Form 3160-3
(June 2015)

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
NMLC0029519B

6. If Indian, Allotee or Tribe Name
319564

1a. Type of work: ☑ DRILL ☐ REENTER

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

1c. Type of Completion: ☐ Hydraulic Fracturing ☑ Single Zone ☐ Multiple Zone

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

8. Lease Name and Well No.
BLACK & TAN 27 FEDERAL COM
202H

2. Name of Operator
APACHE CORPORATION

9. API Well No.
30 025 46864

3a. Address	3b. Phone No. *(include area code)*	10. Field and Pool, or Exploratory
303 Veterans Airpark Lane #1000 Midland TX 79705	(432)818-1000	BONE SPRING / LEA, BONE SPRING, S

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

At surface SESW / 215 FSL / 2140 FWL / LAT 32.5374361 / LONG -103.5497243

At proposed prod. zone NENW / 50 FNL / 1980 FWL / LAT 32.551222 / LONG -103.5502376

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 27 / T20S / R34E / NMP

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

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)	16. No of acres in lease	17. Spacing Unit dedicated to this well
50 feet	40	160

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	19. Proposed Depth	20. BLM/BIA Bond No. in file
20 feet	10529 feet / 15553 feet	FED: NMB000736

21. Elevations (Show whether DF, KDB, RT, GL, etc.)	22. Approximate date work will start*	23. Estimated duration
3717 feet	12/15/2019	15 days

24. Attachments

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

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

25. Signature	Name *(Printed/Typed)*	Date
(Electronic Submission)	Sorina Flores / Ph: (432)818-1167	04/11/2019

Title
Supv of Drilling Services

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
(Electronic Submission)	Cody Layton / Ph: (575)234-5959	02/03/2020

Title	Office
Assistant Field Manager Lands & Minerals	CARLSBAD

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Conditions of approval, if any, are attached.

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

APPROVED WITH CONDITIONS

Approval Date: 02/03/2020

KS 2-11-20

(Continued on page 2)

*(Instructions on page 2)

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**APACHE CORPORATION**
LEASE NO.:	**NMLC0029519B**
WELL NAME & NO.:	BLACK & TAN 27 FEDERAL COM 202H
SURFACE HOLE FOOTAGE:	215'/S & 2140/W
BOTTOM HOLE FOOTAGE	50'/N & 1980'/W
LOCATION:	Section 27, T.20 S., R.34 E., NMPM
COUNTY:	Lea County, New Mexico

COA

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

A. HYDROGEN SULFIDE

A Hydrogen Sulfide (H2S) Drilling Plan shall be activated 500 feet prior to drilling into the Yates-7 Rivers formation. As a result, the Hydrogen Sulfide area must meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, please provide measured values and formations to the BLM.

B. CASING

Casing Design:

1. The **13-3/8** inch surface casing shall be set at approximately **1630** feet (a minimum of **25 feet (Lea County)** into the Rustler Anhydrite and above the salt) and cemented to the surface.

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

completing the cement job.

b. Wait on cement (WOC) time for a primary cement job will be a minimum of **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.

Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.

2. The **9-5/8** inch intermediate casing shall be set at approximately **5690** feet. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:

Option 1 (Single Stage):

- 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. Excess cement calculates to 18%, additional cement might be required.**

Option 2:

Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.

b. Second stage above DV tool:

- Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash. Excess cement calculates to 13%, additional cement might be required.**

- ❖ In R111 Potash 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.
- ❖ In Secretary Potash 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.
- ❖ In Capitan Reef 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.
- ❖ **Special Capitan Reef requirements.** If lost circulation (50% or greater) occurs below the Base of the Salt, the operator shall do the following:
  (Use this for 3 string wells in the Capitan Reef, if 4 string well ensure FW based mud used across the capitan interval)

  - Switch to fresh water mud to protect the Capitan Reef and use fresh water mud until setting the intermediate casing. The appropriate BLM office is to be notified for a PET to witness the switch to fresh water.
  - Daily drilling reports from the Base of the Salt to the setting of the intermediate casing are to be submitted to the BLM CFO engineering staff via e-mail by 0800 hours each morning. Any lost circulation encountered is to be recorded on these drilling reports. The daily drilling report should show mud volume per shift/tour. Failure to submit these reports will result in an Incidence of Non-Compliance being issued for failure to comply with the Conditions of Approval. If not already planned, the operator shall run a caliper survey for the intermediate well bore and submit to the appropriate BLM office.

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

   - Cement should tie-back at least **50 feet** on top of Capitan Reef top. 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.
     Excess cement calculates to 9%, additional cement might be required.

C. PRESSURE CONTROL

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

2.

Option 1:

a. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M)** psi.

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

Option 2:

1. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M)** psi.

    a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
    b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
    c. Manufacturer representative shall install the test plug for the initial BOP test.
    d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
    e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

D. SPECIAL REQUIREMENT (S)

Communitization Agreement

- The operator will submit a Communitization Agreement to the Carlsbad Field Office, 620 E Greene St. Carlsbad, New Mexico 88220, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases

subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.

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

GENERAL REQUIREMENTS

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

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

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

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

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

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

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

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

A. CASING

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

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

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

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

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

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

7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

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

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

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

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

    a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
    b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
    c. Manufacturer representative shall install the test plug for the initial BOP test.
    d. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.

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

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

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

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

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

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

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

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

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

C. DRILLING MUD

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

D. WASTE MATERIAL AND FLUIDS

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

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

OTA01272020

PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Apache Corporation
LEASE NO.:	NMNM60393 NMLC0029519B NMNM0000897
COUNTY:	Lea

Wells:

Black & Tan 27 Federal Com 201H (Figure 1):
Surface Hole Location: 222' FSL & 650' FWL, Section 27, T. 20 S., R. 34 E.
Bottom Hole Location: 50' FNL & 660' FWL, Section 27, T. 20 S, R. 34 E.

Black & Tan 27 Federal Com 201H (Figure 2):
Surface Hole Location: 215' FSL & 2140' FWL, Section 27, T. 20 S., R. 34 E.
Bottom Hole Location: 50' FNL & 1980' FWL, Section 27, T. 20 S, R. 34 E.

Black & Tan 27 Federal Com 201H (Figure 3):
Surface Hole Location: 215' FSL & 822' FEL, Section 27, T. 20 S., R. 34 E.
Bottom Hole Location: 50' FNL & 660' FEL, Section 27, T. 20 S, R. 34 E.

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

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HYDROGEN SULFIDE (H_2S) CONTINGENCY PLAN

Assumed 100 ppm ROE = 3000'

100 ppm H_2S concentration shall trigger activation of this plan.

Emergency Procedures

In the event of a release of gas containing H_2S, the first responder(s) must

- Isolate the area and prevent entry by other persons into the 100 ppm ROE.
- Evacuate any public places encompassed by the 100 ppm ROE.
- Be equipped with H_2S monitors and air packs in order to control the release.
- Use the "buddy system" to ensure no injuries occur during the response
- Take precautions to avoid personal injury during this operation.
- Contact operators and/or local officials to aid in operation. See list of phone numbers attached.
- Have received training in the :
  - Detection of H_2S, and
  - Measures for protection against the gas,
  - Equipment used for protection and emergency response.

Ignition of Gas source

Should control of the well be considered lost and ignition considered, take care to protect against exposure to Sulfur Dioxide (SO_2). Intentional ignition must be coordinated with the NMOCD and local officials. Additionally the NM State Police may become involved. NM State Police shall be the Incident Command on scene of any major release. Take care to protect downwind whenever this is an ignition of the gas.

Characteristics of H_2S and SO_2

Common Name	Chemical Formula	Specific Gravity	Threshold Limit	Hazardous Limit	Lethal Concentration
Hydrogen Sulfide	H_2S	1.189 Air = I	10 ppm	100 ppm/hr	600 ppm
Sulfur Dioxide	SO_2	2.21 Air = I	2 ppm	N/A	1000 ppm

Contacting Authorities

Apache Corporation personnel must liaison with local and state agencies to ensure a proper response to a major release. Additionally, the OCD must be notified of the release as soon as possible but no later than 4 hours. Agencies will ask for information such as type and volume of release, wind direction, location of release, etc. Be prepared with all information available including directions to site. The following call list of essential and potential responders has been prepared for use during a release. Apache's response must be in coordination with the State of New Mexico's *"Hazardous Materials Emergency Response Plan" (HMER).*

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 resource (historic or prehistoric site or object) discovered by the holder, or any person working on the holder's behalf, on public or Federal land shall be immediately reported to the Authorized Officer. The 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 the proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

OR

If the entire project is covered under the Permian Basin Programmatic Agreement (cultural resources only):

The proponent has contributed funds commensurate to the undertaking into an account for offsite mitigation. Participation in the PA serves as mitigation for the effects of this project on cultural resources. If any human skeletal remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered at any time during construction, all construction activities shall halt and the BLM will be notified as soon as possible within 24 hours. Work shall not resume until a Notice to Proceed is issued by the BLM. See information below discussing NAGPRA.

If the proposed project is split between a Class III inventory and a Permian Basin Programmatic Agreement contribution, the portion of the project covered under Class III inventory should default to the first paragraph stipulations.

The holder is hereby obligated to comply with procedures established in the Native American Graves Protection and Repatriation Act (NAGPRA) to protect such cultural items as human remains, associated funerary objects, sacred objects, and objects of cultural patrimony discovered inadvertently during the course of project implementation. In the event that any of the cultural items listed above are discovered during the course of project work, the proponent shall immediately halt the disturbance and contact the BLM within 24 hours for instructions. The proponent or initiator of any project shall be held responsible for protecting, evaluating, reporting, excavating, treating, and disposing of these cultural items according to the procedures established by the BLM in consultation with Indian Tribes."

Any paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on the holder's behalf, on public or Federal land shall be immediately reported to the Authorized Officer. The 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 the proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

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)

Watershed:
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.

Timing Limitation Stipulation / Condition of Approval for lesser prairie-chicken:
Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 feet from the source of the noise.

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well. For more installation details, contact the Carlsbad Field Office at 575-234-5972.

This authorization is subject to your Certificate of Participation and/or Certificate of Inclusion under the New Mexico Candidate Conservation Agreement. Because it involves surface disturbing activities covered under your Certificate, your Habitat Conservation Fund Account with the Center of Excellence for Hazardous Materials Management (CEHMM) will be debited according to Exhibit B Part 2 of the Certificate of Participation.

Potash:
Lessees must comply with the 2012Secretarial Potash Order. The Order is designed to manage the efficient development of oil, gas, and potash resources. Section 6 of the Order provides general provisions which must be followed to minimize conflict between the industries and ensure the safety of operations.

To minimize impacts to potash resources, the proposed well is confined within the boundaries of the established Black & Tan Drill Island (See Potash Memo and Map in attached file for Drill Island description).

VRM IV:

- Above-ground structures including meter housing that are not subject to safety requirements are painted a flat non-reflective paint color, Shale Green from the BLM Standard Environmental Color Chart (CC-001: June 2013).

VI. CONSTRUCTION

A. NOTIFICATION

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

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

B. TOPSOIL

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

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

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

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

D. FEDERAL MINERAL MATERIALS PIT

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

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

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

F. EXCLOSURE FENCING (CELLARS & PITS)

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

G. ON LEASE ACCESS ROADS

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

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

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

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

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

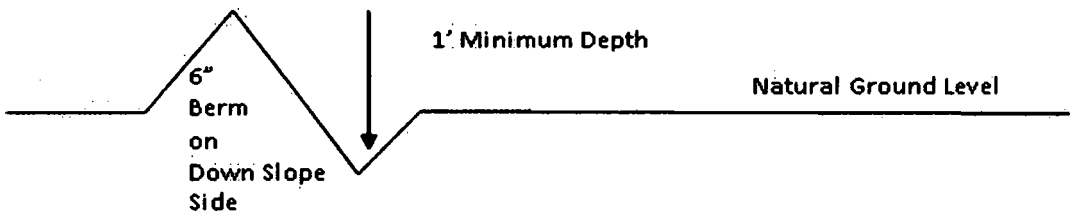
Ditching
Ditching shall be required on both sides of the road.

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

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

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

Cross Section of a Typical Lead-off Ditch



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be

determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

Formula for Spacing Interval of Lead-off Ditches

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

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

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

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

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

Construction Steps

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

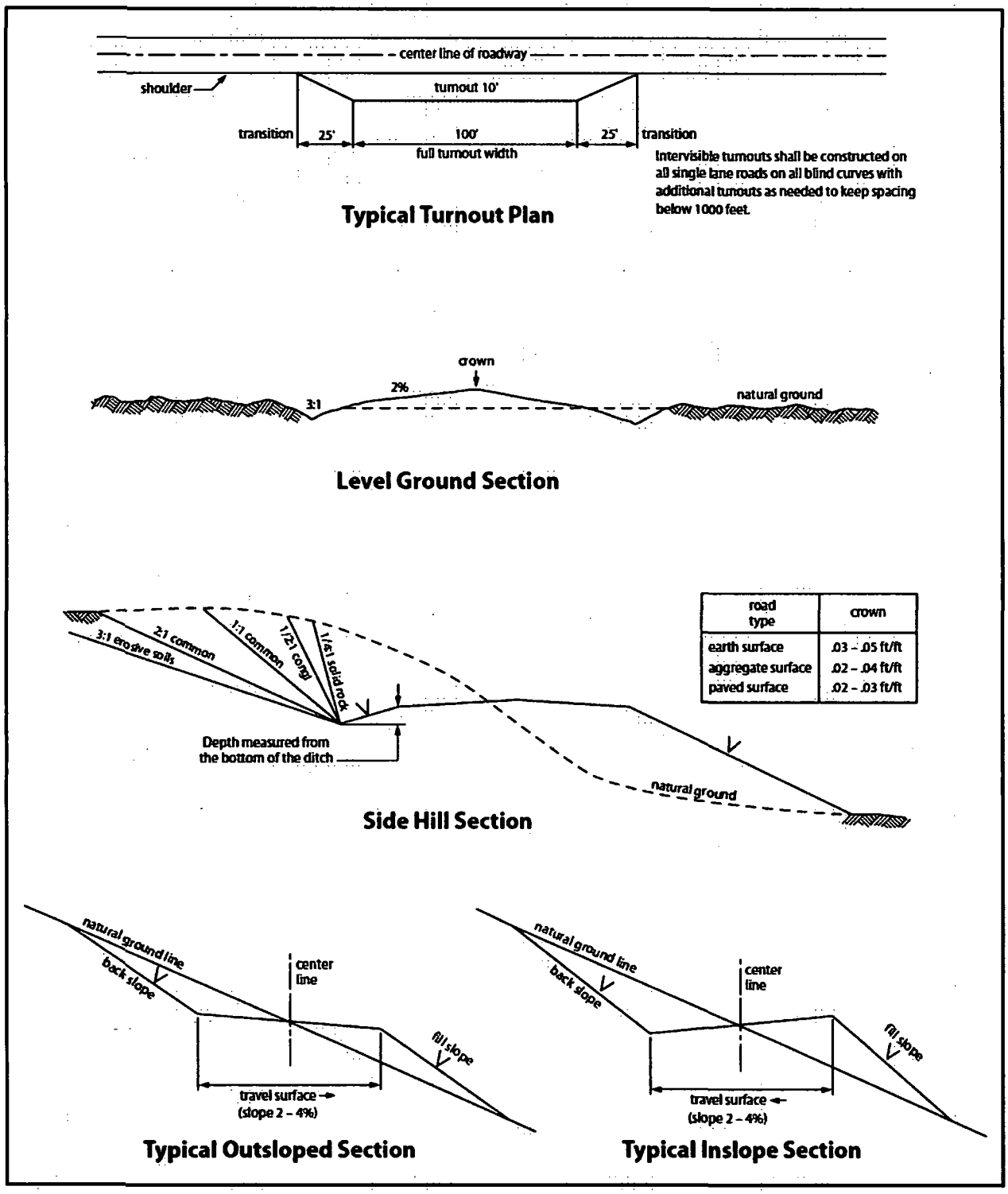


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

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

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

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

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

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

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

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).

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well.

Seed Mixture 1 for Loamy Sites

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

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

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

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

*Pounds of pure live seed:

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

Seed Mixture 2, for Sandy Sites

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

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

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

Species	lb/acre
Sand dropseed (Sporobolus cryptandrus)	1.0
Sand love grass (Eragrostis trichodes)	1.0
Plains bristlegrass (Setaria macrostachya)	2.0

*Pounds of pure live seed:

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

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

Operator Certification Data Report

02/04/2020

Operator Certification

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

NAME: Sorina Flores **Signed on:** 04/04/2019

Title: Supv of Drilling Services

Street Address: 303 Veterans Airpark Ln #1000

City: Midland **State:** TX **Zip:** 79705

Phone: (432)818-1167

Email address: sorina.flores@apachecorp.com

Field Representative

Representative Name:

Street Address:

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

Phone:

Email address:

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BUREAU OF LAND MANAGEMENT

Application Data Report

02/04/2020

APD ID: 10400040615 **Submission Date:** 04/11/2019

Operator Name: APACHE CORPORATION

Well Name: BLACK & TAN 27 FEDERAL COM **Well Number:** 202H

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

[redacted]

Show Final Text

Section 1 - General

APD ID: 10400040615 **Tie to previous NOS?** **Submission Date:** 04/11/2019

BLM Office: CARLSBAD **User:** Sorina Flores **Title:** Supv of Drilling Services

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

Lease number: NMLC0029519B **Lease Acres:** 40

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

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

Agreement number:

Agreement name:

Keep application confidential? YES

Permitting Agent? NO **APD Operator:** APACHE CORPORATION

Operator letter of designation:

Operator Info

Operator Organization Name: APACHE CORPORATION

Operator Address: 303 Veterans Airpark Lane #1000

Zip: 79705

Operator PO Box:

Operator City: Midland **State:** TX

Operator Phone: (432)818-1000

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: BLACK & TAN 27 FEDERAL COM **Well Number:** 202H **Well API Number:**

Field/Pool or Exploratory? Field and Pool **Field Name:** BONE SPRING **Pool Name:** LEA, BONE SPRING, S

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

Operator Name: APACHE CORPORATION

Well Name: BLACK & TAN 27 FEDERAL COM **Well Number:** 202H

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

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

Type of Well Pad: MULTIPLE WELL **Multiple Well Pad Name:** BLACK & TAN 27 FED COM **Number:** PAD 2 WEST

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

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: OTHER

Describe sub-type: DEVELOPMENT

Distance to town: 25 Miles **Distance to nearest well:** 20 FT **Distance to lease line:** 50 FT

Reservoir well spacing assigned acres Measurement: 160 Acres

Well plat: BlkTan27FedCom202H_Plat_signed_20200123144822.pdf

Well work start Date: 12/15/2019 **Duration:** 15 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NAVD88

Survey number: **Reference Datum:**

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this lease?
SHL Leg #1	215	FSL	2140	FWL	20S	34E	27	Aliquot SESW	32.5374361	-103.5497243	LEA	NEW MEXICO	NEW MEXICO	F	NMLC0029519B	3717	0	0	
KOP Leg #1	51	FSL	1979	FWL	20S	34E	27	Aliquot SESW	32.5369857	-103.5502473	LEA	NEW MEXICO	NEW MEXICO	F	NMLC0029519B	-6375	10101	10092	
PPP Leg #1-1	2640	FNL	1979	FWL	20S	34E	27	Aliquot SENW	32.5441031	-103.5502425	LEA	NEW MEXICO	NEW MEXICO	F	NMNM0000082	-6834	12962	10551	

Operator Name: APACHE CORPORATION

Well Name: BLACK & TAN 27 FEDERAL COM **Well Number:** 202H

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this lease?
PPP Leg #1-2	1320	FSL	1979	FWL	20S	34E	27	Aliquot NESW	32.5404737	-103.5502449	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 0000897	-6846	11642	10563	
PPP Leg #1-3	100	FSL	1979	FWL	20S	34E	27	Aliquot SESW	32.5371199	-103.5502472	LEA	NEW MEXICO	NEW MEXICO	F	NMLC0 029519B	-6582	10316	10299	
EXIT Leg #1	50	FNL	1980	FWL	20S	34E	27	Aliquot NENW	32.551222	-103.5502376	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 0000082	-6812	15553	10529	
BHL Leg #1	50	FNL	1980	FWL	20S	34E	27	Aliquot NENW	32.551222	-103.5502376	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 0000082	-6812	15553	10529	

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

Drilling Plan Data Report

02/04/2020

APD ID: 10400040615 **Submission Date:** 04/11/2019

Operator Name: APACHE CORPORATION

Well Name: BLACK & TAN 27 FEDERAL COM **Well Number:** 202H

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

Show Final Text

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
433510	RUSTLER	3717	1608	1608		POTASH	N
433511	SALADO	1750	1967	1967		POTASH	N
433512	TANSILL	377	3340	3340		OIL	N
433513	YATES	174	3543	3543		NATURAL GAS, OIL	N
433516	CAPITAN REEF	-222	3939	3939		USEABLE WATER	N
433514	DELAWARE	-1986	5703	5703		OIL	N
433515	BONE SPRING	-4886	8603	8603		OIL	Y

Section 2 - Blowout Prevention

Pressure Rating (PSI): 5M **Rating Depth:** 11000

Equipment: Rotating Head, Mud Gas Separator, Blow Down Pit, Flare Line

Requesting Variance? YES

Variance request: Apache request a variance to use a flexible hose between BOP and Choke manifold. Flex hose may vary pending availability. A quality control inspection and test certificate will be available for review.
Testing Procedure: BOP/BOPE will be tested by independent service company to 250psi low and high pressure indicated above per Onshore Order 2 requirements. System may be upgraded to higher pressure but sill tested to WP listed . If system is upgraded, all components installed will be functional and tested. Pipe rams will be operationally checked each 24 hr period. Blind rams will be operationally checked on each TOOH. These checks will be noted on daily tour sheets. Other accessories to BOP equipment will include Kelly cock and floor safety valve (inside BOP), choke lines and choke manifold. (see attached schematic)

Choke Diagram Attachment:

BlkTan27FedCom_12.25Hole_BOP_2M_ChokeManifold_Schem_20190404140515.pdf

BOP Diagram Attachment:

BlkTan27FedCom_8.75Hole_BOP_5M_ChokeManifoldSchem_REV_20200115153459.pdf

Flexline_20200123144131.pdf

Operator Name: APACHE CORPORATION

Well Name: BLACK & TAN 27 FEDERAL COM **Well Number:** 202H

BlkTan27FedCom_12.25Hole_BOP_2M_ChokeManifold_Schem_20190404140515.pdf

BlkTan27FedCom_8.75Hole_BOP_5M_ChokeManifoldSchem_REV_20200115153459.pdf

Flexline_20200123144131.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	INTERMEDIATE	12.25	9.625	NEW	API	N	0	840	0	840	-8196	-13076	840	J-55	40	BUTT	5.75	1.82	BUOY	2.26	BUOY	1.98
2	SURFACE	17.5	13.375	NEW	API	N	0	1630	0	1630	-7296	-8996	1630	J-55	54.5	BUTT	2.84	1.67	BUOY	4.11	BUOY	3.86
3	INTERMEDIATE	12.25	9.625	NEW	API	N	840	5690	840	5681	-7296	-8196	4850	J-55	40	LT&C	1.57	1.99	BUOY	1.8	BUOY	2.16
4	PRODUCTION	8.75	5.5	NEW	API	N	0	10854	0	10569	-7296	-23035	10854	P-110	17	BUTT	1.46	1.21	BUOY	2.18	BUOY	2.09
5	PRODUCTION	8.5	5.5	NEW	API	N	0	15552	0	10528		16367	15552	P-110	17	BUTT	1.46	1.21	BUOY	2.18	BUOY	2.09

Casing Attachments

Casing ID: 1 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

BlkTan27FedCom_IntermCsgDesignAssumpt_20181121104400.pdf

Operator Name: APACHE CORPORATION

Well Name: BLACK & TAN 27 FEDERAL COM **Well Number:** 202H

Casing Attachments

Casing ID: 2 **String Type:** SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

BlkTan27FedCom_SurfCsgDesignAssumpt_20181121104411.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

BlkTan27FedCom_IntermCsgDesignAssumpt_20181121104424.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

BlkTan27FedCom_ProdCsgDesignAssumpt_20181121104442.pdf

Operator Name: APACHE CORPORATION

Well Name: BLACK & TAN 27 FEDERAL COM **Well Number:** 202H

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

BlkTan27FedCom_ProdCsgDesignAssumpt_20181121104454.pdf

Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	1304	664	1.73	13.5	1148	25	Cl C	4% Bentonite + 1% CaCl2
SURFACE	Tail		1304	1630	245	1.33	14.8	325.85	25	Cl C	1% CaCl2
INTERMEDIATE	Lead		0	2780	525	1.99	12.7	1044.75	25	Cl C	5% NaCl + 6% bentonite + 0.2% anti-settling + 5% retarder + 0.4 #/sk defoamer
INTERMEDIATE	Tail		2780	3460	200	1.33	14.8	266	25	Cl C	0.3% retarder
INTERMEDIATE	Lead		0	4690	905	1.99	12.7	1800.95	25	Cl C	5% NaCl + 6% Bentonite + 2% anti-settling + 0.5% retarder + 0.4 #/sk defoamer
INTERMEDIATE	Tail		4690	5690	300	1.33	14.8	399	25	Cl C	0.2% Retarder
INTERMEDIATE	Lead	3460	3460	4690	304	1.99	12.7	604.96	25	Cl C	5% NaCl + 6% Bentonite + 0.2% anti-settling + 0.5% retarder + 0.4 #/sk defoamer
INTERMEDIATE	Tail		4690	5690	300	1.33	14.8	399	25	Cl C	0.3% retarder
PRODUCTION	Lead		0	10100	1390	2.03	11.9	2128.7	20	H	4% gel, 5% salt, 0.5% CPT-19, 1% CPT-45, 0.4% CPT-503P, 0.2%

Operator Name: APACHE CORPORATION

Well Name: BLACK & TAN 27 FEDERAL COM **Well Number:** 202H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
											CPT-20A, 0.2% Citric Acid
PRODUCTION	Tail		10100	15552	1070	1.43	13.2	1530.1	20	TXI Lite	1.3% Salt + 5% Expanding Agent + 0.5% Fluid Loss + 0.35% Retarder + 0.1% Anti Settling + 0.2% Dispersant + 0.4 #/sk Defoamer
PRODUCTION	Lead		0	10100	1390	2.03	11.9	2821.7	20	H	4% gel, 5% salt, 0.5% CPT-19, 1% CPT-45, 0.4% CPT-503P, 0.2% CPT-20A, 0.2% Citric Acid
PRODUCTION	Tail		10100	15552	1070	1.43	13.2	1530.1	20	TXI Lite	1.3% Salt + 5% Expanding Agent + 0.5% Fluid Loss + 0.35% Retarder + 0.1% Anti Settling + 0.2% Dispersant + 0.4 #/sk Defoamer

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

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

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

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

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

Circulating Medium Table

Operator Name: APACHE CORPORATION

Well Name: BLACK & TAN 27 FEDERAL COM **Well Number:** 202H

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	1630	SPUD MUD	8.3	9							
1630	5690	SALT SATURATED	9.8	10.5							
5690	15552	OTHER : CUT BRINE	8.6	9.5							

Section 6 - Test, Logging, Coring

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

Onshore Order 2.111.D shall be followed. Will run GR/CNL from TD to surf (horizontal well - vertical portion of hole). Stated logs run will be in the completion report & submitted to BLM.

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

CNL/FDC,DS,GR,MWD,MUDLOG

Coring operation description for the well:

None planned

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 4640 **Anticipated Surface Pressure:** 2316.14

Anticipated Bottom Hole Temperature(F): 159

Anticipated abnormal pressures, temperatures, or potential geologic hazards? YES

Describe:

Capitan reef poses lost circulation potential

Contingency Plans geoharzards description:

For Capitan Reef, Apache will switch over to FW system if lost circ is encountered. A 2-stage cmt job will be proposed to get cmt to surf.

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

BlkTan27FedCom_H2SOpsContPlan_20181121112018.pdf

Operator Name: APACHE CORPORATION

Well Name: BLACK & TAN 27 FEDERAL COM **Well Number:** 202H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

BlkTan27FedCom202H_DirSurvey_20200123143942.pdf

Other proposed operations facets description:

**Cement contingency plan attached if loss circulation is encountered. Prod cmt had to be duplicated due to system irregularities. Complete csg & cmt plan attached.
**Apache request variance to use flexible hose between BOP & Choke Manifold, see attachment for additional information
*Estimated Completion Date: 5/2020
*Estimated First Production Date: 6/2020

Other proposed operations facets attachment:

BlkTan27FedCom202H_CsgDetail_20190404144350.pdf
BlkTan27FedCom202H_CmtDetailREV_20200115153750.pdf

Other Variance attachment:

BlkTan27FedCom_Flexline_20181121112354.pdf

HYDROGEN SULFIDE (H_2S) DRILLING OPERATIONS PLAN

Hydrogen Sulfide Training:

All regularly assigned personnel, contracted or employed by Apache Corporation will receive training from qualified instructor(s) in the following areas prior to commencing drilling possible hydrogen sulfide bearing formations in this well:

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

Supervisory personnel will be trained in the following areas:

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

There will be an initial training session just prior to encountering a known or probable H_2S zone (within 3 days or 500') and weekly H_2S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H_2S Drilling Operations Plan and the Public Protection Plan. This plan shall be available at the well site. All personnel will be required to carry documentation that they have received proper training.

H_2S SAFETY EQUIPMENT AND SYSTEMS:

Well Control Equipment that will be available & installed if H_2S is encountered:

- Flare Line with electronic igniter or continuous pilot.
- Choke manifold with a minimum of one remote choke.
- Blind rams & pipe rams to accommodate all pipe sizes with properly sized closing unit.
- Auxiliary equipment to include: annular preventer, mud-gas separator, rotating head & flare gun with flares

Protective Equipment for Essential Personnel:

- SCBA units located in dog house & at briefing areas, as indicated on wellsite diagram.

H2S Dection and Monitoring Equipment:

- Two portable H_2S monitors positioned on location for best coverage & response. These units have warning lights & audible sirens when H_2S levels of 10 ppm are reached.
- One portable H_2S monitor positioned near flare line.

H2S Visual Warning Systems:

- Wind direction indicators are shown on wellsite diagram.
- Caution / Danger signs shall be posted on roads providing direct access to location. Signs will be painted a high visibility yellow with black lettering of sufficient size to be readable at a reasonable distance from the immediate location. Bilingual signs will be used when appropriate.

Mud Program:

- The Mud Program has been designed to minimize the volume of H_2S circulated to the surface. Proper mud weights, safe drilling practices & the use of H_2S scavengers will minimize hazards when penetrating H_2S bearing zones.
- A mud-gas separator and H_2S gas buster will be utilized as needed.

Metallurgy:

- All drill strings, casing, tubing, wellhead, blowout preventers, drilling spool, kill lines, choke manifold & lines, & valves will be suitable for H_2S service.
- All elastomers used for packing & seals shall be H_2S trim.

Communication:

- Cellular telephone and 2-way radio communications in company vehicles, rig floor and mud logging trailer.

WELL CONTROL EMERGENCY RESPONSE PLAN

I. GENERAL PHILOSOPHY

Our objective is to ensure that during an emergency, a predetermined procedure is followed so that prompt decisions can be made based on accurate information.

The best way to handle and emergency is with an experienced organization set up for the sole purpose of solving the problem. The *Well Control Emergency Response Team* was organized to handle dangerous & expensive well control problems. The *Team* is structured such that each individual can contribute the most from his area of expertise. Key decision-makers are determined prior to an emergency to avoid confusion about who is in charge.

If the well is flowing uncontrolled at the surface or subsurface, *The Emergency Response Team* will be mobilized. The *Team* is customized for the people currently on the Apache staff. Staff changes may require a change in the plan.

II. EMERGENCY PROCEDURE ON DRILLING OR COMPLETION OPERATIONS

A. In the event of an emergency the *Drilling Foreman or Tool-Pusher* will immediately contact only one of the following starting with the first name listed:

Name	Office	Mobile	Home
Larry VanGilder – Drlg Superintendent	432-818-1965	432-557-1097	
John Vacek – Drilling Engineer	432-818-1882	281-222-1812	
Bobby Smith – Drilling Manager	432-818-1020	432-556-7701	
Ted Ward – EH&S Coordinator		432-234-0600	
Erick Wood – EH&S Coordinator		432-250-5904	

***This one phone call will free the Drilling Foreman to devote his full time to securing the safety of personnel & equipment. This call will initiate the process to mobilize the Well Control Emergency Response Team. Apache maintains an Emergency Telephone Conference Room in the Houston office. This room is available for us by the Permian Region. The room has 50 separate telephone lines.*

B. The Apache employee contacted by the Drilling Foreman will begin contacting the rest of the *Team*. If **LARRY VAN GILDER** is out of contact, **JOHN VACEK** will be notified.

C. If a member of the *Emergency Response Team* is away from the job, he must be available for call back. Telephone numbers should be left with secretaries or a key decision-maker.

D. Apache's reporting procedure for spills or releases of oil or hazardous materials will be implemented when spills or releases have occurred or are probable.

EMERGENCY RESPONSE NUMBERS:

SHERIFF DEPARTMENT	
Eddy County	575-887-7551
Lea County	575-396-3611
FIRE DEPARTMENT	**911**
Artesia	575-746-5050
Carlsbad	575-885-2111
Eunice	575-394-2111
Hobbs	575-397-9308
Jal	575-395-2221
Lovington	575-396-2359
HOSPITALS	**911**
Artesia Medical Emergency	575-746-5050
Carlsbad Medical Emergency	575-885-2111
Eunice Medical Emergency	575-394-2112
Hobbs Medical Emergency	575-397-9308
Jal Medical Emergency	575-395-2221
Lovington Medical Emergency	575-396-2359
AGENT NOTIFICATIONS	
Bureau of Land Management	575-393-3612
New Mexico Oil Conservation Division	575-393-6161

Apache

5D Plan Report

Apache Corporation

Field Name: *Apache NM (Nad 83 NMEZ)*
Site Name: *Black & Tan 27 Fed Com Pad 2*
Well Name: *Black & Tan 27 Fed Com 202H*
Plan: *P1:V1*

21 August 2018

Weatherford®

5D Plan Report

Black & Tan 27 Fed Com 202H

Field Name: Apache NM (Nad 83 NMEZ)	**Map Units:** US ft		**Company Name:** Apache Corporation
	Vertical Reference Datum (VRD): Mean Sea Level		
	Projected Coordinate System: NAD83 / New Mexico East (ftUS)		
	Comment:		
Site: Black & Tan 27 Fed Com Pad 2	**Units:** US ft	**North Reference:** Grid	**Convergence Angle:** 0.42
	Position:	**Northing:** 560138.30 US ft	**Latitude:** 32.537436108
		Easting: 782842.60 US ft	**Longitude:** -103.549659332
	Elevation above MSL: 3715.00 US ft		
	Comment:		
Slot: Black & Tan 27 Fed Com 202H	**Position (Relative to Site Centre)**		
	+N/-S: -0.20 US ft	**Northing:** 560138.10 US ft	**Latitude:** 32.537435963
	+E/-W: -20.00 US ft	**Easting:** 782822.60 US ft	**Longitude:** -103.549724230
	Slot TVD Reference: Ground Elevation		
	Elevation above MSL: 3717.00 US ft		
	Comment:		
Well: Black & Tan 27 Fed Com 202H	**Type:** Main well	**UWI:**	**Plan:** P1:V1
	File Number:	**Comment:** H&P 482	
	Closure Distance: 5018.19US ft	**Closure Azimuth:** 357.77°	
	Vertical Section: Position of Origin (Relative to Slot centre)		
		+N/-S: -0.00 US ft **+E/-W:** 0.00 US ft	**Az:** 357.77°
	Magnetic Parameters:		
	Model: HDGM2016v6.0	**Field Strength:** 47966.9nT	**Declination:** 6.72° **Dip:** 59.93° **Date:** 13/Dec/2018

Drill floor: Plan: P1:V1

Rig Height (Drill Floor): 26.00US ft **Elevation above MSL:** 3743.00US ft **Inclination:** 0.00° **Azimuth:** 0.00°

Target set: B&T27FC202H Comment:

Target Name:	Shape:	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (USFt)	Easting (USFt)	C.Pt.Distance (US ft)	Comment
LTP	Point	0.00	4964.40	-194.80	565102.50	782627.80	4968.22	
PBHL	Cuboid	10528.98	5014.40	-195.10	565152.50	782627.50	0.00	

Wellpath created using minimum curvature.

5D Plan Report

Tie Point:

MD: 0.00USFt	Inclination: 0.00°	Azimuth: 0.00°	TVD: - 0.00USFt	North Offset: - 0.00USFt	East Offset: 0.00USFt

Salient Points: (Relative to Slot centre)(TVD relative to Drill Floor)

MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100US ft)	Comment
0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	560138.10	782822.60	0.00	
2000.00	0.00	0.00	2000.00	0.00	-0.00	0.00	560138.10	782822.60	0.00	Nudge
2429.21	4.29	224.12	2428.81	-11.09	-11.54	-11.19	560126.56	782811.41	1.00	Hold
5070.79	4.29	224.12	5062.98	-147.56	-153.46	-148.81	559984.64	782673.79	0.00	Drop
5500.00	0.00	0.00	5491.79	-158.65	-165.00	-160.00	559973.10	782662.60	1.00	Hold
10100.69	0.00	0.00	10092.48	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	KOP
10854.85	90.50	359.61	10569.93	322.73	316.62	-163.26	560454.72	782659.34	12.00	Landing Pt
15552.92	90.50	359.61	10528.98	5018.19	5014.40	-195.10	565152.50	782627.50	0.00	B&T27FC202 H PBHL

Interpolated Points: (Relative to Slot centre)(TVD relative to Drill Floor)

MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100US ft)	Comment
0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	560138.10	782822.60	0.00	
100.00	0.00	0.00	100.00	0.00	-0.00	0.00	560138.10	782822.60	0.00	
200.00	0.00	0.00	200.00	0.00	-0.00	0.00	560138.10	782822.60	0.00	
300.00	0.00	0.00	300.00	0.00	-0.00	0.00	560138.10	782822.60	0.00	
400.00	0.00	0.00	400.00	0.00	-0.00	0.00	560138.10	782822.60	0.00	
500.00	0.00	0.00	500.00	0.00	-0.00	0.00	560138.10	782822.60	0.00	
600.00	0.00	0.00	600.00	0.00	-0.00	0.00	560138.10	782822.60	0.00	
700.00	0.00	0.00	700.00	0.00	-0.00	0.00	560138.10	782822.60	0.00	
800.00	0.00	0.00	800.00	0.00	-0.00	0.00	560138.10	782822.60	0.00	
900.00	0.00	0.00	900.00	0.00	-0.00	0.00	560138.10	782822.60	0.00	
1000.00	0.00	0.00	1000.00	0.00	-0.00	0.00	560138.10	782822.60	0.00	
1100.00	0.00	0.00	1100.00	0.00	-0.00	0.00	560138.10	782822.60	0.00	
1200.00	0.00	0.00	1200.00	0.00	-0.00	0.00	560138.10	782822.60	0.00	
1300.00	0.00	0.00	1300.00	0.00	-0.00	0.00	560138.10	782822.60	0.00	
1400.00	0.00	0.00	1400.00	0.00	-0.00	0.00	560138.10	782822.60	0.00	
1500.00	0.00	0.00	1500.00	0.00	-0.00	0.00	560138.10	782822.60	0.00	
1600.00	0.00	0.00	1600.00	0.00	-0.00	0.00	560138.10	782822.60	0.00	
1608.00	0.00	0.00	1608.00	0.00	-0.00	0.00	560138.10	782822.60	0.00	RUSTLER :
1700.00	0.00	0.00	1700.00	0.00	-0.00	0.00	560138.10	782822.60	0.00	
1800.00	0.00	0.00	1800.00	0.00	-0.00	0.00	560138.10	782822.60	0.00	
1900.00	0.00	0.00	1900.00	0.00	-0.00	0.00	560138.10	782822.60	0.00	
1967.00	0.00	0.00	1967.00	0.00	-0.00	0.00	560138.10	782822.60	0.00	SALADO :
2000.00	0.00	0.00	2000.00	0.00	-0.00	0.00	560138.10	782822.60	0.00	Nudge
2100.00	1.00	224.12	2099.99	-0.60	-0.63	-0.61	560137.47	782821.99	1.00	
2200.00	2.00	224.12	2199.96	-2.41	-2.51	-2.43	560135.59	782820.17	1.00	
2300.00	3.00	224.12	2299.86	-5.42	-5.64	-5.47	560132.46	782817.13	1.00	
2400.00	4.00	224.12	2399.68	-9.63	-10.02	-9.72	560128.08	782812.88	1.00	
2429.21	4.29	224.12	2428.81	-11.09	-11.54	-11.19	560126.56	782811.41	1.00	Hold
2500.00	4.29	224.12	2499.40	-14.75	-15.34	-14.87	560122.76	782807.73	0.00	
2600.00	4.29	224.12	2599.12	-19.91	-20.71	-20.08	560117.39	782802.52	0.00	
2700.00	4.29	224.12	2698.84	-25.08	-26.08	-25.29	560112.02	782797.31	0.00	
2800.00	4.29	224.12	2798.56	-30.25	-31.46	-30.50	560106.64	782792.10	0.00	
2900.00	4.29	224.12	2898.28	-35.41	-36.83	-35.71	560101.27	782786.89	0.00	
3000.00	4.29	224.12	2998.00	-40.58	-42.20	-40.92	560095.90	782781.68	0.00	
3100.00	4.29	224.12	3097.72	-45.75	-47.58	-46.13	560090.52	782776.47	0.00	
3200.00	4.29	224.12	3197.44	-50.91	-52.95	-51.34	560085.15	782771.26	0.00	
3300.00	4.29	224.12	3297.16	-56.08	-58.32	-56.55	560079.78	782766.05	0.00	
3342.96	4.29	224.12	3340.00	-58.30	-60.63	-58.79	560077.47	782763.81	0.00	TANSILL :
3400.00	4.29	224.12	3396.88	-61.24	-63.69	-61.76	560074.41	782760.84	0.00	
3500.00	4.29	224.12	3496.60	-66.41	-69.07	-66.97	560069.03	782755.63	0.00	
3546.53	4.29	224.12	3543.00	-68.81	-71.57	-69.40	560066.53	782753.20	0.00	YATES :
3600.00	4.29	224.12	3596.32	-71.58	-74.44	-72.18	560063.66	782750.42	0.00	
3700.00	4.29	224.12	3696.03	-76.74	-79.81	-77.39	560058.29	782745.21	0.00	

5D Plan Report

Interpolated Points: (Relative to Slot centre)(TVD relative to Drill Floor)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N Offset (US ft)	E Offset (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100US ft)	Comment
3800.00	4.29	224.12	3795.75	-81.91	-85.19	-82.60	560052.91	782740.00	0.00	
3900.00	4.29	224.12	3895.47	-87.07	-90.56	-87.82	560047.54	782734.78	0.00	
3943.65	4.29	224.12	3939.00	-89.33	-92.90	-90.09	560045.20	782732.51	0.00	SEVEN RIVERS :
4000.00	4.29	224.12	3995.19	-92.24	-95.93	-93.03	560042.17	782729.57	0.00	
4100.00	4.29	224.12	4094.91	-97.41	-101.30	-98.24	560036.80	782724.36	0.00	
4200.00	4.29	224.12	4194.63	-102.57	-106.68	-103.45	560031.42	782719.15	0.00	
4300.00	4.29	224.12	4294.35	-107.74	-112.05	-108.66	560026.05	782713.94	0.00	
4400.00	4.29	224.12	4394.07	-112.90	-117.42	-113.87	560020.68	782708.73	0.00	
4500.00	4.29	224.12	4493.79	-118.07	-122.80	-119.08	560015.30	782703.52	0.00	
4600.00	4.29	224.12	4593.51	-123.24	-128.17	-124.29	560009.93	782698.31	0.00	
4700.00	4.29	224.12	4693.23	-128.40	-133.54	-129.50	560004.56	782693.10	0.00	
4800.00	4.29	224.12	4792.95	-133.57	-138.91	-134.71	559999.19	782687.89	0.00	
4900.00	4.29	224.12	4892.67	-138.73	-144.29	-139.92	559993.81	782682.68	0.00	
5000.00	4.29	224.12	4992.39	-143.90	-149.66	-145.13	559988.44	782677.47	0.00	
5070.79	4.29	224.12	5062.98	-147.56	-153.46	-148.81	559984.64	782673.79	0.00	Drop
5100.00	4.00	224.12	5092.11	-149.02	-154.98	-150.28	559983.12	782672.32	1.00	
5200.00	3.00	224.12	5191.93	-153.23	-159.36	-154.53	559978.74	782668.07	1.00	
5300.00	2.00	224.12	5291.83	-156.24	-162.49	-157.57	559975.61	782665.03	1.00	
5400.00	1.00	224.12	5391.79	-158.05	-164.37	-159.39	559973.73	782663.21	1.00	
5500.00	0.00	0.00	5491.79	-158.65	-165.00	-160.00	559973.10	782662.60	1.00	Hold
5600.00	0.00	0.00	5591.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
5700.00	0.00	0.00	5691.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
5711.21	0.00	0.00	5703.00	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	DELAWARE :
5800.00	0.00	0.00	5791.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
5900.00	0.00	0.00	5891.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
6000.00	0.00	0.00	5991.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
6100.00	0.00	0.00	6091.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
6200.00	0.00	0.00	6191.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
6300.00	0.00	0.00	6291.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
6400.00	0.00	0.00	6391.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
6500.00	0.00	0.00	6491.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
6600.00	0.00	0.00	6591.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
6700.00	0.00	0.00	6691.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
6800.00	0.00	0.00	6791.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
6900.00	0.00	0.00	6891.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
7000.00	0.00	0.00	6991.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
7100.00	0.00	0.00	7091.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
7200.00	0.00	0.00	7191.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
7300.00	0.00	0.00	7291.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
7400.00	0.00	0.00	7391.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
7500.00	0.00	0.00	7491.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
7600.00	0.00	0.00	7591.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
7700.00	0.00	0.00	7691.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
7800.00	0.00	0.00	7791.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
7900.00	0.00	0.00	7891.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
8000.00	0.00	0.00	7991.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
8100.00	0.00	0.00	8091.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
8200.00	0.00	0.00	8191.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
8300.00	0.00	0.00	8291.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
8400.00	0.00	0.00	8391.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
8500.00	0.00	0.00	8491.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
8600.00	0.00	0.00	8591.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
8611.21	0.00	0.00	8603.00	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	AVALON :
8700.00	0.00	0.00	8691.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
8800.00	0.00	0.00	8791.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
8900.00	0.00	0.00	8891.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
9000.00	0.00	0.00	8991.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
9100.00	0.00	0.00	9091.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	

5D Plan Report

Interpolated Points: (Relative to Slot centre)(TVD relative to Drill Floor)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100US ft)	Comment
9200.00	0.00	0.00	9191.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
9300.00	0.00	0.00	9291.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
9400.00	0.00	0.00	9391.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
9500.00	0.00	0.00	9491.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
9528.21	0.00	0.00	9520.00	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	1 BSC :
9600.00	0.00	0.00	9591.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
9700.00	0.00	0.00	9691.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
9726.21	0.00	0.00	9718.00	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	1 BSS :
9800.00	0.00	0.00	9791.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
9900.00	0.00	0.00	9891.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
9967.21	0.00	0.00	9959.00	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	2 BSC :
10000.00	0.00	0.00	9991.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
10100.00	0.00	0.00	10091.79	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	
10100.69	0.00	0.00	10092.48	-158.65	-165.00	-160.00	559973.10	782662.60	0.00	KOP
10199.92	11.91	359.61	10191.00	-148.38	-154.73	-160.07	559983.37	782662.53	12.00	2 BSS :
10200.00	11.92	359.61	10191.08	-148.36	-154.71	-160.07	559983.39	782662.53	12.00	
10300.00	23.92	359.61	10286.05	-117.67	-124.00	-160.28	560014.10	782662.32	12.00	
10400.00	35.92	359.61	10372.57	-67.91	-74.22	-160.62	560063.88	782661.98	12.00	
10500.00	47.92	359.61	10446.84	-1.26	-7.54	-161.07	560130.56	782661.53	12.00	
10600.00	59.92	359.61	10505.63	79.36	73.13	-161.61	560211.23	782660.99	12.00	
10700.00	71.92	359.61	10546.36	170.44	164.26	-162.23	560302.36	782660.37	12.00	
10800.00	83.92	359.61	10567.26	268.00	261.86	-162.89	560399.96	782659.71	12.00	
10854.85	90.50	359.61	10569.93	322.73	316.62	-163.26	560454.72	782659.34	12.00	Landing Pt
10900.00	90.50	359.61	10569.53	367.85	361.76	-163.57	560499.86	782659.03	0.00	
11000.00	90.50	359.61	10568.66	467.80	461.75	-164.25	560599.85	782658.35	0.00	
11100.00	90.50	359.61	10567.79	567.74	561.75	-164.93	560699.85	782657.67	0.00	
11200.00	90.50	359.61	10566.92	667.69	661.74	-165.60	560799.84	782657.00	0.00	
11300.00	90.50	359.61	10566.05	767.63	761.74	-166.28	560899.84	782656.32	0.00	
11400.00	90.50	359.61	10565.18	867.57	861.73	-166.96	560999.83	782655.64	0.00	
11500.00	90.50	359.61	10564.30	967.52	961.72	-167.64	561099.82	782654.96	0.00	
11600.00	90.50	359.61	10563.43	1067.46	1061.72	-168.31	561199.82	782654.29	0.00	
11700.00	90.50	359.61	10562.56	1167.41	1161.71	-168.99	561299.81	782653.61	0.00	
11800.00	90.50	359.61	10561.69	1267.35	1261.71	-169.67	561399.81	782652.93	0.00	
11900.00	90.50	359.61	10560.82	1367.30	1361.70	-170.35	561499.80	782652.25	0.00	
12000.00	90.50	359.61	10559.95	1467.24	1461.69	-171.02	561599.79	782651.58	0.00	
12100.00	90.50	359.61	10559.07	1567.19	1561.69	-171.70	561699.79	782650.90	0.00	
12200.00	90.50	359.61	10558.20	1667.13	1661.68	-172.38	561799.78	782650.22	0.00	
12300.00	90.50	359.61	10557.33	1767.08	1761.68	-173.06	561899.78	782649.54	0.00	
12400.00	90.50	359.61	10556.46	1867.02	1861.67	-173.73	561999.77	782648.87	0.00	
12500.00	90.50	359.61	10555.59	1966.96	1961.66	-174.41	562099.76	782648.19	0.00	
12600.00	90.50	359.61	10554.72	2066.91	2061.66	-175.09	562199.76	782647.51	0.00	
12700.00	90.50	359.61	10553.85	2166.85	2161.65	-175.77	562299.75	782646.83	0.00	
12800.00	90.50	359.61	10552.97	2266.80	2261.65	-176.45	562399.75	782646.15	0.00	
12900.00	90.50	359.61	10552.10	2366.74	2361.64	-177.12	562499.74	782645.48	0.00	
13000.00	90.50	359.61	10551.23	2466.69	2461.63	-177.80	562599.73	782644.80	0.00	
13100.00	90.50	359.61	10550.36	2566.63	2561.63	-178.48	562699.73	782644.12	0.00	
13200.00	90.50	359.61	10549.49	2666.58	2661.62	-179.16	562799.72	782643.44	0.00	
13300.00	90.50	359.61	10548.62	2766.52	2761.61	-179.83	562899.71	782642.77	0.00	
13400.00	90.50	359.61	10547.74	2866.47	2861.61	-180.51	562999.71	782642.09	0.00	
13500.00	90.50	359.61	10546.87	2966.41	2961.60	-181.19	563099.70	782641.41	0.00	
13600.00	90.50	359.61	10546.00	3066.35	3061.60	-181.87	563199.70	782640.73	0.00	
13700.00	90.50	359.61	10545.13	3166.30	3161.59	-182.54	563299.69	782640.06	0.00	
13800.00	90.50	359.61	10544.26	3266.24	3261.58	-183.22	563399.68	782639.38	0.00	
13900.00	90.50	359.61	10543.39	3366.19	3361.58	-183.90	563499.68	782638.70	0.00	
14000.00	90.50	359.61	10542.51	3466.13	3461.57	-184.58	563599.67	782638.02	0.00	
14100.00	90.50	359.61	10541.64	3566.08	3561.57	-185.25	563699.67	782637.35	0.00	
14200.00	90.50	359.61	10540.77	3666.02	3661.56	-185.93	563799.66	782636.67	0.00	
14300.00	90.50	359.61	10539.90	3765.97	3761.55	-186.61	563899.65	782635.99	0.00	
14400.00	90.50	359.61	10539.03	3865.91	3861.55	-187.29	563999.65	782635.31	0.00	

5D Plan Report

Interpolated Points: (Relative to Slot centre)(TVD relative to Drill Floor)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100US ft)	Comment
14500.00	90.50	359.61	10538.16	3965.86	3961.54	-187.96	564099.64	782634.64	0.00	
14600.00	90.50	359.61	10537.29	4065.80	4061.54	-188.64	564199.64	782633.96	0.00	
14700.00	90.50	359.61	10536.41	4165.74	4161.53	-189.32	564299.63	782633.28	0.00	
14800.00	90.50	359.61	10535.54	4265.69	4261.52	-190.00	564399.62	782632.60	0.00	
14900.00	90.50	359.61	10534.67	4365.63	4361.52	-190.68	564499.62	782631.92	0.00	
15000.00	90.50	359.61	10533.80	4465.58	4461.51	-191.35	564599.61	782631.25	0.00	
15100.00	90.50	359.61	10532.93	4565.52	4561.51	-192.03	564699.61	782630.57	0.00	
15200.00	90.50	359.61	10532.06	4665.47	4661.50	-192.71	564799.60	782629.89	0.00	
15300.00	90.50	359.61	10531.18	4765.41	4761.49	-193.39	564899.59	782629.21	0.00	
15400.00	90.50	359.61	10530.31	4865.36	4861.49	-194.06	564999.59	782628.54	0.00	
15500.00	90.50	359.61	10529.44	4965.30	4961.48	-194.74	565099.58	782627.86	0.00	
15552.92	90.50	359.61	10528.98	5018.19	5014.40	-195.10	565152.50	782627.50	0.00	B&T27FC202 H PBHL

BLACK & TAN 27 FEDERAL COM 202H - CSG DETAIL

String: **SURFACE**

Hole Size:	17.5						
Top Setting Depth (MD):	0	Top Setting Depth (TVD):	0	Btm setting depth (MD):	1630	Btm setting depth (TVD):	1630
Size:	13-3/8"	Grade:	J-55	Weight (lbs/ft):	54.5	Joint (Butt,FJ, LTC,STC, SLH, N/A, Other):	Buttress

Condition (New/Used): New Standard (API/Non-API): API

Tapered String (Y/N)?: N
If yes, need spec attachment

Safety Factors

Collapse Design Safety Factor: 2.84 Burst Design Safety Factor: 1.67

Body Tensile Design Safety Factor type?: Dry/Buoyant Buoyant
Body Tensile Design Safety Factor: 3.86

Joint Tensile Design Safety Factor type?: Dry/Buoyant Buoyant
Joint Tensile Design Safety Factor: 4.11

String: **INTERMEDIATE**

Hole Size:	12.25						
Top Setting Depth (MD):	0	Top Setting Depth (TVD):	0	Btm setting depth (MD):	840	Btm setting depth (TVD):	840
Size:	9-5/8"	Grade:	J-55	Weight (lbs/ft):	40	Joint (Butt,FJ, LTC,STC, SLH, N/A, Other):	Buttress

Condition (New/Used): New Standard (API/Non-API): API

Tapered String (Y/N)?: N
If yes, need spec attachment

Safety Factors

Collapse Design Safety Factor: 5.75 Burst Design Safety Factor: 1.82

Body Tensile Design Safety Factor type?: Dry/Buoyant Buoyant
Body Tensile Design Safety Factor: 1.98

Joint Tensile Design Safety Factor type?: Dry/Buoyant Buoyant
Joint Tensile Design Safety Factor: 2.26

Top Setting Depth (MD):	840	Top Setting Depth (TVD):	840	Btm setting depth (MD):	5690	Btm setting depth (TVD):	5681.8
Size:	9-5/8"	Grade:	J-55	Weight (lbs/ft):	40	Joint (Butt,FJ, LTC,STC, SLH, N/A, Other):	LTC

Condition (New/Used): New Standard (API/Non-API): API

Tapered String (Y/N)?: N
If yes, need spec attachment

Safety Factors

Collapse Design Safety Factor: 1.57 Burst Design Safety Factor: 1.99

Body Tensile Design Safety Factor type?: Dry/Buoyant Buoyant
Body Tensile Design Safety Factor: 2.16

Joint Tensile Design Safety Factor type?: Dry/Buoyant Buoyant
Joint Tensile Design Safety Factor: 1.8

String: PRODUCTION

Hole Size:	8.75						
Top Setting Depth (MD):	0	Top Setting Depth (TVD):	0	Btm setting depth (MD):	10854.85	Btm setting depth (TVD):	10569.93
Size:	5-1/2"	Grade:	P-110	Weight (lbs/ft):	17	Joint (Butt,FJ, LTC,STC, SLH, N/A, Other):	Buttress
Hole Size:	8.5						
Top Setting Depth (MD):	10854.85	Top Setting Depth (TVD):	10569.93	Btm setting depth (MD):	15552.92	Btm setting depth (TVD):	10528.98
Size:	5-1/2"	Grade:	P-110	Weight (lbs/ft):	17	Joint (Butt,FJ, LTC,STC, SLH, N/A, Other):	Buttress

Condition (New/Used): New Standard (API/Non-API): API

Safety Factors

Collapse Design Safety Factor: 1.46 Burst Design Safety Factor: 1.21

Body Tensile Design Safety Factor type?: Dry/Buoyant Buoyant
Body Tensile Design Safety Factor: 2.09

Joint Tensile Design Safety Factor type?: Dry/Buoyant Buoyant
Joint Tensile Design Safety Factor: 2.18

Tapered String (Y/N)?: N
If yes, need spec attachment

BLACK & TAN 27 FED COM 202H - CMT DETAIL REVISED 1.15.20

CEMENT: SURFACE

Stage Tool Depth: N/A

Lead:

Top MD of Segment:	0	Btm MD of Segment:	1304
Cmt Type:	C	Cmt Additives:	4% Bentonite + 1% CaCl2
Quantity (sks):	664		
Yield (cu/ft/sk):	1.73	Volume (cu/ft):	1148.72
Density (lbs/gal):	13.5	Percent OH Excess:	25%

Tail:

Top MD of Segment:	1304	Btm MD of Segment:	1630
Cmt Type:	C	Cmt Additives:	1% CaCl2
Quantity (sks):	245		
Yield (cu/ft/sk):	1.33	Volume (cu/ft):	325.85
Density (lbs/gal):	14.8	Percent OH Excess:	25%

CEMENT: INTERMEDIATE

Single Stage

Lead:

Top MD of Segment:	0	Btm MD of Segment:	4690
Cmt Type:	C	Cmt Additives:	5% NaCl + 6% Bentonite + 0.2% Anti-Settling + 0.5% Retarder + 0.4% Retarder
Quantity (sks):	905		
Yield (cu/ft/sk):	1.99	Volume (cu/ft):	1800.95
Density (lbs/gal):	12.7	Percent OH Excess:	25%

Tail:

Top MD of Segment:	4690	Btm MD of Segment:	5690
Cmt Type:	C	Cmt Additives:	0.2% Retarder

Quantity (sks):	300		
Yield (cu/ft/sk):	1.33	Volume (cu/ft):	399
Density (lbs/gal):	14.8	Percent OH Excess:	25%

2 Stage Cement Job

*** DV tool depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. DV tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe. Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.**

***If lost circulation is encountered, Apache may 2-stage Interm csg. A DVT may be used in the 9-5/8" csg & ECP may be placed below DVT.**

1st Stage

Lead:

Top MD of Segment:	3460	Btm MD of Segment:	4690
Cmt Type:	C	Cmt Additives:	5% NaCl + 6% Bentonite + 0.2% Anti-Settling + 0.5% Retarder + 0.4% Retarder

Quantity (sks):	304		
Yield (cu/ft/sk):	1.99	Volume (cu/ft):	604.96
Density (lbs/gal):	12.7	Percent OH Excess:	25%

Tail:

Top MD of Segment:	4690	Btm MD of Segment:	5690
Cmt Type:	C	Cmt Additives:	0.3% Retarder

Quantity (sks):	300		
Yield (cu/ft/sk):	1.33	Volume (cu/ft):	399
Density (lbs/gal):	14.8	Percent OH Excess:	25%

Stage Tool / ECP Depth: ± 3460'

2nd Stage

Lead:

Top MD of Segment:	0	Btm MD of Segment:	2780.55

Cmt Type:	C	Cmt Additives:	5% NaCl + 6% Bentonite + 0.2% Anti-Settling + 0.5% Retarder + 0.4% Retarder
Quantity (sks):	525		
Yield (cu/ft/sk):	1.99	Volume (cu/ft):	1044.75
Density (lbs/gal):	12.7	Percent OH Excess:	25%

Tail:

Top MD of Segment:	2780.55	Btm MD of Segment:	3460
Cmt Type:	C	Cmt Additives:	0.3% Retarder
Quantity (sks):	200		
Yield (cu/ft/sk):	1.33	Volume (cu/ft):	266
Density (lbs/gal):	14.8	Percent OH Excess:	25%

CEMENT: PRODUCTION

Single Stage

Lead:

Top MD of Segment:	[redacted]	Btm MD of Segment:	10100.69
Cmt Type:	H	Cmt Additives:	[redacted]
Quantity (sks):	[redacted]		
Yield (cu/ft/sk):		Volume (cu/ft):	[redacted]
Density (lbs/gal):	11.9	Percent OH Excess:	20%

Tail:

Top MD of Segment:	10100.69	Btm MD of Segment:	15552.92
Cmt Type:	TXI Lite	Cmt Additives:	1.3% Salt + 5% Expanding Agent + 0.5% Fluid Loss + 0.35% Retarder + 0.1% Anti Settling + 0.2% Dispersant + 0.4 #/sk Defoamer
Quantity (sks):	[redacted]		
Yield (cu/ft/sk):		Volume (cu/ft):	[redacted]

Density (lbs/gal):	13.2	Percent OH Excess:	20%