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

Sundry Print Report

04/03/2024

Well Name: JAMES RANCH UNIT DI 7 SAWTOOTH

Well Location: T23S / R31E / SEC 6 / LOT 1 / 32.34001 / -103.809752

County or Parish/State: EDDY / NM

Well Number: 904H

Type of Well: OIL WELL

Allottee or Tribe Name:

Lease Number: NMNM02887A

Unit or CA Name: JAMES RANCH, JAMES RANCH UNIT

Unit or CA Number: NMNM070965Z, NMNM70965X

US Well Number: 3001550091

Well Status: Drilling Well

Operator: XTO PERMIAN OPERATING LLC

Notice of Intent

Sundry ID: 2755174

Type of Submission: Notice of Intent

Type of Action: APD Change

Date Sundry Submitted: 10/05/2023

Time Sundry Submitted: 05:02

Date proposed operation will begin: 10/05/2023

Procedure Description: ** Surface hole Change, First and Last Take Point Changes, Bottomhole Location Change, Drilling Plan Change, Casing/Cement Change XTO Permian Operating, LCC. requests permission to make the following changes to the original APD: No Additional Surface Disturbance SHL: fr/270'FNL & 400'F FEL to 155'FNL & 350'FEL, FTP: fr/1000'FNL & 990'FEL to 330'FNL & 2090'FWL, PPP #1: 189' FNL & 0' FWL, PPP#2: 1319' FNL & 1649' FWL, LTP: fr/2440'FNL & 990'FEL to 2540'FNL & 2090'FWL, BHL: fr/2490'FNL & 990'FEL to 2590'FNL & 2090'FWL, Section 17-T23S-R31E Additionally, XTO Permian Operating, LLC. respectfully requests permission to change from a three-string design to a four-string design. The surface, intermediate and production hole, casing, and cement based on the attached drilling program. Due to the design change in these strings, the wellhead configuration has also changed based on the attached drilling program. Casing/Cement design per the attached drilling program. Attachments: C102 Drilling Program MBS Directional Plan OLCV Spud BOP BTV Cement Variance

NOI Attachments

Procedure Description

JRU_7_Sawtooth_904H_Sundry_Attachments_20231005170003.pdf

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Conditions of Approval

Additional

Sec_06_23S_31E_NMP_Sundry_2755174_James_Ranch_Unit_DI_7_Sawtooth_904H_COAs_20231017095101.pdf

Sec_06_23S_31E_NMP_Sundry_2755174_James_Ranch_Unit_DI_7_Sawtooth_904H_Eng_Worksheet_20231017095101.pdf

Operator

I certify that the foregoing is true and correct. 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. Electronic submission of Sundry Notices through this system satisfies regulations requiring a

Operator Electronic Signature: CASSIE EVANS

Signed on: NOV 11, 2023 02:01 PM

Name: XTO PERMIAN OPERATING LLC

Title: Regulatory Analyst

Street Address: 6401 Holiday Hill Road, Bldg 5

City: Midland **State:** TX

Phone: (432) 218-3671

Email address: RANELL.KLEIN@EXXONMOBIL.COM

Field

Representative Name:

Street Address:

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

Phone:

Email address:

BLM Point of Contact

BLM POC Name: CHRISTOPHER WALLS

BLM POC Title: Petroleum Engineer

BLM POC Phone: 5752342234

BLM POC Email Address: cwalls@blm.gov

Disposition: Approved

Disposition Date: 12/29/2023

Signature: Chris Walls

Form 3160-5
(June 2019)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No. 1004-0137
Expires: October 31, 2021

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE *- Other instructions on page 2*

5. Lease Serial No.

6. If Indian, Allottee or Tribe Name

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

1. Type of Well
☐ Oil Well ☐ Gas Well ☐ Other

8. Well Name and No.

2. Name of Operator

9. API Well No.

3a. Address

3b. Phone No. *(include area code)*

10. Field and Pool or Exploratory Area

4. Location of Well *(Footage, Sec., T.,R.,M., or Survey Description)*

11. Country or Parish, State

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☐ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Subsequent Report	☐ Casing Repair	☐ New Construction	☐ Recomplete	☐ Other
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
☐ Final Abandonment Notice	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be perfonned or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has detennined that the site is ready for final inspection.)

14. I hereby certify that the foregoing is true and correct. Name *(Printed/Typed)*

Title

Signature

Date

THE SPACE FOR FEDERAL OR STATE OFICE USE

Approved by

Title

Date

Conditions of approval, if any, are attached. Approval of this notice 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.

Office

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.

(Instructions on page 2)

GENERAL INSTRUCTIONS

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

SPECIFIC INSTRUCTIONS

Item 4 - Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult the local Federal office for specific instructions.

Item 13: Proposals to abandon a well and subsequent reports of abandonment should include such special information as is required by the local Federal office. In addition, such proposals and reports should include reasons for the abandonment; data on any former or present productive zones or other zones with present significant fluid contents not sealed off by cement or otherwise; depths (top and bottom) and method of placement of cement plugs; mud or other material placed below, between and above plugs; amount, size, method of parting of any casing, liner or tubing pulled and the depth to the top of any tubing left in the hole; method of closing top of well and date well site conditioned for final inspection looking for approval of the abandonment. If the proposal will involve **hydraulic fracturing operations**, you must comply with 43 CFR 3162.3-3, including providing information about the protection of usable water. Operators should provide the best available information about all formations containing water and their depths. This information could include data and interpretation of resistivity logs run on nearby wells. Information may also be obtained from state or tribal regulatory agencies and from local BLM offices.

NOTICES

The privacy Act of 1974 and the regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.
AUTHORITY: 30 U.S.C. 181 et seq., 351 et seq., 25 U.S.C. 396; 43 CFR 3160.
PRINCIPAL PURPOSE: The information is used to: (1) Evaluate, when appropriate, approve applications, and report completion of subsequent well operations, on a Federal or Indian lease; and (2) document for administrative use, information for the management, disposal and use of National Resource lands and resources, such as: (a) evaluating the equipment and procedures to be used during a proposed subsequent well operation and reviewing the completed well operations for compliance with the approved plan; (b) requesting and granting approval to perform those actions covered by 43 CFR 3162.3-2, 3162.3-3, and 3162.3-4; (c) reporting the beginning or resumption of production, as required by 43 CFR 3162.4-1(c)and (d) analyzing future applications to drill or modify operations in light of data obtained and methods used.
ROUTINE USES: Information from the record and/or the record will be transferred to appropriate Federal, State, local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecutions in connection with congressional inquiries or to consumer reporting agencies to facilitate collection of debts owed the Government.
EFFECT OF NOT PROVIDING THE INFORMATION: Filing of this notice and report and disclosure of the information is mandatory for those subsequent well operations specified in 43 CFR 3162.3-2, 3162.3-3, 3162.3-4.

The Paperwork Reduction Act of 1995 requires us to inform you that:
The BLM collects this information to evaluate proposed and/or completed subsequent well operations on Federal or Indian oil and gas leases.
Response to this request is mandatory.
The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

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

Additional Information

Additional Remarks

PPP#2: 1319 FNL & 1649 FWL,

LTP: fr/2440FNL & 990FEL to 2540FNL & 2090FWL,

BHL: fr/2490FNL & 990FEL to 2590FNL & 2090FWL, Section 17-T23S-R31E

Additionally, XTO Permian Operating, LLC. respectfully requests permission to change from a three-string design to a four-string design. The surface, intermediate and production hole, casing, and cement based on the attached drilling program. Due to the design change in these strings, the wellhead configuration has also changed based on the attached drilling program.
Casing/Cement design per the attached drilling program.

Attachments:
C102
Drilling Program
MBS
Directional Plan
OLCV
Spud
BOP BTV
Cement Variance

Location of Well

0. SHL: LOT 1 / 270 FNL / 400 FEL / TWSP: 23S / RANGE: 31E / SECTION: 6 / LAT: 32.34001 / LONG: -103.809752 (TVD: 0 feet, MD: 0 feet)
PPP: NENE / 330 FNL / 990 FEL / TWSP: 23S / RANGE: 31E / SECTION: 7 / LAT: 32.32489 / LONG: -103.81068 (TVD: 11068 feet, MD: 15932 feet)
PPP: SESE / 990 FSL / 990 FEL / TWSP: 23S / RANGE: 31E / SECTION: 6 / LAT: 32.32808 / LONG: -103.81068 (TVD: 11068 feet, MD: 14612 feet)
PPP: SENE / 1650 FNL / 990 FEL / TWSP: 23S / RANGE: 31E / SECTION: 7 / LAT: 32.32112 / LONG: -103.81068 (TVD: 11068 feet, MD: 17252 feet)
PPP: LOT 1 / 1000 FNL / 990 FEL / TWSP: 23S / RANGE: 31E / SECTION: 6 / LAT: 32.338004 / LONG: -103.811655 (TVD: 11068 feet, MD: 11652 feet)
BHL: SENE / 2490 FNL / 990 FEL / TWSP: 23S / RANGE: 31E / SECTION: 18 / LAT: 32.304884 / LONG: -103.811591 (TVD: 11068 feet, MD: 23462 feet)

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	XTO Permian Operating
WELL NAME & NO.:	James Ranch Unit DI 7 Sawtooth 904H
LOCATION:	Sec 06-23S-31E-NMP
COUNTY:	Eddy County, New Mexico

*Changes approved through engineering via **Sundry 2755174** on 10/17/2023. Any previous COAs not addressed within the updated COAs still apply.*

COA

H_2S	○ No	◉ Yes		
Potash / WIPP	○ None	○ Secretary	◉ R-111-P	☐ WIPP
Cave / Karst	○ Low	◉ Medium	○ High	○ Critical
Wellhead	○ Conventional	◉ Multibowl	○ Both	○ Diverter
Cementing	☐ Primary Squeeze	☑ Cont. Squeeze	☑ EchoMeter	☐ DV Tool
Special Req	☑ Break Testing	☐ Water Disposal	☐ COM	☑ Unit
Variance	☑ Flex Hose	☐ Casing Clearance	☐ Pilot Hole	☐ Capitan Reef
Variance	☑ Four-String	☑ Offline Cementing	☐ Fluid-Filled	☐ Open Annulus
☐ **Batch APD / Sundry**				

A. HYDROGEN SULFIDE

A Hydrogen Sulfide (H2S) Drilling Plan shall be activated 500 feet prior to drilling into the **H2S Stream** (per BLM geologist). As a result, the Hydrogen Sulfide area must meet all requirements from 43 CFR 3176, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, please provide measured values and formations to the BLM.

B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately 621 feet (a minimum of 70 feet (Eddy County) into the Rustler Anhydrite, above the salt, and below usable fresh water) and cemented to the surface. ***Notes from the BLM geologist regarding this set point dictate:*** *Operator has extensive drilling experience in this area and has encountered lost circulation in BLM's preferred setpoint for the surface casing just below the Magenta Dolomite. BLM accepts the base of the Rustler Formation and Top of the Salt as surface casing setpoint. Operator must set surface casing at this depth and not deeper in the salt. If operator's proposed setpoint is deeper than top of salt, Operator will set surface casing at top of salt.*

a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
b. Wait on cement (WOC) time for a primary cement job will be a minimum of **24 hours in the Potash Area** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
d. If cement falls back, remedial cementing will be done prior to drilling out that string.

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:

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

❖ In R111 Potash Areas if cement does not circulate to surface on the first two salt protection casing strings, the cement on the 3rd casing salt string must come to surface.

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

Operator has proposed to cement in two stages by conventionally cementing the first stage and performing a bradenhead squeeze on the second stage, contingent upon no returns to surface.

a. First stage: Operator will cement with intent to reach the top of the **Brushy Canyon at 6550'**

b. Second stage:
- Operator will perform bradenhead squeeze and top-out. Cement to surface. If cement does not reach surface, the appropriate BLM office shall be notified. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst, Capitan Reef, or potash.**

Operator has proposed to pump down 9-5/8" X 7-5/8" annulus after primary cementing stage. Operator must run Echo-meter to verify Cement Slurry/Fluid top in the annulus OR operator shall run a CBL from TD of the 7-5/8" casing to surface after the second stage BH to verify TOC.

Submit results to the BLM. No displacement fluid/wash out shall be utilized at the top of the cement slurry between second stage BH and top out.

If cement does not reach surface, the next casing string must come to surface.

Operator must use a limited flush fluid volume of 1 bbl following backside cementing procedures.

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

    - Cement should tie-back at least **500 feet** into previous casing string. Operator shall provide method of verification. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst, Capitan Reef, or potash.**

C. PRESSURE CONTROL

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

2. Operator has proposed a multi-bowl wellhead assembly. 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 43 CFR 3172 must be followed.

D. SPECIAL REQUIREMENT (S)

Unit Wells

The well sign for a unit well shall include the unit number in addition to the surface and bottom hole lease numbers. This also applies to participating area numbers. If a participating area has not been established, the operator can use the general unit designation, but will replace the unit number with the participating area number when the sign is replaced.

Commercial Well Determination

A commercial well determination shall be submitted after production has been established for at least six months.

(Note: For a minimum 5M BOPE or less (Utilizing a 10M BOPE system)

BOPE Break Testing Variance

- BOPE Break Testing is ONLY permitted for 5M BOPE or less. **(Annular preventer must be tested to a minimum of 70% of BOPE working pressure and shall be higher than the MASP)**
- BOPE Break Testing is NOT permitted to drilling the production hole section.
- Variance only pertains to the intermediate hole-sections and no deeper than the Bone Springs formation.
- While in transfer between wells, the BOPE shall be secured by the hydraulic carrier or cradle.
- Any well control event while drilling require notification to the BLM Petroleum Engineer **(575-706-2779)** prior to the commencement of any BOPE Break Testing operations.
- A full BOPE test is required prior to drilling the first deep intermediate hole section. If any subsequent hole interval is deeper than the first, a full BOPE test will be required. (200' TVD tolerance between intermediate shoes is allowable).
- The BLM is to be contacted (575-361-2822 Eddy County) 4 hours prior to BOPE tests.
- As a minimum, a full BOPE test shall be performed at 21-day intervals.
- In the event any repairs or replacement of the BOPE is required, the BOPE shall test as per Onshore Oil and Gas Order No. 2.
- If in the event break testing is not utilized, then a full BOPE test would be conducted.

Offline Cementing

Contact the BLM prior to the commencement of any offline cementing procedure.

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
Email **or** call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, **BLM_NM_CFO_DrillingNotifications@BLM.GOV**
(575) 361-2822

☒ Lea County
Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240,
(575) 689-5981

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 **43 CFR part 3170 Subpart 3172** 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 integrity test can be done (prior to the cement setting up) immediately after bumping the plug.

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

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

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

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

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

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in **43 CFR part 3170 Subpart 3172** and **API STD 53 Sec. 5.3**.

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 **43 CFR part 3170 Subpart 3172** 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 cement), 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 cement plug. The BOPE test can be initiated after bumping the cement plug with the casing valve open. (only applies to single stage cement jobs, prior to the cement setting up.)

    c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer and can be initiated immediately with the casing valve open. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to **43 CFR part 3170**

Subpart 3172 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 **43 CFR part 3170 Subpart 3172**.

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.

Sec 06-23S-31E-NMP Sundry 2755174 James Ranch Unit DI 7 Sawtooth 904H Eng Worksheet

James Ranch Unit DI 7 Sawtooth 904H

13 3/8	surface csg in a	17 1/2	inch hole.	Design Factors			Surface			
Segment	#/ft	Grade	Coupling	Body	Collapse	Burst	Length	B@s	a-B	a-C	Weight
"A"	54.50	J 55	BTC	25.21	3.89	1.29	621	10	2.16	7.35	33,845
"B"			BTC				0				0
w/8.4#/g mud, 30min Sfc Csg Test psig:	1,500		Tail Cmt	does not	circ to sfc.		Totals:	621			33,845

Comparison of Proposed to Minimum Required Cement Volumes

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
17 1/2	0.6946	530	835	431	94	9.00	1266	2M	1.56

Site plat (pipe racks S or E) as per C-O-A III.D.4.i. not found.

9 5/8	casing inside the	13 3/8		Design Factors			Int 1				
Segment	#/ft	Grade	Coupling	Body	Collapse	Burst	Length	B@s	a-B	a-C	Weight
"A"	40.00	J 55	BTC	4.05	1.21	2.09	3,891	2	3.92	2.03	155,640
"B"							0				0
w/8.4#/g mud, 30min Sfc Csg Test psig:							Totals:	3,891			155,640
The cement volume(s) are intended to achieve a top of				0	ft from surface or a		621				overlap.

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
12 1/4	0.3132	1740	2413	1249	93	10.50	1009	2M	0.81

Class 'H' tail cmt yld > 1.20

7 5/8	casing inside the	9 5/8		Design Factors			Int 2				
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	B@s	a-B	a-C	Weight
"A"	29.70	RY P 110	Flush Joint	4.71	2.84	1.78	3,991	5	2.98	5.30	118,533
"B"	29.70	HCL 80	Flush Joint	∞	3.06	1.29	5,869	4	2.17	5.73	174,309
w/8.4#/g mud, 30min Sfc Csg Test psig:	1,500						Totals:	9,860			292,842
The cement volume(s) are intended to achieve a top of				0	ft from surface or a		3891				overlap.

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
8 3/4	0.1005	450	821	1022	-20	9.10	3176	5M	0.56

Tail cmt

5 1/2	casing inside the	7 5/8		Design Factors			Prod 1				
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	B@s	a-B	a-C	Weight
"A"	23.00	RY P 110	Semi-Premiur	2.70	2.73	1.88	9,760	2	3.15	4.58	224,480
"B"	23.00	RY P 110	Semi-Flush	∞	2.09	2.37	13,938	2	3.98	3.49	320,574
w/8.4#/g mud, 30min Sfc Csg Test psig:	2,147						Totals:	23,698			545,054
The cement volume(s) are intended to achieve a top of				9360	ft from surface or a		500				overlap.

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
6 3/4	0.0835	990	1542	1202	28	10.50			0.43

Class 'H' tail cmt yld > 1.20 Capitan Reef est top XXXX.

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
30-015-	40295	LOS MEDANOS; BONE SPRING

[4] Property Code	[5] Property Name	[6] Well Number
333473	JRU DI 7 SAWTOOTH FED COM	904H

[7] OGRID No.	[8] Operator Name	[9] Elevation
373075	XTO PERMIAN OPERATING, LLC	3,329'

[10] Surface Location

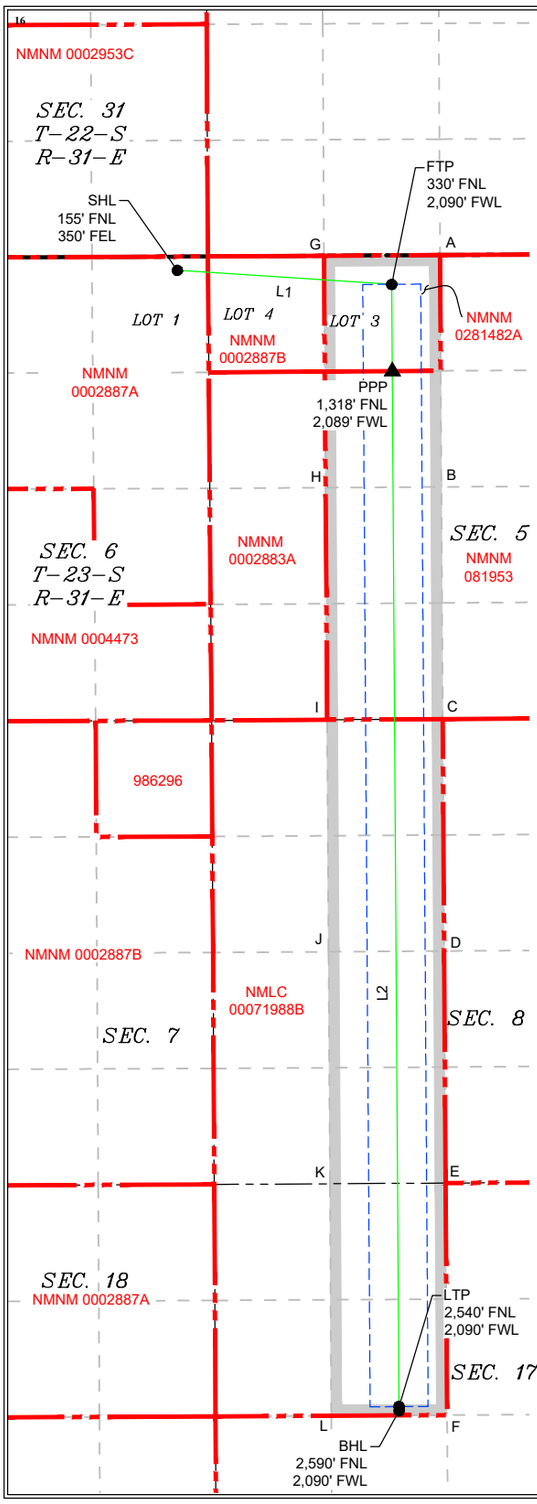
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
1	6	23 S	31 E		155	NORTH	350	EAST	EDDY

[11] Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
F	17	23 S	31 E		2,590	NORTH	2,090	WEST	EDDY

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
399.92			

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.



LINE TABLE		
LINE	AZUMITH	LENGTH
L1	273°45'08"	2,446.18'
L2	179°37'25"	12,820.50'

LOT ACREAGE TABLE

SECTION 6, T-23-S, R-31-E
LOT 1 = 39.98 ACRES

SECTION 5, T-23-S, R-31-E
LOT 4 = 39.98 ACRES
LOT 3 = 39.92 ACRES

LEGEND

- SECTION LINE
- WELL BORE
- NEW MEXICO MINERAL LEASE
- 330' BUFFER
- ALLOCATION AREA

COORDINATE TABLE

SHL (NAD 83 NME)	SHL (NAD 27 NME)
Y = 487,937.7 N	Y = 487,877.6 N
X = 703,090.1 E	X = 661,907.9 E
LAT. = 32.340325 °N	LAT. = 32.340202 °N
LONG. = 103.809590 °W	LONG. = 103.809099 °W

FTP (NAD 83 NME)	FTP (NAD 27 NME)
Y = 487,777.7 N	Y = 487,717.5 N
X = 705,531.0 E	X = 664,348.9 E
LAT. = 32.339852 °N	LAT. = 32.339729 °N
LONG. = 103.801689 °W	LONG. = 103.801199 °W

PPP (NAD 83 NME)	PPP (NAD 27 NME)
Y = 486,789.3 N	Y = 486,729.2 N
X = 705,537.5 E	X = 664,355.3 E
LAT. = 32.337135 °N	LAT. = 32.337012 °N
LONG. = 103.801684 °W	LONG. = 103.801194 °W

LTP (NAD 83 NME)	LTP (NAD 27 NME)
Y = 475,007.4 N	Y = 474,947.6 N
X = 705,615.0 E	X = 664,432.4 E
LAT. = 32.304749 °N	LAT. = 32.304625 °N
LONG. = 103.801623 °W	LONG. = 103.801134 °W

BHL (NAD 83 NME)	BHL (NAD 27 NME)
Y = 474,957.4 N	Y = 474,897.6 N
X = 705,615.3 E	X = 664,432.6 E
LAT. = 32.304611 °N	LAT. = 32.304488 °N
LONG. = 103.801623 °W	LONG. = 103.801134 °W

CORNER COORDINATES (NAD 83 NME)		CORNER COORDINATES (NAD 27 NME)	
A - Y = 488,111.1 N	A - X = 706,080.8 E	A - Y = 488,051.0 N	A - X = 664,898.6 E
B - Y = 485,472.0 N	B - X = 706,096.0 E	B - Y = 485,412.0 N	B - X = 664,913.8 E
C - Y = 482,831.3 N	C - X = 706,111.3 E	C - Y = 482,771.3 N	C - X = 664,928.9 E
D - Y = 480,191.1 N	D - X = 706,127.8 E	D - Y = 480,131.2 N	D - X = 664,945.3 E
E - Y = 477,550.9 N	E - X = 706,144.3 E	E - Y = 477,491.0 N	E - X = 664,961.7 E
F - Y = 474,910.4 N	F - X = 706,160.9 E	F - Y = 474,850.6 N	F - X = 664,978.2 E
G - Y = 488,102.8 N	G - X = 704,759.6 E	G - Y = 488,042.7 N	G - X = 663,577.5 E
H - Y = 485,463.3 N	H - X = 704,777.7 E	H - Y = 485,403.2 N	H - X = 663,595.5 E
I - Y = 482,823.0 N	I - X = 704,795.9 E	I - Y = 482,763.0 N	I - X = 663,613.5 E
J - Y = 480,182.9 N	J - X = 704,812.6 E	J - Y = 480,122.9 N	J - X = 663,630.1 E
K - Y = 477,543.1 N	K - X = 704,827.9 E	K - Y = 477,483.3 N	K - X = 663,645.4 E
L - Y = 474,903.2 N	L - X = 704,843.2 E	L - Y = 474,843.4 N	L - X = 663,660.6 E

[17] OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature Date

Printed Name

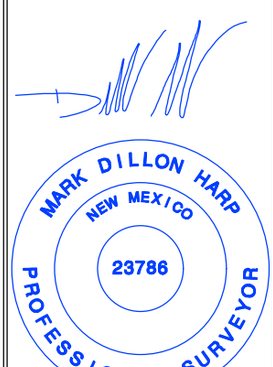
E-mail Address

[18] SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

08-02-2023
Date of Survey

Signature and Seal of Professional Surveyor:



MARK DILLON HARP 23786
Certificate Number

DB 618.013002.06-08

Instructions:

1) Enter all data into table below using the plat, geoprog, and directional plan
2) Enter GeoProg data directly into permit -- surface and intermediate casing/cement calculations are based on salt top & bot
3) If there is not a 3rd bone or Wolfcamp X/Y then hide the row from columns A - M
4) Enter Casing Specs on "Casing Design Page" for Burst, Collapse, and Tension

	Field Needs an Input
	Calculated Field
	Pull Down Menu

Input Data			
Well Name	JRU DI 7 Sawtooth FED COM 904H		
Well Formation and Lateral	3rd Bone Spring Shale		2.5 Mile L
Date Created	9/26/2023		
	SHL Data		BHL Da
Section	6		17
T	23	S	23
R	31	E	31
Northing	155	N	2590
Easting	350	E	2090
County	Eddy		

Formations			
Formation	Well Depth (TVD)	Water/Oil/Gas	
Rustler	324'	Water	
Top of Salt	646'	Water	
Base of Salt	3791'	Water	
Delaware	3998'	Water	
Brushy Canyon	6550'	Water/Oil/Gas	
Bone Spring	7863'	Water	
1st Bone Spring Ss	8893'	Water/Oil/Gas	
2nd Bone Spring Ss	9699'	Water/Oil/Gas	
3rd Bone Spring Sh	10306'	Water/Oil/Gas	
Target/Land Curve	**10454'**	**Water/Oil/Gas**	Match Directional Plan wh
BHL	**10666'**	**Water/Oil/Gas**	

Hole Sizes	
Hole Section	Hole Size
Surface	17.5
Intermediate 1	12.25

Intermediate 2	8.75
Production Curve	6.75
Production Lateral	6.75

Mud Weights	
Surface	8.5
Intermediate 1	10
Intermediate 2	8.6
Production	10

Casing Points		
Surface	621'	25' above Top Salt
Intermediate 1	3891'	100' below Base of Salt
Intermediate 2	9860'	~200' above KOP, but ensure casing is set in
DV Tool &/or Int 2 XO	3991'	100' below previous casing shoe (if needed)
Production	23698'	Equals BHL

Casing

Hole Section	Name	Size	Weight
Surface	13.375 | 54.5 | J-55 | BTC	13.375	54.5
Intermediate 1	9.625 | 40 | J-55 | BTC	9.625	40
Intermediate 2	7.625 | 29.7 | RY P-110 | Flush Joint	7.625	29.7
Intermediate 2	7.625 | 29.7 | HC L-80 | Flush Joint	7.625	29.7
Production	5.5 | 23 | RY P-110 | Semi-Premium	5.5	23
Production	5.5 | 23 | RY P-110 | Semi-Flush	5.5	23
Production	5.5 | 23 | RY P-110 | Semi-Flush	5.5	23

Directional		
	MD	TVD
KOP	10,469	9,820
Landing Point	11,594	10,536
TD	23,698	10,536

OH Logs		
If Yes, Paste if no, "NO" >	No	Check 8. to see that it reads correctly

Max Frac Pressure	
12000	psi

Temps

Surf Temp	BHT
85	180

** Calculated off LP TVD

Casing Table

Name	OD	Weight	Grade
20 | 169 | K-55 | BTC	20	169	K-55
18.625 | 87.5 | J-55 | BTC	18 5/8	87.5	J-55
13.375 | 68 | HC L-80 | BTC	13 3/8	68	HC L-80
13.375 | 54.5 | J-55 | BTC	13 3/8	54.5	J-55
9.625 | 40 | J-55 | BTC	9 5/8	40	J-55
9.625 | 40 | HC L-80 | BTC	9 5/8	40	HC L-80
9.625 | 53.5 | HC P-110 | BTC	9 5/8	53.5	HC P-110
9.625 | 40 | HC P-110 | BTC	9 5/8	40	HC P-110
7.625 | 29.7 | RY P-110 | Flush Joint	7 5/8	29.7	RY P-110
7.625 | 29.7 | CY P-110 | Flush Joint	7 5/8	29.7	CY P-110
7.625 | 29.7 | HC L-80 | Flush Joint	7 5/8	29.7	HC L-80
6 | 26 | P-110 | Semi-Flush	6	26	P-110
5.5 | 23 | RY P-110 | Semi-Flush	5 1/2	23	RY P-110
5.5 | 23 | RY P-110 | Semi-Premium	5 1/2	23	RY P-110
5.5 | 20 | RY P-110 | Semi-Flush	5 1/2	20	RY P-110
5.5 | 20 | RY P-110 | Semi-Premium	5 1/2	20	RY P-110

Open hole logging will not be done on this we

tom.

ateral

ata

S

E

N

W

en appropriate

competent rock per geo

Well Plan LP	10,536	(82)
Geoprog LP	10,454	
Well Plan KOP	10,469	
New KOP	10,387	

Check Hole sizes on Cement Calcs

Grade	Collar
J-55	BTC
J-55	BTC
RY P-110	Flush Joint
HC L-80	Flush Joint
RY P-110	Semi-Premium
RY P-110	Semi-Flush
RY P-110	Semi-Flush

Connection	Tube ID	Collapse	Burst	Tension	
BTC	18.376	2,500	3,380	2,689,000	K-55
BTC	17.755	630	2,250	1,329,000	J-55
BTC	12.415	2,690	5,020	1,545,000	HCL-80
BTC	12.615	1,130	2,740	909,000	J-55
BTC	8.835	2,750	3,950	630,000	J-55
BTC	8.835	4,230	5,750	916,000	HCL-80
BTC	8.835	9,190	10,900	1,718,000	P110 HC
BTC	8.535	4,230	7,910	1,266,000	P110 HC
Flush Joint	6.875	5,350	9,460	558,000	P110 RY -IFJ
Flush Joint	6.875	5,350	9,460	960,000	P110 CY - IFJ
Flush Joint	6.875	5,780	6,880	406,000	HCL-80 - IFJ
Semi-Flush	5.128	13,570	14,010	838,000	P-110 - Talon HTQ
Semi-Flush	4.67	14,540	14,530	707,000	P110 RY - Talon HTQ
Semi-Premium	4.67	14,540	14,520	729,000	P110 RY - Freedom HTQ
Semi-Flush	4.778	11,100	12,640	641,000	P110 RY - Talon HTQ
Semi-Premium	4.778	11,100	12,640	641,000	P110 RY - Freedom HTQ

DRILLING PLAN: BLM COMPLIANCE
(Supplement to BLM 3160-3)

XTO Energy Inc.
JRU DI 7 Sawtooth FED COM 904H
Projected TD: 23698.2' MD / 10536' TVD
SHL: 155' FNL & 350' FEL , Section 6, T23S, R31E
BHL: 2590' FNL & 2090' FWL , Section 17, T23S, R31E
Eddy County, NM

1. Geologic Name of Surface Formation

A. Quaternary

2. Estimated Tops of Geological Markers & Depths of Anticipated Fresh Water, Oil or Gas

Formation	Well Depth (TVD)	Water/Oil/Gas
Rustler	324'	Water
Top of Salt	646'	Water
Base of Salt	3791'	Water
Delaware	3998'	Water
Brushy Canyon	6550'	Water/Oil/Gas
Bone Spring	7863'	Water
1st Bone Spring Ss	8893'	Water/Oil/Gas
2nd Bone Spring Ss	9699'	Water/Oil/Gas
3rd Bone Spring Sh	10306'	Water/Oil/Gas
Target/Land Curve	10454'	Water/Oil/Gas

Rows hidde

*** Hydrocarbons @ Brushy Canyon
*** Groundwater depth 40’ (per NM State Engineers Office).

No other formations are expected to yield oil, gas or fresh water in measurable volumes. The surface fresh water sands will be protected by setting 13.375 inch casing @ 621' (25' above the salt) and circulating cement back to surface. The salt will be isolated by setting 9.625 inch casing at 3891' and circulating cement to surface. The second intermediate will isolate from the salt down to the next casing seat by setting 7.625 inch casing at 9860' and cementing to surface. A 6.75 inch curve and 6.75 inch lateral hole will be drilled to 23698.2 MD/TD and 5.5 inch production casing will be set at TD and cemented back up to 2nd intermediate (estimated TOC 9360 feet) per Potash regulations.

3. Casing Design

Hole Size	MD	TVD	OD Csg	Weight	Grade	Collar	New/Used	SF Burst	SF Collapse	SF Tension
17.5	0’ – 621'	571'	13.375	54.5	J-55	BTC	New	2.35	4.12	26.86
12.25	0’ – 3891'	3688'	9.625	40	J-55	BTC	New	1.76	2.32	4.05

8.75	0' – 3991'	3788'	7.625	29.7	RY P-110	Flush Joint	New	2.99	3.00	1.91
8.75	3991' – 9860'	9502'	7.625	29.7	HC L-80	Flush Joint	New	2.18	3.68	2.33
6.75	0' – 9760'	9409'	5.5	23	RY P-110	Semi-Premium	New	1.21	2.86	2.00
6.75	9760' - 23698.2'	10451'	5.5	23	RY P-110	Semi-Flush	New	1.21	2.65	5.06

· Production casing meets the clearance requiremenets as tapered string crosses over before encountering the intermediate shoe, per Onshore Order 2.3.B.1
· XTO requests the option to utilize a spudder rig (Atlas Copco RD20 or Equivalent) to set and cement surface and intermediate 1 casing per this Sundry
· XTO requests to not utilize centralizers in the curve and lateral
· 9.625 Collapse analyzed using 50% evacuation based on regional experience.
· 7.625 Collapse analyzed using 50% evacuation based on regional experience.
· 5.5 Tension calculated using vertical hanging weight plus the lateral weight multiplied by a friction factor of 0.35
· Test on 2M annular & Casing will be limited to 70% burst of the casing or 1500 psi, whichever is less
· XTO requests the option to use 5" BTC Float equipment for the the production casing

Wellhead:

Permanent Wellhead – Multibowl System
A. Starting Head: 13-5/8” 10M top flange x 13-3/8” bottom
B. Tubing Head: 13-5/8” 10M bottom flange x 7-1/16” 15M top flange
· Wellhead will be installed by manufacturer’s representatives.
· Manufacturer will monitor welding process to ensure appropriate temperature of seal.
· Operator will test the 7-5/8" casing per BLM Onshore Order 2
· Wellhead Manufacturer representative will not be present for BOP test plug installation

Check casing size here

4. Cement Program

Surface Casing: 13.375, 54.5 New BTC, J-55 casing to be set at +/- 621'

Lead: 230 sxs EconoCem-HLTRRC (mixed at 12.9 ppg, 1.87 ft3/sx, 10.13 gal/sx water)
Tail: 300 sxs Class C + 2% CaCl (mixed at 14.8 ppg, 1.35 ft3/sx, 6.39 gal/sx water)
Top of Cement: Surface
Compressives: 12-hr = 250 psi 24 hr = 500 psi

Due to the high probability of not getting cement to surface during conventional top-out jobs in the area, ~10-20 ppb gravel will be added on the backside of the 1" to get cement to surface, if required.

1st Intermediate Casing: 9.625, 40 New BTC, J-55 casing to be set at +/- 3891

Lead: 1610 sxs Class C (mixed at 12.9 ppg, 1.39 ft3/sx, 10.13 gal/sx water)
Tail: 130 sxs Class C + 2% CaCl (mixed at 14.8 ppg, 1.35 ft3/sx, 6.39 gal/sx water)
Top of Cement: Surface
Compressives: 12-hr = 900 psi 24 hr = 1500 psi

2nd Intermediate Casing: 7.625, 29.7 New casing to be set at +/- 9860'

DV Tool can be hidder

1st Stage
Optional Lead: 150 sxs Class C (mixed at 10.5 ppg, 2.77 ft3/sx, 15.59 gal/sx water)
TOC: 3691
Tail: 300 sxs Class C (mixed at 14.8 ppg, 1.35 ft3/sx, 6.39 gal/sx water)
TOC: Brushy Canyon @ 6550
Compressives: 12-hr = 900 psi 24 hr = 1150 psi

2nd Stage
Lead: 0 sxs Class C (mixed at 12.9 ppg, 2.16 ft3/sx, 9.61 gal/sx water)
Tail: 410 sxs Class C (mixed at 14.8 ppg, 1.33 ft3/sx, 6.39 gal/sx water)
Top of Cement: 0
Compressives: 12-hr = 900 psi 24 hr = 1150 psi

Bradenhead squeeze I

XTO requests to pump a two stage cement job on the 7-5/8" intermediate casing string with the first stage being pumped conventionally with the calculated top of cement at the Brush Canyon (6550') and the second stage performed as a bradenhead squeeze with planned cement from the Brushy Canyon to surface. If cement is not visually confirmed to circulate to surface, the final cement top after the second stage job will be verified by Echo-meter. If necessary, a top out consisting of 1,500 sack of Class C cement + 3% Salt + 1% PreMag-M + 6% Bentonite Gel (2.30 yld, 12.91 ppg) will be executed as a contingency. If cement is still unable to circulate to surface, another Echo-meter run will be performed for cement top verification.

XTO will include the Echo-meter verified fluid top and the volume of displacement fluid above the cement slurry in the annulus in all post-drill sundries on wells utilizing this cement program.

XTO will report to the BLM the volume of fluid (limited to 5 bbls) used to flush intermediate casing valves following backside cementing procedures.

XTO requests to pump an Optional Lead if well conditions dictate in an attempt to bring cement to surface. If cement reaches the desired height, the BLM will be notified and the second stage bradenhead squeeze and subsequent TOC verification will be negated.

XTO requests the option to conduct the bradenhead squeeze and TOC verification offline as per standard approval from BLM when unplanned remediation is needed and batch drilling is approved. In the event the bradenhead is conducted, we will ensure the first stage cement job is cemented properly and the well is static with floats holding and no pressure on the csg annulus as with all other casing strings where batch drilling operations occur before moving off the rig. The TA cap will also be installed per Cactus procedure and pressure inside the casing will be monitored via the valve on the TA cap as per standard batch drilling ops.

Production Casing: 5.5, 23 New Semi-Flush, RY P-110 casing to be set at +/- 23698.2

Lead: 40 sxs NeoCem (mixed at 11.5 ppg, 2.69 ft3/sx, 15.00 gal/sx water) Top of Cement: 9360 feet
Tail: 950 sxs VersaCem (mixed at 13.2 ppg, 1.51 ft3/sx, 8.38 gal/sx water) Top of Cement: 10469.2 feet
Compressives: 12-hr = 1375 psi 24 hr = 2285 psi

XTO requests the option to offline cement and remediate (if needed) surface and intermediate casing strings where batch drilling is approved and if unplanned remediation is needed. XTO will ensure well is static with no pressure on the csg annulus, as with all other casing strings where batch drilling operations occur before moving off the rig. The TA cap will also be installed when applicable per Cactus procedure and pressure inside the casing will be monitored via the valve on the TA cap as per standard batch drilling ops. Offline cement operations will then be conducted after the rig is moved off the current well to the next well in the batch sequence.

5. Pressure Control Equipment

Temporary wellhead/d

Check casing sizes he

Once the permanent WH is installed on the 13.375 casing, the blow out preventer equipment (BOP) will consist of a 13-5/8" minimum 5M Hydril and a 13-5/8" minimum 5M Double Ram BOP. MASP should not exceed 3161 psi. In any instance where 10M BOP is required by BLM, XTO requests a variance to utilize 5M annular with 10M ram preventers (a common BOP configuration, which allows use of 10M rams in unlikely event that pressures exceed 5M).

All BOP testing will be done by an independent service company. Annular pressure tests will be limited to 50% of the working pressure. When nippling up on the 13.375, 5M bradenhead and flange, the BOP test will be limited to 5000 psi. When nippling up on the 7.625, the BOP will be tested to a minimum of 5000 psi. All BOP tests will include a low pressure test as per BLM regulations. The 5M BOP diagrams are attached. Blind rams will be functioned tested each trip, pipe rams will be functioned tested each day.

A variance is requested to allow use of a flex hose as the choke line from the BOP to the Choke Manifold. If this hose is used, a copy of the manufacturer's certification and pressure test chart will be kept on the rig. Attached is an example of a certification and pressure test chart. The manufacturer does not require anchors.

XTO requests a variance to be able to batch drill this well if necessary. In doing so, XTO will set casing and ensure that the well is cemented properly (unless approval is given for offline cementing) and the well is static. With floats holding, no pressure on the csg annulus, and the installation of a 10K TA cap as per Cactus recommendations, XTO will contact the BLM to skid the rig to drill the remaining wells on the pad. Once surface and both intermediate strings are all completed, XTO will begin drilling the production hole on each of the wells.

A variance is requested to **ONLY** test broken pressure seals on the BOP equipment when moving from wellhead to wellhead which is in compliance with API Standard 53. API standard 53 states, that for pad drilling operation, moving from one wellhead to another within 21 days, pressure testing is required for pressure-containing and pressure-controlling connections when the integrity of a pressure seal is broken. Based on discussions with the BLM on February 27th 2020, we will request permission to **ONLY** retest broken pressure seals if the following conditions are met: 1. After a full BOP test is conducted on the first well on the pad 2. When skidding to drill an intermediate section that does not penetrate into the Wolfcamp.

6. Proposed Mud Circulation System

INTERVAL	Hole Size	Mud Type	MW (ppg)	Viscosity (sec/qt)	Fluid Loss (cc)
0' - 621'	17.5	FW/Native	8.5-9	35-40	NC
621' - 3891'	12.25	Brine	10-10.5	30-32	NC
3891' to 9860'	8.75	BDE/OBM or FW/Brine	8.6-9.1	30-32	NC
9860' to 23698.2'	6.75	OBM	10-10.5	50-60	NC - 20

Check properties

The necessary mud products for weight addition and fluid loss control will be on location at all times.

Spud with fresh water/native mud. Drill out from under 13-3/8" surface casing with brine solution. A 10.0 ppg -10.5 ppg brine mud will be used while drilling through the salt formation. Use fibrous materials as needed to control seepage and lost circulation. Pump viscous sweeps as needed for hole cleaning. Pump speed will be recorded on a daily drilling report after mudding up. A Pason or Totco will be used to detect changes in loss or gain of mud volume. A mud test will be performed every 24 hours to determine: density, viscosity, strength, filtration and pH as necessary. Use available solids controls equipment to help keep mud weight down after mud up. Rig up solids control equipment to operate as a closed loop system.

Double che

7. Auxiliary Well Control and Monitoring Equipment

A. A Kelly cock will be in the drill string at all times.
B. A full opening drill pipe stabbing valve having appropriate connections will be on the rig floor at all times.
C. H2S monitors will be on location when drilling below the 13.375 casing.

8. Logging, Coring and Testing Program

Mud Logger: Mud Logging Unit (2 man) below intermediate casing.

Open hole logging will not be done on this well.

9. Abnormal Pressures and Temperatures / Potential Hazards

None Anticipated. BHT of 170 to 190 F is anticipated. No H2S is expected but monitors will be in place to detect any H2S occurrences. Should these circumstances be encountered the operator and drilling contractor are prepared to take all necessary steps to ensure safety of all personnel and environment. Lost circulation could occur but is not expected to be a serious problem in this area and hole seepage will be compensated for by additions of small amounts of LCM in the drilling fluid. The maximum anticipated bottom hole pressure for this well is 5479 psi.

10. Anticipated Starting Date and Duration of Operations

Anticipated spud date will be after BLM approval. Move in operations and drilling is expected to take 40 days.

JRU DI 7 Sawtooth FED COM 904H	**23,698** ft TD	9/26/2023

Field Needs an Input		BLM Min. Burst:	1
Calculated Field		BLM Min. Collapse:	1.125
Collapse Assumptions		BLM Min. Tension (Dry):	1.6
Burst Assumptions		BLM Min. Tension (Buoyed):	1.8

13.375 | 54.5 | J-55 | BTC — 621 MD/TVD — 8.5 ppg mud

collapse = 1130 — Burst = 2740 — Tension = 909000

Collapse				
(8.5)(0.052)(621) =	274 psi	1130/274 =	4.12	SF for collapse
Burst				
Max exp. surf pressure	1167 psi	2740/1167.3 =	2.35	SF for burst
Tension				
(621)(54.5)=	33844.5 lb	909/33.8 =	26.86	SF for tension

Burst Assumes MASP Equation (10)(0.052)(3891) - (.22)(3891)

9.625 | 40 | J-55 | BTC — 3891 MD/TVD — 10 # mud

Collapse = 2750 — Burst = 3950 — Tension = 630000

Collapse				
(10)(0.052)(3891) * =	1184 psi	2750/1184 =	2.32	SF for collapse
*Less internal fluid height				
Burst				
Max expected surf pressure =	2240 psi	3950/2240.192 =	1.76	SF for burst
Tension				
(3891)(40)=	155640 lb	630/155.64 =	4.05	SF for tension

Collapse Assumes 1/2 evacuation & FW internal
Fluid Top: 1946 MD/TVD

Burst Assumes MASP Equation (8.6)(0.052)(9860) - (.22)(9860)

7.625 | 29.7 | RY P-110 | Flush Joint — 0 Top MD/TVD — 3991 Bottom MD/TVD — 8.6 # mud

Collapse = 5350 — Burst = 9460 — Tension = 558000

Collapse				
(8.6)(0.052)(3991)=	1785 psi	5350/1785=	3.00	SF for collapse
Burst				
Max expected surf pressure =	3161 psi	9460/3160.8=	2.99	SF for burst
Tension				
(3991*29.7)+(5869*29.7)=	292842 lb	558/292.842=	1.91	SF for tension

Collapse Assumes full evacuation

Burst Assumes MASP Equation (10)(0.052)(10536) - (.22)(10536)

7.625 | 29.7 | HC L-80 | Flush Joint — 3991 Top MD/TVD — 9860 TD MD/TVD — 8.6 # mud

Collapse = 5780 — Burst = 6880 — Tension = 406000

Collapse				
(8.6)(0.052)(9860) * =	1572 psi	5780/1572=	3.68	SF for collapse
*Less internal fluid height				
Burst				
Max expected surf pressure =	3161 psi	6880/3160.8=	2.18	SF for burst
Tension				
(5869)(29.7)=	174309.3 lb	406/174.3093=	2.33	SF for tension

Collapse Assumes 1/3 evacuation & FW internal
Fluid Top: 6573 MD/TVD

Burst Assumes MASP Equation (10)(0.052)(10536) - (.22)(10536)

5.5 | 23 | RY P-110 | Semi-Premium — 0 Top — 9,760 TD (MD) — 10 # mud — 0.35 FF

Collapse = 14540 — Burst= 14520 — Tension= 729000

Collapse				
(10)(0.052)(9760) =	5075 psi	14540/5075=	2.86	SF for collapse
Burst				
Max expected surf pressure =	12000 psi *for frac	14520/12000=	1.21	SF for burst
Tension				
#REF!	364104 lb	729/364.1038=	2.00	SF for tension

5.5 | 23 | RY P-110 | Semi-Flush — 9,760 Top — 23,698 TD (MD) — 10,536 TVD (max) — 10 # mud — 0.35 FF — 11,594 LP (MD) — 12104 Lat Length

Collapse= 14540 — Burst= 14530 — Tension= 707000

Collapse				
(10)(0.052)(10536) =	5479 psi	14540/5479=	2.65	SF for collapse
Burst				
Max expected surf pressure =	12000 psi *for frac	14530/12000=	1.21	SF for burst
Tension				
#REF!	139624 lb	707/139.6238=	5.06	SF for tension

Surface Cement			1st Intermediate	
Top of Cement:	0 ft, MD		Top of Cement:	0
Casing Shoe:	621 ft, MD		Casing Shoe:	3891
Hole Size:	17.5 in		Hole Size:	12.25
Casing Size:	13.375 in		Casing Size:	9.625
Lead			Lead	
% Excess, OH	100 %		% Excess, OH	100
yield	1.87 ft^3 / sack		yield	1.39
TOC for Lead	0 ft, MD		TOC for Lead	0
Tail			Tail	
% Excess, OH	100 %		% Excess, OH	100
yield	1.35 ft^3 / sack		yield	1.35
TOC for Tail	321 ft, MD		TOC for Tail	3,591
Lead Calcs			*Lead Calcs*	
Annular Volume:	445.98 ft^3 (w/ excess)		Annular Volume:	2249.44
Cement Volume:	238.5 sacks		Cement Volume:	1618.3
Tail Calcs			*Tail Calcs*	
Annular Volume:	416.81 ft^3 (w/ excess)		Annular Volume:	187.92
Cement Volume:	308.7 sacks		Cement Volume:	139.2

Field Needs an Input
Calculated Field

	2nd Intermediate, 2nd Stage			2nd Intermediate,
ft, MD	Top of Cement:	0	ft, MD	Top of Cem
ft, MD	Bottom of Cement:	3,691	ft, MD	Casing Sho
in	Hole Size:	8.75	in	Hole Size:
in	Casing Size:	7.625	in	Casing Size
	Lead			Lead
%	% Excess, OH	100	%	% Excess,
ft^3 / sack	yield	2.16	ft^3 / sack	yield
ft, MD	TOC for Lead	0	ft, MD	TOC for Le
	Tail			Tail
%	% Excess, OH	50	%	% Excess,
ft^3 / sack	yield	1.33	ft^3 / sack	yield
ft, MD	TOC for Tail	0	ft, MD	TOC for Ta
	Lead Calcs			*Lead Calcs*
ft^3 (w/ excess)	Annular Volume:	0.00	ft^3 (w/ excess)	Annular Vo
sacks	Cement Volume:	0.0	sacks	Cement Vo
	Tail Calcs			*Tail Calcs*
ft^3 (w/ excess)	Annular Volume:	556.32	ft^3 (w/ excess)	Annular Vo
sacks	Cement Volume:	418.3	sacks	Cement Vo

1st Stage			Production Cement		
ıent:	3691	ft, MD	Top of Cement:	9360	ft, MD
ɔe:	9860	ft, MD	Casing Shoe:	23,698	ft, MD
			Kick Off Point:	10,469	ft, MD
	8.75	in	Landing Point:	11,594	ft, MD
e:	7.625	in	Hole Size 1:	6.75	in
			Hole Size 2:	6.75	in
			Casing Size 1:	5.5	in
			Casing Size 2:	5.5	in
			XO Depth:	0	ft, MD
			Lead		
OH	50	%	% Excess, OH	30	%
	2.77	ft^3 / sack	yield	2.69	ft^3 / sack
ad	3,691	ft, MD	TOC for Lead	9,360	ft, MD
			Tail		
OH	25	%	% Excess, OH	30	%
	1.35	ft^3 / sack	yield	1.51	ft^3 / sack
il	6,550	ft, MD	TOC for Tail	10,469	ft, MD
			Lead Calcs		
lume:	430.91	ft^3 (w/ excess)	Annular Volume:	120.43	ft^3 (w/ excess)
lume:	155.6	sacks	Cement Volume:	44.8	sacks
			Tail Calcs		
lume:	415.74	ft^3 (w/ excess)	Annular Volume:	1436.38	ft^3 (w/ excess)
lume:	308.0	sacks	Cement Volume:	951.2	sacks

= Calculate

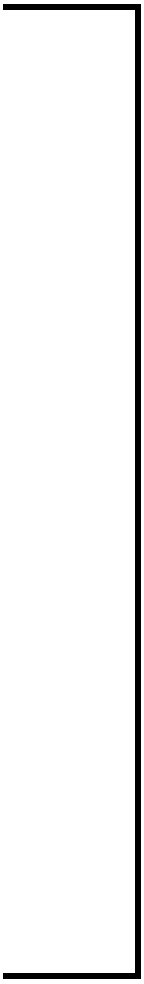
		Field Needs an Input
		Calculated Field

Permanent System

Prod MW =	10	ppg	
Max TVD =	10,536	ft	
			3M system if MASP < 3000
BHP =	5479	psi	5M system if 3000 < MASP < 5000
			10M system if MASP > 5000
MASP =	**3161**	**psi**	
Permit for =	5M		
	5000	psi	

Temporary System (if required)

1st Int MW =	10	ppg	
Max TVD =	3891	ft	
			2M system if MASP < 3000
BHP =	2023	psi	5M system if 2000 < MASP < 5000
MASP =	**1167**	**psi**	
Permit for =	2M		
	2000		



JRU DI 7 Sawtooth FED COM 904H

3rd Bone Spring Shale | 2.5 Mile Lateral

County: Eddy County, NM
SHL: SHL: 155' FNL & 350' FEL , Section 6, T23S, R31E
BHL: BHL: 2590' FNL & 2090' FWL , Section 17, T23S, R31E
Area: Potash mines (~4,500')

TVD	Geology	Casing & Cement	Wellhead	Hole Size	General Notes
120'	*Conductor*		(Tech Data Sheet)	17.5"	
324'	Rustler				
		13.375 | 54.5 | J-55 | BTC	**621' MD**	12-1/4"	
646'	Top of Salt				
3,791'	Base of Salt				
		9.625 | 40 | J-55 | BTC	**3891' MD**	8-3/4"	
3,998'	Delaware/Lamar				
			Composite DV Tool (If Required)		
6,550'	Brushy Canyon Ss.				
7,863'	Bone Spring Lm				
8,893'	1st Bone Spring Ss.				
		7.625 | 29.7 | RY P-110 | Flush Joint **7.625 | 29.7 | HC L-80 | Flush Joint**	**9860' MD**	6-3/4" Curve	
			KOP 10469' MD 9820' TVD		
9,699'	2nd Bone Spring Ss.			6-3/4" Lateral	
			LP 11594' MD 10536' TVD		
		5.5 | 23 | RY P-110 | Semi-Premium **5.5 | 23 | RY P-110 | Semi-Flush**		**23,698' MD**	
10,536'	Landing TVD	**5.5 | 23 | RY P-110 | Semi-Flush**		**10,536' TVD @ BHL**	
10,536'	TVD @ BHL				

Formations
1st Bone Spring
1st Bone Spring Sand
2nd Bone Spring
2nd Bone Spring Shale
2nd Bone Spring Sand
3rd Bone Spring
3rd Bone Spring Shale
3rd Bone Spring Sand
Wolfcamp X
Wolfcamp Y
Wolfcamp X/Y
Wolfcamp A
Wolfcamp B
Wolfcamp B/C
Wolfcamp C
Wolfcamp D/E
Wolfcamp D
Wolfcamp E

Lateral Length
1 Mile Lateral
1.5 Mile Lateral
2 Mile Lateral
2.25 Mile Lateral
2.5 Mile Lateral
3 Mile Lateral
3.5 Mile Lateral
4 Mile Lateral

1st Bone Spring
1st Bone Spring
1st Bone Spring
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3rd Bone Spring Shale
Wolfcamp X
Wolfcamp X
Wolfcamp X
Wolfcamp X
Wolfcamp X
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Wolfcamp X
Wolfcamp Y
Wolfcamp Y
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Wolfcamp Y
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Wolfcamp B
Wolfcamp B
Wolfcamp D/E
Wolfcamp D/E
Wolfcamp D/E
Wolfcamp D/E
Wolfcamp D/E
Wolfcamp D/E
Wolfcamp D/E
1st Bone Spring Sand
1st Bone Spring Sand
1st Bone Spring Sand
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Wolfcamp C
Wolfcamp C
Wolfcamp C
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Wolfcamp C
Wolfcamp C
Wolfcamp C
Wolfcamp B/C
Wolfcamp B/C
Wolfcamp B/C
Wolfcamp B/C
Wolfcamp B/C

Wolfcamp B/C
Wolfcamp B/C
Wolfcamp D
Wolfcamp D
Wolfcamp D
Wolfcamp D
Wolfcamp D
Wolfcamp D
Wolfcamp D
Wolfcamp E
Wolfcamp E
Wolfcamp E
Wolfcamp E
Wolfcamp E
Wolfcamp E
Wolfcamp E
Wolfcamp X/Y
Wolfcamp X/Y
Wolfcamp X/Y
Wolfcamp X/Y
Wolfcamp X/Y
Wolfcamp X/Y
Wolfcamp X/Y
1st Bone Spring
2nd Bone Spring
3rd Bone Spring
3rd Bone Spring Shale
Wolfcamp X
Wolfcamp Y
Wolfcamp A
Wolfcamp B
Wolfcamp D/E
1st Bone Spring Sand
2nd Bone Spring Shale
2nd Bone Spring Sand
3rd Bone Spring Sand
Wolfcamp C
Wolfcamp B/C
Wolfcamp D
Wolfcamp E
Wolfcamp X/Y

Target formation and Lateral Length: 3rd Bone Spring Shale 2.5 Mile Lateral

		Production 1
1 Mile Lateral	1st Bone Spring 1 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
1.5 Mile Lateral	1st Bone Spring 1.5 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2 Mile Lateral	1st Bone Spring 2 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2.5 Mile Lateral	1st Bone Spring 2.5 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3 Mile Lateral	1st Bone Spring 3 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3.5 Mile Lateral	1st Bone Spring 3.5 Mile Lateral	6 | 26 | P-110 | Semi-Flush
4 Mile Lateral	1st Bone Spring 4 Mile Lateral	6 | 26 | P-110 | Semi-Flush
1 Mile Lateral	2nd Bone Spring 1 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
1.5 Mile Lateral	2nd Bone Spring 1.5 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2 Mile Lateral	2nd Bone Spring 2 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2.5 Mile Lateral	2nd Bone Spring 2.5 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3 Mile Lateral	2nd Bone Spring 3 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3.5 Mile Lateral	2nd Bone Spring 3.5 Mile Lateral	6 | 26 | P-110 | Semi-Flush
4 Mile Lateral	2nd Bone Spring 4 Mile Lateral	6 | 26 | P-110 | Semi-Flush
1 Mile Lateral	3rd Bone Spring 1 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
1.5 Mile Lateral	3rd Bone Spring 1.5 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2 Mile Lateral	3rd Bone Spring 2 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2.5 Mile Lateral	3rd Bone Spring 2.5 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3 Mile Lateral	3rd Bone Spring 3 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3.5 Mile Lateral	3rd Bone Spring 3.5 Mile Lateral	6 | 26 | P-110 | Semi-Flush
4 Mile Lateral	3rd Bone Spring 4 Mile Lateral	6 | 26 | P-110 | Semi-Flush
1 Mile Lateral	3rd Bone Spring Shale 1 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
1.5 Mile Lateral	3rd Bone Spring Shale 1.5 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2 Mile Lateral	3rd Bone Spring Shale 2 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2.5 Mile Lateral	3rd Bone Spring Shale 2.5 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3 Mile Lateral	3rd Bone Spring Shale 3 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3.5 Mile Lateral	3rd Bone Spring Shale 3.5 Mile Lateral	6 | 26 | P-110 | Semi-Flush
4 Mile Lateral	3rd Bone Spring Shale 4 Mile Lateral	6 | 26 | P-110 | Semi-Flush
1 Mile Lateral	Wolfcamp X 1 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
1.5 Mile Lateral	Wolfcamp X 1.5 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2 Mile Lateral	Wolfcamp X 2 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
2.5 Mile Lateral	Wolfcamp X 2.5 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3 Mile Lateral	Wolfcamp X 3 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3.5 Mile Lateral	Wolfcamp X 3.5 Mile Lateral	6 | 26 | P-110 | Semi-Flush
4 Mile Lateral	Wolfcamp X 4 Mile Lateral	6 | 26 | P-110 | Semi-Flush
1 Mile Lateral	Wolfcamp Y 1 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
1.5 Mile Lateral	Wolfcamp Y 1.5 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2 Mile Lateral	Wolfcamp Y 2 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
2.5 Mile Lateral	Wolfcamp Y 2.5 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3 Mile Lateral	Wolfcamp Y 3 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3.5 Mile Lateral	Wolfcamp Y 3.5 Mile Lateral	6 | 26 | P-110 | Semi-Flush
4 Mile Lateral	Wolfcamp Y 4 Mile Lateral	6 | 26 | P-110 | Semi-Flush
1 Mile Lateral	Wolfcamp A 1 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
1.5 Mile Lateral	Wolfcamp A 1.5 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2 Mile Lateral	Wolfcamp A 2 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
2.5 Mile Lateral	Wolfcamp A 2.5 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3 Mile Lateral	Wolfcamp A 3 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3.5 Mile Lateral	Wolfcamp A 3.5 Mile Lateral	6 | 26 | P-110 | Semi-Flush

4 Mile Lateral	Wolfcamp A 4 Mile Lateral	6 | 26 | P-110 | Semi-Flush
1 Mile Lateral	Wolfcamp B 1 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
1.5 Mile Lateral	Wolfcamp B 1.5 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2 Mile Lateral	Wolfcamp B 2 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
2.5 Mile Lateral	Wolfcamp B 2.5 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3 Mile Lateral	Wolfcamp B 3 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3.5 Mile Lateral	Wolfcamp B 3.5 Mile Lateral	6 | 26 | P-110 | Semi-Flush
4 Mile Lateral	Wolfcamp B 4 Mile Lateral	6 | 26 | P-110 | Semi-Flush
1 Mile Lateral	Wolfcamp D/E 1 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
1.5 Mile Lateral	Wolfcamp D/E 1.5 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2 Mile Lateral	Wolfcamp D/E 2 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
2.5 Mile Lateral	Wolfcamp D/E 2.5 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3 Mile Lateral	Wolfcamp D/E 3 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3.5 Mile Lateral	Wolfcamp D/E 3.5 Mile Lateral	6 | 26 | P-110 | Semi-Flush
4 Mile Lateral	Wolfcamp D/E 4 Mile Lateral	6 | 26 | P-110 | Semi-Flush
1 Mile Lateral	1st Bone Spring Sand 1 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
1.5 Mile Lateral	1st Bone Spring Sand 1.5 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2 Mile Lateral	1st Bone Spring Sand 2 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2.5 Mile Lateral	1st Bone Spring Sand 2.5 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3 Mile Lateral	1st Bone Spring Sand 3 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3.5 Mile Lateral	1st Bone Spring Sand 3.5 Mile Lateral	6 | 26 | P-110 | Semi-Flush
4 Mile Lateral	1st Bone Spring Sand 4 Mile Lateral	6 | 26 | P-110 | Semi-Flush
1 Mile Lateral	2nd Bone Spring Shale 1 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
1.5 Mile Lateral	2nd Bone Spring Shale 1.5 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2 Mile Lateral	2nd Bone Spring Shale 2 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2.5 Mile Lateral	2nd Bone Spring Shale 2.5 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3 Mile Lateral	2nd Bone Spring Shale 3 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3.5 Mile Lateral	2nd Bone Spring Shale 3.5 Mile Lateral	6 | 26 | P-110 | Semi-Flush
4 Mile Lateral	2nd Bone Spring Shale 4 Mile Lateral	6 | 26 | P-110 | Semi-Flush
1 Mile Lateral	2nd Bone Spring Sand 1 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
1.5 Mile Lateral	2nd Bone Spring Sand 1.5 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2 Mile Lateral	2nd Bone Spring Sand 2 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2.5 Mile Lateral	2nd Bone Spring Sand 2.5 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3 Mile Lateral	2nd Bone Spring Sand 3 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3.5 Mile Lateral	2nd Bone Spring Sand 3.5 Mile Lateral	6 | 26 | P-110 | Semi-Flush
4 Mile Lateral	2nd Bone Spring Sand 4 Mile Lateral	6 | 26 | P-110 | Semi-Flush
1 Mile Lateral	3rd Bone Spring Sand 1 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
1.5 Mile Lateral	3rd Bone Spring Sand 1.5 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2 Mile Lateral	3rd Bone Spring Sand 2 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2.5 Mile Lateral	3rd Bone Spring Sand 2.5 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3 Mile Lateral	3rd Bone Spring Sand 3 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3.5 Mile Lateral	3rd Bone Spring Sand 3.5 Mile Lateral	6 | 26 | P-110 | Semi-Flush
4 Mile Lateral	3rd Bone Spring Sand 4 Mile Lateral	6 | 26 | P-110 | Semi-Flush
1 Mile Lateral	Wolfcamp C 1 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
1.5 Mile Lateral	Wolfcamp C 1.5 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2 Mile Lateral	Wolfcamp C 2 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
2.5 Mile Lateral	Wolfcamp C 2.5 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3 Mile Lateral	Wolfcamp C 3 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3.5 Mile Lateral	Wolfcamp C 3.5 Mile Lateral	6 | 26 | P-110 | Semi-Flush
4 Mile Lateral	Wolfcamp C 4 Mile Lateral	6 | 26 | P-110 | Semi-Flush
1 Mile Lateral	Wolfcamp B/C 1 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
1.5 Mile Lateral	Wolfcamp B/C 1.5 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2 Mile Lateral	Wolfcamp B/C 2 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
2.5 Mile Lateral	Wolfcamp B/C 2.5 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3 Mile Lateral	Wolfcamp B/C 3 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium

3.5 Mile Lateral	Wolfcamp B/C 3.5 Mile Lateral	6 | 26 | P-110 | Semi-Flush
4 Mile Lateral	Wolfcamp B/C 4 Mile Lateral	6 | 26 | P-110 | Semi-Flush
1 Mile Lateral	Wolfcamp D 1 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
1.5 Mile Lateral	Wolfcamp D 1.5 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2 Mile Lateral	Wolfcamp D 2 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
2.5 Mile Lateral	Wolfcamp D 2.5 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3 Mile Lateral	Wolfcamp D 3 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3.5 Mile Lateral	Wolfcamp D 3.5 Mile Lateral	6 | 26 | P-110 | Semi-Flush
4 Mile Lateral	Wolfcamp D 4 Mile Lateral	6 | 26 | P-110 | Semi-Flush
1 Mile Lateral	Wolfcamp E 1 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
1.5 Mile Lateral	Wolfcamp E 1.5 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2 Mile Lateral	Wolfcamp E 2 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
2.5 Mile Lateral	Wolfcamp E 2.5 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3 Mile Lateral	Wolfcamp E 3 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3.5 Mile Lateral	Wolfcamp E 3.5 Mile Lateral	6 | 26 | P-110 | Semi-Flush
4 Mile Lateral	Wolfcamp E 4 Mile Lateral	6 | 26 | P-110 | Semi-Flush
1 Mile Lateral	Wolfcamp X/Y 1 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
1.5 Mile Lateral	Wolfcamp X/Y 1.5 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2 Mile Lateral	Wolfcamp X/Y 2 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
2.5 Mile Lateral	Wolfcamp X/Y 2.5 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3 Mile Lateral	Wolfcamp X/Y 3 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
3.5 Mile Lateral	Wolfcamp X/Y 3.5 Mile Lateral	6 | 26 | P-110 | Semi-Flush
4 Mile Lateral	Wolfcamp X/Y 4 Mile Lateral	6 | 26 | P-110 | Semi-Flush
2.25 Mile Lateral	1st Bone Spring 2.25 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2.25 Mile Lateral	2nd Bone Spring 2.25 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2.25 Mile Lateral	3rd Bone Spring 2.25 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2.25 Mile Lateral	3rd Bone Spring Shale 2.25 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2.25 Mile Lateral	Wolfcamp X 2.25 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
2.25 Mile Lateral	Wolfcamp Y 2.25 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
2.25 Mile Lateral	Wolfcamp A 2.25 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
2.25 Mile Lateral	Wolfcamp B 2.25 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
2.25 Mile Lateral	Wolfcamp D/E 2.25 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
2.25 Mile Lateral	1st Bone Spring Sand 2.25 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2.25 Mile Lateral	2nd Bone Spring Shale 2.25 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2.25 Mile Lateral	2nd Bone Spring Sand 2.25 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2.25 Mile Lateral	3rd Bone Spring Sand 2.25 Mile Lateral	5.5 | 20 | RY P-110 | Semi-Premium
2.25 Mile Lateral	Wolfcamp C 2.25 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
2.25 Mile Lateral	Wolfcamp B/C 2.25 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
2.25 Mile Lateral	Wolfcamp D 2.25 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
2.25 Mile Lateral	Wolfcamp E 2.25 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium
2.25 Mile Lateral	Wolfcamp X/Y 2.25 Mile Lateral	5.5 | 23 | RY P-110 | Semi-Premium

Production 1	Production 2
5.5 | 23 | RY P-110 | Semi-Premium	5.5 | 23 | RY P-110 | Semi-Flush

Production 2	Production 3
5.5 | 20 | RY P-110 | Semi-Flush	5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush	5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush	5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush	5.5 | 23 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush	5.5 | 23 | RY P-110 | Semi-Flush
6 | 26 | P-110 | Semi-Flush	6 | 26 | P-110 | Semi-Flush
6 | 26 | P-110 | Semi-Flush	6 | 26 | P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush	5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush	5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush	5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush	5.5 | 23 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush	5.5 | 23 | RY P-110 | Semi-Flush
6 | 26 | P-110 | Semi-Flush	6 | 26 | P-110 | Semi-Flush
6 | 26 | P-110 | Semi-Flush	6 | 26 | P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush	5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush	5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush	5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush	5.5 | 23 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush	5.5 | 23 | RY P-110 | Semi-Flush
6 | 26 | P-110 | Semi-Flush	6 | 26 | P-110 | Semi-Flush
6 | 26 | P-110 | Semi-Flush	6 | 26 | P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush	5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush	5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush	5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush	5.5 | 23 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush	5.5 | 23 | RY P-110 | Semi-Flush
6 | 26 | P-110 | Semi-Flush	6 | 26 | P-110 | Semi-Flush
6 | 26 | P-110 | Semi-Flush	6 | 26 | P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush	5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush	5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush	5.5 | 23 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush	5.5 | 23 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush	5.5 | 23 | RY P-110 | Semi-Flush
6 | 26 | P-110 | Semi-Flush	6 | 26 | P-110 | Semi-Flush
6 | 26 | P-110 | Semi-Flush	6 | 26 | P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush	5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush	5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush	5.5 | 23 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush	5.5 | 23 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush	5.5 | 23 | RY P-110 | Semi-Flush
6 | 26 | P-110 | Semi-Flush	6 | 26 | P-110 | Semi-Flush
6 | 26 | P-110 | Semi-Flush	6 | 26 | P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush	5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush	5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush	5.5 | 23 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush	5.5 | 23 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush	5.5 | 23 | RY P-110 | Semi-Flush
6 | 26 | P-110 | Semi-Flush	6 | 26 | P-110 | Semi-Flush

6	26	P-110	Semi-Flush
5.5	20	RY P-110	Semi-Flush
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6	26	P-110	Semi-Flush
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6 | 26 | P-110 | Semi-Flush
6 | 26 | P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush
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5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush
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5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush
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5.5 | 20 | RY P-110 | Semi-Flush
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5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush
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6 | 26 | P-110 | Semi-Flush
6 | 26 | P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush
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5.5 | 23 | RY P-110 | Semi-Flush
6 | 26 | P-110 | Semi-Flush
6 | 26 | P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush
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6 | 26 | P-110 | Semi-Flush
6 | 26 | P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush
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5.5 | 20 | RY P-110 | Semi-Flush
5.5 | 20 | RY P-110 | Semi-Flush
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5.5 | 23 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush
5.5 | 23 | RY P-110 | Semi-Flush

Production 3	Max Frac Pressure
5.5 | 23 | RY P-110 | Semi-Flush	12000

Max Frac Pressure
10000
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Name
20 | 169 | K-55 | BTC
18.625 | 87.5 | J-55 | BTC
13.375 | 68 | HC L-80 | BT
13.375 | 54.5 | J-55 | BTC
9.625 | 40 | J-55 | BTC
9.625 | 40 | HC L-80 | BTC
9.625 | 53.5 | HC P110 | B
9.625 | 40 | HC P110 | BT
7.625 | 29.7 | P110 RY -IF
7.625 | 29.7 | P110 CY - IF
7.625 | 29.7 | HCL-80 - IFJ
6 | 26 | P-110 - Talon HTQ
5.5 | 23 | P110 RY - Talon
5.5 | 23 | P110 RY - VAM S
5.5 | 23 | P110 RY - Freed
5.5 | 20 | P110 RY - Talon
5.5 | 20 | P110 RY - Freed

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Casing Table			
	OD	Weight	Grade
	20	169	K-55
	18 5/8	87.5	J-55
C	13 3/8	68	HC L-80
	13 3/8	54.5	J-55
	9 5/8	40	J-55
	9 5/8	40	HC L-80
TC	9 5/8	53.5	HC P110
C	9 5/8	40	HC P110
J | Flush Joint	7 5/8	29.7	P110 RY -IFJ
J | Flush Joint	7 5/8	29.7	P110 CY - IFJ
| Flush Joint	7 5/8	29.7	HCL-80 - IFJ
| Semi-Flush	6	26	P-110 - Talon HTC
HTQ | Semi-Flu	5 1/2	23	P110 RY - Talon HT
SPRINT | Semi-F	5 1/2	23	P110 RY - VAM SPR
om HTQ | Semi-	5 1/2	23	P110 RY - Freedom H
HTQ | Semi-Flu	5 1/2	20	P110 RY - Talon HT
om HTQ | Semi-	5 1/2	20	P110 RY - Freedom H

	Connection	Tube ID	Collapse	Burst	Tension
	BTC	18.376	2,500	3,380	2,689,000
	BTC	17.755	630	2,250	1,329,000
	BTC	12.415	2,690	5,020	1,545,000
	BTC	12.615	1,130	2,740	909,000
	BTC	8.835	2,750	3,950	630,000
	BTC	8.835	4,230	5,750	916,000
	BTC	8.835	9,190	10,900	1,718,000
	BTC	8.535	4,230	7,910	1,266,000
	Flush Joint	6.875	5,350	9,460	558,000
	Flush Joint	6.875	5,350	9,460	960,000
	Flush Joint	6.875	5,780	6,880	406,000
Q	Semi-Flush	5.128	13,570	14,010	838,000
TQ	Semi-Flush	4.67	14,540	14,530	707,000
INT	Semi-Flush	4.67	14,550	14,530	671,000
HTQ	Semi-Premium	4.67	14,540	14,520	729,000
TQ	Semi-Flush	4.778	11,100	12,640	641,000
HTQ	Semi-Premium	4.778	11,100	12,640	641,000

Well Plan Report - 904H

Measured Depth: 23698.16 ft

TVD RKB: 10536.00 ft

Location

Cartographic Reference System: New Mexico East - NAD 27

Northing: 487877.60 ft

Easting: 661907.90 ft

RKB: 3361.00 ft

Ground Level: 3315.00 ft

North Reference: Grid

Convergence Angle: 0.28 Deg

Site: JRU DI7

Plan Sections 904H

Measured Depth (ft)	Inclination (Deg)	Azimuth (Deg)	TVD RKB (ft)	Y Offset (ft)	X Offset (ft)	Build Rate (Deg/100ft)	Turn Rate (Deg/100ft)	Dogleg Rate (Deg/100ft)
0	0	0.01	0	0	0	0	0	0
1200	0	0.01	1200	0	0	0	0	0
2917.63	34.35	93.76	2816.56	-32.76	498.6	2	0	2
5481.75	34.35	93.76	4933.44	-127.63	1942.38	0	0	0
7199.38	0	0.01	6550	-160.39	2440.98	-2	0	2
10469.18	0	0.01	9819.8	-160.39	2440.98	0	0	0
11594.18	90	179.63	10536	-876.57	2445.58	8	15.97	8
23648.16	90	179.63	10536	-12930.3	2522.95	0	0	0
23698.16	90	179.63	10536	-12980.3	2523.27	0	0	0

Position Uncertainty	904H

Measured Depth (ft)	Inclination (°)	Azimuth (°)	TVD RKB (ft)	Highside Error (ft)	Bias (ft)	Lateral Error (ft)	Bias (ft)	Vertical Error (ft)
0	0	0.007	0	0	0	0	0	0
100	0	0	100	0.358	0	0.179	0	2.3
200	0	0	200	0.717	0	0.538	0	2.309
300	0	0	300	1.075	0	0.896	0	2.325
400	0	0	400	1.434	0	1.255	0	2.347
500	0	0	500	1.792	0	1.613	0	2.374
600	0	0	600	2.151	0	1.972	0	2.406
700	0	0	700	2.509	0	2.33	0	2.443
800	0	0	800	2.868	0	2.689	0	2.485
900	0	0	900	3.226	0	3.047	0	2.531
1000	0	0	1000	3.585	0	3.405	0	2.58
1100	0	0	1100	3.943	0	3.764	0	2.634
1200	0	0.007	1200	4.302	0	4.122	0	2.69
1300	2	93.759	1299.98	4.47	0	4.651	0	2.749
1400	4	93.759	1399.838	4.805	0	4.994	0	2.809
1500	6	93.759	1499.452	5.137	0	5.342	0	2.87
1600	8	93.759	1598.702	5.465	0	5.693	0	2.932
1700	10	93.759	1697.465	5.79	0	6.049	0	2.995

1800	12	93.759	1795.623	6.112	0	6.41	0	3.06
1900	14	93.759	1893.055	6.431	0	6.776	0	3.128
2000	16	93.759	1989.643	6.747	0	7.15	0	3.2
2100	18	93.759	2085.269	7.062	0	7.533	0	3.277
2200	20	93.759	2179.816	7.375	0	7.926	0	3.361
2300	22	93.759	2273.169	7.687	0	8.332	0	3.453
2400	24	93.759	2365.215	7.999	0	8.752	0	3.555
2500	26	93.759	2455.841	8.312	0	9.189	0	3.669
2600	28	93.759	2544.937	8.625	0	9.645	0	3.797
2700	30	93.759	2632.395	8.94	0	10.122	0	3.942
2800	32	93.759	2718.107	9.257	0	10.624	0	4.106
2900	34	93.759	2801.97	9.576	0	11.152	0	4.289
2917.631	34.353	93.759	2816.556	9.632	0	11.247	0	4.316
3000	34.353	93.759	2884.558	10.001	0	11.702	0	4.498
3100	34.353	93.759	2967.116	10.457	0	12.269	0	4.731
3200	34.353	93.759	3049.674	10.92	0	12.848	0	4.973
3300	34.353	93.759	3132.232	11.389	0	13.439	0	5.224
3400	34.353	93.759	3214.79	11.864	0	14.04	0	5.481
3500	34.353	93.759	3297.348	12.344	0	14.649	0	5.744
3600	34.353	93.759	3379.906	12.828	0	15.265	0	6.013
3700	34.353	93.759	3462.464	13.317	0	15.888	0	6.286

3800	34.353	93.759	3545.022	13.809	0	16.517	0	6.563
3900	34.353	93.759	3627.581	14.304	0	17.152	0	6.844
4000	34.353	93.759	3710.139	14.802	0	17.79	0	7.129
4100	34.353	93.759	3792.697	15.302	0	18.434	0	7.416
4200	34.353	93.759	3875.255	15.805	0	19.08	0	7.706
4300	34.353	93.759	3957.813	16.31	0	19.731	0	7.998
4400	34.353	93.759	4040.371	16.817	0	20.384	0	8.292
4500	34.353	93.759	4122.929	17.326	0	21.04	0	8.589
4600	34.353	93.759	4205.487	17.836	0	21.699	0	8.887
4700	34.353	93.759	4288.045	18.348	0	22.36	0	9.187
4800	34.353	93.759	4370.603	18.861	0	23.023	0	9.488
4900	34.353	93.759	4453.161	19.375	0	23.688	0	9.791
5000	34.353	93.759	4535.719	19.891	0	24.354	0	10.095
5100	34.353	93.759	4618.277	20.408	0	25.023	0	10.401
5200	34.353	93.759	4700.835	20.925	0	25.693	0	10.707
5300	34.353	93.759	4783.393	21.444	0	26.364	0	11.015
5400	34.353	93.759	4865.951	21.963	0	27.037	0	11.324
5481.752	34.353	93.759	4933.444	22.388	0	27.587	0	11.578
5500	33.988	93.759	4948.542	22.502	0	27.709	0	11.635
5600	31.988	93.759	5032.416	23.107	0	28.364	0	11.937
5700	29.988	93.759	5118.14	23.674	0	28.989	0	12.224

5800	27.988	93.759	5205.608	24.203	0	29.585	0	12.493
5900	25.988	93.759	5294.714	24.692	0	30.151	0	12.744
6000	23.988	93.759	5385.349	25.141	0	30.687	0	12.977
6100	21.988	93.759	5477.403	25.548	0	31.193	0	13.193
6200	19.988	93.759	5570.764	25.912	0	31.67	0	13.393
6300	17.988	93.759	5665.318	26.234	0	32.119	0	13.578
6400	15.988	93.759	5760.95	26.511	0	32.54	0	13.747
6500	13.988	93.759	5857.543	26.744	0	32.935	0	13.903
6600	11.988	93.759	5954.98	26.932	0	33.304	0	14.046
6700	9.988	93.759	6053.142	27.076	0	33.649	0	14.178
6800	7.988	93.759	6151.909	27.175	0	33.972	0	14.299
6900	5.988	93.759	6251.161	27.229	0	34.273	0	14.411
7000	3.988	93.759	6350.778	27.238	0	34.554	0	14.515
7100	1.988	93.759	6450.637	27.204	0	34.817	0	14.613
7199.383	0	0.007	6550	34.977	0	27.233	0	14.704
7300	0	0	6650.617	35.22	0	27.505	0	14.795
7400	0	0	6750.617	35.464	0	27.776	0	14.888
7500	0	0	6850.617	35.71	0	28.049	0	14.985
7600	0	0	6950.617	35.958	0	28.325	0	15.083
7700	0	0	7050.617	36.207	0	28.602	0	15.185
7800	0	0	7150.617	36.459	0	28.881	0	15.29

7900	0	0	7250.617	36.712	0	29.161	0	15.397
8000	0	0	7350.617	36.967	0	29.444	0	15.508
8100	0	0	7450.617	37.224	0	29.728	0	15.621
8200	0	0	7550.617	37.482	0	30.013	0	15.738
8300	0	0	7650.617	37.742	0	30.301	0	15.858
8400	0	0	7750.617	38.003	0	30.589	0	15.98
8500	0	0	7850.617	38.266	0	30.879	0	16.106
8600	0	0	7950.617	38.531	0	31.171	0	16.236
8700	0	0	8050.617	38.797	0	31.464	0	16.368
8800	0	0	8150.617	39.065	0	31.758	0	16.504
8900	0	0	8250.617	39.334	0	32.054	0	16.643
9000	0	0	8350.617	39.604	0	32.35	0	16.786
9100	0	0	8450.617	39.876	0	32.649	0	16.932
9200	0	0	8550.617	40.149	0	32.948	0	17.081
9300	0	0	8650.617	40.424	0	33.248	0	17.234
9400	0	0	8750.617	40.7	0	33.55	0	17.39
9500	0	0	8850.617	40.977	0	33.853	0	17.55
9600	0	0	8950.617	41.255	0	34.156	0	17.713
9700	0	0	9050.617	41.535	0	34.461	0	17.88
9800	0	0	9150.617	41.816	0	34.767	0	18.05
9900	0	0	9250.617	42.098	0	35.074	0	18.224

10000	0	0	9350.617	42.381	0	35.382	0	18.401
10100	0	0	9450.617	42.665	0	35.69	0	18.582
10200	0	0	9550.617	42.951	0	36	0	18.767
10300	0	0	9650.617	43.237	0	36.311	0	18.956
10400	0	0	9750.617	43.525	0	36.622	0	19.148
10469.183	0	0.007	9819.8	43.725	0	36.838	0	19.282
10500	2.465	179.632	9850.607	43.77	0	36.943	0	19.343
10600	10.465	179.632	9949.891	43.49	0	37.24	0	19.547
10700	18.465	179.632	10046.642	42.549	0	37.531	0	19.763
10800	26.465	179.632	10138.978	40.989	0	37.815	0	20
10900	34.465	179.632	10225.102	38.88	0	38.088	0	20.265
11000	42.465	179.632	10303.337	36.32	0	38.348	0	20.561
11100	50.465	179.632	10372.16	33.446	0	38.595	0	20.892
11200	58.465	179.632	10430.233	30.442	0	38.827	0	21.259
11300	66.465	179.632	10476.424	27.557	0	39.043	0	21.661
11400	74.465	179.632	10509.834	25.113	0	39.243	0	22.094
11500	82.465	179.632	10529.815	23.484	0	39.424	0	22.55
11594.183	90	179.632	10535.997	22.992	0	39.575	0	22.992
11600	90	179.632	10535.997	23.019	0	39.584	0	23.019
11700	90	179.632	10535.997	23.501	0	39.746	0	23.501
11800	90	179.632	10535.997	23.998	0	39.926	0	23.998

11900	90	179.632	10535.997	24.511	0	40.125	0	24.511
12000	90	179.632	10535.997	25.037	0	40.342	0	25.037
12100	90	179.632	10535.997	25.577	0	40.577	0	25.577
12200	90	179.632	10535.997	26.129	0	40.83	0	26.129
12300	90	179.632	10535.997	26.693	0	41.1	0	26.693
12400	90	179.632	10535.997	27.268	0	41.387	0	27.268
12500	90	179.632	10535.997	27.853	0	41.69	0	27.853
12600	90	179.632	10535.997	28.448	0	42.01	0	28.448
12700	90	179.632	10535.997	29.052	0	42.346	0	29.052
12800	90	179.632	10535.998	29.664	0	42.697	0	29.664
12900	90	179.632	10535.998	30.284	0	43.064	0	30.284
13000	90	179.632	10535.998	30.912	0	43.445	0	30.912
13100	90	179.632	10535.998	31.547	0	43.841	0	31.547
13200	90	179.632	10535.998	32.188	0	44.25	0	32.188
13300	90	179.632	10535.998	32.835	0	44.673	0	32.835
13400	90	179.632	10535.998	33.489	0	45.11	0	33.489
13500	90	179.632	10535.998	34.148	0	45.559	0	34.148
13600	90	179.632	10535.998	34.812	0	46.021	0	34.812
13700	90	179.632	10535.998	35.481	0	46.495	0	35.481
13800	90	179.632	10535.998	36.155	0	46.98	0	36.155
13900	90	179.632	10535.998	36.833	0	47.477	0	36.833

14000	90	179.632	10535.998	37.515	0	47.985	0	37.515
14100	90	179.632	10535.998	38.201	0	48.504	0	38.201
14200	90	179.632	10535.998	38.891	0	49.033	0	38.891
14300	90	179.632	10535.998	39.585	0	49.572	0	39.585
14400	90	179.632	10535.998	40.282	0	50.12	0	40.282
14500	90	179.632	10535.998	40.982	0	50.678	0	40.982
14600	90	179.632	10535.998	41.685	0	51.245	0	41.685
14700	90	179.632	10535.998	42.391	0	51.821	0	42.391
14800	90	179.632	10535.998	43.099	0	52.405	0	43.099
14900	90	179.632	10535.998	43.811	0	52.998	0	43.811
15000	90	179.632	10535.998	44.524	0	53.598	0	44.524
15100	90	179.632	10535.998	45.24	0	54.206	0	45.24
15200	90	179.632	10535.998	45.959	0	54.822	0	45.959
15300	90	179.632	10535.998	46.679	0	55.444	0	46.679
15400	90	179.632	10535.998	47.402	0	56.074	0	47.402
15500	90	179.632	10535.998	48.126	0	56.71	0	48.126
15600	90	179.632	10535.998	48.853	0	57.353	0	48.853
15700	90	179.632	10535.998	49.581	0	58.002	0	49.581
15800	90	179.632	10535.998	50.31	0	58.657	0	50.31
15900	90	179.632	10535.998	51.042	0	59.318	0	51.042
16000	90	179.632	10535.998	51.775	0	59.984	0	51.775

16100	90	179.632	10535.998	52.509	0	60.656	0	52.509
16200	90	179.632	10535.998	53.245	0	61.333	0	53.245
16300	90	179.632	10535.998	53.983	0	62.016	0	53.983
16400	90	179.632	10535.998	54.721	0	62.703	0	54.721
16500	90	179.632	10535.998	55.461	0	63.395	0	55.461
16600	90	179.632	10535.998	56.202	0	64.092	0	56.202
16700	90	179.632	10535.998	56.944	0	64.793	0	56.944
16800	90	179.632	10535.998	57.688	0	65.498	0	57.688
16900	90	179.632	10535.998	58.432	0	66.208	0	58.432
17000	90	179.632	10535.998	59.178	0	66.922	0	59.178
17100	90	179.632	10535.999	59.924	0	67.639	0	59.924
17200	90	179.632	10535.999	60.672	0	68.361	0	60.672
17300	90	179.632	10535.999	61.42	0	69.086	0	61.42
17400	90	179.632	10535.999	62.17	0	69.815	0	62.17
17500	90	179.632	10535.999	62.92	0	70.547	0	62.92
17600	90	179.632	10535.999	63.671	0	71.283	0	63.671
17700	90	179.632	10535.999	64.423	0	72.022	0	64.423
17800	90	179.632	10535.999	65.175	0	72.764	0	65.175
17900	90	179.632	10535.999	65.929	0	73.509	0	65.929
18000	90	179.632	10535.999	66.683	0	74.257	0	66.683
18100	90	179.632	10535.999	67.437	0	75.008	0	67.437

18200	90	179.632	10535.999	68.193	0	75.761	0	68.193
18300	90	179.632	10535.999	68.949	0	76.518	0	68.949
18400	90	179.632	10535.999	69.706	0	77.277	0	69.706
18500	90	179.632	10535.999	70.463	0	78.038	0	70.463
18600	90	179.632	10535.999	71.221	0	78.802	0	71.221
18700	90	179.632	10535.999	71.98	0	79.569	0	71.98
18800	90	179.632	10535.999	72.739	0	80.338	0	72.739
18900	90	179.632	10535.999	73.498	0	81.109	0	73.498
19000	90	179.632	10535.999	74.259	0	81.882	0	74.259
19100	90	179.632	10535.999	75.019	0	82.658	0	75.019
19200	90	179.632	10535.999	75.78	0	83.435	0	75.78
19300	90	179.632	10535.999	76.542	0	84.215	0	76.542
19400	90	179.632	10535.999	77.304	0	84.996	0	77.304
19500	90	179.632	10535.999	78.067	0	85.78	0	78.067
19600	90	179.632	10535.999	78.83	0	86.565	0	78.83
19700	90	179.632	10535.999	79.593	0	87.352	0	79.593
19800	90	179.632	10535.999	80.357	0	88.141	0	80.357
19900	90	179.632	10535.999	81.121	0	88.932	0	81.121
20000	90	179.632	10535.999	81.886	0	89.724	0	81.886
20100	90	179.632	10535.999	82.651	0	90.518	0	82.651
20200	90	179.632	10535.999	83.416	0	91.314	0	83.416

20300	90	179.632	10535.999	84.182	0	92.111	0	84.182
20400	90	179.632	10535.999	84.948	0	92.909	0	84.948
20500	90	179.632	10535.999	85.714	0	93.71	0	85.714
20600	90	179.632	10535.999	86.481	0	94.511	0	86.481
20700	90	179.632	10535.999	87.248	0	95.314	0	87.248
20800	90	179.632	10535.999	88.015	0	96.118	0	88.015
20900	90	179.632	10535.999	88.783	0	96.924	0	88.783
21000	90	179.632	10535.999	89.551	0	97.731	0	89.551
21100	90	179.632	10535.999	90.319	0	98.539	0	90.319
21200	90	179.632	10535.999	91.088	0	99.348	0	91.088
21300	90	179.632	10535.999	91.856	0	100.159	0	91.856
21400	90	179.632	10535.999	92.625	0	100.971	0	92.625
21500	90	179.632	10536	93.395	0	101.784	0	93.395
21600	90	179.632	10536	94.164	0	102.598	0	94.164
21700	90	179.632	10536	94.934	0	103.413	0	94.934
21800	90	179.632	10536	95.704	0	104.229	0	95.704
21900	90	179.632	10536	96.475	0	105.046	0	96.475
22000	90	179.632	10536	97.245	0	105.864	0	97.245
22100	90	179.632	10536	98.016	0	106.684	0	98.016
22200	90	179.632	10536	98.787	0	107.504	0	98.787
22300	90	179.632	10536	99.558	0	108.325	0	99.558

22400	90	179.632	10536	100.33	0	109.147	0	100.33
22500	90	179.632	10536	101.101	0	109.97	0	101.101
22600	90	179.632	10536	101.873	0	110.794	0	101.873
22700	90	179.632	10536	102.645	0	111.619	0	102.645
22800	90	179.632	10536	103.417	0	112.444	0	103.417
22900	90	179.632	10536	104.19	0	113.271	0	104.19
23000	90	179.632	10536	104.962	0	114.098	0	104.962
23100	90	179.632	10536	105.735	0	114.926	0	105.735
23200	90	179.632	10536	106.508	0	115.755	0	106.508
23300	90	179.632	10536	107.281	0	116.584	0	107.281
23400	90	179.632	10536	108.054	0	117.415	0	108.054
23500	90	179.632	10536	108.828	0	118.246	0	108.828
23600	90	179.632	10536	109.601	0	119.077	0	109.601
23648.159	90	179.632	10536	109.974	0	119.478	0	109.974
23698.159	90	179.632	10536	110.361	0	119.893	0	110.361

Plan Targets	904H

Target Name	Measured Depth (ft)	Grid Northing (ft)	Grid Easting (ft)	TVD MSL (ft)	Target Shape
904H_JRU LTP	23647.89	474947.6	664432.4	7175	LOCATION
904H_JRU BHL	23697.89	474897.6	664432.6	7175	LOCATION
904H_JRU PPP	11866.02	486729.2	664355.3	7175	LOCATION
904H_JRU FTP	11299.23	487717.5	664348.9	7175	LOCATION
904H_JRU SHL	0	487877.6	661907.9	-3361	RECTANGLE

904H_JRU LTP

904H_JRU BHL

Bias (ft)	Magnitude of Bias (ft)	Semi-major Error (ft)	Semi-minor Error (ft)	Semi-minor Azimuth (°)	Tool Used
0	0	0	0	0	XOM_R2OWSG MWD+IFR1+MS
0	0	0.358	0.179	90	XOM_R2OWSG MWD+IFR1+MS
0	0	0.717	0.538	90	XOM_R2OWSG MWD+IFR1+MS
0	0	1.075	0.896	90	XOM_R2OWSG MWD+IFR1+MS
0	0	1.434	1.255	90	XOM_R2OWSG MWD+IFR1+MS
0	0	1.792	1.613	90	XOM_R2OWSG MWD+IFR1+MS
0	0	2.151	1.972	90	XOM_R2OWSG MWD+IFR1+MS
0	0	2.509	2.33	90	XOM_R2OWSG MWD+IFR1+MS
0	0	2.868	2.689	90	XOM_R2OWSG MWD+IFR1+MS
0	0	3.226	3.047	90	XOM_R2OWSG MWD+IFR1+MS
0	0	3.585	3.405	90	XOM_R2OWSG MWD+IFR1+MS
0	0	3.943	3.764	90	XOM_R2OWSG MWD+IFR1+MS
0	0	4.302	4.122	90	XOM_R2OWSG MWD+IFR1+MS
0	0	4.651	4.472	90.054	XOM_R2OWSG MWD+IFR1+MS
0	0	4.995	4.814	90.173	XOM_R2OWSG MWD+IFR1+MS
0	0	5.343	5.16	90.368	XOM_R2OWSG MWD+IFR1+MS
0	0	5.694	5.507	90.684	XOM_R2OWSG MWD+IFR1+MS
0	0	6.049	5.856	91.147	XOM_R2OWSG MWD+IFR1+MS

0	0	6.41	6.206	91.759	XOM_R2OWSG MWD+IFR1+MS
0	0	6.776	6.558	92.496	XOM_R2OWSG MWD+IFR1+MS
0	0	7.15	6.911	93.311	XOM_R2OWSG MWD+IFR1+MS
0	0	7.533	7.266	94.142	XOM_R2OWSG MWD+IFR1+MS
0	0	7.926	7.623	94.928	XOM_R2OWSG MWD+IFR1+MS
0	0	8.332	7.981	95.618	XOM_R2OWSG MWD+IFR1+MS
0	0	8.753	8.341	96.18	XOM_R2OWSG MWD+IFR1+MS
0	0	9.19	8.702	96.605	XOM_R2OWSG MWD+IFR1+MS
0	0	9.647	9.065	96.898	XOM_R2OWSG MWD+IFR1+MS
0	0	10.125	9.43	97.076	XOM_R2OWSG MWD+IFR1+MS
0	0	10.627	9.795	97.158	XOM_R2OWSG MWD+IFR1+MS
0	0	11.155	10.16	97.165	XOM_R2OWSG MWD+IFR1+MS
0	0	11.25	10.228	97.175	XOM_R2OWSG MWD+IFR1+MS
0	0	11.706	10.525	97.131	XOM_R2OWSG MWD+IFR1+MS
0	0	12.273	10.891	97.078	XOM_R2OWSG MWD+IFR1+MS
0	0	12.853	11.262	97.032	XOM_R2OWSG MWD+IFR1+MS
0	0	13.444	11.639	96.992	XOM_R2OWSG MWD+IFR1+MS
0	0	14.045	12.021	96.957	XOM_R2OWSG MWD+IFR1+MS
0	0	14.655	12.407	96.926	XOM_R2OWSG MWD+IFR1+MS
0	0	15.272	12.797	96.898	XOM_R2OWSG MWD+IFR1+MS
0	0	15.896	13.191	96.873	XOM_R2OWSG MWD+IFR1+MS

0	0	16.525	13.588	96.851	XOM_R2OWSG MWD+IFR1+MS
0	0	17.16	13.988	96.831	XOM_R2OWSG MWD+IFR1+MS
0	0	17.799	14.391	96.813	XOM_R2OWSG MWD+IFR1+MS
0	0	18.443	14.796	96.796	XOM_R2OWSG MWD+IFR1+MS
0	0	19.09	15.204	96.781	XOM_R2OWSG MWD+IFR1+MS
0	0	19.741	15.614	96.767	XOM_R2OWSG MWD+IFR1+MS
0	0	20.395	16.027	96.754	XOM_R2OWSG MWD+IFR1+MS
0	0	21.051	16.441	96.742	XOM_R2OWSG MWD+IFR1+MS
0	0	21.71	16.857	96.731	XOM_R2OWSG MWD+IFR1+MS
0	0	22.372	17.274	96.721	XOM_R2OWSG MWD+IFR1+MS
0	0	23.035	17.693	96.711	XOM_R2OWSG MWD+IFR1+MS
0	0	23.701	18.114	96.702	XOM_R2OWSG MWD+IFR1+MS
0	0	24.368	18.536	96.694	XOM_R2OWSG MWD+IFR1+MS
0	0	25.037	18.959	96.686	XOM_R2OWSG MWD+IFR1+MS
0	0	25.707	19.384	96.679	XOM_R2OWSG MWD+IFR1+MS
0	0	26.379	19.809	96.672	XOM_R2OWSG MWD+IFR1+MS
0	0	27.052	20.236	96.666	XOM_R2OWSG MWD+IFR1+MS
0	0	27.602	20.585	96.661	XOM_R2OWSG MWD+IFR1+MS
0	0	27.725	20.663	96.66	XOM_R2OWSG MWD+IFR1+MS
0	0	28.38	21.09	96.661	XOM_R2OWSG MWD+IFR1+MS
0	0	29.006	21.517	96.67	XOM_R2OWSG MWD+IFR1+MS

0	0	29.602	21.944	96.687	XOM_R2OWSG MWD+IFR1+MS
0	0	30.169	22.368	96.71	XOM_R2OWSG MWD+IFR1+MS
0	0	30.705	22.789	96.74	XOM_R2OWSG MWD+IFR1+MS
0	0	31.212	23.205	96.774	XOM_R2OWSG MWD+IFR1+MS
0	0	31.69	23.614	96.811	XOM_R2OWSG MWD+IFR1+MS
0	0	32.14	24.015	96.852	XOM_R2OWSG MWD+IFR1+MS
0	0	32.562	24.407	96.895	XOM_R2OWSG MWD+IFR1+MS
0	0	32.957	24.788	96.94	XOM_R2OWSG MWD+IFR1+MS
0	0	33.327	25.159	96.986	XOM_R2OWSG MWD+IFR1+MS
0	0	33.673	25.516	97.031	XOM_R2OWSG MWD+IFR1+MS
0	0	33.996	25.861	97.076	XOM_R2OWSG MWD+IFR1+MS
0	0	34.297	26.192	97.119	XOM_R2OWSG MWD+IFR1+MS
0	0	34.579	26.508	97.16	XOM_R2OWSG MWD+IFR1+MS
0	0	34.843	26.809	97.198	XOM_R2OWSG MWD+IFR1+MS
0	0	35.089	27.09	97.202	XOM_R2OWSG MWD+IFR1+MS
0	0	35.331	27.363	97.174	XOM_R2OWSG MWD+IFR1+MS
0	0	35.574	27.636	97.146	XOM_R2OWSG MWD+IFR1+MS
0	0	35.818	27.911	97.118	XOM_R2OWSG MWD+IFR1+MS
0	0	36.065	28.188	97.091	XOM_R2OWSG MWD+IFR1+MS
0	0	36.313	28.467	97.064	XOM_R2OWSG MWD+IFR1+MS
0	0	36.564	28.748	97.037	XOM_R2OWSG MWD+IFR1+MS

0	0	36.816	29.03	97.01	XOM_R2OWSG MWD+IFR1+MS
0	0	37.07	29.314	96.983	XOM_R2OWSG MWD+IFR1+MS
0	0	37.325	29.6	96.957	XOM_R2OWSG MWD+IFR1+MS
0	0	37.583	29.887	96.931	XOM_R2OWSG MWD+IFR1+MS
0	0	37.841	30.176	96.905	XOM_R2OWSG MWD+IFR1+MS
0	0	38.102	30.466	96.879	XOM_R2OWSG MWD+IFR1+MS
0	0	38.364	30.758	96.854	XOM_R2OWSG MWD+IFR1+MS
0	0	38.628	31.051	96.829	XOM_R2OWSG MWD+IFR1+MS
0	0	38.893	31.345	96.804	XOM_R2OWSG MWD+IFR1+MS
0	0	39.16	31.641	96.779	XOM_R2OWSG MWD+IFR1+MS
0	0	39.428	31.938	96.754	XOM_R2OWSG MWD+IFR1+MS
0	0	39.697	32.236	96.73	XOM_R2OWSG MWD+IFR1+MS
0	0	39.968	32.536	96.706	XOM_R2OWSG MWD+IFR1+MS
0	0	40.241	32.836	96.682	XOM_R2OWSG MWD+IFR1+MS
0	0	40.514	33.138	96.658	XOM_R2OWSG MWD+IFR1+MS
0	0	40.789	33.441	96.634	XOM_R2OWSG MWD+IFR1+MS
0	0	41.065	33.745	96.611	XOM_R2OWSG MWD+IFR1+MS
0	0	41.343	34.05	96.588	XOM_R2OWSG MWD+IFR1+MS
0	0	41.622	34.356	96.565	XOM_R2OWSG MWD+IFR1+MS
0	0	41.902	34.663	96.542	XOM_R2OWSG MWD+IFR1+MS
0	0	42.183	34.972	96.519	XOM_R2OWSG MWD+IFR1+MS

0	0	42.465	35.281	96.497	XOM_R2OWSG MWD+IFR1+MS
0	0	42.749	35.59	96.474	XOM_R2OWSG MWD+IFR1+MS
0	0	43.033	35.901	96.452	XOM_R2OWSG MWD+IFR1+MS
0	0	43.319	36.213	96.43	XOM_R2OWSG MWD+IFR1+MS
0	0	43.606	36.526	96.408	XOM_R2OWSG MWD+IFR1+MS
0	0	43.805	36.742	96.393	XOM_R2OWSG MWD+IFR1+MS
0	0	43.889	36.837	96.39	XOM_R2OWSG MWD+IFR1+MS
0	0	44.146	37.134	96.391	XOM_R2OWSG MWD+IFR1+MS
0	0	44.396	37.426	96.392	XOM_R2OWSG MWD+IFR1+MS
0	0	44.63	37.71	96.419	XOM_R2OWSG MWD+IFR1+MS
0	0	44.844	37.981	96.502	XOM_R2OWSG MWD+IFR1+MS
0	0	45.033	38.237	96.678	XOM_R2OWSG MWD+IFR1+MS
0	0	45.195	38.475	96.987	XOM_R2OWSG MWD+IFR1+MS
0	0	45.329	38.693	97.467	XOM_R2OWSG MWD+IFR1+MS
0	0	45.438	38.887	98.155	XOM_R2OWSG MWD+IFR1+MS
0	0	45.526	39.055	99.071	XOM_R2OWSG MWD+IFR1+MS
0	0	45.6	39.191	100.22	XOM_R2OWSG MWD+IFR1+MS
0	0	45.663	39.285	101.495	XOM_R2OWSG MWD+IFR1+MS
0	0	45.668	39.29	101.578	XOM_R2OWSG MWD+IFR1+MS
0	0	45.738	39.377	103.042	XOM_R2OWSG MWD+IFR1+MS
0	0	45.819	39.475	104.545	XOM_R2OWSG MWD+IFR1+MS

0	0	45.909	39.58	106.088	XOM_R2OWSG MWD+IFR1+MS
0	0	46.009	39.693	107.673	XOM_R2OWSG MWD+IFR1+MS
0	0	46.12	39.813	109.303	XOM_R2OWSG MWD+IFR1+MS
0	0	46.244	39.938	110.977	XOM_R2OWSG MWD+IFR1+MS
0	0	46.38	40.068	112.693	XOM_R2OWSG MWD+IFR1+MS
0	0	46.529	40.202	114.449	XOM_R2OWSG MWD+IFR1+MS
0	0	46.693	40.338	116.24	XOM_R2OWSG MWD+IFR1+MS
0	0	46.871	40.475	118.062	XOM_R2OWSG MWD+IFR1+MS
0	0	47.065	40.613	119.907	XOM_R2OWSG MWD+IFR1+MS
0	0	47.275	40.75	121.766	XOM_R2OWSG MWD+IFR1+MS
0	0	47.502	40.885	123.631	XOM_R2OWSG MWD+IFR1+MS
0	0	47.747	41.018	125.492	XOM_R2OWSG MWD+IFR1+MS
0	0	48.009	41.148	127.337	XOM_R2OWSG MWD+IFR1+MS
0	0	48.289	41.275	129.158	XOM_R2OWSG MWD+IFR1+MS
0	0	48.587	41.397	130.945	XOM_R2OWSG MWD+IFR1+MS
0	0	48.903	41.515	132.69	XOM_R2OWSG MWD+IFR1+MS
0	0	49.237	41.629	134.385	XOM_R2OWSG MWD+IFR1+MS
0	0	49.588	41.738	-43.977	XOM_R2OWSG MWD+IFR1+MS
0	0	49.957	41.842	-42.398	XOM_R2OWSG MWD+IFR1+MS
0	0	50.342	41.941	-40.883	XOM_R2OWSG MWD+IFR1+MS
0	0	50.744	42.036	-39.433	XOM_R2OWSG MWD+IFR1+MS

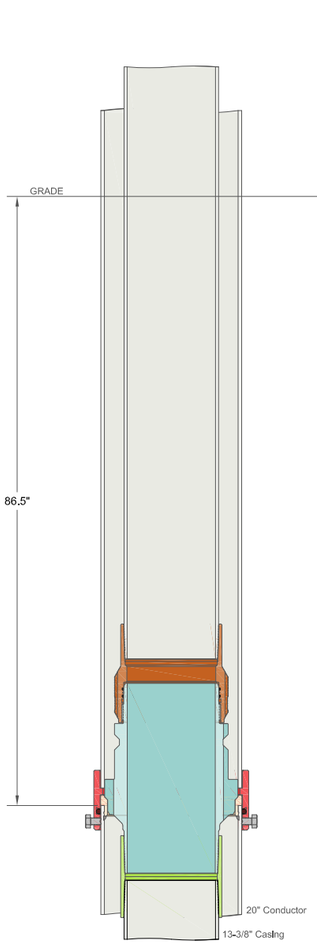
0	0	51.161	42.127	-38.05	XOM_R2OWSG MWD+IFR1+MS
0	0	51.594	42.214	-36.733	XOM_R2OWSG MWD+IFR1+MS
0	0	52.042	42.297	-35.48	XOM_R2OWSG MWD+IFR1+MS
0	0	52.504	42.376	-34.291	XOM_R2OWSG MWD+IFR1+MS
0	0	52.979	42.452	-33.164	XOM_R2OWSG MWD+IFR1+MS
0	0	53.467	42.525	-32.095	XOM_R2OWSG MWD+IFR1+MS
0	0	53.968	42.595	-31.082	XOM_R2OWSG MWD+IFR1+MS
0	0	54.481	42.663	-30.122	XOM_R2OWSG MWD+IFR1+MS
0	0	55.006	42.728	-29.213	XOM_R2OWSG MWD+IFR1+MS
0	0	55.541	42.791	-28.352	XOM_R2OWSG MWD+IFR1+MS
0	0	56.087	42.853	-27.535	XOM_R2OWSG MWD+IFR1+MS
0	0	56.643	42.912	-26.76	XOM_R2OWSG MWD+IFR1+MS
0	0	57.209	42.97	-26.025	XOM_R2OWSG MWD+IFR1+MS
0	0	57.784	43.027	-25.327	XOM_R2OWSG MWD+IFR1+MS
0	0	58.368	43.082	-24.664	XOM_R2OWSG MWD+IFR1+MS
0	0	58.961	43.136	-24.033	XOM_R2OWSG MWD+IFR1+MS
0	0	59.562	43.189	-23.433	XOM_R2OWSG MWD+IFR1+MS
0	0	60.17	43.241	-22.861	XOM_R2OWSG MWD+IFR1+MS
0	0	60.787	43.292	-22.317	XOM_R2OWSG MWD+IFR1+MS
0	0	61.41	43.343	-21.797	XOM_R2OWSG MWD+IFR1+MS
0	0	62.041	43.393	-21.301	XOM_R2OWSG MWD+IFR1+MS

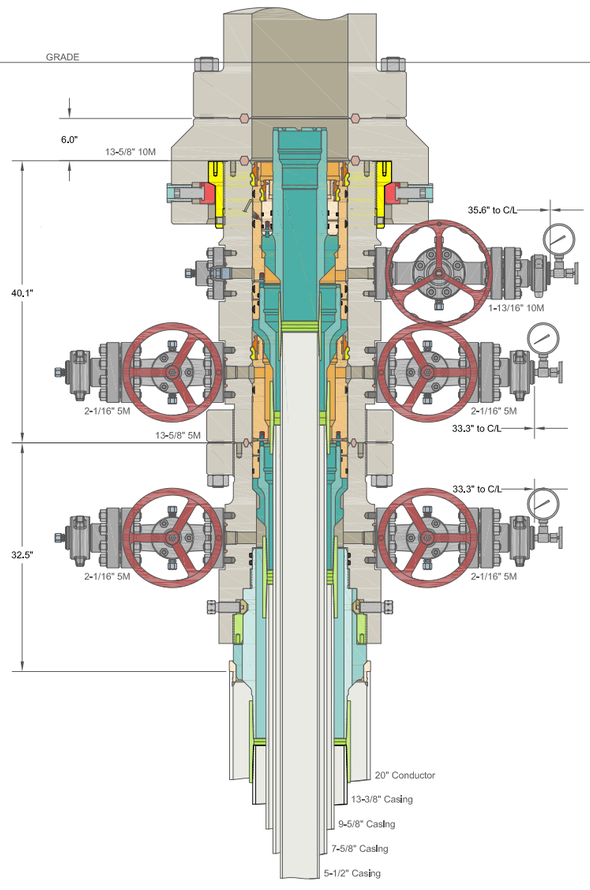
0	0	62.678	43.443	-20.826	XOM_R2OWSG MWD+IFR1+MS
0	0	63.322	43.492	-20.373	XOM_R2OWSG MWD+IFR1+MS
0	0	63.972	43.541	-19.939	XOM_R2OWSG MWD+IFR1+MS
0	0	64.628	43.589	-19.523	XOM_R2OWSG MWD+IFR1+MS
0	0	65.29	43.637	-19.125	XOM_R2OWSG MWD+IFR1+MS
0	0	65.958	43.685	-18.743	XOM_R2OWSG MWD+IFR1+MS
0	0	66.631	43.733	-18.376	XOM_R2OWSG MWD+IFR1+MS
0	0	67.309	43.78	-18.024	XOM_R2OWSG MWD+IFR1+MS
0	0	67.992	43.828	-17.685	XOM_R2OWSG MWD+IFR1+MS
0	0	68.68	43.875	-17.359	XOM_R2OWSG MWD+IFR1+MS
0	0	69.373	43.923	-17.045	XOM_R2OWSG MWD+IFR1+MS
0	0	70.07	43.97	-16.743	XOM_R2OWSG MWD+IFR1+MS
0	0	70.771	44.018	-16.451	XOM_R2OWSG MWD+IFR1+MS
0	0	71.477	44.065	-16.17	XOM_R2OWSG MWD+IFR1+MS
0	0	72.187	44.113	-15.899	XOM_R2OWSG MWD+IFR1+MS
0	0	72.901	44.161	-15.637	XOM_R2OWSG MWD+IFR1+MS
0	0	73.619	44.209	-15.384	XOM_R2OWSG MWD+IFR1+MS
0	0	74.34	44.257	-15.139	XOM_R2OWSG MWD+IFR1+MS
0	0	75.065	44.305	-14.902	XOM_R2OWSG MWD+IFR1+MS
0	0	75.794	44.353	-14.673	XOM_R2OWSG MWD+IFR1+MS
0	0	76.525	44.402	-14.451	XOM_R2OWSG MWD+IFR1+MS

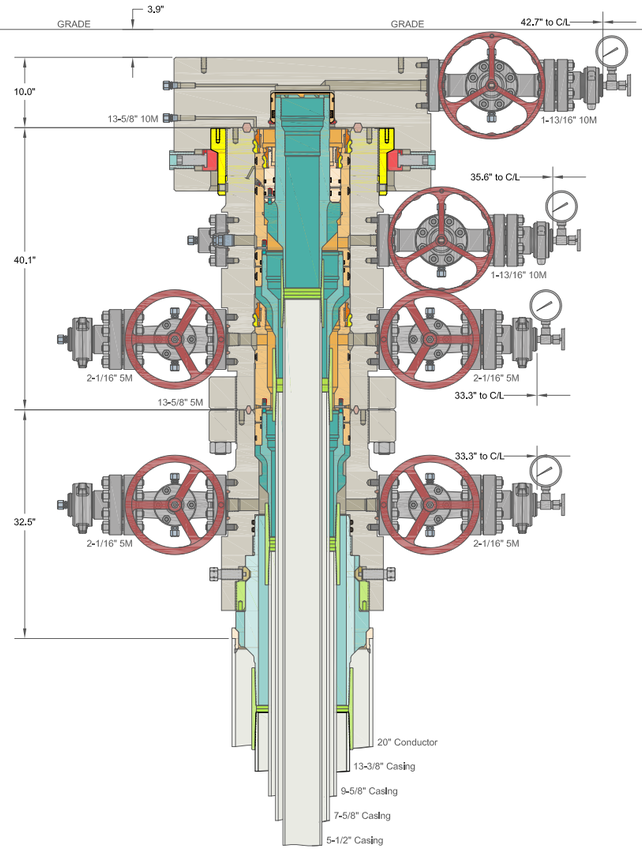
0	0	77.261	44.451	-14.236	XOM_R2OWSG MWD+IFR1+MS
0	0	77.999	44.5	-14.027	XOM_R2OWSG MWD+IFR1+MS
0	0	78.74	44.55	-13.825	XOM_R2OWSG MWD+IFR1+MS
0	0	79.484	44.599	-13.629	XOM_R2OWSG MWD+IFR1+MS
0	0	80.232	44.649	-13.439	XOM_R2OWSG MWD+IFR1+MS
0	0	80.982	44.7	-13.254	XOM_R2OWSG MWD+IFR1+MS
0	0	81.734	44.75	-13.074	XOM_R2OWSG MWD+IFR1+MS
0	0	82.49	44.801	-12.9	XOM_R2OWSG MWD+IFR1+MS
0	0	83.247	44.852	-12.73	XOM_R2OWSG MWD+IFR1+MS
0	0	84.008	44.904	-12.565	XOM_R2OWSG MWD+IFR1+MS
0	0	84.771	44.955	-12.404	XOM_R2OWSG MWD+IFR1+MS
0	0	85.536	45.008	-12.248	XOM_R2OWSG MWD+IFR1+MS
0	0	86.303	45.06	-12.096	XOM_R2OWSG MWD+IFR1+MS
0	0	87.073	45.113	-11.947	XOM_R2OWSG MWD+IFR1+MS
0	0	87.844	45.166	-11.803	XOM_R2OWSG MWD+IFR1+MS
0	0	88.618	45.22	-11.662	XOM_R2OWSG MWD+IFR1+MS
0	0	89.394	45.273	-11.524	XOM_R2OWSG MWD+IFR1+MS
0	0	90.172	45.328	-11.39	XOM_R2OWSG MWD+IFR1+MS
0	0	90.952	45.382	-11.259	XOM_R2OWSG MWD+IFR1+MS
0	0	91.734	45.437	-11.132	XOM_R2OWSG MWD+IFR1+MS
0	0	92.517	45.493	-11.007	XOM_R2OWSG MWD+IFR1+MS

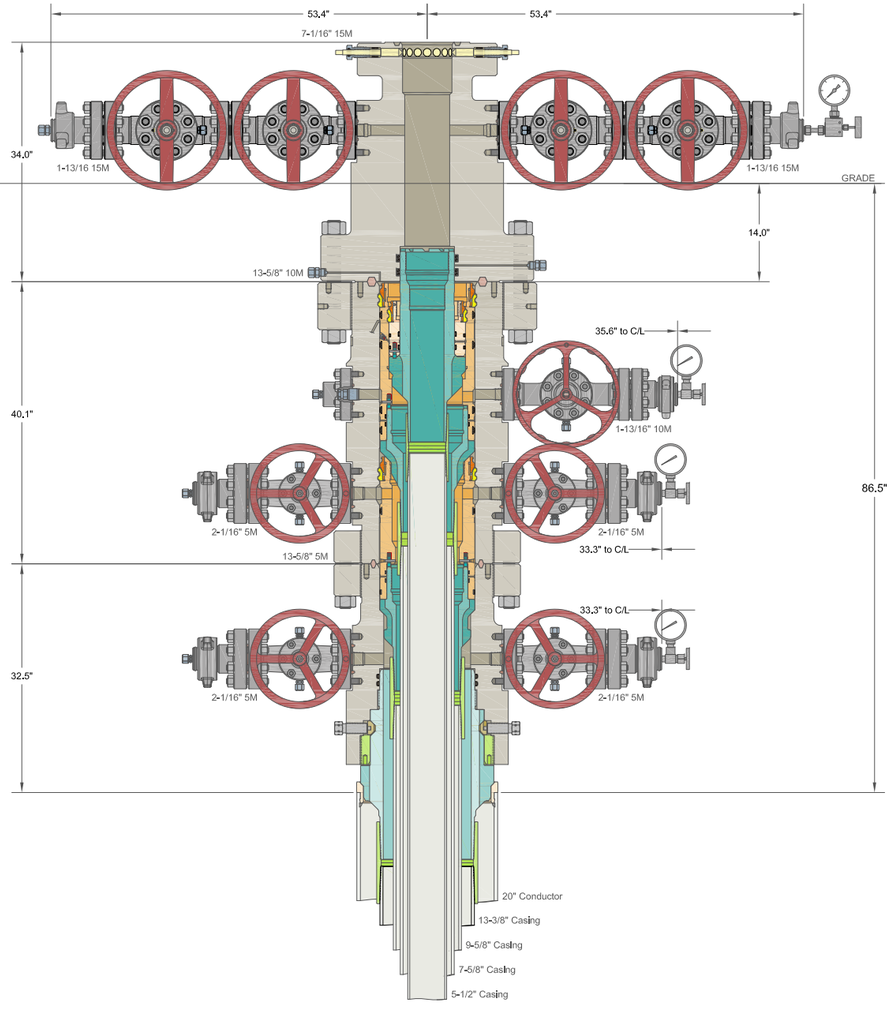
0	0	93.302	45.548	-10.885	XOM_R2OWSG MWD+IFR1+MS
0	0	94.089	45.604	-10.766	XOM_R2OWSG MWD+IFR1+MS
0	0	94.878	45.661	-10.65	XOM_R2OWSG MWD+IFR1+MS
0	0	95.669	45.718	-10.536	XOM_R2OWSG MWD+IFR1+MS
0	0	96.46	45.775	-10.425	XOM_R2OWSG MWD+IFR1+MS
0	0	97.254	45.833	-10.317	XOM_R2OWSG MWD+IFR1+MS
0	0	98.049	45.891	-10.21	XOM_R2OWSG MWD+IFR1+MS
0	0	98.846	45.949	-10.107	XOM_R2OWSG MWD+IFR1+MS
0	0	99.644	46.008	-10.005	XOM_R2OWSG MWD+IFR1+MS
0	0	100.443	46.067	-9.905	XOM_R2OWSG MWD+IFR1+MS
0	0	101.244	46.127	-9.808	XOM_R2OWSG MWD+IFR1+MS
0	0	102.046	46.186	-9.712	XOM_R2OWSG MWD+IFR1+MS
0	0	102.849	46.247	-9.619	XOM_R2OWSG MWD+IFR1+MS
0	0	103.654	46.308	-9.527	XOM_R2OWSG MWD+IFR1+MS
0	0	104.46	46.369	-9.437	XOM_R2OWSG MWD+IFR1+MS
0	0	105.267	46.43	-9.349	XOM_R2OWSG MWD+IFR1+MS
0	0	106.075	46.492	-9.263	XOM_R2OWSG MWD+IFR1+MS
0	0	106.885	46.554	-9.178	XOM_R2OWSG MWD+IFR1+MS
0	0	107.696	46.617	-9.095	XOM_R2OWSG MWD+IFR1+MS
0	0	108.507	46.68	-9.013	XOM_R2OWSG MWD+IFR1+MS
0	0	109.32	46.744	-8.933	XOM_R2OWSG MWD+IFR1+MS

0	0	110.134	46.808	-8.855	XOM_R2OWSG MWD+IFR1+MS
0	0	110.949	46.872	-8.778	XOM_R2OWSG MWD+IFR1+MS
0	0	111.765	46.937	-8.702	XOM_R2OWSG MWD+IFR1+MS
0	0	112.582	47.002	-8.628	XOM_R2OWSG MWD+IFR1+MS
0	0	113.4	47.067	-8.555	XOM_R2OWSG MWD+IFR1+MS
0	0	114.219	47.133	-8.484	XOM_R2OWSG MWD+IFR1+MS
0	0	115.039	47.199	-8.413	XOM_R2OWSG MWD+IFR1+MS
0	0	115.859	47.266	-8.344	XOM_R2OWSG MWD+IFR1+MS
0	0	116.681	47.333	-8.276	XOM_R2OWSG MWD+IFR1+MS
0	0	117.504	47.401	-8.21	XOM_R2OWSG MWD+IFR1+MS
0	0	118.327	47.468	-8.144	XOM_R2OWSG MWD+IFR1+MS
0	0	119.151	47.537	-8.079	XOM_R2OWSG MWD+IFR1+MS
0	0	119.976	47.605	-8.016	XOM_R2OWSG MWD+IFR1+MS
0	0	120.373	47.638	-7.986	XOM_R2OWSG MWD+IFR1+MS
0	0	120.786	47.673	-7.955	XOM_R2OWSG MWD+IFR1+MS









ALL DIMENSIONS APPROXIMA

CACTUS WELLHEAD LLC

(20") x 13-3/8" x 9-5/8" x 7-5/8" x 5-1/2" MBU-4T-CFL-R-DBLO
With 13-5/8" 10M x 7-1/16" 15M CTH-DBLHPS-SB Tubing Head
And Drilling & Skid Configurations

XTO ENERGY INC
DELAWARE BASIN

DRAWN	VJK	31MAR22
APPRV		

DRAWING NO. SDT-3301

Cement Variance Request

XTO requests to pump a two stage cement job on the 7-5/8” intermediate casing string with the first stage being pumped conventionally with the calculated top of cement at the Brushy Canyon (6452') and the second stage performed as a bradenhead squeeze with planned cement from the Brushy Canyon to surface. If cement is not visually confirmed to circulate to surface, the final cement top after the second stage job will be verified by Echo-meter. If necessary, a top out consisting of 1,500 sack of Class C cement + 3% Salt + 1% PreMag-M + 6% Bentonite Gel (2.30 yld, 12.91 ppg) will be executed as a contingency. If cement is still unable to circulate to surface, another Echo-meter run will be performed for cement top verification.

XTO will include the Echo-meter verified fluid top and the volume of displacement fluid above the cement slurry in the annulus in all post-drill sundries on wells utilizing this cement program.

XTO will report to the BLM the volume of fluid (limited to 5 bbls) used to flush intermediate casing valves following backside cementing procedures.

XTO requests to pump an Optional Lead if well conditions dictate in an attempt to bring cement to surface on the first stage. If cement is brought to surface, the BLM will be notified and the second stage bradenhead squeeze and subsequent TOC verification will be negated.

In the event cement is not circulated to surface on the first stage, whether intentionally or unintentionally, XTO requests the option to conduct the bradenhead squeeze and TOC verification offline as per standard approval from BLM when unplanned remediation is needed and batch drilling is approved. In the event the bradenhead is conducted, we will ensure first stage cement job is cemented properly and the well is static with floats holding and no pressure on the csg annulus as with all other casing strings where batch drilling operations occur before moving off the rig. The TA cap will also be installed per GE procedure and pressure inside the casing will be monitored via the valve on the TA cap as per standard batch drilling ops.

Subject: Request for a Variance Allowing break Testing of the Blowout Preventer Equipment (BOPE)

XTO Energy requests a variance to ONLY test broken pressure seals on the BOPE and function test BOP when skidding a drilling rig between multiple wells on a pad.

Background

Onshore Oil and Gas Order (OOGO) No. 2, Drilling Operations, Sections III.A.2.i.iv.B states that the BOP test must be performed whenever any seal subject to test pressure is broken. The current interpretation of the Bureau of Land Management (BLM) requires a complete BOP test and not just a test of the affected component. OOGO No. 2, Section I.D.2 states, "Some situation may exist either on a well-by-well basis or field-wide basis whereby it is commonly accepted practice to vary a particular minimum standard(s) established in this order. This situation can be resolved by requesting a variance…". XTO Energy feels the break testing the BOPE is such a situation. Therefore, as per OOGO No. 2, Section IV., XTO Energy submits this request for the variance.

Supporting Documentation

OOGO No. 2 became effective on December 19, 1988 and has remained the standard for regulating BLM onshore drilling operations for over 30 years. During this time there have been significant changes in drilling technology. BLM continues to use the variance request process to allow for the use of modern technology and acceptable engineering practices that have arisen since OOGO No. 2 was originally released. The XTO Energy drilling rig fleet has many modern upgrades that allow the intact BOP stack to be moved between well slots on a multi-well pad, as well as, wellhead designs that incorporate quick connects facilitating release of the BOP from the wellhead without breaking any BOP stack components apart. These technologies have been used extensively offshore, and other regulators, API, and many operators around the world have endorsed break testing as safe and reliable.

Figure 1: Winch System attached to BOP Stack

Figure 2: BOP Winch System

American Petroleum Institute (API) standards, specification and recommended practices are considered the industry standard and are consistently utilized and referenced by the industry. OOGO No. 2 recognizes API recommended Practices (RP) 53 in its original development. API Standard 53, *Well Control Equipment Systems for Drilling Wells* (Fifth Edition, December 2018, Annex C, Table C.4) recognizes break testing as an acceptable practice. Specifically, API Standard 53, Section 5.3.7.1 states "A pressure test of the pressure containing component shall be performed following the disconnection or repair, limited to the affected component." See Table C.4 below for reference.

Table C.4—Initial Pressure Testing, Surface BOP Stacks

Component to be Pressure Tested	Pressure Test—Low Pressure[ac] psig (MPa)	Pressure Test—High Pressure[ac]	
		Change Out of Component, Elastomer, or Ring Gasket	No Change Out of Component, Elastomer, or Ring Gasket
Annular preventer[b]	250 to 350 (1.72 to 2.41)	RWP of annular preventer	MASP or 70% annular RWP, whichever is lower.
Fixed pipe, variable bore, blind, and BSR preventers[bd]	250 to 350 (1.72 to 2.41)	RWP of ram preventer or wellhead system, whichever is lower	ITP
Choke and kill line and BOP side outlet valves below ram preventers (both sides)	250 to 350 (1.72 to 2.41)	RWP of side outlet valve or wellhead system, whichever is lower	ITP
Choke manifold—upstream of chokes[e]	250 to 350 (1.72 to 2.41)	RWP of ram preventers or wellhead system, whichever is lower	ITP
Choke manifold—downstream of chokes[e]	250 to 350 (1.72 to 2.41)	RWP of valve(s), line(s), or MASP for the well program, whichever is lower	
Kelly, kelly valves, drill pipe safety valves, IBOPs	250 to 350 (1.72 to 2.41)	MASP for the well program	

[a] Pressure test evaluation periods shall be a minimum of five minutes.
No visible leaks.
The pressure shall remain stable during the evaluation period. The pressure shall not decrease below the intended test pressure.

[b] Annular(s) and VBR(s) shall be pressure tested on the largest and smallest OD drill pipe to be used in well program.

[c] For pad drilling operations, moving from one wellhead to another within the 21 days, pressure testing is required for pressure-containing and pressure-controlling connections when the integrity of a pressure seal is broken.

[d] For surface offshore operations, the ram BOPs shall be pressure tested with the ram locks engaged and the closing and locking pressure vented during the initial test. For land operations, the ram BOPs shall be pressure tested with the ram locks engaged and the closing and locking pressure vented at commissioning and annually.

[e] Adjustable chokes are not required to be full sealing devices. Pressure testing against a closed choke is not required.

The Bureau of Safety and Environmental Enforcement (BSEE), Department of Interior, has also utilized the API standards, specification and best practices in the development of its offshore oil and gas regulations and incorporates them by reference within its regulations.

Break testing has been approved by the BLM in the past with other operators based on the detailed information provided in this document.

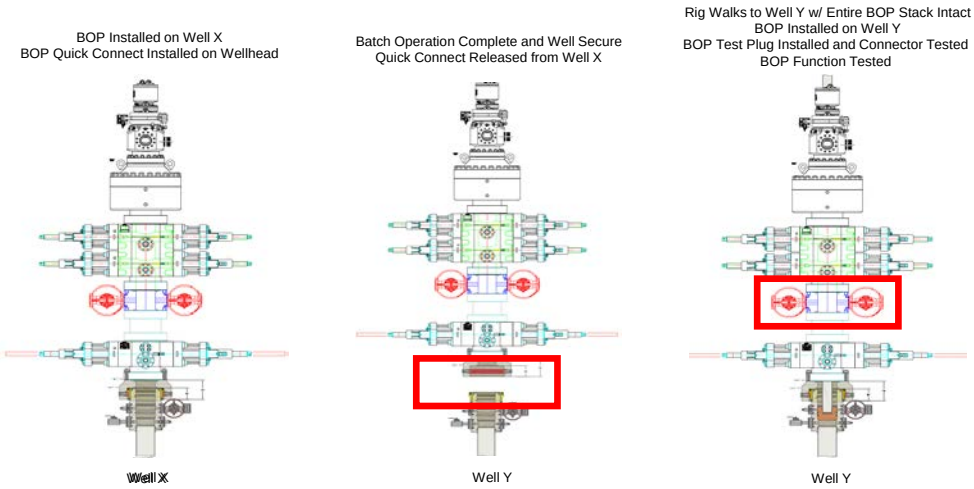
XTO Energy feels break testing and our current procedures meet the intent of OOGO No. 2 and often exceed it. There has been no evidence that break testing results in more components failing than seen on full BOP tests. XTO Energy's internal standards requires complete BOPE tests more often than that of OOGO No. 2 (Every 21 days). In addition to function testing the annular, pipe rams and blind rams after each BOP nipple up, XTO Energy performs a choke drill with the rig crew prior to drilling out every casing shoe. This is additional training for the rig crew that exceeds the requirements of the OOGO No.2.

Procedures

1. XTO Energy will use this document for our break testing plan for New Mexico Delaware basin. The summary below will be referenced in the APD or Sundry Notice and receive approval prior to implementing this variance.
2. XTO Energy will perform BOP break testing on multi-wells pads where multiple intermediate sections can be drilled and cased within the 21-day BOP test window.
    a. A full BOP test will be conducted on the first well on the pad.
    b. The first intermediate hole section drilled on the pad will be the deepest. All of the remaining hole sections will be the same depth or shallower.
        i. Our Lower WC targets set the intermediate casing shoe no deeper than the Wolfcamp B.
        ii. Our Upper WC targets set the intermediate casing shoe shallower than the Wolfcamp B.
    c. A Full BOP test will be required if the intermediate hole section being drilled has a MASP over 5M.
    d. A full BOP test will be required prior to drilling any production hole.
3. After performing a complete BOP test on the first well, the intermediate hole section will be drilled and cased, two breaks would be made on the BOP equipment.
    a. Between the HCV valve and choke line connection
    b. Between the BOP quick connect and the wellhead
4. The BOP is then lifted and removed from the wellhead by a hydraulic system.
5. After skidding to the next well, the BOP is moved to the wellhead by the same hydraulic system and installed.
6. The connections mentioned in 3a and 3b will then be reconnected.
7. Install test plug into the wellhead using test joint or drill pipe.
8. A shell test is performed against the upper pipe rams testing the two breaks.
9. The shell test will consist of a 250 psi low test and a high test to the value submitted in the APD or Sundry (e.g. 5,000 psi or 10,000psi).
10. Function test will be performed on the following components: lower pipe rams, blind rams, and annular.

11. For a multi-well pad the same two breaks on the BOP would be made and on the next wells and steps 4 through 10 would be repeated.
12. A second break test would only be done if the intermediate hole section being drilled could not be completed within the 21 day BOP test window.

Note: Picture below highlights BOP components that will be tested during batch operations



Summary

A variance is requested to **ONLY** test broken pressure seals on the BOP equipment when moving from wellhead to wellhead which is in compliance with API Standard 53. API Standard 53 states, that for pad drilling operation, moving from one wellhead to another within 21 days, pressure testing is required for pressure-containing and pressure-controlling connections when the integrity of a pressure seal is broken.

The BOP will be secured by a hydraulic carrier or cradle. The BLM will be contacted if a Well Control event occurs prior to the commencement of a BOPE Break Testing operation.

Based on discussions with the BLM on February 27th 2020 and the supporting documentation submitted to the BLM, we will request permission to ONLY retest broken pressure seals if the following conditions are met:

1. After a full BOP test is conducted on the first well on the pad.

2. The first intermediate hole section drilled on the pad will be the deepest. All of the remaining hole sections will be the same depth or shallower.

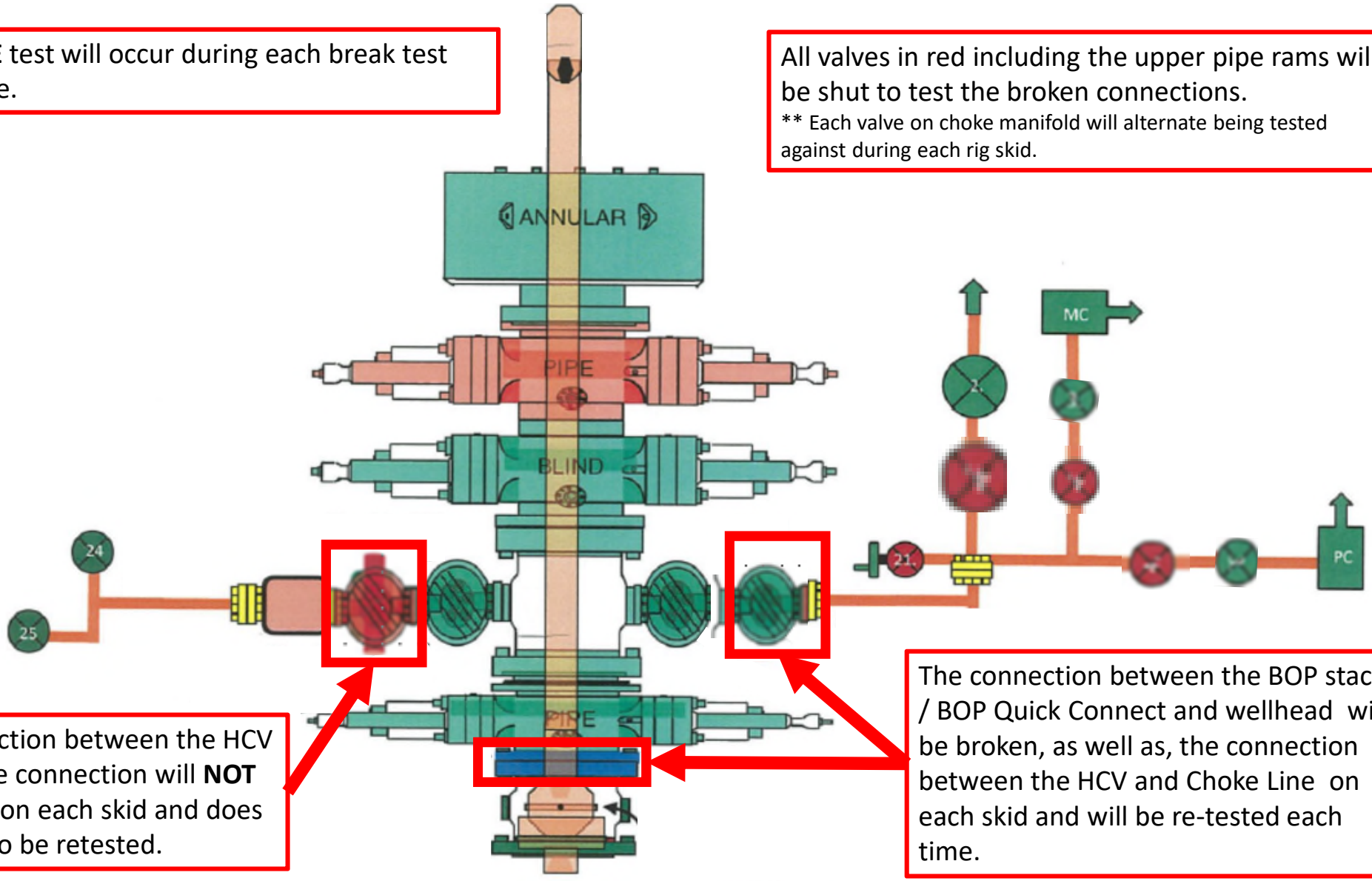
3. Full BOP test will be required if the intermediate hole section being drilled has a MASP over 5M.

4. Full BOP test will be required prior to drilling the production hole.

Only **ONE** test will occur during each break test procedure.

All valves in red including the upper pipe rams will be shut to test the broken connections.

** Each valve on choke manifold will alternate being tested against during each rig skid.



The connection between the HCV and kill line connection will **NOT** be broken on each skid and does not need to be retested.

The connection between the BOP stack / BOP Quick Connect and wellhead will be broken, as well as, the connection between the HCV and Choke Line on each skid and will be re-tested each time.

XTO Permian Operating, LLC Offline Cementing Variance Request

XTO requests the option to cement the surface and intermediate casing strings offline as a prudent batch drilling efficiency of acreage development.

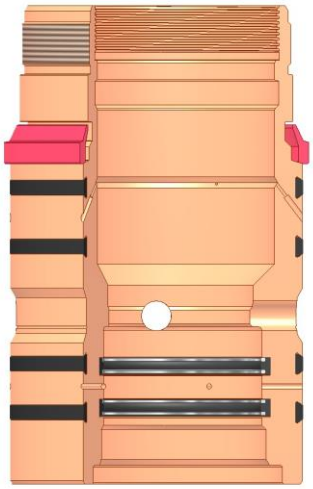
1. Cement Program

No changes to the cement program will take place for offline cementing.

2. Offline Cementing Procedure

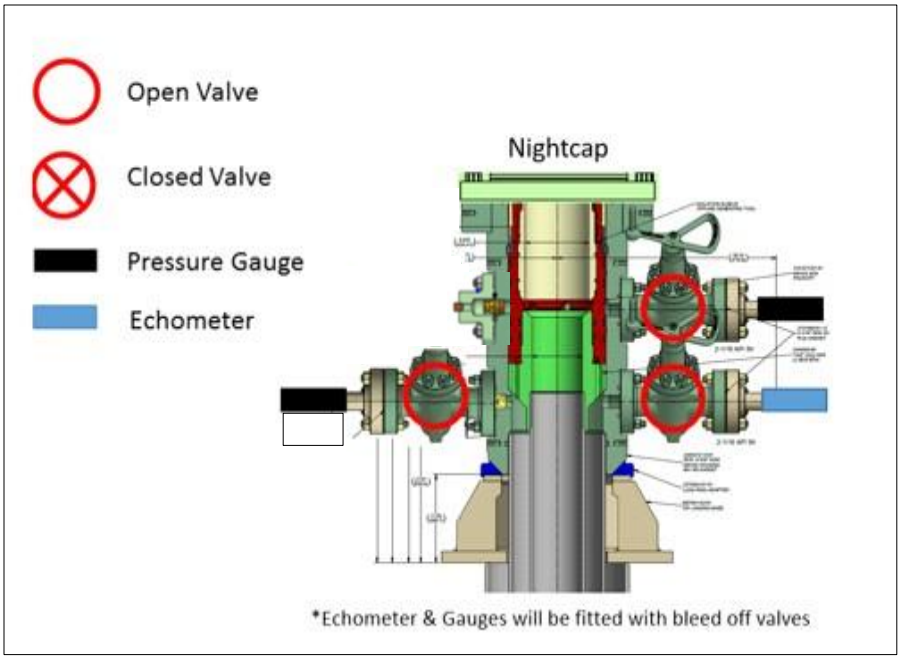
The operational sequence will be as follows. If a well control event occurs, the BLM will be contacted for approval prior to conducting offline cementing operations.

1. Run casing as per normal operations. While running casing, conduct negative pressure test and confirm integrity of the float equipment (float collar and shoe)
2. Land casing with mandrel
3. Fill pipe with kill weight fluid, do not circulate through floats and confirm well is static
4. Set annular packoff shown below and pressure test to confirm integrity of the seal. Pressure ratings of wellhead components and valves is 5,000 psi.
5. After confirmation of both annular barriers and internal barriers, nipple down BOP and install cap flange.
    a. If any barrier fails to test, the BOP stack will not be nippled down until after the cement job is completed with cement 500ft above the highest formation capable of flow with kill weight mud above or after it has achieved 50-psi compressive strength if kill weight fluid cannot be verified.



Annular packoff with both external and internal seals

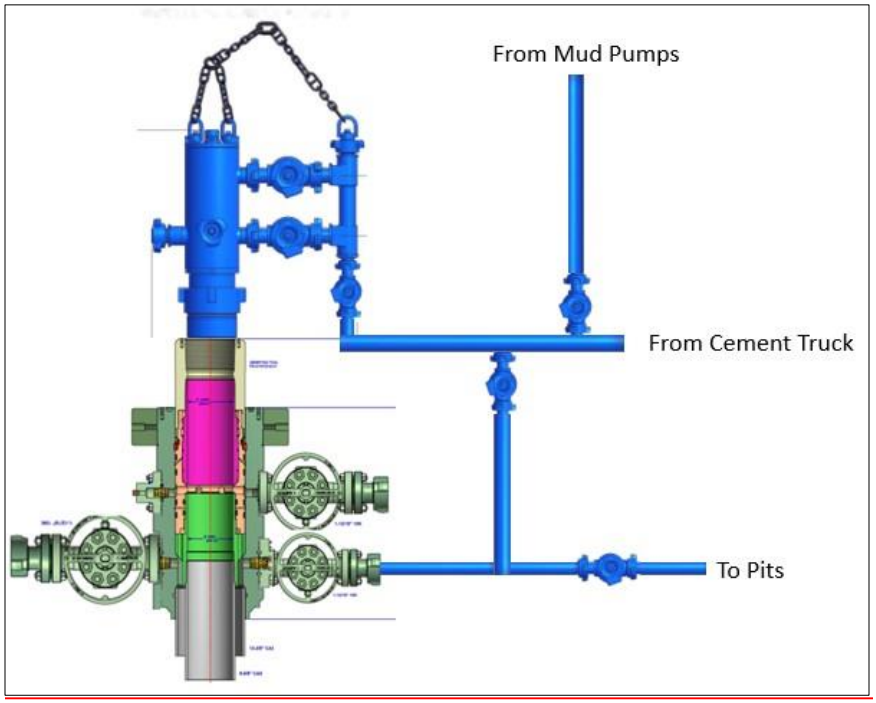
XTO Permian Operating, LLC Offline Cementing Variance Request



Wellhead diagram during skidding operations

6. Skid rig to next well on pad.
7. Confirm well is static before removing cap flange, flange will not be removed and offline cementing operations will not commence until well is under control. If well is not static, casing outlet valves will provide access to both the casing ID and annulus. Rig or third party pump truck will kill well prior to cementing or nippling up for further remediation.
    a. Well Control Plan
        i. The Drillers Method will be the primary well control method to regain control of the wellbore prior to cementing, if wellbore conditions do not permit the drillers method other methods of well control may be used
        ii. Rig pumps or a 3rd party pump will be tied into the upper casing valve to pump down the casing ID
        iii. A high pressure return line will be rigged up to lower casing valve and run to choke manifold to control annular pressure
        iv. Once influx is circulated out of the hole, kill weight mud will be circulated
        v. Well will be confirmed static
        vi. Once confirmed static, cap flange will be removed to allow for offline cementing operations to commence
8. Install offline cement tool
9. Rig up cement equipment

XTO Permian Operating, LLC Offline Cementing Variance Request



Wellhead diagram during offline cementing operations

10. Circulate bottoms up with cement truck
    a. If gas is present on bottoms up, well will be shut in and returns rerouted through gas buster to handle entrained gas
    b. Max anticipated time before circulating with cement truck is 6 hrs
11. Perform cement job taking returns from the annulus wellhead valve
12. Confirm well is static and floats are holding after cement job
13. Remove cement equipment, offline cement tools and install night cap with pressure gauge for monitoring.

XTO respectfully requests approval to utilize a spudder rig to pre-set surface casing.

Description of Operations:

1. Spudder rig will move in to drill the surface hole and pre-set surface casing on the well.
    a. After drilling the surface hole section, the spudder rig will run casing and cement following all of the applicable rules and regulations (OnShore Order 2, all COAs and NMOCD regulations).
    b. The spudder rig will utilize fresh water-based mud to drill the surface hole to TD. Solids control will be handled entirely on a closed loop basis. No earth pits will be used.
2. The wellhead will be installed and tested as soon as the surface casing is cut off and WOC time has been reached.
3. A blind flange at the same pressure rating as the wellhead will be installed to seal the wellbore. Pressure will be monitored with needle valves installed on two wing valves.
    a. A means for intervention will be maintained while the drilling rig is not over the well.
4. Spudder rig operations are expected to take 2-3 days per well on the pad.
5. The BLM will be contacted and notified 24 hours prior to commencing spudder rig operations.
6. Drilling Operations will begin with a larger rig and a BOP stack equal to or greater than the pressure rating that was permitted will be nippled up and tested on the wellhead before drilling operations resume on each well.
    a. The larger rig will move back onto the location within 180 days from the point at which the wells are secured and the spudder rig is moved off location.
    b. The BLM will be notified 24 hours before the larger rig moves back on the pre-set locations
7. XTO will have supervision on the rig to ensure compliance with all BLM and NMOCD regulations and to oversee operations.
8. Once the rig is removed, XTO will secure the wellhead area by placing a guard rail around the cellar area.

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS

Action 346222

CONDITIONS

Operator: XTO PERMIAN OPERATING LLC. 6401 HOLIDAY HILL ROAD MIDLAND, TX 79707	OGRID: 373075
	Action Number: 346222
	Action Type: [C-103] NOI Change of Plans (C-103A)

CONDITIONS

Created By	Condition	Condition Date
ward.rikala	All original COA's still apply.	6/12/2024