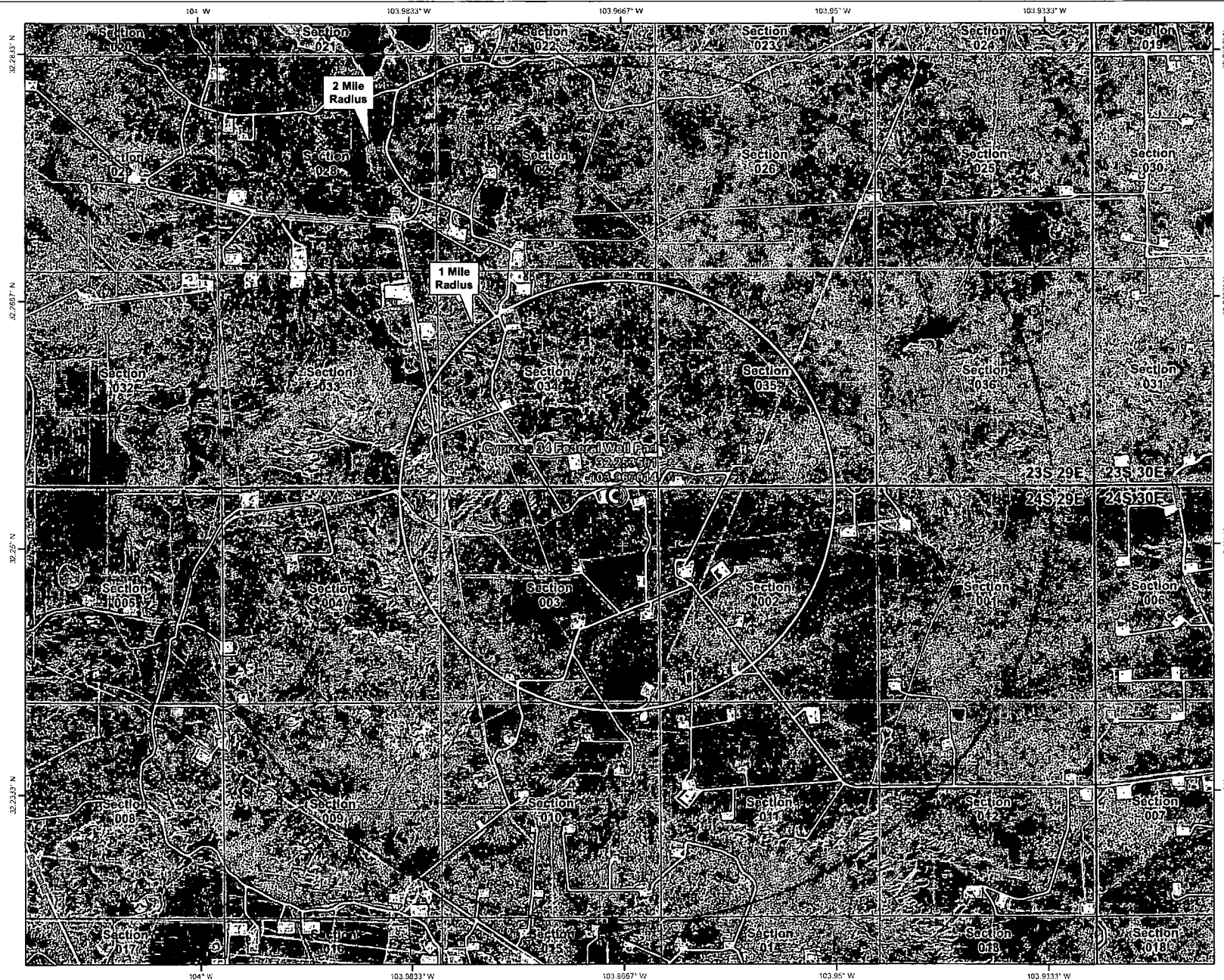
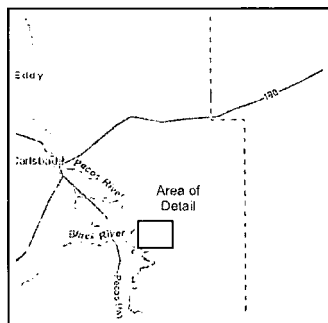
Pad Location



NAD 1983 New Mexico State Plane East
FIPS 3001 Feet



Prepared by Permits West, Inc., May 31, 2018
for Tap Rock Operating, LLC

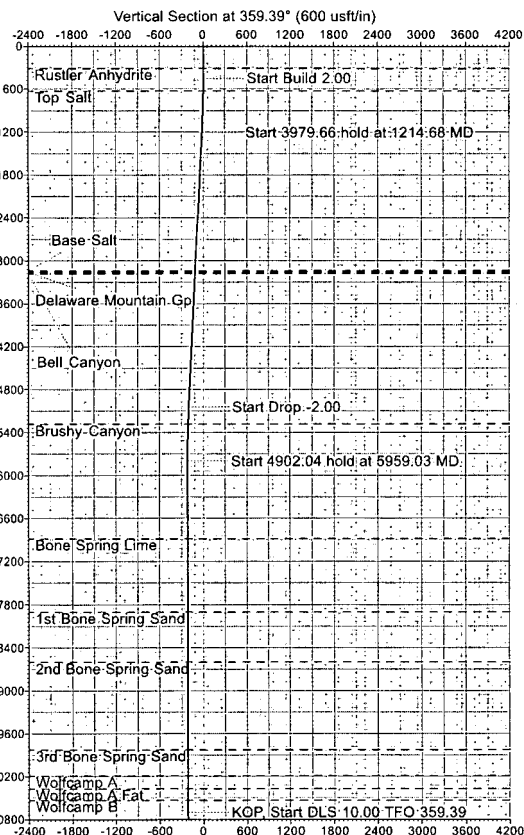




Tap Rock Operating, LLC
Eddy County, NM (NAD 83)
Cypress 34
243H
Plan 1
GL: 3093' + Est. KB: 26.5'

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

RKB Elevation: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')

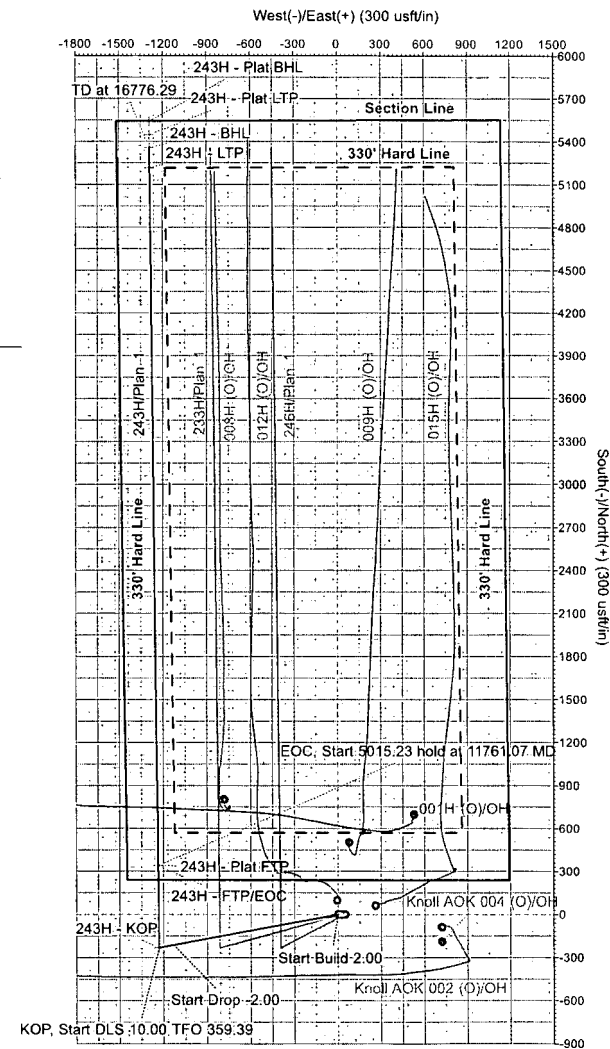


		+N-S	+E-W	Northing	Easting	Latitude	Longitude	Slot
		0.00	0.00	456089.00	654349.00	32.253335	-103.967758	
SECTION DETAILS								
Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	VSec
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	450.00	0.00	0.00	450.00	0.00	0.00	0.00	0.00
3	1214.68	15.29	259.33	1205.63	-18.79	-99.70	2.00	-17.72
4	5194.35	15.29	259.33	5044.37	-213.17	-1131.24	0.00	-201.12
5	5959.03	0.00	0.00	5800.00	-231.96	-1230.94	2.00	-218.84
6	10861.07	0.00	0.00	10702.04	-231.96	-1230.94	0.00	-218.84
7	11761.07	90.00	359.39	11275.00	340.97	-1237.00	10.00	354.12
8	16776.29	90.00	359.39	11275.00	5355.91	-1290.04	0.00	5369.34

TARGET DETAILS

Name	TVD	+N-S	+E-W	Northing	Easting	Shape
243H - Plat FTP	0.00	341.00	-1237.00	456430.00	653112.00	Point
243H - Plat LTP	0.00	5446.00	-1291.00	461535.00	653058.00	Point
243H - KOP	10702.04	-231.96	-1230.94	455857.04	653118.06	Point
243H - FTP/EOC	11275.00	340.97	-1237.00	456429.97	653112.00	Point
243H - LTP	11275.00	5215.91	-1288.56	461304.91	653060.44	Point
243H - BHL	11275.00	5355.91	-1290.04	461444.91	653058.96	Point
243H - Plat BHL	11275.00	5541.00	-1292.00	461630.00	653057.00	Point

*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;
Which could be missing or have inaccurate data.



Azimuths to Grd North
True North: -0.20°
Magnetic North: 5.87°
Magnetic Field
Strength: 47994.0nT
Dip Angle: 80.03°
Date: 6/19/2018
Model: HDGM

Azimuth Corrections

Total Magnetic Corr. (M to G): 6.87°

Declination (M to T): 7.07° East

36" x 48"

Vertical Section at 359.39" (300 usft/in)



Tap Rock Operating, LLC

Eddy County, NM (NAD 83)

Cypress 34

243H

OH

Plan: Plan 1

Standard Survey Report

28 August, 2018





Pro Directional Survey Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Well:	243H	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	Cypress 34		
Site Position:		Northing:	456,089.00 usft
From:	Map	Easting:	654,374.00 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32.253335
		Longitude:	-103.967678
		Grid Convergence:	0.20 °

Well	243H		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32.253335
		Longitude:	-103.967759
		Ground Level:	3,093.00 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
			(°)
	HDGM	8/19/2018	7.07
			Dip Angle
			(°)
			60.03
			Field Strength
			(nT)
			47,994.00

Design	Plan 1		
Audit Notes:			
Version:	Phase:	PROTOTYPE	Tie On Depth:
			0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction
			(°)
			359.39

Survey Tool Program	Date 8/23/2018		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		Description
0.00	16,776.29	Plan 1 (OH)	MWD+HDGM
			OWSG MWD + HRGM

Planned Survey									
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Turn
Depth	(°)	(°)	Depth	(usft)	(usft)	Section	Rate	Rate	Rate
(usft)			(usft)			(usft)	(°/100usft)	(°/100usft)	(°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
312.00	0.00	0.00	312.00	0.00	0.00	0.00	0.00	0.00	0.00
Rustler Anhydrite									
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
450.00	0.00	0.00	450.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
500.00	1.00	259.33	500.00	-0.08	-0.43	-0.08	2.00	2.00	0.00



Pro Directional Survey Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Well:	243H	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)
600.00	3.00	259.33	599.93	-0.73	-3.86	-0.69	2.00	2.00	0.00
627.11	3.54	259.33	627.00	-1.01	-5.38	-0.96	2.00	2.00	0.00
Top Salt									
700.00	5.00	259.33	699.68	-2.02	-10.71	-1.90	2.00	2.00	0.00
800.00	7.00	259.33	799.13	-3.95	-20.98	-3.73	2.00	2.00	0.00
900.00	9.00	259.33	898.15	-6.53	-34.66	-6.16	2.00	2.00	0.00
1,000.00	11.00	259.33	996.63	-9.75	-51.72	-9.20	2.00	2.00	0.00
1,100.00	13.00	259.33	1,094.44	-13.60	-72.15	-12.83	2.00	2.00	0.00
1,200.00	15.00	259.33	1,191.46	-18.08	-95.93	-17.05	2.00	2.00	0.00
1,214.68	15.29	259.33	1,205.63	-18.79	-99.70	-17.72	2.00	2.00	0.00
Start 3979.66 hold at 1214.68 MD									
1,300.00	15.29	259.33	1,287.93	-22.95	-121.81	-21.66	0.00	0.00	0.00
1,400.00	15.29	259.33	1,384.39	-27.84	-147.73	-26.26	0.00	0.00	0.00
1,500.00	15.29	259.33	1,480.85	-32.72	-173.65	-30.87	0.00	0.00	0.00
1,600.00	15.29	259.33	1,577.31	-37.61	-199.57	-35.48	0.00	0.00	0.00
1,700.00	15.29	259.33	1,673.77	-42.49	-225.49	-40.09	0.00	0.00	0.00
1,800.00	15.29	259.33	1,770.22	-47.38	-251.41	-44.70	0.00	0.00	0.00
1,900.00	15.29	259.33	1,866.68	-52.26	-277.33	-49.31	0.00	0.00	0.00
2,000.00	15.29	259.33	1,963.14	-57.15	-303.25	-53.91	0.00	0.00	0.00
2,100.00	15.29	259.33	2,059.60	-62.03	-329.18	-58.52	0.00	0.00	0.00
2,200.00	15.29	259.33	2,156.06	-66.91	-355.10	-63.13	0.00	0.00	0.00
2,300.00	15.29	259.33	2,252.52	-71.80	-381.02	-67.74	0.00	0.00	0.00
2,400.00	15.29	259.33	2,348.98	-76.68	-406.94	-72.35	0.00	0.00	0.00
2,500.00	15.29	259.33	2,445.43	-81.57	-432.86	-76.96	0.00	0.00	0.00
2,600.00	15.29	259.33	2,541.89	-86.45	-458.78	-81.56	0.00	0.00	0.00
2,700.00	15.29	259.33	2,638.35	-91.34	-484.70	-86.17	0.00	0.00	0.00
2,800.00	15.29	259.33	2,734.81	-96.22	-510.62	-90.78	0.00	0.00	0.00
2,900.00	15.29	259.33	2,831.27	-101.11	-536.54	-95.39	0.00	0.00	0.00
3,000.00	15.29	259.33	2,927.73	-105.99	-562.46	-100.00	0.00	0.00	0.00
3,100.00	15.29	259.33	3,024.19	-110.87	-588.38	-104.60	0.00	0.00	0.00
3,200.00	15.29	259.33	3,120.65	-115.76	-614.30	-109.21	0.00	0.00	0.00
3,216.96	15.29	259.33	3,137.00	-116.59	-618.69	-109.99	0.00	0.00	0.00
Base Salt									
3,237.69	15.29	259.33	3,157.00	-117.60	-624.07	-110.95	0.00	0.00	0.00
Delaware Mountain Gp									
3,258.42	15.29	259.33	3,177.00	-118.61	-629.44	-111.91	0.00	0.00	0.00
Bell Canyon									
3,300.00	15.29	259.33	3,217.10	-120.64	-640.22	-113.82	0.00	0.00	0.00
3,400.00	15.29	259.33	3,313.56	-125.53	-666.14	-118.43	0.00	0.00	0.00
3,500.00	15.29	259.33	3,410.02	-130.41	-692.06	-123.04	0.00	0.00	0.00
3,600.00	15.29	259.33	3,506.48	-135.30	-717.98	-127.65	0.00	0.00	0.00
3,700.00	15.29	259.33	3,602.94	-140.18	-743.90	-132.25	0.00	0.00	0.00
3,800.00	15.29	259.33	3,699.40	-145.07	-769.82	-136.86	0.00	0.00	0.00
3,900.00	15.29	259.33	3,795.86	-149.95	-795.74	-141.47	0.00	0.00	0.00



Pro Directional
Survey Report



Company: Tap Rock Operating, LLC
Project: Eddy County, NM (NAD 83)
Site: Cypress 34
Well: 243H
Wellbore: OH
Design: Plan 1

Local Co-ordinate Reference: Well 243H
TVD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
MD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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	15.29	259.33	3,892.31	-154.84	-821.66	-146.08	0.00	0.00	0.00
4,100.00	15.29	259.33	3,988.77	-159.72	-847.58	-150.69	0.00	0.00	0.00
4,200.00	15.29	259.33	4,085.23	-164.60	-873.50	-155.30	0.00	0.00	0.00
4,300.00	15.29	259.33	4,181.69	-169.49	-899.42	-159.90	0.00	0.00	0.00
4,400.00	15.29	259.33	4,278.15	-174.37	-925.34	-164.51	0.00	0.00	0.00
4,500.00	15.29	259.33	4,374.61	-179.26	-951.27	-169.12	0.00	0.00	0.00
4,600.00	15.29	259.33	4,471.07	-184.14	-977.19	-173.73	0.00	0.00	0.00
4,700.00	15.29	259.33	4,567.53	-189.03	-1,003.11	-178.34	0.00	0.00	0.00
4,800.00	15.29	259.33	4,663.98	-193.91	-1,029.03	-182.94	0.00	0.00	0.00
4,900.00	15.29	259.33	4,760.44	-198.80	-1,054.95	-187.55	0.00	0.00	0.00
5,000.00	15.29	259.33	4,856.90	-203.68	-1,080.87	-192.16	0.00	0.00	0.00
5,100.00	15.29	259.33	4,953.36	-208.56	-1,106.79	-196.77	0.00	0.00	0.00
5,194.35	15.29	259.33	5,044.37	-213.17	-1,131.24	-201.12	0.00	0.00	0.00
Start Drop -2.00									
5,200.00	15.18	259.33	5,049.82	-213.45	-1,132.70	-201.38	2.00	-2.00	0.00
5,300.00	13.18	259.33	5,146.77	-217.98	-1,156.78	-205.66	2.00	-2.00	0.00
5,400.00	11.18	259.33	5,244.51	-221.89	-1,177.51	-209.34	2.00	-2.00	0.00
5,443.25	10.32	259.33	5,287.00	-223.38	-1,185.43	-210.75	2.00	-2.00	0.00
Brushy Canyon									
5,500.00	9.18	259.33	5,342.93	-225.16	-1,194.88	-212.43	2.00	-2.00	0.00
5,600.00	7.18	259.33	5,441.91	-227.80	-1,208.86	-214.92	2.00	-2.00	0.00
5,700.00	5.18	259.33	5,541.32	-229.79	-1,219.44	-216.80	2.00	-2.00	0.00
5,800.00	3.18	259.33	5,641.05	-231.14	-1,226.60	-218.07	2.00	-2.00	0.00
5,900.00	1.18	259.33	5,740.97	-231.85	-1,230.34	-218.74	2.00	-2.00	0.00
5,959.03	0.00	0.01	5,800.00	-231.96	-1,230.94	-218.84	2.00	-2.00	0.00
Start 4902.04 hold at 5959.03 MD									
6,000.00	0.00	0.00	5,840.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
6,100.00	0.00	0.00	5,940.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
6,200.00	0.00	0.00	6,040.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
6,300.00	0.00	0.00	6,140.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
6,400.00	0.00	0.00	6,240.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
6,500.00	0.00	0.00	6,340.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
6,600.00	0.00	0.00	6,440.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
6,700.00	0.00	0.00	6,540.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
6,800.00	0.00	0.00	6,640.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
6,900.00	0.00	0.00	6,740.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
7,000.00	0.00	0.00	6,840.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
7,041.03	0.00	0.00	6,882.00	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
Bone Spring Lime									
7,100.00	0.00	0.00	6,940.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
7,200.00	0.00	0.00	7,040.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
7,300.00	0.00	0.00	7,140.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
7,400.00	0.00	0.00	7,240.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
7,500.00	0.00	0.00	7,340.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00



Pro Directional Survey Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Well:	243H	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)
7,600.00	0.00	0.00	7,440.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
7,700.00	0.00	0.00	7,540.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
7,800.00	0.00	0.00	7,640.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
7,900.00	0.00	0.00	7,740.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
8,000.00	0.00	0.00	7,840.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
8,061.03	0.00	0.00	7,902.00	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
1st Bone Spring Sand									
8,100.00	0.00	0.00	7,940.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
8,200.00	0.00	0.00	8,040.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
8,300.00	0.00	0.00	8,140.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
8,400.00	0.00	0.00	8,240.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
8,500.00	0.00	0.00	8,340.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
8,600.00	0.00	0.00	8,440.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
8,700.00	0.00	0.00	8,540.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
8,761.03	0.00	0.00	8,602.00	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
2nd Bone Spring Sand									
8,800.00	0.00	0.00	8,640.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
8,900.00	0.00	0.00	8,740.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
9,000.00	0.00	0.00	8,840.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
9,100.00	0.00	0.00	8,940.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
9,200.00	0.00	0.00	9,040.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
9,300.00	0.00	0.00	9,140.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
9,400.00	0.00	0.00	9,240.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
9,500.00	0.00	0.00	9,340.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
9,600.00	0.00	0.00	9,440.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
9,700.00	0.00	0.00	9,540.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
9,800.00	0.00	0.00	9,640.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
9,900.00	0.00	0.00	9,740.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
9,986.03	0.00	0.00	9,827.00	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
3rd Bone Spring Sand									
10,000.00	0.00	0.00	9,840.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
10,100.00	0.00	0.00	9,940.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
10,200.00	0.00	0.00	10,040.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
10,300.00	0.00	0.00	10,140.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
10,351.03	0.00	0.00	10,192.00	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
Wolfcamp A									
10,400.00	0.00	0.00	10,240.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
10,500.00	0.00	0.00	10,340.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
10,531.03	0.00	0.00	10,372.00	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
Wolfcamp A Fat									
10,600.00	0.00	0.00	10,440.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
10,691.03	0.00	0.00	10,532.00	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
Wolfcamp B									
10,700.00	0.00	0.00	10,540.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00



Pro Directional Survey Report



Company: Tap Rock Operating, LLC
Project: Eddy County, NM (NAD 83)
Site: Cypress 34
Well: 243H
Wellbore: OH
Design: Plan 1

Local Co-ordinate Reference: Well 243H
TVD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
MD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
10,800.00	0.00	0.00	10,640.97	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
10,861.07	0.00	0.00	10,702.04	-231.96	-1,230.94	-218.84	0.00	0.00	0.00
KOP, Start DLS 10.00 TFO 359.39									
10,900.00	3.89	359.39	10,740.94	-230.64	-1,230.95	-217.52	10.00	10.00	0.00
10,950.00	8.89	359.39	10,790.61	-225.07	-1,231.01	-211.95	10.00	10.00	0.00
11,000.00	13.89	359.39	10,839.61	-215.20	-1,231.12	-202.08	10.00	10.00	0.00
11,050.00	18.89	359.39	10,887.57	-201.09	-1,231.27	-187.97	10.00	10.00	0.00
11,100.00	23.89	359.39	10,934.11	-182.86	-1,231.46	-169.74	10.00	10.00	0.00
11,150.00	28.89	359.39	10,978.88	-160.64	-1,231.69	-147.52	10.00	10.00	0.00
11,200.00	33.89	359.39	11,021.55	-134.61	-1,231.97	-121.48	10.00	10.00	0.00
11,250.00	38.89	359.39	11,061.78	-104.95	-1,232.28	-91.83	10.00	10.00	0.00
11,300.00	43.89	359.39	11,099.28	-71.90	-1,232.63	-58.78	10.00	10.00	0.00
11,350.00	48.89	359.39	11,133.75	-35.71	-1,233.02	-22.58	10.00	10.00	0.00
11,400.00	53.89	359.39	11,164.94	3.34	-1,233.43	16.47	10.00	10.00	0.00
11,450.00	58.89	359.39	11,192.61	44.97	-1,233.87	58.10	10.00	10.00	0.00
11,500.00	63.89	359.39	11,216.54	88.85	-1,234.33	101.99	10.00	10.00	0.00
11,550.00	68.89	359.39	11,236.56	134.65	-1,234.82	147.79	10.00	10.00	0.00
11,600.00	73.89	359.39	11,252.51	182.02	-1,235.32	195.16	10.00	10.00	0.00
11,650.00	78.89	359.39	11,264.27	230.60	-1,235.83	243.74	10.00	10.00	0.00
11,700.00	83.89	359.39	11,271.75	280.02	-1,236.35	293.16	10.00	10.00	0.00
11,750.00	88.89	359.39	11,274.89	329.90	-1,236.88	343.05	10.00	10.00	0.00
11,761.07	90.00	359.39	11,275.00	340.97	-1,237.00	354.12	10.00	10.00	0.00
EOC, Start 5015.23 hold at 11761.07 MD									
11,800.00	90.00	359.39	11,275.00	379.89	-1,237.41	393.05	0.00	0.00	0.00
11,900.00	90.00	359.39	11,275.00	479.89	-1,238.47	493.05	0.00	0.00	0.00
12,000.00	90.00	359.39	11,275.00	579.88	-1,239.53	593.05	0.00	0.00	0.00
12,100.00	90.00	359.39	11,275.00	679.88	-1,240.58	693.05	0.00	0.00	0.00
12,200.00	90.00	359.39	11,275.00	779.87	-1,241.64	793.05	0.00	0.00	0.00
12,300.00	90.00	359.39	11,275.00	879.87	-1,242.70	893.05	0.00	0.00	0.00
12,400.00	90.00	359.39	11,275.00	979.86	-1,243.76	993.05	0.00	0.00	0.00
12,500.00	90.00	359.39	11,275.00	1,079.85	-1,244.81	1,093.05	0.00	0.00	0.00
12,600.00	90.00	359.39	11,275.00	1,179.85	-1,245.87	1,193.05	0.00	0.00	0.00
12,700.00	90.00	359.39	11,275.00	1,279.84	-1,246.93	1,293.05	0.00	0.00	0.00
12,800.00	90.00	359.39	11,275.00	1,379.84	-1,247.99	1,393.05	0.00	0.00	0.00
12,900.00	90.00	359.39	11,275.00	1,479.83	-1,249.05	1,493.05	0.00	0.00	0.00
13,000.00	90.00	359.39	11,275.00	1,579.83	-1,250.10	1,593.05	0.00	0.00	0.00
13,100.00	90.00	359.39	11,275.00	1,679.82	-1,251.16	1,693.05	0.00	0.00	0.00
13,200.00	90.00	359.39	11,275.00	1,779.82	-1,252.22	1,793.05	0.00	0.00	0.00
13,300.00	90.00	359.39	11,275.00	1,879.81	-1,253.28	1,893.05	0.00	0.00	0.00
13,400.00	90.00	359.39	11,275.00	1,979.80	-1,254.33	1,993.05	0.00	0.00	0.00
13,500.00	90.00	359.39	11,275.00	2,079.80	-1,255.39	2,093.05	0.00	0.00	0.00
13,600.00	90.00	359.39	11,275.00	2,179.79	-1,256.45	2,193.05	0.00	0.00	0.00
13,700.00	90.00	359.39	11,275.00	2,279.79	-1,257.51	2,293.05	0.00	0.00	0.00
13,800.00	90.00	359.39	11,275.00	2,379.78	-1,258.56	2,393.05	0.00	0.00	0.00



Pro Directional Survey Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Well:	243H	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)
13,900.00	90.00	359.39	11,275.00	2,479.78	-1,259.62	2,493.05	0.00	0.00	0.00
14,000.00	90.00	359.39	11,275.00	2,579.77	-1,260.68	2,593.05	0.00	0.00	0.00
14,100.00	90.00	359.39	11,275.00	2,679.77	-1,261.74	2,693.05	0.00	0.00	0.00
14,200.00	90.00	359.39	11,275.00	2,779.76	-1,262.79	2,793.05	0.00	0.00	0.00
14,300.00	90.00	359.39	11,275.00	2,879.75	-1,263.85	2,893.05	0.00	0.00	0.00
14,400.00	90.00	359.39	11,275.00	2,979.75	-1,264.91	2,993.05	0.00	0.00	0.00
14,500.00	90.00	359.39	11,275.00	3,079.74	-1,265.97	3,093.05	0.00	0.00	0.00
14,600.00	90.00	359.39	11,275.00	3,179.74	-1,267.03	3,193.05	0.00	0.00	0.00
14,700.00	90.00	359.39	11,275.00	3,279.73	-1,268.08	3,293.05	0.00	0.00	0.00
14,800.00	90.00	359.39	11,275.00	3,379.73	-1,269.14	3,393.05	0.00	0.00	0.00
14,900.00	90.00	359.39	11,275.00	3,479.72	-1,270.20	3,493.05	0.00	0.00	0.00
15,000.00	90.00	359.39	11,275.00	3,579.72	-1,271.26	3,593.05	0.00	0.00	0.00
15,100.00	90.00	359.39	11,275.00	3,679.71	-1,272.31	3,693.05	0.00	0.00	0.00
15,200.00	90.00	359.39	11,275.00	3,779.70	-1,273.37	3,793.05	0.00	0.00	0.00
15,300.00	90.00	359.39	11,275.00	3,879.70	-1,274.43	3,893.05	0.00	0.00	0.00
15,400.00	90.00	359.39	11,275.00	3,979.69	-1,275.49	3,993.05	0.00	0.00	0.00
15,500.00	90.00	359.39	11,275.00	4,079.69	-1,276.54	4,093.05	0.00	0.00	0.00
15,600.00	90.00	359.39	11,275.00	4,179.68	-1,277.60	4,193.05	0.00	0.00	0.00
15,700.00	90.00	359.39	11,275.00	4,279.68	-1,278.66	4,293.05	0.00	0.00	0.00
15,800.00	90.00	359.39	11,275.00	4,379.67	-1,279.72	4,393.05	0.00	0.00	0.00
15,900.00	90.00	359.39	11,275.00	4,479.66	-1,280.77	4,493.05	0.00	0.00	0.00
16,000.00	90.00	359.39	11,275.00	4,579.66	-1,281.83	4,593.05	0.00	0.00	0.00
16,100.00	90.00	359.39	11,275.00	4,679.65	-1,282.89	4,693.05	0.00	0.00	0.00
16,200.00	90.00	359.39	11,275.00	4,779.65	-1,283.95	4,793.05	0.00	0.00	0.00
16,300.00	90.00	359.39	11,275.00	4,879.64	-1,285.00	4,893.05	0.00	0.00	0.00
16,400.00	90.00	359.39	11,275.00	4,979.64	-1,286.06	4,993.05	0.00	0.00	0.00
16,500.00	90.00	359.39	11,275.00	5,079.63	-1,287.12	5,093.05	0.00	0.00	0.00
16,600.00	90.00	359.39	11,275.00	5,179.63	-1,288.18	5,193.05	0.00	0.00	0.00
16,700.00	90.00	359.39	11,275.00	5,279.62	-1,289.24	5,293.05	0.00	0.00	0.00
16,776.29	90.00	359.39	11,275.00	5,355.91	-1,290.04	5,369.34	0.00	0.00	0.00

TD at 16776.29



Pro Directional Survey Report



Company: Tap Rock Operating, LLC
Project: Eddy County, NM (NAD 83)
Site: Cypress 34
Well: 243H
Wellbore: OH
Design: Plan 1

Local Co-ordinate Reference: Well 243H
TVD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
MD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

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
243H - Plat FTP - plan misses target center by 1283.14usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Point	0.00	0.01	0.00	341.00	-1,237.00	456,430.00	653,112.00	32.254284	-103.971756
243H - Plat LTP - plan misses target center by 5596.93usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Point	0.00	0.01	0.00	5,446.00	-1,291.00	461,535.00	653,058.00	32.268317	-103.971875
243H - KOP - plan hits target center - Point	0.00	0.00	10,702.0 4	-231.96	-1,230.94	455,857.04	653,118.06	32.252709	-103.971743
243H - Plat BHL - plan misses target center by 185.10usft at 16776.29usft MD (11275.00 TVD, 5355.91 N, -1290.04 E) - Point	0.00	0.01	11,275.00	5,541.00	-1,292.00	461,630.00	653,057.00	32.268579	-103.971878
243H - LTP - plan hits target center - Point	0.00	0.00	11,275.00	5,215.91	-1,288.56	461,304.91	653,060.44	32.267685	-103.971870
243H - BHL - plan hits target center - Point	0.00	0.01	11,275.00	5,355.91	-1,290.04	461,444.91	653,058.96	32.268070	-103.971873
243H - FTP/EOC - plan hits target center - Point	0.00	0.00	11,275.00	340.97	-1,237.00	456,429.97	653,112.01	32.254284	-103.971756

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
312.00	312.00	Rustler Anhydrite			
627.11	627.00	Top Salt			
3,216.96	3,137.00	Base Salt			
3,237.69	3,157.00	Delaware Mountain Gp			
3,258.42	3,177.00	Bell Canyon			
5,443.25	5,287.00	Brushy Canyon			
7,041.03	6,882.00	Bone Spring Lime			
8,061.03	7,902.00	1st Bone Spring Sand			
8,761.03	8,602.00	2nd Bone Spring Sand			
9,986.03	9,827.00	3rd Bone Spring Sand			
10,351.03	10,192.00	Wolfcamp A			
10,531.03	10,372.00	Wolfcamp A Fat			
10,691.03	10,532.00	Wolfcamp B			



Pro Directional
Survey Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Well:	243H	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		Comment
		+N/-S (usft)	+E/-W (usft)	
450	450	0	0	Start Build 2.00
1215	1206	-19	-100	Start 3979.66 hold at 1214.68 MD
5194	5044	-213	-1131	Start Drop -2.00
5959	5800	-232	-1231	Start 4902.04 hold at 5959.03 MD
10,861	10,702	-232	-1231	KOP, Start DLS 10.00 TFO 359.39
11,761	11,275	341	-1237	EOC, Start 5015.23 hold at 11761.07 MD
16,776	11,275	5356	-1290	TD at 16776.29

Checked By: _____	Approved By: _____	Date: _____
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Tap Rock Operating, LLC

Eddy County, NM (NAD 83)

Cypress 34

243H

OH

Plan 1

Anticollision Report

23 August, 2018





Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 8/23/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	16,776.29	Plan 1 (OH)	MWD+HDGM	OWSG MWD + HRGM

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Cypress 34						
001H (O) - OH - OH	518.51	511.48	873.35	868.47	178.948	CC
001H (O) - OH - OH	8,167.28	9,511.88	977.30	858.39	8.218	ES, SF
008H (O) - OH - OH	3,569.56	3,453.34	869.64	829.79	21.823	CC
008H (O) - OH - OH	3,700.00	3,578.27	870.45	829.55	21.282	ES
008H (O) - OH - OH	8,600.00	8,312.16	1,061.48	980.12	13.046	SF
009H (O) - OH - OH	627.52	643.27	506.76	501.68	99.734	CC
009H (O) - OH - OH	700.00	715.65	507.06	501.21	86.629	ES
009H (O) - OH - OH	16,776.29	13,333.00	2,850.05	2,675.35	16.314	SF
012H (O) - OH - OH	515.21	517.59	99.18	95.13	24.511	CC
012H (O) - OH - OH	600.00	602.27	99.50	94.56	20.144	ES
012H (O) - OH - OH	16,776.29	15,026.06	1,224.62	1,048.30	6.946	SF
015H (O) - OH - OH	434.09	408.60	265.70	261.72	66.732	CC
015H (O) - OH - OH	450.00	423.54	265.73	261.58	64.126	ES
015H (O) - OH - OH	16,600.00	14,857.00	2,121.59	1,895.18	9.370	SF
233H - OH - Plan 1	450.00	450.00	25.00	20.84	6.011	CC
233H - OH - Plan 1	1,000.00	1,004.60	25.99	16.04	2.611	ES
233H - OH - Plan 1	16,776.29	16,482.56	481.27	248.65	2.069	SF
246H - OH - Plan 1	450.00	450.00	50.01	45.85	12.024	CC
246H - OH - Plan 1	700.00	703.91	50.97	44.21	7.543	ES
246H - OH - Plan 1	16,776.29	16,652.45	840.02	577.74	3.203	SF
Knoll AOK 002 (O) - OH - OH	8,134.83	9,945.79	204.95	74.96	1.577	CC, ES, SF

Offset Design											Cypress 34 - 001H (O) - OH - OH		Offset Site Error: 0.00 usft	
Survey Program: 100-MWD+HDGM, 7420-MWD+HDGM													Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
0.00	0.00	0.00	0.00	0.00	0.00	36.91	699.33	525.34	874.96					
100.00	100.00	74.08	74.08	0.20	0.20	36.91	699.47	525.40	874.82	874.42	0.40	2,201.693		
200.00	200.00	174.40	174.40	0.74	0.67	36.90	699.89	525.58	875.27	873.86	1.40	623.287		
300.00	300.00	279.80	279.80	1.27	1.23	36.87	700.26	525.24	875.36	872.86	2.50	350.158		
400.00	400.00	388.86	388.84	1.81	1.80	36.76	700.61	523.41	874.61	871.00	3.61	242.344		

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 Cypress 34 - 001H (O) - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 100-MWD+HDGM, 7420-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N-S (usft)	+E-W (usft)					
450.00	450.00	440.99	440.95	2.08	2.07	36.69	700.63	522.12	873.88	869.73	4.15	210.457	
500.00	500.00	492.43	492.38	2.34	2.34	137.32	700.63	520.73	873.39	868.71	4.68	186.439	
518.51	518.50	511.48	511.42	2.44	2.45	137.31	700.62	520.19	873.35	868.47	4.88	178.948	CC
600.00	599.93	589.20	589.10	2.86	2.86	137.31	700.79	518.00	874.41	868.70	5.72	152.990	
700.00	699.68	688.15	688.01	3.39	3.39	137.39	701.33	515.19	878.28	871.51	6.77	129.662	
800.00	799.13	791.97	791.79	3.93	3.95	137.63	701.51	512.45	884.57	876.70	7.87	112.451	
900.00	898.15	891.12	890.93	4.50	4.48	138.04	700.89	510.42	893.20	884.25	8.94	99.873	
1,000.00	996.63	984.77	984.57	5.09	4.98	138.53	700.24	509.04	904.79	894.79	10.00	90.445	
1,100.00	1,094.44	1,079.50	1,079.29	5.71	5.48	139.14	699.69	508.28	919.64	908.56	11.08	82.987	
1,200.00	1,191.46	1,163.83	1,163.61	6.37	5.91	139.73	699.54	508.14	938.02	925.91	12.11	77.444	
1,214.68	1,205.63	1,175.70	1,175.49	6.47	5.98	139.81	699.60	508.19	941.10	928.83	12.27	76.725	
1,300.00	1,287.93	1,244.63	1,244.40	7.07	6.33	140.53	700.41	508.84	959.91	946.78	13.12	73.143	
1,400.00	1,384.39	1,329.74	1,329.48	7.79	6.76	141.38	702.43	510.32	983.55	969.40	14.15	69.498	
1,500.00	1,480.85	1,428.86	1,428.55	8.51	7.27	142.31	705.07	512.22	1,007.80	992.53	15.27	66.008	
1,600.00	1,577.31	1,537.02	1,536.68	9.25	7.84	143.29	707.15	513.64	1,031.34	1,014.90	16.44	62.720	
1,700.00	1,673.77	1,640.84	1,640.49	10.00	8.38	144.19	708.33	514.47	1,054.22	1,036.63	17.60	59.908	
1,800.00	1,770.22	1,742.00	1,741.64	10.75	8.90	145.05	708.75	515.11	1,076.72	1,057.99	18.73	57.475	
1,900.00	1,866.68	1,839.83	1,839.47	11.50	9.41	145.86	708.77	515.73	1,099.16	1,079.31	19.85	55.380	
2,000.00	1,963.14	1,934.43	1,934.07	12.26	9.89	146.63	708.59	516.50	1,121.78	1,100.84	20.94	53.569	
2,100.00	2,059.60	2,028.28	2,027.92	13.03	10.38	147.36	708.69	517.38	1,144.88	1,122.85	22.03	51.967	
2,200.00	2,156.06	2,126.84	2,126.47	13.79	10.90	148.08	708.92	518.08	1,168.07	1,144.92	23.15	50.449	
2,300.00	2,252.52	2,221.68	2,221.31	14.56	11.40	148.75	709.08	518.72	1,191.38	1,167.13	24.25	49.126	
2,400.00	2,348.98	2,312.93	2,312.56	15.33	11.88	149.37	709.48	519.55	1,215.16	1,189.84	25.33	47.982	
2,500.00	2,445.43	2,409.77	2,409.38	16.11	12.39	149.99	710.10	520.44	1,239.23	1,212.80	26.44	46.874	
2,600.00	2,541.89	2,506.35	2,505.97	16.88	12.90	150.60	710.55	521.43	1,263.41	1,235.86	27.55	45.865	
2,700.00	2,638.35	2,605.34	2,604.95	17.65	13.42	151.22	710.63	522.58	1,287.58	1,258.92	28.67	44.914	
2,800.00	2,734.81	2,703.88	2,703.47	18.43	13.94	151.83	710.29	523.80	1,311.71	1,281.92	29.78	44.042	
2,900.00	2,831.27	2,806.21	2,805.79	19.21	14.47	152.46	709.34	525.11	1,335.64	1,304.72	30.92	43.196	
3,000.00	2,927.73	2,903.54	2,903.11	19.98	14.98	153.07	707.80	526.53	1,359.47	1,327.45	32.02	42.456	
3,100.00	3,024.19	3,006.31	3,005.84	20.76	15.52	153.71	705.51	528.13	1,383.15	1,349.99	33.16	41.716	
3,200.00	3,120.65	3,111.20	3,110.67	21.54	16.06	154.35	702.56	529.49	1,406.44	1,372.14	34.30	40.999	
3,300.00	3,217.10	3,209.35	3,208.78	22.32	16.58	154.93	699.75	530.38	1,429.53	1,394.13	35.41	40.376	
3,400.00	3,313.56	3,306.76	3,306.15	23.10	17.08	155.47	697.12	531.01	1,452.64	1,416.14	36.50	39.795	
3,500.00	3,410.02	3,401.45	3,400.81	23.88	17.58	155.97	694.79	531.50	1,475.89	1,438.31	37.58	39.272	
3,600.00	3,506.48	3,500.61	3,499.94	24.66	18.10	156.47	692.56	531.82	1,499.20	1,460.51	38.69	38.748	
3,700.00	3,602.94	3,598.57	3,597.88	25.45	18.61	156.94	690.39	531.95	1,522.48	1,482.69	39.79	38.261	
3,800.00	3,699.40	3,694.63	3,693.92	26.23	19.12	157.38	688.37	531.97	1,545.82	1,504.94	40.88	37.813	
3,900.00	3,795.86	3,785.90	3,785.18	27.01	19.60	157.79	686.63	532.06	1,569.42	1,527.49	41.93	37.426	
4,000.00	3,892.31	3,883.28	3,882.54	27.79	20.11	158.20	684.95	532.26	1,593.27	1,550.24	43.03	37.024	
4,100.00	3,988.77	3,976.34	3,975.59	28.58	20.60	158.58	683.53	532.35	1,617.21	1,573.11	44.10	36.672	
4,200.00	4,085.23	4,068.74	4,067.98	29.36	21.09	158.94	682.44	532.54	1,641.48	1,596.32	45.16	36.346	
4,300.00	4,181.69	4,162.83	4,162.07	30.14	21.59	159.29	681.62	532.77	1,666.01	1,619.77	46.24	36.031	
4,400.00	4,278.15	4,258.20	4,257.44	30.93	22.09	159.62	680.99	533.00	1,690.68	1,643.36	47.32	35.725	
4,500.00	4,374.61	4,354.85	4,354.09	31.71	22.60	159.94	680.54	533.15	1,715.44	1,667.02	48.42	35.427	
4,600.00	4,471.07	4,451.77	4,451.01	32.49	23.12	160.25	680.10	533.25	1,740.21	1,690.69	49.52	35.141	
4,700.00	4,567.53	4,548.26	4,547.49	33.28	23.63	160.56	679.61	533.37	1,765.02	1,714.41	50.62	34.871	
4,800.00	4,663.98	4,644.71	4,643.94	34.06	24.14	160.85	679.18	533.46	1,789.88	1,738.17	51.71	34.613	
4,900.00	4,760.44	4,743.42	4,742.65	34.85	24.66	161.14	678.77	533.51	1,814.75	1,761.93	52.82	34.354	
5,000.00	4,856.90	4,843.92	4,843.14	35.63	25.19	161.43	678.28	533.33	1,839.45	1,785.50	53.95	34.096	
5,100.00	4,953.36	4,941.97	4,941.19	36.42	25.71	161.70	677.72	533.05	1,864.05	1,808.99	55.05	33.859	
5,194.35	5,044.37	5,035.72	5,034.95	37.16	26.20	161.95	677.29	532.66	1,887.23	1,831.13	56.10	33.638	

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 Cypress 34 - 001H (O) - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 100-MWD+HDGM, 7420-MWD+HDGM												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
5,200.00	5,049.82	5,041.57	5,040.80	37.20	26.23	161.97	677.26	532.62	1,888.61	1,832.44	56.17	33.624	
5,300.00	5,146.77	5,143.72	5,142.94	37.95	26.77	162.36	676.64	531.95	1,911.15	1,853.85	57.30	33.356	
5,400.00	5,244.51	5,243.08	5,242.30	38.66	27.29	162.68	675.83	531.21	1,930.30	1,871.91	58.38	33.062	
5,500.00	5,342.93	5,348.17	5,347.38	39.30	27.84	162.95	675.04	530.29	1,946.10	1,886.60	59.50	32.706	
5,600.00	5,441.91	5,454.93	5,454.12	39.90	28.40	163.15	674.19	528.73	1,958.06	1,897.44	60.62	32.301	
5,700.00	5,541.32	5,555.91	5,555.09	40.44	28.93	163.29	673.31	527.13	1,966.58	1,904.90	61.67	31.886	
5,800.00	5,641.05	5,655.39	5,654.55	40.94	29.45	163.38	672.51	525.47	1,971.71	1,909.01	62.70	31.446	
5,900.00	5,740.97	5,756.81	5,755.95	41.39	29.98	163.42	671.66	523.82	1,973.53	1,909.80	63.73	30.968	
5,959.03	5,800.00	5,816.95	5,816.08	41.63	30.30	62.75	671.14	522.77	1,972.96	1,908.64	64.32	30.673	
6,000.00	5,840.97	5,856.36	5,855.49	41.78	30.50	62.75	670.77	522.12	1,972.18	1,907.47	64.71	30.477	
6,100.00	5,940.97	5,954.45	5,953.55	42.17	31.02	62.76	669.72	520.66	1,970.37	1,904.70	65.68	30.002	
6,200.00	6,040.97	6,053.47	6,052.56	42.56	31.54	62.77	668.67	519.24	1,968.61	1,901.96	66.65	29.536	
6,300.00	6,140.97	6,151.01	6,150.09	42.95	32.06	62.78	667.69	517.90	1,966.93	1,899.31	67.62	29.089	
6,400.00	6,240.97	6,248.61	6,247.67	43.34	32.58	62.79	666.68	516.78	1,965.39	1,896.81	68.59	28.656	
6,500.00	6,340.97	6,340.97	7,981.91	43.74	71.10	-2.79	747.19	-1,278.70	1,930.82	1,860.73	70.09	27.548	
6,600.00	6,440.97	9,596.42	7,982.10	44.14	70.97	-2.55	747.08	-1,274.48	1,845.36	1,773.11	72.25	25.541	
6,700.00	6,540.97	9,592.15	7,982.28	44.55	70.85	-2.30	746.98	-1,270.22	1,761.42	1,686.82	74.60	23.612	
6,800.00	6,640.97	9,587.85	7,982.47	44.95	70.73	-2.05	746.87	-1,265.92	1,679.23	1,602.08	77.15	21.766	
6,900.00	6,740.97	9,583.50	7,982.66	45.36	70.60	-1.79	746.75	-1,261.58	1,599.06	1,519.14	79.92	20.008	
7,000.00	6,840.97	9,579.12	7,982.86	45.78	70.48	-1.54	746.64	-1,257.20	1,521.23	1,438.32	82.92	18.347	
7,100.00	6,940.97	9,574.70	7,983.05	46.19	70.35	-1.28	746.53	-1,252.79	1,446.12	1,359.97	86.14	16.787	
7,200.00	7,040.97	9,570.23	7,983.25	46.61	70.22	-1.02	746.41	-1,248.33	1,374.16	1,284.56	89.60	15.337	
7,300.00	7,140.97	9,569.59	7,983.27	47.03	70.20	-0.98	746.38	-1,247.68	1,305.88	1,212.53	93.34	13.990	
7,400.00	7,240.97	9,561.92	7,983.63	47.45	69.98	-0.53	746.19	-1,240.03	1,241.90	1,144.78	97.12	12.787	
7,500.00	7,340.97	9,554.56	7,983.96	47.87	69.78	-0.10	745.99	-1,232.67	1,182.90	1,081.90	101.00	11.712	
7,600.00	7,440.97	9,547.47	7,984.27	48.30	69.57	0.31	745.78	-1,225.59	1,129.66	1,024.77	104.89	10.770	
7,700.00	7,540.97	9,540.65	7,984.56	48.73	69.38	0.71	745.56	-1,218.78	1,083.02	974.38	108.65	9.968	
7,800.00	7,640.97	9,534.08	7,984.84	49.16	69.19	1.10	745.34	-1,212.22	1,043.88	931.79	112.09	9.313	
7,900.00	7,740.97	9,527.74	7,985.11	49.59	69.01	1.47	745.11	-1,205.90	1,013.11	898.08	115.03	8.807	
8,000.00	7,840.97	9,521.63	7,985.36	50.03	68.84	1.83	744.88	-1,199.80	991.48	874.23	117.25	8.456	
8,100.00	7,940.97	9,515.74	7,985.60	50.47	68.67	2.17	744.64	-1,193.91	979.61	861.03	118.58	8.261	
8,167.28	8,008.25	9,511.88	7,985.75	50.76	68.56	2.40	744.49	-1,190.06	977.30	858.39	118.92	8.218 ES, SF	
8,200.00	8,040.97	9,510.04	7,985.82	50.90	68.51	2.51	744.41	-1,188.22	977.85	858.94	118.91	8.223	
8,300.00	8,140.97	9,504.54	7,986.03	51.35	68.36	2.83	744.17	-1,182.73	986.25	868.02	118.23	8.342	
8,400.00	8,240.97	9,499.22	7,986.24	51.79	68.20	3.14	743.93	-1,177.42	1,004.57	887.96	116.61	8.615	
8,500.00	8,340.97	9,494.34	7,986.42	52.23	68.07	3.42	743.71	-1,172.56	1,032.27	918.04	114.24	9.036	
8,600.00	8,440.97	9,489.92	7,986.59	52.68	67.94	3.68	743.50	-1,168.14	1,068.64	957.33	111.30	9.601	
8,700.00	8,540.97	9,485.42	7,986.76	53.13	67.82	3.95	743.28	-1,163.65	1,112.81	1,004.81	108.00	10.304	
8,800.00	8,640.97	9,480.84	7,986.94	53.58	67.69	4.22	743.06	-1,159.08	1,163.90	1,059.38	104.52	11.135	
8,900.00	8,740.97	9,476.18	7,987.12	54.03	67.56	4.49	742.83	-1,154.43	1,221.05	1,120.02	101.03	12.087	
9,000.00	8,840.97	9,471.44	7,987.30	54.48	67.42	4.77	742.60	-1,149.69	1,283.44	1,185.82	97.62	13.147	
9,100.00	8,940.97	9,466.61	7,987.49	54.94	67.29	5.05	742.36	-1,144.87	1,350.34	1,255.96	94.39	14.307	
9,200.00	9,040.97	9,461.69	7,987.69	55.39	67.15	5.34	742.11	-1,139.97	1,421.13	1,329.76	91.37	15.554	
9,300.00	9,140.97	9,456.68	7,987.89	55.85	67.01	5.63	741.85	-1,134.97	1,495.24	1,406.65	88.59	16.878	
9,400.00	9,240.97	9,451.58	7,988.10	56.31	66.87	5.93	741.59	-1,129.88	1,572.21	1,486.14	86.06	18.268	
9,500.00	9,340.97	9,446.39	7,988.31	56.77	66.72	6.23	741.32	-1,124.69	1,651.63	1,567.85	83.78	19.714	
9,600.00	9,440.97	9,441.09	7,988.53	57.23	66.57	6.54	741.04	-1,119.41	1,733.17	1,651.44	81.73	21.206	
9,700.00	9,540.97	9,435.69	7,988.76	57.69	66.42	6.85	740.75	-1,114.03	1,816.55	1,736.65	79.90	22.734	
9,800.00	9,640.97	9,430.82	7,988.96	58.16	66.29	7.14	740.48	-1,109.17	1,901.52	1,823.23	78.29	24.287	
9,900.00	9,740.97	9,427.27	7,989.11	58.62	66.19	7.34	740.29	-1,105.62	1,987.88	1,910.99	76.89	25.852	

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 Cypress 34 - 001H (O) - OH - OH														Offset Site Error:	0.00 usft
Survey Program: 100-MWD+HDGM, 7420-MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)					
10,000.00	9,840.97	9,423.78	7,989.25	59.09	66.09	7.55	740.10	-1,102.14	2,075.46	1,999.79	75.67	27.428			
10,100.00	9,940.97	9,420.37	7,989.39	59.56	66.00	7.75	739.91	-1,098.74	2,164.11	2,089.51	74.60	29.010			
10,200.00	10,040.97	9,417.02	7,989.53	60.02	65.90	7.94	739.73	-1,095.40	2,253.70	2,180.03	73.67	30.592			
10,300.00	10,140.97	9,413.74	7,989.66	60.49	65.81	8.13	739.55	-1,092.12	2,344.13	2,271.26	72.87	32.169			
10,400.00	10,240.97	9,410.52	7,989.79	60.97	65.72	8.32	739.37	-1,088.91	2,435.30	2,363.11	72.19	33.737			
10,500.00	10,340.97	9,407.36	7,989.91	61.44	65.64	8.50	739.20	-1,085.76	2,527.13	2,455.53	71.61	35.293			
10,600.00	10,440.97	9,404.27	7,990.04	61.91	65.55	8.68	739.03	-1,082.67	2,619.56	2,548.44	71.12	36.833			
10,700.00	10,540.97	9,401.23	7,990.15	62.39	65.47	8.86	738.86	-1,079.64	2,712.52	2,641.80	70.72	38.356			
10,800.00	10,640.97	9,398.24	7,990.27	62.86	65.38	9.03	738.70	-1,076.66	2,805.96	2,735.57	70.40	39.859			
10,861.07	10,702.04	9,396.45	7,990.34	63.15	65.33	9.14	738.60	-1,074.87	2,863.24	2,793.01	70.23	40.767			
10,900.00	10,740.94	9,395.38	7,990.38	63.34	65.31	8.28	738.54	-1,073.81	2,899.37	2,829.25	70.12	41.349			
10,950.00	10,790.61	9,394.23	7,990.42	63.57	65.27	6.96	738.48	-1,072.65	2,944.33	2,874.41	69.92	42.111			
11,000.00	10,839.61	9,393.32	7,990.45	63.79	65.25	6.04	738.43	-1,071.75	2,987.44	2,917.77	69.67	42.880			
11,050.00	10,887.57	9,392.66	7,990.48	64.00	65.23	5.35	738.39	-1,071.09	3,028.45	2,959.08	69.38	43.652			
11,100.00	10,934.11	9,392.25	7,990.49	64.19	65.22	4.82	738.37	-1,070.68	3,067.15	2,998.10	69.05	44.421			
11,150.00	10,978.88	9,392.09	7,990.50	64.37	65.21	4.40	738.36	-1,070.52	3,103.32	3,034.64	68.69	45.182			
11,200.00	11,021.55	9,392.18	7,990.50	64.53	65.22	4.06	738.36	-1,070.61	3,136.80	3,068.50	68.30	45.929			
11,250.00	11,061.78	9,392.51	7,990.48	64.67	65.23	3.79	738.38	-1,070.94	3,167.40	3,099.51	67.89	46.656			
11,300.00	11,099.28	9,393.08	7,990.46	64.79	65.24	3.57	738.41	-1,071.51	3,194.98	3,127.52	67.47	47.357			
11,350.00	11,133.75	9,393.88	7,990.43	64.89	65.26	3.38	738.46	-1,072.31	3,219.42	3,152.39	67.04	48.025			
11,400.00	11,164.94	9,394.91	7,990.39	64.97	65.29	3.23	738.51	-1,073.34	3,240.60	3,174.00	66.61	48.653			
11,450.00	11,192.61	9,396.16	7,990.35	65.04	65.33	3.10	738.58	-1,074.58	3,258.43	3,192.25	66.18	49.234			
11,500.00	11,216.54	9,397.60	7,990.29	65.09	65.37	2.99	738.66	-1,076.02	3,272.82	3,207.05	65.77	49.761			
11,550.00	11,236.56	9,399.24	7,990.23	65.13	65.41	2.90	738.75	-1,077.66	3,283.70	3,218.33	65.38	50.227			
11,600.00	11,252.51	9,401.06	7,990.16	65.16	65.46	2.83	738.85	-1,079.48	3,291.04	3,226.03	65.01	50.623			
11,650.00	11,264.27	9,403.05	7,990.08	65.19	65.52	2.78	738.96	-1,081.46	3,294.80	3,230.13	64.68	50.944			
11,700.00	11,271.75	9,405.19	7,990.00	65.22	65.58	2.74	739.08	-1,083.59	3,294.96	3,230.58	64.38	51.183			
11,750.00	11,274.89	9,407.47	7,989.91	65.26	65.64	2.72	739.21	-1,085.87	3,291.52	3,227.40	64.12	51.336			
11,761.07	11,275.00	9,407.99	7,989.89	65.27	65.65	2.72	739.23	-1,086.39	3,290.28	3,226.21	64.07	51.356			
11,800.00	11,275.00	9,409.84	7,989.82	65.31	65.71	2.68	739.34	-1,088.23	3,285.81	3,221.90	63.91	51.417			
11,900.00	11,275.00	9,414.56	7,989.63	65.46	65.84	2.60	739.60	-1,092.95	3,276.42	3,212.77	63.65	51.476			
12,000.00	11,275.00	9,419.27	7,989.44	65.68	65.97	2.52	739.85	-1,097.64	3,270.06	3,206.42	63.63	51.388			
12,100.00	11,275.00	9,423.97	7,989.25	65.97	66.10	2.44	740.11	-1,102.33	3,266.74	3,202.87	63.87	51.150			
12,158.95	11,275.00	9,426.73	7,989.13	66.18	66.17	2.39	740.26	-1,105.08	3,266.20	3,202.08	64.12	50.938			
12,200.00	11,275.00	9,432.00	7,988.91	66.35	66.32	2.30	740.55	-1,110.34	3,266.46	3,202.09	64.38	50.740			
12,300.00	11,275.00	9,434.34	7,988.81	66.82	66.38	2.26	740.67	-1,112.68	3,269.24	3,204.17	65.07	50.240			
12,400.00	11,275.00	9,442.56	7,988.47	67.37	66.61	2.11	741.11	-1,120.87	3,275.06	3,208.99	66.06	49.575			
12,500.00	11,275.00	9,450.52	7,988.14	68.01	66.84	1.97	741.53	-1,128.82	3,283.89	3,216.62	67.27	48.817			
12,600.00	11,275.00	9,458.25	7,987.83	68.73	67.05	1.84	741.93	-1,136.53	3,295.72	3,227.05	68.68	47.989			
12,700.00	11,275.00	9,465.76	7,987.53	69.53	67.27	1.71	742.32	-1,144.02	3,310.52	3,240.26	70.26	47.117			
12,800.00	11,275.00	9,473.05	7,987.24	70.39	67.47	1.58	742.68	-1,151.30	3,328.25	3,256.25	72.00	46.224			
12,900.00	11,275.00	9,480.14	7,986.96	71.32	67.67	1.45	743.03	-1,158.37	3,348.85	3,274.98	73.88	45.331			
13,000.00	11,275.00	9,487.03	7,986.70	72.31	67.86	1.33	743.36	-1,165.25	3,372.29	3,296.43	75.86	44.454			
13,100.00	11,275.00	9,493.73	7,986.44	73.36	68.05	1.22	743.68	-1,171.94	3,398.49	3,320.56	77.93	43.609			
13,200.00	11,275.00	9,500.24	7,986.20	74.46	68.23	1.10	743.98	-1,178.44	3,427.40	3,347.34	80.07	42.806			
13,300.00	11,275.00	9,506.59	7,985.97	75.61	68.41	0.99	744.27	-1,184.78	3,458.96	3,376.70	82.25	42.054			
13,400.00	11,275.00	9,496.00	7,986.36	76.80	68.11	1.18	743.78	-1,174.21	3,493.11	3,408.93	84.19	41.493			
13,500.00	11,275.00	9,507.59	7,985.92	78.04	68.44	0.97	744.30	-1,185.78	3,529.72	3,443.23	86.50	40.807			
13,600.00	11,275.00	9,510.51	7,985.80	79.32	68.53	0.92	744.43	-1,188.69	3,568.78	3,480.11	88.66	40.251			
13,700.00	11,275.00	9,513.34	7,985.69	80.64	68.61	0.87	744.55	-1,191.52	3,610.17	3,519.36	90.81	39.753			
13,800.00	11,275.00	9,516.07	7,985.58	82.00	68.68	0.82	744.66	-1,194.24	3,653.84	3,560.90	92.94	39.314			

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 Cypress 34 - 001H (O) - OH - OH														Offset Site Error: 0.00 usft
Survey Program: 100-MWD+HDGM, 7420-MWD+HDGM														Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
13,900.00	11,275.00	9,518.71	7,985.48	83.39	68.76	0.78	744.76	-1,196.88	3,699.68	3,604.65	95.03	38.931		
14,000.00	11,275.00	9,521.28	7,985.37	84.81	68.83	0.73	744.86	-1,199.44	3,747.63	3,650.55	97.08	38.603		
14,100.00	11,275.00	9,523.76	7,985.27	86.27	68.90	0.69	744.96	-1,201.92	3,797.61	3,698.52	99.09	38.326		
14,200.00	11,275.00	9,526.16	7,985.17	87.75	68.97	0.65	745.05	-1,204.32	3,849.53	3,748.49	101.04	38.099		
14,300.00	11,275.00	9,528.49	7,985.08	89.27	69.04	0.61	745.14	-1,206.65	3,903.32	3,800.38	102.94	37.918		
14,400.00	11,275.00	9,530.76	7,984.98	90.81	69.10	0.57	745.22	-1,208.91	3,958.90	3,854.12	104.79	37.781		
14,500.00	11,275.00	9,532.95	7,984.89	92.37	69.16	0.53	745.30	-1,211.10	4,016.21	3,909.63	106.57	37.685		
14,600.00	11,275.00	9,535.09	7,984.80	93.96	69.22	0.49	745.37	-1,213.23	4,075.15	3,966.85	108.30	37.628		
14,700.00	11,275.00	9,537.16	7,984.71	95.57	69.28	0.46	745.44	-1,215.30	4,135.68	4,025.71	109.97	37.607		
14,800.00	11,275.00	9,539.17	7,984.63	97.20	69.34	0.42	745.51	-1,217.31	4,197.71	4,086.13	111.58	37.620		
14,900.00	11,275.00	9,541.13	7,984.54	98.86	69.39	0.39	745.58	-1,219.27	4,261.18	4,148.05	113.14	37.665		
15,000.00	11,275.00	9,543.04	7,984.46	100.53	69.45	0.35	745.64	-1,221.17	4,326.03	4,211.40	114.63	37.739		
15,100.00	11,275.00	9,560.00	7,983.71	102.22	69.93	0.06	746.14	-1,238.11	4,392.26	4,275.81	116.46	37.715		
15,200.00	11,275.00	9,560.00	7,983.71	103.93	69.93	0.06	746.14	-1,238.11	4,459.68	4,341.88	117.80	37.857		
15,300.00	11,275.00	9,560.00	7,983.71	105.66	69.93	0.06	746.14	-1,238.11	4,528.30	4,409.21	119.09	38.023		
15,400.00	11,275.00	9,560.00	7,983.71	107.40	69.93	0.06	746.14	-1,238.11	4,598.07	4,477.74	120.33	38.212		
15,500.00	11,275.00	9,560.00	7,983.71	109.16	69.93	0.06	746.14	-1,238.11	4,668.94	4,547.42	121.52	38.421		
15,600.00	11,275.00	9,560.00	7,983.71	110.93	69.93	0.06	746.14	-1,238.11	4,740.86	4,618.20	122.66	38.650		
15,700.00	11,275.00	9,560.00	7,983.71	112.71	69.93	0.06	746.14	-1,238.11	4,813.78	4,690.03	123.75	38.898		
15,800.00	11,275.00	9,560.00	7,983.71	114.51	69.93	0.06	746.14	-1,238.11	4,887.66	4,762.86	124.80	39.162		
15,900.00	11,275.00	9,560.00	7,983.71	116.32	69.93	0.06	746.14	-1,238.11	4,962.46	4,836.65	125.81	39.443		
16,000.00	11,275.00	9,560.00	7,983.71	118.14	69.93	0.06	746.14	-1,238.11	5,038.13	4,911.35	126.78	39.739		
16,100.00	11,275.00	9,562.51	7,983.60	119.98	70.00	0.01	746.20	-1,240.61	5,114.64	4,986.86	127.78	40.027		
16,200.00	11,275.00	9,566.07	7,983.44	121.82	70.10	-0.05	746.30	-1,244.17	5,191.94	5,063.16	128.78	40.318		
16,300.00	11,275.00	9,569.60	7,983.28	123.68	70.21	-0.11	746.39	-1,247.70	5,270.00	5,140.27	129.74	40.621		
16,400.00	11,275.00	9,573.10	7,983.12	125.54	70.31	-0.17	746.48	-1,251.19	5,348.80	5,218.13	130.66	40.935		
16,500.00	11,275.00	9,576.57	7,982.97	127.41	70.41	-0.23	746.58	-1,254.66	5,428.28	5,296.72	131.56	41.261		
16,600.00	11,275.00	9,580.00	7,982.82	129.30	70.50	-0.29	746.66	-1,258.09	5,508.44	5,376.01	132.43	41.597		
16,700.00	11,275.00	9,583.41	7,982.67	131.19	70.60	-0.35	746.75	-1,261.48	5,589.23	5,455.97	133.26	41.942		
16,776.29	11,275.00	9,585.98	7,982.55	132.64	70.68	-0.40	746.82	-1,264.06	5,651.28	5,517.40	133.88	42.211		



Pro Directional
Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 Cypress 34 - 008H (O) - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 408-MWD+HDGM, 3154-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	-44.15	805.13	-781.56	1,123.41					
100.00	100.00	45.50	45.50	0.20	0.12	-44.15	805.13	-781.56	1,122.08	1,121.77	0.31	3,587.907		
200.00	200.00	145.50	145.50	0.74	0.37	-44.15	805.13	-781.56	1,122.08	1,120.98	1.10	1,016.853		
300.00	300.00	245.50	245.50	1.27	0.62	-44.15	805.13	-781.56	1,122.08	1,120.19	1.89	592.368		
400.00	400.00	345.50	345.50	1.81	0.87	-44.15	805.13	-781.56	1,122.08	1,119.40	2.68	417.911		
450.00	450.00	395.50	395.50	2.08	1.00	-44.15	805.13	-781.56	1,122.08	1,119.00	3.08	364.271		
500.00	500.00	464.80	464.79	2.34	1.33	56.55	804.63	-781.26	1,121.44	1,117.77	3.67	305.837		
600.00	599.93	565.37	565.35	2.86	1.84	56.74	803.05	-780.35	1,117.77	1,113.06	4.70	237.722		
700.00	699.68	665.73	665.69	3.39	2.36	57.11	801.41	-779.44	1,112.14	1,106.39	5.75	193.453		
800.00	799.13	765.97	765.92	3.93	2.89	57.66	799.58	-778.63	1,104.60	1,097.78	6.82	161.955		
900.00	898.15	865.39	865.31	4.50	3.42	58.38	797.44	-778.05	1,095.20	1,087.29	7.91	138.527		
1,000.00	996.63	962.90	962.79	5.09	3.94	59.28	795.23	-777.66	1,084.16	1,075.15	9.01	120.392		
1,100.00	1,094.44	1,060.68	1,060.54	5.71	4.46	60.37	792.97	-777.43	1,071.63	1,061.49	10.13	105.748		
1,200.00	1,191.46	1,159.32	1,159.15	6.37	4.99	61.67	790.42	-777.36	1,057.59	1,046.29	11.30	93.579		
1,214.68	1,205.63	1,173.74	1,173.57	6.47	5.07	61.87	790.02	-777.36	1,055.41	1,043.93	11.48	91.954		
1,300.00	1,287.93	1,257.03	1,256.82	7.07	5.52	62.86	787.57	-777.45	1,042.77	1,030.27	12.50	83.450		
1,400.00	1,384.39	1,353.85	1,353.60	7.79	6.04	64.03	784.63	-777.63	1,028.31	1,014.61	13.70	75.033		
1,500.00	1,480.85	1,450.50	1,450.19	8.51	6.56	65.23	781.62	-777.86	1,014.29	999.36	14.93	67.935		
1,600.00	1,577.31	1,546.73	1,546.38	9.25	7.08	66.44	778.61	-778.15	1,000.76	984.59	16.17	61.895		
1,700.00	1,673.77	1,642.35	1,641.95	10.00	7.59	67.68	775.65	-778.48	987.76	970.34	17.42	56.713		
1,800.00	1,770.22	1,736.78	1,736.35	10.75	8.10	68.95	773.03	-778.67	975.44	956.77	18.67	52.245		
1,900.00	1,866.68	1,830.39	1,829.93	11.50	8.61	70.26	770.82	-778.67	963.90	943.97	19.93	48.363		
2,000.00	1,963.14	1,922.50	1,922.03	12.26	9.10	71.59	769.10	-778.63	953.33	932.14	21.19	44.986		
2,100.00	2,059.60	2,015.75	2,015.27	13.03	9.61	72.98	767.84	-778.60	943.81	921.34	22.47	42.011		
2,200.00	2,156.06	2,111.96	2,111.47	13.79	10.12	74.45	766.72	-778.51	935.06	911.30	23.76	39.354		
2,300.00	2,252.52	2,207.53	2,207.04	14.56	10.64	75.93	765.70	-778.35	927.01	901.96	25.06	36.997		
2,400.00	2,348.98	2,301.85	2,301.35	15.33	11.14	77.42	764.84	-778.28	919.84	893.49	26.35	34.909		
2,500.00	2,445.43	2,399.32	2,398.82	16.11	11.67	78.98	764.09	-778.30	913.53	885.87	27.66	33.026		
2,600.00	2,541.89	2,502.82	2,502.31	16.88	12.22	80.68	762.90	-777.79	907.41	878.40	29.00	31.287		
2,700.00	2,638.35	2,605.24	2,604.71	17.65	12.77	82.40	761.13	-776.66	901.32	870.98	30.34	29.709		
2,800.00	2,734.81	2,706.95	2,706.38	18.43	13.32	84.13	758.73	-775.45	895.41	863.74	31.67	28.273		
2,900.00	2,831.27	2,808.37	2,807.75	19.21	13.87	85.87	755.72	-774.16	889.71	856.71	33.00	26.962		
3,000.00	2,927.73	2,909.47	2,908.78	19.98	14.42	87.63	752.22	-772.56	884.27	849.94	34.32	25.763		
3,100.00	3,024.19	3,004.06	3,003.29	20.76	14.93	89.31	748.72	-770.89	879.40	843.79	35.62	24.691		
3,200.00	3,120.65	3,098.67	3,097.82	21.54	15.31	91.00	745.43	-769.25	875.59	838.81	36.78	23.809		
3,300.00	3,217.10	3,193.28	3,192.38	22.32	15.48	92.70	742.37	-767.71	872.89	835.18	37.71	23.149		
3,400.00	3,313.56	3,290.68	3,289.70	23.10	15.51	94.46	739.18	-766.11	871.01	832.51	38.50	22.626		
3,500.00	3,410.02	3,387.09	3,386.04	23.88	15.56	96.22	735.91	-764.43	869.88	830.59	39.29	22.140		
3,569.56	3,477.11	3,453.34	3,452.25	24.43	15.60	97.42	733.70	-763.27	869.64	829.79	39.85	21.823 CC		
3,600.00	3,506.48	3,482.34	3,481.23	24.66	15.62	97.95	732.75	-762.76	869.69	829.60	40.09	21.691		
3,700.00	3,602.94	3,578.27	3,577.10	25.45	15.71	99.70	729.63	-761.05	870.45	829.55	40.90	21.282 ES		
3,800.00	3,699.40	3,674.97	3,673.72	26.23	15.81	101.46	726.45	-759.29	872.06	830.34	41.72	20.905		
3,900.00	3,795.86	3,760.21	3,758.91	27.01	15.90	103.01	723.83	-757.70	874.79	832.27	42.52	20.575		
4,000.00	3,892.31	3,834.48	3,833.16	27.79	16.00	104.35	723.20	-756.21	880.48	837.19	43.29	20.341		
4,100.00	3,988.77	3,911.00	3,909.65	28.58	16.09	105.71	724.45	-754.55	889.40	845.38	44.02	20.204		
4,200.00	4,085.23	4,002.77	4,001.36	29.36	16.23	107.31	727.17	-752.54	900.42	855.61	44.81	20.094		
4,300.00	4,181.69	4,097.84	4,096.36	30.14	16.37	108.92	730.07	-750.59	912.31	866.71	45.60	20.005		
4,400.00	4,278.15	4,193.77	4,192.23	30.93	16.54	110.51	733.02	-748.65	924.97	878.56	46.42	19.928		
4,500.00	4,374.61	4,289.71	4,288.10	31.71	16.71	112.05	735.94	-746.67	938.34	891.12	47.22	19.872		
4,600.00	4,471.07	4,384.39	4,382.72	32.49	16.91	113.54	738.87	-744.70	952.44	904.41	48.03	19.829		
4,700.00	4,567.53	4,479.07	4,477.33	33.28	17.10	114.97	741.90	-742.77	967.31	918.47	48.84	19.807		

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



Pro Directional
Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 Cypress 34 - 008H (O) - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 408-MWD+HDGM, 3154-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance				Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Between Centres (usft)	Between Ellipses (usft)	Between Centres (usft)	Between Ellipses (usft)				
4,800.00	4,663.98	4,574.67	4,572.86	34.06	17.32	116.38	745.04	-740.87	982.86	933.19	49.66	19.791		
4,900.00	4,760.44	4,670.73	4,668.85	34.85	17.55	117.75	748.21	-738.99	999.01	948.53	50.48	19.789		
5,000.00	4,856.90	4,785.34	4,783.41	35.63	17.84	119.30	751.15	-737.66	1,014.81	963.38	51.43	19.731		
5,100.00	4,953.36	4,893.65	4,891.71	36.42	18.13	120.66	752.49	-737.89	1,029.45	977.10	52.35	19.666		
5,194.35	5,044.37	4,984.60	4,982.66	37.16	18.38	121.78	753.30	-738.23	1,043.35	990.20	53.15	19.630		
5,200.00	5,049.82	4,990.05	4,988.11	37.20	18.39	121.86	753.34	-738.24	1,044.19	990.99	53.20	19.629		
5,300.00	5,146.77	5,087.02	5,085.07	37.95	18.67	123.18	754.15	-738.43	1,058.35	1,004.31	54.04	19.584		
5,400.00	5,244.51	5,184.97	5,183.02	38.66	18.96	124.30	754.89	-738.51	1,070.93	1,016.05	54.87	19.516		
5,500.00	5,342.93	5,284.12	5,282.17	39.30	19.27	125.23	755.58	-738.52	1,081.74	1,026.05	55.70	19.422		
5,600.00	5,441.91	5,384.45	5,382.50	39.90	19.59	125.97	756.19	-738.59	1,090.60	1,034.09	56.51	19.298		
5,700.00	5,541.32	5,485.30	5,483.34	40.44	19.91	126.52	756.71	-738.78	1,097.38	1,040.05	57.32	19.144		
5,800.00	5,641.05	5,586.52	5,584.56	40.94	20.25	126.88	757.18	-739.17	1,101.99	1,043.87	58.12	19.959		
5,900.00	5,740.97	5,688.10	5,686.14	41.39	20.60	127.04	757.61	-739.79	1,104.39	1,045.47	58.92	18.744		
5,959.03	5,800.00	5,748.14	5,746.17	41.63	20.80	126.37	757.84	-740.27	1,104.75	1,045.36	59.38	18.604		
6,000.00	5,840.97	5,789.80	5,787.84	41.78	20.95	126.35	757.99	-740.67	1,104.71	1,045.01	59.70	18.505		
6,100.00	5,940.97	5,890.48	5,888.51	42.17	21.31	126.30	758.29	-741.63	1,104.55	1,044.07	60.48	18.264		
6,200.00	6,040.97	5,991.00	5,989.03	42.56	21.66	126.25	758.45	-742.42	1,104.34	1,043.08	61.26	18.028		
6,300.00	6,140.97	6,091.28	6,089.30	42.95	22.04	126.22	758.53	-743.15	1,104.09	1,042.04	62.05	17.794		
6,400.00	6,240.97	6,191.56	6,189.58	43.34	22.41	126.18	758.63	-743.95	1,103.83	1,040.98	62.85	17.563		
6,500.00	6,340.97	6,291.85	6,289.87	43.74	22.79	126.14	758.66	-744.69	1,103.53	1,039.87	63.66	17.335		
6,600.00	6,440.97	6,392.50	6,390.52	44.14	23.18	126.12	758.58	-745.28	1,103.21	1,038.73	64.48	17.110		
6,700.00	6,540.97	6,494.53	6,492.54	44.55	23.58	126.10	758.31	-745.79	1,102.75	1,037.44	65.31	16.885		
6,800.00	6,640.97	6,596.06	6,594.07	44.95	23.98	126.09	757.83	-746.28	1,102.11	1,035.97	66.14	16.662		
6,900.00	6,740.97	6,696.61	6,694.62	45.36	24.38	126.08	757.30	-746.82	1,101.40	1,034.42	66.98	16.443		
7,000.00	6,840.97	6,797.92	6,795.93	45.78	24.79	126.06	756.74	-747.47	1,100.62	1,032.78	67.83	16.226		
7,100.00	6,940.97	6,900.14	6,898.14	46.19	25.21	126.04	756.03	-748.26	1,099.66	1,030.96	68.69	16.008		
7,200.00	7,040.97	7,007.91	7,005.90	46.61	25.65	126.01	754.97	-749.34	1,098.34	1,028.74	69.60	15.780		
7,300.00	7,140.97	7,119.20	7,117.16	47.03	26.12	125.97	753.00	-751.09	1,096.05	1,025.52	70.53	15.540		
7,400.00	7,240.97	7,221.35	7,219.26	47.45	26.55	125.95	750.52	-752.86	1,093.12	1,021.70	71.42	15.307		
7,500.00	7,340.97	7,323.02	7,320.89	47.87	26.99	125.95	747.67	-754.11	1,090.06	1,017.76	72.29	15.078		
7,600.00	7,440.97	7,435.68	7,433.46	48.30	27.48	126.01	743.43	-755.04	1,086.32	1,013.08	73.23	14.833		
7,700.00	7,540.97	7,537.97	7,535.62	48.73	27.92	126.10	738.34	-755.63	1,081.58	1,007.46	74.12	14.593		
7,800.00	7,640.97	7,621.91	7,619.49	49.16	28.29	126.12	735.26	-756.61	1,077.77	1,002.85	74.92	14.386		
7,900.00	7,740.97	7,709.02	7,706.58	49.59	28.68	126.07	733.87	-758.36	1,075.43	999.70	75.74	14.200		
8,000.00	7,840.97	7,822.31	7,819.82	50.03	29.19	125.99	731.98	-760.92	1,072.95	996.22	76.73	13.984		
8,100.00	7,940.97	7,932.22	7,929.65	50.47	29.68	125.95	728.70	-763.35	1,069.29	991.59	77.69	13.763		
8,200.00	8,040.97	8,037.80	8,035.13	50.90	30.16	125.89	725.15	-766.44	1,064.98	986.34	78.64	13.543		
8,300.00	8,140.97	8,140.72	8,137.91	51.35	30.63	125.79	721.54	-770.27	1,060.20	980.63	79.58	13.323		
8,400.00	8,240.97	8,205.63	8,202.69	51.79	30.93	125.61	721.20	-774.14	1,057.09	976.78	80.30	13.163		
8,455.53	8,296.50	8,245.13	8,242.00	52.04	31.11	125.40	722.49	-777.83	1,056.55	975.83	80.72	13.089		
8,500.00	8,340.97	8,269.28	8,265.93	52.23	31.22	125.22	724.05	-780.61	1,056.96	975.98	80.98	13.052		
8,600.00	8,440.97	8,312.16	8,308.17	52.68	31.41	124.83	728.74	-786.32	1,061.48	980.12	81.37	13.046 SF		
8,700.00	8,540.97	8,353.00	8,347.92	53.13	31.59	124.38	735.99	-792.21	1,071.73	990.16	81.57	13.139		
8,800.00	8,640.97	8,391.77	8,385.14	53.58	31.75	123.90	745.15	-797.98	1,087.54	1,005.96	81.58	13.330		
8,900.00	8,740.97	8,434.48	8,425.63	54.03	31.93	123.35	757.33	-803.96	1,108.62	1,027.09	81.53	13.598		
9,000.00	8,840.97	8,479.00	8,467.60	54.48	32.12	122.83	771.46	-808.49	1,134.46	1,053.05	81.41	13.935		
9,100.00	8,940.97	8,510.00	8,496.60	54.94	32.25	122.52	782.25	-810.35	1,165.13	1,084.23	80.90	14.402		
9,200.00	9,040.97	8,543.00	8,527.07	55.39	32.39	122.21	794.83	-811.75	1,200.45	1,120.10	80.35	14.940		
9,300.00	9,140.97	8,574.00	8,555.11	55.85	32.53	121.90	808.01	-812.79	1,240.45	1,160.76	79.70	15.565		
9,400.00	9,240.97	8,606.00	8,582.96	56.31	32.66	121.56	823.71	-813.77	1,285.57	1,206.53	79.04	16.264		

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 Cypress 34 - 008H (O) - OH - OH														Offset Site Error:	0.00 usft
Survey Program: 408-MWD+HDGM, 3154-MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance								Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
9,500.00	9,340.97	8,620.89	8,595.48	56.77	32.73	21.39	831.76	-814.26	1,335.14	1,257.22	77.92	17.135			
9,600.00	9,440.97	8,637.00	8,608.73	57.23	32.80	21.20	840.90	-814.82	1,388.91	1,312.08	76.84	18.076			
9,700.00	9,540.97	8,669.00	8,634.37	57.69	32.94	20.81	860.02	-815.86	1,445.96	1,369.71	76.24	18.965			
9,800.00	9,640.97	8,700.00	8,658.37	58.16	33.07	20.44	879.63	-816.58	1,506.22	1,430.54	75.68	19.904			
9,900.00	9,740.97	8,714.97	8,669.58	58.62	33.14	20.27	889.54	-816.78	1,569.51	1,494.79	74.72	21.005			
10,000.00	9,840.97	8,732.00	8,681.96	59.09	33.22	20.07	901.23	-816.88	1,635.69	1,561.79	73.90	22.132			
10,100.00	9,940.97	8,746.09	8,691.89	59.56	33.28	19.91	911.23	-816.84	1,704.52	1,631.44	73.09	23.322			
10,200.00	10,040.97	8,763.00	8,703.36	60.02	33.36	19.72	923.65	-816.61	1,775.80	1,703.37	72.43	24.519			
10,300.00	10,140.97	8,763.00	8,703.36	60.49	33.36	19.72	923.65	-816.61	1,849.35	1,777.92	71.43	25.892			
10,400.00	10,240.97	8,780.17	8,714.46	60.97	33.44	19.54	936.75	-816.15	1,924.77	1,853.83	70.94	27.132			
10,500.00	10,340.97	8,795.00	8,723.52	61.44	33.50	19.39	948.47	-815.54	2,002.20	1,931.72	70.48	28.408			
10,600.00	10,440.97	8,795.00	8,723.52	61.91	33.50	19.39	948.47	-815.54	2,081.20	2,011.44	69.76	29.833			
10,700.00	10,540.97	8,814.11	8,734.66	62.39	33.59	19.20	963.95	-814.50	2,161.59	2,092.04	69.55	31.080			
10,800.00	10,640.97	8,826.00	8,741.39	62.86	33.65	19.09	973.72	-813.72	2,243.23	2,173.98	69.24	32.396			
10,861.07	10,702.04	8,842.25	8,750.41	63.15	33.73	18.94	987.19	-812.55	2,293.58	2,224.30	69.27	33.109			
10,900.00	10,740.94	8,858.00	8,759.01	63.34	33.80	17.71	1,000.33	-811.37	2,325.15	2,255.76	69.39	33.509			
10,950.00	10,790.61	8,858.00	8,759.01	63.57	33.80	15.97	1,000.33	-811.37	2,363.61	2,294.51	69.09	34.210			
11,000.00	10,839.61	8,871.96	8,766.50	63.79	33.87	14.55	1,012.06	-810.28	2,399.60	2,330.57	69.03	34.760			
11,050.00	10,887.57	8,890.00	8,775.91	64.00	33.96	13.43	1,027.38	-808.82	2,433.00	2,363.99	69.01	35.254			
11,100.00	10,934.11	8,890.00	8,775.91	64.19	33.96	12.56	1,027.38	-808.82	2,463.50	2,394.88	68.62	35.900			
11,150.00	10,978.88	8,902.10	8,782.04	64.37	34.03	11.85	1,037.77	-807.80	2,491.08	2,422.66	68.42	36.406			
11,200.00	11,021.55	8,921.00	8,791.26	64.53	34.13	11.29	1,054.18	-806.14	2,515.67	2,447.35	68.32	36.819			
11,250.00	11,061.78	8,921.00	8,791.26	64.67	34.13	10.84	1,054.18	-806.14	2,536.92	2,469.06	67.86	37.386			
11,300.00	11,099.28	8,934.05	8,797.40	64.79	34.20	10.49	1,065.64	-804.95	2,554.93	2,487.32	67.60	37.793			
11,350.00	11,133.75	8,953.00	8,806.00	64.89	34.30	10.24	1,082.42	-803.16	2,569.57	2,502.13	67.43	38.106			
11,400.00	11,164.94	8,953.00	8,806.00	64.97	34.30	10.04	1,082.42	-803.16	2,580.69	2,513.77	66.92	38.563			
11,450.00	11,192.61	8,972.90	8,814.68	65.04	34.41	9.94	1,100.24	-801.25	2,588.26	2,521.52	66.74	38.783			
11,500.00	11,216.54	8,984.00	8,819.35	65.09	34.48	9.89	1,110.24	-800.18	2,592.28	2,525.89	66.40	39.042			
11,550.00	11,236.56	8,999.61	8,825.72	65.13	34.57	9.92	1,124.42	-798.71	2,592.71	2,526.59	66.13	39.207			
11,600.00	11,252.51	9,016.00	8,832.14	65.16	34.66	10.02	1,139.42	-797.20	2,589.57	2,523.70	65.87	39.313			
11,650.00	11,264.27	9,016.00	8,832.14	65.19	34.66	10.14	1,139.42	-797.20	2,582.92	2,517.56	65.36	39.518			
11,700.00	11,271.75	9,034.60	8,839.05	65.22	34.78	10.38	1,156.62	-795.55	2,572.66	2,507.51	65.15	39.487			
11,750.00	11,274.89	9,047.00	8,843.39	65.26	34.85	10.68	1,168.18	-794.49	2,559.02	2,494.16	64.86	39.456			
11,761.07	11,275.00	9,047.00	8,843.39	65.27	34.85	10.75	1,168.18	-794.49	2,555.53	2,490.78	64.76	39.464			
11,800.00	11,275.00	9,047.00	8,843.39	65.31	34.85	10.75	1,168.18	-794.49	2,543.27	2,478.87	64.39	39.495			
11,900.00	11,275.00	9,079.00	8,853.62	65.46	35.06	10.86	1,198.37	-791.76	2,513.54	2,449.55	63.99	39.279			
12,000.00	11,275.00	9,092.81	8,857.55	65.68	35.15	10.91	1,211.56	-790.56	2,486.79	2,423.36	63.43	39.206			
12,100.00	11,275.00	9,110.00	8,861.98	65.97	35.26	10.97	1,228.09	-789.02	2,463.14	2,400.11	63.03	39.079			
12,200.00	11,275.00	9,127.94	8,866.04	66.35	35.38	11.04	1,245.49	-787.37	2,442.67	2,379.90	62.77	38.917			
12,300.00	11,275.00	9,142.00	8,868.83	66.82	35.48	11.08	1,259.21	-786.04	2,425.45	2,362.84	62.60	38.743			
12,400.00	11,275.00	9,167.05	8,872.95	67.37	35.65	11.16	1,283.81	-783.78	2,411.42	2,348.73	62.69	38.467			
12,500.00	11,275.00	9,189.00	8,875.72	68.01	35.80	11.22	1,305.51	-782.03	2,400.64	2,337.76	62.88	38.178			
12,600.00	11,275.00	9,238.93	8,880.40	68.73	36.17	11.30	1,355.17	-780.03	2,392.45	2,329.07	63.38	37.746			
12,700.00	11,275.00	9,315.00	8,885.74	69.53	36.78	11.34	1,431.05	-780.43	2,385.71	2,321.58	64.13	37.203			
12,800.00	11,275.00	9,371.64	8,889.04	70.39	37.28	11.35	1,487.59	-781.11	2,380.19	2,315.36	64.83	36.715			
12,900.00	11,275.00	9,426.00	8,890.71	71.32	37.78	11.35	1,541.92	-781.82	2,376.98	2,311.39	65.59	36.240			
13,000.00	11,275.00	9,532.52	8,893.63	72.31	38.85	11.40	1,648.40	-781.75	2,374.53	2,307.82	66.71	35.594			
13,100.00	11,275.00	9,638.99	8,897.19	73.36	40.01	11.45	1,754.80	-781.43	2,371.50	2,303.59	67.92	34.917			
13,200.00	11,275.00	9,694.00	8,898.69	74.46	40.65	11.45	1,809.79	-782.22	2,369.09	2,300.23	68.86	34.402			
13,282.36	11,275.00	9,751.37	8,899.30	75.40	41.35	11.44	1,867.14	-783.50	2,368.23	2,298.46	69.77	33.944			
13,300.00	11,275.00	9,759.96	8,899.26	75.61	41.45	11.43	1,875.73	-783.69	2,368.26	2,298.32	69.94	33.860			

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 Cypress 34 - 008H (O) - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 408-MWD+HDGM, 3154-MWD+HDGM												Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Minimum		Separation		Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
13,400.00	11,275.00	9,838.26	8,898.00	76.80	42.45	11.40	1,953.99	-785.64	2,369.46	2,298.32	71.14	33.306	
13,500.00	11,275.00	9,959.07	8,896.51	78.04	44.06	11.35	2,074.75	-788.95	2,370.34	2,297.69	72.65	32.628	
13,600.00	11,275.00	10,088.34	8,896.39	79.32	45.87	11.30	2,203.97	-792.10	2,370.17	2,295.88	74.29	31.904	
13,700.00	11,275.00	10,189.42	8,896.61	80.64	47.38	11.24	2,304.99	-795.82	2,369.44	2,293.62	75.81	31.254	
13,800.00	11,275.00	10,300.24	8,897.04	82.00	49.09	11.15	2,415.68	-800.94	2,368.36	2,290.92	77.45	30.580	
13,900.00	11,275.00	10,391.34	8,897.78	83.39	50.53	11.09	2,506.71	-804.64	2,367.02	2,288.03	78.99	29.968	
13,971.00	11,275.00	10,441.02	8,897.94	84.40	51.33	11.08	2,556.37	-805.60	2,366.67	2,286.69	79.99	29.588	
14,000.00	11,275.00	10,464.47	8,897.92	84.81	51.71	11.08	2,579.83	-805.77	2,366.71	2,286.28	80.43	29.427	
14,100.00	11,275.00	10,558.28	8,897.58	86.27	53.25	11.08	2,673.63	-806.64	2,367.08	2,285.01	82.07	28.842	
14,200.00	11,275.00	10,667.77	8,897.35	87.75	55.10	11.08	2,783.11	-807.79	2,367.29	2,283.41	83.88	28.222	
14,300.00	11,275.00	10,766.70	8,897.50	89.27	56.79	11.11	2,882.05	-807.73	2,367.36	2,281.71	85.65	27.640	
14,400.00	11,275.00	10,851.98	8,897.53	90.81	58.27	11.14	2,967.32	-807.46	2,367.62	2,280.28	87.34	27.110	
14,500.00	11,275.00	10,924.00	8,896.55	92.37	59.54	11.15	3,039.33	-807.33	2,369.12	2,280.19	88.93	26.641	
14,600.00	11,275.00	10,995.91	8,894.69	93.96	60.83	11.16	3,111.22	-807.24	2,371.81	2,281.26	90.55	26.194	
14,700.00	11,275.00	11,065.06	8,892.27	95.57	62.08	11.17	3,180.33	-807.28	2,375.47	2,283.32	92.16	25.776	
14,800.00	11,275.00	11,193.60	8,886.42	97.20	64.43	11.16	3,308.73	-807.90	2,380.27	2,285.96	94.31	25.239	
14,900.00	11,275.00	11,325.95	8,883.48	98.86	66.88	11.17	3,441.05	-808.22	2,382.55	2,286.00	96.55	24.677	
15,000.00	11,275.00	11,427.17	8,881.82	100.53	68.77	11.17	3,542.25	-809.01	2,384.22	2,285.69	98.53	24.199	
15,100.00	11,275.00	15,100.00	8,879.86	102.22	138.66	11.14	3,670.34	-811.46	2,385.59	2,248.96	136.63	17.460	
15,200.00	11,275.00	11,682.16	8,880.44	103.93	73.63	11.13	3,797.18	-813.09	2,384.97	2,281.92	103.05	23.144	
15,295.91	11,275.00	11,765.47	8,880.65	105.59	75.23	11.13	3,880.48	-814.00	2,384.71	2,279.84	104.87	22.739	
15,300.00	11,275.00	11,769.02	8,880.65	105.66	75.30	11.13	3,884.03	-814.04	2,384.71	2,279.76	104.95	22.722	
15,400.00	11,275.00	11,860.27	8,880.30	107.40	77.07	11.11	3,975.26	-815.81	2,384.93	2,278.02	106.91	22.308	
15,500.00	11,275.00	11,935.37	8,879.36	109.16	78.54	11.07	4,050.32	-818.03	2,385.80	2,277.09	108.71	21.946	
15,600.00	11,275.00	12,062.95	8,877.28	110.93	81.04	11.00	4,177.83	-821.89	2,387.12	2,276.08	111.04	21.498	
15,700.00	11,275.00	12,190.49	8,877.51	112.71	83.56	10.97	4,305.32	-824.69	2,386.70	2,273.30	113.40	21.047	
15,800.00	11,275.00	12,372.56	8,881.62	114.51	87.18	10.96	4,487.30	-828.08	2,384.52	2,268.19	116.33	20.499	
15,900.00	11,275.00	12,473.51	8,886.08	116.32	89.20	10.96	4,588.14	-829.63	2,380.09	2,261.61	118.47	20.090	
16,000.00	11,275.00	12,563.34	8,889.76	118.14	91.00	10.97	4,677.88	-831.13	2,375.95	2,255.43	120.52	19.714	
16,100.00	11,275.00	12,654.86	8,893.12	119.98	92.85	10.96	4,769.32	-833.00	2,372.16	2,249.57	122.59	19.350	
16,200.00	11,275.00	12,752.85	8,896.24	121.82	94.83	10.95	4,867.24	-835.17	2,368.81	2,244.08	124.73	18.991	
16,300.00	11,275.00	12,890.02	8,901.74	123.68	97.62	10.92	5,004.23	-839.13	2,364.52	2,237.27	127.25	18.581	
16,400.00	11,275.00	12,974.22	8,905.40	125.54	99.34	10.89	5,088.32	-841.70	2,359.87	2,230.59	129.28	18.255	
16,500.00	11,275.00	13,075.94	8,909.70	127.41	101.41	10.88	5,189.92	-844.12	2,355.46	2,223.98	131.48	17.915	
16,600.00	11,275.00	13,073.00	8,909.58	129.30	101.35	10.88	5,186.98	-844.06	2,353.22	2,220.59	132.64	17.742	
16,602.66	11,275.00	13,073.00	8,909.58	129.35	101.35	10.88	5,186.98	-844.06	2,353.22	2,220.56	132.67	17.738	
16,700.00	11,275.00	13,073.00	8,909.58	131.19	101.35	10.88	5,186.98	-844.06	2,355.24	2,221.50	133.73	17.611	
16,776.29	11,275.00	13,073.00	8,909.58	132.64	101.35	10.88	5,186.98	-844.06	2,359.62	2,225.11	134.51	17.542	



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 Cypress 34 - 009H (O) - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 489-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	5.07	5.07	0.00	0.01	8.80	504.89	78.16	510.90				
100.00	100.00	106.55	106.55	0.20	0.27	8.80	504.73	78.15	510.74	510.27	0.47	1,086.200	
200.00	200.00	208.02	208.02	0.74	0.53	8.81	504.27	78.12	510.30	509.03	1.27	402.706	
300.00	300.00	309.49	309.49	1.27	0.79	8.81	503.52	78.07	509.56	507.50	2.06	246.866	
400.00	400.00	410.96	410.95	1.81	1.05	8.82	502.48	77.99	508.54	505.67	2.86	177.746	
450.00	450.00	461.69	461.67	2.08	1.18	8.83	501.85	77.95	507.91	504.66	3.26	155.828	
500.00	500.00	512.65	512.64	2.34	1.38	109.57	501.14	77.90	507.36	503.64	3.72	136.475	
600.00	599.93	615.10	615.06	2.86	1.93	109.98	499.33	77.83	506.79	502.01	4.78	105.929	
627.52	627.41	643.27	643.23	3.00	2.09	110.16	498.75	77.81	506.76	501.68	5.08	99.734 CC	
700.00	699.68	715.65	715.59	3.39	2.48	110.75	497.14	77.75	507.06	501.21	5.85	86.629 ES	
800.00	799.13	814.25	814.17	3.93	3.01	111.81	495.13	77.49	508.80	501.88	6.93	73.460	
900.00	898.15	912.37	912.28	4.50	3.54	113.16	493.34	77.02	512.28	504.26	8.01	63.924	
1,000.00	996.63	1,009.95	1,009.84	5.09	4.06	114.76	491.79	76.44	517.72	508.60	9.12	56.775	
1,100.00	1,094.44	1,110.25	1,110.12	5.71	4.60	116.66	490.20	75.65	525.14	514.87	10.26	51.178	
1,200.00	1,191.46	1,210.89	1,210.73	6.37	5.15	118.79	488.09	74.45	534.27	522.84	11.43	46.741	
1,214.68	1,205.63	1,225.61	1,225.45	6.47	5.23	119.11	487.74	74.24	535.77	524.16	11.60	46.167	
1,300.00	1,287.93	1,309.41	1,309.22	7.07	5.68	121.16	485.45	73.49	544.87	532.26	12.61	43.224	
1,400.00	1,384.39	1,407.23	1,406.98	7.79	6.21	123.59	482.12	73.64	556.21	542.44	13.78	40.368	
1,500.00	1,480.85	1,505.79	1,505.45	8.51	6.74	126.00	478.23	74.32	568.28	553.33	14.95	38.000	
1,600.00	1,577.31	1,604.42	1,603.99	9.25	7.28	128.33	473.95	74.90	580.95	564.82	16.13	36.023	
1,700.00	1,673.77	1,700.34	1,699.81	10.00	7.80	130.52	469.57	75.61	594.40	577.12	17.28	34.399	
1,800.00	1,770.22	1,796.26	1,795.62	10.75	8.32	132.65	465.07	76.62	608.78	590.36	18.42	33.042	
1,900.00	1,866.68	1,887.44	1,886.71	11.50	8.81	134.56	461.24	77.71	624.47	604.94	19.53	31.971	
2,000.00	1,963.14	1,979.03	1,978.24	12.26	9.31	136.36	458.21	78.82	641.62	620.98	20.63	31.095	
2,100.00	2,059.60	2,071.62	2,070.79	13.03	9.81	138.06	455.82	80.03	660.04	638.31	21.73	30.373	
2,200.00	2,156.06	2,164.10	2,163.25	13.79	10.30	139.65	453.98	81.36	679.59	656.77	22.82	29.780	
2,300.00	2,252.52	2,258.48	2,257.61	14.56	10.80	141.17	452.50	82.84	700.04	676.13	23.91	29.275	
2,400.00	2,348.98	2,352.81	2,351.91	15.33	11.30	142.60	451.25	84.41	721.21	696.21	25.00	28.847	
2,500.00	2,445.43	2,446.81	2,463.88	16.11	11.90	144.20	448.95	85.61	741.91	715.70	26.22	28.296	
2,600.00	2,541.89	2,577.93	2,576.91	16.88	12.51	145.75	444.63	85.32	760.92	733.48	27.44	27.734	
2,700.00	2,638.35	2,649.61	2,648.54	17.65	12.89	146.75	442.11	86.55	781.61	753.25	28.36	27.564	
2,800.00	2,734.81	2,729.93	2,728.77	18.43	13.33	147.87	439.52	89.28	804.38	775.07	29.32	27.439	
2,900.00	2,831.27	2,832.90	2,831.58	19.21	13.88	149.31	435.84	93.86	828.09	797.64	30.45	27.192	
3,000.00	2,927.73	2,936.64	2,935.10	19.98	14.44	150.73	430.76	98.27	851.28	819.68	31.59	26.945	
3,100.00	3,024.19	3,027.66	3,025.93	20.76	14.94	151.92	426.19	102.10	874.76	842.13	32.63	26.806	
3,200.00	3,120.65	3,120.34	3,118.42	21.54	15.44	153.05	421.94	106.02	898.91	865.23	33.68	26.686	
3,300.00	3,217.10	3,212.58	3,210.52	22.32	15.94	154.08	418.42	109.79	923.71	888.98	34.73	26.597	
3,400.00	3,313.56	3,290.19	3,288.03	23.10	16.36	154.86	416.33	113.02	949.54	913.91	35.64	26.645	
3,500.00	3,410.02	3,367.53	3,365.27	23.88	16.76	155.52	416.47	116.82	977.68	941.16	36.52	26.772	
3,600.00	3,506.48	3,461.72	3,459.32	24.66	17.23	156.10	419.63	120.68	1,006.99	969.43	37.56	26.812	
3,700.00	3,602.94	3,546.50	3,543.92	25.45	17.64	156.46	424.78	122.97	1,036.70	998.20	38.50	26.928	
3,800.00	3,699.40	3,630.51	3,627.59	26.23	18.05	156.68	432.00	125.00	1,067.52	1,028.09	39.43	27.072	
3,900.00	3,795.86	3,720.86	3,717.42	27.01	18.48	156.82	441.44	126.96	1,099.13	1,058.70	40.44	27.181	
4,000.00	3,892.31	3,815.61	3,811.61	27.79	18.95	156.95	451.53	129.03	1,130.86	1,089.37	41.49	27.254	
4,100.00	3,988.77	3,912.30	3,907.74	28.58	19.42	157.09	461.75	131.11	1,162.53	1,119.96	42.57	27.306	
4,200.00	4,085.23	3,999.71	3,994.61	29.36	19.86	157.18	471.23	132.89	1,194.26	1,150.70	43.56	27.418	
4,300.00	4,181.69	4,088.02	4,082.25	30.14	20.30	157.24	481.91	134.90	1,226.80	1,182.25	44.56	27.534	
4,400.00	4,278.15	4,185.88	4,179.37	30.93	20.79	157.30	493.71	137.17	1,259.39	1,213.72	45.66	27.580	
4,500.00	4,374.61	4,280.67	4,273.46	31.71	21.28	157.35	505.03	139.13	1,291.70	1,244.96	46.74	27.636	
4,600.00	4,471.07	4,373.31	4,365.41	32.49	21.75	157.41	516.07	141.28	1,324.20	1,276.41	47.80	27.705	
4,700.00	4,567.53	4,461.11	4,452.56	33.28	22.20	157.47	526.54	143.47	1,356.86	1,308.06	48.80	27.805	

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



Pro Directional
Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 Cypress 34 - 009H (O) - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 489-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset		Between Centres (usft)	Between Ellipses (usft)				Offset TVD Reference:	Offset Datum	
4,800.00	4,663.98	4,541.95	4,532.78	34.06	22.63	157.54	536.07	146.38	1,390.33	1,340.60	49.72	27.961		
4,900.00	4,760.44	4,624.79	4,614.96	34.85	23.06	157.64	545.68	150.40	1,424.69	1,374.03	50.67	28.119		
5,000.00	4,856.90	4,718.37	4,707.85	35.63	23.55	157.80	555.74	155.79	1,459.37	1,407.64	51.74	28.207		
5,100.00	4,953.36	4,815.91	4,804.74	36.42	24.07	158.01	564.98	162.16	1,494.05	1,441.20	52.85	28.270		
5,194.35	5,044.37	4,927.24	4,915.52	37.16	24.66	158.33	573.02	169.68	1,525.91	1,471.80	54.11	28.198		
5,200.00	5,049.82	4,933.94	4,922.19	37.20	24.69	158.37	573.40	170.13	1,527.78	1,473.59	54.19	28.193		
5,300.00	5,146.77	5,074.78	5,062.64	37.95	25.44	159.07	579.14	178.84	1,557.95	1,502.21	55.74	27.952		
5,400.00	5,244.51	5,225.33	5,213.06	38.66	26.23	159.69	581.43	184.26	1,581.48	1,524.16	57.32	27.592		
5,500.00	5,342.93	5,360.47	5,348.19	39.30	26.94	160.15	581.39	186.07	1,599.24	1,540.53	58.70	27.242		
5,600.00	5,441.91	5,462.99	5,450.71	39.90	27.49	160.44	580.66	186.32	1,612.50	1,552.71	59.79	26.971		
5,700.00	5,541.32	5,565.10	5,552.81	40.44	28.02	160.67	579.81	186.44	1,622.34	1,561.49	60.85	26.661		
5,800.00	5,641.05	5,664.47	5,652.18	40.94	28.55	160.82	578.93	186.51	1,628.85	1,566.97	61.88	26.325		
5,900.00	5,740.97	5,766.78	5,754.48	41.39	29.09	160.91	578.21	186.46	1,632.05	1,569.14	62.91	25.944		
5,959.03	5,800.00	5,831.84	5,819.54	41.63	29.43	60.26	577.68	186.23	1,632.21	1,568.67	63.54	25.688		
6,000.00	5,840.97	5,877.00	5,864.70	41.78	29.66	60.27	577.22	185.96	1,631.79	1,567.82	63.97	25.508		
6,100.00	5,940.97	5,976.47	5,964.16	42.17	30.18	60.29	576.06	185.14	1,630.49	1,565.56	64.94	25.109		
6,200.00	6,040.97	6,065.25	6,052.94	42.56	30.64	60.30	575.58	184.63	1,629.72	1,563.91	65.81	24.763		
6,300.00	6,140.97	6,159.95	6,147.64	42.95	31.12	60.29	575.71	184.40	1,629.57	1,562.83	66.74	24.417		
6,400.00	6,240.97	6,264.62	6,252.30	43.34	31.66	60.29	575.67	184.12	1,629.33	1,561.57	67.75	24.048		
6,500.00	6,340.97	6,367.73	6,355.41	43.74	32.20	60.29	575.27	183.75	1,628.82	1,560.06	68.76	23.689		
6,600.00	6,440.97	6,469.65	6,457.33	44.14	32.73	60.30	574.74	183.30	1,628.18	1,558.42	69.76	23.340		
6,700.00	6,540.97	6,569.19	6,556.87	44.55	33.25	60.31	574.09	182.87	1,627.48	1,556.73	70.74	23.005		
6,800.00	6,640.97	6,667.78	6,655.46	44.95	33.77	60.33	573.26	182.63	1,626.85	1,555.13	71.72	22.682		
6,900.00	6,740.97	6,766.13	6,753.80	45.36	34.29	60.36	572.38	182.52	1,626.32	1,553.61	72.71	22.368		
7,000.00	6,840.97	6,864.42	6,852.09	45.78	34.81	60.38	571.73	182.41	1,625.89	1,552.20	73.69	22.064		
7,100.00	6,940.97	6,967.77	6,955.44	46.19	35.36	60.39	571.18	182.17	1,625.43	1,550.71	74.72	21.755		
7,200.00	7,040.97	7,071.86	7,059.53	46.61	35.90	60.40	570.56	181.88	1,624.72	1,548.97	75.75	21.449		
7,300.00	7,140.97	7,174.66	7,162.32	47.03	36.44	60.41	569.75	181.05	1,623.80	1,547.03	76.77	21.151		
7,400.00	7,240.97	7,279.41	7,267.06	47.45	36.99	60.44	568.62	180.36	1,622.69	1,544.88	77.81	20.854		
7,500.00	7,340.97	7,390.86	7,378.50	47.87	37.58	60.44	567.63	179.80	1,621.04	1,542.14	78.90	20.545		
7,600.00	7,440.97	7,496.23	7,483.84	48.30	38.13	60.42	566.91	176.48	1,618.78	1,538.83	79.95	20.249		
7,700.00	7,540.97	7,596.07	7,583.65	48.73	38.65	60.44	565.38	174.66	1,616.44	1,535.50	80.95	19.969		
7,800.00	7,640.97	7,686.39	7,673.94	49.16	39.13	60.48	563.45	173.53	1,614.30	1,532.43	81.88	19.716		
7,900.00	7,740.97	7,777.34	7,764.88	49.59	39.60	60.50	562.33	172.74	1,612.94	1,530.13	82.82	19.476		
8,000.00	7,840.97	7,869.41	7,856.94	50.03	40.08	60.48	562.21	171.76	1,611.95	1,528.19	83.76	19.246		
8,100.00	7,940.97	7,964.62	7,952.15	50.47	40.57	60.44	563.16	170.77	1,611.54	1,526.82	84.72	19.022		
8,200.00	8,040.97	8,066.25	8,053.75	50.90	41.09	60.37	564.53	169.46	1,611.08	1,525.34	85.74	18.791		
8,300.00	8,140.97	8,167.94	8,155.43	51.35	41.61	60.31	565.64	168.22	1,610.56	1,523.80	86.76	18.564		
8,400.00	8,240.97	8,260.00	8,247.48	51.79	42.09	60.28	566.16	167.16	1,609.87	1,522.17	87.70	18.357		
8,401.51	8,242.48	8,260.00	8,247.48	51.80	42.09	60.28	566.16	167.16	1,609.87	1,522.17	87.70	18.356		
8,500.00	8,340.97	8,292.00	8,279.46	52.23	42.25	60.24	567.19	166.96	1,611.58	1,523.49	88.08	18.296		
8,600.00	8,440.97	8,323.00	8,310.36	52.68	42.41	60.17	569.69	167.28	1,617.42	1,529.07	88.34	18.308		
8,700.00	8,540.97	8,361.97	8,348.92	53.13	42.62	60.04	575.02	168.78	1,627.65	1,539.05	88.60	18.370		
8,800.00	8,640.97	8,417.00	8,402.79	53.58	42.91	59.73	586.07	170.57	1,640.89	1,551.88	89.02	18.434		
8,900.00	8,740.97	8,449.00	8,433.67	54.03	43.08	59.49	594.39	171.60	1,657.56	1,568.54	89.03	18.619		
9,000.00	8,840.97	8,488.32	8,470.91	54.48	43.29	59.14	606.89	173.15	1,678.03	1,588.96	89.07	18.839		
9,100.00	8,940.97	8,544.00	8,522.47	54.94	43.59	58.56	627.76	175.41	1,701.85	1,612.49	89.35	19.047		
9,200.00	9,040.97	8,589.15	8,563.41	55.39	43.83	58.03	646.73	176.99	1,728.36	1,638.95	89.40	19.332		
9,300.00	9,140.97	8,655.85	8,622.11	55.85	44.20	57.13	678.36	177.75	1,757.13	1,667.30	89.83	19.561		
9,400.00	9,240.97	8,691.05	8,652.06	56.31	44.39	56.60	696.84	177.50	1,788.61	1,698.99	89.61	19.959		

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 Cypress 34 - 009H (O) - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 489-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Tooface (")	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
9,500.00	9,340.97	8,719.13	8,675.29	56.77	44.55	56.15	712.61	177.41	1,823.59	1,734.38	89.21	20.442	
9,600.00	9,440.97	8,755.07	8,704.18	57.23	44.75	55.56	733.98	177.55	1,862.02	1,773.10	88.92	20.940	
9,700.00	9,540.97	8,809.30	8,746.35	57.69	45.06	54.61	768.05	176.54	1,902.74	1,813.74	89.00	21.379	
9,800.00	9,640.97	8,828.00	8,760.45	58.16	45.17	54.27	780.33	176.07	1,946.42	1,858.12	88.31	22.042	
9,900.00	9,740.97	8,859.00	8,783.21	58.62	45.35	53.70	801.37	175.62	1,993.26	1,905.39	87.86	22.686	
10,000.00	9,840.97	8,877.70	8,796.56	59.09	45.47	53.35	814.47	175.53	2,043.14	1,955.99	87.15	23.444	
10,100.00	9,940.97	8,891.00	8,805.82	59.56	45.55	53.10	824.01	175.49	2,095.96	2,009.64	86.32	24.281	
10,200.00	10,040.97	8,922.00	8,826.65	60.02	45.73	52.51	846.97	175.66	2,151.59	2,065.69	85.90	25.047	
10,300.00	10,140.97	8,922.00	8,826.65	60.49	45.73	52.51	846.97	175.66	2,209.80	2,124.98	84.82	26.053	
10,400.00	10,240.97	8,954.00	8,846.97	60.97	45.93	51.89	871.68	176.21	2,270.53	2,186.06	84.47	26.880	
10,500.00	10,340.97	8,954.00	8,846.97	61.44	45.93	51.89	871.68	176.21	2,332.47	2,250.01	83.46	27.959	
10,600.00	10,440.97	8,985.00	8,865.73	61.91	46.13	51.29	896.34	176.96	2,398.42	2,315.25	83.17	28.839	
10,700.00	10,540.97	9,007.24	8,878.84	62.39	46.27	50.86	914.29	177.60	2,465.20	2,382.47	82.72	29.801	
10,800.00	10,640.97	9,016.00	8,883.94	62.86	46.33	50.69	921.41	177.88	2,533.73	2,451.69	82.04	30.883	
10,861.07	10,702.04	9,030.42	8,892.14	63.15	46.42	50.42	933.26	178.35	2,576.38	2,494.54	81.84	31.481	
10,900.00	10,740.94	9,034.99	8,894.67	63.34	46.45	48.10	937.07	178.50	2,603.32	2,521.71	81.61	31.900	
10,950.00	10,790.61	9,048.00	8,901.70	63.57	46.54	44.71	948.00	178.91	2,636.45	2,555.02	81.44	32.375	
11,000.00	10,839.61	9,048.00	8,901.70	63.79	46.54	41.97	948.00	178.91	2,667.61	2,586.63	80.98	32.943	
11,050.00	10,887.57	9,048.00	8,901.70	64.00	46.54	39.63	948.00	178.91	2,696.77	2,616.27	80.50	33.501	
11,100.00	10,934.11	9,066.41	8,911.31	64.19	46.66	37.48	963.69	179.58	2,723.52	2,643.15	80.37	33.889	
11,150.00	10,978.88	9,080.00	8,918.21	64.37	46.75	35.73	975.39	180.20	2,747.91	2,667.79	80.12	34.296	
11,200.00	11,021.55	9,080.00	8,918.21	64.53	46.75	34.33	975.39	180.20	2,769.73	2,690.13	79.60	34.795	
11,250.00	11,061.78	9,080.00	8,918.21	64.67	46.75	33.17	975.39	180.20	2,789.02	2,709.94	79.07	35.271	
11,300.00	11,099.28	9,096.02	8,925.99	64.79	46.86	32.18	989.36	181.10	2,805.33	2,726.49	78.85	35.579	
11,350.00	11,133.75	9,111.00	8,932.82	64.89	46.96	31.41	1,002.65	182.17	2,819.06	2,740.46	78.60	35.867	
11,400.00	11,164.94	9,111.00	8,932.82	64.97	46.96	30.85	1,002.65	182.17	2,829.71	2,751.64	78.07	36.245	
11,450.00	11,192.61	9,111.00	8,932.82	65.04	46.96	30.45	1,002.65	182.17	2,837.53	2,759.98	77.56	36.586	
11,500.00	11,216.54	9,111.00	8,932.82	65.09	46.96	30.20	1,002.65	182.17	2,842.49	2,765.43	77.06	36.886	
11,550.00	11,236.56	9,143.00	8,946.12	65.13	47.18	30.17	1,031.60	185.07	2,844.23	2,767.07	77.16	36.862	
11,600.00	11,252.51	9,143.00	8,946.12	65.16	47.18	30.24	1,031.60	185.07	2,842.85	2,766.14	76.71	37.061	
11,650.00	11,264.27	9,143.00	8,946.12	65.19	47.18	30.45	1,031.60	185.07	2,838.59	2,762.30	76.29	37.208	
11,700.00	11,271.75	9,174.00	8,957.92	65.22	47.40	30.98	1,060.05	188.62	2,831.25	2,754.80	76.45	37.035	
11,750.00	11,274.89	9,174.00	8,957.92	65.26	47.40	31.54	1,060.05	188.62	2,820.77	2,744.66	76.11	37.063	
11,761.07	11,275.00	9,174.00	8,957.92	65.27	47.40	31.68	1,060.05	188.62	2,818.07	2,742.03	76.04	37.061	
11,800.00	11,275.00	9,186.69	8,962.51	65.31	47.49	31.76	1,071.78	190.20	2,808.47	2,732.45	76.02	36.944	
11,900.00	11,275.00	9,206.00	8,969.04	65.46	47.63	31.88	1,089.80	192.51	2,785.71	2,709.91	75.81	36.748	
12,000.00	11,275.00	9,237.00	8,978.43	65.68	47.85	32.05	1,119.16	195.76	2,765.52	2,689.65	75.86	36.454	
12,100.00	11,275.00	9,255.82	8,983.38	65.97	47.99	32.14	1,137.23	197.42	2,747.99	2,672.17	75.82	36.243	
12,200.00	11,275.00	9,269.00	8,986.43	66.35	48.09	32.19	1,150.02	198.46	2,733.38	2,657.57	75.81	36.057	
12,300.00	11,275.00	9,300.00	8,992.45	66.82	48.32	32.30	1,180.35	200.60	2,721.45	2,645.33	76.12	35.751	
12,400.00	11,275.00	9,317.51	8,995.14	67.37	48.45	32.36	1,197.61	201.73	2,712.46	2,636.09	76.37	35.517	
12,500.00	11,275.00	9,332.00	8,996.90	68.01	48.55	32.40	1,211.96	202.71	2,706.53	2,629.83	76.70	35.288	
12,600.00	11,275.00	9,363.00	8,999.40	68.73	48.78	32.47	1,242.78	204.83	2,703.63	2,626.35	77.28	34.984	
12,656.27	11,275.00	9,371.71	8,999.84	69.17	48.85	32.49	1,251.47	205.39	2,703.19	2,625.61	77.58	34.845	
12,700.00	11,275.00	9,393.00	9,000.63	69.53	49.01	32.52	1,272.70	206.60	2,703.39	2,625.46	77.93	34.689	
12,800.00	11,275.00	9,470.62	9,002.37	70.39	49.63	32.62	1,350.23	210.15	2,704.56	2,625.54	79.02	34.227	
12,900.00	11,275.00	9,531.75	9,002.58	71.32	50.14	32.68	1,411.31	212.55	2,706.95	2,626.92	80.03	33.823	
13,000.00	11,275.00	9,593.89	9,001.63	72.31	50.69	32.72	1,473.40	214.75	2,710.73	2,629.62	81.11	33.420	
13,100.00	11,275.00	9,654.39	8,999.55	73.36	51.26	32.74	1,533.83	216.82	2,716.01	2,633.78	82.23	33.028	
13,200.00	11,275.00	9,746.88	8,995.65	74.46	52.19	32.77	1,626.17	220.23	2,722.12	2,638.46	83.66	32.537	
13,300.00	11,275.00	9,849.71	8,992.06	75.61	53.29	32.84	1,728.82	224.97	2,728.13	2,642.85	85.28	31.989	

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



Pro Directional
Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 Cypress 34 - 009H (O) - OH - OH											Offset Site Error:	0.00 usft
Survey Program: 489-MWD+HDGM											Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset		Between Centres (usft)	Between Ellipses (usft)				
13,400.00	11,275.00	9,916.18	8,989.06	76.80	54.04	32.87	1,795.17	227.85	2,734.84	2,648.20	86.64	31.565
13,500.00	11,275.00	10,164.17	8,983.85	78.04	57.05	33.04	2,042.75	238.55	2,739.62	2,649.66	89.96	30.454
13,600.00	11,275.00	10,244.57	8,984.32	79.32	58.09	33.12	2,123.07	242.07	2,742.07	2,650.41	91.66	29.917
13,700.00	11,275.00	10,336.36	8,985.39	80.64	59.31	33.24	2,214.73	247.09	2,744.68	2,651.11	93.57	29.332
13,800.00	11,275.00	10,419.29	8,985.72	82.00	60.45	33.35	2,297.50	252.11	2,748.20	2,652.77	95.43	28.797
13,900.00	11,275.00	10,554.71	8,988.27	83.39	62.38	33.54	2,432.65	260.12	2,750.25	2,652.17	98.07	28.043
14,000.00	11,275.00	10,654.97	8,989.93	84.81	63.85	33.68	2,532.73	266.12	2,752.77	2,652.46	100.31	27.443
14,100.00	11,275.00	10,736.99	8,991.26	86.27	65.08	33.79	2,614.60	270.79	2,755.21	2,652.88	102.34	26.923
14,200.00	11,275.00	14,200.00	8,992.42	87.75	118.71	33.93	2,726.57	276.98	2,758.03	2,616.09	141.94	19.431
14,300.00	11,275.00	10,968.64	8,994.59	89.27	68.68	34.08	2,845.91	282.75	2,759.75	2,652.25	107.50	25.673
14,400.00	11,275.00	11,058.56	8,995.81	90.81	70.13	34.18	2,935.73	286.81	2,761.75	2,651.99	109.76	25.161
14,500.00	11,275.00	11,144.59	8,996.59	92.37	71.53	34.27	3,021.67	290.77	2,764.19	2,652.19	112.00	24.680
14,600.00	11,275.00	11,205.53	8,996.57	93.96	72.54	34.33	3,082.53	293.64	2,767.52	2,653.64	113.88	24.302
14,700.00	11,275.00	11,271.71	8,995.19	95.57	73.64	34.38	3,148.62	296.72	2,772.39	2,656.55	115.84	23.932
14,800.00	11,275.00	11,383.84	8,993.12	97.20	75.54	34.48	3,260.59	302.62	2,777.49	2,658.93	118.56	23.427
14,900.00	11,275.00	11,484.03	8,991.93	98.86	77.25	34.58	3,360.61	308.28	2,782.27	2,661.13	121.14	22.967
15,000.00	11,275.00	11,637.74	8,991.57	100.53	79.92	34.76	3,514.01	317.91	2,786.87	2,662.19	124.68	22.352
15,100.00	11,275.00	11,747.16	8,993.14	102.22	81.85	34.91	3,623.21	324.55	2,789.78	2,662.22	127.56	21.870
15,200.00	11,275.00	11,865.09	8,995.51	103.93	83.95	35.08	3,740.93	331.25	2,791.99	2,661.36	130.62	21.374
15,300.00	11,275.00	11,964.42	8,997.62	105.66	85.74	35.21	3,840.10	336.60	2,793.96	2,660.56	133.40	20.945
15,400.00	11,275.00	12,043.18	8,999.30	107.40	87.17	35.32	3,918.70	341.17	2,796.23	2,660.39	135.84	20.584
15,500.00	11,275.00	12,108.04	8,999.81	109.16	88.35	35.40	3,983.45	345.07	2,799.67	2,661.63	138.04	20.281
15,600.00	11,275.00	12,198.95	8,999.63	110.93	90.01	35.50	4,074.19	350.46	2,803.89	2,663.19	140.71	19.927
15,700.00	11,275.00	12,348.32	9,000.67	112.71	92.78	35.68	4,223.32	358.92	2,807.17	2,662.70	144.47	19.431
15,800.00	11,275.00	12,491.68	9,004.04	114.51	95.46	35.88	4,366.42	366.84	2,809.15	2,660.96	148.19	18.956
15,900.00	11,275.00	12,557.71	9,005.64	116.32	96.70	35.97	4,432.32	370.43	2,810.95	2,660.42	150.53	18.674
16,000.00	11,275.00	12,610.98	9,006.35	118.14	97.71	36.04	4,485.50	373.53	2,814.00	2,661.38	152.62	18.438
16,100.00	11,275.00	12,671.00	9,005.83	119.98	98.84	36.11	4,545.39	377.46	2,818.98	2,664.17	154.81	18.209
16,200.00	11,275.00	12,744.78	9,004.29	121.82	100.24	36.19	4,618.98	382.53	2,825.21	2,667.95	157.26	17.965
16,300.00	11,275.00	12,867.62	9,001.95	123.68	102.59	36.31	4,741.54	390.44	2,831.20	2,670.54	160.67	17.622
16,400.00	11,275.00	13,019.96	9,001.18	125.54	105.51	36.47	4,893.61	399.44	2,835.73	2,671.05	164.68	17.220
16,500.00	11,275.00	13,121.33	9,000.66	127.41	107.47	36.55	4,994.89	403.60	2,839.21	2,671.53	167.68	16.932
16,600.00	11,275.00	13,219.64	8,999.72	129.30	109.38	36.62	5,093.13	407.36	2,842.89	2,672.26	170.62	16.662
16,700.00	11,275.00	13,319.76	8,998.74	131.19	111.33	36.68	5,193.17	411.13	2,846.56	2,672.94	173.62	16.396
16,776.29	11,275.00	13,333.00	8,998.61	132.64	111.59	36.69	5,206.40	411.63	2,850.05	2,675.35	174.70	16.314 SF



Pro Directional
Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 Cypress 34 - 012H (O) - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 404-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	2.00	2.00	0.00	0.01	-3.61	100.39	-6.33	100.59					
100.00	100.00	102.13	102.13	0.20	0.26	-3.53	100.33	-6.19	100.52	100.07	0.45	221.193		
200.00	200.00	202.26	202.26	0.74	0.51	-3.31	100.16	-5.80	100.33	99.08	1.24	80.655		
300.00	300.00	302.39	302.38	1.27	0.76	-2.94	99.87	-5.13	100.01	97.97	2.03	49.183		
400.00	400.00	402.51	402.50	1.81	1.01	-2.42	99.48	-4.21	99.57	96.74	2.82	35.272		
450.00	450.00	452.46	452.45	2.08	1.28	-2.12	99.26	-3.67	99.33	95.97	3.36	29.596		
500.00	500.00	502.40	502.39	2.34	1.55	99.13	99.07	-3.09	99.18	95.30	3.89	25.524		
515.21	515.20	517.59	517.57	2.42	1.63	99.41	99.01	-2.91	99.18	95.13	4.05	24.511 CC		
600.00	599.93	602.27	602.25	2.86	2.08	101.82	98.75	-1.86	99.50	94.56	4.94	20.144 ES		
700.00	699.68	702.29	702.25	3.39	2.62	106.42	98.23	-0.57	100.76	94.75	6.01	16.776		
800.00	799.13	802.04	801.99	3.93	3.16	112.67	97.34	0.73	103.60	96.51	7.09	14.622		
900.00	898.15	901.49	901.42	4.50	3.69	120.13	95.95	1.98	108.84	100.66	8.18	13.313		
1,000.00	996.63	1,000.37	1,000.28	5.09	4.22	128.17	94.00	3.19	117.40	108.13	9.27	12.661		
1,100.00	1,094.44	1,098.53	1,098.40	5.71	4.75	136.18	91.48	4.50	130.08	119.71	10.37	12.543		
1,200.00	1,191.46	1,195.19	1,194.99	6.37	5.27	143.57	88.45	6.05	147.48	136.01	11.46	12.866		
1,214.68	1,205.63	1,209.23	1,209.02	6.47	5.35	144.58	87.98	6.33	150.48	138.85	11.63	12.943		
1,300.00	1,287.93	1,290.90	1,290.63	7.07	5.79	149.98	85.35	8.03	169.08	156.54	12.54	13.483		
1,400.00	1,384.39	1,387.62	1,387.33	7.79	6.30	154.61	83.28	9.20	192.29	178.69	13.60	14.138		
1,500.00	1,480.85	1,484.18	1,483.89	8.51	6.78	157.57	83.05	8.70	216.00	201.36	14.64	14.749		
1,600.00	1,577.31	1,580.46	1,580.16	9.25	7.26	159.90	83.03	8.26	240.31	224.62	15.68	15.322		
1,700.00	1,673.77	1,676.85	1,676.55	10.00	7.75	161.77	83.19	7.81	265.01	248.28	16.73	15.842		
1,800.00	1,770.22	1,773.23	1,772.93	10.75	8.23	163.32	83.39	7.42	289.99	272.21	17.78	16.313		
1,900.00	1,866.68	1,869.41	1,869.11	11.50	8.72	164.65	83.51	7.15	315.22	296.39	18.83	16.742		
2,000.00	1,963.14	1,964.58	1,964.28	12.26	9.20	165.74	83.84	7.06	340.84	320.97	19.88	17.148		
2,100.00	2,059.60	2,060.29	2,059.98	13.03	9.70	166.65	84.52	7.13	366.85	345.91	20.93	17.523		
2,200.00	2,156.06	2,155.87	2,155.56	13.79	10.19	167.42	85.41	7.30	393.12	371.12	22.00	17.872		
2,300.00	2,252.52	2,252.14	2,251.83	14.56	10.69	168.09	86.39	7.58	419.57	396.50	23.07	18.189		
2,400.00	2,348.98	2,348.08	2,347.76	15.33	11.19	168.69	87.32	7.90	446.09	421.95	24.14	18.480		
2,500.00	2,445.43	2,441.82	2,441.50	16.11	11.68	169.24	88.09	8.56	472.94	447.75	25.19	18.774		
2,600.00	2,541.89	2,532.22	2,531.88	16.88	12.16	169.81	88.36	10.19	500.63	474.42	26.21	19.099		
2,700.00	2,638.35	2,630.99	2,630.62	17.65	12.68	170.48	87.87	12.74	528.82	501.50	27.32	19.355		
2,800.00	2,734.81	2,739.66	2,739.27	18.43	13.26	171.14	86.79	14.01	555.64	527.12	28.53	19.477		
2,900.00	2,831.27	2,837.21	2,836.79	19.21	13.77	171.76	84.63	14.26	581.28	551.66	29.62	19.625		
3,000.00	2,927.73	2,938.78	2,938.29	19.98	14.31	172.49	80.85	14.38	606.41	575.66	30.75	19.720		
3,100.00	3,024.19	3,036.44	3,035.92	20.76	14.82	172.99	78.54	13.59	631.14	599.30	31.84	19.820		
3,200.00	3,120.65	3,132.76	3,132.22	21.54	15.32	173.34	77.31	12.47	655.90	622.98	32.93	19.921		
3,300.00	3,217.10	3,225.44	3,224.89	22.32	15.81	173.64	76.45	11.53	680.92	646.94	33.98	20.042		
3,400.00	3,313.56	3,316.44	3,315.89	23.10	16.28	173.88	76.07	11.24	706.74	671.73	35.01	20.187		
3,500.00	3,410.02	3,412.37	3,411.82	23.88	16.78	174.10	76.05	11.23	732.97	696.89	36.09	20.311		
3,600.00	3,506.48	3,508.83	3,508.28	24.66	17.28	174.30	76.14	11.23	759.25	722.08	37.17	20.426		
3,700.00	3,602.94	3,605.21	3,604.66	25.45	17.79	174.49	76.19	11.25	785.54	747.28	38.25	20.535		
3,800.00	3,699.40	3,701.28	3,700.73	26.23	18.29	174.67	76.22	11.30	811.86	772.52	39.34	20.638		
3,900.00	3,795.86	3,797.58	3,797.04	27.01	18.79	174.83	76.27	11.39	838.23	797.81	40.42	20.736		
4,000.00	3,892.31	3,895.15	3,894.60	27.79	19.30	174.99	76.32	11.40	864.53	823.01	41.52	20.822		
4,100.00	3,988.77	3,991.69	3,991.14	28.58	19.80	175.13	76.36	11.34	890.78	848.17	42.60	20.908		
4,200.00	4,085.23	4,087.79	4,087.24	29.36	20.30	175.27	76.41	11.31	917.05	873.36	43.69	20.992		
4,300.00	4,181.69	4,183.92	4,183.37	30.14	20.80	175.40	76.39	11.33	943.36	898.59	44.77	21.070		
4,400.00	4,278.15	4,280.10	4,279.55	30.93	21.31	175.53	76.36	11.39	969.71	923.85	45.86	21.144		
4,500.00	4,374.61	4,376.60	4,376.05	31.71	21.82	175.65	76.37	11.45	996.07	949.12	46.96	21.213		
4,600.00	4,471.07	4,473.45	4,472.90	32.49	22.33	175.75	76.47	11.46	1,022.41	974.36	48.05	21.278		
4,700.00	4,567.53	4,570.10	4,569.55	33.28	22.83	175.86	76.51	11.45	1,048.73	999.59	49.14	21.341		

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



Pro Directional
Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 Cypress 34 - 012H (O) - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 404-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Tooface (")	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)				Between Centres (usft)	Between Ellipses (usft)	
4,800.00	4,663.98	4,666.54	4,665.99	34.06	23.34	175.96	76.46	11.46	1,075.04	1,024.81		50.23	21.402	
4,900.00	4,760.44	4,762.64	4,762.09	34.85	23.84	176.06	76.40	11.49	1,101.37	1,050.05		51.32	21.460	
5,000.00	4,856.90	4,858.82	4,858.27	35.63	24.35	176.16	76.38	11.54	1,127.73	1,075.32		52.41	21.516	
5,100.00	4,953.36	4,955.51	4,954.96	36.42	24.86	176.24	76.38	11.60	1,154.11	1,100.60		53.51	21.568	
5,194.35	5,044.37	5,047.46	5,046.91	37.16	25.34	176.33	76.35	11.60	1,178.94	1,124.39		54.55	21.612	
5,200.00	5,049.82	5,052.97	5,052.42	37.20	25.37	176.33	76.34	11.60	1,180.42	1,125.81		54.61	21.615	
5,300.00	5,146.77	5,150.03	5,149.48	37.95	25.88	176.44	76.27	11.54	1,204.80	1,149.10		55.70	21.630	
5,400.00	5,244.51	5,247.91	5,247.36	38.66	26.39	176.53	76.30	11.49	1,225.82	1,169.05		56.78	21.591	
5,500.00	5,342.93	5,346.98	5,346.43	39.30	26.90	176.60	76.31	11.38	1,243.36	1,185.51		57.85	21.493	
5,600.00	5,441.91	5,445.70	5,445.15	39.90	27.41	176.65	76.28	11.27	1,257.45	1,198.54		58.91	21.347	
5,700.00	5,541.32	5,544.61	5,544.06	40.44	27.93	176.69	76.24	11.20	1,268.12	1,208.17		59.95	21.153	
5,800.00	5,641.05	5,643.69	5,643.14	40.94	28.45	176.72	76.21	11.17	1,275.36	1,214.39		60.98	20.915	
5,900.00	5,740.97	5,743.04	5,742.49	41.39	28.96	176.73	76.27	11.17	1,279.18	1,217.19		61.99	20.634	
5,959.03	5,800.00	5,801.43	5,800.88	41.63	29.27	176.06	76.33	11.19	1,279.82	1,217.24		62.58	20.452	
6,000.00	5,840.97	5,841.81	5,841.26	41.78	29.48	176.06	76.43	11.21	1,279.87	1,216.89		62.97	20.325	
6,100.00	5,940.97	5,930.98	5,930.42	42.17	29.94	175.99	77.99	11.27	1,280.35	1,216.51		63.84	20.055	
6,200.00	6,040.97	6,018.10	6,017.38	42.56	30.40	175.77	83.10	11.32	1,281.84	1,217.15		64.69	19.816	
6,300.00	6,140.97	6,130.33	6,129.00	42.95	30.98	175.26	94.62	10.48	1,283.74	1,217.93		65.80	19.508	
6,400.00	6,240.97	6,257.83	6,254.93	43.34	31.64	174.38	113.77	5.46	1,283.89	1,216.81		67.07	19.141	
6,500.00	6,340.97	6,397.05	6,391.58	43.74	32.37	173.20	138.20	-5.13	1,281.40	1,212.96		68.44	18.724	
6,600.00	6,440.97	6,570.53	6,561.23	44.14	33.29	171.65	167.74	-25.71	1,275.28	1,205.28		70.00	18.218	
6,700.00	6,540.97	6,676.33	6,652.60	44.55	34.95	168.12	222.82	-98.72	1,258.82	1,187.15		71.67	17.565	
6,800.00	6,640.97	7,026.25	6,993.90	44.95	35.78	166.70	234.90	-147.07	1,231.21	1,158.61		72.60	16.958	
6,900.00	6,740.97	7,090.00	7,054.60	45.36	36.13	166.31	235.10	-166.55	1,203.41	1,129.72		73.69	16.331	
7,000.00	6,840.97	7,158.19	7,120.19	45.78	36.51	165.98	234.09	-185.13	1,178.04	1,103.30		74.74	15.762	
7,100.00	6,940.97	7,219.21	7,179.52	46.19	36.84	165.72	233.37	-199.36	1,156.13	1,080.37		75.76	15.260	
7,200.00	7,040.97	7,278.00	7,237.10	46.61	37.17	165.53	232.04	-211.15	1,137.08	1,060.35		76.73	14.819	
7,300.00	7,140.97	7,339.33	7,297.51	47.03	37.51	165.33	231.69	-221.70	1,121.35	1,043.70		77.65	14.441	
7,400.00	7,240.97	7,408.16	7,365.53	47.45	37.89	164.98	234.31	-231.90	1,109.29	1,030.73		78.56	14.121	
7,500.00	7,340.97	7,484.88	7,441.33	47.87	38.32	164.53	238.78	-242.84	1,098.91	1,019.43		79.48	13.826	
7,600.00	7,440.97	7,537.38	7,493.20	48.30	38.62	164.15	243.74	-249.14	1,092.13	1,011.94		80.19	13.620	
7,700.00	7,540.97	7,608.69	7,563.59	48.73	39.02	163.66	253.05	-255.81	1,089.28	1,008.29		80.99	13.449	
7,800.00	7,640.97	7,785.54	7,738.32	49.16	40.01	162.20	272.33	-274.33	1,085.59	1,002.82		82.76	13.117	
7,900.00	7,740.97	7,899.09	7,850.68	49.59	40.65	161.58	277.20	-289.87	1,075.39	991.47		83.92	12.815	
8,000.00	7,840.97	7,989.26	7,940.05	50.03	41.16	161.13	280.62	-301.42	1,065.92	980.98		84.93	12.550	
8,100.00	7,940.97	8,095.15	8,044.91	50.47	41.76	160.52	285.74	-315.28	1,056.81	970.76		86.05	12.281	
8,200.00	8,040.97	8,200.83	8,149.56	50.90	42.36	159.96	289.38	-329.54	1,046.75	959.59		87.16	12.009	
8,300.00	8,140.97	8,297.31	8,245.26	51.35	42.90	159.55	290.91	-341.65	1,036.67	948.47		88.21	11.753	
8,400.00	8,240.97	8,391.97	8,339.30	51.79	43.42	159.23	291.20	-352.39	1,027.05	937.81		89.23	11.510	
8,500.00	8,340.97	8,535.55	8,481.59	52.23	44.22	158.68	291.10	-371.42	1,015.67	925.20		90.47	11.227	
8,600.00	8,440.97	8,632.67	8,577.44	52.68	44.77	158.24	290.44	-387.06	1,001.56	910.03		91.53	10.942	
8,700.00	8,540.97	8,706.30	8,650.42	53.13	45.18	158.00	289.34	-396.76	989.52	897.02		92.50	10.698	
8,800.00	8,640.97	8,796.16	8,739.73	53.58	45.67	157.81	287.03	-406.40	979.07	885.58		93.49	10.472	
8,900.00	8,740.97	8,868.44	8,811.68	54.03	46.07	157.64	286.25	-413.15	970.59	876.21		94.38	10.284	
9,000.00	8,840.97	8,934.44	8,877.47	54.48	46.43	157.42	287.47	-418.17	965.19	870.02		95.16	10.142	
9,099.41	8,940.39	8,999.45	8,942.39	54.93	46.78	157.21	289.80	-421.01	963.45	867.60		95.85	10.052	
9,100.00	8,940.97	8,999.85	8,942.78	54.94	46.78	157.21	289.82	-421.02	963.45	867.59		95.85	10.051	
9,200.00	9,040.97	9,073.00	9,015.81	55.39	47.17	156.98	293.76	-421.97	965.17	868.61		96.56	9.995	
9,300.00	9,140.97	9,149.41	9,092.05	55.85	47.57	156.75	298.83	-421.22	969.52	872.26		97.27	9.968	
9,400.00	9,240.97	9,288.49	9,230.60	56.31	48.31	156.13	310.27	-422.96	973.14	874.23		98.91	9.839	

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 Cypress 34 - 012H (O) - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 404-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,500.00	9,340.97	9,415.08	9,355.80	56.77	49.02	55.04	325.67	-433.40	973.24	872.86	100.38	9.695		
9,600.00	9,440.97	9,517.00	9,456.10	57.23	49.61	53.98	339.28	-445.27	971.48	869.90	101.58	9.564		
9,700.00	9,540.97	9,608.04	9,545.44	57.69	50.15	52.95	352.95	-456.24	970.71	868.05	102.66	9.456		
9,739.02	9,579.99	9,645.26	9,581.99	57.87	50.36	52.53	358.51	-460.53	970.66	867.56	103.10	9.415		
9,800.00	9,640.97	9,703.63	9,639.45	58.16	50.70	51.92	366.73	-466.77	970.77	866.99	103.78	9.354		
9,900.00	9,740.97	9,793.64	9,727.80	58.62	51.23	50.91	380.52	-476.97	971.51	866.67	104.85	9.266		
10,000.00	9,840.97	9,859.52	9,791.34	59.09	51.63	49.90	395.09	-486.24	974.90	869.34	105.56	9.236		
10,100.00	9,940.97	9,905.34	9,834.36	59.56	51.92	49.00	408.95	-493.75	982.86	877.07	105.79	9.291		
10,200.00	10,040.97	9,943.24	9,868.76	60.02	52.15	48.11	423.52	-500.02	997.11	891.52	105.59	9.443		
10,300.00	10,140.97	9,971.00	9,893.15	60.49	52.33	47.40	435.96	-504.61	1,017.88	913.04	104.84	9.709		
10,400.00	10,240.97	9,971.00	9,893.15	60.97	52.33	47.40	435.96	-504.61	1,046.92	944.07	102.85	10.179		
10,500.00	10,340.97	10,049.74	9,958.14	61.44	52.81	45.11	478.24	-517.91	1,077.44	974.04	103.40	10.420		
10,600.00	10,440.97	10,080.31	9,981.52	61.91	53.01	44.15	497.19	-523.22	1,116.00	1,013.83	102.17	10.923		
10,700.00	10,540.97	10,160.00	10,036.90	62.39	53.53	41.48	552.65	-537.26	1,163.15	1,060.48	102.67	11.329		
10,800.00	10,640.97	10,160.00	10,036.90	62.86	53.53	41.48	552.65	-537.26	1,210.02	1,109.77	100.25	12.070		
10,861.07	10,702.04	10,160.00	10,036.90	63.15	53.53	41.48	552.65	-537.26	1,241.73	1,142.98	98.75	12.574		
10,900.00	10,740.94	10,160.00	10,036.90	63.34	53.53	40.49	552.65	-537.26	1,262.24	1,164.47	97.78	12.910		
10,950.00	10,790.61	10,160.00	10,036.90	63.57	53.53	38.64	552.65	-537.26	1,287.35	1,190.88	96.46	13.345		
11,000.00	10,839.61	10,160.00	10,036.90	63.79	53.53	37.00	552.65	-537.26	1,310.96	1,215.86	95.10	13.785		
11,050.00	10,887.57	10,197.22	10,060.21	64.00	53.77	34.80	581.03	-543.27	1,331.50	1,236.39	95.12	13.999		
11,100.00	10,934.11	10,212.13	10,069.25	64.19	53.87	33.38	592.71	-545.35	1,350.44	1,256.21	94.24	14.330		
11,150.00	10,978.88	10,254.00	10,093.66	64.37	54.15	31.83	626.37	-550.17	1,367.85	1,273.48	94.37	14.495		
11,200.00	11,021.55	10,254.00	10,093.66	64.53	54.15	31.08	626.37	-550.17	1,381.53	1,288.67	92.86	14.878		
11,250.00	11,061.78	10,254.00	10,093.66	64.67	54.15	30.47	626.37	-550.17	1,393.28	1,301.95	91.33	15.256		
11,300.00	11,099.28	10,283.80	10,110.40	64.79	54.34	29.76	650.90	-552.62	1,402.39	1,311.46	90.93	15.422		
11,350.00	11,133.75	10,306.46	10,122.97	64.89	54.48	29.33	669.71	-553.86	1,408.76	1,318.49	90.27	15.606		
11,400.00	11,164.94	10,348.00	10,145.62	64.97	54.75	29.07	704.52	-554.75	1,412.57	1,322.22	90.36	15.634		
11,450.00	11,192.61	10,348.00	10,145.62	65.04	54.75	29.05	704.52	-554.75	1,413.01	1,324.17	88.84	15.905		
11,500.00	11,216.54	10,377.40	10,161.17	65.09	54.94	29.20	729.48	-554.73	1,410.78	1,322.28	88.50	15.941		
11,550.00	11,236.56	10,401.99	10,173.71	65.13	55.10	29.52	750.62	-554.69	1,405.66	1,317.66	88.01	15.972		
11,600.00	11,252.51	10,443.00	10,193.71	65.16	55.37	30.11	786.42	-554.56	1,397.87	1,309.68	88.19	15.851		
11,650.00	11,264.27	10,443.00	10,193.71	65.19	55.37	30.68	786.42	-554.56	1,386.89	1,300.02	86.86	15.966		
11,700.00	11,271.75	10,443.00	10,193.71	65.22	55.37	31.37	786.42	-554.56	1,373.97	1,288.34	85.63	16.046		
11,750.00	11,274.89	10,443.00	10,193.71	65.26	55.37	32.19	786.42	-554.56	1,359.14	1,274.65	84.50	16.085		
11,761.07	11,275.00	10,474.95	10,207.87	65.27	55.59	32.75	815.05	-554.26	1,354.23	1,268.80	85.43	15.852		
11,800.00	11,275.00	10,484.68	10,211.80	65.31	55.65	32.86	823.95	-554.10	1,341.18	1,256.21	84.96	15.786		
11,900.00	11,275.00	10,537.00	10,229.75	65.46	56.01	33.37	873.05	-552.73	1,312.07	1,227.29	84.78	15.476		
12,000.00	11,275.00	10,537.00	10,229.75	65.68	56.01	33.37	873.05	-552.73	1,286.22	1,203.25	82.97	15.502		
12,100.00	11,275.00	10,583.09	10,242.07	65.97	56.34	33.76	917.43	-551.22	1,265.99	1,183.16	82.83	15.284		
12,200.00	11,275.00	10,632.00	10,252.70	66.35	56.69	34.11	965.15	-549.80	1,249.86	1,166.98	82.89	15.079		
12,300.00	11,275.00	10,701.04	10,263.35	66.82	57.23	34.39	1,033.32	-550.56	1,236.97	1,153.53	83.43	14.826		
12,400.00	11,275.00	10,761.27	10,268.34	67.37	57.73	34.37	1,093.15	-555.12	1,226.56	1,142.89	83.67	14.660		
12,500.00	11,275.00	10,821.00	10,269.03	68.01	58.25	34.16	1,152.51	-561.65	1,219.83	1,135.99	83.84	14.550		
12,600.00	11,275.00	10,922.79	10,267.54	68.73	59.21	33.68	1,253.54	-573.93	1,214.89	1,130.32	84.56	14.366		
12,700.00	11,275.00	11,025.21	10,267.91	69.53	60.23	33.30	1,355.36	-584.94	1,209.22	1,123.74	85.47	14.147		
12,800.00	11,275.00	11,098.96	10,268.80	70.39	60.99	33.12	1,428.87	-590.78	1,204.49	1,118.36	86.13	13.984		
12,900.00	11,275.00	11,172.08	10,269.21	71.32	61.77	33.03	1,501.92	-593.98	1,202.18	1,115.24	86.94	13.828		
12,962.41	11,275.00	11,219.84	10,269.17	71.94	62.28	33.01	1,549.66	-595.11	1,201.78	1,114.23	87.55	13.727		
13,000.00	11,275.00	11,252.90	10,269.05	72.31	62.65	33.00	1,582.72	-595.53	1,201.85	1,113.85	88.00	13.657		
13,100.00	11,275.00	11,348.15	10,268.93	73.36	63.71	33.03	1,677.96	-595.62	1,202.47	1,113.04	89.43	13.446		
13,200.00	11,275.00	11,448.45	10,269.45	74.46	64.88	33.12	1,778.26	-594.75	1,203.09	1,112.02	91.07	13.210		

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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										Cypress 34 - 012H (O) - OH - OH				Offset Site Error:		0.00 usft	
Survey Program: 404-MWD+HDGM														Offset Well Error:		0.00 usft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/S (usft)	+E/W (usft)	Between Centres (usft)	Between Ellipses (usft)							
13,300.00	11,275.00	11,543.00	10,270.12	75.61	66.02	33.25	1,872.79	-593.01	1,204.07	1,111.35	92.72	12.985					
13,400.00	11,275.00	11,642.57	10,270.80	76.80	67.26	33.40	1,972.34	-590.84	1,205.29	1,110.73	94.56	12.746					
13,500.00	11,275.00	11,742.20	10,271.49	78.04	68.55	33.54	2,071.95	-588.75	1,206.45	1,109.98	96.47	12.506					
13,600.00	11,275.00	11,839.22	10,272.01	79.32	69.84	33.68	2,168.94	-586.58	1,207.82	1,109.43	98.39	12.276					
13,700.00	11,275.00	11,931.10	10,272.35	80.64	71.09	33.82	2,260.79	-584.25	1,209.52	1,109.25	100.27	12.062					
13,800.00	11,275.00	12,027.62	10,272.89	82.00	72.45	34.04	2,357.21	-579.99	1,212.11	1,109.70	102.40	11.837					
13,900.00	11,275.00	12,142.01	10,273.06	83.39	74.10	34.20	2,471.56	-577.15	1,213.97	1,109.06	104.91	11.572					
14,000.00	11,275.00	12,292.16	10,272.47	84.81	76.38	34.03	2,621.53	-582.76	1,212.60	1,104.67	107.94	11.234					
14,100.00	11,275.00	12,362.17	10,272.09	86.27	77.48	33.92	2,691.45	-586.08	1,210.99	1,101.73	109.26	11.083					
14,200.00	11,275.00	12,479.87	10,271.86	87.75	79.34	33.82	2,809.10	-589.66	1,210.07	1,098.32	111.75	10.828					
14,300.00	11,275.00	12,594.74	10,273.65	89.27	81.21	33.73	2,923.85	-594.41	1,206.99	1,092.74	114.24	10.565					
14,400.00	11,275.00	12,681.09	10,274.51	90.81	82.63	33.65	3,010.12	-597.86	1,204.52	1,088.43	116.09	10.376					
14,500.00	11,275.00	12,762.70	10,274.99	92.37	83.98	33.61	3,091.70	-600.08	1,203.16	1,085.26	117.89	10.205					
14,515.30	11,275.00	12,773.08	10,275.03	92.61	84.16	33.61	3,102.08	-600.15	1,203.12	1,084.99	118.13	10.185					
14,600.00	11,275.00	12,834.00	10,275.25	93.96	85.16	33.68	3,162.99	-599.15	1,204.09	1,084.49	119.60	10.067					
14,700.00	11,275.00	12,959.65	10,275.28	95.57	87.27	33.76	3,288.62	-598.60	1,204.88	1,082.17	122.71	9.819					
14,772.84	11,275.00	13,032.09	10,275.16	96.76	88.51	33.74	3,361.05	-599.71	1,204.78	1,080.36	124.42	9.683					
14,800.00	11,275.00	13,054.45	10,275.06	97.20	88.89	33.74	3,383.41	-600.04	1,204.82	1,079.88	124.95	9.643					
14,900.00	11,275.00	13,145.90	10,274.05	98.86	90.48	33.70	3,474.84	-601.21	1,205.61	1,078.50	127.11	9.485					
15,000.00	11,275.00	13,258.29	10,272.52	100.53	92.45	33.62	3,587.20	-603.35	1,206.29	1,076.51	129.78	9.295					
15,092.06	11,275.00	13,349.93	10,272.21	102.09	94.08	33.57	3,678.82	-605.52	1,205.88	1,073.90	131.98	9.137					
15,100.00	11,275.00	13,356.33	10,272.16	102.22	94.19	33.56	3,685.22	-605.66	1,205.89	1,073.76	132.13	9.126					
15,200.00	11,275.00	13,446.73	10,270.87	103.93	95.81	33.50	3,775.59	-607.28	1,206.64	1,072.34	134.30	8.985					
15,300.00	11,275.00	13,551.47	10,269.32	105.66	97.70	33.43	3,880.30	-609.28	1,207.41	1,070.57	136.84	8.823					
15,400.00	11,275.00	13,653.82	10,268.21	107.40	99.56	33.36	3,982.62	-611.35	1,207.78	1,068.43	139.35	8.667					
15,500.00	11,275.00	13,747.31	10,267.24	109.16	101.27	33.31	4,076.10	-612.93	1,208.31	1,066.64	141.67	8.529					
15,600.00	11,275.00	13,845.97	10,265.86	110.93	103.09	33.27	4,174.73	-614.17	1,209.36	1,065.21	144.16	8.389					
15,700.00	11,275.00	13,941.23	10,264.52	112.71	104.85	33.22	4,269.98	-615.34	1,210.46	1,063.89	146.57	8.259					
15,800.00	11,275.00	14,041.50	10,263.09	114.51	106.72	33.21	4,370.24	-615.88	1,211.93	1,062.76	149.17	8.125					
15,900.00	11,275.00	14,134.54	10,261.94	116.32	108.46	33.21	4,463.28	-616.03	1,213.47	1,061.86	151.61	8.004					
16,000.00	11,275.00	14,234.61	10,260.45	118.14	110.34	33.23	4,563.33	-615.62	1,215.51	1,061.21	154.30	7.877					
16,100.00	11,275.00	14,338.51	10,259.36	119.98	112.29	33.27	4,667.22	-615.05	1,217.27	1,060.13	157.14	7.746					
16,200.00	11,275.00	14,453.79	10,258.62	121.82	114.48	33.29	4,782.50	-615.27	1,218.29	1,058.00	160.29	7.600					
16,300.00	11,275.00	14,551.75	10,258.22	123.68	116.36	33.29	4,880.46	-616.02	1,218.79	1,055.85	162.95	7.480					
16,400.00	11,275.00	14,651.28	10,257.94	125.54	118.27	33.30	4,979.98	-616.54	1,219.33	1,053.66	165.67	7.360					
16,500.00	11,275.00	14,728.93	10,257.17	127.41	119.76	33.33	5,057.63	-616.13	1,220.97	1,053.16	167.81	7.276					
16,600.00	11,275.00	14,839.46	10,256.02	129.30	121.89	33.39	5,168.15	-615.13	1,222.92	1,051.96	170.96	7.153					
16,700.00	11,275.00	14,947.68	10,255.69	131.19	123.98	33.45	5,276.37	-614.56	1,224.04	1,049.98	174.06	7.032					
16,776.29	11,275.00	15,026.06	10,255.76	132.64	125.50	33.49	5,354.75	-614.20	1,224.62	1,048.30	176.32	6.946 SF					



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 Cypress 34 - 015H(O) - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 76-MWD+HDGM													Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Minimum		Separation		Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	76.33	63.00	259.00	267.77					
100.00	100.00	74.79	74.79	0.20	0.20	76.35	62.90	258.98	266.51	266.11	0.40	668.311		
200.00	200.00	174.82	174.82	0.74	0.74	76.42	62.54	258.96	266.40	264.93	1.47	180.923		
300.00	300.00	275.34	275.34	1.27	1.28	76.55	61.92	258.88	266.18	263.63	2.55	104.358		
400.00	400.00	375.55	375.55	1.81	1.81	76.64	61.41	258.60	265.80	262.17	3.63	73.323		
434.09	434.09	408.60	408.59	1.99	1.99	76.65	61.35	258.52	265.70	261.72	3.98	66.732 CC		
450.00	450.00	423.54	423.53	2.08	2.06	76.64	61.39	258.54	265.73	261.58	4.14	64.126 ES		
500.00	500.00	470.49	470.48	2.34	2.30	177.25	61.81	258.89	266.63	261.98	4.65	57.376		
600.00	599.93	567.81	567.77	2.86	2.80	177.00	63.56	260.63	272.27	266.61	5.66	48.110		
700.00	699.68	668.67	668.60	3.39	3.32	176.85	65.15	262.63	281.53	274.82	6.71	41.985		
800.00	799.13	759.20	759.07	3.93	3.79	176.77	66.66	265.27	295.20	287.48	7.72	38.259		
900.00	898.15	840.74	840.37	4.50	4.22	176.72	68.84	270.96	316.43	307.75	8.68	36.454		
1,000.00	996.63	936.17	935.21	5.09	4.74	176.72	72.12	281.01	344.54	334.82	9.72	35.443		
1,100.00	1,094.44	1,031.81	1,030.36	5.71	5.26	176.88	74.40	290.51	375.17	364.40	10.77	34.834		
1,200.00	1,191.46	1,134.13	1,132.22	6.37	5.83	177.11	76.28	299.99	408.40	396.53	11.87	34.401		
1,214.68	1,205.63	1,149.44	1,147.48	6.47	5.91	177.14	76.54	301.20	413.37	401.32	12.05	34.318		
1,300.00	1,287.93	1,237.54	1,235.36	7.07	6.39	177.28	78.10	307.19	441.58	428.60	12.98	34.019		
1,400.00	1,384.39	1,330.11	1,327.74	7.79	6.90	177.39	79.73	312.84	473.99	459.98	14.01	33.828		
1,500.00	1,480.85	1,422.34	1,419.76	8.51	7.40	177.51	81.27	318.92	506.84	491.80	15.05	33.686		
1,600.00	1,577.31	1,537.91	1,535.16	9.25	8.03	177.56	83.47	324.52	538.15	521.90	16.25	33.113		
1,700.00	1,673.77	1,634.89	1,632.07	10.00	8.55	177.45	86.20	326.94	567.46	550.13	17.33	32.749		
1,800.00	1,770.22	1,724.68	1,721.78	10.75	9.03	177.33	89.02	329.31	596.97	578.61	18.36	32.523		
1,900.00	1,866.68	1,808.90	1,805.89	11.50	9.49	177.28	91.51	332.83	627.86	608.52	19.34	32.463		
2,000.00	1,963.14	1,898.61	1,895.44	12.26	9.98	177.30	93.62	337.87	659.96	639.59	20.37	32.399		
2,100.00	2,059.60	1,992.03	1,988.65	13.03	10.49	177.36	95.42	343.67	692.52	671.09	21.43	32.314		
2,200.00	2,156.06	2,083.83	2,080.25	13.79	11.00	177.42	97.21	349.61	725.31	702.83	22.48	32.265		
2,300.00	2,252.52	2,182.34	2,178.54	14.56	11.54	177.50	98.89	356.00	758.08	734.49	23.59	32.137		
2,400.00	2,348.98	2,278.89	2,274.89	15.33	12.07	177.58	100.28	361.89	790.42	765.74	24.68	32.024		
2,500.00	2,445.43	2,376.16	2,371.99	16.11	12.60	177.67	101.53	367.57	822.51	796.72	25.78	31.901		
2,600.00	2,541.89	2,465.00	2,460.66	16.88	13.09	177.71	103.17	372.82	854.76	827.96	26.81	31.883		
2,700.00	2,638.35	2,554.64	2,550.09	17.65	13.59	177.73	105.18	378.62	887.62	859.78	27.84	31.880		
2,800.00	2,734.81	2,649.12	2,644.33	18.43	14.11	177.75	107.23	385.02	920.76	891.83	28.92	31.836		
2,900.00	2,831.27	2,745.05	2,740.02	19.21	14.64	177.76	109.54	391.37	953.78	923.77	30.02	31.776		
3,000.00	2,927.73	2,843.52	2,838.27	19.98	15.18	177.84	110.78	397.85	986.54	955.41	31.13	31.687		
3,100.00	3,024.19	2,939.95	2,934.49	20.76	15.71	177.99	110.63	404.19	1,019.01	986.78	32.23	31.615		
3,200.00	3,120.65	3,028.01	3,022.35	21.54	16.20	178.08	111.16	410.04	1,051.69	1,018.44	33.25	31.628		
3,300.00	3,217.10	3,127.21	3,121.32	22.32	16.74	178.08	113.36	416.40	1,084.50	1,050.12	34.38	31.544		
3,400.00	3,313.56	3,212.54	3,206.46	23.10	17.22	178.07	115.53	421.62	1,117.14	1,081.76	35.37	31.580		
3,500.00	3,410.02	3,285.86	3,279.52	23.88	17.63	178.04	118.03	427.24	1,151.34	1,115.09	36.25	31.764		
3,600.00	3,506.48	3,363.55	3,356.81	24.66	18.06	177.99	121.32	434.38	1,187.10	1,149.95	37.16	31.949		
3,700.00	3,602.94	3,435.99	3,428.79	25.45	18.48	177.94	124.61	441.84	1,224.01	1,186.01	38.00	32.207		
3,800.00	3,699.40	3,494.83	3,487.06	26.23	18.82	177.87	128.39	449.11	1,263.13	1,224.44	38.69	32.651		
3,900.00	3,795.86	3,570.89	3,562.11	27.01	19.27	177.73	134.51	459.85	1,304.15	1,264.59	39.56	32.965		
4,000.00	3,892.31	3,637.89	3,628.09	27.79	19.67	177.61	140.17	469.96	1,346.22	1,305.89	40.32	33.386		
4,100.00	3,988.77	3,696.00	3,685.08	28.58	20.02	177.50	145.58	479.96	1,390.31	1,349.35	40.96	33.942		
4,200.00	4,085.23	3,790.99	3,778.05	29.36	20.60	177.32	154.68	497.17	1,435.28	1,393.20	42.08	34.109		
4,300.00	4,181.69	3,878.49	3,863.73	30.14	21.14	177.17	163.00	512.89	1,480.11	1,437.01	43.10	34.341		
4,400.00	4,278.15	3,984.82	3,967.93	30.93	21.80	177.00	173.04	531.53	1,524.55	1,480.18	44.36	34.365		
4,500.00	4,374.61	4,093.92	4,075.09	31.71	22.47	176.84	182.97	549.40	1,567.89	1,522.24	45.65	34.342		
4,600.00	4,471.07	4,196.05	4,175.59	32.49	23.09	176.70	192.02	565.22	1,610.41	1,563.55	46.86	34.369		
4,700.00	4,567.53	4,290.03	4,268.17	33.28	23.67	176.58	200.17	579.15	1,652.27	1,604.32	47.96	34.452		

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 Cypress 34 - 015H (O) - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 76-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset		Between Centres (usft)	Between Ellipses (usft)				Measured Depth (usft)	Vertical Depth (usft)	Reference
4,800.00	4,663.98	4,365.37	4,342.33	34.06	24.14	176.49	206.75	590.73	1,694.65	1,645.81		48.84	34.699	
4,900.00	4,760.44	4,440.08	4,415.75	34.85	24.60	176.41	213.35	602.87	1,737.84	1,688.13		49.71	34.960	
5,000.00	4,856.90	4,545.14	4,518.97	35.63	25.25	176.30	222.56	620.13	1,781.20	1,730.25		50.95	34.959	
5,100.00	4,953.36	4,657.86	4,629.95	36.42	25.95	176.20	231.94	637.44	1,823.49	1,771.21		52.28	34.878	
5,194.35	5,044.37	4,731.30	4,702.31	37.16	26.41	176.17	237.13	648.85	1,863.26	1,810.11		53.14	35.061	
5,200.00	5,049.82	4,735.93	4,706.88	37.20	26.44	176.17	237.42	649.59	1,865.65	1,812.45		53.20	35.070	
5,300.00	5,146.77	4,818.45	4,788.16	37.95	26.95	176.24	241.87	663.15	1,906.45	1,852.29		54.16	35.203	
5,400.00	5,244.51	4,888.16	4,856.73	38.66	27.39	176.32	245.16	675.23	1,944.75	1,889.81		54.94	35.396	
5,500.00	5,342.93	4,955.24	4,922.54	39.30	27.82	176.36	249.27	687.54	1,981.04	1,925.36		55.68	35.581	
5,600.00	5,441.91	5,023.00	4,988.82	39.90	28.25	176.37	254.38	700.63	2,015.31	1,958.92		56.40	35.735	
5,700.00	5,541.32	5,126.77	5,090.23	40.44	28.93	176.34	262.90	720.97	2,046.72	1,989.16		57.56	35.559	
5,800.00	5,641.05	5,241.91	5,202.87	40.94	29.68	176.29	272.16	742.94	2,074.30	2,015.46		58.84	35.251	
5,900.00	5,740.97	5,400.10	5,358.28	41.39	30.69	176.22	283.35	770.22	2,096.49	2,035.87		60.62	34.586	
5,959.03	5,800.00	5,466.81	5,424.02	41.63	31.10	75.51	287.82	780.66	2,107.03	2,045.71		61.32	34.361	
6,000.00	5,840.97	5,513.26	5,469.80	41.78	31.39	75.47	291.20	787.70	2,113.78	2,051.98		61.80	34.202	
6,100.00	5,940.97	5,593.64	5,584.52	42.17	33.75	74.98	318.41	819.75	2,123.49	2,057.70		65.79	32.277	
6,200.00	6,040.97	6,073.31	6,027.14	42.56	34.44	74.88	321.96	819.19	2,123.67	2,056.63		67.05	31.675	
6,300.00	6,140.97	6,190.24	6,144.05	42.95	34.98	74.85	322.77	817.65	2,122.56	2,054.45		68.11	31.165	
6,400.00	6,240.97	6,292.00	6,245.80	43.34	35.45	74.84	322.69	816.21	2,121.17	2,052.11		69.06	30.714	
6,500.00	6,340.97	6,392.80	6,346.59	43.74	35.91	74.85	322.13	814.84	2,119.72	2,049.70		70.02	30.275	
6,600.00	6,440.97	6,493.09	6,446.87	44.14	36.37	74.86	321.20	813.56	2,118.24	2,047.27		70.97	29.848	
6,700.00	6,540.97	6,589.36	6,543.12	44.55	36.81	74.88	320.06	812.46	2,116.83	2,044.93		71.90	29.442	
6,800.00	6,640.97	6,684.57	6,638.32	44.95	37.25	74.91	318.82	811.61	2,115.63	2,042.81		72.83	29.050	
6,900.00	6,740.97	6,781.46	6,735.20	45.36	37.70	74.94	317.48	810.97	2,114.63	2,040.86		73.77	28.664	
7,000.00	6,840.97	6,878.67	6,832.40	45.78	38.16	74.97	316.08	810.47	2,113.77	2,039.04		74.72	28.288	
7,100.00	6,940.97	6,974.86	6,928.58	46.19	38.61	75.01	314.65	810.15	2,113.05	2,037.38		75.67	27.923	
7,200.00	7,040.97	7,070.94	7,024.65	46.61	39.07	75.05	313.19	810.01	2,112.53	2,035.90		76.63	27.569	
7,287.44	7,128.41	7,149.21	7,102.91	46.97	39.45	75.08	311.90	810.18	2,112.33	2,034.90		77.43	27.281	
7,300.00	7,140.97	7,160.42	7,114.11	47.03	39.51	75.09	311.70	810.23	2,112.33	2,034.79		77.54	27.241	
7,400.00	7,240.97	7,249.58	7,203.26	47.45	39.94	75.14	309.97	810.99	2,112.66	2,034.20		78.46	26.927	
7,500.00	7,340.97	7,362.82	7,316.47	47.87	40.49	75.19	308.04	811.90	2,113.01	2,033.47		79.54	26.566	
7,600.00	7,440.97	7,480.36	7,434.01	48.30	41.06	75.21	307.33	811.53	2,112.54	2,031.90		80.64	26.197	
7,700.00	7,540.97	7,570.69	7,524.33	48.73	41.49	75.22	306.76	811.23	2,112.05	2,030.48		81.56	25.894	
7,800.00	7,640.97	7,669.68	7,623.33	49.16	41.97	75.24	305.88	811.11	2,111.71	2,029.17		82.55	25.582	
7,900.00	7,740.97	7,778.55	7,732.19	49.59	42.50	75.26	305.22	810.63	2,111.13	2,027.54		83.59	25.255	
8,000.00	7,840.97	7,888.89	7,842.53	50.03	43.03	75.26	304.94	809.54	2,110.11	2,025.46		84.65	24.928	
8,100.00	7,940.97	8,000.49	7,954.11	50.47	43.57	75.27	304.22	807.93	2,108.55	2,022.85		85.71	24.602	
8,200.00	8,040.97	8,078.30	8,031.90	50.90	43.95	75.28	303.47	806.94	2,107.11	2,020.55		86.57	24.341	
8,256.85	8,097.82	8,118.72	8,072.32	51.16	44.15	75.29	303.09	806.88	2,106.89	2,019.86		87.03	24.209	
8,300.00	8,140.97	8,149.39	8,103.00	51.35	44.31	75.30	302.81	807.05	2,107.02	2,019.64		87.38	24.114	
8,400.00	8,240.97	8,223.66	8,177.25	51.79	44.68	75.32	302.15	808.21	2,108.28	2,020.08		88.20	23.903	
8,500.00	8,340.97	8,314.46	8,268.03	52.23	45.15	75.35	301.67	810.24	2,110.31	2,021.16		89.16	23.670	
8,600.00	8,440.97	8,415.52	8,369.05	52.68	45.67	75.37	301.71	812.78	2,112.76	2,022.57		90.19	23.426	
8,700.00	8,540.97	8,700.00	8,514.82	53.13	47.10	75.36	301.91	812.37	2,111.90	2,019.67		92.24	22.897	
8,750.19	8,591.16	8,647.90	8,601.40	53.35	46.84	75.34	302.22	810.99	2,110.95	2,018.69		92.26	22.880	
8,800.00	8,640.97	8,685.57	8,639.06	53.58	47.02	75.32	302.66	810.33	2,110.25	2,017.56		92.69	22.767	
8,896.69	8,737.66	8,758.68	8,712.16	54.01	47.39	75.28	304.10	809.53	2,109.71	2,016.20		93.51	22.561	
8,900.00	8,740.97	8,761.19	8,714.66	54.03	47.40	75.28	304.17	809.51	2,109.71	2,016.17		93.54	22.555	
9,000.00	8,840.97	8,846.67	8,800.12	54.48	47.83	75.23	306.13	809.39	2,110.15	2,015.70		94.46	22.340	
9,100.00	8,940.97	8,935.46	8,888.90	54.94	48.29	75.21	306.80	810.13	2,111.15	2,015.75		95.40	22.129	

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



Pro Directional Anticollision Report



Company: Tap Rock Operating, LLC
Project: Eddy County, NM (NAD 83)
Reference Site: Cypress 34
Site Error: 0.00 usft
Reference Well: 243H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1

Local Co-ordinate Reference: Well 243H
TVD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
MD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: WellPlanner1
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 - 015H (O) - OH - OH													Offset Site Error:
Survey Program: 76-MWD+HDGM													0.00 usft
Reference Offset Semi Major Axis Distance													Offset Well Error:
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
9,200.00	9,040.97	9,045.87	8,999.30	55.39	48.85	75.24	306.11	811.67	2,112.35	2,015.86	96.50	21.891	
9,300.00	9,140.97	9,170.90	9,124.32	55.85	49.48	75.27	305.10	812.19	2,112.56	2,014.87	97.69	21.626	
9,400.00	9,240.97	9,310.16	9,263.54	56.31	50.16	75.34	302.19	811.01	2,111.21	2,012.27	98.94	21.339	
9,500.00	9,340.97	9,402.00	9,355.33	56.77	50.61	75.41	299.25	809.51	2,108.84	2,008.94	99.90	21.110	
9,600.00	9,440.97	9,493.43	9,446.73	57.23	51.06	75.44	297.78	808.55	2,107.39	2,006.54	100.86	20.895	
9,700.00	9,540.97	9,579.55	9,532.85	57.69	51.49	75.45	297.17	807.34	2,105.91	2,004.13	101.78	20.690	
9,746.69	9,587.66	9,608.87	9,562.16	57.91	51.64	75.44	297.34	807.17	2,105.72	2,003.57	102.14	20.615	
9,800.00	9,640.97	9,648.03	9,601.32	58.16	51.83	75.43	297.90	807.22	2,105.95	2,003.36	102.59	20.528	
9,900.00	9,740.97	9,776.34	9,729.58	58.62	52.49	75.34	301.11	806.69	2,106.25	2,002.44	103.81	20.290	
10,000.00	9,840.97	9,901.57	9,853.62	59.09	53.12	74.92	315.40	800.42	2,104.16	1,999.17	104.99	20.042	
10,100.00	9,940.97	10,042.93	9,986.15	59.56	53.77	73.61	360.18	782.11	2,099.52	1,993.27	106.25	19.760	
10,200.00	10,040.97	10,089.13	10,027.45	60.02	53.98	73.04	379.78	775.45	2,097.61	1,990.65	106.96	19.612	
10,300.00	10,140.97	10,207.19	10,123.39	60.49	54.46	71.18	444.50	753.77	2,096.84	1,988.75	108.09	19.398	
10,312.16	10,153.13	10,213.00	10,127.63	60.55	54.48	71.07	448.25	752.48	2,096.82	1,988.64	108.18	19.383	
10,400.00	10,240.97	10,253.01	10,155.13	60.97	54.62	70.28	475.77	743.20	2,098.04	1,989.31	108.72	19.297	
10,500.00	10,340.97	10,282.38	10,173.34	61.44	54.71	69.65	497.67	736.09	2,102.80	1,993.66	109.14	19.267	
10,600.00	10,440.97	10,300.00	10,183.59	61.91	54.77	69.26	511.37	731.87	2,111.62	2,002.28	109.34	19.312	
10,700.00	10,540.97	10,314.98	10,191.91	62.39	54.82	68.92	523.34	728.43	2,124.69	2,015.30	109.39	19.423	
10,800.00	10,640.97	10,331.00	10,200.37	62.86	54.88	68.55	536.50	724.99	2,142.08	2,032.76	109.32	19.595	
10,861.07	10,702.04	10,331.00	10,200.37	63.15	54.88	68.55	536.50	724.99	2,154.74	2,045.63	109.12	19.747	
10,900.00	10,740.94	10,331.00	10,200.37	63.34	54.88	68.35	536.50	724.99	2,163.22	2,054.26	108.96	19.853	
10,950.00	10,790.61	10,331.00	10,200.37	63.57	54.88	67.36	536.50	724.99	2,173.68	2,064.95	108.72	19.993	
11,000.00	10,839.61	10,347.25	10,208.51	63.79	54.93	66.12	550.21	721.82	2,183.24	2,074.60	108.64	20.096	
11,050.00	10,887.57	10,362.00	10,215.52	64.00	54.99	65.01	562.93	719.27	2,192.34	2,083.82	108.51	20.203	
11,100.00	10,934.11	10,362.00	10,215.52	64.19	54.99	64.27	562.93	719.27	2,200.44	2,092.24	108.20	20.338	
11,150.00	10,978.88	10,362.00	10,215.52	64.37	54.99	63.61	562.93	719.27	2,207.77	2,099.92	107.86	20.470	
11,200.00	11,021.55	10,362.00	10,215.52	64.53	54.99	63.02	562.93	719.27	2,214.30	2,106.80	107.50	20.598	
11,250.00	11,061.78	10,394.00	10,229.91	64.67	55.12	62.17	591.18	715.03	2,219.66	2,112.12	107.54	20.641	
11,300.00	11,099.28	10,394.00	10,229.91	64.79	55.12	61.80	591.18	715.03	2,223.78	2,116.60	107.18	20.748	
11,350.00	11,133.75	10,394.00	10,229.91	64.89	55.12	61.52	591.18	715.03	2,226.97	2,120.14	106.83	20.847	
11,400.00	11,164.94	10,394.00	10,229.91	64.97	55.12	61.32	591.18	715.03	2,229.19	2,122.70	106.49	20.934	
11,450.00	11,192.61	10,426.00	10,243.06	65.04	55.27	61.10	620.25	712.53	2,230.09	2,123.50	106.59	20.922	
11,500.00	11,216.54	10,426.00	10,243.06	65.09	55.27	61.14	620.25	712.53	2,229.65	2,123.34	106.31	20.973	
11,550.00	11,236.56	10,426.00	10,243.06	65.13	55.27	61.26	620.25	712.53	2,228.23	2,122.16	106.06	21.008	
11,600.00	11,252.51	10,426.00	10,243.06	65.16	55.27	61.47	620.25	712.53	2,225.83	2,119.96	105.87	21.025	
11,650.00	11,264.27	10,455.74	10,253.60	65.19	55.42	61.87	648.01	711.17	2,221.62	2,115.52	106.10	20.940	
11,700.00	11,271.75	10,489.00	10,263.25	65.22	55.60	62.45	679.82	710.16	2,217.00	2,110.59	106.40	20.836	
11,750.00	11,274.89	10,489.00	10,263.25	65.26	55.60	63.04	679.82	710.16	2,210.41	2,104.04	106.37	20.780	
11,761.07	11,275.00	10,489.00	10,263.25	65.27	55.60	63.18	679.82	710.16	2,208.84	2,102.46	106.38	20.765	
11,800.00	11,275.00	10,489.00	10,263.25	65.31	55.60	63.18	679.82	710.16	2,203.56	2,097.17	106.39	20.711	
11,900.00	11,275.00	10,505.47	10,267.16	65.46	55.69	63.27	695.82	710.01	2,192.75	2,086.08	106.68	20.555	
12,000.00	11,275.00	10,521.00	10,270.32	65.68	55.78	63.35	711.02	710.23	2,185.76	2,078.74	107.02	20.423	
12,100.00	11,275.00	10,553.00	10,275.83	65.97	55.97	63.50	742.52	711.46	2,182.30	2,074.69	107.60	20.281	
12,164.23	11,275.00	10,575.55	10,279.24	66.20	56.11	63.59	764.77	712.72	2,181.71	2,073.68	108.04	20.194	
12,200.00	11,275.00	10,585.00	10,280.57	66.35	56.17	63.63	774.11	713.32	2,181.90	2,073.66	108.25	20.157	
12,300.00	11,275.00	10,616.00	10,283.76	66.82	56.36	63.74	804.84	715.72	2,184.88	2,075.95	108.92	20.059	
12,400.00	11,275.00	10,741.70	10,293.56	67.37	57.23	64.10	929.78	725.37	2,189.47	2,078.89	110.58	19.799	
12,500.00	11,275.00	10,842.00	10,301.15	68.01	58.00	64.36	1,029.62	731.28	2,192.45	2,080.33	112.12	19.555	
12,600.00	11,275.00	10,896.10	10,304.65	68.73	58.44	64.48	1,083.49	734.71	2,196.52	2,083.28	113.24	19.397	
12,700.00	11,275.00	10,936.43	10,306.35	69.53	58.77	64.57	1,123.65	738.07	2,203.22	2,088.96	114.26	19.282	
12,800.00	11,275.00	10,984.82	10,307.33	70.39	59.19	64.65	1,171.77	743.08	2,212.54	2,097.13	115.41	19.171	

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



Pro Directional
Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 Cypress 34 - 015H (O) - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 76-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highslide Tooface (")	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset		Between Centres (usft)	Between Ellipses (usft)				Offset Depth (usft)	Vertical Depth (usft)	Reference
12,900.00	11,275.00	11,058.00	10,307.73	71.32	59.84	64.76	1,244.45	751.60	2,223.72	2,106.83	116.88	19.025		
13,000.00	11,275.00	11,118.84	10,307.02	72.31	60.42	64.84	1,304.81	759.16	2,236.30	2,118.03	118.28	18.907		
13,100.00	11,275.00	11,265.12	10,303.01	73.36	61.87	64.95	1,450.02	776.32	2,249.29	2,128.52	120.77	18.624		
13,200.00	11,275.00	11,340.14	10,300.27	74.46	62.68	64.98	1,524.57	784.24	2,261.27	2,138.79	122.48	18.462		
13,300.00	11,275.00	11,504.13	10,294.58	75.61	64.54	65.04	1,687.68	800.14	2,272.73	2,147.24	125.49	18.111		
13,400.00	11,275.00	11,852.92	10,299.59	76.80	68.85	65.30	2,036.02	810.61	2,273.65	2,142.16	131.49	17.292		
13,500.00	11,275.00	11,925.96	10,299.74	78.04	69.81	65.30	2,109.04	809.14	2,272.71	2,139.17	133.53	17.020		
13,523.97	11,275.00	11,942.53	10,299.57	78.35	70.04	65.29	2,125.61	808.86	2,272.67	2,138.65	134.02	16.958		
13,600.00	11,275.00	11,995.05	10,298.55	79.32	70.74	65.27	2,178.11	808.13	2,273.06	2,137.51	135.55	16.769		
13,700.00	11,275.00	12,175.33	10,298.51	80.64	73.26	65.25	2,358.33	804.24	2,271.86	2,132.50	139.36	16.302		
13,800.00	11,275.00	12,259.66	10,299.00	82.00	74.48	65.24	2,442.60	801.44	2,269.58	2,127.80	141.78	16.008		
13,900.00	11,275.00	12,339.22	10,298.12	83.39	75.66	65.20	2,522.13	799.01	2,268.24	2,124.09	144.15	15.735		
14,000.00	11,275.00	12,441.53	10,295.08	84.81	77.20	65.11	2,624.33	795.73	2,267.54	2,120.64	146.90	15.436		
14,100.00	11,275.00	12,537.19	10,291.77	86.27	78.67	65.00	2,719.86	792.00	2,266.43	2,116.84	149.59	15.151		
14,200.00	11,275.00	12,718.27	10,292.47	87.75	81.53	64.97	2,900.73	785.46	2,264.04	2,110.20	153.84	14.717		
14,300.00	11,275.00	12,809.41	10,296.32	89.27	83.01	65.03	2,991.72	781.83	2,259.63	2,102.90	156.72	14.418		
14,400.00	11,275.00	12,889.40	10,298.42	90.81	84.31	65.05	3,071.62	778.90	2,256.14	2,096.72	159.42	14.152		
14,500.00	11,275.00	12,976.48	10,300.41	92.37	85.75	65.08	3,158.64	776.16	2,253.28	2,091.00	162.28	13.885		
14,600.00	11,275.00	13,058.67	10,301.74	93.96	87.13	65.10	3,240.79	773.94	2,251.12	2,086.05	165.07	13.637		
14,700.00	11,275.00	13,136.08	10,302.88	95.57	88.43	65.12	3,318.17	772.59	2,249.87	2,082.06	167.81	13.407		
14,753.20	11,275.00	13,172.43	10,303.40	96.44	89.05	65.13	3,354.52	772.29	2,249.66	2,080.48	169.19	13.297		
14,800.00	11,275.00	13,203.69	10,303.67	97.20	89.59	65.14	3,385.78	772.20	2,249.82	2,079.45	170.38	13.205		
14,900.00	11,275.00	13,285.80	10,303.83	98.86	90.99	65.16	3,467.89	772.57	2,251.08	2,077.84	173.23	12.995		
15,000.00	11,275.00	13,362.48	10,303.97	100.53	92.32	65.18	3,544.56	773.30	2,252.88	2,076.88	176.00	12.800		
15,100.00	11,275.00	13,424.00	10,303.49	102.22	93.39	65.19	3,606.07	774.75	2,256.29	2,077.83	178.46	12.643		
15,200.00	11,275.00	13,498.44	10,301.87	103.93	94.70	65.18	3,680.45	777.19	2,261.12	2,079.95	181.17	12.481		
15,300.00	11,275.00	13,586.53	10,298.59	105.66	96.26	65.15	3,768.42	780.29	2,266.82	2,082.65	184.17	12.308		
15,400.00	11,275.00	13,718.24	10,294.44	107.40	98.61	65.12	3,899.98	784.80	2,272.28	2,084.12	188.16	12.076		
15,500.00	11,275.00	13,804.62	10,293.48	109.16	100.17	65.14	3,986.30	788.02	2,277.08	2,085.85	191.23	11.908		
15,600.00	11,275.00	14,776.88	10,314.71	110.93	118.19	64.09	4,938.46	639.00	2,263.39	2,058.74	204.66	11.059		
15,700.00	11,275.00	14,857.00	10,322.53	112.71	119.71	63.98	5,013.83	612.98	2,230.82	2,022.94	207.87	10.732		
15,800.00	11,275.00	14,857.00	10,322.53	114.51	119.71	63.98	5,013.83	612.98	2,200.85	1,989.91	210.94	10.433		
15,900.00	11,275.00	14,857.00	10,322.53	116.32	119.71	63.98	5,013.83	612.98	2,175.07	1,961.23	213.84	10.172		
16,000.00	11,275.00	14,857.00	10,322.53	118.14	119.71	63.98	5,013.83	612.98	2,153.62	1,937.10	216.52	9.947		
16,100.00	11,275.00	14,857.00	10,322.53	119.98	119.71	63.98	5,013.83	612.98	2,136.65	1,917.69	218.96	9.758		
16,200.00	11,275.00	14,857.00	10,322.53	121.82	119.71	63.98	5,013.83	612.98	2,124.25	1,903.14	221.11	9.607		
16,300.00	11,275.00	14,857.00	10,322.53	123.68	119.71	63.98	5,013.83	612.98	2,116.51	1,893.56	222.95	9.493		
16,400.00	11,275.00	14,857.00	10,322.53	125.54	119.71	63.98	5,013.83	612.98	2,113.48	1,889.02	224.46	9.416		
16,414.11	11,275.00	14,857.00	10,322.53	125.80	119.71	63.98	5,013.83	612.98	2,113.43	1,888.79	224.64	9.408		
16,500.00	11,275.00	14,857.00	10,322.53	127.41	119.71	63.98	5,013.83	612.98	2,115.18	1,889.56	225.62	9.375		
16,600.00	11,275.00	14,857.00	10,322.53	129.30	119.71	63.98	5,013.83	612.98	2,121.59	1,895.18	226.41	9.370 SF		
16,700.00	11,275.00	14,857.00	10,322.53	131.19	119.71	63.98	5,013.83	612.98	2,132.68	1,905.83	226.86	9.401		
16,776.29	11,275.00	14,857.00	10,322.53	132.64	119.71	63.98	5,013.83	612.98	2,144.24	1,917.29	226.96	9.448		



Pro Directional Anticollision Report



Company: Tap Rock Operating, LLC
Project: Eddy County, NM (NAD 83)
Reference Site: Cypress 34
Site Error: 0.00 usft
Reference Well: 243H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1

Local Co-ordinate Reference: Well 243H
TVD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
MD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: WellPlanner1
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 - 233H - OH - Plan 1													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	0.00	0.00	0.00	0.00	90.00	0.00	25.00	25.00				
100.00	100.00	100.00	100.00	0.20	0.20	90.00	0.00	25.00	25.00	24.60	0.40	63.257	
200.00	200.00	200.00	200.00	0.74	0.74	90.00	0.00	25.00	25.00	23.53	1.47	17.000	
300.00	300.00	300.00	300.00	1.27	1.27	90.00	0.00	25.00	25.00	22.45	2.55	9.819	
400.00	400.00	400.00	400.00	1.81	1.81	90.00	0.00	25.00	25.00	21.38	3.62	6.903	
450.00	450.00	450.00	450.00	2.08	2.08	90.00	0.00	25.00	25.00	20.84	4.16	6.011 CC	
500.00	500.00	500.42	500.42	2.34	2.34	-169.24	-0.12	24.57	25.00	20.32	4.68	5.339	
600.00	599.93	601.27	601.20	2.86	2.86	-168.55	-1.07	21.15	25.05	19.33	5.71	4.385	
700.00	699.68	702.11	701.79	3.39	3.39	-167.18	-2.98	14.32	25.14	18.39	6.75	3.723	
800.00	799.13	802.95	802.06	3.93	3.94	-165.15	-5.83	4.08	25.31	17.50	7.80	3.243	
900.00	898.15	903.78	901.88	4.50	4.51	-162.49	-9.63	-9.55	25.58	16.71	8.87	2.884	
1,000.00	996.63	1,004.60	1,001.14	5.09	5.11	-159.26	-14.37	-26.55	25.99	16.04	9.95	2.611 ES	
1,100.00	1,094.44	1,104.85	1,099.33	5.71	5.73	-156.35	-19.81	-46.06	27.27	16.18	11.09	2.459	
1,200.00	1,191.46	1,204.75	1,197.13	6.37	6.37	-156.31	-25.28	-65.68	31.60	19.35	12.25	2.581	
1,214.68	1,205.63	1,219.41	1,211.47	6.47	6.46	-156.51	-26.08	-68.56	32.50	20.09	12.42	2.618	
1,300.00	1,287.93	1,304.55	1,294.82	7.07	7.01	-157.64	-30.74	-85.29	37.97	24.57	13.40	2.833	
1,400.00	1,384.39	1,404.34	1,392.52	7.79	7.67	-158.62	-36.20	-104.90	44.40	29.83	14.57	3.047	
1,500.00	1,480.85	1,504.13	1,490.21	8.51	8.32	-159.34	-41.67	-124.50	50.83	35.09	15.74	3.229	
1,600.00	1,577.31	1,603.92	1,587.90	9.25	8.99	-159.91	-47.13	-144.11	57.27	40.35	16.92	3.384	
1,700.00	1,673.77	1,703.71	1,685.60	10.00	9.66	-160.36	-52.60	-163.71	63.71	45.60	18.11	3.518	
1,800.00	1,770.22	1,803.50	1,783.29	10.75	10.33	-160.73	-58.06	-183.31	70.16	50.86	19.30	3.635	
1,900.00	1,866.68	1,903.29	1,880.99	11.50	11.00	-161.03	-63.53	-202.92	76.61	56.11	20.49	3.738	
2,000.00	1,963.14	2,003.08	1,978.68	12.26	11.68	-161.29	-68.99	-222.52	83.06	61.37	21.69	3.829	
2,100.00	2,059.60	2,102.87	2,076.37	13.03	12.35	-161.51	-74.45	-242.13	89.51	66.62	22.89	3.910	
2,200.00	2,156.06	2,202.67	2,174.07	13.79	13.03	-161.70	-79.92	-261.73	95.97	71.87	24.09	3.983	
2,300.00	2,252.52	2,302.46	2,271.76	14.56	13.71	-161.87	-85.38	-281.34	102.42	77.13	25.30	4.049	
2,400.00	2,348.98	2,402.25	2,369.45	15.33	14.39	-162.02	-90.85	-300.94	108.88	82.38	26.50	4.109	
2,500.00	2,445.43	2,502.04	2,467.15	16.11	15.07	-162.15	-96.31	-320.55	115.33	87.63	27.71	4.163	
2,600.00	2,541.89	2,601.83	2,564.84	16.88	15.76	-162.26	-101.78	-340.15	121.79	92.88	28.91	4.212	
2,700.00	2,638.35	2,701.62	2,662.53	17.65	16.44	-162.37	-107.24	-359.76	128.25	98.13	30.12	4.258	
2,800.00	2,734.81	2,801.41	2,760.23	18.43	17.12	-162.46	-112.70	-379.36	134.70	103.37	31.33	4.299	
2,900.00	2,831.27	2,901.20	2,857.92	19.21	17.81	-162.55	-118.17	-398.97	141.16	108.62	32.54	4.338	
3,000.00	2,927.73	3,000.99	2,955.62	19.98	18.49	-162.63	-123.63	-418.57	147.62	113.87	33.75	4.374	
3,100.00	3,024.19	3,100.79	3,053.31	20.76	19.18	-162.70	-129.10	-438.18	154.08	119.12	34.96	4.407	
3,200.00	3,120.65	3,200.58	3,151.00	21.54	19.86	-162.77	-134.56	-457.78	160.54	124.36	36.17	4.438	
3,300.00	3,217.10	3,300.37	3,248.70	22.32	20.55	-162.83	-140.03	-477.39	167.00	129.61	37.39	4.467	
3,400.00	3,313.56	3,400.16	3,346.39	23.10	21.23	-162.89	-145.49	-496.99	173.45	134.85	38.60	4.494	
3,500.00	3,410.02	3,500.05	3,444.08	23.88	21.92	-162.94	-150.95	-516.60	179.91	140.10	39.81	4.519	
3,600.00	3,506.48	3,599.74	3,541.78	24.66	22.61	-162.99	-156.42	-536.20	186.37	145.35	41.03	4.543	
3,700.00	3,602.94	3,700.47	3,639.47	25.45	23.30	-163.03	-161.88	-555.81	192.83	150.59	42.25	4.564	
3,800.00	3,699.40	3,800.68	3,737.16	26.23	23.99	-163.08	-167.35	-575.41	199.29	155.83	43.46	4.585	
3,900.00	3,795.86	3,899.11	3,834.86	27.01	24.67	-163.12	-172.81	-595.02	205.75	161.08	44.67	4.606	
4,000.00	3,892.31	3,998.90	3,932.55	27.79	25.36	-163.15	-178.28	-614.62	212.21	166.33	45.89	4.625	
4,100.00	3,988.77	4,101.30	4,030.25	28.58	26.06	-163.19	-183.74	-634.23	218.67	171.55	47.12	4.641	
4,200.00	4,085.23	4,201.51	4,127.94	29.36	26.75	-163.22	-189.20	-653.83	225.13	176.80	48.33	4.658	
4,300.00	4,181.69	4,301.72	4,225.63	30.14	27.44	-163.25	-194.67	-673.44	231.59	182.04	49.55	4.674	
4,400.00	4,278.15	4,401.93	4,323.33	30.93	28.13	-163.28	-200.13	-693.04	238.05	187.28	50.77	4.689	
4,500.00	4,374.61	4,502.14	4,421.02	31.71	28.82	-163.31	-205.60	-712.65	244.51	192.52	51.99	4.703	
4,600.00	4,471.07	4,602.35	4,518.71	32.49	29.52	-163.34	-211.06	-732.25	250.97	197.76	53.21	4.717	
4,700.00	4,567.53	4,697.44	4,616.41	33.28	30.17	-163.36	-216.53	-751.86	257.43	203.03	54.40	4.732	
4,800.00	4,663.98	4,789.75	4,707.03	34.06	30.79	-163.49	-221.23	-768.75	265.22	209.70	55.52	4.777	

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



Pro Directional
Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 Cypress 34 - 233H - OH - Plan 1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance		Minimum		Separation		Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
4,900.00	4,760.44	4,881.11	4,797.23	34.85	31.37	-163.83	-225.12	-782.69	275.99	219.43	56.55	4.880		
5,000.00	4,856.90	4,971.75	4,887.14	35.63	31.90	-164.34	-228.21	-793.78	289.71	232.22	57.50	5.039		
5,100.00	4,953.36	5,061.51	4,976.48	36.42	32.40	-165.00	-230.52	-802.06	306.39	248.04	58.35	5.251		
5,194.35	5,044.37	5,145.24	5,060.03	37.16	32.83	-165.70	-231.99	-807.35	324.82	265.73	59.09	5.497		
5,200.00	5,049.82	5,150.23	5,065.01	37.20	32.86	-165.75	-232.06	-807.59	326.00	266.87	59.13	5.513		
5,300.00	5,146.77	5,238.16	5,152.88	37.95	33.28	-166.58	-232.86	-810.46	346.69	286.87	59.83	5.795		
5,400.00	5,244.51	5,329.79	5,244.51	38.66	33.68	-167.36	-232.99	-810.93	366.75	306.16	60.59	6.053		
5,500.00	5,342.93	5,428.21	5,342.93	39.30	34.10	-168.01	-232.99	-810.93	384.03	322.49	61.54	6.240		
5,600.00	5,441.91	5,527.19	5,441.91	39.90	34.52	-168.49	-232.99	-810.93	397.96	335.46	62.50	6.367		
5,700.00	5,541.32	5,626.60	5,541.32	40.44	34.95	-168.84	-232.99	-810.93	408.52	345.05	63.47	6.437		
5,800.00	5,641.05	5,726.33	5,641.05	40.94	35.38	-169.06	-232.99	-810.93	415.68	351.24	64.44	6.451		
5,900.00	5,740.97	5,826.25	5,740.97	41.39	35.82	-169.17	-232.99	-810.93	419.41	354.01	65.40	6.413		
5,959.03	5,800.00	5,885.28	5,800.00	41.63	36.08	90.14	-232.99	-810.93	420.01	354.05	65.96	6.368		
6,000.00	5,840.97	5,926.25	5,840.97	41.78	36.26	90.14	-232.99	-810.93	420.01	353.67	66.34	6.331		
6,100.00	5,940.97	6,026.25	5,940.97	42.17	36.70	90.14	-232.99	-810.93	420.01	352.74	67.27	6.243		
6,200.00	6,040.97	6,126.25	6,040.97	42.56	37.15	90.14	-232.99	-810.93	420.01	351.80	68.21	6.157		
6,300.00	6,140.97	6,226.25	6,140.97	42.95	37.59	90.14	-232.99	-810.93	420.01	350.85	69.16	6.073		
6,400.00	6,240.97	6,326.25	6,240.97	43.34	38.04	90.14	-232.99	-810.93	420.01	349.91	70.10	5.991		
6,500.00	6,340.97	6,426.25	6,340.97	43.74	38.49	90.14	-232.99	-810.93	420.01	348.96	71.05	5.911		
6,600.00	6,440.97	6,526.25	6,440.97	44.14	38.95	90.14	-232.99	-810.93	420.01	348.00	72.01	5.833		
6,700.00	6,540.97	6,626.25	6,540.97	44.55	39.40	90.14	-232.99	-810.93	420.01	347.05	72.96	5.756		
6,800.00	6,640.97	6,726.25	6,640.97	44.95	39.86	90.14	-232.99	-810.93	420.01	346.09	73.93	5.682		
6,900.00	6,740.97	6,826.25	6,740.97	45.36	40.32	90.14	-232.99	-810.93	420.01	345.12	74.89	5.608		
7,000.00	6,840.97	6,926.25	6,840.97	45.78	40.78	90.14	-232.99	-810.93	420.01	344.16	75.86	5.537		
7,100.00	6,940.97	7,026.25	6,940.97	46.19	41.25	90.14	-232.99	-810.93	420.01	343.19	76.82	5.467		
7,200.00	7,040.97	7,126.25	7,040.97	46.61	41.71	90.14	-232.99	-810.93	420.01	342.21	77.80	5.399		
7,300.00	7,140.97	7,226.25	7,140.97	47.03	42.18	90.14	-232.99	-810.93	420.01	341.24	78.77	5.332		
7,400.00	7,240.97	7,326.25	7,240.97	47.45	42.65	90.14	-232.99	-810.93	420.01	340.26	79.75	5.267		
7,500.00	7,340.97	7,426.25	7,340.97	47.87	43.12	90.14	-232.99	-810.93	420.01	339.28	80.73	5.203		
7,600.00	7,440.97	7,526.25	7,440.97	48.30	43.59	90.14	-232.99	-810.93	420.01	338.30	81.71	5.140		
7,700.00	7,540.97	7,626.25	7,540.97	48.73	44.07	90.14	-232.99	-810.93	420.01	337.31	82.70	5.079		
7,800.00	7,640.97	7,726.25	7,640.97	49.16	44.54	90.14	-232.99	-810.93	420.01	336.33	83.68	5.019		
7,900.00	7,740.97	7,826.25	7,740.97	49.59	45.02	90.14	-232.99	-810.93	420.01	335.34	84.67	4.960		
8,000.00	7,840.97	7,926.25	7,840.97	50.03	45.49	90.14	-232.99	-810.93	420.01	334.35	85.66	4.903		
8,100.00	7,940.97	8,026.25	7,940.97	50.47	45.97	90.14	-232.99	-810.93	420.01	333.35	86.66	4.847		
8,200.00	8,040.97	8,126.25	8,040.97	50.90	46.45	90.14	-232.99	-810.93	420.01	332.36	87.65	4.792		
8,300.00	8,140.97	8,226.25	8,140.97	51.35	46.94	90.14	-232.99	-810.93	420.01	331.36	88.65	4.738		
8,400.00	8,240.97	8,326.25	8,240.97	51.79	47.42	90.14	-232.99	-810.93	420.01	330.36	89.65	4.685		
8,500.00	8,340.97	8,426.25	8,340.97	52.23	47.90	90.14	-232.99	-810.93	420.01	329.36	90.65	4.633		
8,600.00	8,440.97	8,526.25	8,440.97	52.68	48.39	90.14	-232.99	-810.93	420.01	328.36	91.65	4.583		
8,700.00	8,540.97	8,626.25	8,540.97	53.13	48.87	90.14	-232.99	-810.93	420.01	327.36	92.65	4.533		
8,800.00	8,640.97	8,726.25	8,640.97	53.58	49.36	90.14	-232.99	-810.93	420.01	326.35	93.66	4.484		
8,900.00	8,740.97	8,826.25	8,740.97	54.03	49.85	90.14	-232.99	-810.93	420.01	325.35	94.67	4.437		
9,000.00	8,840.97	8,926.25	8,840.97	54.48	50.34	90.14	-232.99	-810.93	420.01	324.34	95.67	4.390		
9,100.00	8,940.97	9,026.25	8,940.97	54.94	50.83	90.14	-232.99	-810.93	420.01	323.33	96.68	4.344		
9,200.00	9,040.97	9,126.25	9,040.97	55.39	51.32	90.14	-232.99	-810.93	420.01	322.32	97.70	4.299		
9,300.00	9,140.97	9,226.25	9,140.97	55.85	51.81	90.14	-232.99	-810.93	420.01	321.30	98.71	4.255		
9,400.00	9,240.97	9,326.25	9,240.97	56.31	52.31	90.14	-232.99	-810.93	420.01	320.29	99.72	4.212		
9,500.00	9,340.97	9,426.25	9,340.97	56.77	52.80	90.14	-232.99	-810.93	420.01	319.27	100.74	4.169		
9,600.00	9,440.97	9,526.25	9,440.97	57.23	53.30	90.14	-232.99	-810.93	420.01	318.26	101.75	4.128		

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 Cypress 34 - 233H - OH - Plan 1														Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
9,700.00	9,540.97	9,626.25	9,540.97	57.69	53.79	90.14	-232.99	-810.93	420.01	317.24	102.77	4.087			
9,800.00	9,640.97	9,726.25	9,640.97	58.16	54.29	90.14	-232.99	-810.93	420.01	316.22	103.79	4.047			
9,900.00	9,740.97	9,826.25	9,740.97	58.62	54.78	90.14	-232.99	-810.93	420.01	315.20	104.81	4.007			
10,000.00	9,840.97	9,926.25	9,840.97	59.09	55.28	90.14	-232.99	-810.93	420.01	314.18	105.83	3.969			
10,100.00	9,940.97	10,026.25	9,940.97	59.56	55.78	90.14	-232.99	-810.93	420.01	313.16	106.85	3.931			
10,200.00	10,040.97	10,126.25	10,040.97	60.02	56.28	90.14	-232.99	-810.93	420.01	312.14	107.88	3.893			
10,300.00	10,140.97	10,226.25	10,140.97	60.49	56.78	90.14	-232.99	-810.93	420.01	311.11	108.90	3.857			
10,400.00	10,240.97	10,326.25	10,240.97	60.97	57.28	90.14	-232.99	-810.93	420.01	310.09	109.92	3.821			
10,500.00	10,340.97	10,426.25	10,340.97	61.44	57.78	90.14	-232.99	-810.93	420.01	309.06	110.95	3.786			
10,600.00	10,440.97	10,526.25	10,440.97	61.91	58.29	90.14	-232.99	-810.93	420.01	308.03	111.98	3.751			
10,700.00	10,540.97	10,626.59	10,541.18	62.39	58.78	89.65	-229.39	-810.97	419.98	307.01	112.97	3.718			
10,715.06	10,556.03	10,641.56	10,556.03	62.46	58.86	89.39	-227.52	-810.99	419.98	306.87	113.10	3.713			
10,800.00	10,640.97	10,723.44	10,636.05	62.86	59.23	87.07	-210.48	-811.17	420.35	306.67	113.68	3.698			
10,861.07	10,702.04	10,778.59	10,688.22	63.15	59.47	84.65	-192.66	-811.36	421.65	307.75	113.89	3.702			
10,900.00	10,740.94	10,812.23	10,719.10	63.34	59.60	83.45	-179.35	-811.50	423.14	309.20	113.94	3.714			
10,950.00	10,790.61	10,854.52	10,756.74	63.57	59.76	81.19	-160.08	-811.70	425.67	311.74	113.92	3.736			
11,000.00	10,839.61	10,895.91	10,792.10	63.79	59.90	79.02	-138.59	-811.93	428.77	314.98	113.79	3.768			
11,050.00	10,887.57	10,936.49	10,825.17	64.00	60.02	76.95	-115.10	-812.18	432.35	318.81	113.54	3.808			
11,100.00	10,934.11	10,976.35	10,855.97	64.19	60.13	74.98	-89.80	-812.44	436.28	323.12	113.16	3.855			
11,150.00	10,978.88	11,015.57	10,884.48	64.37	60.23	73.13	-62.87	-812.73	440.46	327.79	112.66	3.909			
11,200.00	11,021.55	11,054.24	10,910.72	64.53	60.31	71.41	-34.48	-813.03	444.77	332.71	112.06	3.969			
11,250.00	11,061.78	11,092.42	10,934.69	64.67	60.37	69.82	-4.78	-813.34	449.11	337.75	111.36	4.033			
11,300.00	11,099.28	11,130.16	10,956.39	64.79	60.43	68.37	26.09	-813.67	453.38	342.78	110.60	4.099			
11,350.00	11,133.75	11,167.53	10,975.82	64.89	60.48	67.07	58.00	-814.01	457.49	347.68	109.81	4.166			
11,400.00	11,164.94	11,204.57	10,993.00	64.97	60.52	65.90	90.81	-814.35	461.35	352.34	109.00	4.232			
11,450.00	11,192.61	11,241.33	11,007.91	65.04	60.54	64.88	124.40	-814.71	464.89	356.66	108.23	4.295			
11,500.00	11,216.54	11,277.86	11,020.56	65.09	60.57	64.01	158.66	-815.07	468.04	360.53	107.51	4.353			
11,550.00	11,236.56	11,314.19	11,030.96	65.13	60.59	63.28	193.46	-815.44	470.75	363.87	106.88	4.405			
11,600.00	11,252.51	11,350.00	11,039.02	65.16	60.62	62.70	228.34	-815.81	472.98	366.62	106.36	4.447			
11,650.00	11,264.27	11,386.41	11,044.98	65.19	60.64	62.27	264.26	-816.19	474.68	368.68	106.00	4.478			
11,700.00	11,271.75	11,422.38	11,048.61	65.22	60.67	61.98	300.03	-816.57	475.83	370.04	105.79	4.498			
11,750.00	11,274.89	11,458.30	11,049.98	65.26	60.71	61.83	335.92	-816.95	476.41	370.66	105.75	4.505			
11,761.07	11,275.00	11,467.34	11,049.99	65.27	60.72	61.82	344.96	-817.04	476.46	370.68	105.78	4.504			
11,800.00	11,275.00	11,506.27	11,049.91	65.31	60.77	61.81	383.89	-817.45	476.49	370.57	105.93	4.498			
11,900.00	11,275.00	11,606.27	11,049.71	65.46	60.99	61.79	483.88	-818.51	476.59	370.17	106.41	4.479			
12,000.00	11,275.00	11,706.27	11,049.51	65.68	61.32	61.77	583.87	-819.57	476.68	369.64	107.04	4.453			
12,100.00	11,275.00	11,806.27	11,049.31	65.97	61.76	61.75	683.87	-820.63	476.78	368.96	107.82	4.422			
12,200.00	11,275.00	11,906.27	11,049.11	66.35	62.30	61.73	783.86	-821.68	476.87	368.14	108.73	4.386			
12,300.00	11,275.00	12,006.27	11,048.92	66.82	62.93	61.71	883.86	-822.74	476.96	367.18	109.78	4.345			
12,400.00	11,275.00	12,106.27	11,048.72	67.37	63.64	61.68	983.85	-823.80	477.06	366.10	110.96	4.299			
12,500.00	11,275.00	12,206.27	11,048.52	68.01	64.42	61.66	1,083.84	-824.86	477.15	364.88	112.27	4.250			
12,600.00	11,275.00	12,306.27	11,048.32	68.73	65.26	61.64	1,183.84	-825.91	477.25	363.55	113.70	4.197			
12,700.00	11,275.00	12,406.27	11,048.12	69.53	66.17	61.62	1,283.83	-826.97	477.34	362.09	115.25	4.142			
12,800.00	11,275.00	12,506.27	11,047.92	70.39	67.14	61.60	1,383.83	-828.03	477.44	360.53	116.91	4.084			
12,900.00	11,275.00	12,606.27	11,047.72	71.32	68.16	61.58	1,483.82	-829.09	477.53	358.85	118.68	4.024			
13,000.00	11,275.00	12,706.27	11,047.52	72.31	69.23	61.56	1,583.81	-830.14	477.63	357.07	120.56	3.962			
13,100.00	11,275.00	12,806.27	11,047.32	73.36	70.35	61.54	1,683.81	-831.20	477.72	355.19	122.53	3.899			
13,200.00	11,275.00	12,906.27	11,047.12	74.46	71.53	61.52	1,783.80	-832.26	477.82	353.22	124.60	3.835			
13,300.00	11,275.00	13,006.27	11,046.92	75.61	72.74	61.50	1,883.80	-833.31	477.91	351.16	126.75	3.770			
13,400.00	11,275.00	13,106.27	11,046.72	76.80	74.00	61.47	1,983.79	-834.37	478.01	349.01	129.00	3.706			
13,500.00	11,275.00	13,206.27	11,046.52	78.04	75.31	61.45	2,083.78	-835.43	478.10	346.79	131.32	3.641			

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



Pro Directional
Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 Cypress 34 - 233H - OH - Plan 1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset		+N/-S (usft)	+E/-W (usft)						
13,600.00	11,275.00	13,306.27	11,046.32	79.32	76.65	61.43	2,183.78	-836.49	478.20	344.48	133.72	3.576		
13,700.00	11,275.00	13,406.27	11,046.13	80.64	78.02	61.41	2,283.77	-837.54	478.30	342.11	136.19	3.512		
13,800.00	11,275.00	13,506.27	11,045.93	82.00	79.43	61.39	2,383.77	-838.60	478.39	339.67	138.72	3.449		
13,900.00	11,275.00	13,606.27	11,045.73	83.39	80.88	61.37	2,483.76	-839.66	478.49	337.16	141.33	3.386		
14,000.00	11,275.00	13,706.27	11,045.53	84.81	82.36	61.35	2,583.75	-840.72	478.58	334.59	143.99	3.324		
14,100.00	11,275.00	13,806.27	11,045.33	86.27	83.86	61.33	2,683.75	-841.77	478.68	331.97	146.71	3.263		
14,200.00	11,275.00	13,906.27	11,045.13	87.75	85.40	61.31	2,783.74	-842.83	478.77	329.29	149.48	3.203		
14,300.00	11,275.00	14,006.27	11,044.93	89.27	86.96	61.29	2,883.74	-843.89	478.87	326.56	152.31	3.144		
14,400.00	11,275.00	14,106.27	11,044.73	90.81	88.54	61.26	2,983.73	-844.95	478.97	323.79	155.18	3.087		
14,500.00	11,275.00	14,206.27	11,044.53	92.37	90.15	61.24	3,083.72	-846.00	479.06	320.96	158.10	3.030		
14,600.00	11,275.00	14,306.27	11,044.33	93.96	91.79	61.22	3,183.72	-847.06	479.16	318.10	161.06	2.975		
14,700.00	11,275.00	14,406.27	11,044.13	95.57	93.44	61.20	3,283.71	-848.12	479.25	315.19	164.06	2.921		
14,800.00	11,275.00	14,506.26	11,043.93	97.20	95.11	61.18	3,383.71	-849.18	479.35	312.25	167.10	2.869		
14,900.00	11,275.00	14,606.26	11,043.73	98.86	96.81	61.16	3,483.70	-850.23	479.45	309.27	170.18	2.817		
15,000.00	11,275.00	14,706.26	11,043.53	100.53	98.52	61.14	3,583.69	-851.29	479.54	306.25	173.29	2.767		
15,100.00	11,275.00	14,806.26	11,043.34	102.22	100.25	61.12	3,683.69	-852.35	479.64	303.20	176.44	2.719		
15,200.00	11,275.00	14,906.26	11,043.14	103.93	102.00	61.10	3,783.68	-853.41	479.74	300.13	179.61	2.671		
15,300.00	11,275.00	15,006.26	11,042.94	105.66	103.76	61.08	3,883.68	-854.46	479.83	297.02	182.81	2.625		
15,400.00	11,275.00	15,106.26	11,042.74	107.40	105.54	61.06	3,983.67	-855.52	479.93	293.89	186.04	2.580		
15,500.00	11,275.00	15,206.26	11,042.54	109.16	107.33	61.04	4,083.66	-856.58	480.03	290.73	189.30	2.536		
15,600.00	11,275.00	15,306.26	11,042.34	110.93	109.13	61.01	4,183.66	-857.64	480.12	287.54	192.58	2.493		
15,700.00	11,275.00	15,406.26	11,042.14	112.71	110.95	60.99	4,283.65	-858.69	480.22	284.34	195.88	2.452		
15,800.00	11,275.00	15,506.26	11,041.94	114.51	112.78	60.97	4,383.65	-859.75	480.32	281.11	199.21	2.411		
15,900.00	11,275.00	15,606.26	11,041.74	116.32	114.62	60.95	4,483.64	-860.81	480.41	277.86	202.55	2.372		
16,000.00	11,275.00	15,706.26	11,041.54	118.14	116.47	60.93	4,583.63	-861.87	480.51	274.59	205.92	2.333		
16,100.00	11,275.00	15,806.26	11,041.34	119.98	118.33	60.91	4,683.63	-862.92	480.61	271.30	209.30	2.296		
16,200.00	11,275.00	15,906.26	11,041.14	121.82	120.21	60.89	4,783.62	-863.98	480.70	268.00	212.71	2.260		
16,300.00	11,275.00	16,006.26	11,040.94	123.68	122.09	60.87	4,883.62	-865.04	480.80	264.68	216.13	2.225		
16,400.00	11,275.00	16,106.26	11,040.74	125.54	123.98	60.85	4,983.61	-866.10	480.90	261.34	219.56	2.190		
16,500.00	11,275.00	16,206.26	11,040.55	127.41	125.88	60.83	5,083.61	-867.15	481.00	257.98	223.01	2.157		
16,600.00	11,275.00	16,306.26	11,040.35	129.30	127.79	60.81	5,183.60	-868.21	481.09	254.62	226.48	2.124		
16,700.00	11,275.00	16,406.26	11,040.15	131.19	129.71	60.79	5,283.59	-869.27	481.19	251.23	229.96	2.093		
16,776.29	11,275.00	16,482.56	11,040.00	132.64	131.17	60.77	5,359.88	-870.07	481.27	248.65	232.62	2.069 SF		



Pro Directional
Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 Cypress 34 - 246H - OH - Plan 1														Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Tooface (")	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)							
0.00	0.00	0.00	0.00	0.00	0.00	88.85	1.00	50.00	50.01						
100.00	100.00	100.00	100.00	0.20	0.20	88.85	1.00	50.00	50.01	49.61	0.40	126.539			
200.00	200.00	200.00	200.00	0.74	0.74	88.85	1.00	50.00	50.01	48.54	1.47	34.006			
300.00	300.00	300.00	300.00	1.27	1.27	88.85	1.00	50.00	50.01	47.46	2.55	19.642			
400.00	400.00	400.00	400.00	1.81	1.81	88.85	1.00	50.00	50.01	46.39	3.62	13.809			
450.00	450.00	450.00	450.00	2.08	2.08	88.85	1.00	50.00	50.01	45.85	4.16	12.024 CC			
500.00	500.00	500.79	500.79	2.34	2.34	-170.33	0.79	49.60	50.04	45.36	4.68	10.685			
600.00	599.93	602.37	602.29	2.86	2.86	-169.15	-0.89	46.42	50.33	44.62	5.71	8.811			
700.00	699.68	703.91	703.58	3.39	3.40	-166.85	-4.25	40.06	50.97	44.21	6.76	7.543 ES			
800.00	799.13	804.91	804.02	3.93	3.94	-163.64	-9.17	30.75	52.23	44.41	7.82	6.680			
900.00	898.15	904.80	903.28	4.50	4.50	-161.30	-14.41	20.84	56.29	47.39	8.90	6.324			
1,000.00	996.63	1,004.51	1,002.36	5.09	5.06	-160.36	-19.64	10.94	63.70	53.70	10.00	6.370			
1,100.00	1,094.44	1,103.93	1,101.16	5.71	5.62	-160.52	-24.85	1.07	74.39	63.28	11.11	6.697			
1,200.00	1,191.46	1,202.94	1,199.54	6.37	6.19	-161.36	-30.04	-8.76	88.36	76.13	12.23	7.227			
1,214.68	1,205.63	1,217.43	1,213.94	6.47	6.27	-161.51	-30.80	-10.20	90.69	78.29	12.39	7.317			
1,300.00	1,287.93	1,301.62	1,297.60	7.07	6.75	-162.39	-35.22	-18.55	104.43	91.09	13.35	7.825			
1,400.00	1,384.39	1,400.30	1,395.65	7.79	7.32	-163.17	-40.39	-28.35	120.57	106.10	14.47	8.334			
1,500.00	1,480.85	1,501.02	1,493.71	8.51	7.90	-163.77	-45.57	-38.14	136.72	121.12	15.61	8.761			
1,600.00	1,577.31	1,602.34	1,591.76	9.25	8.49	-164.24	-50.74	-47.94	152.89	136.14	16.75	9.125			
1,700.00	1,673.77	1,703.67	1,689.81	10.00	9.08	-164.62	-55.92	-57.73	169.06	151.16	17.91	9.441			
1,800.00	1,770.22	1,804.99	1,787.87	10.75	9.67	-164.93	-61.09	-67.52	185.24	166.18	19.06	9.718			
1,900.00	1,866.68	1,906.31	1,885.92	11.50	10.26	-165.19	-66.27	-77.32	201.43	181.21	20.22	9.962			
2,000.00	1,963.14	2,007.63	1,983.98	12.26	10.85	-165.42	-71.44	-87.11	217.61	196.23	21.38	10.178			
2,100.00	2,059.60	2,091.05	2,082.03	13.03	11.33	-165.61	-76.61	-96.91	233.80	211.36	22.44	10.418			
2,200.00	2,156.06	2,189.72	2,180.09	13.79	11.91	-165.78	-81.79	-106.70	250.00	226.40	23.59	10.596			
2,300.00	2,252.52	2,288.40	2,278.14	14.56	12.49	-165.92	-86.96	-116.50	266.19	241.45	24.74	10.758			
2,400.00	2,348.98	2,387.08	2,376.19	15.33	13.06	-166.05	-92.14	-126.29	282.39	256.49	25.90	10.905			
2,500.00	2,445.43	2,485.76	2,474.25	16.11	13.64	-166.17	-97.31	-136.09	298.58	271.53	27.05	11.039			
2,600.00	2,541.89	2,584.44	2,572.30	16.88	14.22	-166.27	-102.49	-145.88	314.78	286.58	28.20	11.161			
2,700.00	2,638.35	2,683.11	2,670.36	17.65	14.80	-166.37	-107.66	-155.67	330.98	301.62	29.36	11.274			
2,800.00	2,734.81	2,781.79	2,768.41	18.43	15.37	-166.45	-112.84	-165.47	347.18	316.67	30.51	11.378			
2,900.00	2,831.27	2,880.47	2,866.46	19.21	15.95	-166.53	-118.01	-175.26	363.38	331.71	31.67	11.474			
3,000.00	2,927.73	2,979.15	2,964.52	19.98	16.53	-166.60	-123.19	-185.06	379.58	346.75	32.83	11.563			
3,100.00	3,024.19	3,077.82	3,062.57	20.76	17.11	-166.67	-128.36	-194.85	395.78	361.80	33.98	11.646			
3,200.00	3,120.65	3,176.50	3,160.63	21.54	17.69	-166.73	-133.54	-204.65	411.98	376.84	35.14	11.723			
3,300.00	3,217.10	3,275.18	3,258.68	22.32	18.26	-166.78	-138.71	-214.44	428.19	391.89	36.30	11.796			
3,400.00	3,313.56	3,373.86	3,356.73	23.10	18.84	-166.84	-143.88	-224.23	444.39	406.93	37.46	11.863			
3,500.00	3,410.02	3,472.54	3,454.79	23.88	19.42	-166.88	-149.06	-234.03	460.59	421.97	38.62	11.927			
3,600.00	3,506.48	3,571.21	3,552.84	24.65	20.00	-166.93	-154.23	-243.82	476.80	437.02	39.78	11.986			
3,700.00	3,602.94	3,669.89	3,650.90	25.45	20.58	-166.97	-159.41	-253.62	493.00	452.06	40.94	12.043			
3,800.00	3,699.40	3,768.57	3,748.95	26.23	21.16	-167.01	-164.58	-263.41	509.20	467.10	42.10	12.096			
3,900.00	3,795.86	3,867.25	3,847.01	27.01	21.74	-167.05	-169.76	-273.21	525.41	482.15	43.26	12.146			
4,000.00	3,892.31	3,965.93	3,945.06	27.79	22.32	-167.08	-174.93	-283.00	541.61	497.19	44.42	12.193			
4,100.00	3,988.77	4,064.60	4,043.11	28.58	22.90	-167.11	-180.11	-292.80	557.82	512.24	45.58	12.238			
4,200.00	4,085.23	4,163.28	4,141.17	29.36	23.48	-167.14	-185.28	-302.59	574.02	527.28	46.74	12.281			
4,300.00	4,181.69	4,261.96	4,239.22	30.14	24.05	-167.17	-190.46	-312.38	590.22	542.32	47.90	12.321			
4,400.00	4,278.15	4,360.64	4,337.28	30.93	24.63	-167.20	-195.63	-322.18	606.43	557.37	49.06	12.360			
4,500.00	4,374.61	4,459.31	4,435.33	31.71	25.21	-167.23	-200.80	-331.97	622.63	572.41	50.23	12.397			
4,600.00	4,471.07	4,557.99	4,533.38	32.49	25.79	-167.25	-205.98	-341.77	638.84	587.45	51.39	12.432			
4,700.00	4,567.53	4,656.67	4,631.44	33.28	26.37	-167.27	-211.15	-351.56	655.05	602.50	52.55	12.465			
4,800.00	4,663.98	4,755.35	4,729.49	34.06	26.95	-167.30	-216.33	-361.36	671.25	617.54	53.71	12.497			

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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: Cypress 34 - 246H - OH - Plan 1													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)					
4,900.00	4,760.44	4,854.03	4,827.55	34.85	27.53	-167.32	-221.50	-371.15	687.46	632.58	54.87	12.528	
5,000.00	4,856.90	4,942.04	4,915.05	35.63	28.04	-167.35	-225.92	-379.50	704.12	648.20	55.92	12.591	
5,100.00	4,953.36	5,022.73	4,995.47	36.42	28.50	-167.47	-228.97	-385.28	723.03	666.17	56.85	12.717	
5,194.35	5,044.37	5,098.07	5,070.70	37.16	28.91	-167.65	-230.86	-388.86	743.06	685.38	57.69	12.881	
5,200.00	5,049.82	5,102.56	5,075.19	37.20	28.93	-167.67	-230.94	-389.01	744.33	686.59	57.73	12.893	
5,300.00	5,146.77	5,181.80	5,154.40	37.95	29.34	-168.01	-231.87	-390.78	766.16	707.61	58.55	13.085	
5,400.00	5,244.51	5,271.91	5,244.51	38.66	29.78	-168.38	-231.96	-390.94	786.63	727.16	59.47	13.227	
5,500.00	5,342.93	5,370.33	5,342.93	39.30	30.24	-168.70	-231.96	-390.94	803.96	743.48	60.49	13.291	
5,600.00	5,441.91	5,469.31	5,441.91	39.90	30.71	-168.95	-231.96	-390.94	817.93	756.43	61.50	13.300	
5,700.00	5,541.32	5,568.72	5,541.32	40.44	31.18	-169.14	-231.96	-390.94	828.50	766.00	62.50	13.255	
5,800.00	5,641.05	5,668.45	5,641.05	40.94	31.66	-169.26	-231.96	-390.94	835.66	772.16	63.50	13.160	
5,900.00	5,740.97	5,768.37	5,740.97	41.39	32.14	-169.32	-231.96	-390.94	839.40	774.91	64.48	13.017	
5,959.03	5,800.00	5,827.40	5,800.00	41.63	32.42	90.00	-231.96	-390.94	840.00	774.94	65.05	12.913	
6,000.00	5,840.97	5,868.37	5,840.97	41.78	32.62	90.00	-231.96	-390.94	840.00	774.56	65.44	12.836	
6,100.00	5,940.97	5,968.37	5,940.97	42.17	33.10	90.00	-231.96	-390.94	840.00	773.61	66.39	12.653	
6,200.00	6,040.97	6,068.37	6,040.97	42.56	33.59	90.00	-231.96	-390.94	840.00	772.66	67.34	12.474	
6,300.00	6,140.97	6,168.37	6,140.97	42.95	34.07	90.00	-231.96	-390.94	840.00	771.70	68.30	12.299	
6,400.00	6,240.97	6,268.37	6,240.97	43.34	34.56	90.00	-231.96	-390.94	840.00	770.74	69.25	12.129	
6,500.00	6,340.97	6,368.37	6,340.97	43.74	35.05	90.00	-231.96	-390.94	840.00	769.78	70.22	11.963	
6,600.00	6,440.97	6,468.37	6,440.97	44.14	35.54	90.00	-231.96	-390.94	840.00	768.81	71.18	11.801	
6,700.00	6,540.97	6,568.37	6,540.97	44.55	36.03	90.00	-231.96	-390.94	840.00	767.84	72.15	11.642	
6,800.00	6,640.97	6,668.37	6,640.97	44.95	36.52	90.00	-231.96	-390.94	840.00	766.87	73.12	11.487	
6,900.00	6,740.97	6,768.37	6,740.97	45.36	37.02	90.00	-231.96	-390.94	840.00	765.90	74.10	11.336	
7,000.00	6,840.97	6,868.37	6,840.97	45.78	37.51	90.00	-231.96	-390.94	840.00	764.92	75.08	11.189	
7,100.00	6,940.97	6,968.37	6,940.97	46.19	38.01	90.00	-231.96	-390.94	840.00	763.94	76.06	11.045	
7,200.00	7,040.97	7,068.37	7,040.97	46.61	38.51	90.00	-231.96	-390.94	840.00	762.96	77.04	10.904	
7,300.00	7,140.97	7,168.37	7,140.97	47.03	39.01	90.00	-231.96	-390.94	840.00	761.97	78.02	10.766	
7,400.00	7,240.97	7,268.37	7,240.97	47.45	39.51	90.00	-231.96	-390.94	840.00	760.99	79.01	10.632	
7,500.00	7,340.97	7,368.37	7,340.97	47.87	40.01	90.00	-231.96	-390.94	840.00	760.00	80.00	10.500	
7,600.00	7,440.97	7,468.37	7,440.97	48.30	40.51	90.00	-231.96	-390.94	840.00	759.01	80.99	10.372	
7,700.00	7,540.97	7,568.37	7,540.97	48.73	41.01	90.00	-231.96	-390.94	840.00	758.01	81.98	10.246	
7,800.00	7,640.97	7,668.37	7,640.97	49.16	41.52	90.00	-231.96	-390.94	840.00	757.02	82.98	10.123	
7,900.00	7,740.97	7,768.37	7,740.97	49.59	42.02	90.00	-231.96	-390.94	840.00	756.02	83.98	10.003	
8,000.00	7,840.97	7,868.37	7,840.97	50.03	42.53	90.00	-231.96	-390.94	840.00	755.02	84.98	9.885	
8,100.00	7,940.97	7,968.37	7,940.97	50.47	43.03	90.00	-231.96	-390.94	840.00	754.02	85.98	9.770	
8,200.00	8,040.97	8,068.37	8,040.97	50.90	43.54	90.00	-231.96	-390.94	840.00	753.02	86.98	9.657	
8,300.00	8,140.97	8,168.37	8,140.97	51.35	44.05	90.00	-231.96	-390.94	840.00	752.01	87.99	9.547	
8,400.00	8,240.97	8,268.37	8,240.97	51.79	44.56	90.00	-231.96	-390.94	840.00	751.00	88.99	9.439	
8,500.00	8,340.97	8,368.37	8,340.97	52.23	45.07	90.00	-231.96	-390.94	840.00	750.00	90.00	9.333	
8,600.00	8,440.97	8,468.37	8,440.97	52.68	45.58	90.00	-231.96	-390.94	840.00	748.99	91.01	9.230	
8,700.00	8,540.97	8,568.37	8,540.97	53.13	46.09	90.00	-231.96	-390.94	840.00	747.98	92.02	9.128	
8,800.00	8,640.97	8,668.37	8,640.97	53.58	46.60	90.00	-231.96	-390.94	840.00	746.96	93.03	9.029	
8,900.00	8,740.97	8,768.37	8,740.97	54.03	47.11	90.00	-231.96	-390.94	840.00	745.95	94.05	8.932	
9,000.00	8,840.97	8,868.37	8,840.97	54.48	47.62	90.00	-231.96	-390.94	840.00	744.93	95.06	8.836	
9,100.00	8,940.97	8,968.37	8,940.97	54.94	48.13	90.00	-231.96	-390.94	840.00	743.92	96.08	8.743	
9,200.00	9,040.97	9,068.37	9,040.97	55.39	48.65	90.00	-231.96	-390.94	840.00	742.90	97.10	8.651	
9,300.00	9,140.97	9,168.37	9,140.97	55.85	49.16	90.00	-231.96	-390.94	840.00	741.88	98.12	8.561	
9,400.00	9,240.97	9,268.37	9,240.97	56.31	49.68	90.00	-231.96	-390.94	840.00	740.86	99.14	8.473	
9,500.00	9,340.97	9,368.37	9,340.97	56.77	50.19	90.00	-231.96	-390.94	840.00	739.84	100.16	8.387	
9,600.00	9,440.97	9,468.37	9,440.97	57.23	50.71	90.00	-231.96	-390.94	840.00	738.82	101.18	8.302	

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 Cypress 34 - 246H - OH - Plan 1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Between Centres (usft)	Between Ellipses (usft)				Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	
9,700.00	9,540.97	9,568.37	9,540.97	57.69	51.22	90.00	-231.96	-390.94	840.00	737.79	102.20			8.219
9,800.00	9,640.97	9,668.37	9,640.97	58.16	51.74	90.00	-231.96	-390.94	840.00	736.77	103.23			8.137
9,900.00	9,740.97	9,768.37	9,740.97	58.62	52.25	90.00	-231.96	-390.94	840.00	735.74	104.25			8.057
10,000.00	9,840.97	9,868.37	9,840.97	59.09	52.77	90.00	-231.96	-390.94	840.00	734.72	105.28			7.979
10,100.00	9,940.97	9,968.37	9,940.97	59.56	53.29	90.00	-231.96	-390.94	840.00	733.69	106.31			7.902
10,200.00	10,040.97	10,068.37	10,040.97	60.02	53.81	90.00	-231.96	-390.94	840.00	732.66	107.33			7.826
10,300.00	10,140.97	10,168.37	10,140.97	60.49	54.32	90.00	-231.96	-390.94	840.00	731.63	108.36			7.752
10,400.00	10,240.97	10,268.37	10,240.97	60.97	54.84	90.00	-231.96	-390.94	840.00	730.60	109.39			7.679
10,500.00	10,340.97	10,368.37	10,340.97	61.44	55.36	90.00	-231.96	-390.94	840.00	729.57	110.43			7.607
10,600.00	10,440.97	10,468.37	10,440.97	61.91	55.88	90.00	-231.96	-390.94	840.00	728.54	111.46			7.537
10,700.00	10,540.97	10,568.37	10,540.97	62.39	56.40	90.00	-231.96	-390.94	840.00	727.51	112.49			7.467
10,800.00	10,640.97	10,668.37	10,640.97	62.86	56.92	90.00	-231.96	-390.94	840.00	726.47	113.52			7.399
10,861.07	10,702.04	10,729.44	10,702.04	63.15	57.24	90.00	-231.96	-390.94	840.00	725.84	114.15			7.358
10,900.00	10,740.94	10,768.91	10,741.49	63.34	57.44	90.63	-230.92	-390.95	840.00	725.44	114.56			7.332
10,950.00	10,790.61	10,819.74	10,792.03	63.57	57.70	90.65	-225.62	-391.01	840.00	724.93	115.07			7.300
11,000.00	10,839.61	10,870.60	10,841.92	63.79	57.95	90.67	-215.86	-391.11	840.01	724.44	115.56			7.269
11,050.00	10,887.57	10,921.48	10,890.78	64.00	58.18	90.68	-201.70	-391.26	840.01	723.98	116.03			7.239
11,100.00	10,934.11	10,972.38	10,938.20	64.19	58.40	90.69	-183.26	-391.46	840.01	723.53	116.48			7.211
11,150.00	10,978.88	11,023.28	10,983.80	64.37	58.60	90.70	-160.69	-391.70	840.01	723.10	116.91			7.185
11,200.00	11,021.55	11,074.19	11,027.22	64.53	58.78	90.69	-134.15	-391.98	840.01	722.70	117.31			7.160
11,250.00	11,061.78	11,125.08	11,068.11	64.67	58.94	90.69	-103.88	-392.30	840.01	722.31	117.70			7.137
11,300.00	11,099.28	11,175.97	11,106.15	64.79	59.08	90.67	-70.10	-392.65	840.01	721.94	118.06			7.115
11,350.00	11,133.75	11,226.83	11,141.02	64.89	59.20	90.65	-33.10	-393.05	840.01	721.59	118.41			7.094
11,400.00	11,164.94	11,277.67	11,172.46	64.97	59.30	90.63	6.82	-393.47	840.00	721.25	118.75			7.074
11,450.00	11,192.61	11,328.47	11,200.22	65.04	59.38	90.60	49.35	-393.92	840.00	720.92	119.07			7.054
11,500.00	11,216.54	11,379.23	11,224.09	65.09	59.43	90.57	94.12	-394.39	839.99	720.60	119.39			7.036
11,550.00	11,236.56	11,429.94	11,243.89	65.13	59.47	90.53	140.79	-394.88	839.99	720.29	119.70			7.018
11,600.00	11,252.51	11,480.60	11,259.47	65.16	59.50	90.49	188.98	-395.39	839.98	719.98	120.00			7.000
11,650.00	11,264.27	11,531.21	11,270.72	65.19	59.63	90.45	238.30	-395.91	839.98	719.68	120.30			6.983
11,700.00	11,271.75	11,581.75	11,277.58	65.22	59.80	90.40	288.36	-396.44	839.97	719.39	120.59			6.966
11,750.00	11,274.89	11,632.23	11,279.99	65.26	59.97	90.35	338.76	-396.98	839.97	719.09	120.88			6.949
11,760.48	11,275.00	11,642.73	11,280.00	65.27	60.01	90.34	349.26	-397.09	839.97	719.03	120.94			6.945
11,761.07	11,275.00	11,643.32	11,280.00	65.27	60.01	90.34	349.84	-397.09	839.97	719.03	120.94			6.945
11,800.00	11,275.00	11,682.25	11,280.00	65.31	60.15	90.34	388.77	-397.50	839.97	718.79	121.18			6.931
11,900.00	11,275.00	11,782.25	11,280.00	65.46	60.55	90.34	488.77	-398.56	839.97	718.06	121.91			6.890
12,000.00	11,275.00	11,882.25	11,280.00	65.68	61.03	90.34	588.76	-399.62	839.97	717.19	122.78			6.841
12,100.00	11,275.00	11,982.25	11,280.00	65.97	61.57	90.34	688.76	-400.68	839.97	716.17	123.80			6.785
12,200.00	11,275.00	12,082.25	11,280.00	66.35	62.18	90.34	788.75	-401.73	839.97	715.01	124.97			6.722
12,300.00	11,275.00	12,182.25	11,280.00	66.82	62.85	90.34	888.74	-402.79	839.97	713.71	126.26			6.652
12,400.00	11,275.00	12,282.25	11,280.00	67.37	63.59	90.34	988.74	-403.85	839.97	712.27	127.70			6.578
12,500.00	11,275.00	12,382.25	11,280.00	68.01	64.39	90.34	1,088.73	-404.90	839.97	710.71	129.26			6.498
12,600.00	11,275.00	12,482.25	11,280.00	68.73	65.26	90.34	1,188.73	-405.96	839.97	709.03	130.95			6.415
12,700.00	11,275.00	12,582.25	11,280.00	69.53	66.18	90.34	1,288.72	-407.02	839.97	707.22	132.75			6.327
12,800.00	11,275.00	12,682.25	11,280.00	70.39	67.16	90.34	1,388.72	-408.08	839.97	705.30	134.67			6.237
12,900.00	11,275.00	12,782.25	11,280.00	71.32	68.19	90.34	1,488.71	-409.13	839.97	703.27	136.70			6.144
13,000.00	11,275.00	12,882.25	11,280.00	72.31	69.27	90.34	1,588.71	-410.19	839.98	701.13	138.84			6.050
13,100.00	11,275.00	12,982.25	11,280.00	73.36	70.40	90.34	1,688.70	-411.25	839.98	698.90	141.08			5.954
13,200.00	11,275.00	13,082.25	11,280.00	74.46	71.58	90.34	1,788.69	-412.30	839.98	696.57	143.41			5.857
13,300.00	11,275.00	13,182.25	11,280.00	75.61	72.81	90.34	1,888.69	-413.36	839.98	694.14	145.84			5.760
13,400.00	11,275.00	13,282.25	11,280.00	76.80	74.08	90.34	1,988.68	-414.42	839.98	691.63	148.35			5.662
13,500.00	11,275.00	13,382.25	11,280.00	78.04	75.38	90.34	2,088.68	-415.47	839.98	689.04	150.94			5.565

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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													Cypress 34 - 246H - OH - Plan 1		Offset Site Error:		0.00 usft
Survey Program: 0-MWD+HDGM															Offset Well Error:		0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset		+N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)							
13,600.00	11,275.00	13,482.25	11,280.00	79.32	76.73	90.34	2,188.67	-416.53	839.98	686.37	153.61	5.468					
13,700.00	11,275.00	13,582.25	11,280.00	80.64	78.12	90.34	2,288.67	-417.59	839.98	683.62	156.36	5.372					
13,800.00	11,275.00	13,682.25	11,280.00	82.00	79.53	90.34	2,388.66	-418.65	839.98	680.81	159.17	5.277					
13,900.00	11,275.00	13,782.25	11,280.00	83.39	80.98	90.34	2,488.66	-419.70	839.98	677.93	162.06	5.183					
14,000.00	11,275.00	13,882.25	11,280.00	84.81	82.47	90.34	2,588.65	-420.76	839.98	674.98	165.00	5.091					
14,100.00	11,275.00	13,982.25	11,280.00	86.27	83.98	90.34	2,688.64	-421.82	839.98	671.97	168.01	5.000					
14,200.00	11,275.00	14,082.25	11,280.00	87.75	85.52	90.34	2,788.64	-422.87	839.98	668.91	171.07	4.910					
14,300.00	11,275.00	14,182.25	11,280.00	89.27	87.08	90.34	2,888.63	-423.93	839.98	665.80	174.19	4.822					
14,400.00	11,275.00	14,282.25	11,280.00	90.81	88.67	90.34	2,988.63	-424.99	839.98	662.63	177.35	4.736					
14,500.00	11,275.00	14,382.25	11,280.00	92.37	90.29	90.34	3,088.62	-426.04	839.98	659.42	180.57	4.652					
14,600.00	11,275.00	14,482.25	11,280.00	93.96	91.93	90.34	3,188.62	-427.10	839.99	656.15	183.83	4.569					
14,700.00	11,275.00	14,582.25	11,280.00	95.57	93.59	90.34	3,288.61	-428.16	839.99	652.85	187.14	4.489					
14,800.00	11,275.00	14,682.25	11,280.00	97.20	95.27	90.34	3,388.60	-429.22	839.99	649.51	190.48	4.410					
14,900.00	11,275.00	14,782.25	11,280.00	98.86	96.96	90.34	3,488.60	-430.27	839.99	646.12	193.87	4.333					
15,000.00	11,275.00	14,882.25	11,280.00	100.53	98.68	90.34	3,588.59	-431.33	839.99	642.70	197.29	4.258					
15,100.00	11,275.00	14,982.25	11,280.00	102.22	100.41	90.34	3,688.59	-432.39	839.99	639.25	200.74	4.184					
15,200.00	11,275.00	15,082.25	11,280.00	103.93	102.16	90.34	3,788.58	-433.44	839.99	635.76	204.23	4.113					
15,300.00	11,275.00	15,182.25	11,280.00	105.66	103.93	90.34	3,888.58	-434.50	839.99	632.24	207.75	4.043					
15,400.00	11,275.00	15,282.25	11,280.00	107.40	105.71	90.34	3,988.57	-435.56	839.99	628.68	211.31	3.975					
15,500.00	11,275.00	15,382.25	11,280.00	109.16	107.51	90.34	4,088.57	-436.61	839.99	625.11	214.89	3.909					
15,600.00	11,275.00	15,482.25	11,280.00	110.93	109.31	90.34	4,188.56	-437.67	839.99	621.50	218.49	3.844					
15,700.00	11,275.00	15,582.25	11,280.00	112.71	111.13	90.34	4,288.55	-438.73	839.99	617.87	222.12	3.782					
15,800.00	11,275.00	15,682.25	11,280.00	114.51	112.97	90.34	4,388.55	-439.79	839.99	614.21	225.78	3.720					
15,900.00	11,275.00	15,782.25	11,280.00	116.32	114.81	90.34	4,488.54	-440.84	839.99	610.53	229.46	3.661					
16,000.00	11,275.00	15,882.25	11,280.00	118.14	116.67	90.34	4,588.54	-441.90	839.99	606.83	233.17	3.603					
16,100.00	11,275.00	15,982.25	11,280.00	119.98	118.53	90.34	4,688.53	-442.96	839.99	603.10	236.89	3.546					
16,200.00	11,275.00	16,082.25	11,280.00	121.82	120.41	90.34	4,788.53	-444.01	839.99	599.36	240.63	3.491					
16,300.00	11,275.00	16,182.25	11,280.00	123.68	122.29	90.34	4,888.52	-445.07	840.00	595.60	244.40	3.437					
16,400.00	11,275.00	16,282.25	11,280.00	125.54	124.19	90.34	4,988.52	-446.13	840.00	591.82	248.18	3.385					
16,500.00	11,275.00	16,382.25	11,280.00	127.41	126.09	90.34	5,088.51	-447.19	840.00	588.02	251.98	3.334					
16,600.00	11,275.00	16,482.25	11,280.00	129.30	128.00	90.34	5,188.50	-448.24	840.00	584.20	255.80	3.284					
16,700.00	11,275.00	16,582.25	11,280.00	131.19	129.92	90.34	5,288.50	-449.30	840.00	580.37	259.63	3.235					
16,706.23	11,275.00	16,588.48	11,280.00	131.31	130.04	90.34	5,294.73	-449.37	840.00	580.13	259.87	3.232					
16,776.29	11,275.00	16,652.45	11,280.00	132.64	131.27	90.34	5,358.70	-450.04	840.02	577.74	262.28	3.203 SF					



Pro Directional Anticollision Report



Company: Tap Rock Operating, LLC
Project: Eddy County, NM (NAD 83)
Reference Site: Cypress 34
Site Error: 0.00 usft
Reference Well: 243H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1

Local Co-ordinate Reference: Well 243H
TVD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
MD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: WellPlanner1
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 - Knoll AOK 002 (O) - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 100-MWD+HDGM, 7421-MWD+HDGM													Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis			Distance									Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	97.00	-88.10	717.60	723.91					
100.00	100.00	66.51	66.51	0.20	0.18	97.00	-88.07	717.46	722.86	722.48	0.38	1,917.102		
200.00	200.00	168.63	168.63	0.74	0.64	96.99	-87.86	716.85	722.23	720.86	1.37	525.935		
300.00	300.00	266.54	266.53	1.27	1.16	96.95	-87.28	716.30	721.61	719.17	2.43	296.603		
351.28	351.28	314.79	314.78	1.55	1.42	96.91	-86.76	716.23	721.47	718.50	2.96	243.391		
400.00	400.00	358.11	358.09	1.81	1.64	96.85	-86.03	716.48	721.65	718.20	3.45	208.911		
450.00	450.00	402.55	402.52	2.08	1.88	96.76	-84.96	717.12	722.22	718.26	3.96	182.530		
500.00	500.00	446.59	446.53	2.34	2.11	-162.68	-83.73	718.12	723.60	719.15	4.45	162.575		
600.00	599.93	537.80	537.64	2.86	2.59	-162.96	-81.00	721.27	730.01	724.56	5.45	133.934		
700.00	699.68	636.77	636.50	3.39	3.12	-163.29	-78.36	725.23	740.37	733.87	6.50	113.834		
800.00	799.13	739.55	739.18	3.93	3.66	-163.66	-76.11	728.87	753.68	746.10	7.59	99.364		
900.00	898.15	839.87	839.45	4.50	4.20	-163.98	-74.83	732.01	770.03	761.37	8.66	88.933		
1,000.00	996.63	937.20	936.74	5.09	4.71	-164.27	-74.36	734.81	789.53	779.81	9.72	81.226		
1,100.00	1,094.44	1,028.68	1,028.16	5.71	5.20	-164.53	-74.45	737.80	812.78	802.02	10.76	75.566		
1,200.00	1,191.46	1,117.59	1,117.00	6.37	5.67	-164.76	-75.06	741.46	840.18	828.40	11.78	71.314		
1,214.68	1,205.63	1,131.34	1,130.74	6.47	5.75	-164.80	-75.21	742.07	844.53	832.59	11.94	70.707		
1,300.00	1,287.93	1,212.29	1,211.60	7.07	6.18	-165.13	-76.30	745.75	870.11	857.27	12.84	67.775		
1,400.00	1,384.39	1,314.68	1,313.88	7.79	6.72	-165.50	-77.97	749.89	899.67	885.73	13.94	64.555		
1,500.00	1,480.85	1,412.73	1,411.86	8.51	7.24	-165.82	-79.63	753.41	928.82	913.80	15.02	61.851		
1,600.00	1,577.31	1,515.66	1,514.73	9.25	7.79	-166.18	-80.69	756.56	957.46	941.32	16.14	59.339		
1,700.00	1,673.77	1,617.71	1,616.76	10.00	8.34	-166.57	-80.73	758.98	985.43	968.17	17.26	57.109		
1,800.00	1,770.22	1,715.74	1,714.77	10.75	8.87	-166.94	-80.56	760.89	1,013.03	994.67	18.35	55.195		
1,900.00	1,866.68	1,809.54	1,808.55	11.50	9.37	-167.26	-80.69	762.73	1,040.68	1,021.25	19.43	53.570		
2,000.00	1,963.14	1,900.29	1,899.28	12.26	9.86	-167.53	-81.07	764.83	1,068.70	1,048.22	20.48	52.182		
2,100.00	2,059.60	1,991.66	1,990.61	13.03	10.35	-167.79	-81.66	767.34	1,097.17	1,075.63	21.54	50.942		
2,200.00	2,156.06	2,093.99	2,092.90	13.79	10.90	-168.04	-82.57	770.09	1,125.61	1,102.94	22.67	49.647		
2,300.00	2,252.52	2,198.10	2,196.98	14.56	11.45	-168.28	-83.77	772.17	1,153.41	1,129.59	23.82	48.424		
2,400.00	2,348.98	2,295.54	2,294.40	15.33	11.97	-168.48	-84.98	773.71	1,180.81	1,155.89	24.92	47.385		
2,500.00	2,445.43	2,384.34	2,383.18	16.11	12.44	-168.66	-86.08	775.31	1,208.45	1,182.49	25.96	46.549		
2,600.00	2,541.89	2,466.58	2,465.38	16.88	12.88	-168.79	-87.59	777.47	1,236.90	1,209.95	26.95	45.891		
2,700.00	2,638.35	2,550.38	2,549.07	17.65	13.33	-168.87	-90.31	780.63	1,266.42	1,238.47	27.95	45.303		
2,800.00	2,734.81	2,642.56	2,641.07	18.43	13.83	-168.90	-94.42	784.72	1,296.60	1,267.58	29.02	44.677		
2,900.00	2,831.27	2,740.46	2,738.77	19.21	14.36	-168.91	-99.11	788.88	1,326.61	1,296.47	30.13	44.023		
3,000.00	2,927.73	2,836.98	2,835.01	19.98	14.88	-168.86	-105.20	792.98	1,356.61	1,325.37	31.24	43.427		
3,100.00	3,024.19	2,937.25	2,934.87	20.76	15.42	-168.73	-113.29	796.92	1,386.31	1,353.94	32.38	42.818		
3,200.00	3,120.65	3,035.47	3,032.66	21.54	15.95	-168.58	-121.69	800.54	1,415.79	1,382.29	33.50	42.261		
3,300.00	3,217.10	3,132.22	3,129.05	22.32	16.47	-168.48	-129.38	803.94	1,445.11	1,410.50	34.62	41.748		
3,400.00	3,313.56	3,227.07	3,223.60	23.10	16.99	-168.41	-136.02	807.32	1,474.47	1,438.76	35.71	41.285		
3,500.00	3,410.02	3,323.99	3,320.26	23.88	17.51	-168.36	-142.33	810.74	1,503.79	1,466.96	36.83	40.828		
3,600.00	3,506.48	3,420.44	3,416.45	24.66	18.04	-168.32	-148.57	814.06	1,533.04	1,495.09	37.95	40.399		
3,700.00	3,602.94	3,514.84	3,510.60	25.45	18.55	-168.29	-154.59	817.33	1,562.30	1,523.25	39.05	40.011		
3,800.00	3,699.40	3,607.63	3,603.15	26.23	19.06	-168.26	-160.37	820.68	1,591.69	1,551.56	40.13	39.661		
3,900.00	3,795.86	3,703.35	3,698.62	27.01	19.58	-168.23	-166.35	824.20	1,621.16	1,579.92	41.25	39.306		
4,000.00	3,892.31	3,799.40	3,794.41	27.79	20.11	-168.20	-172.38	827.72	1,650.62	1,608.25	42.36	38.965		
4,100.00	3,988.77	3,892.81	3,887.58	28.58	20.68	-168.17	-178.66	831.25	1,679.83	1,636.29	43.54	38.581		
4,200.00	4,085.23	3,995.56	3,990.11	29.36	21.19	-168.16	-184.20	834.29	1,708.91	1,664.28	44.63	38.292		
4,300.00	4,181.69	4,090.71	4,085.04	30.14	21.71	-168.14	-189.85	837.50	1,738.09	1,692.35	45.74	38.000		
4,400.00	4,278.15	4,189.41	4,183.52	30.93	22.25	-168.13	-195.43	840.77	1,767.20	1,720.32	46.88	37.697		
4,500.00	4,374.61	4,285.22	4,279.13	31.71	22.77	-168.13	-200.70	843.84	1,796.20	1,748.21	47.99	37.425		
4,600.00	4,471.07	4,382.77	4,376.50	32.49	23.31	-168.13	-206.02	846.94	1,825.18	1,776.05	49.12	37.154		
4,700.00	4,567.53	4,478.98	4,472.52	33.28	23.84	-168.14	-211.10	849.91	1,854.07	1,803.83	50.24	36.901		

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 Cypress 34 - Knoll AOK 002 (O) - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 100-MWD+HDGM, 7421-MWD+HDGM													Offset Well Error: 0.00 usft
Measured Depth (usft)	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
4,800.00	4,663.98	4,574.28	4,567.64	34.06	24.36	-168.14	-216.12	852.86	1,882.97	1,831.62	51.36	36.665	
4,900.00	4,760.44	4,673.73	4,666.90	34.85	24.90	-168.15	-221.38	855.89	1,911.82	1,859.32	52.50	36.413	
5,000.00	4,856.90	4,773.87	4,766.87	35.63	25.45	-168.16	-226.59	858.69	1,940.43	1,886.78	53.66	36.163	
5,100.00	4,953.36	4,873.18	4,866.03	36.42	26.00	-168.17	-231.48	861.28	1,968.86	1,914.05	54.80	35.926	
5,194.35	5,044.37	4,965.95	4,958.66	37.16	26.50	-168.19	-235.96	863.56	1,995.54	1,939.67	55.88	35.713	
5,200.00	5,049.82	4,971.49	4,964.20	37.20	26.53	-168.20	-236.23	863.70	1,997.13	1,941.19	55.94	35.701	
5,300.00	5,146.77	5,068.62	5,061.19	37.95	27.06	-168.32	-240.81	866.00	2,023.50	1,966.45	57.06	35.464	
5,400.00	5,244.51	5,165.60	5,158.03	38.66	27.59	-168.40	-245.28	868.31	2,046.56	1,988.40	58.16	35.189	
5,500.00	5,342.93	5,265.25	5,257.56	39.30	28.14	-168.46	-249.83	870.67	2,066.27	2,007.00	59.27	34.862	
5,600.00	5,441.91	5,362.62	5,354.81	39.90	28.67	-168.48	-254.10	872.91	2,082.55	2,022.21	60.34	34.511	
5,700.00	5,541.32	5,461.97	5,454.03	40.44	29.21	-168.47	-258.61	875.30	2,095.55	2,034.13	61.42	34.118	
5,800.00	5,641.05	5,563.12	5,555.05	40.94	29.76	-168.43	-263.06	877.64	2,105.06	2,042.57	62.50	33.683	
5,900.00	5,740.97	5,663.36	5,655.18	41.39	30.31	-168.36	-267.35	879.91	2,111.13	2,047.58	63.55	33.222	
5,959.03	5,800.00	5,722.14	5,713.89	41.63	30.63	91.03	-269.80	881.24	2,113.10	2,048.96	64.15	32.942	
6,000.00	5,840.97	5,762.65	5,754.35	41.78	30.85	91.07	-271.49	882.16	2,114.07	2,049.52	64.55	32.750	
6,100.00	5,940.97	5,862.07	5,853.09	42.17	31.17	173.91	-436.90	-1,209.08	2,045.02	1,997.68	47.34	43.196	
6,200.00	6,040.97	5,962.31	5,953.09	42.56	31.21	174.25	-436.90	-1,210.32	1,945.56	1,897.82	47.73	40.757	
6,300.00	6,140.97	6,062.52	6,053.10	42.95	31.24	174.59	-436.90	-1,211.53	1,846.15	1,798.00	48.15	38.340	
6,400.00	6,240.97	6,162.72	6,153.12	43.34	31.28	174.92	-436.90	-1,212.73	1,746.81	1,698.21	48.60	35.942	
6,500.00	6,340.97	6,262.90	6,253.13	43.74	31.31	175.25	-436.90	-1,213.91	1,647.54	1,598.46	49.09	33.565	
6,600.00	6,440.97	6,363.06	6,353.14	44.14	31.35	175.57	-436.90	-1,215.07	1,548.38	1,498.76	49.62	31.207	
6,700.00	6,540.97	6,463.20	6,453.15	44.55	31.38	175.89	-436.90	-1,216.21	1,449.32	1,399.12	50.20	28.870	
6,800.00	6,640.97	6,563.32	6,553.17	44.95	31.42	176.20	-436.90	-1,217.33	1,350.41	1,299.55	50.86	26.551	
6,900.00	6,740.97	6,663.43	6,653.18	45.36	31.45	176.51	-436.90	-1,218.44	1,251.66	1,200.05	51.61	24.252	
7,000.00	6,840.97	6,763.52	6,753.19	45.78	31.48	176.81	-436.90	-1,219.53	1,153.13	1,100.65	52.48	21.972	
7,100.00	6,940.97	6,863.59	6,853.20	46.19	31.51	177.11	-436.90	-1,220.60	1,054.88	1,001.36	53.52	19.711	
7,200.00	7,040.97	6,963.65	6,953.21	46.61	31.54	177.41	-436.90	-1,221.65	956.99	902.21	54.78	17.469	
7,300.00	7,140.97	7,063.69	7,053.22	47.03	31.58	177.70	-436.90	-1,222.69	859.58	803.21	56.36	15.250	
7,400.00	7,240.97	7,163.71	7,153.23	47.45	31.61	177.98	-436.90	-1,223.72	762.84	704.42	58.42	13.058	
7,500.00	7,340.97	7,263.72	7,253.24	47.87	31.64	178.26	-436.90	-1,224.73	667.06	605.88	61.18	10.903	
7,600.00	7,440.97	7,363.71	7,353.25	48.30	31.67	178.54	-436.90	-1,225.72	572.73	507.67	65.06	8.804	
7,700.00	7,540.97	7,463.69	7,453.26	48.73	31.69	178.81	-436.90	-1,226.70	480.69	409.97	70.71	6.798	
7,800.00	7,640.97	7,563.66	7,553.27	49.16	31.72	179.08	-436.90	-1,227.66	392.56	313.26	79.30	4.950	
7,900.00	7,740.97	7,663.61	7,653.28	49.59	31.75	179.35	-436.90	-1,228.61	311.67	219.17	92.50	3.369	
8,000.00	7,840.97	7,763.54	7,753.28	50.03	31.78	179.61	-436.90	-1,229.55	245.31	134.14	111.17	2.207	
8,100.00	7,940.97	7,863.47	7,853.29	50.47	31.81	179.87	-436.91	-1,230.47	207.88	79.79	128.09	1.623	
8,134.83	7,975.80	7,898.29	7,888.30	50.62	31.82	179.96	-436.91	-1,230.79	204.95	74.96	129.99	1.577	CC, ES, SF
8,200.00	8,040.97	7,963.38	7,953.30	50.90	31.83	179.88	-436.91	-1,231.39	215.06	89.49	125.57	1.713	
8,300.00	8,140.97	8,063.28	8,053.31	51.35	31.86	179.62	-436.91	-1,232.28	263.22	155.31	107.91	2.439	
8,400.00	8,240.97	8,163.16	8,153.32	51.79	31.89	179.38	-436.91	-1,233.17	335.13	243.46	91.67	3.656	
8,500.00	8,340.97	8,263.03	8,253.33	52.23	31.91	179.13	-436.91	-1,234.04	418.74	338.00	80.74	5.186	
8,600.00	8,440.97	8,362.89	8,353.33	52.68	31.94	178.89	-436.91	-1,234.90	508.30	434.51	73.79	6.888	
8,700.00	8,540.97	8,462.74	8,453.34	53.13	31.96	178.66	-436.91	-1,235.75	601.16	531.81	69.35	8.668	
8,800.00	8,640.97	8,562.58	8,553.35	53.58	31.99	178.42	-436.91	-1,236.59	696.01	629.55	66.46	10.473	
8,900.00	8,740.97	8,662.41	8,653.36	54.03	80.01	178.19	-436.91	-1,237.42	792.12	727.57	64.54	12.273	
9,000.00	8,840.97	8,762.22	8,753.36	54.48	80.04	177.96	-436.91	-1,238.23	889.08	825.82	63.27	14.053	
9,100.00	8,940.97	8,862.03	8,853.37	54.94	80.06	177.74	-436.91	-1,239.03	986.66	924.23	62.43	15.805	
9,200.00	9,040.97	8,961.82	8,953.38	55.39	80.09	177.52	-436.91	-1,239.83	1,084.67	1,022.79	61.88	17.528	
9,300.00	9,140.97	9,061.60	9,053.38	55.85	80.11	177.30	-436.91	-1,240.61	1,183.02	1,121.46	61.56	19.219	
9,400.00	9,240.97	9,161.38	9,153.39	56.31	80.13	177.08	-436.92	-1,241.38	1,281.62	1,220.23	61.39	20.878	

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



Pro Directional Anticollision Report



Company: Tap Rock Operating, LLC
Project: Eddy County, NM (NAD 83)
Reference Site: Cypress 34
Site Error: 0.00 usft
Reference Well: 243H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1

Local Co-ordinate Reference: Well 243H
TVD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
MD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: WellPlanner1
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 - Knoll AOK 002 (O) - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 100-MWD+HDGM, 7421-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,500.00	9,340.97	9,957.14	7,939.40	56.77	80.16	-176.87	-436.92	-1,242.15	1,380.42	1,319.09	61.34	22.506		
9,600.00	9,440.97	9,957.89	7,939.40	57.23	80.18	-176.66	-436.92	-1,242.90	1,479.38	1,418.01	61.38	24.104		
9,700.00	9,540.97	9,958.64	7,939.41	57.69	80.20	-176.45	-436.92	-1,243.64	1,578.48	1,516.99	61.49	25.671		
9,800.00	9,640.97	9,959.37	7,939.41	58.16	80.22	-176.25	-436.92	-1,244.38	1,677.68	1,616.02	61.66	27.209		
9,900.00	9,740.97	9,960.10	7,939.42	58.62	80.24	-176.05	-436.92	-1,245.10	1,776.97	1,715.09	61.87	28.719		
10,000.00	9,840.97	9,960.81	7,939.43	59.09	80.27	-175.85	-436.92	-1,245.82	1,876.33	1,814.20	62.13	30.201		
10,100.00	9,940.97	9,961.52	7,939.43	59.56	80.29	-175.65	-436.92	-1,246.53	1,975.76	1,913.35	62.41	31.656		
10,200.00	10,040.97	9,962.22	7,939.44	60.02	80.31	-175.46	-436.92	-1,247.22	2,075.24	2,012.52	62.73	33.084		
10,300.00	10,140.97	9,962.91	7,939.44	60.49	80.33	-175.27	-436.93	-1,247.91	2,174.77	2,111.71	63.06	34.486		
10,400.00	10,240.97	9,963.59	7,939.45	60.97	80.35	-175.08	-436.93	-1,248.59	2,274.35	2,210.93	63.42	35.863		
10,500.00	10,340.97	9,964.26	7,939.45	61.44	80.37	-174.89	-436.93	-1,249.27	2,373.95	2,310.16	63.79	37.214		
10,600.00	10,440.97	9,964.92	7,939.46	61.91	80.39	-174.71	-436.93	-1,249.93	2,473.59	2,409.41	64.18	38.541		
10,700.00	10,540.97	9,965.58	7,939.46	62.39	80.41	-174.52	-436.93	-1,250.59	2,573.26	2,508.67	64.58	39.843		
10,800.00	10,640.97	9,966.23	7,939.47	62.86	80.43	-174.35	-436.93	-1,251.23	2,672.95	2,607.95	65.00	41.122		
10,861.07	10,702.04	9,966.62	7,939.47	63.15	80.44	-174.24	-436.93	-1,251.63	2,733.84	2,668.58	65.26	41.891		
10,900.00	10,740.94	9,966.88	7,939.47	63.34	80.45	-172.70	-436.93	-1,251.88	2,772.73	2,707.29	65.44	42.371		
10,950.00	10,790.61	9,967.23	7,939.48	63.57	80.46	-5.93	-436.93	-1,252.24	2,822.68	2,756.98	65.69	42.967		
11,000.00	10,839.61	9,967.61	7,939.48	63.79	80.47	-2.89	-436.93	-1,252.62	2,872.29	2,806.31	65.98	43.534		
11,050.00	10,887.57	9,968.01	7,939.48	64.00	80.48	-1.93	-436.93	-1,253.02	2,921.20	2,854.91	66.29	44.069		
11,100.00	10,934.11	9,968.43	7,939.49	64.19	80.49	-1.46	-436.94	-1,253.44	2,969.09	2,902.47	66.62	44.567		
11,150.00	10,978.88	9,968.86	7,939.49	64.37	80.51	-1.19	-436.94	-1,253.87	3,015.66	2,948.67	66.98	45.022		
11,200.00	11,021.55	9,969.30	7,939.49	64.53	80.52	-1.01	-436.94	-1,254.31	3,060.60	2,993.23	67.37	45.428		
11,250.00	11,061.78	9,969.75	7,939.50	64.67	80.53	-0.89	-436.94	-1,254.76	3,103.67	3,035.88	67.79	45.782		
11,300.00	11,099.28	9,970.21	7,939.50	64.79	80.55	-0.80	-436.94	-1,255.21	3,144.62	3,076.37	68.25	46.077		
11,350.00	11,133.75	9,970.66	7,939.50	64.89	80.56	-0.73	-436.94	-1,255.66	3,183.22	3,114.48	68.74	46.309		
11,400.00	11,164.94	9,971.11	7,939.51	64.97	80.57	-0.68	-436.94	-1,256.11	3,219.27	3,150.00	69.27	46.473		
11,450.00	11,192.61	9,971.55	7,939.51	65.04	80.59	-0.64	-436.94	-1,256.56	3,252.58	3,182.73	69.85	46.567		
11,500.00	11,216.54	9,971.98	7,939.51	65.09	80.60	-0.60	-436.94	-1,256.99	3,282.99	3,212.52	70.47	46.588		
11,550.00	11,236.56	9,972.40	7,939.52	65.13	80.61	-0.58	-436.94	-1,257.41	3,310.34	3,239.20	71.14	46.533		
11,600.00	11,252.51	9,972.81	7,939.52	65.16	80.62	-0.56	-436.94	-1,257.81	3,334.52	3,262.65	71.86	46.402		
11,650.00	11,264.27	9,973.19	7,939.52	65.19	80.63	-0.54	-436.95	-1,258.20	3,355.39	3,282.76	72.63	46.196		
11,700.00	11,271.75	9,973.56	7,939.52	65.22	80.65	-0.53	-436.95	-1,258.57	3,372.88	3,299.42	73.46	45.915		
11,750.00	11,274.89	9,973.90	7,939.53	65.26	80.66	-0.53	-436.95	-1,258.91	3,386.89	3,312.56	74.33	45.563		
11,761.07	11,275.00	9,973.97	7,939.53	65.27	80.66	-0.52	-436.95	-1,258.98	3,389.52	3,314.99	74.53	45.477		
11,800.00	11,275.00	9,974.23	7,939.53	65.31	80.67	-0.53	-436.95	-1,259.23	3,398.66	3,323.40	75.26	45.160		
11,900.00	11,275.00	9,977.00	7,939.55	65.46	80.75	-0.58	-436.95	-1,262.01	3,424.07	3,346.83	77.24	44.331		
12,000.00	11,275.00	9,977.00	7,939.55	65.68	80.75	-0.58	-436.95	-1,262.01	3,452.18	3,372.89	79.29	43.540		
12,100.00	11,275.00	9,977.00	7,939.55	65.97	80.75	-0.58	-436.95	-1,262.01	3,482.94	3,401.52	81.42	42.779		
12,200.00	11,275.00	9,977.00	7,939.55	66.35	80.75	-0.58	-436.95	-1,262.01	3,516.27	3,432.66	83.61	42.058		
12,300.00	11,275.00	9,977.00	7,939.55	66.82	80.75	-0.58	-436.95	-1,262.01	3,552.11	3,466.27	85.83	41.385		
12,400.00	11,275.00	9,977.00	7,939.55	67.37	80.75	-0.58	-436.95	-1,262.01	3,590.37	3,502.29	88.08	40.764		
12,500.00	11,275.00	9,977.00	7,939.55	68.01	80.75	-0.58	-436.95	-1,262.01	3,630.99	3,540.66	90.33	40.198		
12,600.00	11,275.00	9,977.00	7,939.55	68.73	80.75	-0.58	-436.95	-1,262.01	3,673.88	3,581.31	92.57	39.688		
12,700.00	11,275.00	9,977.00	7,939.55	69.53	80.75	-0.58	-436.95	-1,262.01	3,718.96	3,624.17	94.79	39.233		
12,800.00	11,275.00	9,977.00	7,939.55	70.39	80.75	-0.58	-436.95	-1,262.01	3,766.17	3,669.18	96.98	38.834		
12,900.00	11,275.00	9,977.00	7,939.55	71.32	80.75	-0.58	-436.95	-1,262.01	3,815.40	3,716.27	99.13	38.487		
13,000.00	11,275.00	9,977.00	7,939.55	72.31	80.75	-0.58	-436.95	-1,262.01	3,866.60	3,765.36	101.24	38.192		
13,100.00	11,275.00	9,977.00	7,939.55	73.36	80.75	-0.58	-436.95	-1,262.01	3,919.68	3,816.38	103.30	37.944		
13,200.00	11,275.00	9,977.00	7,939.55	74.46	80.75	-0.58	-436.95	-1,262.01	3,974.57	3,869.27	105.31	37.743		
13,300.00	11,275.00	9,977.00	7,939.55	75.61	80.75	-0.58	-436.95	-1,262.01	4,031.20	3,923.94	107.25	37.586		
13,400.00	11,275.00	9,983.35	7,939.59	76.80	80.94	-0.69	-436.97	-1,268.36	4,089.47	3,980.19	109.29	37.420		

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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 Cypress 34 - Knoll AOK 002 (O) - OH - OH											Offset Site Error: 0.00 usft		
Survey Program: 100-MWD+HDGM, 7421-MWD+HDGM											Offset Well Error: 0.00 usft		
Reference		Offset		Semi Major Axis			Distance					Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		Separation Factor
13,500.00	11,275.00	9,983.86	7,939.59	78.04	80.95	-0.70	-436.97	-1,268.87	4,149.35	4,038.22	111.13	37.337	
13,600.00	11,275.00	9,984.38	7,939.60	79.32	80.97	-0.71	-436.97	-1,269.38	4,210.75	4,097.83	112.92	37.291	
13,700.00	11,275.00	9,984.88	7,939.60	80.64	80.98	-0.71	-436.98	-1,269.89	4,273.60	4,158.96	114.64	37.278	
13,800.00	11,275.00	9,985.38	7,939.60	82.00	81.00	-0.72	-436.98	-1,270.39	4,337.85	4,221.55	116.31	37.296	
13,900.00	11,275.00	9,985.88	7,939.61	83.39	81.01	-0.73	-436.98	-1,270.88	4,403.44	4,285.53	117.91	37.345	
14,000.00	11,275.00	9,986.37	7,939.61	84.81	81.03	-0.74	-436.98	-1,271.38	4,470.30	4,350.84	119.46	37.420	
14,100.00	11,275.00	9,986.86	7,939.61	86.27	81.04	-0.75	-436.98	-1,271.86	4,538.38	4,417.42	120.95	37.522	
14,200.00	11,275.00	9,987.34	7,939.62	87.75	81.06	-0.76	-436.98	-1,272.35	4,607.62	4,485.23	122.39	37.647	
14,300.00	11,275.00	9,987.82	7,939.62	89.27	81.07	-0.77	-436.98	-1,272.83	4,677.98	4,554.20	123.77	37.795	
14,400.00	11,275.00	9,988.30	7,939.62	90.81	81.09	-0.77	-436.99	-1,273.30	4,749.39	4,624.29	125.10	37.964	
14,500.00	11,275.00	9,988.77	7,939.62	92.37	81.10	-0.78	-436.99	-1,273.77	4,821.83	4,695.45	126.38	38.153	
14,600.00	11,275.00	9,989.23	7,939.63	93.96	81.12	-0.79	-436.99	-1,274.24	4,895.23	4,767.62	127.61	38.360	
14,700.00	11,275.00	9,989.70	7,939.63	95.57	81.13	-0.80	-436.99	-1,274.70	4,969.57	4,840.77	128.80	38.584	
14,800.00	11,275.00	9,990.16	7,939.63	97.20	81.14	-0.81	-436.99	-1,275.16	5,044.79	4,914.85	129.94	38.825	
14,900.00	11,275.00	9,990.61	7,939.63	98.86	81.16	-0.81	-436.99	-1,275.62	5,120.86	4,989.83	131.03	39.081	
15,000.00	11,275.00	9,991.06	7,939.64	100.53	81.17	-0.82	-437.00	-1,276.07	5,197.74	5,065.65	132.09	39.351	
15,100.00	11,275.00	9,991.51	7,939.64	102.22	81.18	-0.83	-437.00	-1,276.51	5,275.39	5,142.29	133.10	39.634	
15,200.00	11,275.00	9,991.95	7,939.64	103.93	81.20	-0.84	-437.00	-1,276.96	5,353.79	5,219.71	134.08	39.930	
15,300.00	11,275.00	9,992.39	7,939.64	105.66	81.21	-0.84	-437.00	-1,277.40	5,432.89	5,297.87	135.02	40.238	
15,400.00	11,275.00	9,992.83	7,939.65	107.40	81.22	-0.85	-437.00	-1,277.83	5,512.68	5,376.75	135.93	40.557	
15,500.00	11,275.00	9,993.26	7,939.65	109.16	81.24	-0.86	-437.00	-1,278.27	5,593.11	5,456.31	136.80	40.886	
15,600.00	11,275.00	9,993.69	7,939.65	110.93	81.25	-0.87	-437.00	-1,278.69	5,674.17	5,536.53	137.64	41.225	
15,700.00	11,275.00	9,994.11	7,939.65	112.71	81.26	-0.87	-437.01	-1,279.12	5,755.82	5,617.37	138.45	41.573	
15,800.00	11,275.00	9,994.53	7,939.66	114.51	81.27	-0.88	-437.01	-1,279.54	5,838.04	5,698.81	139.23	41.930	
15,900.00	11,275.00	9,994.95	7,939.66	116.32	81.29	-0.89	-437.01	-1,279.96	5,920.81	5,780.83	139.99	42.295	
16,000.00	11,275.00	9,995.37	7,939.66	118.14	81.30	-0.90	-437.01	-1,280.37	6,004.11	5,863.39	140.72	42.668	
16,100.00	11,275.00	9,995.78	7,939.66	119.98	81.31	-0.90	-437.01	-1,280.79	6,087.91	5,946.49	141.42	43.048	
16,200.00	11,275.00	9,996.19	7,939.66	121.82	81.32	-0.91	-437.01	-1,281.19	6,172.19	6,030.09	142.10	43.435	
16,300.00	11,275.00	9,996.59	7,939.67	123.68	81.34	-0.92	-437.02	-1,281.60	6,256.93	6,114.17	142.76	43.829	
16,400.00	11,275.00	9,996.99	7,939.67	125.54	81.35	-0.92	-437.02	-1,282.00	6,342.12	6,198.72	143.39	44.229	
16,500.00	11,275.00	9,997.39	7,939.67	127.41	81.36	-0.93	-437.02	-1,282.40	6,427.73	6,283.72	144.01	44.634	
16,600.00	11,275.00	9,997.79	7,939.67	129.30	81.37	-0.94	-437.02	-1,282.79	6,513.75	6,369.15	144.60	45.045	
16,700.00	11,275.00	9,998.18	7,939.67	131.19	81.38	-0.94	-437.02	-1,283.18	6,600.17	6,454.99	145.18	45.461	
16,776.29	11,275.00	9,998.48	7,939.68	132.64	81.39	-0.95	-437.02	-1,283.48	6,666.36	6,520.75	145.61	45.782	



Pro Directional Anticollision Report



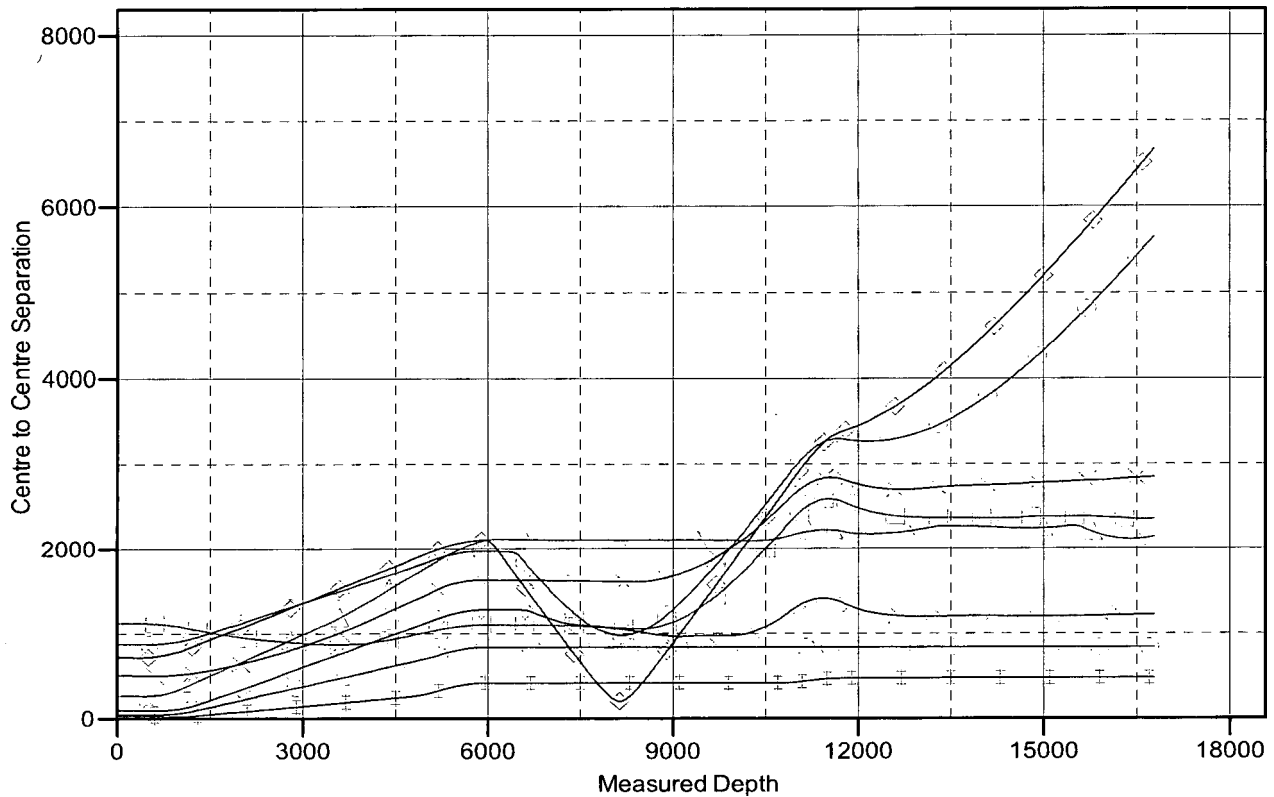
Company: Tap Rock Operating, LLC
Project: Eddy County, NM (NAD 83)
Reference Site: Cypress 34
Site Error: 0.00 usft
Reference Well: 243H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1

Local Co-ordinate Reference: Well 243H
TVD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
MD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: WellPlanner1
Offset TVD Reference: Offset Datum

Reference Depths are relative to Well @ 3119.50usft (GL: 3093' + Est.
Offset Depths are relative to Offset Datum
Central Meridian is -104.333334

Coordinates are relative to: 243H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.20°

Ladder Plot



LEGEND



001H (O), OH, OH V0
015H (O), OH, OH V0
008H (O), OH, OH V0



246H (O), OH, Plan 1 V0
233H (O), OH, Plan 1 V0
012H (O), OH, OH V0



009H (O), OH, OH V0
Knoll AOK 002 (O), OH, OH V0



Pro Directional Anticollision Report

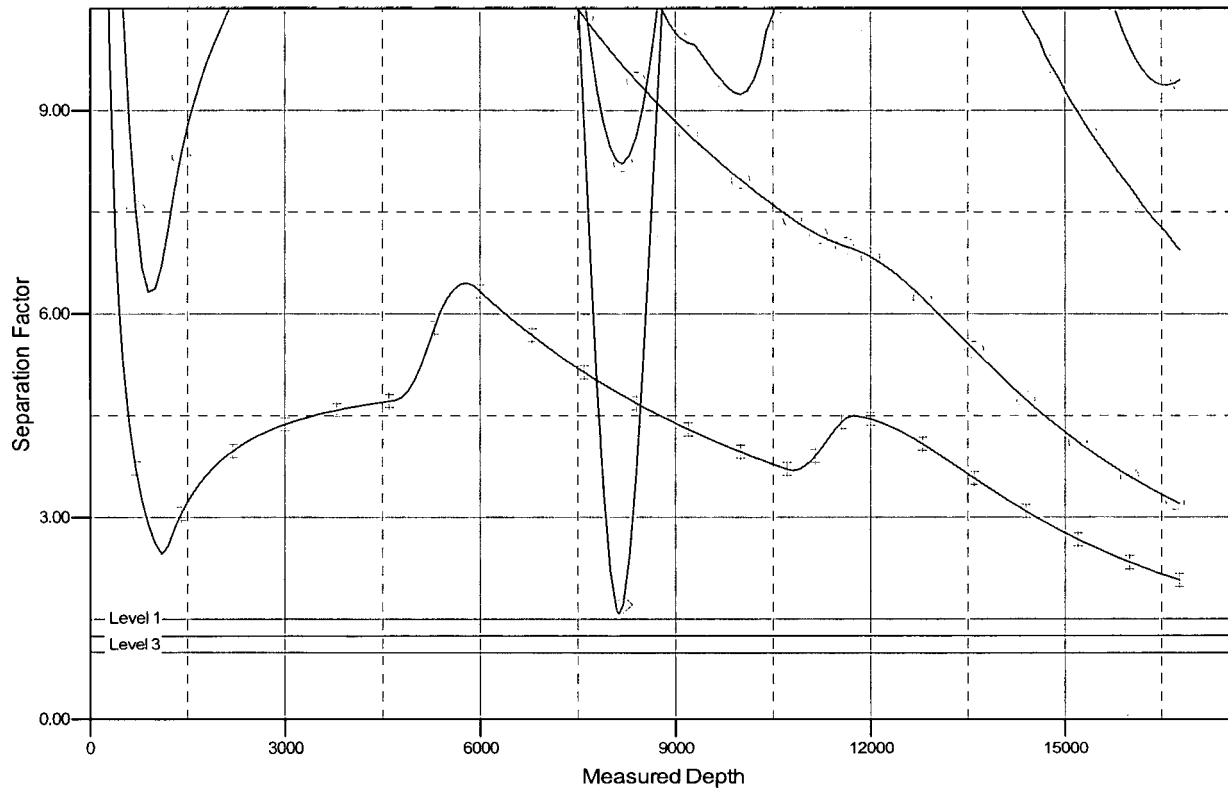


Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 243H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	243H	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

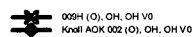
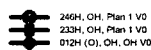
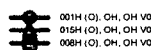
Reference Depths are relative to Well @ 3119.50usft (GL: 3093' + Est.
Offset Depths are relative to Offset Datum
Central Meridian is -104.333334

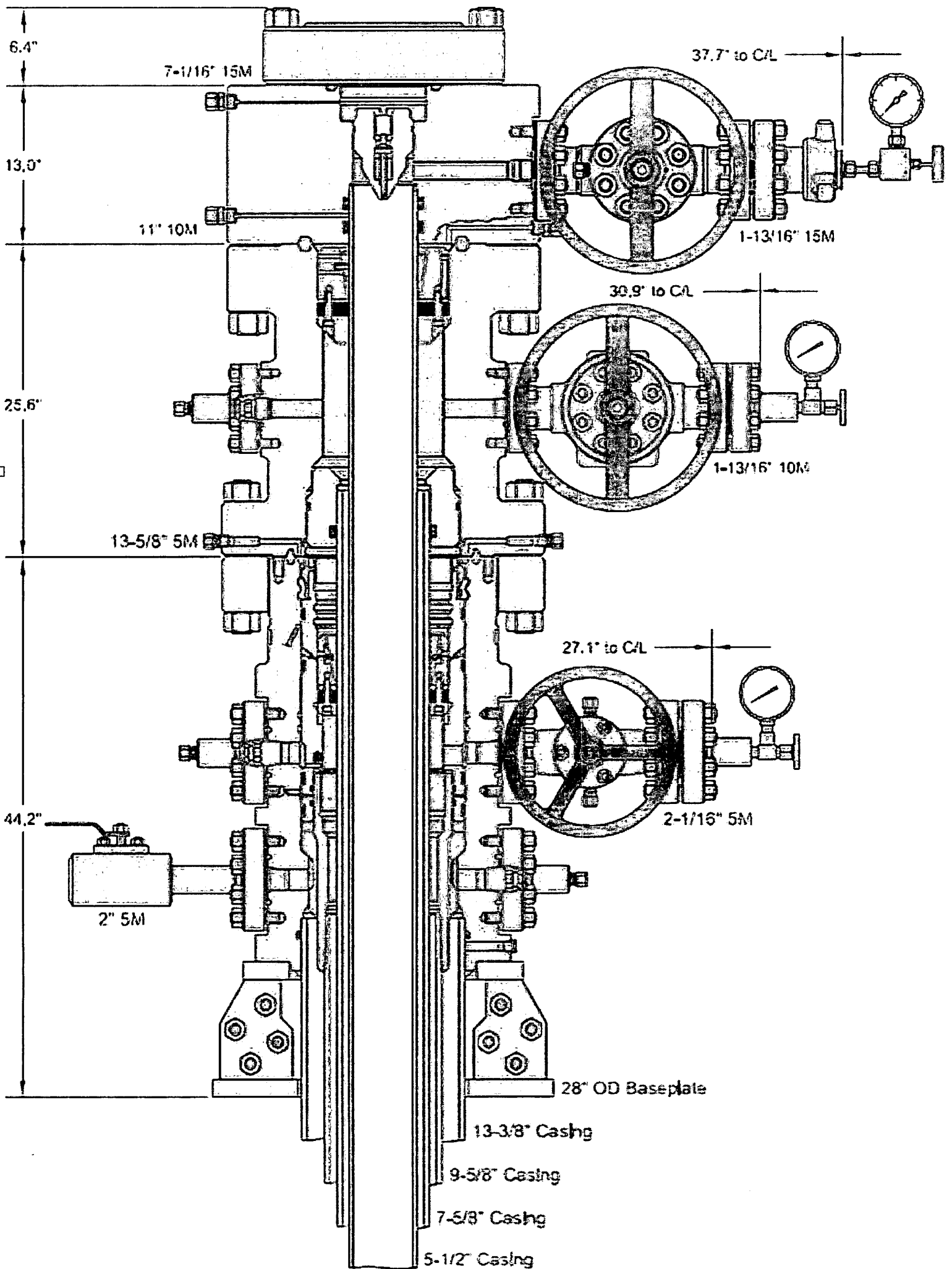
Coordinates are relative to: 243H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.20°

Separation Factor Plot



LEGEND







Tenaris

Casing and Tubing Performance Data

Choose pipe size, wall thickness and steel grade to view API connection options and performance data.

Size Wall Grade Connection Unit

Pipe Body Data

GEOMETRY

Nominal OD	13.375 in	Wall Thickness	0.380 in	API Drift Diameter	12.459 in
Nominal Weight	54.50 lbs/ft	Nominal ID	12.615 in	Alternate Drift Diameter	n.a.
Plain End Weight	52.79 lbs/ft	Nominal Cross Section	15.513 sq in		

PERFORMANCE

Steel Grade	J55	Minimum Yield	55,000 psi	Minimum Ultimate	75,000 psi
Body Yield Strength	853,000 lbs	Internal Yield Pressure	2,730 psi	Collapse Pressure	1,130 psi

Connection Data

GEOMETRY

Regular OD	14.375 in	Threads Per Inch	5	Make-Up Thread Turns	1
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PERFORMANCE

Steel Grade	J55	Minimum Yield	55,000 psi	Minimum Ultimate	75,000 psi
Joint Strength	909,000 lbs	Internal Pressure Resistance	2,730 psi		

Tenaris Hydril Premium Connections

Print

Contact Us

Ver 8.6



Tenaris

Casing and Tubing Performance Data

Choose pipe size, wall thickness and steel grade to view API connection options and performance data.

Size Wall Grade Connection Unit

Pipe Body Data

GEOMETRY

Nominal OD	9.625 in	Wall Thickness	0.395 in	API Drift Diameter	8.679 in
Nominal Weight	40.00 lbs/ft	Nominal ID	8.835 in	Alternate Drift Diameter	8.75 in
Plain End Weight	38.97 lbs/ft	Nominal Cross Section	11.454 sq in		

PERFORMANCE

Steel Grade	J55	Minimum Yield	55,000 psi	Minimum Ultimate	75,000 psi
Body Yield Strength	630,000 lbs	Internal Yield Pressure	3,950 psi	Collapse Pressure	2,570 psi

Connection Data

GEOMETRY

Regular OD	10.625 in	Threads Per Inch	5	Make-Up Thread Turns	1
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PERFORMANCE

Steel Grade	J55	Minimum Yield	55,000 psi	Minimum Ultimate	75,000 psi
Joint Strength	714,000 lbs	Internal Pressure Resistance	3,950 psi		

Tenaris Hydril Premium Connections

Print

Contact Us

Ver 8.6

Casing and Tubing Performance Data

PIPE BODY DATA

GEOMETRY

Outside Diameter	7.625 in	Wall Thickness	0.375 in	API Drift Diameter	6.750 in
Nominal Weight	29.70 lbs/ft	Nominal ID	6.875 in	Alternative Drift Diameter	n.a.
Plain End Weight	29.06 lbs/ft	Nominal cross section	8.541 in		

PERFORMANCE

Steel Grade	P110	Minimum Yield	110,000 psi	Minimum Ultimate	125,000 psi
Tension Yield	940,000 in	Internal Pressure Yield	9,470 psi	Collapse Pressure	5,350 psi
Available Seamless	Yes	Available Welded	Yes		

CONNECTION DATA

TYPE: BTC

GEOMETRY

Coupling Reg OD	8.500 in	Threads per in	5	Thread turns make up	1
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PERFORMANCE

Steel Grade	P110	Coupling Min Yield	110,000 psi	Coupling Min Ultimate	125,000 psi
Joint Strength	960,000 lbs			Internal Pressure Resistance	9,470 psi

Wedge 513®

Printed on: 01/30/2018



Outside Diameter	7.625 in.	Min. Wall Thickness	87.5%	(*) Grade P110	
Wall Thickness	0.375 in.	Connection OD Option	REGULAR	COUPLING	PIPE BODY
Grade	P110*	Drift	API Standard	Body: White	1st Band: White
		Type	Casing	1st Band: -	2nd Band: -
				2nd Band: -	3rd Band: -
				3rd Band: -	4th Band: -

GEOMETRY					
Nominal OD	7.625 in.	Nominal Weight	29.70 lbs/ft	Drift	6.75 in.
Nominal ID	6.875 in.	Wall Thickness	0.375 in.	Plain End Weight	29.06 lbs/ft
OD Tolerance	API				
PERFORMANCE					
Body Yield Strength	940 x1000 lbs	Internal Yield	9470 psi	SMYS	110000 psi
Collapse	5350 psi				
GEOMETRY					
Connection OD	7.625 in.	Connection ID	6.800 in.	Make-up Loss	4.420 in.
Threads per in	3.29	Connection OD Option	REGULAR		
PERFORMANCE					
Tension Efficiency	60.0 %	Joint Yield Strength	564.000 x1000 lbs	Internal Pressure Capacity	9470.000 psi
Compression Efficiency	75.2 %	Compression Strength	706.880 x1000 lbs	Max. Allowable Bending	39.6 °/100 ft
External Pressure Capacity	5350.000 psi				
MAKE-UP TORQUES					
Minimum	9000 ft-lbs	Optimum	10800 ft-lbs	Maximum	15800 ft-lbs
OPERATION LIMIT TORQUES					
Operating Torque	47000 ft-lbs	Yield Torque	70000 ft-lbs		

Notes

This connection is fully interchangeable with:

Wedge 523® - 7.625 in. - 29.7 lbs/ft

Connections with Dopeless® Technology are fully compatible with the same connection in its Standard version

For further information on concepts indicated in this datasheet, download the Datasheet Manual from www.tenaris.com

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Casing and Tubing Performance Data

PIPE BODY DATA

GEOMETRY

Outside Diameter	7.000 in	Wall Thickness	0.408 in	API Drift Diameter	6.059 in
Nominal Weight	29.00 lbs/ft	Nominal ID	6.184 in	Alternative Drift Diameter	6.125 in
Plain End Weight	28.75 lbs/ft	Nominal cross section	8.449 in		

PERFORMANCE

Steel Grade	P110	Minimum Yield	110,000 psi	Minimum Ultimate	125,000 psi
Tension Yield	929,000 in	Internal Pressure Yield	11,220 psi	Collapse Pressure	8,530 psi
Available Seamless	Yes	Available Welded	Yes		

CONNECTION DATA

TYPE: BTC

GEOMETRY

Coupling Reg OD	7.656 in	Threads per in	5	Thread turns make up	1
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PERFORMANCE

Steel Grade	P110	Coupling Min Yield	110,000 psi	Coupling Min Ultimate	125,000 psi
Joint Strength	955,000 lbs			Internal Pressure Resistance	11,220 psi

5.5", 20#, P-110, TXP connection (modified buttress connection that provides a torque rating of nearly 24000ft-lbs)

TXP® BTC

SHARE EXPORT DATA PRINT



Outside Diameter	5.500 in	Min. Wall Thickness	Ø7.5%	▼	Clear Filters
		Drift	API Standard	▼	Compare
Wall Thickness	0.361 in	Type	Casing	▼	Request Info
Grade	P110	Connection OD Option	REGULAR	▼	CONNECTION INFORMATION
					> Blanking Dimensions
					> Connection's Page
					> Brochure
					> Datasheet Manual

PIPE BODY DATA

GEOMETRY					
Nominal OD	5.500 in	Nominal Weight	20 lbs/ft	Drift	4.653 in.
Nominal ID	4.778 in.	Wall Thickness	0.361 in	Plain End Weight	19.83 lbs/ft
OD Tolerance	API				
PERFORMANCE					
Body Yield Strength	641 x 1000 lbs	Internal Yield	12640 psi	SMYS	110000 psi
Collapse	11100 psi				

CONNECTION DATA

GEOMETRY					
Connection OD	6.100 in	Coupling Length	9.450 in	Connection ID	4.766 in.
Make-up Loss	4.204 in	Threads per in	5	Connection OD Option	REGULAR
PERFORMANCE					
Tension Efficiency	100.0 %	Joint Yield Strength	641,000 x 1000 lbs	Internal Pressure Capacity ¹	12640,000 psi
Compression Efficiency	100 %	Compression Strength	641,000 x 1000 lbs	Max. Allowable Bending	92 °/100 ft
External Pressure Capacity	11100,000 psi				
MAKE-UP TORQUES					
Minimum	11270 ft-lbs	Optimum	12520 ft-lbs	Maximum	13770 ft-lbs
OPERATION LIMIT TORQUES					
Operating Torque	21500 ft-lbs	Yield Torque	23900 ft-lbs		



Casing and Tubing Performance Data

PIPE BODY DATA

GEOMETRY

Outside Diameter	4.500 in	Wall Thickness	0.290 in	API Drift Diameter	3.795 in
Nominal Weight	13.50 lbs/ft	Nominal ID	3.920 in	Alternative Drift Diameter	n.a.
Plain End Weight	13.05 lbs/ft	Nominal cross section	3.836 in		

PERFORMANCE

Steel Grade	P110	Minimum Yield	110,000 psi	Minimum Ultimate	125,000 psi
Tension Yield	422,000 in	Internal Pressure Yield	12,410 psi	Collapse Pressure	10,690 psi
Available Seamless	Yes	Available Welded	Yes		

CONNECTION DATA

TYPE: BTC

GEOMETRY

Coupling Reg OD	5.000 in	Threads per in	5	Thread turns make up	0.5
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PERFORMANCE

Steel Grade	P110	Coupling Min Yield	110,000 psi	Coupling Min Ultimate	125,000 psi
Joint Strength	443,000 lbs			Internal Pressure Resistance	12,410 psi

Tap Rock Operating, LLC
 Cypress 34 Federal #243H
 SHL 241' FNL & 1196' FEL, Sec. 3, 24S, 29E
 BHL 5' FNL & 2430' FEL, Sec. 34, 23S, 29E
 Eddy County, NM

DRILL PLAN PAGE 1

DRILLING PROGRAM

1. ESTIMATED TOPS

Formation Name	MD'	TVD'	Bearing
Quaternary caliche	0	0	water/salt
Rustler anhydrite	312	312	salt
Salado salt (top salt)	627	627	salt
Base salt	3217	3137	salt
Delaware Mountain Group	3238	3157	hydrocarbons
Lamar	3248	3167	hydrocarbons
Bell Canyon sandstone	3258	3177	hydrocarbons
Brushy Canyon sandstone	5443	5287	hydrocarbons
Bone Spring limestone	7041	6882	hydrocarbons
1 st Bone Spring sandstone	8061	7902	hydrocarbons
2 nd Bone Spring sandstone	8761	8602	hydrocarbons
3 rd Bone Spring sandstone	9986	9827	hydrocarbons
Wolfcamp A	10351	10192	hydrocarbons
Wolfcamp A Fat	10531	10372	hydrocarbons
Wolfcamp B	10691	10532	hydrocarbons
(KOP)	10861	10702	hydrocarbons)
Wolfcamp B2 (Goal)	11550	11237	hydrocarbons
TD	16776	11275	--

2. NOTABLE ZONES

Wolfcamp B2 is the goal. Closest water well (C 01627) in State Engineer records is 8,400' northwest. Well was drilled to 170'. Depth to water was not reported but OSE estimated ground water depth is 22'.

3. PRESSURE CONTROL

Pressure Control Equipment (See Schematics):

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. See attachments for BOP and choke manifold diagrams. Also present will be an accumulator

Tap Rock Operating, LLC
Cypress 34 Federal #243H
SHL 241' FNL & 1196' FEL, Sec. 3, 24S, 29E
BHL 5' FNL & 2430' FEL, Sec. 34, 23S, 29E
Eddy County, NM

DRILL PLAN PAGE 2

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.

BOP Test procedure will be as follows:

After surface casing is set and the BOP is nipped 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.

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.

4. CASING & CEMENT

All casing will be API and new. See attached casing assumption worksheet.

Hole O. D.	Set MD'	Set TVD'	Casing O. D.	Weight (lb/ft)	Grade	Joint	Collapse	Burst	Tension
17.5"	0 - 390	0 - 390	13.375" surface	54.5	J-55	BTC	1.13	1.15	1.51
12.25"	0 - 3300	0 - 3217	9.625" inter. 1	40.0	J-55	BTC	1.13	1.15	1.51
8.75"	0 - 9861	0 - 9701	7.625" inter. 2 bottom	29.7	P-110	Wedge 513	1.13	1.15	1.51
6.75"	0 - 9661	0 - 9501	5.5" product. top	20.0	P-110	BTC	1.13	1.15	1.51
6.75"	9661 - 16776	9501 - 11275	5" product. bottom	18.0	P-110	Wedge 521	1.13	1.15	1.51

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 Eddy County, NM

DRILL PLAN PAGE 3

Tap Rock requests a variance to run 7-5/8" BTC inside 9-5/8" BTC, Tap Rock is requesting a variance to be less than the 0.422" standoff regulation per Onshore Order No. 2. Wedge 513 will be run on the 7 5/8" casing.

Name	Type	Sacks	Yield	Cu. Ft.	Weight	Blend
Surface	Tail	270	1.8	486	13.5	Class C + 5% Bentonite + 2% CaCl + LCM
TOC = Surface		100% Excess			Centralizers per Onshore Order 2 III. B. 1f	
Intermediate 1	Lead	755	2.19	1653	12.7	Class C + bentonite + 1% CaCl ₂ + 8% NaCl + LCM
	Tail	311	1.33	414	14.8	Class C + 5% NaCl + LCM
TOC = Surface		100% Excess			2 on btm jt, 1 on 2nd jt, 1 every 4th jt to surface	
Intermediate 2	Lead	318	3.36	1069	11.5	TXI + fluid loss + dispersant + retarder + LCM
	Tail	192	1.39	267	13.2	TXI + fluid loss + dispersant + retarder + LCM
TOC = surface		35% Excess			2 on btm jt, 1 on 2nd jt, 1 every other jt to top of tail cement	
Production	Tail	950	1.24	1178	14.2	Class H + fluid loss + dispersant + retarder + LCM
TOC = 8861		10% Excess			2 on btm jt, 1 on 2nd jt, 1 every third jt to top of curve	

5. MUD PROGRAM

Electronic Pason mud monitor system complying with Onshore Order 1 will be used. 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. A closed loop system will be used.

Casing	Hole Size	Type	Interval (MD)	Mud Wt. (lb/gal)	Viscosity	Fluid Loss
Surface	17.5"	FW spud mud	0-390	8.3	28	NC
Inter. 1	12.25"	Brine water	390 – 3300	10.0	30-32	NC
Inter. 2	8.75"	FW & cut brine	3300 – 9861	9.0	30-32	NC
Production	6.75"	OBM	9861 – 16776	12.50	15-20	<10

**Tap Rock Operating, LLC
Cypress 34 Federal #243H
SHL 241' FNL & 1196' FEL, Sec. 3, 24S, 29E
BHL 5' FNL & 2430' FEL, Sec. 34, 23S, 29E
Eddy County, NM**

DRILL PLAN PAGE 4

6. CORES, TESTS, & LOGS

- 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.
- No DSTs or cores are planned at this time.
- CBL w/ CCL from as far as gravity will let it fall to TOC.

7. DOWN HOLE CONDITIONS

No abnormal pressures or temperatures are expected. In accordance with Onshore Order 6, Tap Rock Operating does not anticipate that there will be enough H₂S from the surface to the Wolfcamp formations to meet the BLM's minimum requirements for the submission of an "H₂S Drilling Operation Plan" or "Public Protection Plan" for the drilling and completion of this well. Since we have an H₂S safety package on all wells, attached is an "H₂S Drilling Operations Plan". Adequate flare lines will be installed off the mud/gas separator where gas may be flared safely. All personnel will be familiar with all aspects of safe operation of equipment being used

Estimated BHP: 6,765 psi
Estimated BHT: 160°

8. OTHER INFORMATION

Anticipated spud date is upon approval. It is expected it will take ≈3 months to drill and complete the well.

Casing/Cementing Variance

Tap Rock requests a variance to run 7-5/8" BTC inside 9-5/8" BTC, Tap Rock is requesting a variance to be less than the 0.422" standoff regulation per Onshore Order No. 2.

Wedge 513 will be run on the bottom of the 7 5/8" casing, Butress will be run on top



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

SUPO Data Report

06/17/2019

APD ID: 10400035685

Submission Date: 10/29/2018

Highlighted data
reflects the most
recent changes

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 243H

[Show Final Text](#)

Well Type: CONVENTIONAL GAS WELL

Well Work Type: Drill

Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map:

Cypress_243H_Road_Map1_20181029101931.pdf

Existing Road Purpose: ACCESS

Row(s) Exist? NO

ROW ID(s)

ID:

Do the existing roads need to be improved? NO

Existing Road Improvement Description:

Existing Road Improvement Attachment:

Section 2 - New or Reconstructed Access Roads

Will new roads be needed? NO

Section 3 - Location of Existing Wells

Existing Wells Map? YES

Attach Well map:

Cypress_243H_Well_Map_v1_102518_20181029101951.pdf

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 243H

Existing Wells description:

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

Submit or defer a Proposed Production Facilities plan? SUBMIT

Production Facilities description: Production facilities will be located off-pad, on a separate central tank battery (CTB) site. This facility currently serves the Cypress 34 Fed 15H, which has already been drilled and completed on the same pad, and will also be used for the recently accepted 234H, 236H, and 244H and the proposed 233H, 243H, and 246H wells once they have been drilled. The CTB and its associated infrastructure (road, power line, and flowlines) is located on the producing lease in Section 34, 23S 29E and was permitted with the previous group of Cypress 34 wells (234H, 236H, and 244H). An additional 3 flow lines will be constructed for the 3 additional wells (233H, 243H, and 246H) from the existing Cypress CTB to the existing well pad. These buried flowlines will be poly ~4" OD.

Production Facilities map:

Cypress_243H_Production_Facilities_Diagram_Plat_20190418123222.pdf

Section 5 - Location and Types of Water Supply

Water Source Table

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

Water source type: GW WELL

Describe type:

Source longitude:

Source latitude:

Source datum:

Water source permit type: PRIVATE CONTRACT

Source land ownership: PRIVATE

Water source transport method: TRUCKING

Source transportation land ownership: FEDERAL

Water source volume (barrels): 18000

Source volume (acre-feet): 2.3200758

Source volume (gal): 756000

Water source and transportation map:

Cypress_243H_Water_Gravel_Source_Map_20181029102034.pdf

Water source comments: This well will be drilled using a combination of water mud systems. Water will be trucked from a private water well (C 03662) on private land in NWNE 23-24s-33e.

New water well? NO

New Water Well Info

Well latitude:

Well Longitude:

Well datum:

Well target aquifer:

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 243H

Est. depth to top of aquifer(ft):

Est thickness of aquifer:

Aquifer comments:

Aquifer documentation:

Well depth (ft):

Well casing type:

Well casing outside diameter (in.):

Well casing inside diameter (in.):

New water well casing?

Used casing source:

Drilling method:

Drill material:

Grout material:

Grout depth:

Casing length (ft.):

Casing top depth (ft.):

Well Production type:

Completion Method:

Water well additional information:

State appropriation permit:

Additional information attachment:

Section 6 - Construction Materials

Construction Materials description: NM One Call (811) will be notified before construction starts. There will be no topsoil as fill will be brought in to extend the pad. No topsoil will be removed as it was previously removed and stockpiled to the side of the pad when the location was originally constructed by Oxy USA. If additional caliche is needed it will be obtained from an existing BLM/State/Fee approved pit or from prevailing deposits found on location.

Construction Materials source location attachment:

Cypress_243H_Construction_methods_FIG1_20181029102050.pdf

Section 7 - Methods for Handling Waste

Waste type: DRILLING

Waste content description: Drill cuttings, mud, salts, and other chemicals

Amount of waste: 1000 barrels

Waste disposal frequency : Daily

Safe containment description: Steel tanks

Safe containmant attachment:

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

Disposal type description:

Disposal location description: R360's state approved (NM1-6-0) disposal site at Halfway, NM

Reserve Pit

Reserve Pit being used? NO

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 243H

Temporary disposal of produced water into reserve pit?

Reserve pit length (ft.)

Reserve pit width (ft.)

Reserve pit depth (ft.)

Reserve pit volume (cu. yd.)

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

Reserve pit liner

Reserve pit liner specifications and installation description

Cuttings Area

Cuttings Area being used? NO

Are you storing cuttings on location? YES

Description of cuttings location Steel tanks on pad

Cuttings area length (ft.)

Cuttings area width (ft.)

Cuttings area depth (ft.)

Cuttings area volume (cu. yd.)

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

WCuttings area liner

Cuttings area liner specifications and installation description

Section 8 - Ancillary Facilities

Are you requesting any Ancillary Facilities?: NO

Ancillary Facilities attachment:

Comments:

Section 9 - Well Site Layout

Well Site Layout Diagram:

Cypress_243H_Well_Site_Layout_20181029102159.pdf

Comments:

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 243H

Section 10 - Plans for Surface Reclamation

Type of disturbance: New Surface Disturbance

Multiple Well Pad Name: CYPRESS 34 FEDERAL

Multiple Well Pad Number: 233H

Recontouring attachment:

Cypress_243H_InterimRec_Production_FIG1_20181029102311.pdf

Cypress_243H_PAD_EXTENSION_RECONTOUR_PLATS_20181029102323.pdf

Drainage/Erosion control construction: Crowned and ditched

Drainage/Erosion control reclamation: Harrowed on the contour

Well pad proposed disturbance (acres): 0.63	Well pad interim reclamation (acres): 0.63	Well pad long term disturbance (acres): 0
Road proposed disturbance (acres): 0	Road interim reclamation (acres): 0	Road long term disturbance (acres): 0
Powerline proposed disturbance (acres): 0	Powerline interim reclamation (acres): 0	Powerline long term disturbance (acres): 0
Pipeline proposed disturbance (acres): 2.6	Pipeline interim reclamation (acres): 2.6	Pipeline long term disturbance (acres): 0
Other proposed disturbance (acres): 0	Other interim reclamation (acres): 0	Other long term disturbance (acres): 0
Total proposed disturbance: 3.23	Total interim reclamation: 3.23	Total long term disturbance: 0

Disturbance Comments:

Reconstruction method: Areas of the pad site not required for operations will be reclaimed. These unused areas of the drill pad will be contoured, as close as possible, to match the original topography, and the area will be seeded with an approved BLM mixture to re-establish vegetation.

Topsoil redistribution: The original topsoil will be returned to the area of the drill pad not necessary to operate the well.

Soil treatment: None

Existing Vegetation at the well pad:

Existing Vegetation at the well pad attachment:

Existing Vegetation Community at the road:

Existing Vegetation Community at the road attachment:

Existing Vegetation Community at the pipeline:

Existing Vegetation Community at the pipeline attachment:

Existing Vegetation Community at other disturbances:

Existing Vegetation Community at other disturbances attachment:

Non native seed used? NO

Non native seed description:

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 243H

Seedling transplant description:

Will seedlings be transplanted for this project? NO

Seedling transplant description attachment:

Will seed be harvested for use in site reclamation? NO

Seed harvest description:

Seed harvest description attachment:

Seed Management

Seed Table

Seed type:

Seed source:

Seed name:

Source name:

Source address:

Source phone:

Seed cultivar:

Seed use location:

PLS pounds per acre:

Proposed seeding season:

Seed Summary

Total pounds/Acre:

Seed Type	Pounds/Acre
-----------	-------------

Seed reclamation attachment:

Operator Contact/Responsible Official Contact Info

First Name:

Last Name:

Phone:

Email:

Seedbed prep:

Seed BMP:

Seed method:

Existing invasive species? NO

Existing invasive species treatment description:

Existing invasive species treatment attachment:

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 243H

Weed treatment plan description: To BLM standards

Weed treatment plan attachment:

Monitoring plan description: To BLM standards

Monitoring plan attachment:

Success standards: To BLM satisfaction

Pit closure description: No pit

Pit closure attachment:

Section 11 - Surface Ownership

Disturbance type: WELL PAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland:

USFS Ranger District:

Disturbance type: PIPELINE

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 243H

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland:

USFS Ranger District:

Section 12 - Other Information

Right of Way needed? NO

Use APD as ROW?

ROW Type(s):

ROW Applications

SUPO Additional Information:

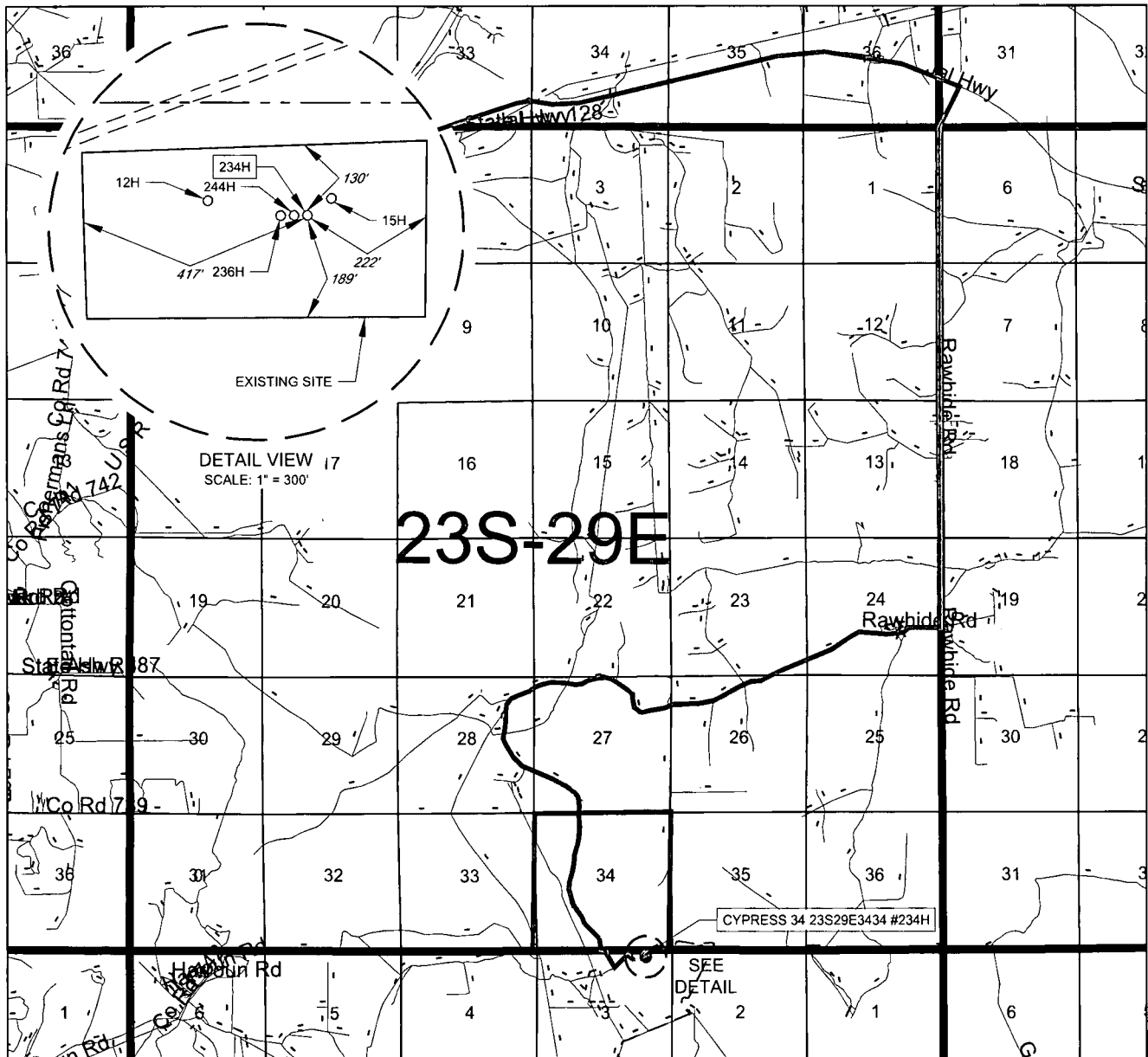
Use a previously conducted onsite? YES

Previous Onsite information: On-site inspection for the pad extension was held with Matt Wirth (BLM) on August 24th, 2018.

Other SUPO Attachment

Cypress_243H_SUPO_20181029102358.pdf

EXHIBIT 2
VICINITY MAP



LEASE NAME & WELL NO.: CYPRESS 34 23S29E3434 #234H

SECTION 3 TWP 24-S RGE 29-E SURVEY N.M.P.M.
COUNTY EDDY STATE NM
DESCRIPTION 209' FNL & 982' FEL

DISTANCE & DIRECTION

FROM INT. OF NM-31, & NM-128-E, HEAD EAST ON NM-128 E ± 4.5
MILES, THENCE SOUTH (RIGHT) ON RAWHIDE ROAD ± 4.1 MILES,
THENCE WEST, (RIGHT) ON MAIN ROAD ± 3.5 MILES, THENCE SOUTH
CONTINUING ON MAIN ROAD ± 2.6 MILES TO A POINT ± 500 FEET
SOUTHWEST OF THE LOCATION.

THIS EASEMENT/SERVITUDE LOCATION SHOWN HEREON HAS BEEN SURVEYED ON THE GROUND UNDER MY SUPERVISION AND PREPARED ACCORDING TO THE EVIDENCE FOUND AT THE TIME OF SURVEY, AND DATA PROVIDED BY TAP ROCK OPERATING, LLC. THIS CERTIFICATION IS MADE AND LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT AND IS NON-TRANSFERABLE. THIS SURVEY IS CERTIFIED FOR THIS TRANSACTION ONLY.

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.

Map 1-2



SCALE: 1" = 10000'
0' 5000' 10000'



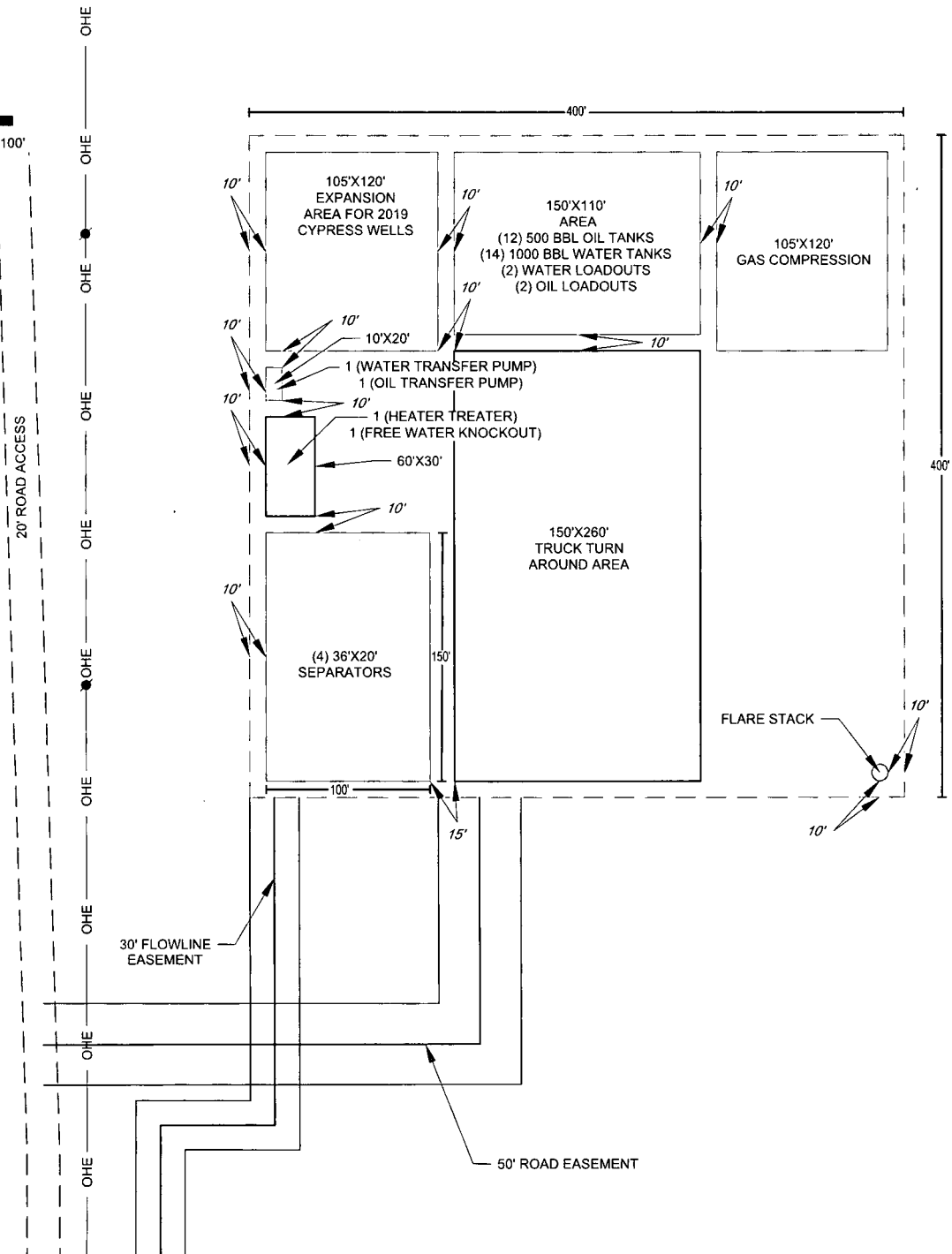
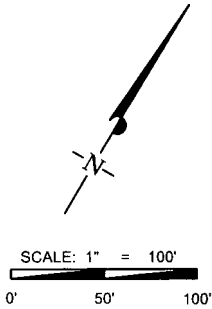
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SKETCH

SECTION 34, TOWNSHIP 23-S, RANGE 29-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO



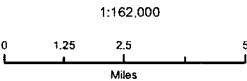
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	INT	DATE
DATE: 04/02/18		
FILE: SK_CYPRESS_34_23S29E34_34_AREA_REV		
DRAWN BY: AMD		
SHEET: 1 OF 1		

Tap Rock Operating LLC

Cypress 34 Federal Water & Caliche Source Map

Lea & Eddy County, New Mexico

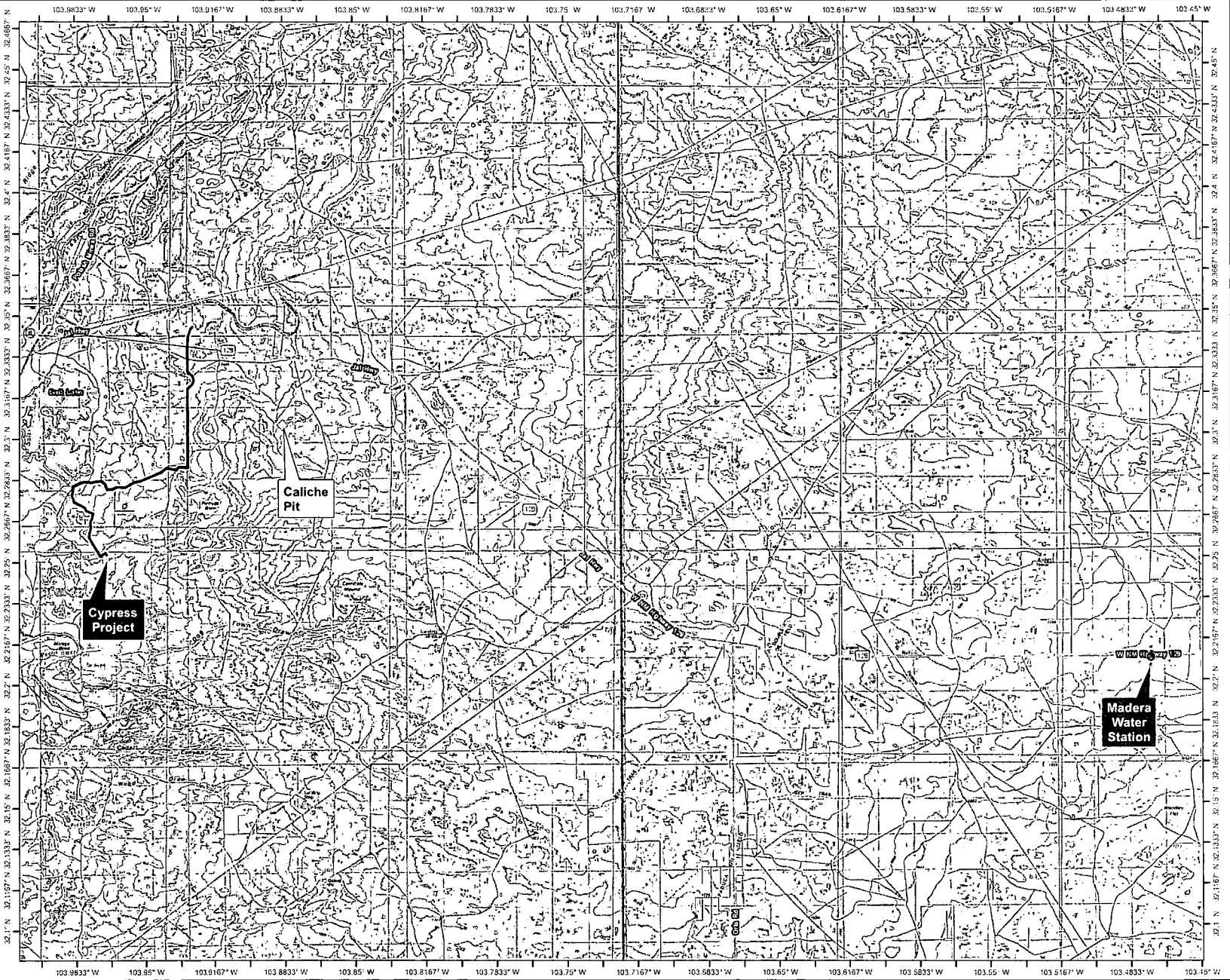
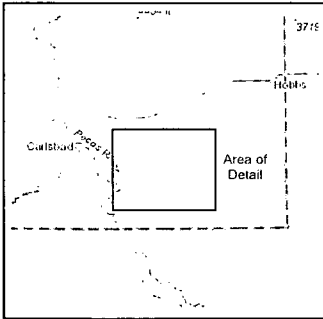
- ◊ Caliche Source
- Water Source



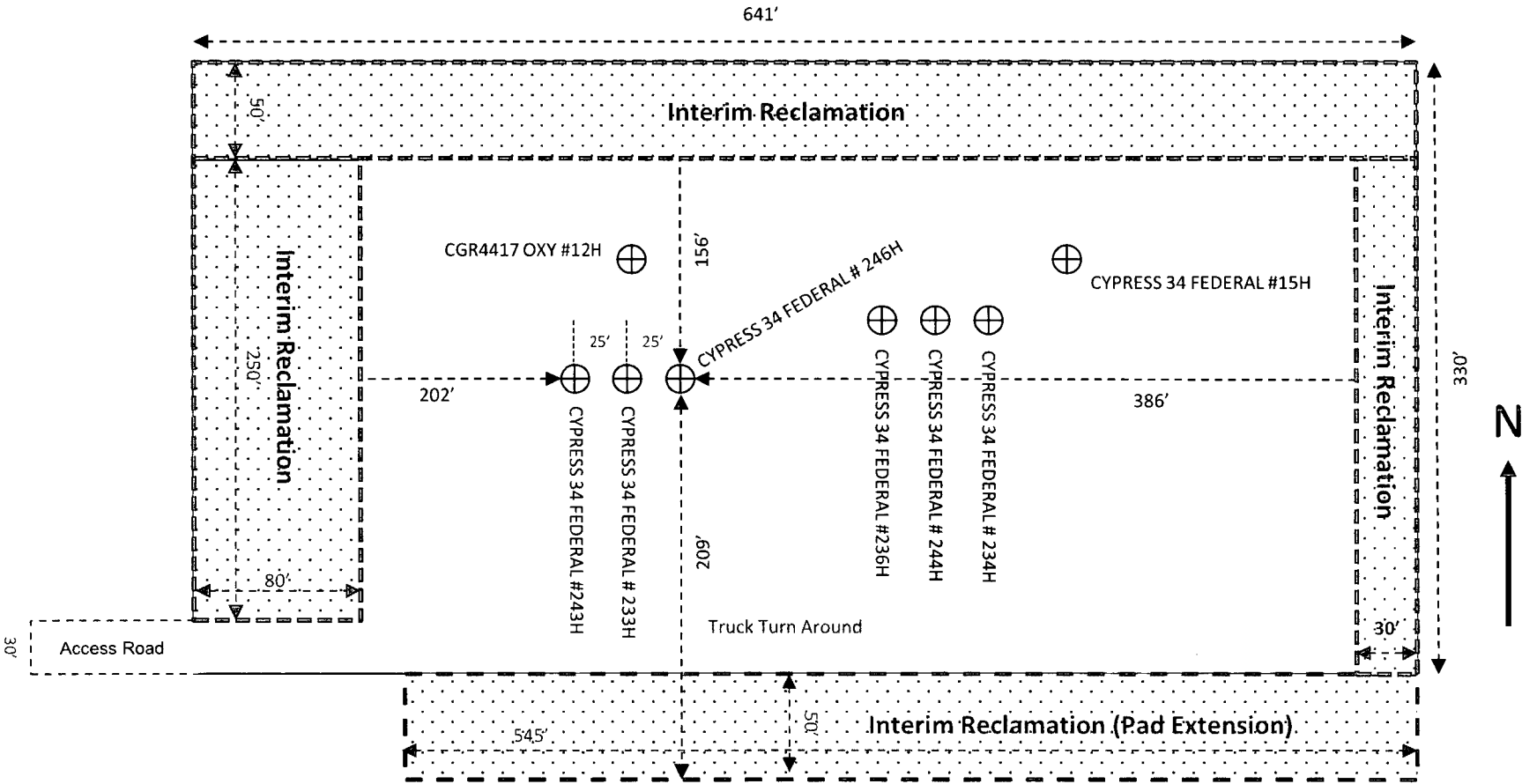
NAD 1983 New Mexico State Plane East
FIPS 3001 Feet



Prepared by Permits West, Inc., May 31, 2018
for Tap Rock Operating, LLC

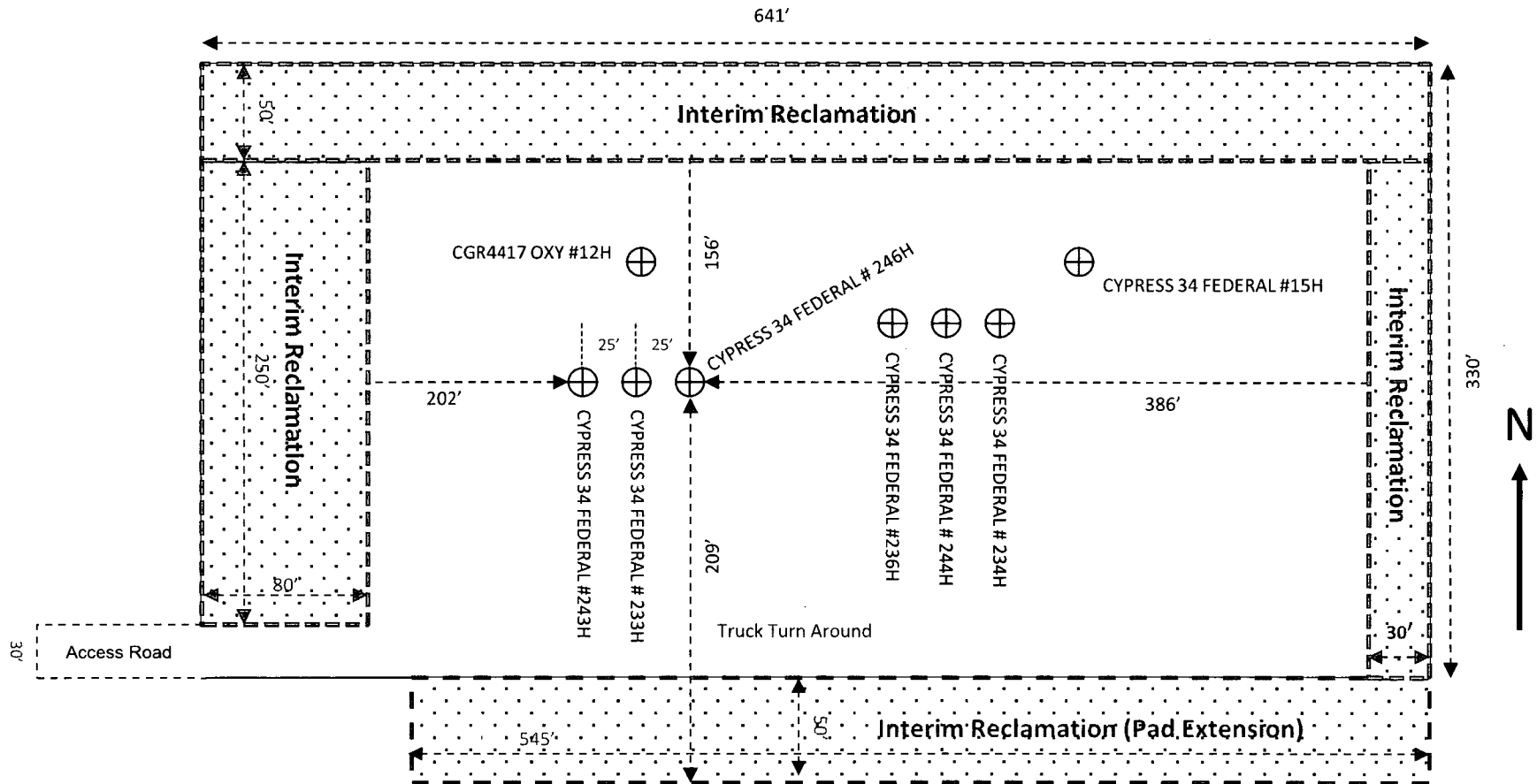


Tap Rock Operating LLC
Cypress 34 Federal
Well Pad Layout
Sec. 3-24N-29W
Eddy County, NM



Production Layout & Interim Reclamation Diagram

Tap Rock Operating LLC
Cypress 34 Federal
Well Pad Layout
Sec. 3-24N-29W
Eddy County, NM



Production Layout & Interim Reclamation Diagram

Rig Layout Diagram

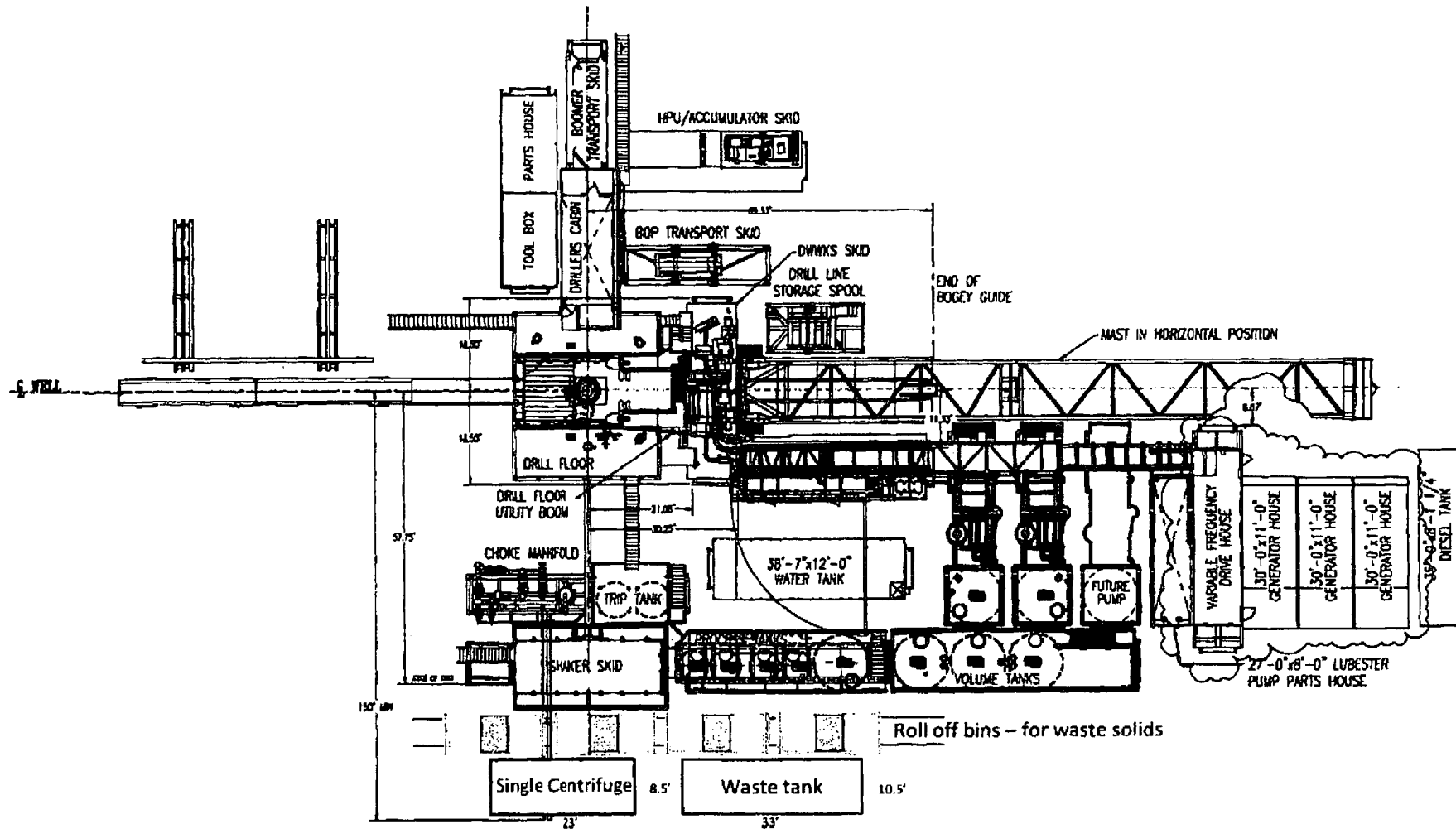
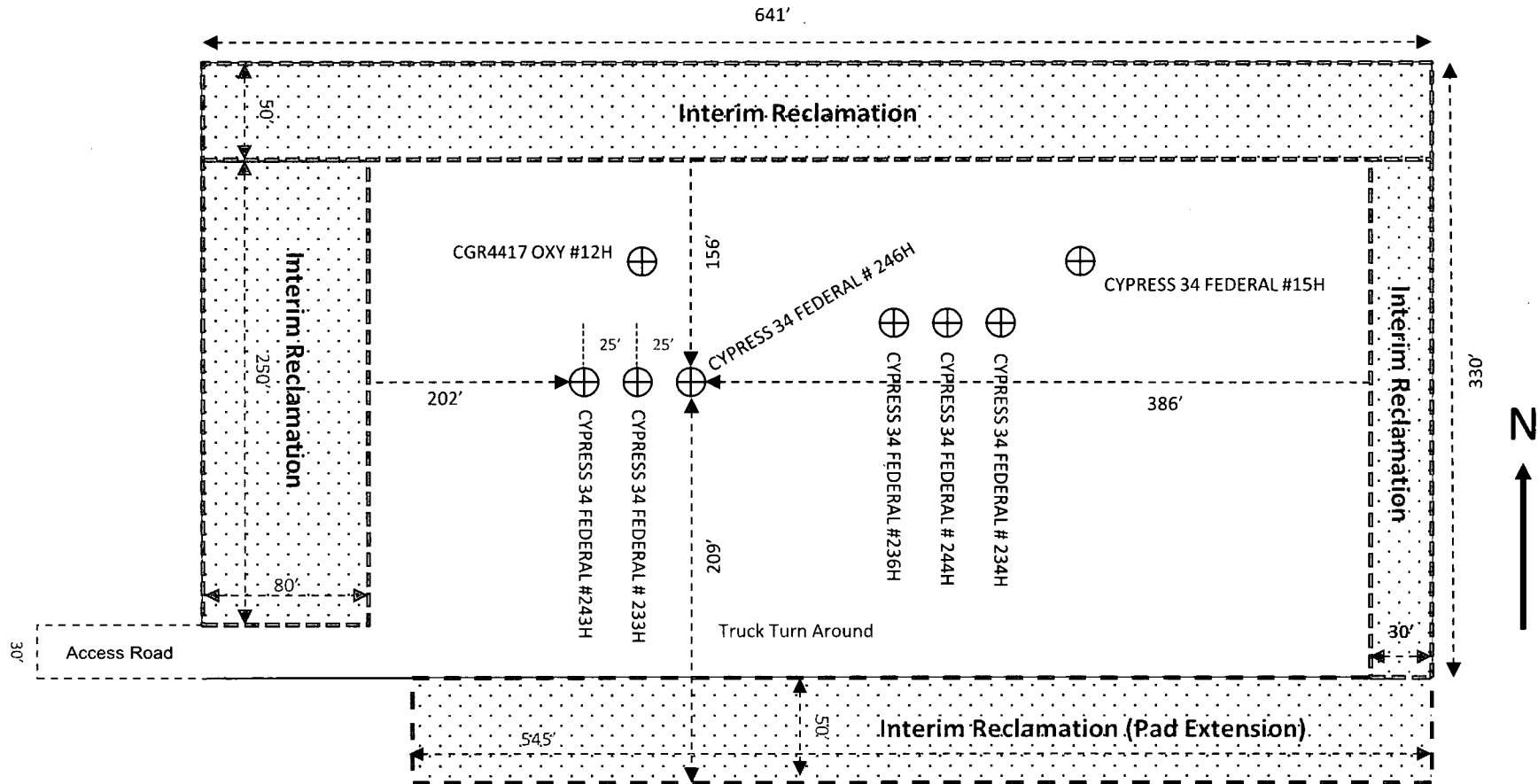


Figure 3

Tap Rock Operating LLC
Cypress 34 Federal
Well Pad Layout
Sec. 3-24N-29W
Eddy County, NM



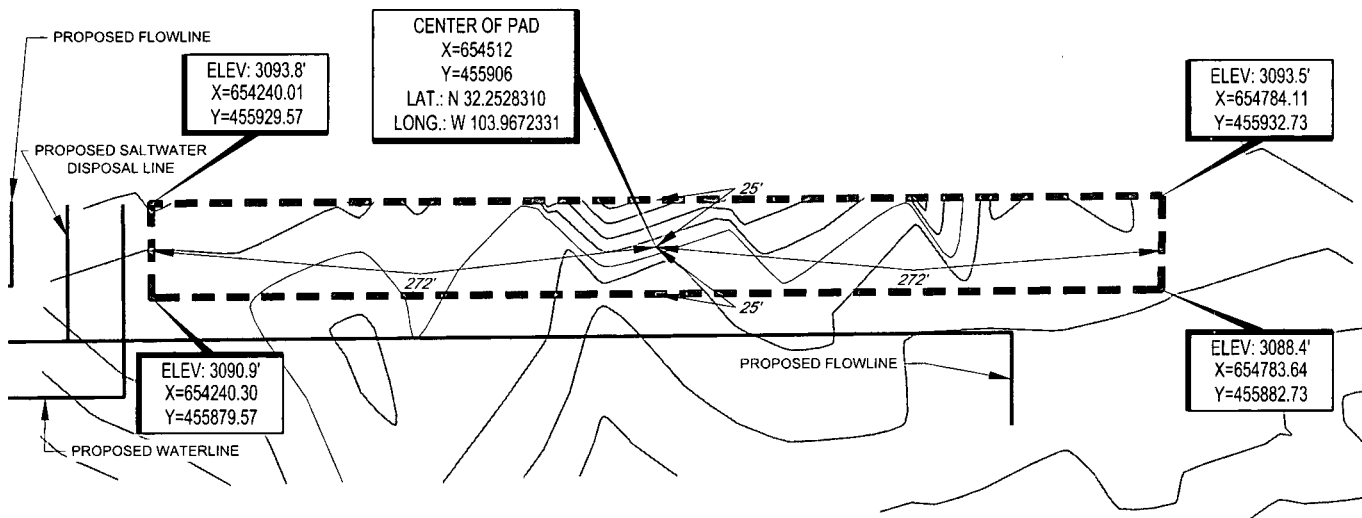
Production Layout & Interim Reclamation Diagram

CONSTRUCTION ESTIMATE

SECTION 3, TOWNSHIP 24-S, RANGE 29-E, N.M.P.M.

EDDY COUNTY, NEW MEXICO

SCALE: 1" = 100'
0' 50' 100'



NOTE: 1' CONTOUR INTERVALS



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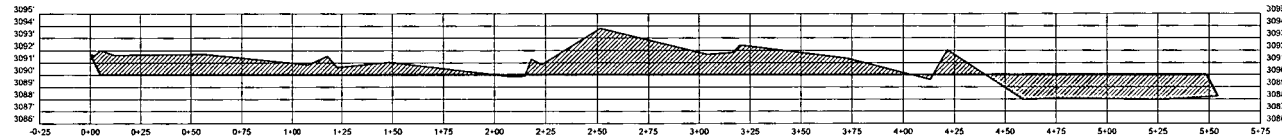
CYPRESS 34 PAD EXTENSION	REVISION:		NOTES: 1. ORIGINAL DOCUMENT SIZE: 8.5" X 11" 2. ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREIN ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET.
DATE: 08/14/2018			
FILE: CD_CYPRESS_34_PAD_EXTENSION			
DRAWN BY: IMU			
SHEET: 1 OF 3			

Top of pad elevation: 3090.0
 Cut Slope: 33.33% 3,000:1 18.43°
 Fill Slope: 33.33% 3,000:1 18.43°
 Balance Tolerance (C.Y.): 0.00
 Cut Swell Factor: 1.00
 Fill Shrink Factor: 1.00
 Pad Earthwork Volumes
 Cut: 17,319.8 C.F., 641.47 C.Y.
 Fill: 17,319.8 C.F., 641.47 C.Y.
 Area: 33187.1 Sq.Ft., 0.762 Acres

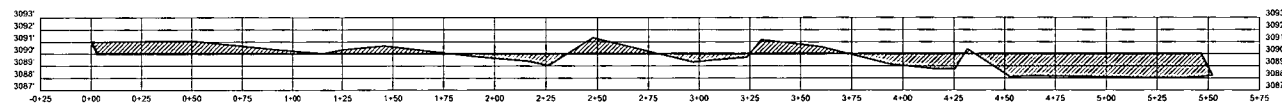
CONSTRUCTION ESTIMATE SECTION 3, TOWNSHIP 24-S, RANGE 29-E, N.M.P.M. EDDY COUNTY, NEW MEXICO



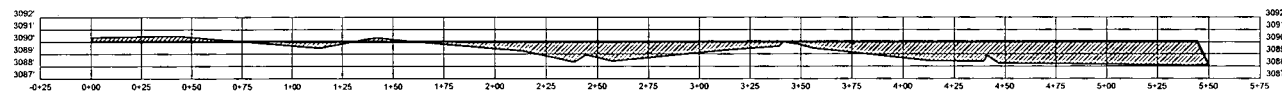
A-A'



B-B'



C-C'



Horizontal Scale = 1:60
 Vertical Scale = 1:10



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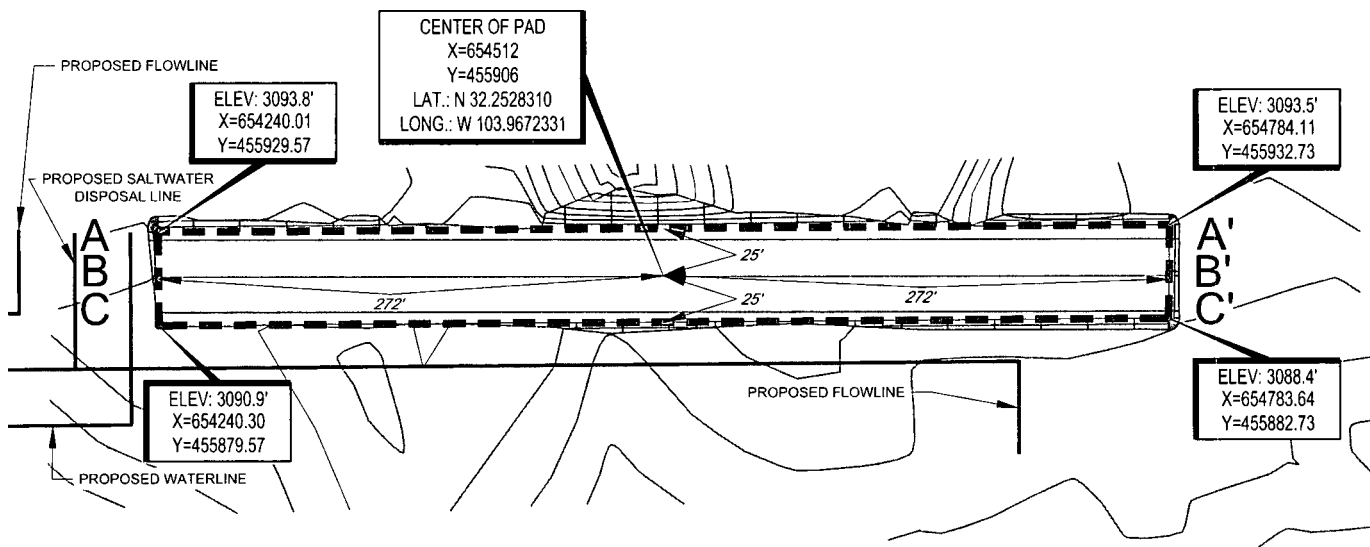
CYPRESS 34 PAD EXTENSION	REVISION:		NOTES:
	INT	DATE	
DATE: 08/14/2018			1. ORIGINAL DOCUMENT SIZE: 11" X 17" 2. ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREIN ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET. 3. CERTIFICATION IS MADE ONLY TO THE LOCATION OF THIS EASEMENT, IN RELATION TO THE EVIDENCE FOUND DURING A FIELD SURVEY, MADE ON THE GROUND UNDER MY SUPERVISION, AND USING DOCUMENTATION PROVIDED BY TAP ROCK OPERATING, LLC. ONLY UTILITIES/SEASMENTS THAT WERE VISIBLE ON THE DATE OF THIS SURVEY, WITHIN/ADJOINING THIS EASEMENT, HAVE BEEN LOCATED AS SHOWN HEREON OF WHICH I HAVE KNOWLEDGE. THIS CERTIFICATION IS LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT AND IS NON-TRANSFERABLE, AND MADE FOR THIS TRANSACTION ONLY.
FILE: CO_CYPRESS_34_PAD_EXTENSION			
DRAWN BY: IMU			
SHEET: 2 OF 3			

CONSTRUCTION ESTIMATE

SECTION 3, TOWNSHIP 24-S, RANGE 29-E, N.M.P.M.

EDDY COUNTY, NEW MEXICO

SCALE: 1" = 100'
0' 50' 100'



NOTE: 1' CONTOUR INTERVALS

TAP
ROCK



TOPOGRAPHIC
LOYALTY INNOVATION LEGACY

1400 EVERMAN PARKWAY, Ste. 146 • FT. WORTH, TEXAS 76140
TELEPHONE: (817) 744-7512 • FAX (817) 744-7554
2903 NORTH BIG SPRING • MIDLAND, TEXAS 79705
TELEPHONE: (432) 682-1653 OR (800) 767-1653 • FAX (432) 682-1743
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DATE: 08/14/2018			
FILE: CD_CYPRESS_34_PAD_EXTENSION			
DRAWN BY: IMU			
SHEET: 3 OF 3			

Tap Rock Operating LLC
Cypress 34 Federal #243H
SHL 241' FNL & 1196' FEL, Sec. 3, 24S, 29E
BHL 5' FNL & 2430' FEL, Sec. 3, 23S, 29E
Eddy County, NM

SURFACE PLAN PAGE 1

SURFACE USE PLAN OF OPERATIONS

1. ROAD DIRECTIONS & DESCRIPTIONS (See Maps 1 & 2)

From the intersection of SH 128 and SH 31, go east on SHW 128 for 4.5 miles. Turn south on CR 793 for 4.1 miles. Turn west on lease road for 3.5 miles. Turn south for 0.6 miles, turn southeast for 0.3 miles, turn south for 0.1 miles, turn southeast for 0.2 miles, turn south for 1.3 miles, and turn northeast for 0.2 miles. Turn right on proposed road and go southeast for 296.9', turn left and go east for 50' to location.

2. ROAD TO BE BUILT OR UPGRADED (See Map 2)

No new roads will be required to access this well pad as all drilling, completion, and production will occur on an existing, producing well pad that was approved and built in 2016 under API# 30-15-44397.

3. EXISTING WELLS (See Map 3)

Existing oil, gas, SWD, and P & A wells are within a mile. No active water or injection well is within a mile of the proposed wellbore.

4. PROPOSED PRODUCTION FACILITIES (See Figures 1-2, 1-3, & 1-4)

Production facilities will be located off-pad, on a separate central tank battery (CTB) site. This facility currently serves the Cypress 34 Fed 15H, which has already been drilled and completed on the same pad, and will also be used for the recently accepted 234H, 236H, and 244H and the proposed 233H, 243H, and 246H wells once they have been drilled. The CTB and its associated infrastructure (road, power line, and flowlines) is located on the producing lease in Section 34, 23S 29E and was permitted with the previous group of Cypress 34 wells (234H, 236H, and 244H). An additional 3 flow lines will be constructed for the 3 additional wells (233H, 243H, and 246H) from the existing Cypress CTB to the existing well pad. These buried flowlines will be poly ~4" OD.

5. WATER SUPPLY (See Map 4)

This well will be drilled using a combination of water mud systems. Water will be trucked from a private water well (C 03662) on private land in NWNE 23-24s-33e.

6. CONSTRUCTION MATERIALS & METHODS (See Figures 1 & 2)

NM One Call (811) will be notified before construction starts. There will be no topsoil as fill will be brought in to extend the pad. No topsoil will be removed as it was previously removed and

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Eddy County, NM

SURFACE PLAN PAGE 2

stockpiled to the side of the pad when the location was originally constructed by Oxy USA. If additional caliche is needed it will be obtained from an existing BLM/State/Fee approved pit or from prevailing deposits found on location.

7. WASTE DISPOSAL

A closed loop drilling system will be used. All trash will be placed in a portable trash cage. It will be hauled to the Eddy County landfill. There will be no trash burning. Contents (drill cuttings, mud, salts, and other chemicals) of the mud tanks will be hauled to R360's state approved (NM1-6-0) disposal site at Halfway. Human waste will be disposed of in chemical toilets and hauled to the Carlsbad wastewater treatment plant.

8. ANCILLARY FACILITIES

There will be no airstrip or camp. Camper trailers will be on location for the company man, tool pusher, or mud logger.

9. WELL SITE LAYOUT (See Figures 1 & 3)

See attached rig diagram for depictions of the well pad, trash cage, access onto the location, parking, living facilities, and rig orientation.

10. RECLAMATION (See Figures 1 & 2)

Areas of the pad site not required for operations will be reclaimed. The original topsoil will be returned to the area of the drill pad not necessary to operate the well. These unused areas of the drill pad will be contoured, as close as possible, to match the original topography, and the area will be seeded with an approved BLM mixture to re-establish vegetation.

Disturbance:

+ 50' x 545' well pad expansion	= 0.63 acres
+ 3782' x 30' additional flowlines	= 2.60 acres
Short-term disturbance = 3.23 acres	
– flowlines route	= 2.60 acres
– Interim pad expansion reclamation	= 0.63 acres
Long-term disturbance = 0.00 acres	

11. SURFACE OWNER (See Map 3)

All construction will be on BLM, 620 E. Greene, Carlsbad NM 88220. Phone is (575) 234-5972.

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Eddy County, NM

SURFACE PLAN PAGE 3

12. OTHER INFORMATION

- On-site inspection was held with Matt Wirth (BLM) on August 24th, 2018.
- The vegetation cover is generally sparse consisting of mesquite, yucca, shinnery oak, sandsage and perennial native range grass. The topsoil is sandy in nature. Wildlife in the area is also sparse consisting of deer, coyotes, rabbits, rodents, reptiles, dove and quail.
- There is no permanent or live water in the general proximity of the location.
- There are no dwellings within one mile of the proposed well site.
- Cultural Resources Examination - This well is located in the Permian Basin MOA - Fees were paid 2/11/16 Receipt 3490901, for the Cypress 34 Federal #15H.

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. Executed this 25th day of October, 2018.



Cory Walk, Consultant
Permits West, Inc.
37 Verano Loop, Santa Fe, NM 87508
(505) 466-8120

Field representative will be:

Doug Sproul
Tap Rock Operating, LLC
602 Park Point Dr., Suite 200, Golden CO 80401
Phone: (720) 772-5090



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

PWD Data Report

06/17/2019

Section 1 - General

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

Section 2 - Lined Pits

Would you like to utilize Lined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit specifications:

Pit liner description:

Pit liner manufacturers information:

Precipitated solids disposal:

Describe precipitated solids disposal:

Precipitated solids disposal permit:

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule attachment:

Lined pit reclamation description:

Lined pit reclamation attachment:

Leak detection system description:

Leak detection system attachment:

Lined pit Monitor description:

Lined pit Monitor attachment:

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

Is the reclamation bond a rider under the BLM bond?

Lined pit bond number:

Lined pit bond amount:

Additional bond information attachment:

Section 3 - Unlined Pits

Would you like to utilize Unlined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit specifications:

Precipitated solids disposal:

Describe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

Unlined pit Monitor attachment:

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

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

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

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

Unlined Produced Water Pit Estimated percolation:

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

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Additional bond information attachment:

Section 4 - Injection

Would you like to utilize Injection PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Injection PWD discharge volume (bbl/day):

Injection well mineral owner:

Injection well type:

Injection well number:

Injection well name:

Assigned injection well API number?

Injection well API number:

Injection well new surface disturbance (acres):

Minerals protection information:

Mineral protection attachment:

Underground Injection Control (UIC) Permit?

UIC Permit attachment:

Section 5 - Surface Discharge

Would you like to utilize Surface Discharge PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Surface discharge PWD discharge volume (bbl/day):

Surface Discharge NPDES Permit?

Surface Discharge NPDES Permit attachment:

Surface Discharge site facilities information:

Surface discharge site facilities map:

Section 6 - Other

Would you like to utilize Other PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Other PWD discharge volume (bbl/day):

Other PWD type description:

Other PWD type attachment:

Have other regulatory requirements been met?

Other regulatory requirements attachment:



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

Bond Info Data Report

06/17/2019

Bond Information

Federal/Indian APD: FED

BLM Bond number: NMB001443

BIA Bond number:

Do you have a reclamation bond? NO

Is the reclamation bond a rider under the BLM bond?

Is the reclamation bond BLM or Forest Service?

BLM reclamation bond number:

Forest Service reclamation bond number:

Forest Service reclamation bond attachment:

Reclamation bond number:

Reclamation bond amount:

Reclamation bond rider amount:

Additional reclamation bond information attachment: