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(H)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

HOBBS OCD  
JUN 13 2019  
RECEIVED

|  |   |  |
|--|---|--|
| 1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER   |   | 5. Lease Serial No.<br>NMNM113970  |
| 1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other  |   | 6. If Indian, Allottee or Tribe Name   |
| 1c. Type of Completion: <input type="checkbox"/> Hydraulic Fracturing <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone   |   | 7. If Unit or CA Agreement, Name and No.   |
| 2. Name of Operator<br>MARATHON OIL PERMIAN LLC (372098)   |   | 8. Lease Name and Well No.<br>MAMMOTH FED COM 26 34 1 TB<br>10H (325751)         |
| 3a. Address<br>5555 San Felipe St. Houston TX 77056  | 3b. Phone No. (include area code)<br>(713)629-6600  | 9. API Well No.<br>30-025-46128  |
| 4. Location of Well (Report location clearly and in accordance with any State requirements. *)<br>At surface SESW / 448 FSL / 1569 FWL / LAT 32.0663924 / LONG -103.4271155<br>At proposed prod. zone NENW / 150 FNL / 2311 FWL / LAT 32.0937595 / LONG -103.4247323 |   | 10. Field and Pool, or Exploratory<br>WE-025-G-08-62535340 / BONE SPRING (96661) |
| 11. Sec., T. R. M. or Blk. and Survey or Area<br>SEC 1 / T26S / R34E / NMP   |   |  |
| 12. Distance in miles and direction from nearest town or post office*<br>63 miles  |   | 12. County or Parish<br>LEA  |
| 13. State<br>NM  |   |  |
| 14. Distance from proposed* location to nearest property or lease line, ft.<br>(Also to nearest drig. unit line, if any)<br>448 feet   | 15. No of acres in lease<br>640                     | 16. Spacing Unit dedicated to this well<br>320                                   |
| 17. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.<br>1720 feet  | 18. Proposed Depth<br>12409 feet / 22646 feet       | 19. BLM/BIA Bond No. in file<br>FED: NMB001555                                   |
| 20. Elevations (Show whether DF, KDB, RT, GL, etc.)<br>3281 feet   | 21. Approximate date work will start*<br>01/01/2019 | 22. Estimated duration<br>30 days  |

24. Attachments

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

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

|   |  |                    |
|---|--|--------------------|
| 25. Signature<br>(Electronic Submission)                                | Name (Printed/Typed)<br>Jennifer Van Curen / Ph: (713)296-2500 | Date<br>07/31/2018 |
| Title<br>Sr. Regulatory Compliance Rep                                  |  |                    |
| Approved by (Signature)<br>(Electronic Submission)                      | Name (Printed/Typed)<br>Cody Layton / Ph: (575)234-5959        | Date<br>04/05/2019 |
| Title<br>Assistant Field Manager Lands & Minerals<br>Office<br>CARLSBAD |  |                    |

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

Conditions of approval, if any, are attached.

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

GCP Rec 06/13/19

APPROVED WITH CONDITIONS

KZ  
06/14/19

## INSTRUCTIONS

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

**ITEM 1:** If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable Federal regulations concerning subsequent work proposals or reports on the well.

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

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

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

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

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

## NOTICES

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

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

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

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

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

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

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

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

## Additional Operator Remarks

### Location of Well

1. SHL: SESW / 448 FSL / 1569 FWL / TWSP: 26S / RANGE: 34E / SECTION: 1 / LAT: 32.0663924 / LONG: -103.4271155 ( TVD: 0 feet, MD: 0 feet )  
PPP: SESW / 150 FSL / 2310 FWL / TWSP: 26S / RANGE: 34E / SECTION: 1 / LAT: 32.0655668 / LONG: -103.4247218 ( TVD: 12493 feet, MD: 12894 feet )  
PPP: SESW / 0 FSL / 2310 FWL / TWSP: 25S / RANGE: 34E / SECTION: 36 / LAT: 32.0796572 / LONG: -103.4247264 ( TVD: 12453 feet, MD: 17515 feet )  
BHL: NENW / 150 FNL / 2311 FWL / TWSP: 25S / RANGE: 34E / SECTION: 36 / LAT: 32.0937595 / LONG: -103.4247323 ( TVD: 12409 feet, MD: 22646 feet )

### BLM Point of Contact

Name: Katrina Ponder  
Title: Geologist  
Phone: 5752345969  
Email: kponder@blm.gov

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### **Review and Appeal Rights**

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

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## PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

|                              |                                   |
|------------------------------|-----------------------------------|
| <b>OPERATOR'S NAME:</b>      | Marathon Oil Permian LLC          |
| <b>LEASE NO.:</b>            | NMNM113970                        |
| <b>WELL NAME &amp; NO.:</b>  | Mammoth Fed Com 26 34 1 TB 10H    |
| <b>SURFACE HOLE FOOTAGE:</b> | 448'/S & 1569'/W                  |
| <b>BOTTOM HOLE FOOTAGE:</b>  | 150'/N & 2311'/W                  |
| <b>LOCATION:</b>             | Section 1, T.26 S., R.34 E., NMPM |
| <b>COUNTY:</b>               | Lea County, New Mexico            |

COA

|                      |  |  |                                       |
|----------------------|--|--|---------------------------------------|
| H2S                  | <input type="radio"/> Yes                        | <input checked="" type="radio"/> No        |                                       |
| Potash               | <input checked="" type="radio"/> None            | <input type="radio"/> Secretary            | <input type="radio"/> R-111-P         |
| Cave/Karst Potential | <input checked="" type="radio"/> Low             | <input type="radio"/> Medium               | <input type="radio"/> High            |
| Variance             | <input type="radio"/> None                       | <input checked="" type="radio"/> Flex Hose | <input type="radio"/> Other           |
| Wellhead             | <input type="radio"/> Conventional               | <input type="radio"/> Multibowl            | <input checked="" type="radio"/> Both |
| Other                | <input type="checkbox"/> 4 String Area           | <input type="checkbox"/> Capitan Reef      | <input type="checkbox"/> WIPP         |
| Other                | <input checked="" type="checkbox"/> Fluid Filled | <input type="checkbox"/> Cement Squeeze    | <input type="checkbox"/> Pilot Hole   |
| Special Requirements | <input type="checkbox"/> Water Disposal          | <input checked="" type="checkbox"/> COM    | <input type="checkbox"/> Unit         |

### A. HYDROGEN SULFIDE

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

### B. CASING

#### Casing Design:

1. The 13-3/8 inch surface casing shall be set at approximately 1130 feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.
  - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.

- b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
- c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
- d. If cement falls back, remedial cementing will be done prior to drilling out that string.

**1<sup>st</sup> intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.**

2. The minimum required fill of cement behind the **9-5/8 inch 1<sup>st</sup> intermediate casing** is:
  - Cement to surface. If cement does not circulate see B.1.a, c-d above.
3. The minimum required fill of cement behind the **7 inch 2<sup>nd</sup> intermediate casing** is:
  - Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.
4. The minimum required fill of cement behind the **4-1/2 inch production liner** is:
  - Cement should tie-back **100 feet** into the previous casing. Operator shall provide method of verification.

### **C. PRESSURE CONTROL**

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).'
- 2.

#### **Option 1:**

Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **10,000 (10M) psi**. Variance is approved to use a **5000 (5M) Annular** which shall be tested to **5000 (5M) psi**.

#### **Option 2:**

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

below the surface casing shoe shall be **10,000 (10M) psi. Variance is approved to use a 5000 (5M) Annular which shall be tested to 5000 (5M) psi.**

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

#### **D. SPECIAL REQUIREMENT (S)**

##### **Communitization Agreement**

- The operator will submit a Communitization Agreement to the Carlsbad Field Office, 620 E Greene St. Carlsbad, New Mexico 88220, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

##### **Well Name:**

**Operator shall submit a sundry to add 'Com' to the well name.**

## GENERAL REQUIREMENTS

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

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

☒ Chaves and Roosevelt Counties

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

☒ Eddy County

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

☒ Lea County

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

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



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

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.
2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log.
3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements.
4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.
5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.
7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

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

**B. PRESSURE CONTROL**

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.
3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.
4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
  - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
  - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
  - c. Manufacturer representative shall install the test plug for the initial BOP test.
  - d. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
  - e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
  - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the

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

- b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time.
- c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).
- d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
- e. The results of the test shall be reported to the appropriate BLM office.
- f. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.
- g. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.
- h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

**C. DRILLING MUD**

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

**D. WASTE MATERIAL AND FLUIDS**

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

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

**NMK342019**

# PECOS DISTRICT SURFACE USE CONDITIONS OF APPROVAL

|                       |                                   |
|-----------------------|-----------------------------------|
| OPERATOR'S NAME:      | Marathon Oil Permian LLC          |
| LEASE NO.:            | NMNM113970                        |
| WELL NAME & NO.:      | Mammoth Fed Com 26 34 1 TB 10H    |
| SURFACE HOLE FOOTAGE: | 448'/S & 1569'/W                  |
| BOTTOM HOLE FOOTAGE:  | 150'/N & 2311'/W                  |
| LOCATION:             | Section 1, T.26 S., R.34 E., NMPM |
| COUNTY:               | Lea County, New Mexico            |

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

- ☐ **General Provisions**
- ☐ **Permit Expiration**
- ☐ **Archaeology, Paleontology, and Historical Sites**
- ☐ **Noxious Weeds**
- ☒ **Special Requirements**
  - Lesser Prairie-Chicken Timing Stipulations
  - Ground-level Abandoned Well Marker
  - Hydrology
- ☐ **Construction**
  - Notification
  - Topsoil
  - Closed Loop System
  - Federal Mineral Material Pits
  - Well Pads
  - Roads
- ☐ **Road Section Diagram**
- ☐ **Production (Post Drilling)**
  - Well Structures & Facilities
- ☐ **Interim Reclamation**
- ☐ **Final Abandonment & Reclamation**

## **I. GENERAL PROVISIONS**

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

## **II. PERMIT EXPIRATION**

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

## **III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES**

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

## **IV. NOXIOUS WEEDS**

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

## **V. SPECIAL REQUIREMENT(S)**

### **Timing Limitation Stipulation / Condition of Approval for lesser prairie-chicken:**

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

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

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

### **Hydrology:**

The entire well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad. The compacted berm shall be constructed at a minimum of 12 inches with impermeable mineral material (e.g. caliche). Topsoil shall not be used to construct the berm. No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad. The integrity of the berm shall be maintained around the surfaced pad throughout the life of the well and around the downsized pad after interim reclamation has been completed. Any water erosion that may occur due to the construction of the well pad during the life of the well will be quickly corrected and proper measures will be taken to prevent future erosion. Stockpiling of topsoil is required. The top soil shall be stockpiled in an appropriate location to prevent loss of soil due to water or wind erosion and not used for berming or erosion control. If fluid collects within the bermed area, the fluid must be vacuumed into a safe container and disposed of properly at a state approved facility.

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

will be installed for tanks to minimize the effects of catastrophic line failures used in production or drilling.

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

## **VI. CONSTRUCTION**

### **A. NOTIFICATION**

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

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

### **B. TOPSOIL**

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

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

### **C. CLOSED LOOP SYSTEM**

Tanks are required for drilling operations: No Pits.

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

### **D. FEDERAL MINERAL MATERIALS PIT**

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



## **E. WELL PAD SURFACING**

Surfacing of the well pad is not required.

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

## **F. EXCLOSURE FENCING (CELLARS & PITS)**

### **Exclosure Fencing**

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

## **G. ON LEASE ACCESS ROADS**

### **Road Width**

The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed twenty (20) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed thirty (30) feet.

### **Surfacing**

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

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

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

### **Crowning**

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

### **Ditching**

Ditching shall be required on both sides of the road.

#### **Turnouts**

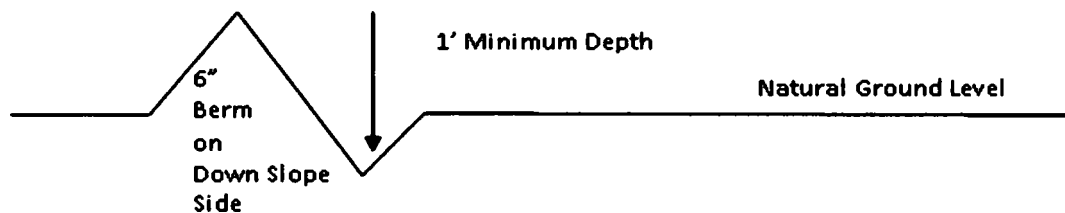
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

#### **Drainage**

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

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

**Cross Section of a Typical Lead-off Ditch**



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

#### **Formula for Spacing Interval of Lead-off Ditches**

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

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

#### **Cattle guards**

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

**Fence Requirement**

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

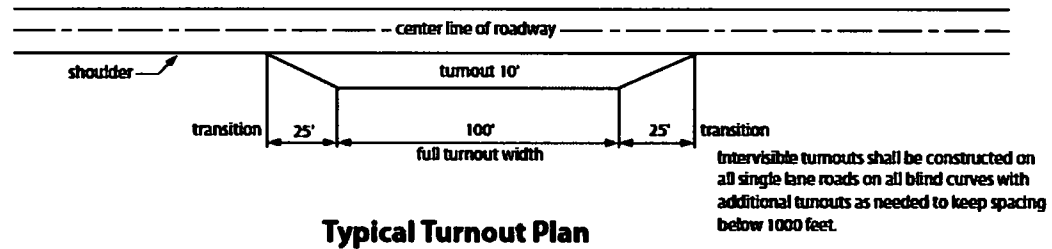
**Public Access**

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

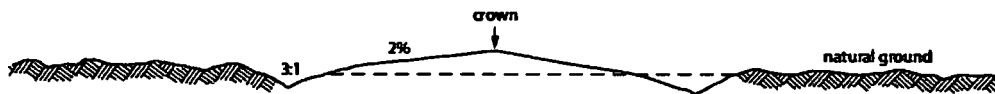
### Construction Steps

1. Salvage topsoil
2. Construct road

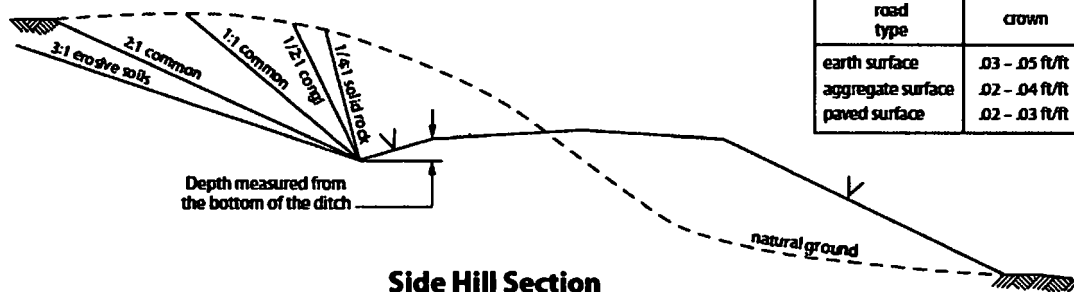
3. Redistribute topsoil
4. Revegetate slopes



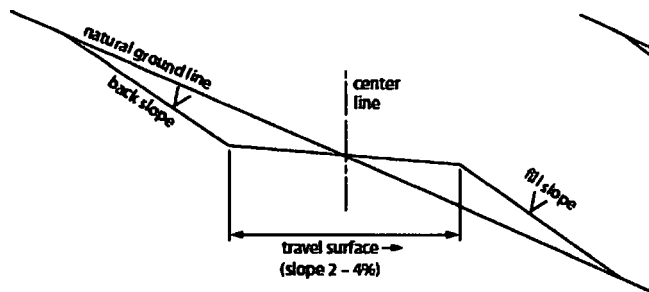
**Typical Turnout Plan**



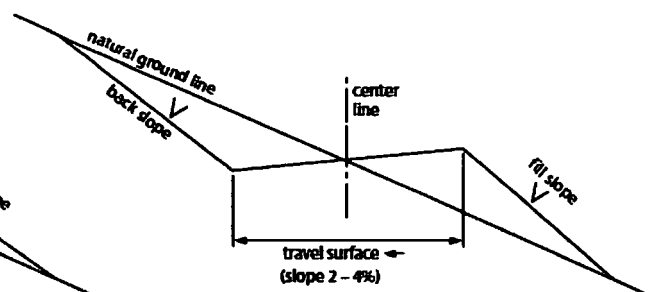
**Level Ground Section**



**Side Hill Section**



**Typical Outsploped Section**



**Typical Inslope Section**

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

## **VII. PRODUCTION (POST DRILLING)**

### **A. WELL STRUCTURES & FACILITIES**

#### **Placement of Production Facilities**

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

#### **Exclosure Netting (Open-top Tanks)**

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

#### **Chemical and Fuel Secondary Containment and Exclosure Screening**

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

#### **Open-Vent Exhaust Stack Exclosures**

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

**Containment Structures**

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

**Painting Requirement**

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

**VIII. INTERIM RECLAMATION**

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

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

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

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

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

**IX. FINAL ABANDONMENT & RECLAMATION**

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

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

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

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

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

## Seed Mixture for LPC Sand/Shinnery Sites

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

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

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

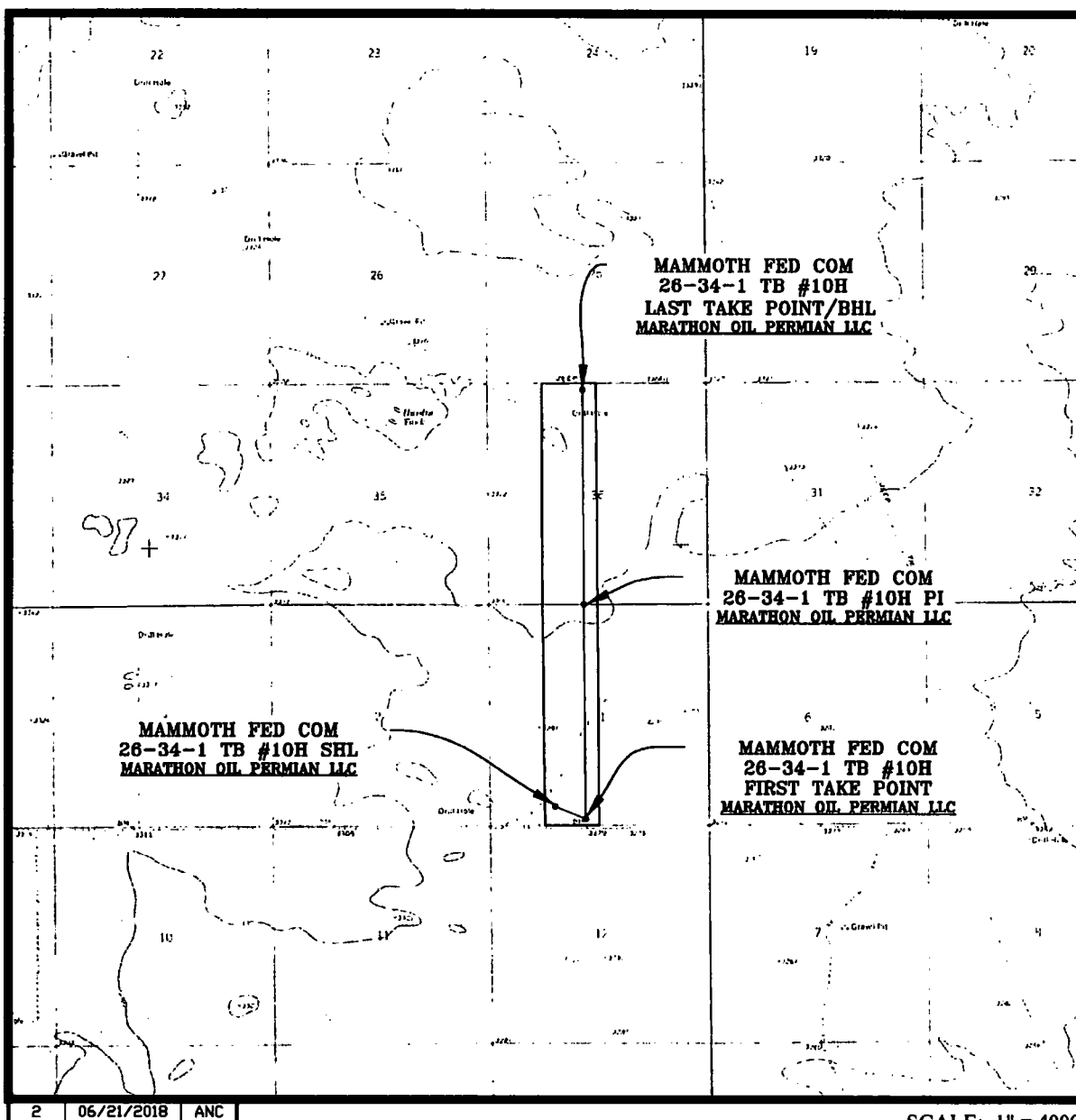
| <u>Species</u>      | <u>lb/acre</u> |
|---------------------|----------------|
| Plains Bristlegrass | 5lbs/A         |
| Sand Bluestem       | 5lbs/A         |
| Little Bluestem     | 3lbs/A         |
| Big Bluestem        | 6lbs/A         |
| Plains Coreopsis    | 2lbs/A         |
| Sand Dropseed       | 1lbs/A         |

\*Pounds of pure live seed:

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



# LOCATION VERIFICATION MAP



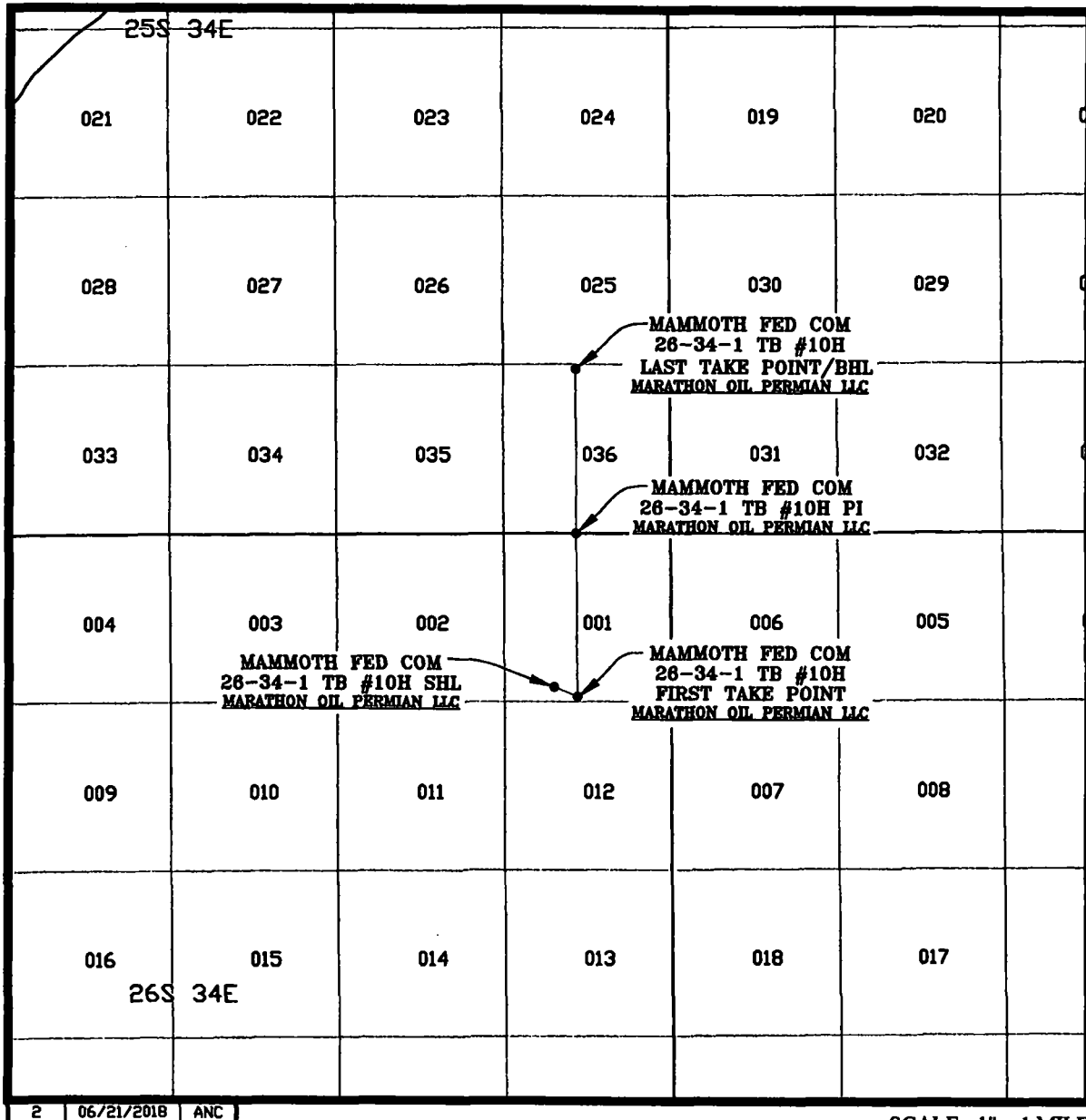
SEC. 1 TWP. 26-S RGE. 34-E  
 SURVEY: N.M.P.M.  
 COUNTY: LEA  
 DESCRIPTION: 448' FSL & 1569' FWL  
 ELEVATION: 3281'  
 OPERATOR: MARATHON OIL PERMIAN LLC  
 LEASE: MAMMOTH FED COM 26-34-1  
 U.S.G.S. TOPOGRAPHIC MAP: ANDREWS PLACE, N.M.

SCALE: 1" = 4000'  
 CONTOUR INTERVAL = 10'

SHEET 2 OF 3

PREPARED BY:  
 R-SQUARED GLOBAL, LLC  
 1309 LOUISVILLE AVENUE, MONROE, LA 71201  
 318-323-6900 OFFICE  
 JOB No. R3762\_011

# VICINITY MAP



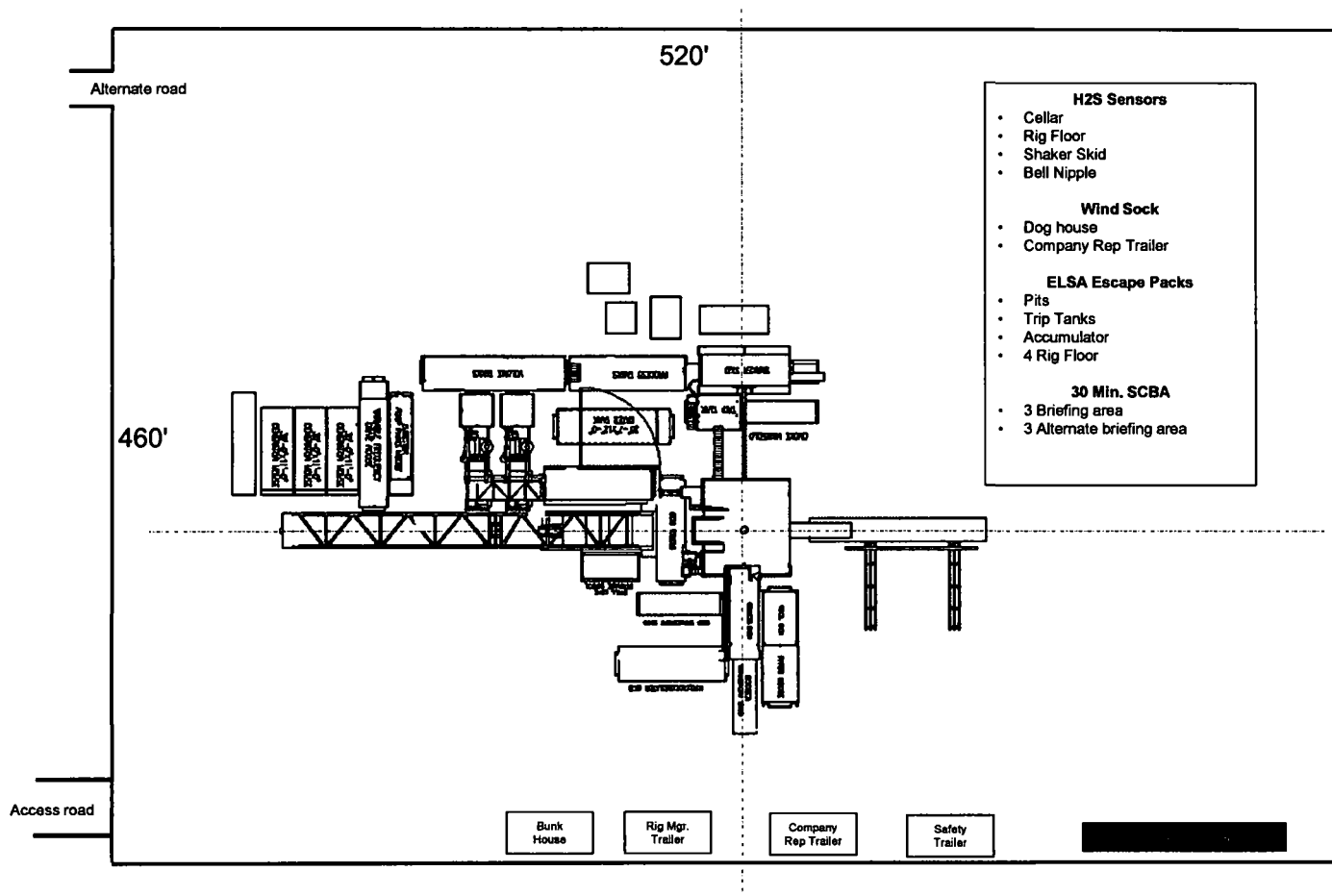
SCALE: 1" = 1 MILE

SEC. 1 TWP. 26-S RGE. 34-E  
 SURVEY: N.M.P.M.  
 COUNTY: LEA  
 DESCRIPTION: 448' FSL & 1569' FWL  
 ELEVATION: 3281'  
 OPERATOR: MARATHON OIL PERMIAN LLC  
 LEASE: MAMMOTH FED COM 26-34-1  
 U.S.G.S. TOPOGRAPHIC MAP: ANDREWS PLACE, N.M.

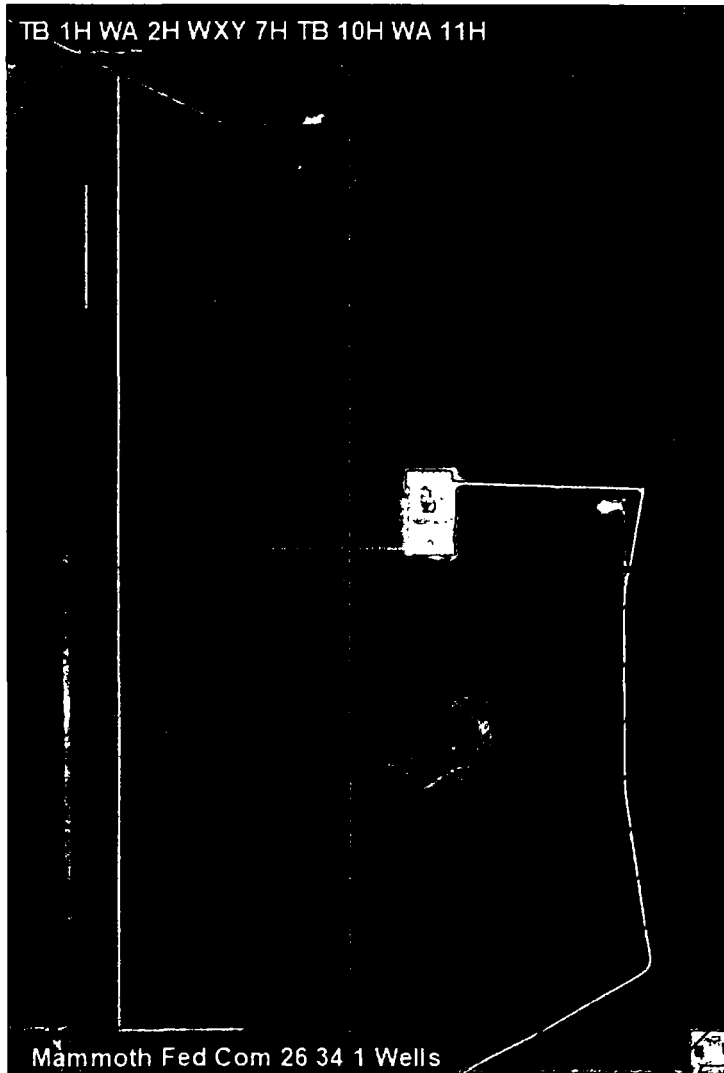
SHEET 3 OF 3

PREPARED BY:  
 R-SQUARED GLOBAL, LLC  
 1309 LOUISVILLE AVENUE, MONROE, LA 71201  
 318-323-6900 OFFICE  
 JOB No. R3762\_011

## MARATHON OIL - H2S Preparedness and Contingency Plan Summary



TB 1H WA 2H WXY 7H TB 10H WA 11H



Mammoth Fed Com 26 34 1 Wells



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

## Operator Certification Data Report

06/12/2019

### Operator Certification

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

**NAME:** Jennifer Van Curen

**Signed on:** 07/27/2018

**Title:** Sr. Regulatory Compliance Rep

**Street Address:** 5555 San Felipe St.

**City:** Houston

**State:** TX

**Zip:** 77056

**Phone:** (713)296-2500

**Email address:** jvancuren@marathonoil.com

### Field Representative

**Representative Name:**

**Street Address:**

**City:**

**State:**

**Zip:**

**Phone:**

**Email address:**



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

## Application Data Report

06/12/2019

APD ID: 10400032518

Submission Date: 07/31/2018

Operator Name: MARATHON OIL PERMIAN LLC

Well Name: MAMMOTH FED COM 26 34 1 TB

Well Number: 10H

Well Type: OIL WELL

Well Work Type: Drill

Highlighted  
fields, their  
values and change

[Show Final Text](#)

### Section 1 - General

APD ID: 10400032518

Tie to previous NOS?

Submission Date: 07/31/2018

BLM Office: CARLSBAD

User: Jennifer Van Curen

Title: Sr. Regulatory Compliance Rep

Federal/Indian APD: FED

Is the first lease penetrated for production Federal or Indian? FED

Lease number: NMNM113970

Lease Acres: 640

Surface access agreement in place?

Allotted?

Reservation:

Agreement in place? NO

Federal or Indian agreement:

Agreement number:

Agreement name:

Keep application confidential? YES

Permitting Agent? NO

APD Operator: MARATHON OIL PERMIAN LLC

Operator letter of designation:

### Operator Info

Operator Organization Name: MARATHON OIL PERMIAN LLC

Operator Address: 5555 San Felipe St.

Zip: 77056

Operator PO Box:

Operator City: Houston

State: TX

Operator Phone: (713)629-6600

Operator Internet Address:

### Section 2 - Well Information

Well in Master Development Plan? NO

Master Development Plan name:

Well in Master SUPO? NO

Master SUPO name:

Well in Master Drilling Plan? NO

Master Drilling Plan name:

Well Name: MAMMOTH FED COM 26 34 1 TB

Well Number: 10H

Well API Number:

Field/Pool or Exploratory? Field and Pool

Field Name: WC 025 G 08  
S2535340

Pool Name: BONE SPRING

Is the proposed well in an area containing other mineral resources? NATURAL GAS,OIL

**Operator Name:** MARATHON OIL PERMIAN LLC

**Well Name:** MAMMOTH FED COM 26 34 1 TB

**Well Number:** 10H

**Describe other minerals:**

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

**Type of Well Pad:** MULTIPLE WELL

**Multiple Well Pad Name:**  
MAMMOTH FED COM 26 34 1  
**Number of Legs:** 1

**Number:** 298-1

**Well Class:** HORIZONTAL

**Well Work Type:** Drill

**Well Type:** OIL WELL

**Describe Well Type:**

**Well sub-Type:** INFILL

**Describe sub-type:**

**Distance to town:** 63 Miles

**Distance to nearest well:** 1720 FT

**Distance to lease line:** 448 FT

**Reservoir well spacing assigned acres Measurement:** 320 Acres

**Well plat:** App\_2\_\_signed\_MAMMOTH\_FED\_COM\_26\_34\_TB\_10H\_REV2\_CERT\_FORM\_C\_102\_201807271003  
10.pdf  
App\_2\_\_3160\_\_Mammoth\_Fed\_Com\_26\_34\_1\_TB\_10H\_20180727114122.pdf

**Well work start Date:** 01/01/2019

**Duration:** 30 DAYS

### Section 3 - Well Location Table

**Survey Type:** RECTANGULAR

**Describe Survey Type:**

**Datum:** NAD83

**Vertical Datum:** NAVD88

**Survey number:** R3817

|                  | NS-Foot | NS Indicator | EW-Foot  | EW Indicator | Twsp | Range | Section | Aliquot/Lot/Tract | Latitude       | Longitude            | County | State             | Meridian          | Lease Type | Lease Number   | Elevation     | MD        | TVD       |
|------------------|---------|--------------|----------|--------------|------|-------|---------|-------------------|----------------|----------------------|--------|-------------------|-------------------|------------|----------------|---------------|-----------|-----------|
| SHL<br>Leg<br>#1 | 448     | FSL          | 156<br>9 | FWL          | 26S  | 34E   | 1       | Aliquot<br>SESW   | 32.06639<br>24 | -<br>103.4271<br>155 | LEA    | NEW<br>MEXI<br>CO | NEW<br>MEXI<br>CO | F          | NMNM<br>113970 | 328<br>1      | 0         | 0         |
| KOP<br>Leg<br>#1 | 91      | FSL          | 214<br>0 | FWL          | 26S  | 34E   | 1       | Aliquot<br>SESW   | 32.06539<br>77 | -<br>103.4251<br>849 | LEA    | NEW<br>MEXI<br>CO | NEW<br>MEXI<br>CO | F          | NMNM<br>113970 | -<br>864<br>0 | 119<br>89 | 119<br>21 |

**Operator Name:** MARATHON OIL PERMIAN LLC

**Well Name:** MAMMOTH FED COM 26 34 1 TB

**Well Number:** 10H

|                   | NS-Foot | NS Indicator | EW-Foot  | EW Indicator | Twsp | Range | Section | Aliquot/Lot/Tract | Latitude       | Longitude            | County | State             | Meridian          | Lease Type | Lease Number   | Elevation     | MD        | TVD       |
|-------------------|---------|--------------|----------|--------------|------|-------|---------|-------------------|----------------|----------------------|--------|-------------------|-------------------|------------|----------------|---------------|-----------|-----------|
| PPP<br>Leg<br>#1  | 150     | FSL          | 231<br>0 | FWL          | 26S  | 34E   | 1       | Aliquot<br>SESW   | 32.06556<br>68 | -<br>103.4247<br>213 | LEA    | NEW<br>MEXI<br>CO | NEW<br>MEXI<br>CO | F          | NMNM<br>113970 | -<br>921<br>2 | 128<br>94 | 124<br>93 |
| PPP<br>Leg<br>#1  | 0       | FSL          | 231<br>0 | FWL          | 25S  | 34E   | 36      | Aliquot<br>SESW   | 32.07965<br>72 | -<br>103.4247<br>264 | LEA    | NEW<br>MEXI<br>CO | NEW<br>MEXI<br>CO | S          | STATE          | -<br>917<br>2 | 175<br>15 | 124<br>53 |
| EXIT<br>Leg<br>#1 | 150     | FNL          | 231<br>1 | FWL          | 25S  | 34E   | 36      | Aliquot<br>NENW   | 32.09375<br>95 | -<br>103.4247<br>323 | LEA    | NEW<br>MEXI<br>CO | NEW<br>MEXI<br>CO | S          | STATE          | -<br>912<br>8 | 226<br>46 | 124<br>09 |
| BHL<br>Leg<br>#1  | 150     | FNL          | 231<br>1 | FWL          | 25S  | 34E   | 36      | Aliquot<br>NENW   | 32.09375<br>95 | -<br>103.4247<br>323 | LEA    | NEW<br>MEXI<br>CO | NEW<br>MEXI<br>CO | S          | STATE          | -<br>912<br>8 | 226<br>46 | 124<br>09 |



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
**APPLICATION FOR PERMIT TO DRILL OR REENTER**

FORM APPROVED  
OMB No. 1004-0137  
Expires October 31, 2014

|  |  |
|--|--|
| 5. Lease Serial No.<br>NMNM113970  |  |
| 6. If Indian, Allottee or Tribe Name   |  |
| 7. If Unit or CA Agreement, Name and No.   |  |
| 8. Lease Name and Well No.<br>MAMMOTH FED COM 26 34 1 TB 10H   |  |
| 9. API Well No.  |  |
| 1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER   | 10. Field and Pool, or Exploratory<br>WC 025 G 08 S2535340 / BONE SPRING   |
| 1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone | 11. Sec., T. R. M. or Blk. and Survey or Area<br>SEC 1 / T26S / R34E / NMP   |
| 2. Name of Operator<br>MARATHON OIL PERMIAN LLC  |  |
| 3a. Address<br>5555 San Felipe St. Houston TX 77056  | 3b. Phone No. (include area code)<br>(713)629-6600   |
| 12. County or Parish<br>LEA  |  |
| 13. State<br>NM  |  |
| 14. Distance in miles and direction from nearest town or post office*<br>63 miles  |  |
| 15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)<br>448 feet  | 16. No. of acres in lease<br>640   |
| 17. Spacing Unit dedicated to this well<br>320   | 18. Distance from proposed location* to nearest well, drilling, completed, 1720 feet applied for, on this lease, ft. |
| 19. Proposed Depth<br>12409 feet / 22646 feet  | 20. BLM/BIA Bond No. on file<br>FED: NMB001555   |
| 21. Elevations (Show whether DF, KDB, RT, GL, etc.)<br>3281 feet   | 22. Approximate date work will start*<br>01/01/2019  |
| 23. Estimated duration<br>30 days  |  |

**24. Attachments**

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, must be attached to this form:

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

|                         |                      |      |
|-------------------------|----------------------|------|
| 25. Signature           | Name (Printed Typed) | Date |
| Title                   |                      |      |
| Approved by (Signature) | Name (Printed Typed) | Date |
| Title                   |                      |      |
| Office                  |                      |      |

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

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

(Continued on page 2)

\*(Instructions on page 2)

## INSTRUCTIONS

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

**ITEM 1:** If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable Federal regulations concerning subsequent work proposals or reports on the well.

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

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

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

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

## NOTICES

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

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

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

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

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

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

The BLM collects this information to allow evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases. This information will be used to analyze and approve applications.

Response to this request is mandatory only if the operator elects to initiate drilling or reentry operations on an oil and gas lease.

The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

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

## Additional Operator Remarks

### Location of Well

1. SHL: SESW / 448 FSL / 1539 FWL / TWSP: 26S / RANGE: 34E / SECTION: 1 / LAT: 32.0663924 / LONG: -103.4271155 ( TVD: 0 feet, MD: 0 feet )  
PPP: SESW / 0 FSL / 2310 FWL / TWSP: 25S / RANGE: 34E / SECTION: 36 / LAT: 32.0796572 / LONG: -103.4247264 ( TVD: 12453 feet, MD: 17515 feet )  
PPP: SESW / 150 FSL / 2310 FWL / TWSP: 26S / RANGE: 34E / SECTION: 1 / LAT: 32.0655668 / LONG: -103.4247213 ( TVD: 12493 feet, MD: 12894 feet )  
BHL: NENW / 150 FNL / 2310 FWL / TWSP: 25S / RANGE: 34E / SECTION: 36 / LAT: 32.0937595 / LONG: -103.4247323 ( TVD: 12409 feet, MD: 22646 feet )

### BLM Point of Contact

Name:

Title:

Phone:

Email:

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### **Review and Appeal Rights**

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

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

## Drilling Plan Data Report

06/12/2019

APD ID: 10400032518

Submission Date: 07/31/2018

Operator Name: MARATHON OIL PERMIAN LLC

Well Name: MAMMOTH FED COM 26 34 1 TB

Well Number: 10H

Well Type: OIL WELL

Well Work Type: Drill

[Show Final Text](#)

### Section 1 - Geologic Formations

| Formation ID | Formation Name  | Elevation | True Vertical Depth | Measured Depth | Lithologies              | Mineral Resources | Producing Formation |
|--------------|-----------------|-----------|---------------------|----------------|--------------------------|-------------------|---------------------|
| 1            | RUSTLER         | 2165      | 1116                | 1116           | DOLOMITE, ANHYDRITE      | OTHER : Brine     | No                  |
| 2            | SALADO          | 610       | 1555                | 1555           | SALT, ANHYDRITE          | OTHER : Brine     | No                  |
| 3            | CASTILE         | -1428     | 3593                | 3613           | SALT                     | OTHER : Brine     | No                  |
| 4            | BASE OF SALT    | -2984     | 5149                | 5204           | LIMESTONE, SANDSTONE     | OTHER : Brine     | No                  |
| 5            | LAMAR           | -3250     | 5415                | 5476           | OTHER : Sand/Shales      | OIL               | No                  |
| 6            | BELL CANYON     | -3278     | 5443                | 5505           | SHALE, SANDSTONE         | OIL               | No                  |
| 7            | BRUSHY CANYON   | -5886     | 8051                | 8119           | OTHER : Sands/Carbonate  | OIL               | No                  |
| 8            | BONE SPRING     | -7177     | 9342                | 9411           | OTHER : Sands/Carbonate  | OIL               | No                  |
| 9            | BONE SPRING 1ST | -8298     | 10463               | 10531          | OTHER : Sands/Carbonate  | OIL               | No                  |
| 10           | BONE SPRING 2ND | -8847     | 11012               | 11080          | OTHER : Sands/Carbonates | OIL               | No                  |
| 11           | BONE SPRING 3RD | -9932     | 12097               | 12168          | OTHER : Sands/Carbonates | OIL               | Yes                 |

### Section 2 - Blowout Prevention

Pressure Rating (PSI): 10M

Rating Depth: 15152

**Equipment:** 13 5/8 Annular, Double Ram and Blind Ram will be installed and tested before 12 1/4", 8 3/4" and 6 1/8" holes. Annular has a min required WP of 5000, Double Ram and Annular have a minimum required WP of 10000.

**Requesting Variance?** YES

**Variance request:** A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart. BOP variance is requested for the annular to be 5000 psi on 10000 psi BOP stack.

**Testing Procedure:** - BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table attached. If the system is upgraded all the components installed will be functional and tested. The Annular will be tested to 70% of 5000 working pressure (see attached BOP plan). The working pressure of 10000 for the Blind Ram and Double Ram will be tested to 10000 psi. - Pipe rams will be operationally checked each 24 hour period.

**Operator Name:** MARATHON OIL PERMIAN LLC

**Well Name:** MAMMOTH FED COM 26 34 1 TB

**Well Number:** 10H

Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock, full opening safety valve / inside BOP and choke lines and choke manifold. See attached schematics. - Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i. - A multibowl wellhead is being used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested. See attached schematic.

**Choke Diagram Attachment:**

Drill\_2\_Choke\_\_\_Choke\_Line\_Flex\_III\_Rig\_20180727061211.pdf

Drill\_2\_Choke\_\_\_Contitech\_Hose\_SN\_663393\_20180727061236.pdf

Drill\_2\_Choke\_\_\_10M.THREE\_CHOKE\_MANIFOLD.BLM\_20180727061158.pdf

Drill\_2\_Choke\_\_\_Choke\_Line\_Test\_Chart\_SN\_63393\_20180727061226.pdf

**BOP Diagram Attachment:**

Drill\_2\_BOP\_\_\_PT\_10K\_DRAWING\_20180727061320.pdf

Drill\_2\_BOP\_\_\_10M\_Flex.BOPE\_x\_5M\_ANNULAR.BLM\_20180727061312.pdf

Drill\_2\_BOP\_\_\_WH\_TH\_DESIGN\_\_2\_DRAWING\_20180727061342.pdf

Drill\_2\_BOP\_\_\_Well\_Control\_Plan\_\_\_Permian\_20180727061332.pdf

**Section 3 - Casing**

| Casing ID | String Type  | Hole Size | Csg Size | Condition | Standard | Tapered String | Top Set MD | Bottom Set MD | Top Set TVD | Bottom Set TVD | Top Set MSL | Bottom Set MSL | Calculated casing length MD | Grade | Weight | Joint Type | Collapse SF | Burst SF | Joint SF Type | Joint SF | Body SF Type | Body SF |
|-----------|--------------|-----------|----------|-----------|----------|----------------|------------|---------------|-------------|----------------|-------------|----------------|-----------------------------|-------|--------|------------|-------------|----------|---------------|----------|--------------|---------|
| 1         | SURFACE      | 17.5      | 13.375   | NEW       | API      | N              | 0          | 1130          | 0           | 1130           | 3281        | 2151           | 1130                        | J-55  | 54.5   | STC        | 5.52        | 2.5      | BUOY          | 2.5      | BUOY         | 2.5     |
| 2         | INTERMEDIATE | 12.25     | 9.625    | NEW       | API      | N              | 0          | 5500          | 0           | 5438           | 3281        | -2157          | 5500                        | J-55  | 40     | LTC        | 1.74        | 1.15     | BUOY          | 2.19     | BUOY         | 2.19    |
| 3         | INTERMEDIATE | 8.75      | 7.0      | NEW       | API      | N              | 0          | 12900         | 0           | 12494          | 3281        | -9213          | 12900                       | P-110 | 29     | BUTT       | 2.21        | 1.18     | BUOY          | 1.9      | BUOY         | 1.9     |
| 4         | PRODUCTION   | 6.125     | 4.5      | NEW       | API      | N              | 12600      | 22645         | 12421       | 12409          | -9140       | -9128          | 10045                       | P-110 | 13.5   | BUTT       | 1.33        | 1.56     | BUOY          | 1.88     | BUOY         | 1.88    |

**Casing Attachments**

**Operator Name:** MARATHON OIL PERMIAN LLC

**Well Name:** MAMMOTH FED COM 26 34 1 TB

**Well Number:** 10H

### Casing Attachments

---

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

**Casing Design Assumptions and Worksheet(s):**

Drill\_3\_\_Red\_Hills\_3\_csg\_\_liner\_\_Surface\_Csg\_20180727102742.pdf

---

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

**Casing Design Assumptions and Worksheet(s):**

Drill\_3\_\_Red\_Hills\_3\_csg\_\_liner\_\_Int\_I\_Csg\_20180727062049.pdf

---

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

**Casing Design Assumptions and Worksheet(s):**

Drill\_3\_\_Red\_Hills\_3\_csg\_\_liner\_\_Int\_II\_Csg\_20180727103015.pdf

---

Operator Name: MARATHON OIL PERMIAN LLC

Well Name: MAMMOTH FED COM 26 34 1 TB

Well Number: 10H

#### Casing Attachments

Casing ID: 4 String Type: PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Drill\_3\_\_Red\_Hills\_3\_csg\_\_liner\_\_Prod\_Liner\_20180727103122.pdf

#### Section 4 - Cement

| String Type  | Lead/Tail | Stage Tool Depth | Top MD    | Bottom MD | Quantity(sx) | Yield | Density | Cu Ft | Excess% | Cement type            | Additives  |
|--------------|-----------|------------------|-----------|-----------|--------------|-------|---------|-------|---------|------------------------|--|
| PRODUCTION   | Lead      |                  | 0         | 0         | 0            | 0     | 0       | 0     | 0       | N/A, cement tail only. | N/A, cement tail only.   |
| PRODUCTION   | Tail      |                  | 1260<br>0 | 2264<br>5 | 1008         | 1.22  | 14.5    | 1230  | 30      | Class H                | 0.1% retarder + 3.5% extender + 0.3% fluid loss + 0.1% Dispersant                        |
| SURFACE      | Lead      |                  | 0         | 904       | 719          | 1.75  | 13.5    | 1256  | 100     | Class C                | 3 lbm/sk granular LCM + 0.1250 lbm/sk Poly-E-Flake                                       |
| SURFACE      | Tail      |                  | 904       | 1130      | 230          | 1.33  | 14.8    | 314   | 100     | Class C                | N/A  |
| INTERMEDIATE | Lead      |                  | 0         | 4500      | 1426         | 1.75  | 12.8    | 2466  | 75      | Class C                | 0.02 Gal/Sk Defoamer + 0.5% Extender + 1% Accelerator                                    |
| INTERMEDIATE | Tail      |                  | 4500      | 5500      | 353          | 1.33  | 14.8    | 470   | 50      | Class C                | 0.3 % Retarder   |
| INTERMEDIATE | Lead      |                  | 5200      | 1190<br>0 | 634          | 2.7   | 11      | 1712  | 70      | Class C                | 0.85% retarder + 10% extender + 0.02 gal/sk defoamer + 2.0% Extender + 0.15% Viscosifier |
| INTERMEDIATE | Tail      |                  | 1190<br>0 | 1290<br>0 | 179          | 1.09  | 15.6    | 195   | 30      | Class H                | 3% extender + 0.15% Dispersant + 0.03 gal/sk retarder                                    |



**Operator Name:** MARATHON OIL PERMIAN LLC

**Well Name:** MAMMOTH FED COM 26 34 1 TB

**Well Number:** 10H

### Section 5 - Circulating Medium

**Mud System Type:** Closed

**Will an air or gas system be Used?** NO

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

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

**Describe what will be on location to control well or mitigate other conditions:** The necessary mud products for additional weight and fluid loss control will be on location at all times.

**Describe the mud monitoring system utilized:** Losses or gains in the mud system will be monitored visually/manually as well as with an electronic PVT.

### Circulating Medium Table

| Top Depth | Bottom Depth | Mud Type             | Min Weight (lbs/gal) | Max Weight (lbs/gal) | Density (lbs/cu ft) | Gel Strength (lbs/100 sqft) | PH | Viscosity (CP) | Salinity (ppm) | Filtration (cc) | Additional Characteristics |
|-----------|--------------|----------------------|----------------------|----------------------|---------------------|-----------------------------|----|----------------|----------------|-----------------|----------------------------|
| 1290<br>0 | 2264<br>5    | OIL-BASED<br>MUD     | 11.5                 | 13.5                 |                     |                             |    |                |                |                 |                            |
| 1130      | 5500         | OTHER : Brine        | 9.9                  | 10.2                 |                     |                             |    |                |                |                 |                            |
| 0         | 1130         | WATER-BASED<br>MUD   | 8.4                  | 8.8                  |                     |                             |    |                |                |                 |                            |
| 5500      | 1290<br>0    | OTHER : Cut<br>Brine | 8.8                  | 9.4                  |                     |                             |    |                |                |                 |                            |

### Section 6 - Test, Logging, Coring

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

None Planned.

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

GR

**Coring operation description for the well:**

None Planned.

**Operator Name:** MARATHON OIL PERMIAN LLC

**Well Name:** MAMMOTH FED COM 26 34 1 TB

**Well Number:** 10H

### Section 7 - Pressure

**Anticipated Bottom Hole Pressure:** 8711

**Anticipated Surface Pressure:** 5962.54

**Anticipated Bottom Hole Temperature(F):** 195

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

**Describe:**

**Contingency Plans geohazards description:**

**Contingency Plans geohazards attachment:**

**Hydrogen Sulfide drilling operations plan required?** YES

**Hydrogen sulfide drilling operations plan:**

Drill\_7\_\_\_Marathon\_Carlsbad\_\_\_MAMMOTH\_FED\_COM\_26\_34\_1\_Contingency\_Plan\_070518\_20180727075146.pdf

Drill\_7\_\_\_GasCapturePlanFormFinal\_Mammoth\_Fed\_Com\_26\_34\_1\_\_1\_\_2\_\_7\_\_10\_\_11\_\_20180727073252.pdf

Drill\_7\_\_\_H2S\_Contiengency\_Plan\_Summary\_20180727080308.pdf

### Section 8 - Other Information

**Proposed horizontal/directional/multi-lateral plan submission:**

Drill\_8\_PD\_\_\_Mammoth\_Fed\_Com\_26\_34\_1\_Unit\_\_\_Federal\_Minerals\_Plat\_20180727072050.pdf

Drill\_8\_PD\_\_\_MAMMOTH\_FEDERAL\_COM\_26\_34\_1\_TB\_10H\_DRILLING\_PLAN\_20180727104946.pdf

Drill\_8\_PD\_\_\_Marathon\_Oil\_\_\_Mammoth\_Fed\_Com\_26\_34\_1\_TB\_10H\_\_\_Plan\_\_1\_\_36x48WP\_20180727104957.pdf

Drill\_8\_PD\_\_\_Marathon\_Oil\_\_\_Mammoth\_Federal\_Com\_26\_34\_1\_TB\_10H\_\_\_Plan\_\_1\_\_Planning\_Report\_20180727105007.pdf

**Other proposed operations facets description:**

- Kelly cock will be in the drill string at all times.
- A full opening drill pipe stabbing valve having the appropriate connections will be on the rig floor unobstructed and readily accessible at all times.
- Hydrogen Sulfide detection equipment will be in operation after drilling out the surface casing shoe until the production casing is cemented. Breathing equipment will be on location upon drilling the surface casing shoe until total depth is reached. If Hydrogen Sulfide is encountered , measured amounts and formations will be reported to the BLM.

**Potential Hazards:**

- H2S detection equipment will be in operation after drilling out the surface casing shoe until the production casing has been cemented. Breathing equipment will be on location from drilling out the surface shoe until production casing is cemented. If H2S is encountered the operator will comply with Onshore Order #6.
- No abnormal temperatures or pressures are anticipated. All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well. Adequate flare lines will be installed off the mud/gas separator where gas may be flared safely.
- No losses are anticipated at this time.
- All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well.
- Adequate flare lines will be installed off the mud/gas separator where gas may be flared safely.

**Other proposed operations facets attachment:**

Drill\_8\_OF\_\_\_Pad\_Flex\_III\_20180727080232.pdf

**Operator Name:** MARATHON OIL PERMIAN LLC

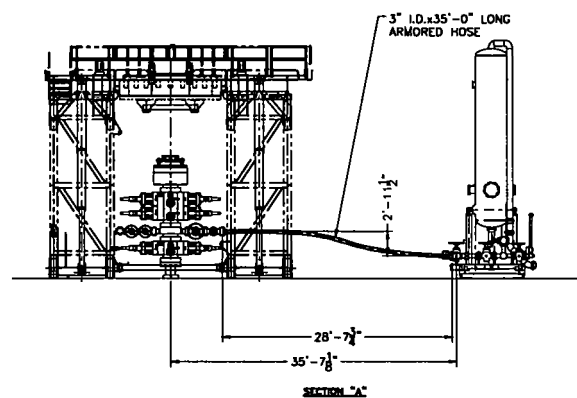
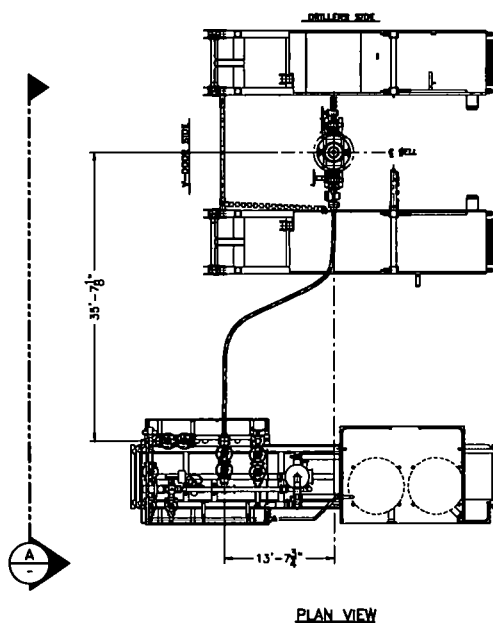
**Well Name:** MAMMOTH FED COM 26 34 1 TB

**Well Number:** 10H

DRILL\_8\_Batch\_Drilling\_Plan\_and\_Surface\_Rig\_Request\_20180628132936.pdf

**Other Variance attachment:**

DRILL\_8\_Batch\_Drilling\_Plan\_and\_Surface\_Rig\_Request\_20180627112019.pdf



ISSUED FOR  
FABRICATION  
December-19-2007  
DRAFTSMAN  
ENGINEER

**PROPRIETARY**

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INTERNATIONAL DRILLING CO.

CHOKE LINE SYSTEM  
FLEXRIG3

| DATE     | DESCRIPTION                | BY          | CHKD | APP'D       | DATE         |
|----------|----------------------------|-------------|------|-------------|--------------|
| 12/18/07 | REVISION SHEET 10% DRAUGHT | JW          | JSC  |             | 12-10-07     |
| REV      | DATE                       | DESCRIPTION | BY   | SCALE       | SHEET 2 OF 2 |
|          |                            |             |      | 2 1/8" = 1" | 210-P1-07    |

210-P1-07 A

|  |                                   |
|--|-----------------------------------|
| QUALITY CONTROL                                  | No.: QC-DB- 380 / 2012            |
|  | Page : 1 / 61                     |
| Hose No.:<br>63389, 63390, 63391<br>63392, 63393 | Revision : 0                      |
|  | Date: 28. August 2012.            |
|  | Prepared by : <i>Scala Linder</i> |
|  | Appr. by: <i>Scala Linder</i>     |

# CHOKE AND KILL HOSES

id.: 3" 69 MPa x 35 ft (10,67 m)

## DATA BOOK

Purchaser: H & P

Purchaser Order No.:

ContiTech Rubber Order No.: 531895

ContiTech Beattie Co. Order No.: 006227

**NOT DESIGNED FOR WELL TESTING**

## CONTENT

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| 2. American Petroleum Institute Certificate of Authority To Use the Official API Monogram (No.: 16C-0004 )                              | 4.          |
| 3. Quality Control Inspection and Test Certificates (No.: 1595, 1596, 1597, 1598, 1599 )  | 5-9.        |
| 4. Hose Data Sheet  | 10.         |
| 5. Metal Parts  |             |
| 5.1. Raw Material Quality Certificates (No.: EUR-240960, EUR-251871, 81687/12-0 )   | 11-14.      |
| 5.2. Hardness Test Reports (No.: HB 2150/12, HB 2151/12, HB 2159/12 )   | 15-17.      |
| 5.3. Ultrasonic Test Reports (No.: U12/124, U12/126, U12/129, U12/127 )   | 18-21.      |
| 5.4. NDT Examiner Certificate (Name: Joó Imre )   | 22-23.      |
| 5.5. Welding Procedure Specification (No.: 140-60 )   | 24-27.      |
| 5.6. Welding Procedure Qualification Record (No.: BUD 0600014/1 )   | 28-29.      |
| 5.7. Welder's Approval Test Certificates<br>(No.: RK-1894628-A1-X2, RK-1894628-A1-X-1, RK-2096656-B, RK-1894628-A1-X3, RK1079715-A1-X ) | 30-41.      |
| 5.8. Welding Log Sheets (No.: 240, 241 )  | 42-43.      |
| 5.9. Visual Examination Record (No.: 696/12 )   | 44.         |
| 5.10. NDT Examiner Certificate (Name: Benkő Péter )   | 45-46.      |
| 5.11. Radiographic Test Certificates (No.: 1458/12, 1459/12, 1460/12, 1461/12, 1462/12 )  | 47-51.      |
| 5.12. NDT Examiner Certificate (Name: Ménesi István )   | 52-53.      |
| 5.13. MP Examination Record (No.: 1262/12 )   | 54.         |
| 5.14. NDT Examiner Certificate (Name: Oravecz Gábor )   | 55-56.      |
| 6. Steel Cord   |             |
| 6.1. Inspection Certificate (No.: 437089 )  | 57.         |
| 7. Outside Stripwound Tube  |             |
| 7.1. Inspection Certificate (No.: 917781/001 )  | 58.         |
| 8. Certificate of Calibration (Manometer Serial No.: 0227-073 )   | 59-61.      |

  
 ContiTech Rubber  
 Industrial Kft.  
 Quality Control Dept.  
 (1)



# Certificate of Registration

APIQR REGISTRATION NUMBER  
0760

*This certifies that the quality management system of*  
**CONTITECH RUBBER INDUSTRIAL LTD.**  
Budapesti ut 10  
Szeged  
Hungary

*has been assessed by the American Petroleum Institute Quality Registrar (APIQR®) and  
found it to be in conformance with the following standard:*

**ISO 9001:2008**

*The scope of this registration and the approved quality management system applies to the*  
**Design and Manufacture of High Pressure Hoses**

*APIQR® approves the organization's justification for excluding:*  
**No Exclusions Identified as Applicable**

## COPY

**Effective Date: October 15, 2010**  
**Expiration Date: October 15, 2013**  
**Registered Since: October 15, 2007**

*W. Don Whittaker*  
**Manager of Operations, APIQR**

Accredited by Member of  
the International  
Accreditation Forum  
Multilateral Recognition  
Arrangement for Quality  
Management Systems



This certificate is valid for the period specified herein. The registered organization must continually meet all requirements of APIQR's Registration Program and the requirements of the Registration Agreement. Registration is maintained and regularly monitored through annual full system audits. Further clarifications regarding the scope of this certificate and the applicability of ISO 9001 standard requirements may be obtained by consulting the registered organization. This certificate has been issued from APIQR offices located at 1120 L Street, N.W., Washington, D.C. 20004-4070, U.S.A. It is the property of APIQR, and must be returned upon request. To verify the authenticity of this certificate, go to [www.api.org/compontelint](http://www.api.org/compontelint).



2009-106 | 6120 | 118

# Certificate of Authority to use the Official API Monogram

License Number: 16C-0004

ORIGINAL

The American Petroleum Institute hereby grants to

## CONTITECH RUBBER INDUSTRIAL LTD.

Budapesti ut 10

Szeged

Hungary

the right to use the Official API Monogram® on manufactured products under the conditions in the official publications of the American Petroleum Institute entitled API Spec Q1® and API Spec 16C and in accordance with the provisions of the License Agreement.

In all cases where the Official API Monogram is applied, the API Monogram should be used in conjunction with this certificate number: 16C-0004

The American Petroleum Institute reserves the right to revoke this authorization to use the Official API Monogram for any reason satisfactory to the Board of Directors of the American Petroleum Institute.

The scope of this license includes the following product: Flexible Choke and Kill Lines

QMS Exclusions: No Exclusions Identified as Applicable

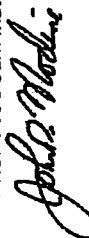
# COPY

Effective Date: OCTOBER 15, 2010

Expiration Date: OCTOBER 15, 2013

To verify the authenticity of this license, go to [www.api.org/compositelist](http://www.api.org/compositelist).

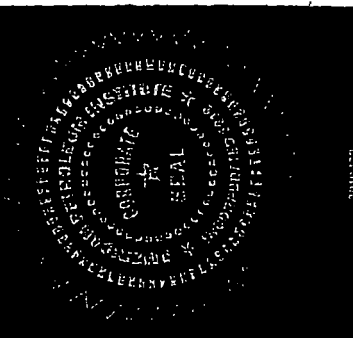
American Petroleum Institute



Director of Global Industry Services



American  
Petroleum  
Institute



CONTITECH RUBBER  
Industrial Kft.

No:QC-DB- 380 /2012

Page: 4 /61



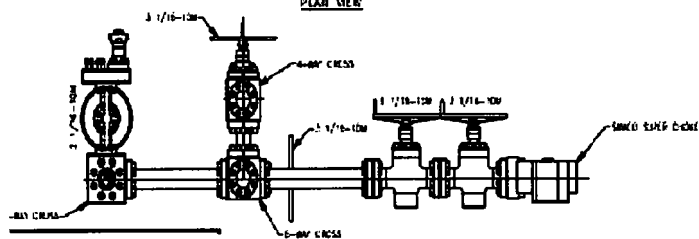
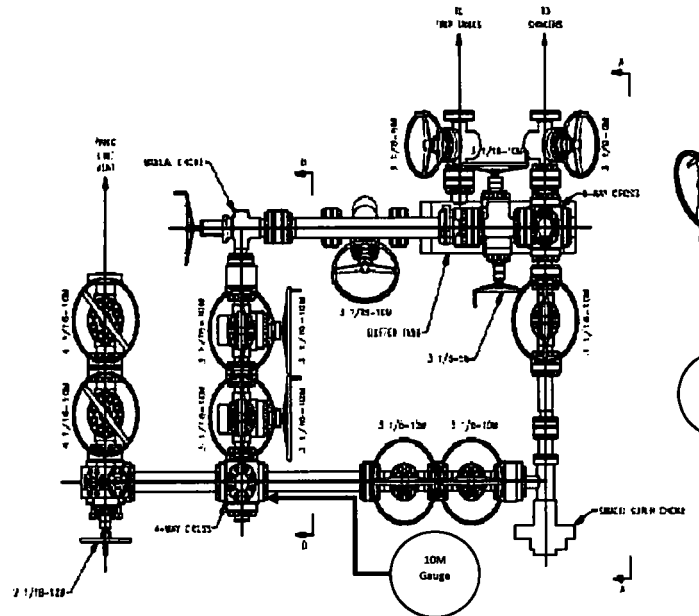
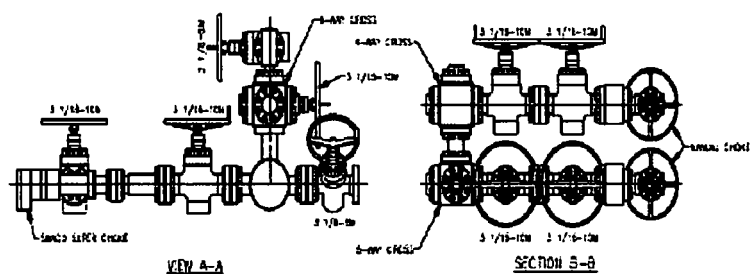
| QUALITY CONTROL<br>INSPECTION AND TEST CERTIFICATE   |           |  |         | CERT. N°: 1599    |  |                |           |         |         |                  |           |           |       |                            |  |           |       |                               |           |  |
|--|-----------|--|---------|-------------------|--|----------------|-----------|---------|---------|------------------|-----------|-----------|-------|----------------------------|--|-----------|-------|-------------------------------|-----------|--|
| PURCHASER: ContiTech Beattie Co.   |           |  |         | P.O. N°: 006227   |  |                |           |         |         |                  |           |           |       |                            |  |           |       |                               |           |  |
| CONTITECH ORDER N°: 531895   |           | HOSE TYPE: 3" ID Choke and Kill Hose   |         |                   |  |                |           |         |         |                  |           |           |       |                            |  |           |       |                               |           |  |
| HOSE SERIAL N°: 63393  |           | NOMINAL / ACTUAL LENGTH: 10,67 m / 10,72 m   |         |                   |  |                |           |         |         |                  |           |           |       |                            |  |           |       |                               |           |  |
| W.P. 68,9 MPa 10000 psi  |           | T.P. 103,4 MPa 15000 psi   |         | Duration: 60 min. |  |                |           |         |         |                  |           |           |       |                            |  |           |       |                               |           |  |
| <p>Pressure test with water at ambient temperature</p> <p style="text-align: center;">See attachment. ( 1 page )</p> <p>↑ 10 mm = 10 Min.<br/>→ 10 mm = 20 MPa</p> <table border="1"> <thead> <tr> <th>COUPLINGS Type</th> <th>Serial N°</th> <th>Quality</th> <th>Heat N°</th> </tr> </thead> <tbody> <tr> <td>3" coupling with</td> <td>2156 2153</td> <td>AISI 4130</td> <td>20231</td> </tr> <tr> <td>4 1/16" 10K API Flange end</td> <td></td> <td>AISI 4130</td> <td>34031</td> </tr> </tbody> </table> <p><b>NOT DESIGNED FOR WELL TESTING</b> <span style="float: right;"><b>API Spec 16 C</b></span><br/><b>Temperature rate:"B"</b></p> <p>All metal parts are flawless</p> <p><b>WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER INSPECTED AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.</b></p> <p><b>STATEMENT OF CONFORMITY:</b> We hereby certify that the above items/equipment supplied by us are in conformity with the terms, conditions and specifications of the above Purchaser Order and that these items/equipment were fabricated inspected and tested in accordance with the referenced standards, codes and specifications and meet the relevant acceptance criteria and design requirements.</p> <p style="text-align: center;">COUNTRY OF ORIGIN HUNGARY/EU</p> <table border="1"> <tr> <td>Date:<br/><br/>23. August 2012.</td> <td>Inspector</td> <td>Quality Control<br/><br/>ContiTech Rubber<br/>Industrial Kft.<br/>Quality Control Dept.<br/>(1)</td> </tr> </table> |           |  |         |                   |  | COUPLINGS Type | Serial N° | Quality | Heat N° | 3" coupling with | 2156 2153 | AISI 4130 | 20231 | 4 1/16" 10K API Flange end |  | AISI 4130 | 34031 | Date:<br><br>23. August 2012. | Inspector | Quality Control<br><br>ContiTech Rubber<br>Industrial Kft.<br>Quality Control Dept.<br>(1) |
| COUPLINGS Type   | Serial N° | Quality  | Heat N° |                   |  |                |           |         |         |                  |           |           |       |                            |  |           |       |                               |           |  |
| 3" coupling with   | 2156 2153 | AISI 4130  | 20231   |                   |  |                |           |         |         |                  |           |           |       |                            |  |           |       |                               |           |  |
| 4 1/16" 10K API Flange end   |           | AISI 4130  | 34031   |                   |  |                |           |         |         |                  |           |           |       |                            |  |           |       |                               |           |  |
| Date:<br><br>23. August 2012.  | Inspector | Quality Control<br><br>ContiTech Rubber<br>Industrial Kft.<br>Quality Control Dept.<br>(1) |         |                   |  |                |           |         |         |                  |           |           |       |                            |  |           |       |                               |           |  |

|                                     |                                     |
|-------------------------------------|-------------------------------------|
| CONTITECH RUBBER<br>Industrial Kft. | No:QC-DB- 380 /2012<br>Page: 10 /61 |
|-------------------------------------|-------------------------------------|



### Hose Data Sheet

|                             |  |
|-----------------------------|--|
| CRI Order No.               | 531895   |
| Customer                    | ContiTech Beattie Co.  |
| Customer Order No           | PO6227 Pbc13080-H&P  |
| Item No.                    | 1  |
| Hose Type                   | Flexible Hose  |
| <b>Standard</b>             | <b>API SPEC 16 C</b>   |
| Inside dia in inches        | 3  |
| Length                      | 35 ft  |
| Type of coupling one end    | FLANGE 4 1/16" API SPEC 6A TYPE 6BX FOR 10000 PSI<br>C/W BX155RING GROOVE  |
| Type of coupling other end  | FLANGE 4 1/16" API SPEC 6A TYPE 6BX FOR 10000 PSI C/W<br>BX155 RING GROOVE |
| H2S service NACE MR0175     | Yes  |
| Working Pressure            | 10 000 psi   |
| Design Pressure             | 10 000 psi   |
| Test Pressure               | 15 000 psi   |
| Safety Factor               | 2,25   |
| Marking                     | USUAL PHOENIX  |
| Cover                       | NOT FIRE RESISTANT   |
| Outside protection          | St. steel outer wrap   |
| Internal stripwound tube    | No   |
| Lining                      | OIL RESISTANT  |
| Safety clamp                | No   |
| Lifting collar              | No   |
| Element C                   | No   |
| Safety chain                | No   |
| Safety wire rope            | No   |
| Max.design temperature [°C] | 100  |
| Min.design temperature [°C] | -20  |
| MBR operating [m]           | 1,60   |
| MBR storage [m]             | 1,40   |
| Type of packing             | WOODEN CRATE ISPM-15   |



# Certificate of Conformity



ContiTech

|   |  |   |  |
|---|--|---|--|
| <b>Certificate Number</b><br>953233-4   | <b>COM Order Reference</b><br>953233                                       | <b>Customer Name &amp; Address</b><br>HELMERICH & PAYNE DRILLING CO<br>1434 SOUTH BOULDER AVE<br>TULSA, OK 74119<br>USA |  |
| <b>Customer Purchase Order No:</b> 740053080  |  |   |  |
| <b>Project:</b>   |  |   |  |
| <b>Test Center Address</b><br>ContiTech Oil & Marine Corp.<br>11535 Brittmoore Park Drive<br>Houston, TX 77041<br>USA | <b>Accepted by COM Inspection</b><br>Signed: Roger Suarez<br>Date: 5/11/17 | <b>Accepted by Client Inspection</b>  |  |

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

# Hydrostatic Test Certificate



ContiTech

|   |                                      |   |                                      |
|---|--------------------------------------|---|--------------------------------------|
| <b>Certificate Number</b><br>953233-4   | <b>COM Order Reference</b><br>953233 | <b>Customer Name &amp; Address</b><br>HELMERICH & PAYNE DRILLING CO<br>1434 SOUTH BOULDER AVE<br>TULSA, OK 74119<br>USA |                                      |
| <b>Customer Purchase Order No:</b> 740053080  |                                      |   |                                      |
| <b>Project:</b>   |                                      |   |                                      |
| <b>Test Center/Address</b><br>ContiTech Oil & Marine Corp.<br>11535 Brittmoore Park Drive<br>Houston, TX 77041<br>USA | <b>Signed:</b><br>Date: 5/11/17      | <b>Accepted by GOM Inspection</b><br>Roger Suarez   | <b>Accepted by Client Inspection</b> |

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

| Qty | Part No | Description | Qty | Part No | Description | Qty | Part No | Description | Qty | Part No | Description |
|-----|---------|-------------|-----|---------|-------------|-----|---------|-------------|-----|---------|-------------|
|-----|---------|-------------|-----|---------|-------------|-----|---------|-------------|-----|---------|-------------|

30

RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL

1

83393

10,000 psi 15,000 psi

60

63393

6 AM

JOB# 45-20-1081  
PBC# 45-230  
HOSE DESCRIPTION 3 1/2 inch 100 ft  
TEST PRESSURE 1500  
CHART RECORDER # 410  
CHART SETTING 410  
CBC REPRESENTATIVE 6-17-05  
DATE 6-17-05



CHART NO. MC MP-20000-150F

METER

CHART PUT ON

LOCATION

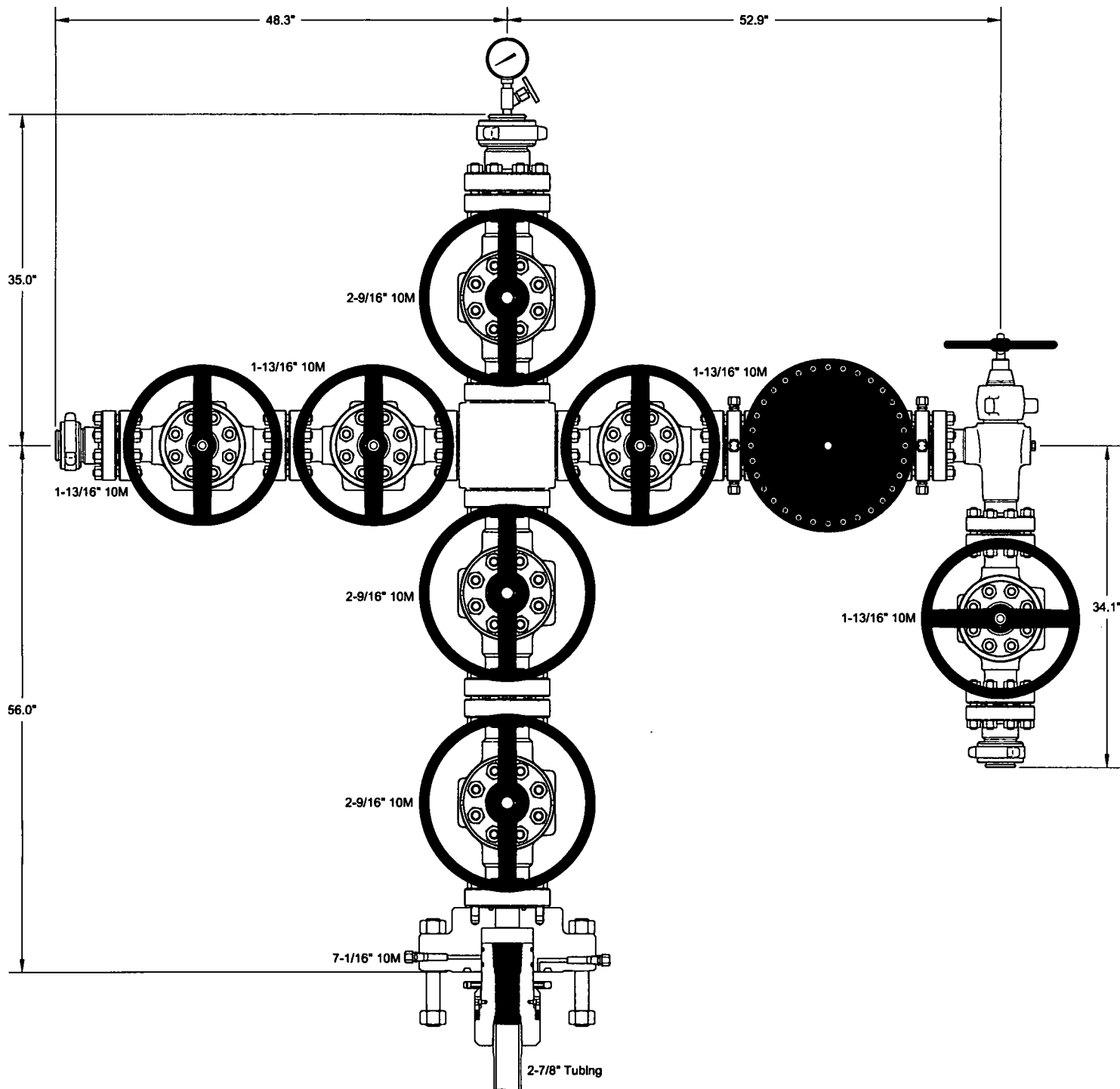
REMARKS

TAKEN OFF

NOON

6 PM

# PT 10K: Natural Flow / Gas Lift



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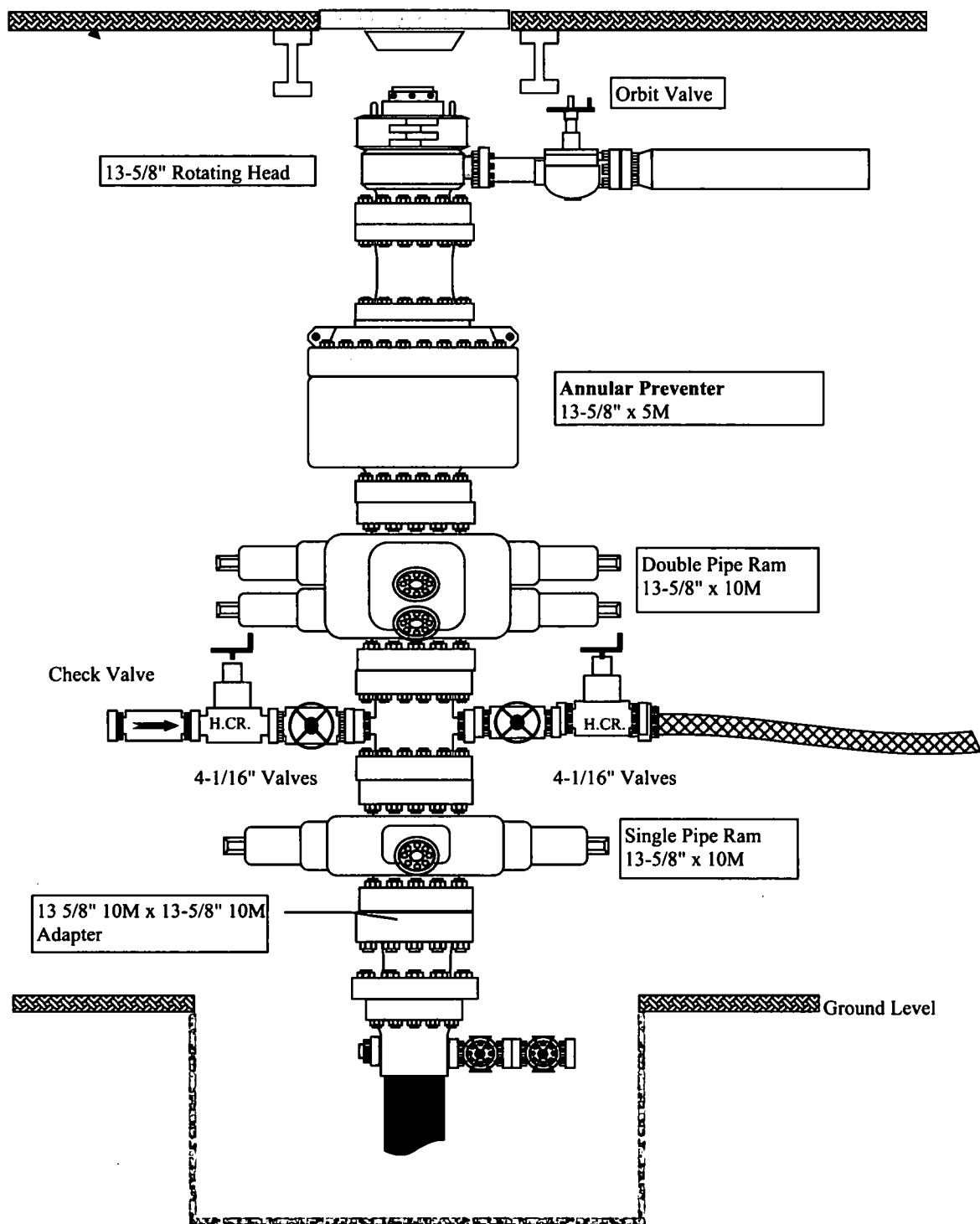
**CACTUS WELLHEAD LLC**

**MARATHON OIL COMPANY  
ODESSA**

**7-1/16" 10M x 2-9/16" 10M x 1-13/16" 10M Production Tree  
With CW-EN-CL Adapter and Hanger**

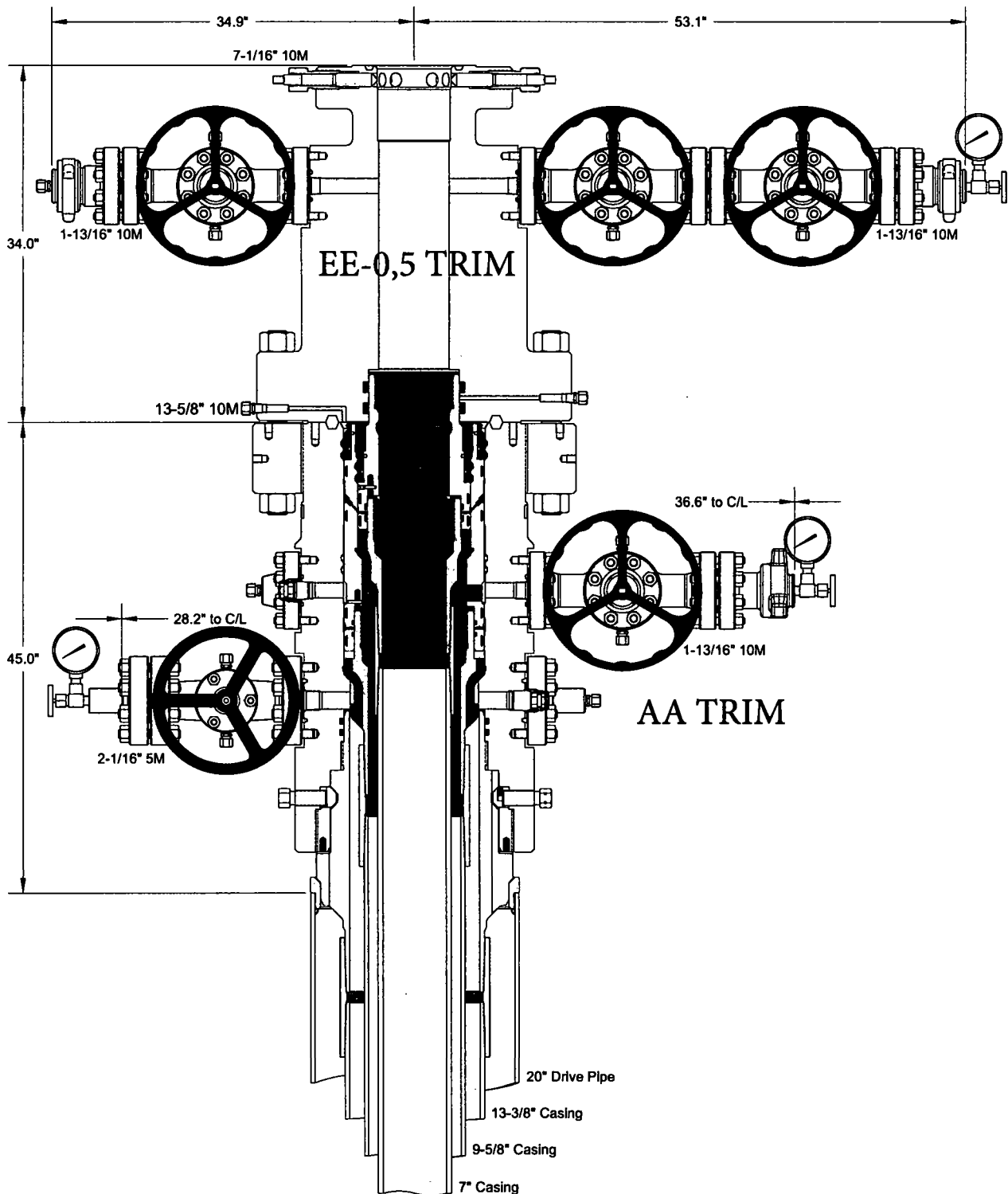
|                    |                   |                |
|--------------------|-------------------|----------------|
| <b>DRAWN</b>       | <b>DLE</b>        | <b>12FEB18</b> |
| <b>APPRV</b>       |                   |                |
| <b>DRAWING NO.</b> | <b>ODE0001831</b> |                |

Operator : **Marathon Oil**





# WH&TH Design # 2



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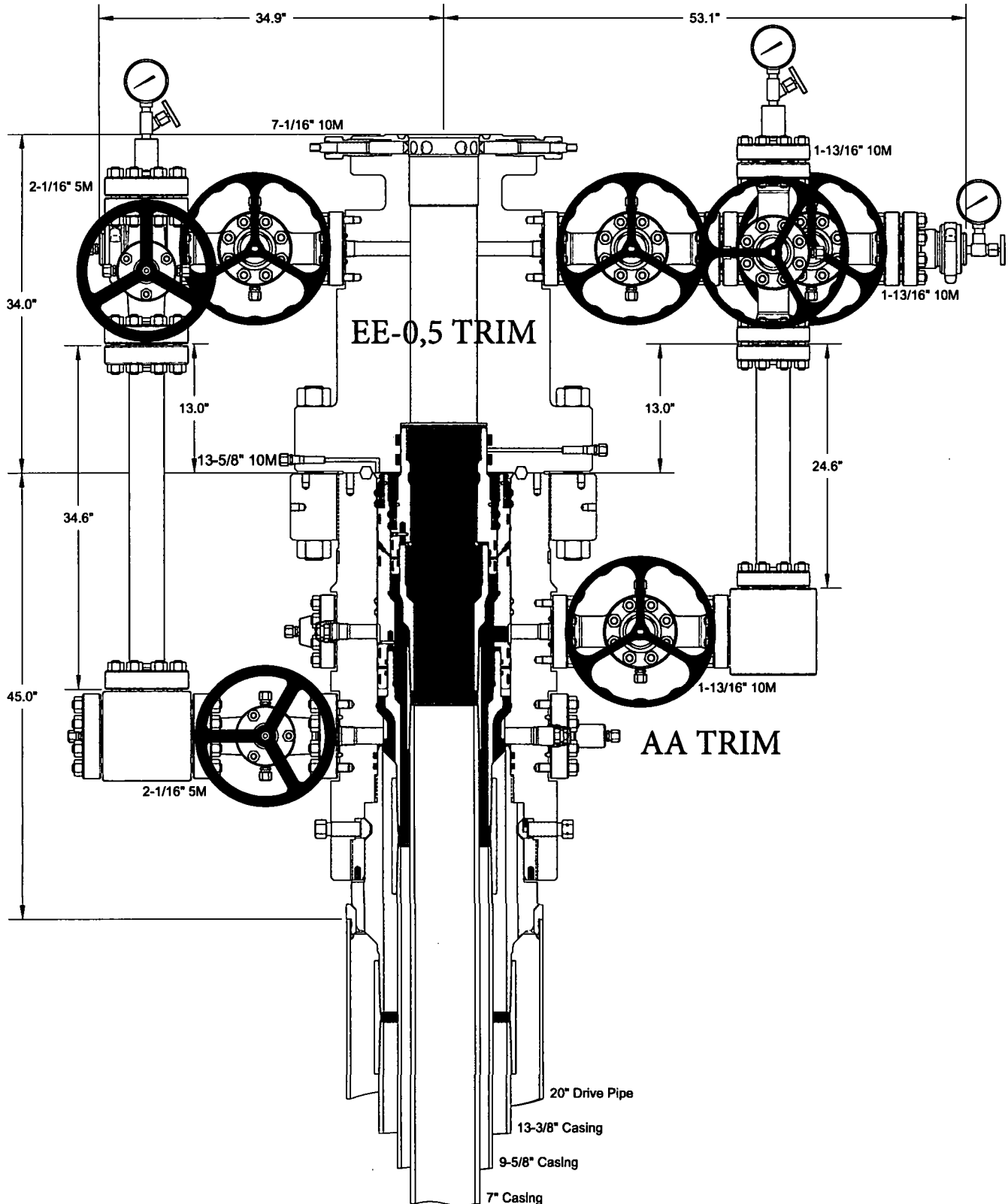
**CACTUS WELLHEAD LLC**

**MARATHON OIL COMPANY**

20" x 13-3/8" x 9-5/8" x 7" MBU-3T-CFL-R-DBLO Wellhead  
 13-5/8" 10M x 7-1/16" 10M CTH-DBLHPS Tubing Head (34" LG)  
 Utilizing Pin Down Mandrel Casing Hangers

|             |     |            |
|-------------|-----|------------|
| DRAWN       | DLE | 23AUG17    |
| APPRV       |     |            |
| DRAWING NO. |     | ODE0001825 |

# WH&TH Design # 2



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**CACTUS WELLHEAD LLC**

**MARATHON OIL COMPANY**

20" x 13-3/8" x 9-5/8" x 7" MBU-3T-CFL-R-DBLO Wellhead  
 13-5/8" 10M x 7-1/16" 10M CTH-DBLHPS Tubing Head (34" LG)  
 Utilizing Pin Down Mandrel Casing Hangers With Annulus Risers

|             |     |            |
|-------------|-----|------------|
| DRAWN       | DLE | 23AUG17    |
| APPRV       |     |            |
| DRAWING NO. |     | ODE0001825 |

## **1. DRILLING WELL CONTROL PLAN**

---

### **1.1 WELL CONTROL - CERTIFICATIONS**

#### **Required IADC/IWCF Well Control Certifications Supervisor Level:**

Any personnel who supervises or operates the BOP must possess a valid current IADC training certification and photo identification. This would include the onsite drilling supervisor, tool pusher/rig manager, driller, and any personnel that will be acting in these capacities. Another example of this may be a wireline or snubbing crew rigged up on the rig to assist the rig, the operator of each system must also have a valid control certification for their level of operation.

BLM recognizes IADC training as the industry approved accredited training. Online self-certifications will not be acceptable. Enforcement actions for the lack of a valid Supervisory Level certificate shall be prompt action to correct the deficiency. **Enforcement actions include but are not limited to immediate replacement of personnel lacking certifications, drilling operations being shut down or installment of a 10M annular.**

IADC Driller Level for all Drillers and general knowledge for the Assistant Driller, Derrick Hands, Floor Hands and Motor Hands is recognized by the BLM; however, a Driller Level certification will need to be presented only if acting in a temporary Driller Level certification capacity.

#### **Well Control-Position/Roles**

IADC Well control training and certification is targeted toward each role, e.g., Supervisor Level toward those who direct, Driller Level to those who act, Introductory to those who need to know.

- **Supervisor Level**
  - Specifies and has oversight that the correct actions are carried out
  - Role is to supervise well control equipment, training, testing, and well control events
  - Directs the testing of BOP and other well control equipment
  - Regularly direct well control crew drills
  - Land based rigs – usually runs the choke during a well kill operation
  - Due to role on the rig, training and certification is targeted more toward management of well control and managing an influx out of the well
- **Driller Level**
  - Performs an action to prevent or respond to well control accident
  - Role is to monitor the well via electronic devices while drilling and detect unplanned influxes
  - Assist with the testing of BOP and other well control equipment
  - Regularly assist with well control crew drills
  - When influx is detected, responsible to close the BOP
  - Due to role on the rig, training and certification is targeted more toward monitoring and shutting the well in (closing the BOP) when an influx is detected

### (Well Control-Positions/Roles Continued)

- **Derrick Hand, Assistant Driller Introductory Level**
  - Role is to assist Driller with kick detection by physically monitoring the well at the mixing pits/tanks
  - Regularly record mud weights/viscosity for analysis by the Supervisor level and mud engineer so pre-influx signs can be detected
  - Mix required kill fluids as directed by Supervisor or Driller
  - Due to role on the rig, training and certification is targeted more toward monitoring for influxes, either via mud samples or visual signs on the pits/tanks
- **Motorman, Floor Hand Introductory Level**
  - Role is to assist the Supervisor, Driller, or Derrick Hand with detecting influxes
  - Be certain all valves are aligned for proper well control as directed by Supervisor
  - Perform Supervisor or Driller assigned tasks during a well control event
  - Due to role on the rig, training and certification is targeted more toward monitoring for influxes

## 1.2 WELL CONTROL-COMPONENT AND PREVENTER COMPATIBILITY CHECKLIST

The table below, which covers the drilling and casing of the 10M Stack portion of the well, outlines the tubulars and the compatible preventers in use. This table, combined with the mud program, documents that two barriers to flow can be maintained at all times, independent of the rating of the annular preventer.

- **Example 8-3/4" Production hole section, 10M requirement**

| Component                   | OD         | Preventer                          | RWP |
|-----------------------------|------------|------------------------------------|-----|
| Drill pipe                  | 5"         | Fixed lower 5"<br>Upper 4.5-7" VBR | 10M |
| HWDP                        | 5"         | Fixed lower 5"<br>Upper 4.5-7" VBR | 10M |
| Drill collars and MWD tools | 6.25-6.75" | Upper 4.5-7" VBR                   | 10M |
| Mud Motor                   | 6.75"      | Upper 4.5-7" VBR                   | 10M |
| Production casing           | 5.5"       | Upper 4.5-7" VBR                   | 10M |
| ALL                         | 0-13-5/8"  | Annular                            | 5M  |
| Open-hole                   | -          | Blind Rams                         | 10M |

- VBR = Variable Bore Ram. Compatible range listed in chart.

## 1.3 WELL CONTROL-BOP TESTING

BOP Test will be completed per Onshore Oil and Gas Order #2 Well Control requirements. The 5M Annular Preventer on a required 10M BOP stack will be tested to 70 % of rated working pressure including a 10 minute low pressure test. Pressure shall be maintained at least 10 minutes.

## 1.4 WELL CONTROL - DRILLS

The following drills are conducted and recorded in the Daily Drilling Report and the Contractor's reporting system while engaged in drilling operations:

| Type                              | Frequency  | Objective   | Comments  |
|-----------------------------------|--|---|---|
| Shallow gas kick drill - drilling | Once per well with crew on tour                                    | Response training to a shallow gas influx   | To be done prior to drilling surface hole if shallow gas is noted   |
| Kick drill - drilling             | Once per week per crew   | Response training to an influx while drilling (bit on bottom)                               | Only one kick drill per week per crew is required, alternating between drilling and tripping.   |
| Kick drill - tripping             | Once per week per crew   | Response training to an influx while tripping (bit off bottom). Practice stabbing TIW valve |   |
| Choke drill                       | Once per well with crew on tour                                    | Practice in operating the remotely operated choke with pressure in the well                 | Before drilling out of the last casing set above a prospective reservoir<br><br>Include the scenario of flowing well with gas on drill floor as a table top |
| H <sub>2</sub> S drill            | Prior to drilling into a potential H <sub>2</sub> S zone/reservoir | Practice in use of respiratory equipment  |   |

## 1.5 WELL CONTROL – MONITORING

- Drilling operations which utilize static fluid levels in the wellbore as the active barrier element, a means of accurately monitoring fill-up and displacement volumes during trips are available to the driller and operator. A recirculating trip tank is installed and equipped with a volume indicator easily read from the driller's / operator's position. This data is recorded on a calibrated chart recorder or digitally. The actual volumes are compared to the calculated volumes.
- The On-Site Supervisor ensures hole-filling and pit monitoring procedures are established and documented for every rig operation.
- The well is kept full of fluid with a known density and monitored at all times even when out of the hole.
- Flow checks are a minimum of 15 minutes.
- A flow check is made:
  - In the event of a drilling break.
  - After indications of down hole gains or losses.
  - Prior to all trips out of the hole.
  - After pulling into the casing shoe.
  - Before the BHA enters the BOP stack.
  - If trip displacement is incorrect.

### **Well Control-Monitoring (Continued)**

- Prior to dropping a survey instrument.
- Prior to dropping a core ball.
- After a well kill operation.
- When the mud density is reduced in the well.
- Flow checks may be made at any time at the sole discretion of the driller or his designate. The Onsite Supervisor ensures that personnel are aware of this authority and the authority to close the well in immediately without further consultation.
- Record slow circulating rates ( SCR ) after each crew change, bit trip, and 500' of new hole drilled and after any variance greater than 0.2 ppg in MW. Slow pump rate recordings should include return flow percent, TVD, MD & pressure. SCR's will be done on all pumps at 30, 40 & 50 SPM. Pressures will be recorded at the choke panel. SCR will be recorded in the IADC daily report and MRO Wellview daily report
- Drilling blind (i.e. without returns) is permissible only in known lithology where the absence of hydrocarbons has been predetermined and written approval of the Drilling Manager.
- All open hole logs to be run with pack-off, lubricator or Drilling Manager approved alternative means.
- The Drilling Contractor has a fully working pit level totalizer / monitoring system with read out for the driller and an audible alarm set to 10 BBL gain / loss volume. Systems are selectable to enable monitoring of all pits in use. Pit volumes are monitored at all times, especially when transferring fluids. Both systems data is recorded on a calibrated chart recorder or electronically.
- The Drilling Contractor has a fully working return mud flow indicator with drillers display and an audible alarm, and is adjustable to record any variance in return volumes.

### **1.6 WELL CONTROL – SHUT IN**

- The “hard shut in” method (i.e. against a closed choke using either an annular or ram type preventer) is the Company standard.
- The HCR(s) or failsafe valves are left closed during drilling to prevent any erosion and buildup of solids. The adjustable choke should also be left closed.
- The rig specific shut in procedure, the BOP configuration along with space-out position for the tool joints is posted in the Driller's control cabin or doghouse.
- No well kill operation commences until there is a plan agreed by the Superintendent, On-Site Supervisor and the Drilling Manager.
- During a well kill by circulation, constant bottom hole pressure is maintained throughout.
- Kill sheets are maintained by the Driller and posted in the Driller's control cabin or doghouse. The sheet is updated at a minimum every 500 feet.

## 2. SHUT-IN PROCEDURES:

---

### 2.1 PROCEDURE WHILE DRILLING

- Sound alarm (alert crew)
- Space out drill string – Stop rotating, pick the drill string up off bottom, and space out to ensure no tool joint is located in the BOP element selected for initial closure.
- Shut down pumps (stop pumps and observe well.)
- Shut-in Well - If flow is suspected or confirmed, close uppermost applicable BOP element. (HCR and choke will already be in the closed position.)
  - **Note:** Either the uppermost pipe ram or annular preventer can be used.
- Confirm shut-in
- Notify toolpusher/company representative
- Gather all relevant data required:
  - SIDPP and SICP
  - Hole Depth and Hole TVD
  - Pit gain
  - Time
  - Kick Volume
  - Pipe depth
  - MW in, MW out
  - SPR's (Slow Pump Rate's)
- Regroup and identify forward plan (let well stabilize, update kill sheet, inventory mud additives and mud volumes on location)
- Company Representative, Drilling Superintendent, Drilling Engineer and Drilling Manager will discuss well control kill method to be utilized. A verbal Risk Assessment and preferred kill method will be finalized. Initial Risk Assessment will be finalized within 1 hour of initial shut in.
- No well kill operation commences until there is a plan agreed by the Superintendent, On-Site Supervisor and the Drilling Contractor PIC.
- Recheck all pressures and fluid volume on accumulator unit
- If pressure has built or is anticipated during the kill to reach 2,500 psi or greater, the annular preventer CANNOT be used as per Oil Company Well Control Policy, swap to the upper BOP pipe ram.

### 2.2 PROCEDURE WHILE TRIPPING

- Sound alarm (alert crew)
- Stab full opening safety valve in the drill string and close.
- Space out drill string (ensure no tool joint is located in the BOP element selected for initial closure).
- Shut down pumps (stop pumps and observe well.)
- Shut-in Well - If flow is suspected or confirmed, close uppermost applicable BOP element. (HCR and choke will already be in the closed position.)
  - **Note:** Either the uppermost pipe ram or annular preventer can be used.
- Confirm shut-in
- Notify tool pusher/company representative
- Gather all relevant data required:
  - SIDPP and SICP
  - Hole Depth and Hole TVD
  - Pit gain

## Procedure While Tripping (Continued)

- Time
  - Kick Volume
  - Pipe depth
  - MW in, MW out
  - SPR's (Slow Pump Rate's)
- Regroup and identify forward plan (let well stabilize, update kill sheet, inventory mud additives and mud volumes on location)
- Company Representative, Drilling Superintendent, Drilling Engineer and Drilling Manager will discuss well control kill method to be utilized. A verbal Risk Assessment and preferred kill method will be finalized. Initial Risk Assessment will be finalized within 1 hour of initial shut in.
- No well kill operation commences until there is a plan agreed by the Superintendent, On-Site Supervisor and the Drilling Contractor PIC.
- Recheck all pressures and fluid volume on accumulator unit  
If pressure has built or is anticipated during the kill to reach X,XXX psi or greater, the annular preventer CANNOT be used as per Company Well Control Policy, swap to the upper BOP pipe ram.

## 2.3 PROCEDURE WHILE RUNNING CASING

- Sound alarm (alert crew)
- Stab crossover and full opening safety valve and close
- Space out casing (ensure no coupling is located in the BOP element selected for initial closure).
- Shut down pumps (stop pumps and observe well.)
- Shut-in Well - If flow is suspected or confirmed, close uppermost applicable BOP element. (HCR and choke will already be in the closed position.)
  - **Note:** Either the uppermost pipe ram or annular preventer can be used.
- Confirm shut-in
- Notify tool pusher/company representative
- Gather all relevant data required:
  - SIDPP and SICP
  - Hole Depth and Hole TVD
  - Pit gain
  - Time
  - Kick Volume
  - Pipe depth
  - MW in, MW out
  - SPR's (Slow Pump Rate's)
- Regroup and identify forward plan (let well stabilize, update kill sheet, inventory mud additives and mud volumes on location)
- Company Representative, Drilling Superintendent, Drilling Engineer and Drilling Manager will discuss well control kill method to be utilized. A verbal Risk Assessment and preferred kill method will be finalized. Initial Risk Assessment will be finalized within 1 hour of initial shut in.
- No well kill operation commences until there is a plan agreed by the Superintendent, On-Site Supervisor and the Drilling Contractor PIC.
- Recheck all pressures and fluid volume on accumulator unit  
If pressure has built or is anticipated during the kill to reach 2,500 psi or greater, the annular preventer CANNOT be used, swap to the upper BOP pipe ram.



## **2.4 PROCEDURE WITH NO PIPE IN HOLE (OPEN HOLE)**

- Sound alarm (alert crew)
- Shut-in with blind rams or BSR. (HCR and choke will already be in the closed position.)
- Confirm shut-in
- Notify toolpusher/company representative
- Gather all relevant data required:
  - Shut-In Pressure
  - Hole Depth and Hole TVD
  - Pit gain
  - Time
  - Kick Volume
  - MW in, MW out
  - SPR's (Slow Pump Rate's)
- Regroup and identify forward plan (let well stabilize, update kill sheet, inventory mud additives and mud volumes on location)
- Company Representative, Drilling Superintendent, Drilling Engineer and Drilling Manager will discuss well control kill method to be utilized. A verbal Risk Assessment and preferred kill method will be finalized. Initial Risk Assessment will be finalized within 1 hour of initial shut in.
- No well kill operation commences until there is a plan agreed by the Superintendent, On-Site Supervisor and the Drilling Contractor PIC.
- Recheck all pressures and fluid volume on accumulator unit.

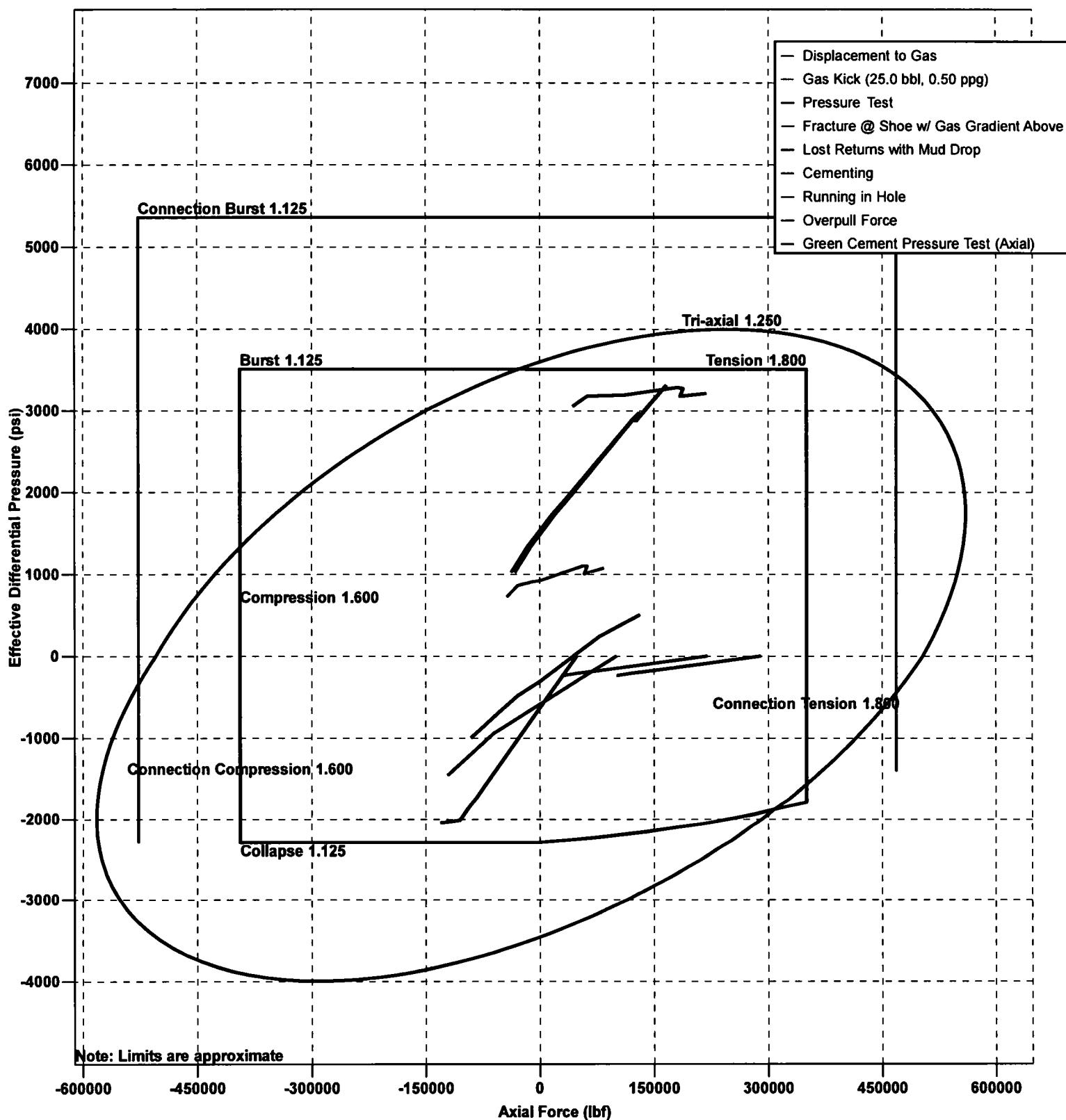
## **2.5 PROCEDURE WHILE PULLING BHA THRU STACK**

- PRIOR to pulling last joint of drill pipe thru the stack.
- Perform flow check, if flowing.
- Sound alarm (alert crew).
- Stab full opening safety valve and close
- Space out drill string with tool joint just beneath the upper pipe ram.
- Shut-in using upper pipe ram. (HCR and choke will already be in the closed position).
- Confirm shut-in.
- Notify toolpusher/company representative
- Read and record the following:
  - SIDPP and SICP
  - Pit gain
  - Time
- Regroup and identify forward plan
- **With BHA in the stack and compatible ram preventer and pipe combo immediately available.**
  - Sound alarm (alert crew)
  - Stab crossover and full opening safety valve and close
  - Space out drill string with upset just beneath the compatible pipe ram.
  - Shut-in using compatible pipe ram. (HCR and choke will already be in the closed position.)
  - Confirm shut-in
  - Notify toolpusher/company representative
  - Read and record the following:
    - SIDPP and SICP
    - Pit gain

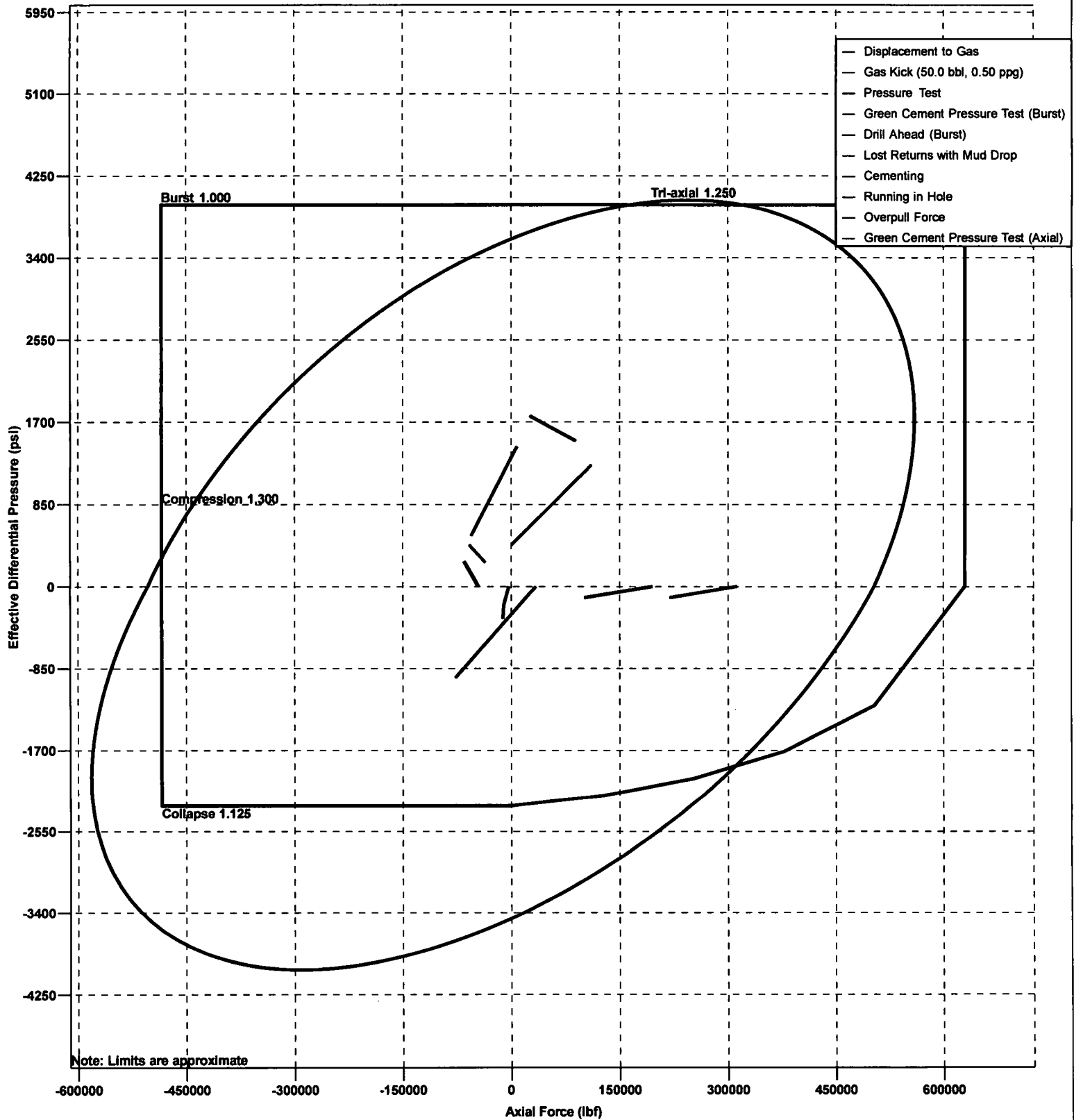
### Procedures While Pulling BHA thru Stack (Continued)

- Time
- Regroup and identify forward plan
- With BHA in the stack and **NO** compatible ram preventer and pipe combo immediately available.
  - Sound alarm (alert crew)
  - If possible to pick up high enough, pull string clear of the stack and follow "Open Hole" scenario.
  - If impossible to pick up high enough to pull the string clear of the stack:
  - Stab crossover, make up one joint/stand of drill pipe, and full opening safety valve and close
  - Space out drill string with tool joint just beneath the upper pipe ram.
  - Shut-in using upper pipe ram. (HCR and choke will already be in the closed position.)
  - Confirm shut-in
  - Notify toolpusher/company representative
  - Read and record the following:
    - SIDPP and SICP
    - Pit gain
    - Time

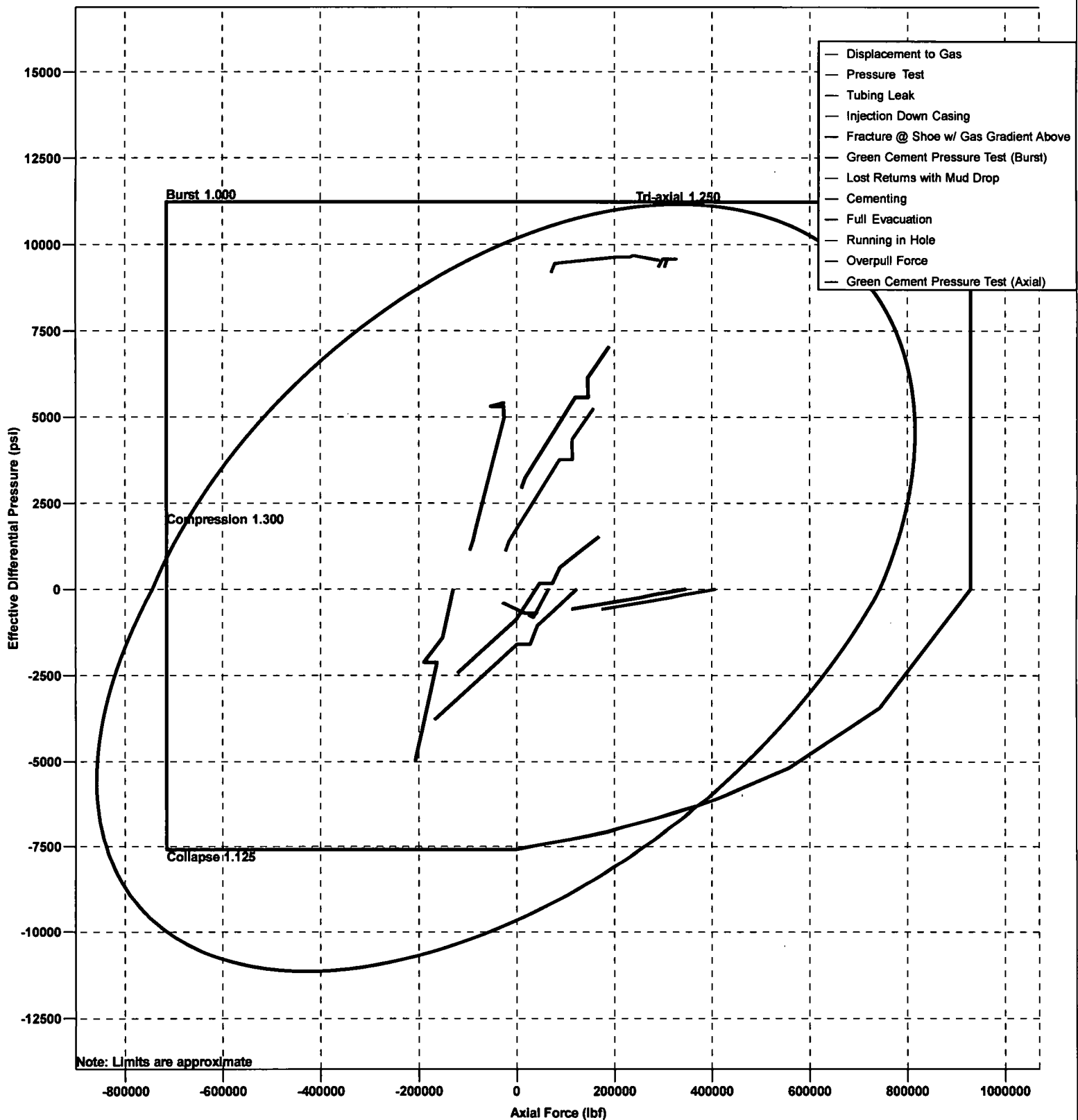
**Design Limits (9 5/8" Intermediate Casing - Section 1)**



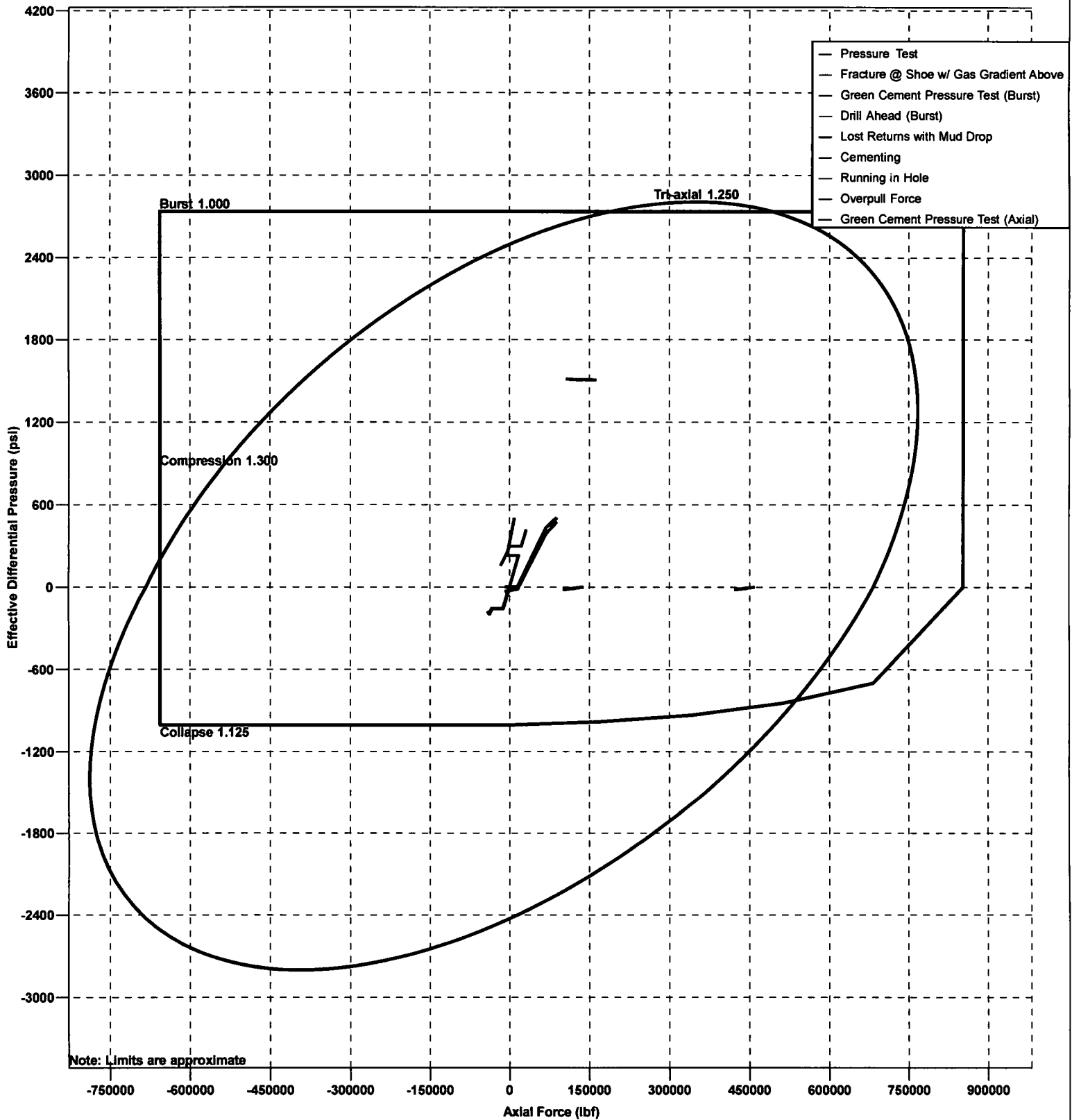
## Design Limits (9 5/8" Intermediate Casing - Section 1)



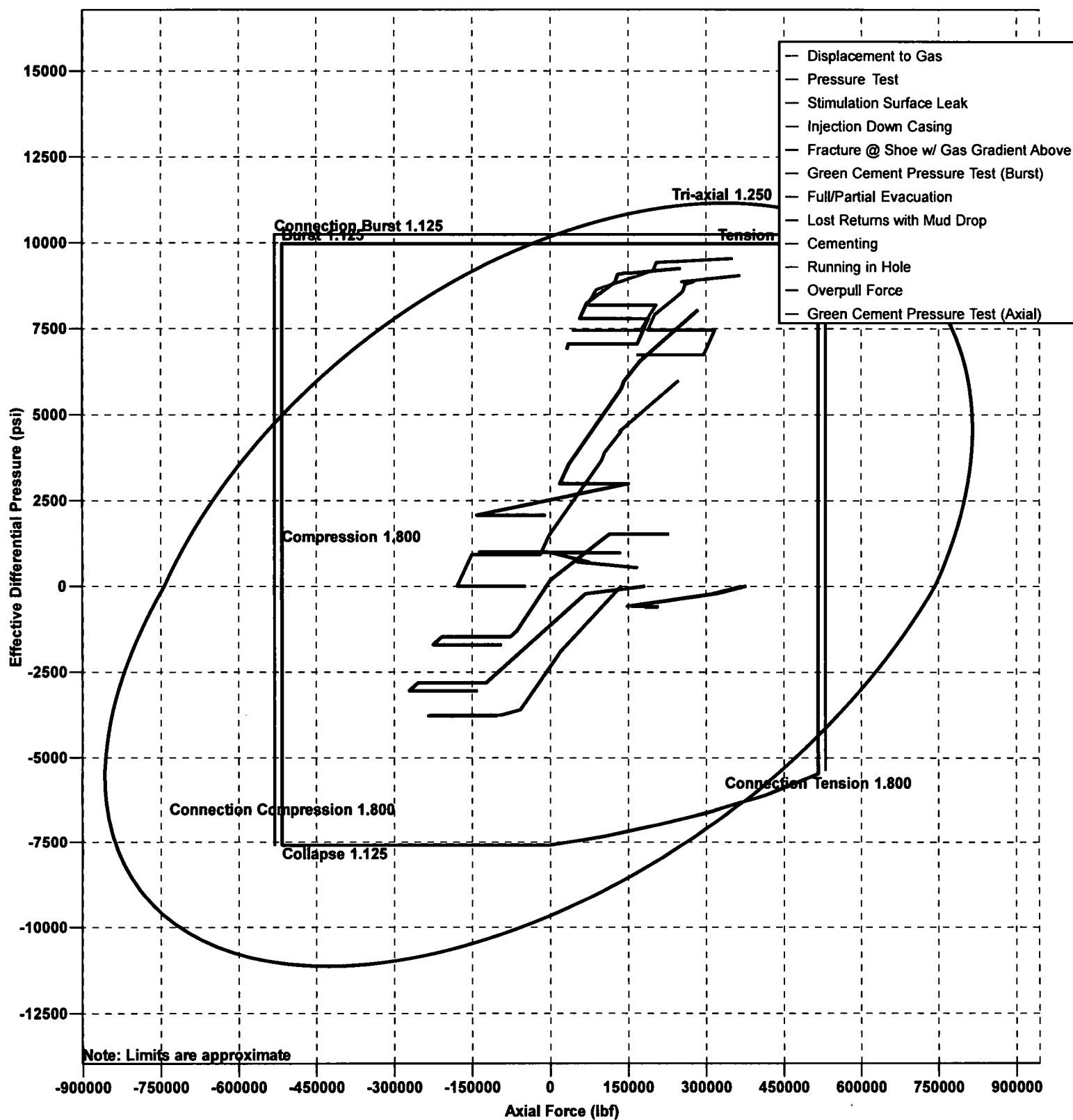
Design Limits (7" Production Casing - Section 1)



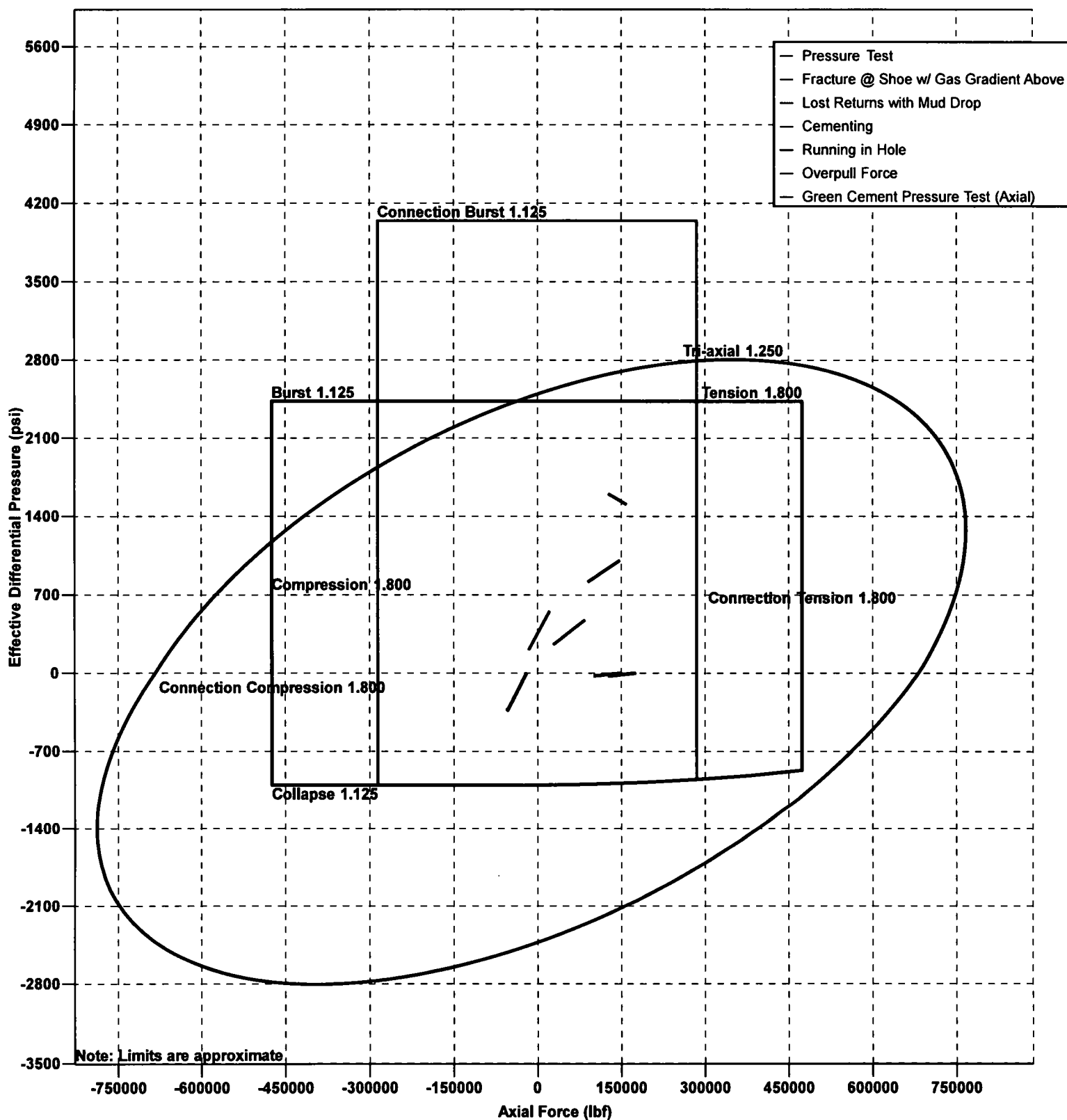
Design Limits (13 3/8" Surface Casing - Section 1)



## Design Limits (7" Production Casing - Section 1)

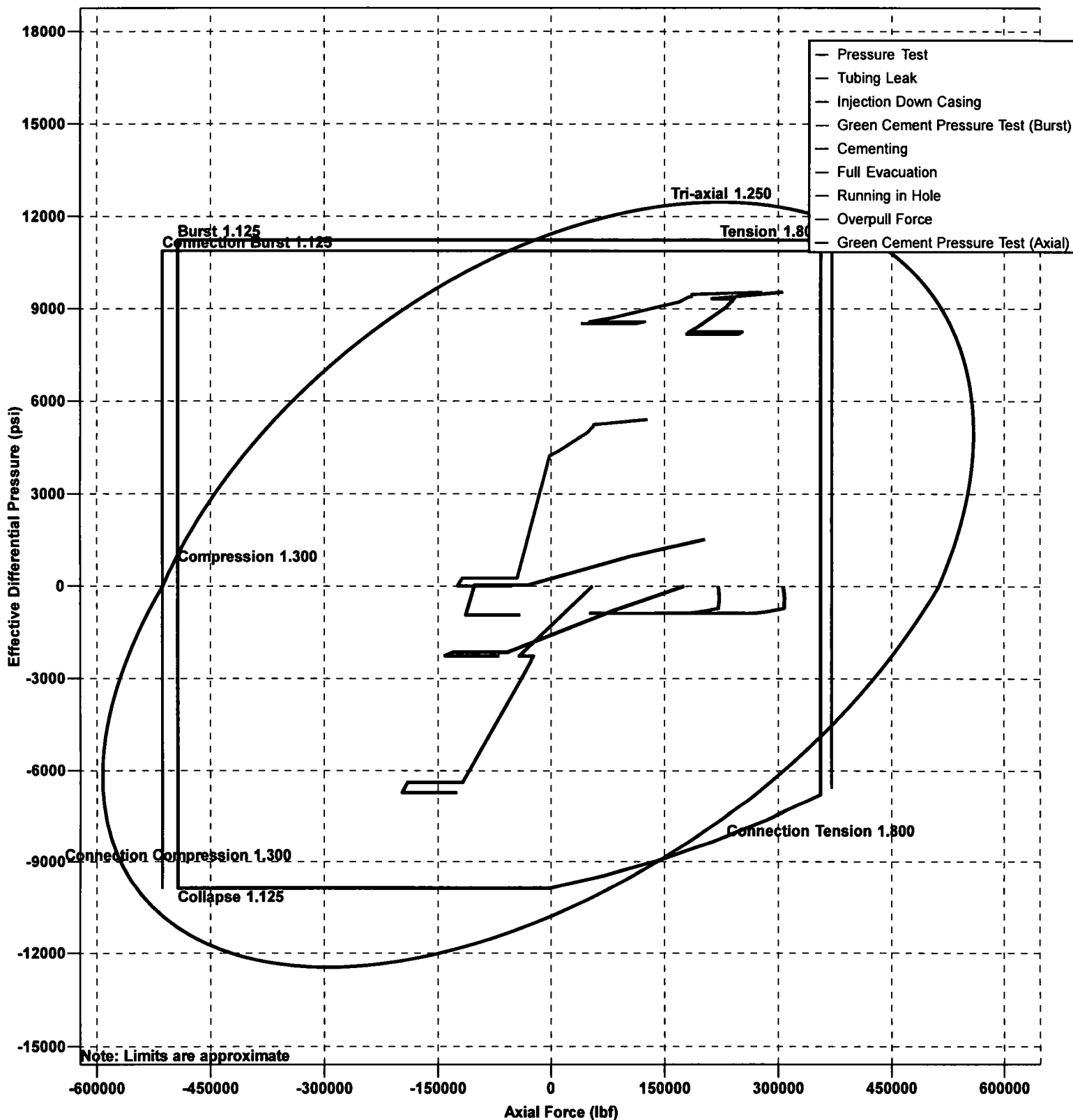


## Design Limits (13 3/8" Surface Casing - Section 1)

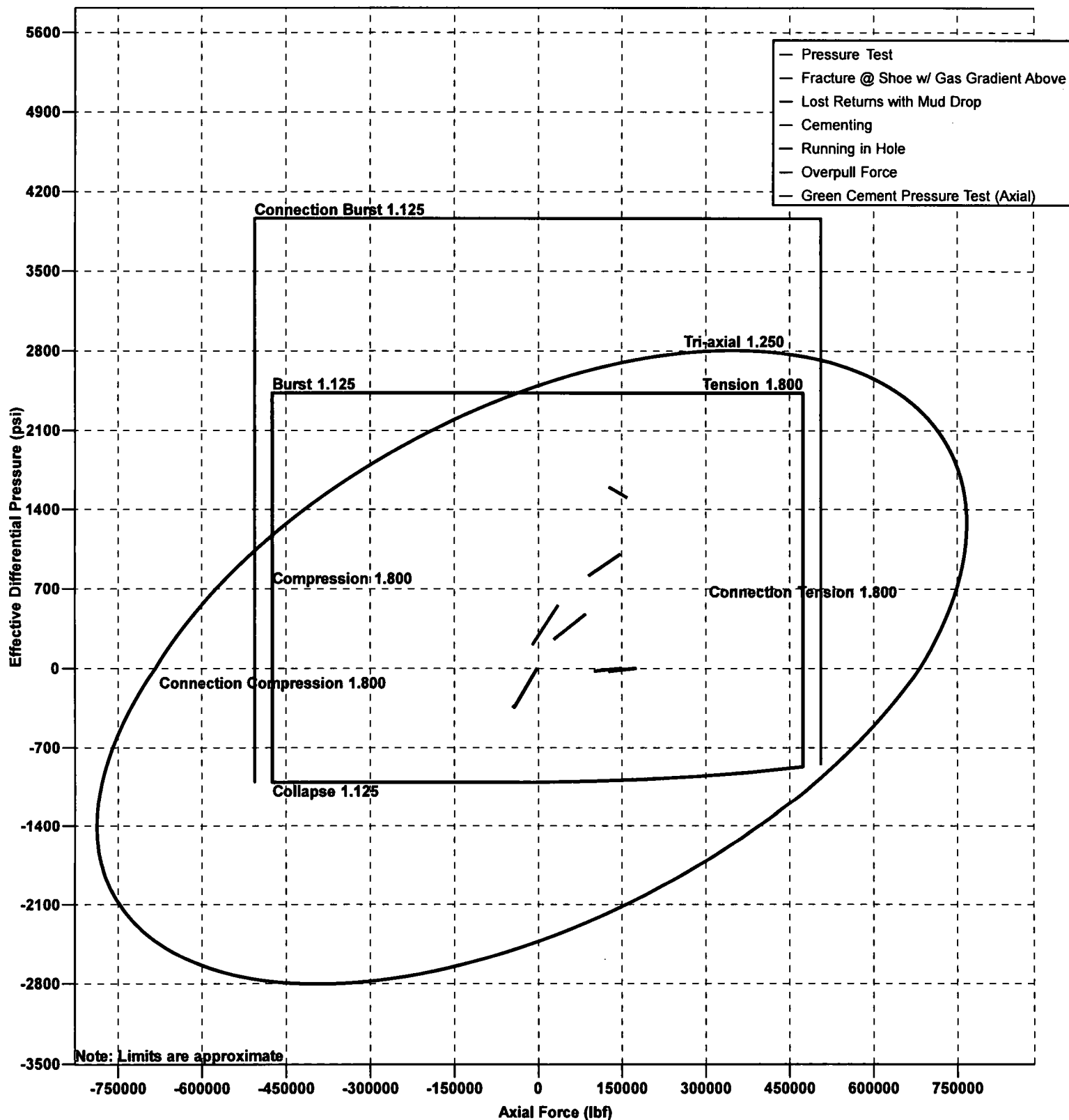




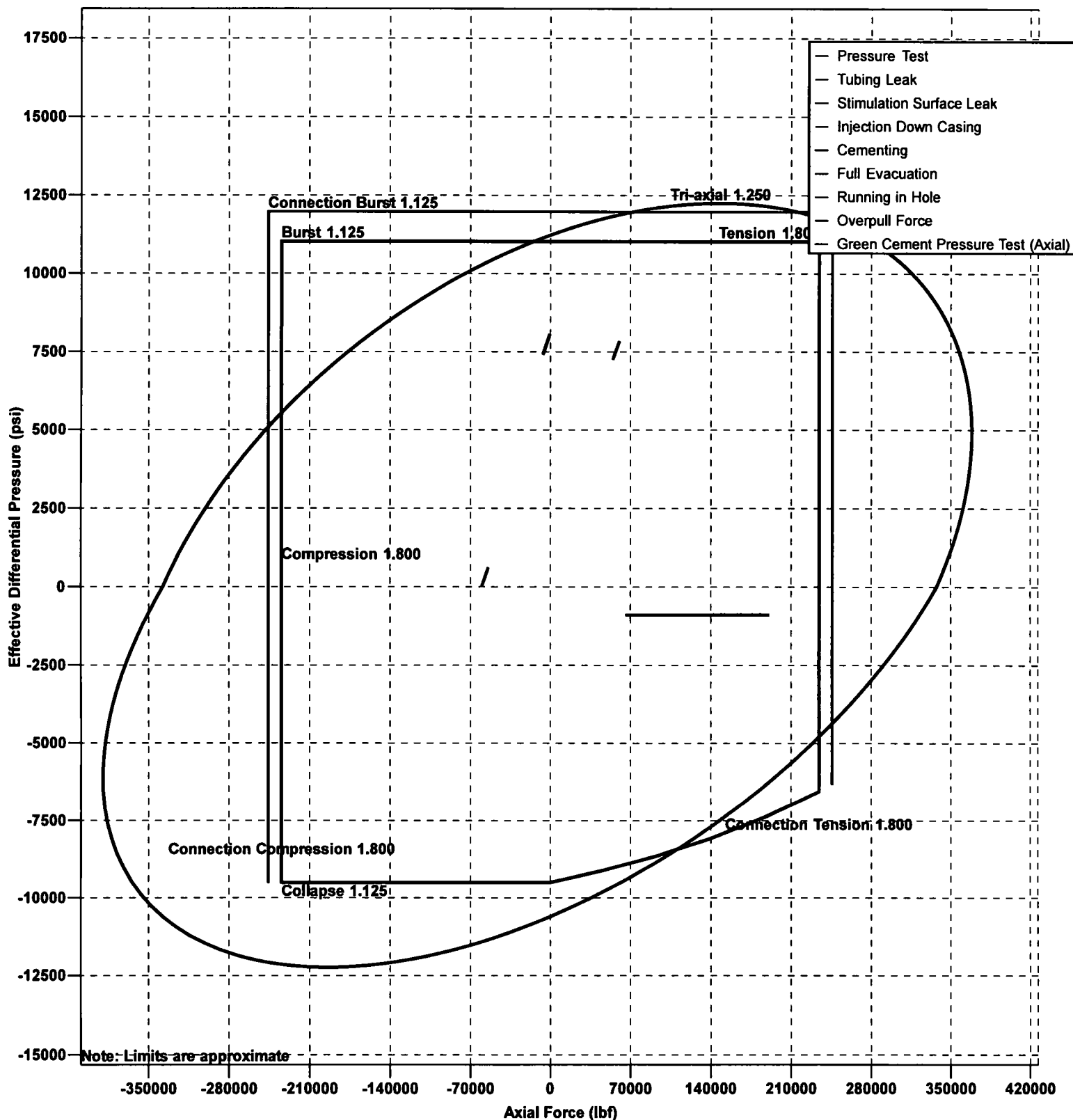
## Design Limits (5 1/2" Production Casing - Section 1)



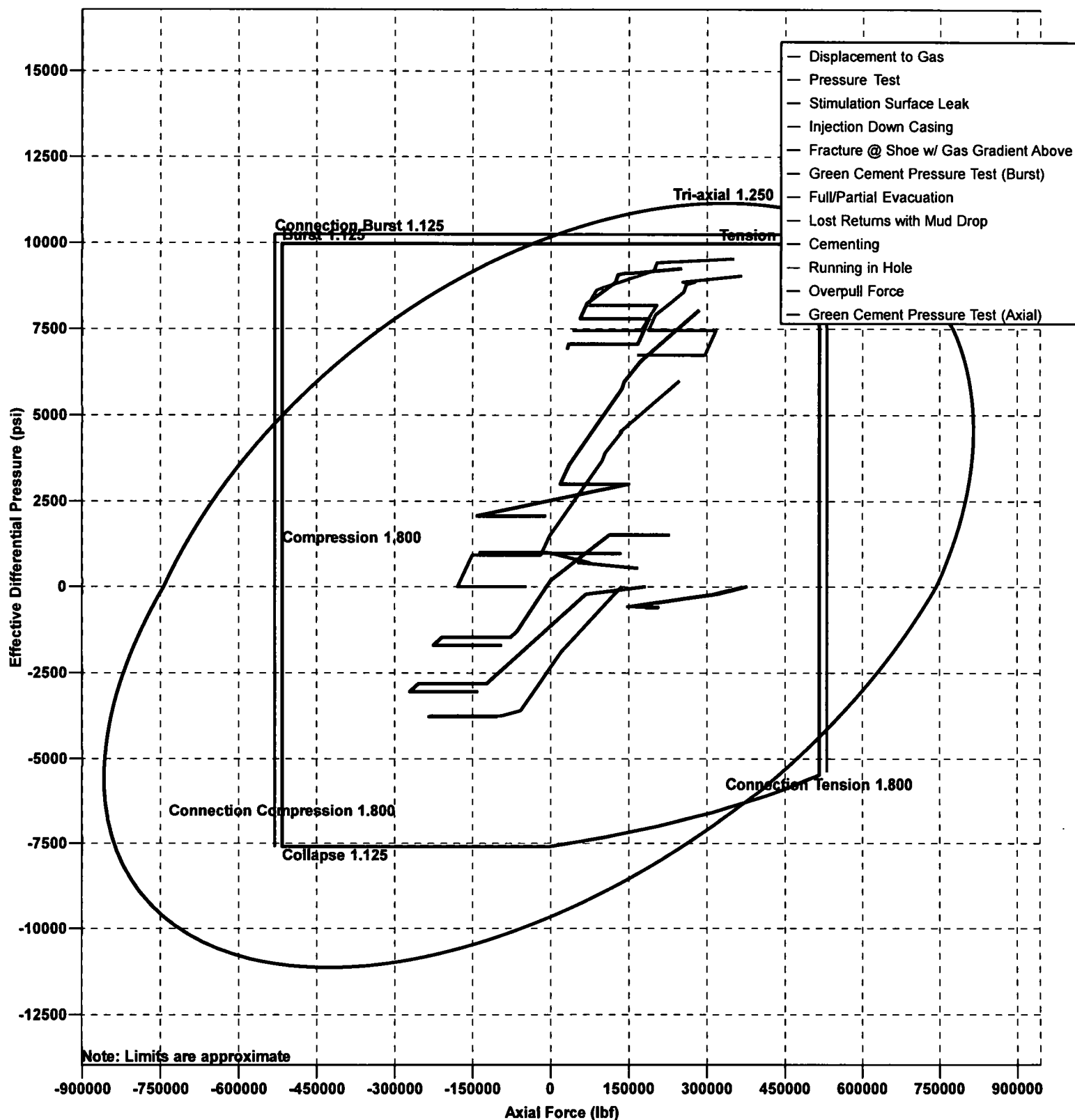
### Design Limits (13 3/8" Surface Casing - Section 1)



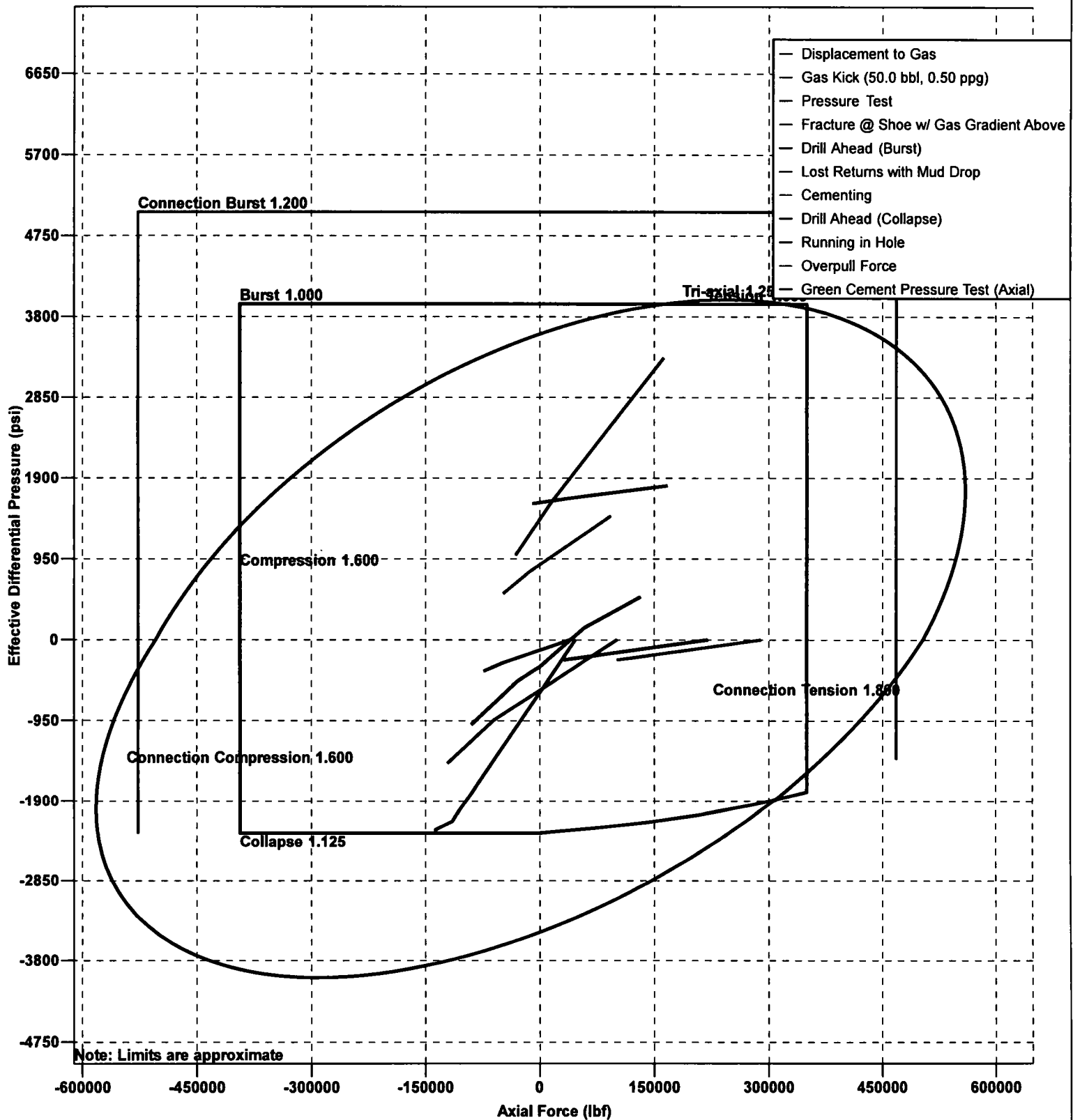
### Design Limits (4 1/2" Production Liner - Section 1)



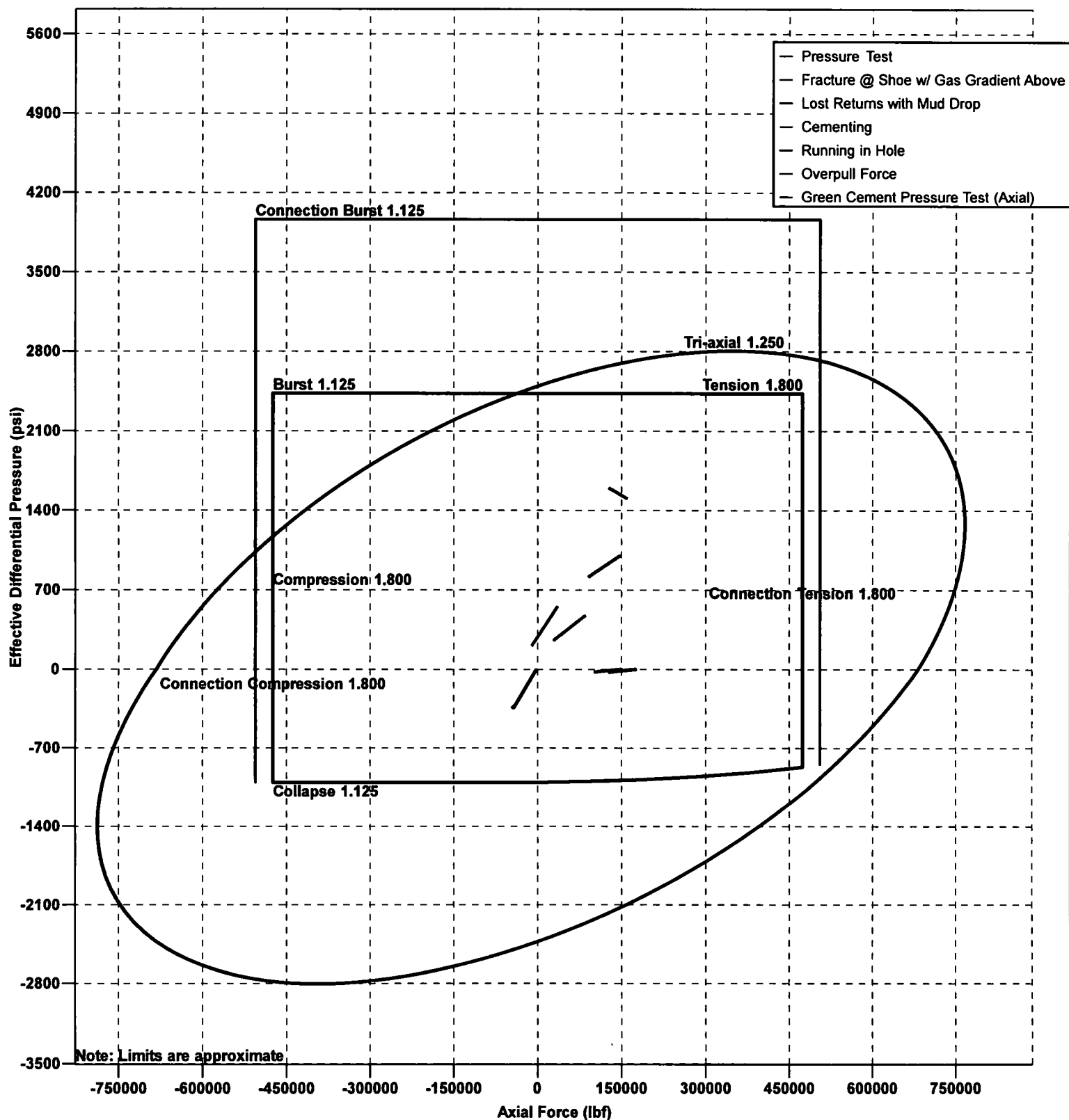
## Design Limits (7" Production Casing - Section 1)



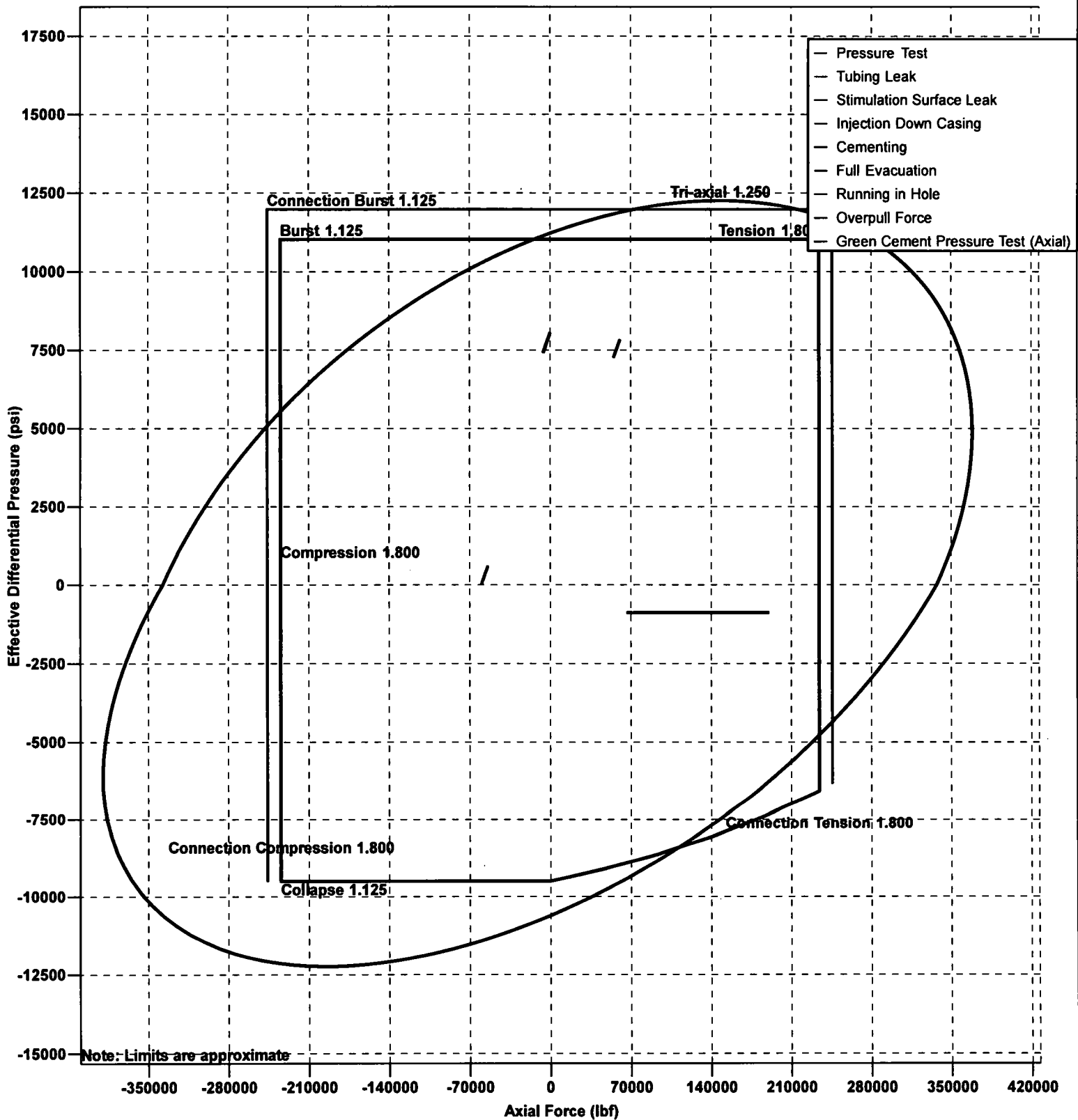
**Design Limits (9 5/8" Intermediate Casing - Section 1)**



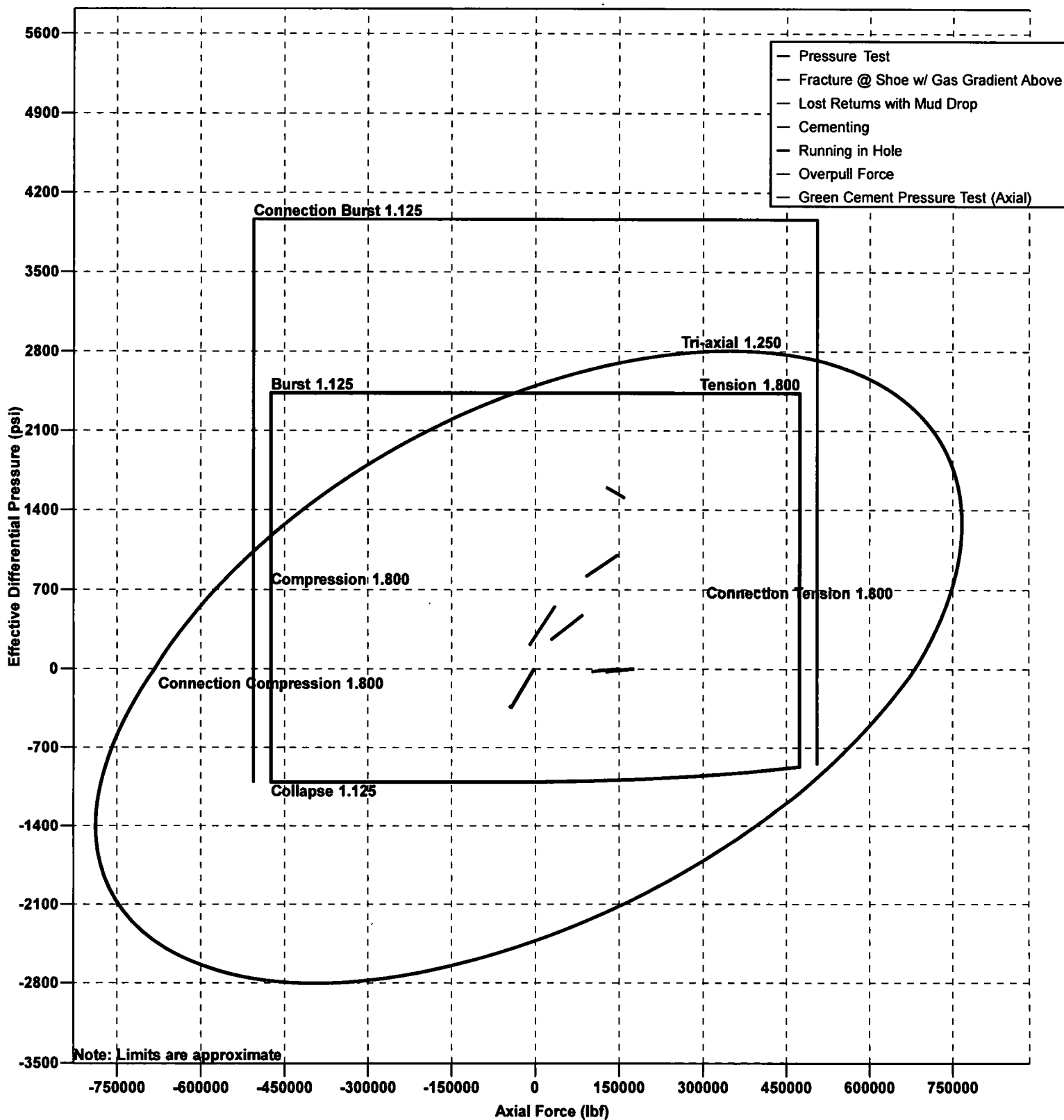
## Design Limits (13 3/8" Surface Casing - Section 1)



**Design Limits (4 1/2" Production Liner - Section 1)**

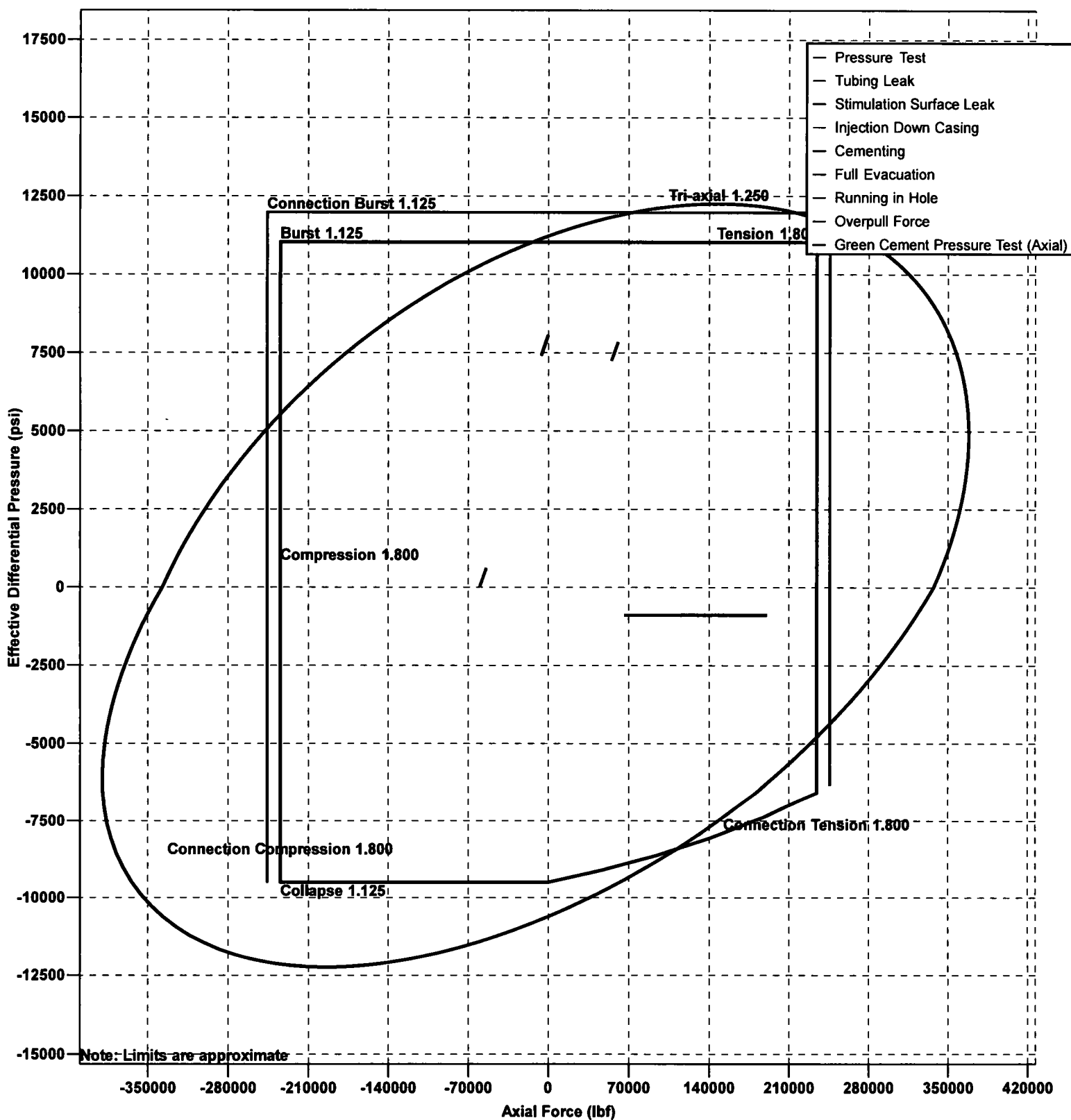


### Design Limits (13 3/8" Surface Casing - Section 1)

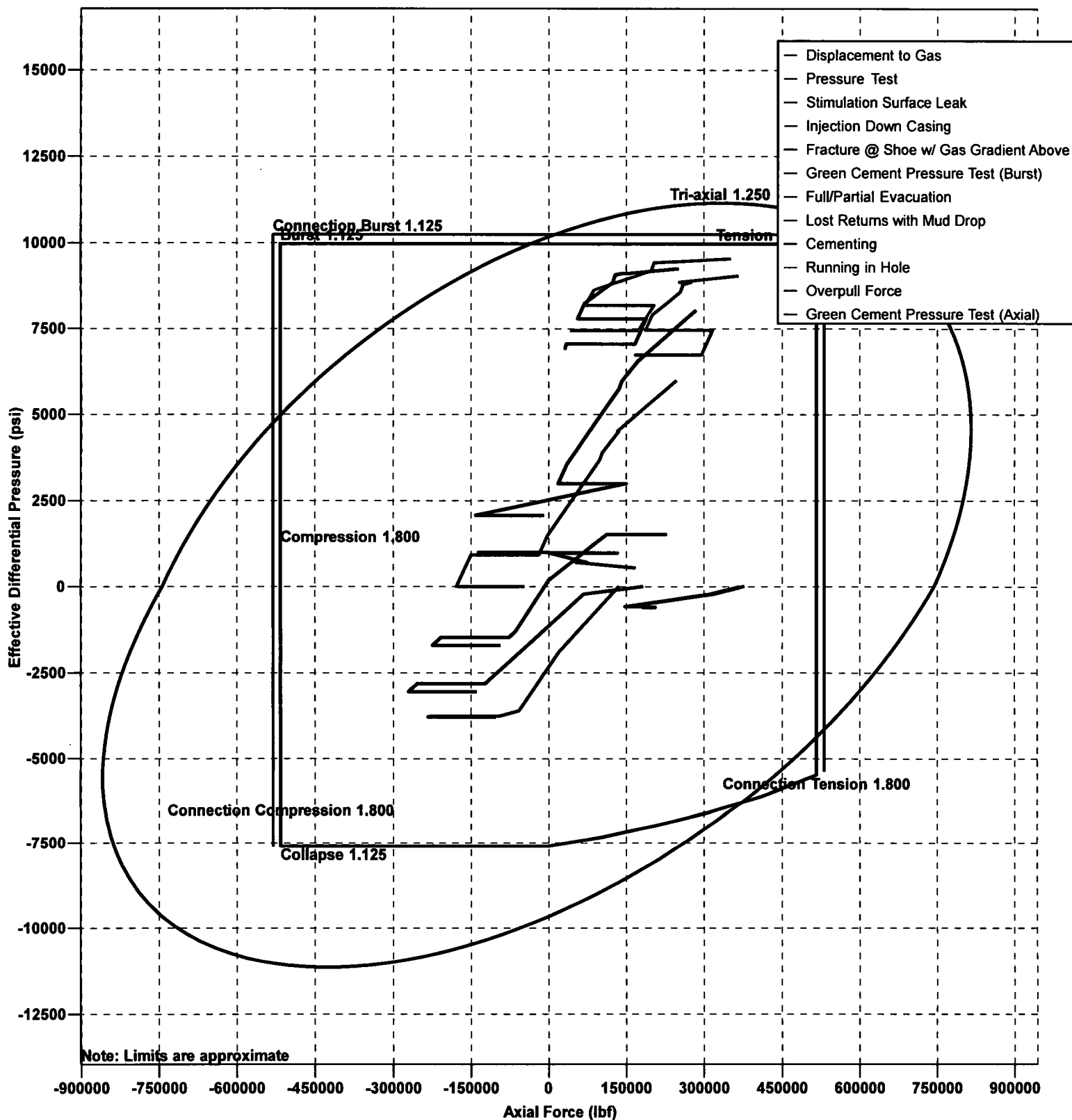


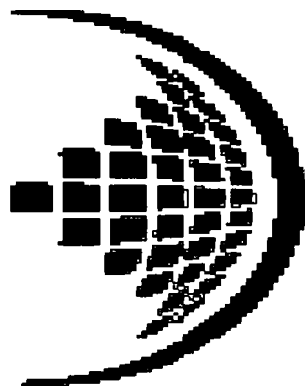


### Design Limits (4 1/2" Production Liner - Section 1)



## Design Limits (7" Production Casing - Section 1)





**TOTAL SAFETY**

**MARATHON OIL COMPANY**

**MAMMOTH FED COM 26-34-1**

**TB Well # 1H**

**TB Well # 10H**

**WA Well # 2H**

**WA Well # 11H**

**WXY Well # 7H**

**SHL: 448' FSL & 1479' FWL of Lot N, Section 1, T-26S, R-34E**  
**BHL: 2490' FSL & 1981' FEL of Lot D, Section 36, T-25S, R-34E**

**LEA County, New Mexico**

**Rig: H&P 498**

**7/05/2018**

**EMERGENCY MEDICAL PROCEDURES  
DO NOT PANIC  
REMAIN CALM-THINK**

1. HOLD YOUR BREATH. (DO NOT INHALE, STOP BREATHING)
2. PUT ON BREATHING APPARATUS. (NOTE: DO NOT ATTEMPT RESCUE UNTIL YOU HAVE PUT ON BREATHING APPARATUS.)
3. REMOVE VICTIM (S) TO FRESH AIR AS QUICKLY AS POSSIBLE.
4. BE SURE YOU HAVE MOVED VICTIM OUT OF CONTAMINATED AREA BEFORE REMOVING YOUR RESPIRATOR.
5. APPLY MOUTH-TO-MOUTH ARTIFICIAL RESPIRATION, WHICH IS MORE EFFECTIVE, WHILE SOMEONE ELSE GETS THE OXYGEN RESUSCITATOR. RENDER OXYGEN RESUSCITATION ONLY IF PROPERLY TRAINED IN ITS USE.
6. PROVIDE FOR PROMPT TRANSPORTATION TO HOSPITAL AND CONTINUE GIVING ARTIFICIAL RESPIRATION IF NEEDED.
7. HOSPITAL (S) OR MEDICAL FACILITIES NEED TO BE INFORMED BEFOREHAND, OF THE POSSIBILITY OF H<sub>2</sub>S GAS POISONING, NO MATTER HOW REMOTE THE POSSIBILITY IS.

|                                       |                |
|---------------------------------------|----------------|
| Lea Regional Medical Center           | (575)492-5000  |
| 5419 N Lovington Hwy, Hobbs, NM 88240 |                |
| AMBULANCE                             | 911            |
| FIRE DEPARTMENT- HOBBS, NM            | (575) 397-9308 |
| POLICE - HOBBS, NM                    | (575) 397-9265 |

8. NOTIFY EMERGENCY-ROOM PERSONEL THAT THE VICTIM (S) HAVE POSSIBLY BEEN EXPOSED TO H<sub>2</sub>S GAS POISONING.

\*\*\*\*\*  
\*\*\*\*\*

**TOTAL SAFETY INC  
1420 East Greene St.  
Carlsbad, NM 88220**

**THIS H2S DRILLING OPERATIONS PLAN WAS  
PREPARED BY: Sean Chamblee  
Strategic Account Manager  
Cell: 713-703-6295**

**TOTAL SAFETY INC  
1420 East Greene St  
Carlsbad, NM 88220  
Phone: 432-561-5049**

## H2S DRILLING OPERATIONS PLAN INDEX

- I. INTRODUCTION
  - A. Oil Company Address and Legal Description of Well Site
  - B. Directions to Well Site
  - C. Purpose of Plan
- II. LOCATION LAYOUT
  - A. Location Map
  - B. General & Specific Area Maps
- III. SAFETY EQUIPMENT
  - A. Safety Equipment Provided by TOTAL SAFETY INC.
  - B. Type of Equipment and Storage Locations
  - C. Maximum Number of People on Location at any one time
  - D. Safety Equipment Layout Diagram
- IV. OPERATING PROCEDURES
  - A. Blowout Prevention Measures During Drilling
  - B. Gas Monitoring Equipment
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  - F. Leak Ignition
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- A. Emergency and Medical Facilities**
- B. Law Enforcement Agencies and Fire Fighting Facilities**
- C. Well Control Specialists**
- D. Governmental Agencies**

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- A. Radius of Exposure Map with Residences Shown**
- B. Residents Within Radius of Exposure and Telephone Numbers**

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- B. Hydrogen Sulfide Hazards**
- C. Toxicity Table**
- D. Treatment**
- E. Characteristics of H<sub>2</sub>S**
- F. Safe Practices**

# **INTRODUCTION**

## **H2S DRILLING OPERATIONS PLAN**

This Drilling Operations Plan was written specifically for:

**MARATHON OIL COMPANY  
3122 NATIONAL PARKS HIGHWAY  
CALRSBAD, NM 88220**

Action Plan for Accidental Release of H2S

## **MAMMOTH FED COM 26-34-1**

**TB Well # 1H**

**TB Well # 10H**

**WA Well # 2H**

**WA Well # 11H**

**WXY Well # 7H**

**LEA COUNTY, NM**

Information, provisions and practices, as set forth in this plan, may be  
subject to revision and/or updating.

7-05-2018



MARATHON OIL COMPANY  
3122 NATIONAL PARKS HIGHWAY  
CARLSBAD, NM 88220

**MAMMOTH FED COM 26-34-1**

**TB Well # 1H                      TB Well # 10H**  
**WA Well # 2H                      WA Well # 11H**  
**WXY Well # 7H**

LEA COUNTY, NM

**Directions:**

FROM THE MARATHON OFFICE AT 4111 TIDWELL, CARLSBAD, NM HEAD SOUTH ON TIDWELL RD TOWARD US HWY 285 N FOR 0.2 MILES. TURN LEFT ONTO US HWY 285 S, HEADING SOUTHEAST, FOR 5.1 MILES TO NM HWY 285 S. TURN LEFT ONTO NM HWY 31, HEADING EAST, FOR 7.7 MILES TO NM HWY 128 E. TURN RIGHT onto NM HWY 128 E, HEADING EAST, FOR 38.7 MILES TO BATTLE AXE ROAD (COUNTY ROAD 2). TURN RIGHT ONTO BATTLE AXE ROAD, HEADING SOUTH, FOR 0.3 MILES. KEEP RIGHT TO STAY ON BATTLE AXE ROAD, HEADING WEST, FOR 2.6 MILES. TURN RIGHT TO STAY ON BATTLE AXE ROAD, HEADING WEST, FOR 9.3 MILES TO A CALICHE ROAD. TURN LEFT ON CALICHE ROAD, HEADING SOUTH, FOR 0.7 MILES TO A "T" INTERSECTION OF CALICHE ROADS. TURN LEFT ONTO CALICHE ROAD, HEADING EAST FOR 6.1 MILES TO THE PROPOSED LEASE ROAD FOR THE MAMMOTH FED COM 26-34-1 TB#1H-WA#2H-WXY#7H-TB#10H-WA#11H WELL PAD. TURN LEFT ONTO SAID PROPOSED LEASE ROAD, HEADING EAST, FOR 0.2 FEET, ENTERING THE SOUTHWEST CORNER OF SAID WELL PAD.

**GPS Coordinates: 32.06626835, -103.42694227**  
**LEA COUNTY, NEW MEXICO**

**PURPOSE OF PLAN:** The purpose of this plan is to safeguard the lives of the public, contract personnel and company personnel in the event of equipment failure or disasters during drilling or completion operations in formations that may contain Hydrogen Sulfide Gas, H<sub>2</sub>S.

As a precautionary measure, this Drilling Plan has been prepared to assure the safety of all concerned, should a disaster occur. However, the Oil Company Representative may have specified materials and practices for the drilling or completion of this well, which supersede the minimum requirements as outlined in this plan.

**Definitions:** For the purpose of this plan the following definitions are to be referred to:

**Controlled Release** – Any release that is planned and occurs during normal operations. A controlled release is managed per the procedures outlined in this section.

**Uncontrolled Release** – Any release that is unplanned and not immediately contained utilizing established shut-in procedures. An uncontrolled release is normally associated with a loss of well control.

**SCBA – (Self Contained Breathing Apparatus)** – A full-face mask respirator with a supplied positive pressure air source.

**Donned SCBA** – When it is required per this plan to “don” a SCBA, personnel will be 100% masked up and be on supplied breathing air.

**SCBA On Person** – When it is required per this plan to have SCBA “on person”, personnel will be required to wear the SCBA equipment - but not be masked up.

**“Qualified Buddy”** – Person who has been fit tested and is trained and is familiar with the requirements of donning an SCBA. This person will provide immediate assistance to another person who may be utilizing an SCBA or SkaPack in an IDLH atmosphere in the event of an emergency situation.

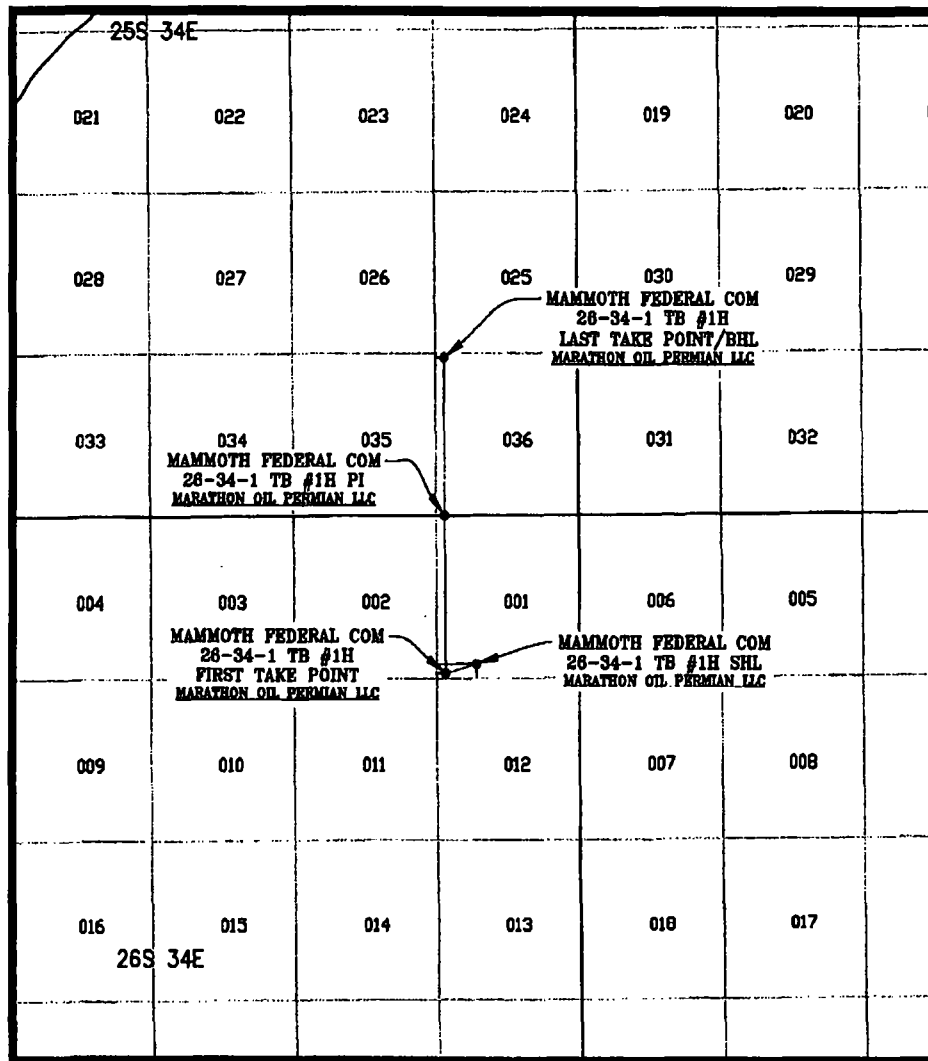
**In Scope Personnel** – Rig Personnel who will be working or otherwise present in potential H<sub>2</sub>S release areas, including the rig floor, cellar, pits, and shaker areas. This would not include 3rd party contractors who do not have a function, besides evacuating the rig, during an emergency condition such as during a well control event or H<sub>2</sub>S / LEL alarm. All qualified personnel that have a function to shut a well in during an emergency will be considered In-Scope per this plan

**Out of Scope Personnel** – All personnel that are not in scope will be Out of Scope per the definition of this plan

**H<sub>2</sub>S Office** – Onsite office trailer space or vehicle that will be designated as the H<sub>2</sub>S office

**Marathon H2S Plan Custodian** – Marathon HES Advisor, Supervisor or Technician that has been specifically assigned per the authorization page of this plan to maintain this document.

# VICINITY MAP



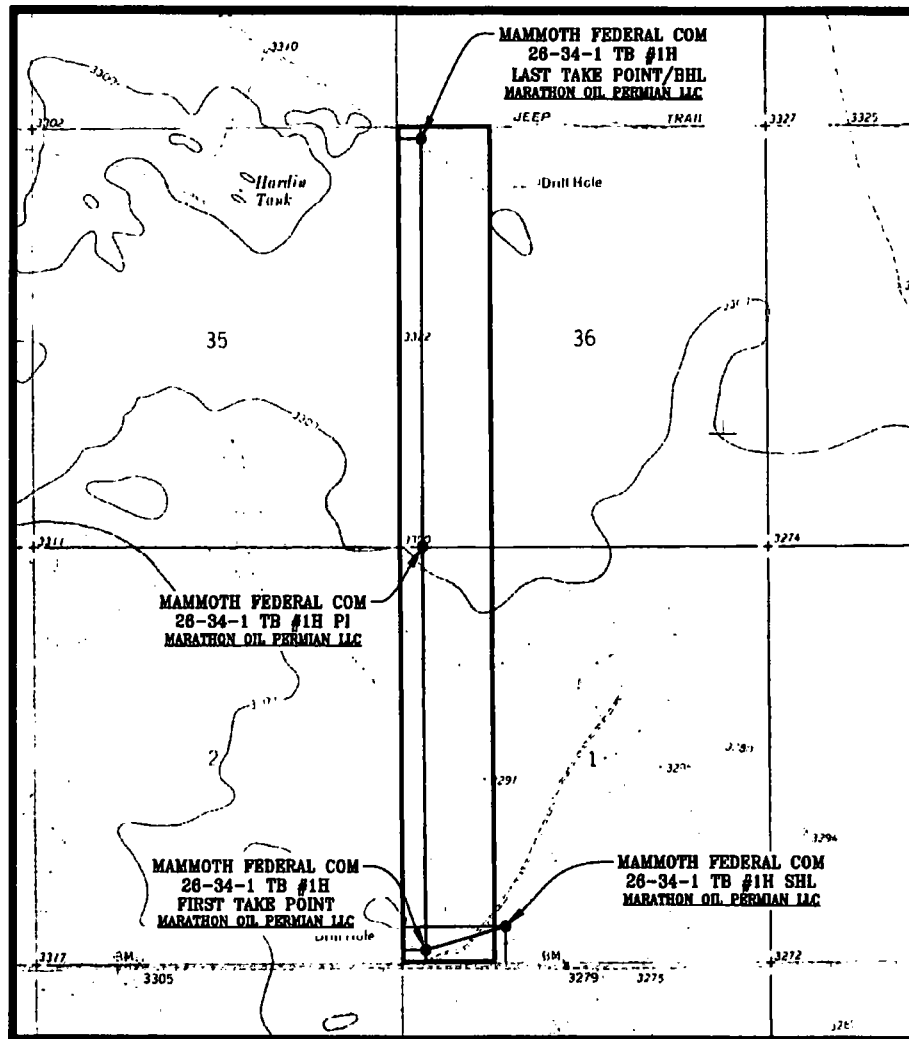
SEC. 1 TWP. 26-S RGE. 34-E  
SURVEY: N.M.P.M.  
COUNTY: LRA  
DESCRIPTION: 448' FSL & 1479' FWL  
ELEVATION: 3281'  
OPERATOR: MARATHON OIL PERMIAN LLC  
LEASE: MAMMOTH FEDERAL COM 26-34-1  
U.S.G.S. TOPOGRAPHIC MAP: ANDREWS PLACE, N.M.

SCALE: 1" = 1 MILE

SHEET 3 OF 3

PREPARED BY:  
R-SQUARED GLOBAL, LLC  
1809 LOUISVILLE AVENUE, MONROE, LA 71201  
518-828-6800 OFFICE  
JOB No. R3763\_008

# LOCATION VERIFICATION MAP



SEC. 1 TWP. 26-S RGE. 34-E  
 SURVEY: N.M.P.M.  
 COUNTY: LEA  
 DESCRIPTION: 448' FSL & 1479' FWL  
 ELEVATION: 3281'  
 OPERATOR: MARATHON OIL PERMIAN LLC  
 LEASE: MAMMOTH FEDERAL COM 26-34-1  
 U.S.G.S. TOPOGRAPHIC MAP: ANDREWS PLACE, N.M.

SCALE: 1" = 2000'  
 CONTOUR INTERVAL = 10'

SHEET 2 OF 3

PREPARED BY:  
 B-SQUARED GLOBAL, LLC  
 1309 LOUISVILLE AVENUE, MONROE, LA 71201  
 518-323-8900 OFFICE  
 JOB No. B3762\_008

## SAFETY EQUIPMENT

All H2S related Safety Equipment must be installed, tested and Operational at a depth of 500 feet above, or 3 days prior to penetrating the first zone expected to contain H2S.

### SAFETY EQUIPMENT PROVIDED BY TOTAL SAFETY INC.

| <u>QTY</u> | <u>EQUIPMENT</u>   |
|------------|--|
| 6 each     | 30-minute self-contained breathing apparatus   |
| 6 each     | ELSA Escape Packs  |
| 1 Lot      | Sufficient low-pressure airline hose with quick connects                                       |
| 1          | 6 Channel fixed H2S monitor  |
| 4          | H2S Sensors (Loc determined at rig up – General: Cellar, Shale Shaker, floor/driller area)     |
| 4          | Explosion proof Alarm Station (1-Drill Floor, 1- Pits/Shakers, 1- Generators, 1 Quarters area) |
| 10         | Personal H2S Monitors  |
| 1          | Gastec pump type gas detector  |
| Set        | Various range of H2s & SO2 detector tubes  |
| 2 each     | Windsocks w/frames and poles   |
| 1 Set      | H2S and briefing area signs  |
| 1 Set      | Well condition signs and flags   |
| 1          | Flare Gun & Flares   |

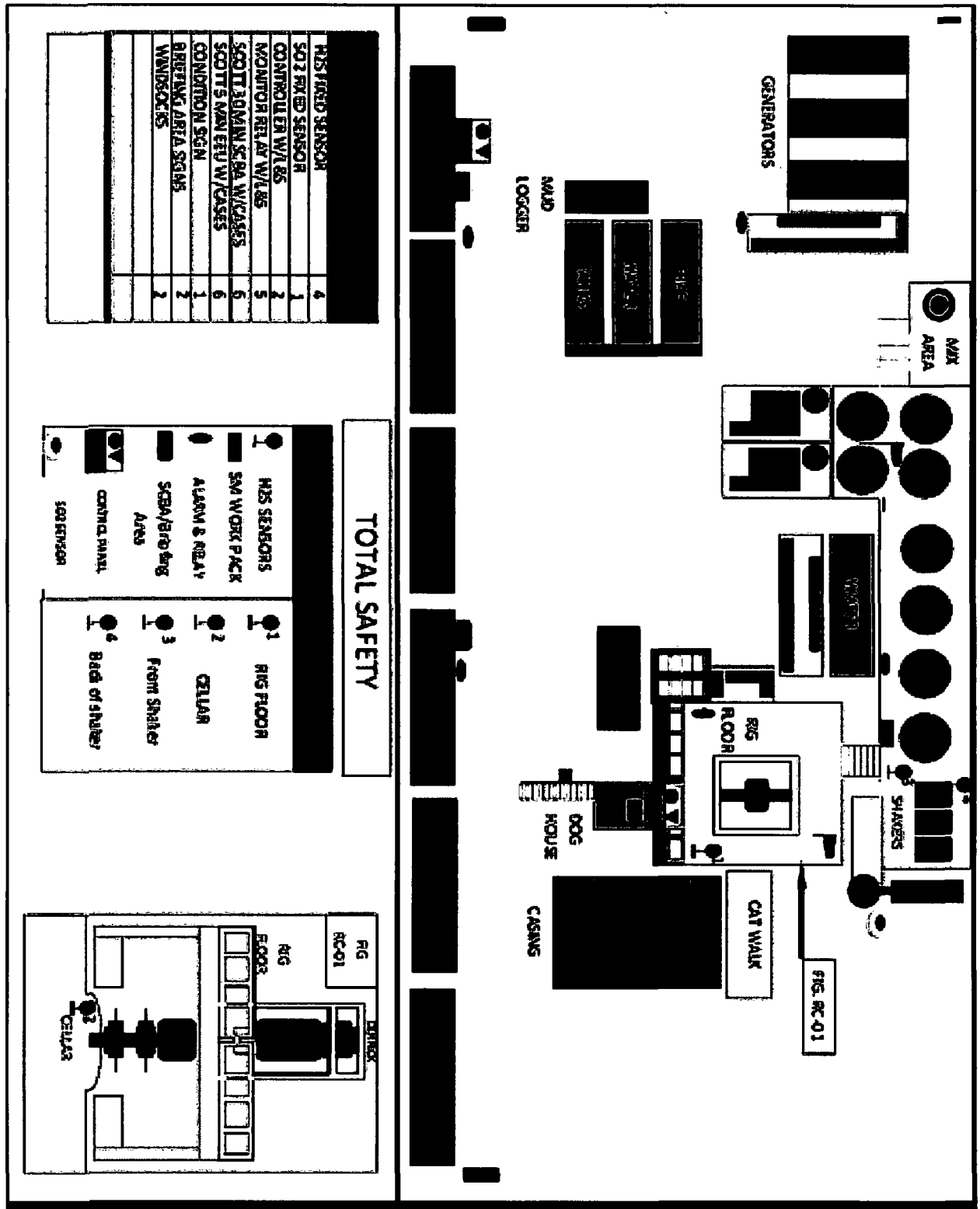
## TYPE OF EQUIPMENT AND STORAGE LOCATIONS

1. There will be six 30-minute self-contained breathing apparatus on location. They will be positioned as follows: Two at Briefing Area #1 Two at Briefing Area #2, Two at rig dog house. SCBA Facepieces will be equipped with voice amplifiers for effective means of communication when using protective breathing apparatus.
2. There will be six Escape-type packs on location. One for the Derrickman. One on the Shaker. One at the bottom of rig dog house stairway and spares.
3. A Gastec, pump type, gas detector with low and high range detector tubes for H<sub>2</sub>S and SO<sub>2</sub> will be located in the doghouse
4. Two Briefing Areas will be designated at opposite ends of the location.
5. The Briefing Area most upwind is designated as the Safety Briefing Area #1. In an emergency, personnel must assemble at this upwind area for instructions from their supervisor.
6. The H<sub>2</sub>S 'Safety' trailer provided by Total Safety, Inc. will contain a cascade system of at least 5 each -300 C.F. air cylinders that will provide a continuous air supply to air lines located on the rig. Note: This trailer will Only be provided if H<sub>2</sub>S conditions require the use of the Air Trailer. (If Required)
7. Two windsocks will be installed so as to be visible from all parts of the location.
8. A well condition warning sign will be displayed at the location entrance to advise of current operating conditions. The condition signs must be at least 200' from the entrance but not more than 500' away.
9. A list of emergency telephone numbers will be kept on rig floor, tool pusher's trailer, the Oil Company's trailer and in the "safety" trailer (if Provided).

10. The primary means of communication will be cell phones.
11. A barricade will be available to block the entrance to location should an emergency occur. In most cases the use of a vehicle is used to block the entrance.
12. A 6-channel H<sub>2</sub>S monitor will be located in the doghouse. The 3 sensors will be installed: one on the shale shaker, one at the Cellar, one at the rig floor.
13. An undulating high and low pitch siren and light will be installed on the derrick "A" leg.
14. If H<sub>2</sub>S concentration reach 10 ppm an explosion-proof bug blower (fan) will be installed under the rig floor to disperse possible accumulations of H<sub>2</sub>S.
15. Any time it is necessary to flare gas containing H<sub>2</sub>S, a Sulfur Dioxide monitor or Detector tubes will be used to determine SO<sub>2</sub> concentrations.
16. A flare gun with flares will also be provided in the event it is necessary to ignite the well from a safe distance.



# SAFETY EQUIPMENT LAYOUT



## OPERATING PROCEDURES

### BLOWOUT PREVENTION MEASURES DURING DRILLING

1. Blowout Prevention Requirements:

All BOP equipment shall meet the American Petroleum Institute specifications as to materials acceptable for H<sub>2</sub>S service and tested accordingly (or to BLM specifications).

2. Drilling String Requirements:

All drill string components are to be of material that meets the American Petroleum Institute's specifications for H<sub>2</sub>S service. All drill string components should be inspected to IADC critical service specifications prior to running in well.

### GAS MONITORING EQUIPMENT

1. A continuous H<sub>2</sub>S detection system, consisting of three H<sub>2</sub>S detectors and an audible/visual warning system will be in operating during all phases of this H<sub>2</sub>S Drilling Operations Plan. The detection system will be adjusted and calibrated such that an H<sub>2</sub>S exposure of 10 ppm or higher (at any sensor) will trigger the audible and visual portion (wailing or yelping siren) of the warning system (i.e. H<sub>2</sub>S continually present at or above threshold levels) a trained operator or H<sub>2</sub>S supervisor will monitor the H<sub>2</sub>S detection system.

2. When approaching or completing H<sub>2</sub>S formations, crewmembers may attach personnel H<sub>2</sub>S monitors to their person.

3. Hand held H<sub>2</sub>S sampling gas detectors will be used to check areas not covered by automatic monitoring equipment.

## CREW TRAINING AND PROTECTION

1. All personnel working at the well site will be properly trained in accordance with the general training requirements outlined in the API Recommended Practices for Safe Drilling of Wells Containing H<sub>2</sub>S. The training will cover, but will not be limited to, the following:

- a. General information of H<sub>2</sub>S AND SO<sub>2</sub> GAS
- b. Hazards of these gases
- c. Safety equipment on location
- d. Proper use and care of personal protective equipment
- e. Operational procedures in dealing with H<sub>2</sub>S gas
- f. Evacuation procedures
- g. First aid, reviving an H<sub>2</sub>S victim, toxicity, etc.
- h. Designated Safe Briefing Areas
- i. Buddy System
- j. Regulations
- k. Review of Drilling Operations Plan

2. Initial training shall be completed when drilling reaches, a depth of 500' above or 3 days prior to penetrating (whichever comes first) the first zone containing or expected to contain H<sub>2</sub>S. It must also include a review of the site specific Drilling Operations Plan and, if applicable, the Public Protections Plan.

3. Weekly H<sub>2</sub>S and well control drills for all personnel on each working crew shall be conducted.

4. All training sessions and drills shall be recorded on the driller's log or its equivalent.

5. Safety Equipment:

As outlined in the Safety Equipment index, H<sub>2</sub>S safety protection equipment will be available to/or assigned each person on location.

6. One person (by job title) shall be designated and identified to all on-site personnel as the person primarily responsible for the overall operation of the on-site safety and training programs. This will be the PIC

## METALLURGICAL CONSIDERATIONS

1. Steel drill pipe used in H<sub>2</sub>S environments should have yield strength of 95,000psi or less because of potential embrittlement problems. Must conform to the current National Association of Corrosion Engineers (NACE) Standard MR-0175-90, Material Requirement, Sulfide Stress Cracking Resistant Metallic Material for Oil Field Equipment. Drill stem joints near the top of the drill string are normally under the highest stress levels during drilling and do not have the protection of elevated down hole temperatures. These factors should be considered in design of the drill string. Precautions should be taken to minimize drill string stress caused by conditions such as excessive dogleg severity, improper torque, whip, abrasive wear or tool joints and joint imbalance. American Petroleum Institute, Bulletin RR 7G, will be used as a guideline for drill string precautions.
2. Corrosion inhibitors may be applied to the drill pipe or to the mud system as an additional safeguard.
3. Blowout preventors should meet or exceed the recommendations for H<sub>2</sub>S service as set forth in the latest edition of API RI 53.

## MUD PROGRAM AND TREATING

1. It is of utmost importance that the mud be closely monitored for detection of H<sub>2</sub>S and reliability of the H<sub>2</sub>S treating chemicals.
2. Identification and analysis of sulfides in the mud and mud filtrates will be carried out per operators prescribed procedures.
3. The mud system will be pre-treated with Zinc Carbonate, Ironite Sponge or similar chemicals of H<sub>2</sub>S control prior to drilling into the H<sub>2</sub>S bearing formation. Sufficient quantities of corrosion inhibitor should be on location to treat the drill string during Drill Stem Test Operations. Additionally, Aqua Ammonia should be on hand to treat the drill string for crew protection, should H<sub>2</sub>S be encountered while tripping string following drill stem testing

## WELL CONTROL EQUIPMENT

### 1. Flare System

a. A flare system shall be designed and installed to safely gather and burn H<sub>2</sub>S Bearing gas.

1. Flare lines shall be located as far from the operating site as feasible and in a manner to compensate for wind changes.

2. The flare line mouth shall be located not less then 150' from wellbore.

3. Flare lines shall be straight unless targeted with running tees.

4. Flare Gun & Flares to ignite the well

### 2. Remote Controlled Choke

a. A remote controlled choke shall be installed for all H<sub>2</sub>S drilling and where feasible for completion operations. A remote controlled valve may be used in lieu of this requirement for completions operations.

### 3. Mud-gas separators and rotating heads shall be installed and operable for all exploratory wells.

## OPERATING CONDITIONS

A Well Condition Sign and Flag will be posted on all access roads to the location. The sign shall be legible and large enough to be read by all persons entering the well site and be placed a minimum of 200' but no more than 500' from the well site which allows vehicles to turn around at a safe distance prior to reaching the site.

### DEFINITION OF WARNING FLAGS

1. Condition:  
**GREEN-NORMAL OPERATIONS**  
Any operation where the possibility of encountering H<sub>2</sub>S exists but no H<sub>2</sub>S has been detected.
2. Condition:  
**YELLOW-POTENTIAL DANGER, CAUTION**  
Any operation where the possibility of encountering H<sub>2</sub>S exists and in all situations where concentrations of H<sub>2</sub>S are detected in the air below the threshold level (10ppm)
  - a. Cause of condition:
    - \*Circulating up drill breaks
    - \*Trip gas after trip
    - \*Circulating out gas on choke
    - \*Poisonous gas present, but below threshold concentrations
    - \*Drill stem test
  - b. Safety Action:
    - \*Check safety equipment and keep it with you
    - \*Be alert for a change in condition
    - \*Follow instructions
3. Condition:  
**RED-EXTREME DANGER**  
Presence of H<sub>2</sub>S at or greater than 10ppm. Breathing apparatus must be worn.
  - a. Safety action:

**\*MASK UP.** All personnel will have protective breathing equipment with them. All nonessential personnel will move to the Safe Briefing Area and stay there until instructed to do otherwise. All essential Qualified Personnel, using the "Buddy System" (those necessary to maintain control of the well) will don breathing apparatus to perform operations related to well control.

The decision to ignite the well is the responsibility of the operator's on-site representative and should be made only as a last resort, when it is clear that:

- \*human life is endangered**
- \*there is no hope of controlling the well under prevailing conditions**

Order evacuation of local people within the danger zone. Request help from local authorities, State Police, Sheriff's Dept. and Service Representative.

### **CIRCULATING OUT KICK (WAIT AND WEIGHT METHOD)**

If it is suspected that H<sub>2</sub>S is present with the gas whenever a kick is taken, the wait and weight method of eliminating gas and raising the mud will be followed.

**1. Wait and Weight Method:**

**a. The wait and Weight Method is:**

- \*increase density of mud in pits to 'kill' weight mud.**
- \*open choke and bring pump to initial circulating pressure by holding casing pressure at original valve until pump is up to predetermined speed.**
- \*when initial circulating pressure is obtained on drill pipe, zero pump stroke counter and record time.**
- \*reduce drill pipe pressure from initial circulating pressure to final circulating pressure by using pump strokes and/or time according to graph**
- \*when 'kill' weight mud is at the bit, hold final circulating pressure until kill weight mud is to surface.**

**b. If a kick has occurred, the standard blowout procedure will be followed and the wait and weight method will be used to kill the well. When the well has been put on the choke and circulation has been established, the following safety procedure must be established.**

- \*determine when gas is anticipated to reach surface.**

- \*all non-essential personnel must be moved to safe briefing area
- \*all remaining personnel will check out and keep with them their protective breathing apparatus.
- \*mud men will see that the proper amount of H<sub>2</sub>S scavenging chemical is in the mud and record times checked
- \*make sure ignition flare is burning and valves are open to designated flare stacks

### CORING OPERATIONS IN H<sub>2</sub>S BEARING ZONES

1. Personal protective breathing apparatus will be worn from 10 to 15 stands in advance of retrieving the core barrel. Cores to be transported should be sealed and marked to the presence of H<sub>2</sub>S.
  - a. Yellow Caution Flag will be flown at the well condition sign.
  - b. The "NO SMOKING" rule will be enforced

### DRILL STEM TESTING OF H<sub>2</sub>S ZONES

1. The DST subsurface equipment will be suitable for H<sub>2</sub>S service as recommended by the API
2. Drill stem testing of H<sub>2</sub>S zone will be conducted in daylight hours
3. All non-essential personnel will be moved to an established safe area or off location
4. The "NO SMOKING" rule will be enforced
5. DST fluids will be circulated through a remote controlled choke and a separator to permit flaring of gas. A continuous pilot light will be used.
6. A yellow or red flag will be flown at entrance to location depending on present gas condition
7. If warranted, the use of Aqua Ammonia for neutralizing the toxicity of H<sub>2</sub>S from drill string
  - a. During drill stem tests adequate Filming Amine for H<sub>2</sub>S corrosion and Aqua Ammonia for neutralizing H<sub>2</sub>S should be on location.
8. On completion of DST, if H<sub>2</sub>S contaminated formation fluids or gases are present in drill string, floor workers will be masked up before test valve is removed from drill string and continue "mask



on" conditions until such time that readings in the work area do not exceed 10ppm of H2S gas.

## **EMERGENCY PROCEDURES**

### **SOUNDING ALARM**

In case of an alarm the crews will muster up at the designated area. Total Safety will be dispatched with (2) HES Techs who are to go in under protective breathing air and check the alarm readings and sniff ambient air for the presence of H2S.

By no means are the Co. Rep or HES Advisor to go in under air with the HES Tech. If there is another method in place where the Rig Manager is to go in with the Tech we need to ensure that the rig company has cleared them and that they are properly trained.

1. The fact is to be instilled in the minds of all rig personnel that the sounding alarm means only one thing: H2S IS PRESENT. Everyone is to proceed to his assigned station and the contingency plan is put into effect.

### **DRILLING CREW ACTIONS**

1. All personnel will don their protective breathing apparatus. The driller will take necessary precautions as indicated in operating procedures.
2. The Buddy system will be implemented. All personnel will act upon directions from the operator's on-site representative.
3. If there are non-essential personnel on location, they will move off location.
4. Entrance to the location will be patrolled, and the proper well condition flag will be displayed at the entrance to the location.

## RESPONSIBILITIES OF PERSONNEL

In order to assure the proper execution of this plan, it is essential that one person be responsible for and in complete charge of implementing these procedures. The responsibility will be as follows:

1. The operator's on-site representative or his assistant
2. Contract Tool Pusher

## STEPS TO BE TAKEN

In the event of an accidental release of a potentially hazardous volume of H<sub>2</sub>S, the following steps will be taken:

1. Contact by the quickest means of communications: the main offices of Oil Company & Contractor as listed on the preceding page.
2. An assigned crewmember will blockade the entrance to the location. No unauthorized personnel will be allowed entry into the location.
3. The operator's on-site representative will remain on location and attempt to regain control of the well.
4. The drilling company's rig superintendent will begin evacuation of those persons in immediate danger. He will begin by telephoning residents in the danger zone. In the event of no contact by telephoning, the tool pusher will proceed at once to each dwelling for a person-to-person contact. In the event the tool pusher cannot leave the location, he will assign a responsible crewmember to proceed in the evacuation of local residents. Upon arrival, the Sheriff's Department and TOTAL SAFETY personnel will aid in further evacuation.

## LEAK IGNITION

Leak Ignition procedure: (used to ignite a leak in the event it becomes necessary to protect the public)

1. Two men, the operator's on-site representative and the contractor's rig superintendent or TOTAL SAFETY's representative(s), wearing self-contained pressure demand air masks must determine the perimeter of the flammable area. This should be done with one man using an H<sub>2</sub>S detector and the other one using a flammable gas

detector. The flammable perimeter should be established at 30% to 40% of the lower flammable limits.

2. After the flammable perimeter has been established and all employees and citizens have been removed from the area, the ignition team should move to the up-wind area of the leak perimeter and fire a flare into the area if the leak isn't ignited on the first attempt, move in 20 to 30 feet and fire again. Continue moving in and firing until the leak is ignited or the flammable gas detector indicates the ignition team is moving into the hazardous area. If trouble is incurred in igniting the leak by firing toward the leak, try firing 40 degrees to 90 degrees to each side of the area where you have been firing. If still no ignition is accomplished ignite the copper line burner and push it into the leak area. This should accomplish ignition. If ignition is not possible due to the makeup of the gas, the toxic leak perimeter must be established and maintained to insure evacuation is completed and continue until the emergency is secure.
3. The following equipment and man-power will be required to support the ignition team:
  - a. one flare gun with flares
  - b. four pressure demand air packs
  - c. two nylon ropes tied to the ignition team
  - d. two men in a clear area equipped with air packs
  - e. portable propane bottle with copper line
4. The person with the final authority to ignite the well.

### GENERAL EQUIPMENT

1. Two areas on the location will be designated as Briefing Areas. The one that is upwind from the well will be designated a the "Safe Briefing Area"
2. In the case of an emergency, personnel will assemble in the upwind area as per prior instructions from the operator's representative.
3. The H<sub>2</sub>S "Safety" trailer provide by TOTAL SAFETY will contain 10 air cylinders, a resuscitator, one 30-minute air pack and will have a windsock.
4. Two other windsocks will be installed.
5. A condition warning sign will be displayed at the location entrance.
6. A list of emergency telephone numbers will be kept on the rig floor, tool pusher's trailer and the Oil Company's trailer.

7. Two barricades will be available to block the entrance to location.
8. An undulating high and low pitch siren will be installed.
9. A telephone line or mobile phone will be available at the well site for incoming and outgoing communications.

### **CRITICAL OPERATIONS**

These guidelines will be implemented during H2S alarms on drilling locations with the intent of minimizing catastrophic damage of “**critical tasks**” **ONLY** and exposure of field personnel (e.g. cement in the stack). **We will wait on Total Safety (or H2S Safety Company) for all other alarm events that aren't defined as “critical”.**

- 1.) H2S alarm sounds, crews secure well, and muster based off of wind direction. MOC Operation, MOC Safety, and H2S service company notification will be made and representative from the H2S Service Company is in route to location.
- 2.) Two qualified in scope personnel will don SCBA, utilizing the "buddy system", and respond to area of H2S alarm location to verify the presence of H2S utilizing hand held four gas analyzer or other approved and provided method.
- 3.) If no H2S is found, the “all clear” will be authorized by the Marathon Oil Drilling Superintendent and HES to resume operations. H2S service company will still be required to respond.

**Note:** Personnel will return to muster area awaiting H2S service company and additional equipment if H2S is verified.

**Note:** Personnel will be trained annually on H2S and the elements of this guideline. The MOC HES Advisor and Co Man will receive hands on training from a H2S service company field tech, on how to properly identify the location of the alarming sensor, and the proper method for checking the alarmed area.

# APPENDICES

## EMERGENCY & MEDICAL FACILITIES:

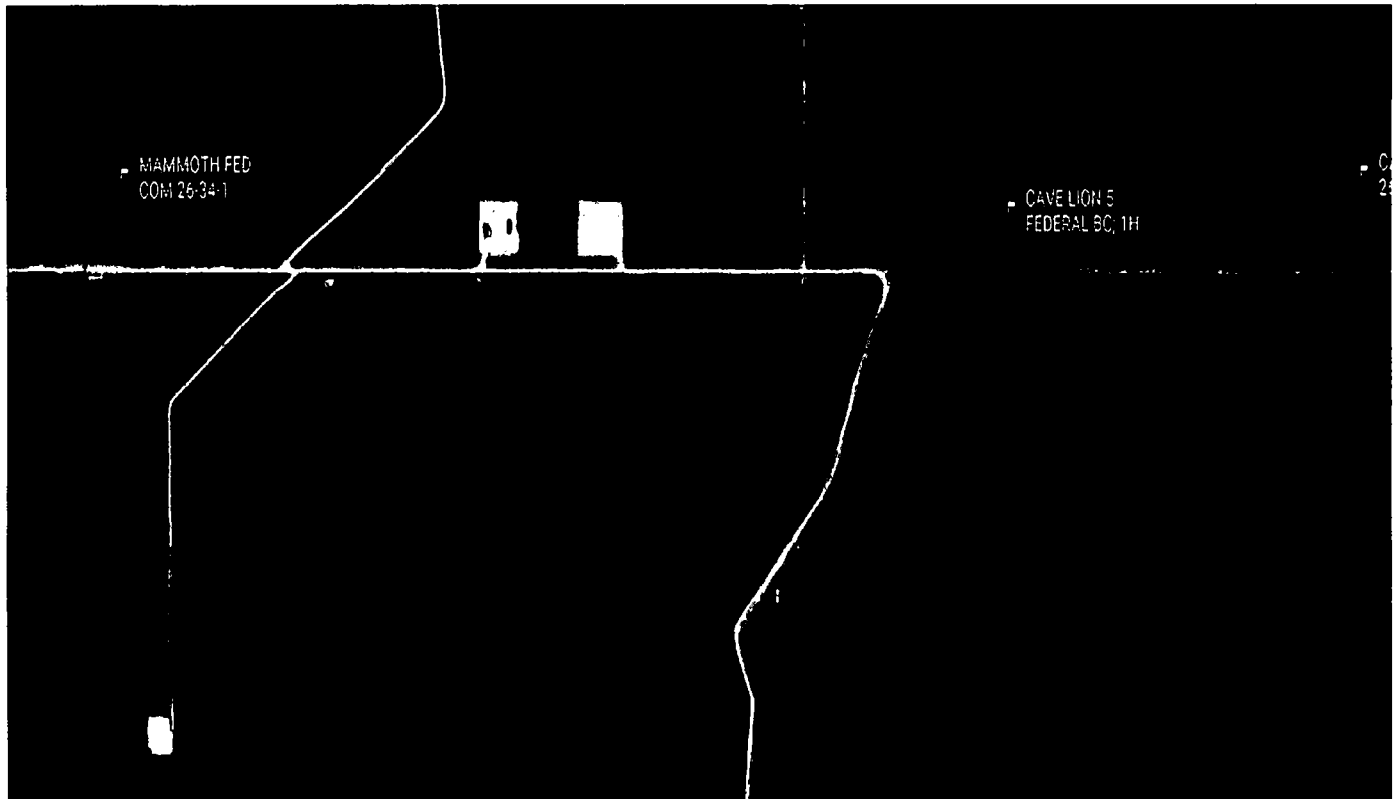
| Marathon Oil Corporation Emergency Numbers |                         |                              |              |
|--|-------------------------|------------------------------|--------------|
| Brent Evans                                | Drilling Manager        | blevans@marathonoil.com      | 832 967-8474 |
| Mark Bly                                   | Drilling Superintendent | permiansuper@marathonoil.com | 281-840-0467 |
| Chad Butler                                | Drilling Superintendent | permiansuper@marathonoil.com | 281-840-0467 |
|  |                         |                              |              |
| Jacob Beaty                                | Drilling Engineer       | jabeaty@marathonoil.com      | 713-296-1915 |
|  |                         |                              |              |
|  |                         |                              |              |
| Noah Adams                                 | HES Professional        | njadams@marathonoil.com      | 713-591-4068 |
| Nick Rogers                                | Lead HES Advisor        | permiansuper@marathonoil.com | 281-659-3734 |
| Scott Doughty                              | Lead HES Advisor        | permiansuper@marathonoil.com | 281-659-3734 |
|  |                         |                              |              |
|  |                         |                              |              |
| H&P 480                                    | Company Man             | Hp480@marathonoil.com        | 281-768-9946 |
| H&P 498                                    | Company Man             | Hp498@marathonoil.com        | 281-745-0771 |
| H&P 441                                    | Company Man             | Hp441@marathonoil.com        |              |
| Precision 582                              | Company Man             | prec582@marathonoil.com      |              |
| Precision 594                              | Company Man             | Prec594@marathonoil.com      |              |
|  |                         |                              |              |
| H&P 480                                    | HES Advisor             | Hp480hes@marathonoil.com     |              |
| H&P 498                                    | HES Advisor             | Hp498hes@marathonoil.com     |              |
| H&P 441                                    | HES Advisor             | Hp441hes@marathonoil.com     |              |
| Precision 582                              | HES Advisor             | prec582@marathonoil.com      |              |
| Precision 594                              | HES Advisor             | Prec594hes@marathonoil.com   |              |

| Emergency Services Area Numbers: Or Call 911 |                   |   |              |
|--|-------------------|---|--------------|
| Sheriff (Eddy County, NM)                    | 575-887-7551      | New Mexico Poison Control                 | 800-222-1222 |
| Sheriff (Lea County, NM)                     | 575-396-3611      | Border Patrol (Las Cruces, NM)            | 575-528-6600 |
| New Mexico State Police                      | 575-392-5580/5588 | Energy Minerals & Natural Resources Dept. | 575-748-1283 |
| Carlsbad Medical Center                      | 575-887-4100      | Environmental Health Dept.                | 505-476-8600 |
| Lea Regional Medical Center                  | 575-492-5000      | OSHA (Santa Fe, NM)                       | 505-827-2855 |
| Police (Carlsbad, NM)                        | 575-885-2111      |   |              |
| Police (Hobbs, NM)                           | 575-392-9265      |   |              |
| Fire (Carlsbad, NM)                          | 575-885-3124      |   |              |
| Fire (Hobbs, NM)                             | 575-397-9308      |   |              |
| Ambulance Service                            | 911               | TOTAL SAFETY H2S – SAFETY SERVICES        | 432-561-5049 |

1. For Life Flight, 1<sup>st</sup> dial "911" They will determine nearest helicopter and confirm the need for helicopter.

# RESIDENTS AND LANDOWNERS

THERE ARE NO RESIDENCE WITHIN 1 MILE RADIUS OF WELL LOCATION.



# ADDITIONAL INFORMATION

## A. HYDROGEN SULFIDE ESSAY

A deadly enemy of those people employed in the petroleum industry, this gas can paralyze or kill quickly. At least part of the answer lies in education in the hazards, symptoms, characteristics, safe practices, treatment, and the proper use of personal protective equipment.

## B. HYDROGEN SULFIDE HAZARDS

The principal hazard to personnel is asphyxiation or poisoning by inhalation. Hydrogen Sulfide is a colorless, flammable gas having an offensive odor and a sweetish taste. It is highly toxic and doubly hazardous because it is heavier than air (specific gravity = 1.19). Its offensive odor, like that of a rotten egg, has been used as an indicator by many old timers in the oil field, but is not a reliable warning of the presence of gas in a dangerous concentration because people differ greatly in their ability to detect smells. Where high concentrations are encountered, the olfactory nerves are rapidly paralyzed, diluting the sense of smell as a warning indicator. A concentration of a few hundredths of one percent higher than that causing irritation can cause asphyxia and death—in other words there is a very narrow margin between consciousness and unconsciousness, and between unconsciousness and death.

Where high concentrations cause respiratory paralysis, spontaneous breathing does not return unless artificial respiration is applied. Although breathing is paralyzed the heart may continue beating for ten minutes after the attack.

## C. PHYSIOLOGICAL SYSTEMS

ACUTE: results in almost instantaneous asphyxia, with seeming respiratory paralysis acute poisoning, or strangulation, may occur after even a few seconds inhalation of high concentration and results in panting respiration, pallor, cramps, paralysis and almost immediate loss of consciousness with extreme rapidity from respiratory and cardiac paralysis. One breath of a sufficiently high concentration may have this result.

**SUBACUTE:** RESULTS IN IRRITATION, PRINCIPALLY OF THE EYES, PERSISTENT COUGH, TIGHTENING OR BURNING IN THE CHEST AND SKIN IRRITATION FOLLOWS BY DEPRESSION OF THE CENTRAL NERVOUS SYSTEM. The eye irritation ranges in severity from mild conjunctivitis to swelling and bulging of the conjunctiva photophobia (abnormal intolerance of light) and temporary blindness.

#### **D. TREATMENT**

1. Victim should be removed to fresh air immediately by rescuers wearing respiratory protective equipment. Protect yourself while rescuing.
2. If the victim is not breathing, begin immediately to apply artificial respiration. (See other chart for the chances for life after breathing has stopped.) If a resuscitator is available let another employee get it and prepare for use.
3. Treat for shock, keep victim warm and comfortable
4. Call a doctor, in all cases, victims of poisoning should be attended by a physician.

#### **E. CHARACTERISTICS OF H<sub>2</sub>S**

1. Extremely Toxic (refer to chart for toxicity of Hydrogen Sulfide).
2. Heavier than air. Specific gravity= 1.19.
3. Colorless, has odor of rotten eggs.
4. Burns with a blue flame and produces sulfur Dioxide (SO<sub>2</sub>) gas, which is very irritating to eyes and lungs. The SO<sub>2</sub> is also toxic and can cause serious injury.
5. H<sub>2</sub>S is almost as toxic as hydrogen cyanide.
6. H<sub>2</sub>S forms explosive mixture, with air between 4.3% and 46% by volume.
7. Between 5 and 6 times as toxic as carbon monoxide.
8. Produces irritation to eyes, throat, and respiratory tract.
9. Threshold Limit Value (TLV) maximum of eight hours exposure without protective respiratory equipment-10ppm.



## F. SAFE PRACTICES

If you are faced with an H<sub>2</sub>S problem in your operations, the following safe practices are recommended:

1. Be absolutely sure all concerned are familiar with the hazards concerning H<sub>2</sub>S and how to avoid it.
2. All employees should know how to operate and maintain respiration equipment.
3. Be able to give and demonstrate artificial respiration.
4. Post areas where there is poisonous gas with suitable warning signs.
5. Be sure all new employees are thoroughly schooled before they are sent to the field-tomorrow may be too late.
6. Teach men to avoid gas whenever possible-work on the windward side, have fresh air mask available.
7. Never let bad judgment guide you-wear respiratory equipment when gauging tanks, etc. Never try to hold your breath in order to enter a contaminated atmosphere.
8. In areas of high concentration, a two-man operation is preferred.
9. Never enter a tank, cellar or other enclosed place where gas can accumulate without proper respiratory protective equipment and a safety belt secured to a lifeline held by another person outside.
10. Always check out danger areas first with H<sub>2</sub>S detectors before allowing anyone to enter. DO NOT TRY TO DETERMINE THE PRESENCE OF GAS BY its ODOR.
11. Wear proper respiratory equipment for the job at hand. Never take a chance with equipment with which you are unfamiliar. If in doubt, consult your supervisor.
12. Carry out practice drills every month with emergency and maintenance breathing air equipment. Telling or showing a group how to operate equipment is not enough-make them show you.
13. Maximum care should be taken to prevent the escape of fumes into the air of working places by leaks, etc.
14. Communication such as radio and telephones should be provided for those people employed where H<sub>2</sub>S may be present.

TOXICITY OF HYDROGEN SULFIDE TO MEN

| <u>H2S Per<br/>Cent (PPM)**</u>   | <u>0 - 2<br/>Minutes</u>                               | <u>0 - 15<br/>Minutes</u>                                       | <u>15 - 30<br/>Minutes</u>   | <u>30 Minutes<br/>to 1 hour</u>  | <u>1 - 4<br/>Hours</u>  | <u>4 - 8<br/>Hours</u>           | <u>4 - 48<br/>Hours</u> |
|---|--|---|--|--|---|----------------------------------|-------------------------|
| 0.005 (50)<br>0.010 (100)   |  |   |  | Mild Conjunctiv-<br>ities; respiratory<br>tract irritation   |   |                                  |                         |
| 0.010 (100)<br>0.015 (150)  |  | Coughing;<br>irritation of<br>eyes; loss of<br>sense of smell   | Disturbed<br>respiration;<br>pain in eyes;<br>sleepiness                         | Throat   | Salivation &<br>mucous dis-<br>charge; sharp<br>pain in eyes;<br>coughing | Increased<br>symptoms*           | Hemorrhage<br>& death*  |
| 0.015 (150)<br>0.020 (200)  |  | Loss of sense<br>of smell                                       | Throat & eye<br>irritation   | Throat & eye<br>irritation   | Difficult<br>breathing;<br>blurred vision;<br>light & shy                 | Serious<br>irritating<br>effects | Hemorrhage<br>& death*  |
| 0.025 (250)<br>0.035 (350)  | Irritation<br>of eyes;<br>loss of<br>sense of<br>smell | Irritation<br>of eyes   | Painful<br>secretion of<br>tears; weari-<br>ness                                 | Light & shy;<br>nasal catarrh;<br>pain in eyes;<br>difficult<br>breathing                                    | Hemorrhage<br>& death   |                                  |                         |
| 0.035 (350)   |  | Irritation of<br>eyes; loss of<br>sense of smell                | Difficult<br>respiration<br>coughing;<br>irritation<br>of eyes                   | Increased<br>irritation of<br>eyes and nasal<br>tract; dull pain<br>head; weariness;<br>light shy            | Dizziness weak-<br>ness; increased<br>irritation;<br>death                | Death*                           |                         |
| 0.050 (500)   | Coughing<br>collapse &<br>unconscious-<br>ness         | Respiratory<br>disturbances;<br>irritation of<br>eyes; collapse | Serious eye<br>irritation;<br>palpitation<br>of heart; few<br>cases of<br>death* | Severe pain in<br>eyes and head<br>dizziness; trem-<br>bling of extre-<br>mities; great<br>weakness & death* |   |                                  |                         |
| 0.060 (600)<br>0.070 (700)<br>0.808 (800)<br>0.100 (1000)<br>0.150 (1500) | Collapse *<br>unconscious-<br>ness; death*             | Collapse*<br>unconscious-<br>ness; death*                       |  |  |   |                                  |                         |

\*Data secured from experiments of dogs which have susceptibility similar to men. \*\*PPM - parts per million

# MARATHON OIL PERMIAN LLC

## DRILLING AND OPERATIONS PLAN

**WELL NAME / NUMBER:** MAMMOTH FED COM 26 34 1 TB 10H

**STATE:** NEW MEXICO

**COUNTY:** LEA

|      | NS-Foot | NS Indicator | EW-Foot | EW Indicator | TWSP | Range | Section | Aliquot/Lot/Trac | Latitude (NAD 83) | Longitude (NAD 83) | County | State | Meridian | Lease Type | Lease Number | Elevation (ft SS) | MD (RKB) | TVD (RKB) |
|------|---------|--------------|---------|--------------|------|-------|---------|------------------|-------------------|--------------------|--------|-------|----------|------------|--------------|-------------------|----------|-----------|
| SHL  | 448     | FSL          | 1539    | FWL          | 26S  | 34E   | 1       | SESW             | 32.06639239 N     | 103.42711552 W     | Lea    | NM    | NMP      | F          | NMNM 113970  | 3281              | 0        | 0         |
| KOP  | 91      | FSL          | 2140    | FWL          | 26S  | 34E   | 1       | SESW             | 32.065397651 N    | 103.425184886 W    | Lea    | NM    | NMP      | F          | NMNM 113970  | -8640             | 11989    | 11921     |
| PPP  | 150     | FSL          | 2310    | FWL          | 26S  | 34E   | 1       | SESW             | 32.06556682 N     | 103.42472125 W     | Lea    | NM    | NMP      | F          | NMNM 113970  | -9662             | 12894    | 12493     |
| EXIT | 0       | FNL          | 2310    | FWL          | 26S  | 34E   | 1       | NENW             | 32.079657161 N    | 103.424726362 W    | Lea    | NM    | NMP      | F          | NMNM 113970  | -9172             | 17515    | 12453     |
| PPP  | 0       | FSL          | 2310    | FWL          | 25S  | 34E   | 36      | SESW             | 32.079657161 N    | 103.424726362 W    | Lea    | NM    | NMP      | S          | State        | -9172             | 17515    | 12453     |
| BHL  | 150     | FNL          | 2310    | FWL          | 25S  | 34E   | 36      | NENW             | 32.09375946 N     | 103.42473227 W     | Lea    | NM    | NMP      | S          | State        | -9128             | 22646    | 12409     |

### 1. GEOLOGIC NAME OF SURFACE FORMATION

a. Permian/Quaternary Alluvium

### 2. ESTIMATED TOPS OF GEOLOGICAL MARKERS & DEPTHS OF ANTICIPATED FRESH WATER, OIL OR GAS

| Formation                        | True Vertical Depth (ft) | Measured Depth (ft) | Lithologies        | Mineral Resources | Producing Formation |
|----------------------------------|--------------------------|---------------------|--------------------|-------------------|---------------------|
| Rustler                          | 1116                     | 1116                | Anhydrite/Dolomite | BRINE             | N                   |
| Salado                           | 1555                     | 1555                | Salt/Anhydrite     | BRINE             | N                   |
| Castile                          | 3593                     | 3613                | Base Salt          | BRINE             | N                   |
| Base of Salt                     | 5149                     | 5204                | Limy Sands         | BRINE             | N                   |
| Lamar                            | 5415                     | 5476                | Sand/Shales        | OIL               | Y                   |
| Bell Canyon                      | 5443                     | 5505                | Sands/Shale        | OIL               | Y                   |
| Brushy Canyon                    | 8051                     | 8119                | Sands/Carbonates   | OIL               | Y                   |
| Bone Spring                      | 9342                     | 9411                | Sands/Carbonates   | OIL               | Y                   |
| 1 <sup>st</sup> Bone Spring Sand | 10463                    | 10531               | Sands/Carbonates   | OIL               | Y                   |
| 2 <sup>nd</sup> Bone Spring Sand | 11012                    | 11080               | Sands/Carbonates   | OIL               | Y                   |
| 3 <sup>rd</sup> Bone Spring Sand | 12097                    | 12168               | Sands/Carbonates   | OIL               | Y                   |

**DEEPEST EXPECTED FRESH WATER:** 400' TVD

**ANTICIPATED BOTTOM HOLE PRESSURE:** 8686 psi

ANTICIPATED BOTTOM HOLE TEMPERATURE: 195°F

ANTICIPATED ABNORMAL PRESSURE: N

ANTICIPATED ABNORMAL TEMPERATURE: N

### 3. CASING PROGRAM

| String Type      | Hole Size | Csg Size | Top Set MD | Bottom Set MD | Top Set TVD | Bottom Set TVD | Weight (lbs/ft) | Grade | Conn. | SF Collapse | SF Burst | SF Tension |
|------------------|-----------|----------|------------|---------------|-------------|----------------|-----------------|-------|-------|-------------|----------|------------|
| Surface          | 17 1/2    | 13 3/8   | 0          | 1130          | 0           | 1130           | 54.5            | J55   | STC   | 5.52        | 2.5      | 2.5        |
| Intermediate I   | 12 1/4    | 9 5/8    | 0          | 5500          | 0           | 5438           | 40              | J55   | LTC   | 1.74        | 1.15     | 2.19       |
| Intermediate II  | 8 3/4     | 7        | 0          | 12900         | 0           | 12494          | 29              | P110  | BTC   | 2.21        | 1.18     | 1.9        |
| Production Liner | 6 1/8     | 4 1/2    | 12600      | 22645         | 12421       | 12409          | 13.5            | P110  | BTC   | 1.33        | 1.56     | 1.88       |

Minimum safety factors: Burst 1.125 Collapse 1.125 Tension 1.8 Wet/1.6 Dry

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

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

#### 4. CEMENT PROGRAM:

| String Type      | Lead/Tail | Stage Tool Depth | Top MD | Bottom MD | Quantity (sks) | Yield (ft3/sks) | Density (ppg) | Slurry Volume (ft3) | Excess (%) | Cement Type | Additives  |
|------------------|-----------|------------------|--------|-----------|----------------|-----------------|---------------|---------------------|------------|-------------|--|
| Surface          | Lead      | --               | 0      | 904       | 719            | 1.75            | 13.5          | 1256                | 100        | Class C     | 3 lbm/sk granular LCM + 0.1250 lbm/sk Poly-E-Flake                                       |
| Surface          | Tail      | --               | 904    | 1130      | 230            | 1.33            | 14.8          | 314                 | 100        | Class C     | N/A  |
| Intermediate I   | Lead      | --               | 0      | 4500      | 1426           | 1.75            | 12.8          | 2466                | 75         | Class C     | 0.02 Gal/Sk Defoamer + 0.5% Extender + 1% Accelerator                                    |
| Intermediate I   | Tail      | --               | 4500   | 5500      | 353            | 1.33            | 14.8          | 470                 | 50         | Class C     | 0.3 % Retarder   |
| Intermediate II  | Lead      | --               | 5200   | 11900     | 634            | 2.7             | 11            | 1712                | 70         | Class C     | 0.85% retarder + 10% extender + 0.02 gal/sk defoamer + 2.0% Extender + 0.15% Viscosifier |
| Intermediate II  | Tail      | --               | 11900  | 12900     | 179            | 1.09            | 15.6          | 195                 | 30         | Class H     | 3% extender + 0.15% Dispersant + 0.03 gal/sk retarder                                    |
| Production Liner | Tail      | --               | 12600  | 22645     | 1008           | 1.22            | 14.5          | 1230                | 30         | Class H     | 0.1% retarder + 3.5% extender + 0.3% fluid loss + 0.1% Dispersant                        |

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

**Pilot hole depth:** N/A TVD/MD

**KOP:** N/A TVD/MD

| Plug top | Plug Bottom | Excess (%) | Quantity (sx) | Density (ppg) | Yield (ft3/sx) | Water gal/sk | Slurry Description and Cement Type |
|----------|-------------|------------|---------------|---------------|----------------|--------------|------------------------------------|
|          |             |            |               |               |                |              |                                    |
|          |             |            |               |               |                |              |                                    |

Attach plugging procedure for pilot hole.

N/A

#### 5. PRESSURE CONTROL EQUIPMENT

| BOP installed and tested before drilling which hole? | Size?  | Min. Required WP | Type       | ✓ | Tested to:              |
|--|--------|------------------|------------|---|-------------------------|
| 12 ¼"  | 13 5/8 | 10000            | Annular    | x | 70% of working pressure |
|  |        |                  | Blind Ram  | x | 10000                   |
|  |        |                  | Pipe Ram   |   |                         |
|  |        |                  | Double Ram | x |                         |
|  |        |                  | Other*     |   |                         |
| 8 ¾"   | 13 5/8 | 10000            | Annular    | x | 70% of working pressure |
|  |        |                  | Blind Ram  | x | 10000                   |
|  |        |                  | Pipe Ram   |   |                         |
|  |        |                  | Double Ram | x |                         |
|  |        |                  | Other*     |   |                         |
| 6 1/8"   | 13 5/8 | 10000            | Annular    | x | 70% of working pressure |
|  |        |                  | Blind Ram  | x | 10000                   |
|  |        |                  | Pipe Ram   |   |                         |
|  |        |                  | Double Ram | x |                         |
|  |        |                  | Other*     |   |                         |

\*Specify if additional ram is utilized.

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

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

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

## 6. MUD PROGRAM:

| Top Depth    | Bottom Depth | Mud Type               | Min. Weight (ppg) | Max. Weight (ppg) | Additional Characteristics |
|--------------|--------------|------------------------|-------------------|-------------------|----------------------------|
| <u>0</u>     | <u>1130</u>  | <u>Water Based Mud</u> | <u>8.4</u>        | <u>8.8</u>        |                            |
| <u>1130</u>  | <u>5500</u>  | <u>Brine</u>           | <u>9.9</u>        | <u>10.2</u>       |                            |
| <u>5500</u>  | <u>12900</u> | <u>Cut Brine</u>       | <u>8.8</u>        | <u>9.4</u>        |                            |
| <u>12900</u> | <u>22645</u> | <u>Oil Based mud</u>   | <u>11.5</u>       | <u>13.5</u>       |                            |

Losses or gains in the mud system will be monitored visually/manually as well as with an electronic PVT. The necessary mud products for additional weight and fluid loss control will be on location at all times.

## 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 the appropriate connections will be on the rig floor unobstructed and readily accessible at all times.
- c. Hydrogen Sulfide detection equipment will be in operation after drilling out the surface casing shoe until the production casing is cemented. Breathing equipment will be on location upon drilling the surface casing shoe until total depth is reached. **If Hydrogen Sulfide is encountered , measured amounts and formations will be reported to the BLM**

## 8. LOGGING / CORING AND TESTING PROGRAM:

- A. Mud Logger: None.
- B. DST's: None.
- C. Open Hole Logs: GR while drilling from Intermediate casing shoe to TD.

## 9. POTENTIAL HAZARDS:

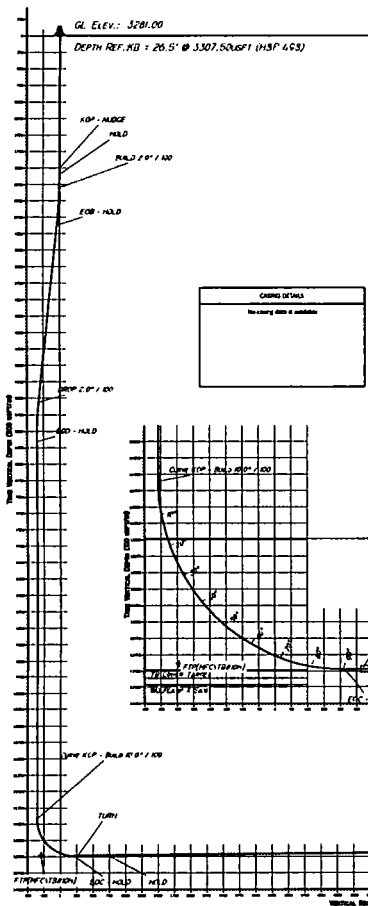
- A. H2S detection equipment will be in operation after drilling out the surface casing shoe until the production casing has been cemented. Breathing equipment will be on location from drilling out the surface shoe until production casing is cemented. If H2S is encountered the operator will comply with Onshore Order #6.
- B. No abnormal temperatures or pressures are anticipated. All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well. Adequate flare lines will be installed off the mud/gas separator where gas may be flared safely.
- C. No losses are anticipated at this time.
- D. All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well.
- E. Adequate flare lines will be installed off the mud/gas separator where gas may be flared safely.

## 10. ANTICIPATED STARTING DATE AND DURATION OF OPERATIONS

Road and location construction will begin after the BLM has approved the APD. Anticipated spud date will be as soon as possible after BLM approval and as soon as a rig will be available. Move in operations and drilling is expected to take 30 days.

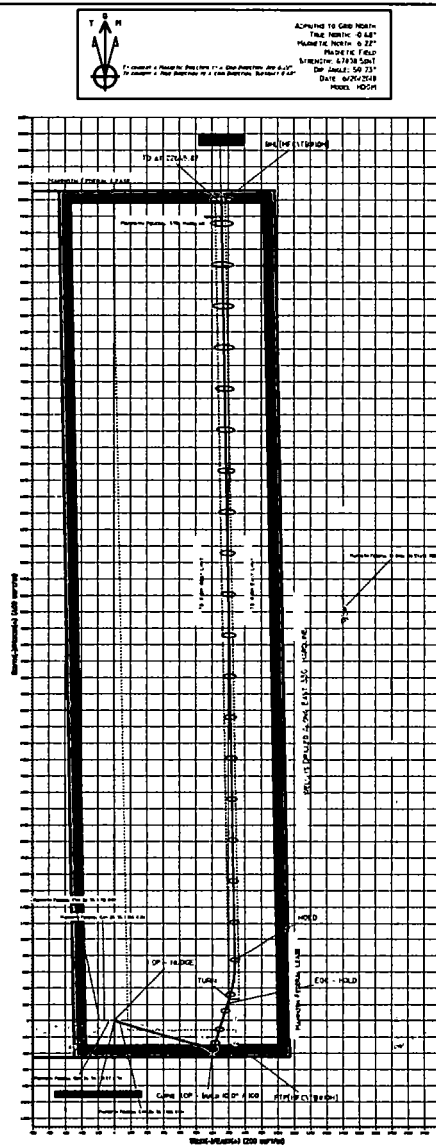
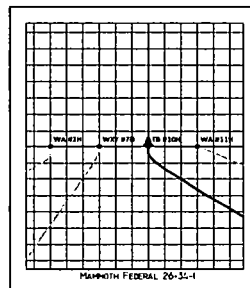


LEA COUNTY, NM (NAD27)  
MAMMOTH FED COM 26-34-1 TB  
#10H

PLAN #1  
H8P 498[illegible]

DRILLING TARGET: 12495' TVD @ OVS // 90.5° INC

TARGET WINDOW: 10' UP // 10' DOWN - 40' L // 20' R

[illegible]



**Scientific Drilling**

## **Marathon Oil Permian, LLC**

**Lea County, NM (NAD27)**

**Mammoth Fed Com 26-34-1**

**TB #10H - Slot TB#10H**

**OH**

**Plan: Plan #1**

## **Standard Planning Report**

**20 June, 2018**



**Scientific Drilling**

[www.scientificdrilling.com](http://www.scientificdrilling.com)



# Scientific Drilling, Intl Planning Report



|           |                            |                              |                                    |
|-----------|----------------------------|------------------------------|------------------------------------|
| Database: | Midland District           | Local Co-ordinate Reference: | Well TB #10H - Slot TB#10H         |
| Company:  | Marathon Oil Permian, LLC  | TVD Reference:               | KB = 26.5' @ 3307.50usft (H&P 498) |
| Project:  | Lea County, NM (NAD27)     | MD Reference:                | KB = 26.5' @ 3307.50usft (H&P 498) |
| Site:     | Mammoth Fed Com 26-34-1 TB | North Reference:             | Grid                               |
| Well:     | #10H                       | Survey Calculation Method:   | Minimum Curvature                  |
| Wellbore: | OH                         |                              |                                    |
| Design:   | Plan #1                    |                              |                                    |

|             |                                      |               |                             |
|-------------|--------------------------------------|---------------|-----------------------------|
| Project     | Lea County, NM (NAD27)               |               |                             |
| Map System: | US State Plane 1927 (Exact solution) | System Datum: | Mean Sea Level              |
| Geo Datum:  | NAD 1927 (NADCON CONUS)              |               |                             |
| Map Zone:   | New Mexico East 3001                 |               | Using geodetic scale factor |

|                       |                         |                   |                   |
|-----------------------|-------------------------|-------------------|-------------------|
| Site                  | Mammoth Fed Com 26-34-1 |                   |                   |
| Site Position:        |                         | Northing:         | 389,012.16 usft   |
| From:                 | Map                     | Easting:          | 780,779.29 usft   |
| Position Uncertainty: | 0.00 usft               | Slot Radius:      | 13-3/16 "         |
|                       |                         | Latitude:         | 32° 3' 58.566 N   |
|                       |                         | Longitude:        | 103° 25' 36.992 W |
|                       |                         | Grid Convergence: | 0.48 °            |

|                      |                       |                     |                   |
|----------------------|-----------------------|---------------------|-------------------|
| Well                 | TB #10H - Slot TB#10H |                     |                   |
| Well Position        | +N/-S                 | 0.09 usft           | Northing:         |
|                      | +E/-W                 | 89.95 usft          | Easting:          |
| Position Uncertainty | 0.00 usft             | Wellhead Elevation: | 0.00 usft         |
|                      |                       | Latitude:           | 32° 3' 58.559 N   |
|                      |                       | Longitude:          | 103° 25' 35.947 W |
|                      |                       | Ground Level:       | 3,281.00 usft     |

|           |            |             |                |
|-----------|------------|-------------|----------------|
| Wellbore  | OH         |             |                |
| Magnetics | Model Name | Sample Date | Declination    |
|           |            |             | (°)            |
|           | HDGM       | 6/20/2018   | 6.70           |
|           |            |             | Dip Angle      |
|           |            |             | (°)            |
|           |            |             | 59.73          |
|           |            |             | Field Strength |
|           |            |             | (nT)           |
|           |            |             | 47,809         |

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

| Plan Sections         |                 |                   |                       |              |              |                         |                        |                       |         |                 |
|-----------------------|-----------------|-------------------|-----------------------|--------------|--------------|-------------------------|------------------------|-----------------------|---------|-----------------|
| Measured Depth (usft) | Inclination (°) | Azimuth (bearing) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) | TFO (°) | Target          |
| 0.00                  | 0.00            | 0.00              | 0.00                  | 0.00         | 0.00         | 0.00                    | 0.00                   | 0.00                  | 0.00    |                 |
| 2,000.00              | 0.00            | 0.00              | 2,000.00              | 0.00         | 0.00         | 0.00                    | 0.00                   | 0.00                  | 0.00    |                 |
| 2,100.00              | 1.00            | 180.00            | 2,099.99              | -0.87        | 0.00         | 1.00                    | 1.00                   | 0.00                  | 180.00  |                 |
| 2,300.00              | 1.00            | 180.00            | 2,299.96              | -4.36        | 0.00         | 0.00                    | 0.00                   | 0.00                  | 0.00    |                 |
| 2,876.60              | 12.00           | 120.00            | 2,872.16              | -39.48       | 52.09        | 2.00                    | 1.91                   | -10.41                | -64.24  |                 |
| 5,626.60              | 12.00           | 120.00            | 5,562.06              | -325.36      | 547.24       | 0.00                    | 0.00                   | 0.00                  | 0.00    |                 |
| 6,226.60              | 0.00            | 0.00              | 6,157.68              | -356.66      | 601.46       | 2.00                    | -2.00                  | 0.00                  | 180.00  |                 |
| 11,989.92             | 0.00            | 0.00              | 11,921.00             | -356.66      | 601.46       | 0.00                    | 0.00                   | 0.00                  | 0.00    |                 |
| 12,894.92             | 90.50           | 9.00              | 12,493.94             | 214.18       | 691.87       | 10.00                   | 10.00                  | 0.00                  | 9.00    |                 |
| 12,949.92             | 90.50           | 9.00              | 12,493.46             | 268.50       | 700.47       | 0.00                    | 0.00                   | 0.00                  | 0.00    |                 |
| 13,424.90             | 90.50           | 359.50            | 12,489.30             | 741.61       | 735.63       | 2.00                    | 0.00                   | -2.00                 | -89.96  |                 |
| 22,645.87             | 90.50           | 359.50            | 12,409.00             | 9,961.89     | 654.88       | 0.00                    | 0.00                   | 0.00                  | 0.00    | BHL[MFC/TB#10H] |
| 22,690.87             | 90.50           | 359.50            | 12,408.61             | 10,006.88    | 654.49       | 0.00                    | 0.00                   | 0.00                  | 0.00    |                 |



Scientific Drilling, Intl  
Planning Report



Database: Midland District  
Company: Marathon Oil Permian, LLC  
Project: Lea County, NM (NAD27)  
Site: Mammoth Fed Com 26-34-1 TB  
Well: #10H  
Wellbore: OH  
Design: Plan #1

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MD Reference: KB = 26.5' @ 3307.50usft (H&P 498)  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature

Planned Survey

| Measured<br>Depth<br>(usft) | Inclination<br>(°) | Azimuth<br>(bearing) | Vertical<br>Depth<br>(usft) | +N/-S<br>(usft) | +E/-W<br>(usft) | Vertical<br>Section<br>(usft) | Dogleg<br>Rate<br>(°/100usft) | Build<br>Rate<br>(°/100usft) | Turn<br>Rate<br>(°/100usft) |
|-----------------------------|--------------------|----------------------|-----------------------------|-----------------|-----------------|-------------------------------|-------------------------------|------------------------------|-----------------------------|
| 0.00                        | 0.00               | 0.00                 | 0.00                        | 0.00            | 0.00            | 0.00                          | 0.00                          | 0.00                         | 0.00                        |
| 100.00                      | 0.00               | 0.00                 | 100.00                      | 0.00            | 0.00            | 0.00                          | 0.00                          | 0.00                         | 0.00                        |
| 200.00                      | 0.00               | 0.00                 | 200.00                      | 0.00            | 0.00            | 0.00                          | 0.00                          | 0.00                         | 0.00                        |
| 300.00                      | 0.00               | 0.00                 | 300.00                      | 0.00            | 0.00            | 0.00                          | 0.00                          | 0.00                         | 0.00                        |
| 400.00                      | 0.00               | 0.00                 | 400.00                      | 0.00            | 0.00            | 0.00                          | 0.00                          | 0.00                         | 0.00                        |
| 500.00                      | 0.00               | 0.00                 | 500.00                      | 0.00            | 0.00            | 0.00                          | 0.00                          | 0.00                         | 0.00                        |
| 600.00                      | 0.00               | 0.00                 | 600.00                      | 0.00            | 0.00            | 0.00                          | 0.00                          | 0.00                         | 0.00                        |
| 700.00                      | 0.00               | 0.00                 | 700.00                      | 0.00            | 0.00            | 0.00                          | 0.00                          | 0.00                         | 0.00                        |
| 800.00                      | 0.00               | 0.00                 | 800.00                      | 0.00            | 0.00            | 0.00                          | 0.00                          | 0.00                         | 0.00                        |
| 900.00                      | 0.00               | 0.00                 | 900.00                      | 0.00            | 0.00            | 0.00                          | 0.00                          | 0.00                         | 0.00                        |
| 1,000.00                    | 0.00               | 0.00                 | 1,000.00                    | 0.00            | 0.00            | 0.00                          | 0.00                          | 0.00                         | 0.00                        |
| 1,100.00                    | 0.00               | 0.00                 | 1,100.00                    | 0.00            | 0.00            | 0.00                          | 0.00                          | 0.00                         | 0.00                        |
| 1,116.00                    | 0.00               | 0.00                 | 1,116.00                    | 0.00            | 0.00            | 0.00                          | 0.00                          | 0.00                         | 0.00                        |
| Rustler                     |                    |                      |                             |                 |                 |                               |                               |                              |                             |
| 1,200.00                    | 0.00               | 0.00                 | 1,200.00                    | 0.00            | 0.00            | 0.00                          | 0.00                          | 0.00                         | 0.00                        |
| 1,300.00                    | 0.00               | 0.00                 | 1,300.00                    | 0.00            | 0.00            | 0.00                          | 0.00                          | 0.00                         | 0.00                        |
| 1,400.00                    | 0.00               | 0.00                 | 1,400.00                    | 0.00            | 0.00            | 0.00                          | 0.00                          | 0.00                         | 0.00                        |
| 1,500.00                    | 0.00               | 0.00                 | 1,500.00                    | 0.00            | 0.00            | 0.00                          | 0.00                          | 0.00                         | 0.00                        |
| 1,555.00                    | 0.00               | 0.00                 | 1,555.00                    | 0.00            | 0.00            | 0.00                          | 0.00                          | 0.00                         | 0.00                        |
| Salado                      |                    |                      |                             |                 |                 |                               |                               |                              |                             |
| 1,600.00                    | 0.00               | 0.00                 | 1,600.00                    | 0.00            | 0.00            | 0.00                          | 0.00                          | 0.00                         | 0.00                        |
| 1,700.00                    | 0.00               | 0.00                 | 1,700.00                    | 0.00            | 0.00            | 0.00                          | 0.00                          | 0.00                         | 0.00                        |
| 1,800.00                    | 0.00               | 0.00                 | 1,800.00                    | 0.00            | 0.00            | 0.00                          | 0.00                          | 0.00                         | 0.00                        |
| 1,900.00                    | 0.00               | 0.00                 | 1,900.00                    | 0.00            | 0.00            | 0.00                          | 0.00                          | 0.00                         | 0.00                        |
| 2,000.00                    | 0.00               | 0.00                 | 2,000.00                    | 0.00            | 0.00            | 0.00                          | 0.00                          | 0.00                         | 0.00                        |
| KOP - NUDGE                 |                    |                      |                             |                 |                 |                               |                               |                              |                             |
| 2,100.00                    | 1.00               | 180.00               | 2,099.99                    | -0.87           | 0.00            | -0.87                         | 1.00                          | 1.00                         | 0.00                        |
| HOLD                        |                    |                      |                             |                 |                 |                               |                               |                              |                             |
| 2,200.00                    | 1.00               | 180.00               | 2,199.98                    | -2.62           | 0.00            | -2.62                         | 0.00                          | 0.00                         | 0.00                        |
| 2,300.00                    | 1.00               | 180.00               | 2,299.96                    | -4.36           | 0.00            | -4.36                         | 0.00                          | 0.00                         | 0.00                        |
| BUILD 2.0° / 100            |                    |                      |                             |                 |                 |                               |                               |                              |                             |
| 2,400.00                    | 2.60               | 136.05               | 2,399.92                    | -6.87           | 1.57            | -6.87                         | 2.00                          | 1.60                         | -43.95                      |
| 2,500.00                    | 4.52               | 127.22               | 2,499.72                    | -10.88          | 6.29            | -10.88                        | 2.00                          | 1.93                         | -8.83                       |
| 2,600.00                    | 6.50               | 123.69               | 2,599.25                    | -16.41          | 14.13           | -16.41                        | 2.00                          | 1.97                         | -3.52                       |
| 2,700.00                    | 8.48               | 121.81               | 2,698.39                    | -23.43          | 25.11           | -23.43                        | 2.00                          | 1.99                         | -1.88                       |
| 2,800.00                    | 10.47              | 120.64               | 2,797.02                    | -31.95          | 39.20           | -31.95                        | 2.00                          | 1.99                         | -1.17                       |
| 2,876.60                    | 12.00              | 120.00               | 2,872.16                    | -39.48          | 52.09           | -39.48                        | 2.00                          | 1.99                         | -0.83                       |
| EOB - HOLD                  |                    |                      |                             |                 |                 |                               |                               |                              |                             |
| 2,900.00                    | 12.00              | 120.00               | 2,895.04                    | -41.92          | 56.30           | -41.92                        | 0.00                          | 0.00                         | 0.00                        |
| 3,000.00                    | 12.00              | 120.00               | 2,992.86                    | -52.31          | 74.30           | -52.31                        | 0.00                          | 0.00                         | 0.00                        |
| 3,100.00                    | 12.00              | 120.00               | 3,090.67                    | -62.71          | 92.31           | -62.71                        | 0.00                          | 0.00                         | 0.00                        |
| 3,200.00                    | 12.00              | 120.00               | 3,188.49                    | -73.10          | 110.32          | -73.10                        | 0.00                          | 0.00                         | 0.00                        |
| 3,300.00                    | 12.00              | 120.00               | 3,286.30                    | -83.50          | 128.32          | -83.50                        | 0.00                          | 0.00                         | 0.00                        |
| 3,400.00                    | 12.00              | 120.00               | 3,384.12                    | -93.89          | 146.33          | -93.89                        | 0.00                          | 0.00                         | 0.00                        |
| 3,500.00                    | 12.00              | 120.00               | 3,481.93                    | -104.29         | 164.33          | -104.29                       | 0.00                          | 0.00                         | 0.00                        |
| 3,600.00                    | 12.00              | 120.00               | 3,579.75                    | -114.69         | 182.34          | -114.69                       | 0.00                          | 0.00                         | 0.00                        |
| 3,613.55                    | 12.00              | 120.00               | 3,593.00                    | -116.09         | 184.78          | -116.09                       | 0.00                          | 0.00                         | 0.00                        |
| Castile                     |                    |                      |                             |                 |                 |                               |                               |                              |                             |
| 3,700.00                    | 12.00              | 120.00               | 3,677.56                    | -125.08         | 200.34          | -125.08                       | 0.00                          | 0.00                         | 0.00                        |
| 3,800.00                    | 12.00              | 120.00               | 3,775.38                    | -135.48         | 218.35          | -135.48                       | 0.00                          | 0.00                         | 0.00                        |
| 3,900.00                    | 12.00              | 120.00               | 3,873.19                    | -145.87         | 236.36          | -145.87                       | 0.00                          | 0.00                         | 0.00                        |
| 4,000.00                    | 12.00              | 120.00               | 3,971.00                    | -156.27         | 254.36          | -156.27                       | 0.00                          | 0.00                         | 0.00                        |
| 4,100.00                    | 12.00              | 120.00               | 4,068.82                    | -166.66         | 272.37          | -166.66                       | 0.00                          | 0.00                         | 0.00                        |



# Scientific Drilling, Intl Planning Report



Database: Midland District  
Company: Marathon Oil Permian, LLC  
Project: Lea County, NM (NAD27)  
Site: Mammoth Fed Corn 26-34-1 TB  
Well: #10H  
Wellbore: OH  
Design: Plan #1

Local Co-ordinate Reference: Well TB #10H - Slot TB#10H  
TVD Reference: KB = 26.5' @ 3307.50usft (H&P 498)  
MD Reference: KB = 26.5' @ 3307.50usft (H&P 498)  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature

## Planned Survey

| Measured Depth (usft)  | Inclination (°) | Azimuth (bearing) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|------------------------|-----------------|-------------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 4,200.00               | 12.00           | 120.00            | 4,166.63              | -177.06      | 290.37       | -177.06                 | 0.00                    | 0.00                   | 0.00                  |
| 4,300.00               | 12.00           | 120.00            | 4,264.45              | -187.45      | 308.38       | -187.45                 | 0.00                    | 0.00                   | 0.00                  |
| 4,400.00               | 12.00           | 120.00            | 4,362.26              | -197.85      | 326.38       | -197.85                 | 0.00                    | 0.00                   | 0.00                  |
| 4,500.00               | 12.00           | 120.00            | 4,460.08              | -208.25      | 344.39       | -208.25                 | 0.00                    | 0.00                   | 0.00                  |
| 4,600.00               | 12.00           | 120.00            | 4,557.89              | -218.64      | 362.40       | -218.64                 | 0.00                    | 0.00                   | 0.00                  |
| 4,700.00               | 12.00           | 120.00            | 4,655.71              | -229.04      | 380.40       | -229.04                 | 0.00                    | 0.00                   | 0.00                  |
| 4,800.00               | 12.00           | 120.00            | 4,753.52              | -239.43      | 398.41       | -239.43                 | 0.00                    | 0.00                   | 0.00                  |
| 4,900.00               | 12.00           | 120.00            | 4,851.34              | -249.83      | 416.41       | -249.83                 | 0.00                    | 0.00                   | 0.00                  |
| 5,000.00               | 12.00           | 120.00            | 4,949.15              | -260.22      | 434.42       | -260.22                 | 0.00                    | 0.00                   | 0.00                  |
| 5,100.00               | 12.00           | 120.00            | 5,046.97              | -270.62      | 452.42       | -270.62                 | 0.00                    | 0.00                   | 0.00                  |
| 5,200.00               | 12.00           | 120.00            | 5,144.78              | -281.01      | 470.43       | -281.01                 | 0.00                    | 0.00                   | 0.00                  |
| 5,204.31               | 12.00           | 120.00            | 5,149.00              | -281.46      | 471.21       | -281.46                 | 0.00                    | 0.00                   | 0.00                  |
| <b>Base of Salt</b>    |                 |                   |                       |              |              |                         |                         |                        |                       |
| 5,300.00               | 12.00           | 120.00            | 5,242.60              | -291.41      | 488.44       | -291.41                 | 0.00                    | 0.00                   | 0.00                  |
| 5,400.00               | 12.00           | 120.00            | 5,340.41              | -301.81      | 506.44       | -301.81                 | 0.00                    | 0.00                   | 0.00                  |
| 5,476.26               | 12.00           | 120.00            | 5,415.00              | -309.73      | 520.17       | -309.73                 | 0.00                    | 0.00                   | 0.00                  |
| <b>Lamar</b>           |                 |                   |                       |              |              |                         |                         |                        |                       |
| 5,500.00               | 12.00           | 120.00            | 5,438.23              | -312.20      | 524.45       | -312.20                 | 0.00                    | 0.00                   | 0.00                  |
| 5,504.88               | 12.00           | 120.00            | 5,443.00              | -312.71      | 525.33       | -312.71                 | 0.00                    | 0.00                   | 0.00                  |
| <b>Bell Canyon</b>     |                 |                   |                       |              |              |                         |                         |                        |                       |
| 5,600.00               | 12.00           | 120.00            | 5,536.04              | -322.60      | 542.45       | -322.60                 | 0.00                    | 0.00                   | 0.00                  |
| 5,626.60               | 12.00           | 120.00            | 5,562.06              | -325.36      | 547.24       | -325.36                 | 0.00                    | 0.00                   | 0.00                  |
| <b>DROP 2.0° / 100</b> |                 |                   |                       |              |              |                         |                         |                        |                       |
| 5,700.00               | 10.53           | 120.00            | 5,634.04              | -332.53      | 559.66       | -332.53                 | 2.00                    | -2.00                  | 0.00                  |
| 5,800.00               | 8.53            | 120.00            | 5,732.66              | -340.81      | 574.00       | -340.81                 | 2.00                    | -2.00                  | 0.00                  |
| 5,900.00               | 6.53            | 120.00            | 5,831.79              | -347.36      | 585.35       | -347.36                 | 2.00                    | -2.00                  | 0.00                  |
| 6,000.00               | 4.53            | 120.00            | 5,931.32              | -352.18      | 593.70       | -352.18                 | 2.00                    | -2.00                  | 0.00                  |
| 6,100.00               | 2.53            | 120.00            | 6,031.12              | -355.26      | 599.04       | -355.26                 | 2.00                    | -2.00                  | 0.00                  |
| 6,200.00               | 0.53            | 120.00            | 6,131.08              | -356.60      | 601.35       | -356.60                 | 2.00                    | -2.00                  | 0.00                  |
| 6,226.60               | 0.00            | 0.00              | 6,157.68              | -356.66      | 601.46       | -356.66                 | 2.00                    | -2.00                  | 0.00                  |
| <b>EOD - HOLD</b>      |                 |                   |                       |              |              |                         |                         |                        |                       |
| 6,300.00               | 0.00            | 0.00              | 6,231.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 6,400.00               | 0.00            | 0.00              | 6,331.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 6,500.00               | 0.00            | 0.00              | 6,431.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 6,600.00               | 0.00            | 0.00              | 6,531.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 6,700.00               | 0.00            | 0.00              | 6,631.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 6,800.00               | 0.00            | 0.00              | 6,731.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 6,900.00               | 0.00            | 0.00              | 6,831.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 7,000.00               | 0.00            | 0.00              | 6,931.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 7,100.00               | 0.00            | 0.00              | 7,031.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 7,200.00               | 0.00            | 0.00              | 7,131.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 7,300.00               | 0.00            | 0.00              | 7,231.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 7,400.00               | 0.00            | 0.00              | 7,331.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 7,500.00               | 0.00            | 0.00              | 7,431.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 7,600.00               | 0.00            | 0.00              | 7,531.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 7,700.00               | 0.00            | 0.00              | 7,631.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 7,800.00               | 0.00            | 0.00              | 7,731.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 7,900.00               | 0.00            | 0.00              | 7,831.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 8,000.00               | 0.00            | 0.00              | 7,931.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 8,100.00               | 0.00            | 0.00              | 8,031.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 8,119.92               | 0.00            | 0.00              | 8,051.00              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| <b>Brushy Canyon</b>   |                 |                   |                       |              |              |                         |                         |                        |                       |
| 8,200.00               | 0.00            | 0.00              | 8,131.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |



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Survey Calculation Method: Minimum Curvature

## Planned Survey

| Measured Depth (usft)                | Inclination (°) | Azimuth (bearing) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|--------------------------------------|-----------------|-------------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 8,300.00                             | 0.00            | 0.00              | 8,231.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 8,400.00                             | 0.00            | 0.00              | 8,331.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 8,500.00                             | 0.00            | 0.00              | 8,431.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 8,600.00                             | 0.00            | 0.00              | 8,531.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 8,700.00                             | 0.00            | 0.00              | 8,631.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 8,800.00                             | 0.00            | 0.00              | 8,731.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 8,900.00                             | 0.00            | 0.00              | 8,831.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 9,000.00                             | 0.00            | 0.00              | 8,931.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 9,100.00                             | 0.00            | 0.00              | 9,031.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 9,200.00                             | 0.00            | 0.00              | 9,131.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 9,300.00                             | 0.00            | 0.00              | 9,231.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 9,400.00                             | 0.00            | 0.00              | 9,331.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 9,410.92                             | 0.00            | 0.00              | 9,342.00              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| <b>Bone Spring</b>                   |                 |                   |                       |              |              |                         |                         |                        |                       |
| 9,500.00                             | 0.00            | 0.00              | 9,431.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 9,600.00                             | 0.00            | 0.00              | 9,531.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 9,700.00                             | 0.00            | 0.00              | 9,631.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 9,800.00                             | 0.00            | 0.00              | 9,731.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 9,900.00                             | 0.00            | 0.00              | 9,831.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 10,000.00                            | 0.00            | 0.00              | 9,931.08              | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 10,100.00                            | 0.00            | 0.00              | 10,031.08             | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 10,200.00                            | 0.00            | 0.00              | 10,131.08             | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 10,300.00                            | 0.00            | 0.00              | 10,231.08             | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 10,400.00                            | 0.00            | 0.00              | 10,331.08             | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 10,500.00                            | 0.00            | 0.00              | 10,431.08             | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 10,531.92                            | 0.00            | 0.00              | 10,463.00             | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| <b>1st Bone Spring Sand</b>          |                 |                   |                       |              |              |                         |                         |                        |                       |
| 10,600.00                            | 0.00            | 0.00              | 10,531.08             | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 10,700.00                            | 0.00            | 0.00              | 10,631.08             | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 10,800.00                            | 0.00            | 0.00              | 10,731.08             | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 10,900.00                            | 0.00            | 0.00              | 10,831.08             | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 11,000.00                            | 0.00            | 0.00              | 10,931.08             | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 11,080.92                            | 0.00            | 0.00              | 11,012.00             | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| <b>2nd Bone Spring Sand</b>          |                 |                   |                       |              |              |                         |                         |                        |                       |
| 11,100.00                            | 0.00            | 0.00              | 11,031.08             | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 11,200.00                            | 0.00            | 0.00              | 11,131.08             | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 11,300.00                            | 0.00            | 0.00              | 11,231.08             | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 11,400.00                            | 0.00            | 0.00              | 11,331.08             | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 11,500.00                            | 0.00            | 0.00              | 11,431.08             | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 11,600.00                            | 0.00            | 0.00              | 11,531.08             | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 11,700.00                            | 0.00            | 0.00              | 11,631.08             | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 11,800.00                            | 0.00            | 0.00              | 11,731.08             | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 11,900.00                            | 0.00            | 0.00              | 11,831.08             | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| 11,989.92                            | 0.00            | 0.00              | 11,921.00             | -356.66      | 601.46       | -356.66                 | 0.00                    | 0.00                   | 0.00                  |
| <b>Curve KOP - Build 10.0° / 100</b> |                 |                   |                       |              |              |                         |                         |                        |                       |
| 12,000.00                            | 1.01            | 9.00              | 11,931.08             | -356.58      | 601.47       | -356.58                 | 10.00                   | 10.00                  | 0.00                  |
| 12,050.00                            | 6.01            | 9.00              | 11,980.97             | -353.55      | 601.95       | -353.55                 | 10.00                   | 10.00                  | 0.00                  |
| 12,100.00                            | 11.01           | 9.00              | 12,030.41             | -346.25      | 603.11       | -346.25                 | 10.00                   | 10.00                  | 0.00                  |
| 12,150.00                            | 16.01           | 9.00              | 12,079.01             | -334.72      | 604.93       | -334.72                 | 10.00                   | 10.00                  | 0.00                  |
| 12,168.81                            | 17.89           | 9.00              | 12,097.00             | -329.30      | 605.79       | -329.30                 | 10.00                   | 10.00                  | 0.00                  |
| <b>3rd Bone Spring Sand</b>          |                 |                   |                       |              |              |                         |                         |                        |                       |
| 12,200.00                            | 21.01           | 9.00              | 12,126.41             | -319.05      | 607.42       | -319.05                 | 10.00                   | 10.00                  | 0.00                  |
| 12,250.00                            | 26.01           | 9.00              | 12,172.24             | -299.35      | 610.53       | -299.35                 | 10.00                   | 10.00                  | 0.00                  |



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Well: #10H  
Wellbore: OH  
Design: Plan #1

Local Co-ordinate Reference: Well TB #10H - Slot TB#10H  
TVD Reference: KB = 26.5' @ 3307.50usft (H&P 498)  
MD Reference: KB = 26.5' @ 3307.50usft (H&P 498)  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature

## Planned Survey

| Measured Depth (usft) | Inclination (°) | Azimuth (bearing) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|-----------------------|-----------------|-------------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 12,300.00             | 31.01           | 9.00              | 12,216.17             | -275.79      | 614.27       | -275.79                 | 10.00                   | 10.00                  | 0.00                  |
| 12,350.00             | 36.01           | 9.00              | 12,257.84             | -248.54      | 618.58       | -248.54                 | 10.00                   | 10.00                  | 0.00                  |
| 12,400.00             | 41.01           | 9.00              | 12,296.96             | -217.80      | 623.45       | -217.80                 | 10.00                   | 10.00                  | 0.00                  |
| 12,450.00             | 46.01           | 9.00              | 12,333.21             | -183.81      | 628.83       | -183.81                 | 10.00                   | 10.00                  | 0.00                  |
| 12,476.53             | 48.66           | 9.00              | 12,351.19             | -164.54      | 631.89       | -164.54                 | 10.00                   | 10.00                  | 0.00                  |
| FTP[MFC\TB#10H]       |                 |                   |                       |              |              |                         |                         |                        |                       |
| 12,500.00             | 51.01           | 9.00              | 12,366.32             | -146.83      | 634.69       | -146.83                 | 10.00                   | 10.00                  | 0.00                  |
| 12,550.00             | 56.01           | 9.00              | 12,396.05             | -107.14      | 640.98       | -107.14                 | 10.00                   | 10.00                  | 0.00                  |
| 12,600.00             | 61.01           | 9.00              | 12,422.16             | -65.04       | 647.65       | -65.04                  | 10.00                   | 10.00                  | 0.00                  |
| 12,650.00             | 66.01           | 9.00              | 12,444.46             | -20.86       | 654.64       | -20.86                  | 10.00                   | 10.00                  | 0.00                  |
| 12,700.00             | 71.01           | 9.00              | 12,462.77             | 25.08        | 661.92       | 25.08                   | 10.00                   | 10.00                  | 0.00                  |
| 12,750.00             | 76.01           | 9.00              | 12,476.96             | 72.41        | 669.42       | 72.41                   | 10.00                   | 10.00                  | 0.00                  |
| 12,800.00             | 81.01           | 9.00              | 12,486.92             | 120.79       | 677.08       | 120.79                  | 10.00                   | 10.00                  | 0.00                  |
| 12,850.00             | 86.01           | 9.00              | 12,492.57             | 169.85       | 684.85       | 169.85                  | 10.00                   | 10.00                  | 0.00                  |
| 12,894.92             | 90.50           | 9.00              | 12,493.94             | 214.18       | 691.87       | 214.18                  | 10.00                   | 10.00                  | 0.00                  |
| EOC - HOLD            |                 |                   |                       |              |              |                         |                         |                        |                       |
| 12,900.00             | 90.50           | 9.00              | 12,493.89             | 219.20       | 692.67       | 219.20                  | 0.00                    | 0.00                   | 0.00                  |
| 12,949.92             | 90.50           | 9.00              | 12,493.46             | 268.50       | 700.47       | 268.50                  | 0.00                    | 0.00                   | 0.00                  |
| TURN                  |                 |                   |                       |              |              |                         |                         |                        |                       |
| 13,000.00             | 90.50           | 8.00              | 12,493.02             | 318.03       | 707.88       | 318.03                  | 2.00                    | 0.00                   | -2.00                 |
| 13,100.00             | 90.50           | 6.00              | 12,492.14             | 417.28       | 720.06       | 417.28                  | 2.00                    | 0.00                   | -2.00                 |
| 13,200.00             | 90.50           | 4.00              | 12,491.27             | 516.89       | 728.77       | 516.89                  | 2.00                    | 0.00                   | -2.00                 |
| 13,300.00             | 90.50           | 2.00              | 12,490.39             | 616.74       | 734.00       | 616.74                  | 2.00                    | 0.00                   | -2.00                 |
| 13,400.00             | 90.50           | 360.00            | 12,489.52             | 716.72       | 735.74       | 716.72                  | 2.00                    | 0.00                   | -2.00                 |
| 13,424.90             | 90.50           | 359.50            | 12,489.30             | 741.61       | 735.63       | 741.61                  | 2.00                    | 0.00                   | -2.00                 |
| HOLD                  |                 |                   |                       |              |              |                         |                         |                        |                       |
| 13,500.00             | 90.50           | 359.50            | 12,488.65             | 816.71       | 734.98       | 816.71                  | 0.00                    | 0.00                   | 0.00                  |
| 13,600.00             | 90.50           | 359.50            | 12,487.77             | 916.70       | 734.10       | 916.70                  | 0.00                    | 0.00                   | 0.00                  |
| 13,700.00             | 90.50           | 359.50            | 12,486.90             | 1,016.69     | 733.23       | 1,016.69                | 0.00                    | 0.00                   | 0.00                  |
| 13,800.00             | 90.50           | 359.50            | 12,486.03             | 1,116.69     | 732.36       | 1,116.69                | 0.00                    | 0.00                   | 0.00                  |
| 13,900.00             | 90.50           | 359.50            | 12,485.16             | 1,216.68     | 731.49       | 1,216.68                | 0.00                    | 0.00                   | 0.00                  |
| 14,000.00             | 90.50           | 359.50            | 12,484.28             | 1,316.67     | 730.61       | 1,316.67                | 0.00                    | 0.00                   | 0.00                  |
| 14,100.00             | 90.50           | 359.50            | 12,483.41             | 1,416.66     | 729.74       | 1,416.66                | 0.00                    | 0.00                   | 0.00                  |
| 14,200.00             | 90.50           | 359.50            | 12,482.54             | 1,516.66     | 728.87       | 1,516.66                | 0.00                    | 0.00                   | 0.00                  |
| 14,300.00             | 90.50           | 359.50            | 12,481.67             | 1,616.65     | 728.00       | 1,616.65                | 0.00                    | 0.00                   | 0.00                  |
| 14,400.00             | 90.50           | 359.50            | 12,480.79             | 1,716.64     | 727.12       | 1,716.64                | 0.00                    | 0.00                   | 0.00                  |
| 14,500.00             | 90.50           | 359.50            | 12,479.92             | 1,816.63     | 726.25       | 1,816.63                | 0.00                    | 0.00                   | 0.00                  |
| 14,600.00             | 90.50           | 359.50            | 12,479.05             | 1,916.63     | 725.38       | 1,916.63                | 0.00                    | 0.00                   | 0.00                  |
| 14,700.00             | 90.50           | 359.50            | 12,478.17             | 2,016.62     | 724.51       | 2,016.62                | 0.00                    | 0.00                   | 0.00                  |
| 14,800.00             | 90.50           | 359.50            | 12,477.30             | 2,116.61     | 723.63       | 2,116.61                | 0.00                    | 0.00                   | 0.00                  |
| 14,900.00             | 90.50           | 359.50            | 12,476.43             | 2,216.60     | 722.76       | 2,216.60                | 0.00                    | 0.00                   | 0.00                  |
| 15,000.00             | 90.50           | 359.50            | 12,475.56             | 2,316.60     | 721.89       | 2,316.60                | 0.00                    | 0.00                   | 0.00                  |
| 15,100.00             | 90.50           | 359.50            | 12,474.68             | 2,416.59     | 721.01       | 2,416.59                | 0.00                    | 0.00                   | 0.00                  |
| 15,200.00             | 90.50           | 359.50            | 12,473.81             | 2,516.58     | 720.14       | 2,516.58                | 0.00                    | 0.00                   | 0.00                  |
| 15,300.00             | 90.50           | 359.50            | 12,472.94             | 2,616.57     | 719.27       | 2,616.57                | 0.00                    | 0.00                   | 0.00                  |
| 15,400.00             | 90.50           | 359.50            | 12,472.07             | 2,716.57     | 718.40       | 2,716.57                | 0.00                    | 0.00                   | 0.00                  |
| 15,500.00             | 90.50           | 359.50            | 12,471.19             | 2,816.56     | 717.52       | 2,816.56                | 0.00                    | 0.00                   | 0.00                  |
| 15,600.00             | 90.50           | 359.50            | 12,470.32             | 2,916.55     | 716.65       | 2,916.55                | 0.00                    | 0.00                   | 0.00                  |
| 15,700.00             | 90.50           | 359.50            | 12,469.45             | 3,016.54     | 715.78       | 3,016.54                | 0.00                    | 0.00                   | 0.00                  |
| 15,800.00             | 90.50           | 359.50            | 12,468.58             | 3,116.53     | 714.91       | 3,116.53                | 0.00                    | 0.00                   | 0.00                  |
| 15,900.00             | 90.50           | 359.50            | 12,467.70             | 3,216.53     | 714.03       | 3,216.53                | 0.00                    | 0.00                   | 0.00                  |
| 16,000.00             | 90.50           | 359.50            | 12,466.83             | 3,316.52     | 713.16       | 3,316.52                | 0.00                    | 0.00                   | 0.00                  |
| 16,100.00             | 90.50           | 359.50            | 12,465.96             | 3,416.51     | 712.29       | 3,416.51                | 0.00                    | 0.00                   | 0.00                  |



# Scientific Drilling, Intl Planning Report



Database: Midland District  
Company: Marathon Oil Permian, LLC  
Project: Lea County, NM (NAD27)  
Site: Mammoth Fed Com 26-34-1 TB  
Well: #10H  
Wellbore: OH  
Design: Plan #1

Local Co-ordinate Reference: Well TB #10H - Slot TB#10H  
TVD Reference: KB = 26.5' @ 3307.50usft (H&P 498)  
MD Reference: KB = 26.5' @ 3307.50usft (H&P 498)  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature

## Planned Survey

| Measured Depth (usft) | Inclination (°) | Azimuth (bearing) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|-----------------------|-----------------|-------------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 16,200.00             | 90.50           | 359.50            | 12,465.08             | 3,516.50     | 711.42       | 3,516.50                | 0.00                    | 0.00                   | 0.00                  |
| 16,300.00             | 90.50           | 359.50            | 12,464.21             | 3,616.50     | 710.54       | 3,616.50                | 0.00                    | 0.00                   | 0.00                  |
| 16,400.00             | 90.50           | 359.50            | 12,463.34             | 3,716.49     | 709.67       | 3,716.49                | 0.00                    | 0.00                   | 0.00                  |
| 16,500.00             | 90.50           | 359.50            | 12,462.47             | 3,816.48     | 708.80       | 3,816.48                | 0.00                    | 0.00                   | 0.00                  |
| 16,600.00             | 90.50           | 359.50            | 12,461.59             | 3,916.47     | 707.93       | 3,916.47                | 0.00                    | 0.00                   | 0.00                  |
| 16,700.00             | 90.50           | 359.50            | 12,460.72             | 4,016.47     | 707.05       | 4,016.47                | 0.00                    | 0.00                   | 0.00                  |
| 16,800.00             | 90.50           | 359.50            | 12,459.85             | 4,116.46     | 706.18       | 4,116.46                | 0.00                    | 0.00                   | 0.00                  |
| 16,900.00             | 90.50           | 359.50            | 12,458.98             | 4,216.45     | 705.31       | 4,216.45                | 0.00                    | 0.00                   | 0.00                  |
| 17,000.00             | 90.50           | 359.50            | 12,458.10             | 4,316.44     | 704.44       | 4,316.44                | 0.00                    | 0.00                   | 0.00                  |
| 17,100.00             | 90.50           | 359.50            | 12,457.23             | 4,416.44     | 703.56       | 4,416.44                | 0.00                    | 0.00                   | 0.00                  |
| 17,200.00             | 90.50           | 359.50            | 12,456.36             | 4,516.43     | 702.69       | 4,516.43                | 0.00                    | 0.00                   | 0.00                  |
| 17,300.00             | 90.50           | 359.50            | 12,455.49             | 4,616.42     | 701.82       | 4,616.42                | 0.00                    | 0.00                   | 0.00                  |
| 17,400.00             | 90.50           | 359.50            | 12,454.61             | 4,716.41     | 700.94       | 4,716.41                | 0.00                    | 0.00                   | 0.00                  |
| 17,500.00             | 90.50           | 359.50            | 12,453.74             | 4,816.41     | 700.07       | 4,816.41                | 0.00                    | 0.00                   | 0.00                  |
| 17,600.00             | 90.50           | 359.50            | 12,452.87             | 4,916.40     | 699.20       | 4,916.40                | 0.00                    | 0.00                   | 0.00                  |
| 17,700.00             | 90.50           | 359.50            | 12,452.00             | 5,016.39     | 698.33       | 5,016.39                | 0.00                    | 0.00                   | 0.00                  |
| 17,800.00             | 90.50           | 359.50            | 12,451.12             | 5,116.38     | 697.45       | 5,116.38                | 0.00                    | 0.00                   | 0.00                  |
| 17,900.00             | 90.50           | 359.50            | 12,450.25             | 5,216.37     | 696.58       | 5,216.37                | 0.00                    | 0.00                   | 0.00                  |
| 18,000.00             | 90.50           | 359.50            | 12,449.38             | 5,316.37     | 695.71       | 5,316.37                | 0.00                    | 0.00                   | 0.00                  |
| 18,100.00             | 90.50           | 359.50            | 12,448.50             | 5,416.36     | 694.84       | 5,416.36                | 0.00                    | 0.00                   | 0.00                  |
| 18,200.00             | 90.50           | 359.50            | 12,447.63             | 5,516.35     | 693.96       | 5,516.35                | 0.00                    | 0.00                   | 0.00                  |
| 18,300.00             | 90.50           | 359.50            | 12,446.76             | 5,616.34     | 693.09       | 5,616.34                | 0.00                    | 0.00                   | 0.00                  |
| 18,400.00             | 90.50           | 359.50            | 12,445.89             | 5,716.34     | 692.22       | 5,716.34                | 0.00                    | 0.00                   | 0.00                  |
| 18,500.00             | 90.50           | 359.50            | 12,445.01             | 5,816.33     | 691.35       | 5,816.33                | 0.00                    | 0.00                   | 0.00                  |
| 18,600.00             | 90.50           | 359.50            | 12,444.14             | 5,916.32     | 690.47       | 5,916.32                | 0.00                    | 0.00                   | 0.00                  |
| 18,700.00             | 90.50           | 359.50            | 12,443.27             | 6,016.31     | 689.60       | 6,016.31                | 0.00                    | 0.00                   | 0.00                  |
| 18,800.00             | 90.50           | 359.50            | 12,442.40             | 6,116.31     | 688.73       | 6,116.31                | 0.00                    | 0.00                   | 0.00                  |
| 18,900.00             | 90.50           | 359.50            | 12,441.52             | 6,216.30     | 687.86       | 6,216.30                | 0.00                    | 0.00                   | 0.00                  |
| 19,000.00             | 90.50           | 359.50            | 12,440.65             | 6,316.29     | 686.98       | 6,316.29                | 0.00                    | 0.00                   | 0.00                  |
| 19,100.00             | 90.50           | 359.50            | 12,439.78             | 6,416.28     | 686.11       | 6,416.28                | 0.00                    | 0.00                   | 0.00                  |
| 19,200.00             | 90.50           | 359.50            | 12,438.91             | 6,516.28     | 685.24       | 6,516.28                | 0.00                    | 0.00                   | 0.00                  |
| 19,300.00             | 90.50           | 359.50            | 12,438.03             | 6,616.27     | 684.36       | 6,616.27                | 0.00                    | 0.00                   | 0.00                  |
| 19,400.00             | 90.50           | 359.50            | 12,437.16             | 6,716.26     | 683.49       | 6,716.26                | 0.00                    | 0.00                   | 0.00                  |
| 19,500.00             | 90.50           | 359.50            | 12,436.29             | 6,816.25     | 682.62       | 6,816.25                | 0.00                    | 0.00                   | 0.00                  |
| 19,600.00             | 90.50           | 359.50            | 12,435.41             | 6,916.25     | 681.75       | 6,916.25                | 0.00                    | 0.00                   | 0.00                  |
| 19,700.00             | 90.50           | 359.50            | 12,434.54             | 7,016.24     | 680.87       | 7,016.24                | 0.00                    | 0.00                   | 0.00                  |
| 19,800.00             | 90.50           | 359.50            | 12,433.67             | 7,116.23     | 680.00       | 7,116.23                | 0.00                    | 0.00                   | 0.00                  |
| 19,900.00             | 90.50           | 359.50            | 12,432.80             | 7,216.22     | 679.13       | 7,216.22                | 0.00                    | 0.00                   | 0.00                  |
| 20,000.00             | 90.50           | 359.50            | 12,431.92             | 7,316.21     | 678.26       | 7,316.21                | 0.00                    | 0.00                   | 0.00                  |
| 20,100.00             | 90.50           | 359.50            | 12,431.05             | 7,416.21     | 677.38       | 7,416.21                | 0.00                    | 0.00                   | 0.00                  |
| 20,200.00             | 90.50           | 359.50            | 12,430.18             | 7,516.20     | 676.51       | 7,516.20                | 0.00                    | 0.00                   | 0.00                  |
| 20,300.00             | 90.50           | 359.50            | 12,429.31             | 7,616.19     | 675.64       | 7,616.19                | 0.00                    | 0.00                   | 0.00                  |
| 20,400.00             | 90.50           | 359.50            | 12,428.43             | 7,716.18     | 674.77       | 7,716.18                | 0.00                    | 0.00                   | 0.00                  |
| 20,500.00             | 90.50           | 359.50            | 12,427.56             | 7,816.18     | 673.89       | 7,816.18                | 0.00                    | 0.00                   | 0.00                  |
| 20,600.00             | 90.50           | 359.50            | 12,426.69             | 7,916.17     | 673.02       | 7,916.17                | 0.00                    | 0.00                   | 0.00                  |
| 20,700.00             | 90.50           | 359.50            | 12,425.82             | 8,016.16     | 672.15       | 8,016.16                | 0.00                    | 0.00                   | 0.00                  |
| 20,800.00             | 90.50           | 359.50            | 12,424.94             | 8,116.15     | 671.28       | 8,116.15                | 0.00                    | 0.00                   | 0.00                  |
| 20,900.00             | 90.50           | 359.50            | 12,424.07             | 8,216.15     | 670.40       | 8,216.15                | 0.00                    | 0.00                   | 0.00                  |
| 21,000.00             | 90.50           | 359.50            | 12,423.20             | 8,316.14     | 669.53       | 8,316.14                | 0.00                    | 0.00                   | 0.00                  |
| 21,100.00             | 90.50           | 359.50            | 12,422.32             | 8,416.13     | 668.66       | 8,416.13                | 0.00                    | 0.00                   | 0.00                  |
| 21,200.00             | 90.50           | 359.50            | 12,421.45             | 8,516.12     | 667.79       | 8,516.12                | 0.00                    | 0.00                   | 0.00                  |
| 21,300.00             | 90.50           | 359.50            | 12,420.58             | 8,616.12     | 666.91       | 8,616.12                | 0.00                    | 0.00                   | 0.00                  |
| 21,400.00             | 90.50           | 359.50            | 12,419.71             | 8,716.11     | 666.04       | 8,716.11                | 0.00                    | 0.00                   | 0.00                  |
| 21,500.00             | 90.50           | 359.50            | 12,418.83             | 8,816.10     | 665.17       | 8,816.10                | 0.00                    | 0.00                   | 0.00                  |





# Scientific Drilling, Intl Planning Report



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Company: Marathon Oil Permian, LLC  
Project: Lea County, NM (NAD27)  
Site: Mammoth Fed Com 26-34-1 TB  
Well: #10H  
Wellbore: OH  
Design: Plan #1

Local Co-ordinate Reference: Well TB #10H - Slot TB#10H  
TVD Reference: KB = 26.5' @ 3307.50usft (H&P 498)  
MD Reference: KB = 26.5' @ 3307.50usft (H&P 498)  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature

## Planned Survey

| Measured Depth (usft)            | Inclination (°) | Azimuth (bearing) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|----------------------------------|-----------------|-------------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 21,600.00                        | 90.50           | 359.50            | 12,417.96             | 8,916.09     | 664.29       | 8,916.09                | 0.00                    | 0.00                   | 0.00                  |
| 21,700.00                        | 90.50           | 359.50            | 12,417.09             | 9,016.09     | 663.42       | 9,016.09                | 0.00                    | 0.00                   | 0.00                  |
| 21,800.00                        | 90.50           | 359.50            | 12,416.22             | 9,116.08     | 662.55       | 9,116.08                | 0.00                    | 0.00                   | 0.00                  |
| 21,900.00                        | 90.50           | 359.50            | 12,415.34             | 9,216.07     | 661.68       | 9,216.07                | 0.00                    | 0.00                   | 0.00                  |
| 22,000.00                        | 90.50           | 359.50            | 12,414.47             | 9,316.06     | 660.80       | 9,316.06                | 0.00                    | 0.00                   | 0.00                  |
| 22,100.00                        | 90.50           | 359.50            | 12,413.60             | 9,416.05     | 659.93       | 9,416.05                | 0.00                    | 0.00                   | 0.00                  |
| 22,200.00                        | 90.50           | 359.50            | 12,412.73             | 9,516.05     | 659.06       | 9,516.05                | 0.00                    | 0.00                   | 0.00                  |
| 22,300.00                        | 90.50           | 359.50            | 12,411.85             | 9,616.04     | 658.19       | 9,616.04                | 0.00                    | 0.00                   | 0.00                  |
| 22,400.00                        | 90.50           | 359.50            | 12,410.98             | 9,716.03     | 657.31       | 9,716.03                | 0.00                    | 0.00                   | 0.00                  |
| 22,500.00                        | 90.50           | 359.50            | 12,410.11             | 9,816.02     | 656.44       | 9,816.02                | 0.00                    | 0.00                   | 0.00                  |
| 22,600.00                        | 90.50           | 359.50            | 12,409.23             | 9,916.02     | 655.57       | 9,916.02                | 0.00                    | 0.00                   | 0.00                  |
| 22,645.87                        | 90.50           | 359.50            | 12,408.83             | 9,961.89     | 655.17       | 9,961.89                | 0.00                    | 0.00                   | 0.00                  |
| TD at 22645.87 - BHL[MFC\TB#10H] |                 |                   |                       |              |              |                         |                         |                        |                       |
| 22,690.87                        | 90.50           | 359.50            | 12,408.61             | 10,006.88    | 654.49       | 10,006.88               | 0.00                    | 0.00                   | 0.00                  |
| TD + 45' VS                      |                 |                   |                       |              |              |                         |                         |                        |                       |

## Design Targets

### Target Name

| - hit/miss target  | Dip Angle (°) | Dip Dir. (bearing) | TVD (usft) | +N/-S (usft) | +E/-W (usft) | Northing (usft) | Easting (usft) | Latitude        | Longitude         |
|--|---------------|--------------------|------------|--------------|--------------|-----------------|----------------|-----------------|-------------------|
| - Shape  |               |                    |            |              |              |                 |                |                 |                   |
| BHL[MFC\TB#10H]  | -90.50        | 359.50             | 12,409.00  | 9,961.89     | 654.88       | 398,974.13      | 781,524.12     | 32° 5' 37.081 N | 103° 25' 27.362 W |
| - plan misses target center by 0.33usft at 22645.87usft MD (12408.83 TVD, 9961.89 N, 655.17 E)   |               |                    |            |              |              |                 |                |                 |                   |
| - Rectangle (sides W60.00 H20.00 D9,700.00)  |               |                    |            |              |              |                 |                |                 |                   |
| FTP[MFC\TB#10H]  | 0.00          | 0.00               | 12,476.00  | -294.10      | 744.21       | 388,718.15      | 781,613.45     | 32° 3' 55.587 N | 103° 25' 27.328 W |
| - plan misses target center by 212.08usft at 12476.53usft MD (12351.19 TVD, -164.54 N, 631.89 E) |               |                    |            |              |              |                 |                |                 |                   |
| - Point  |               |                    |            |              |              |                 |                |                 |                   |

## Formations

| Measured Depth (usft) | Vertical Depth (usft) | Name                 | Lithology | Dip (°) | Dip Direction (bearing) |
|-----------------------|-----------------------|----------------------|-----------|---------|-------------------------|
| 1,116.00              | 1,116.00              | Rustler              |           |         |                         |
| 1,555.00              | 1,555.00              | Salado               |           |         |                         |
| 3,613.55              | 3,593.00              | Castile              |           |         |                         |
| 5,204.31              | 5,149.00              | Base of Salt         |           |         |                         |
| 5,476.26              | 5,415.00              | Lamar                |           |         |                         |
| 5,504.88              | 5,443.00              | Bell Canyon          |           |         |                         |
| 8,119.92              | 8,051.00              | Brushy Canyon        |           |         |                         |
| 9,410.92              | 9,342.00              | Bone Spring          |           |         |                         |
| 10,531.92             | 10,463.00             | 1st Bone Spring Sand |           |         |                         |
| 11,080.92             | 11,012.00             | 2nd Bone Spring Sand |           |         |                         |
| 12,168.81             | 12,097.00             | 3rd Bone Spring Sand |           |         |                         |



Scientific Drilling, Intl  
Planning Report



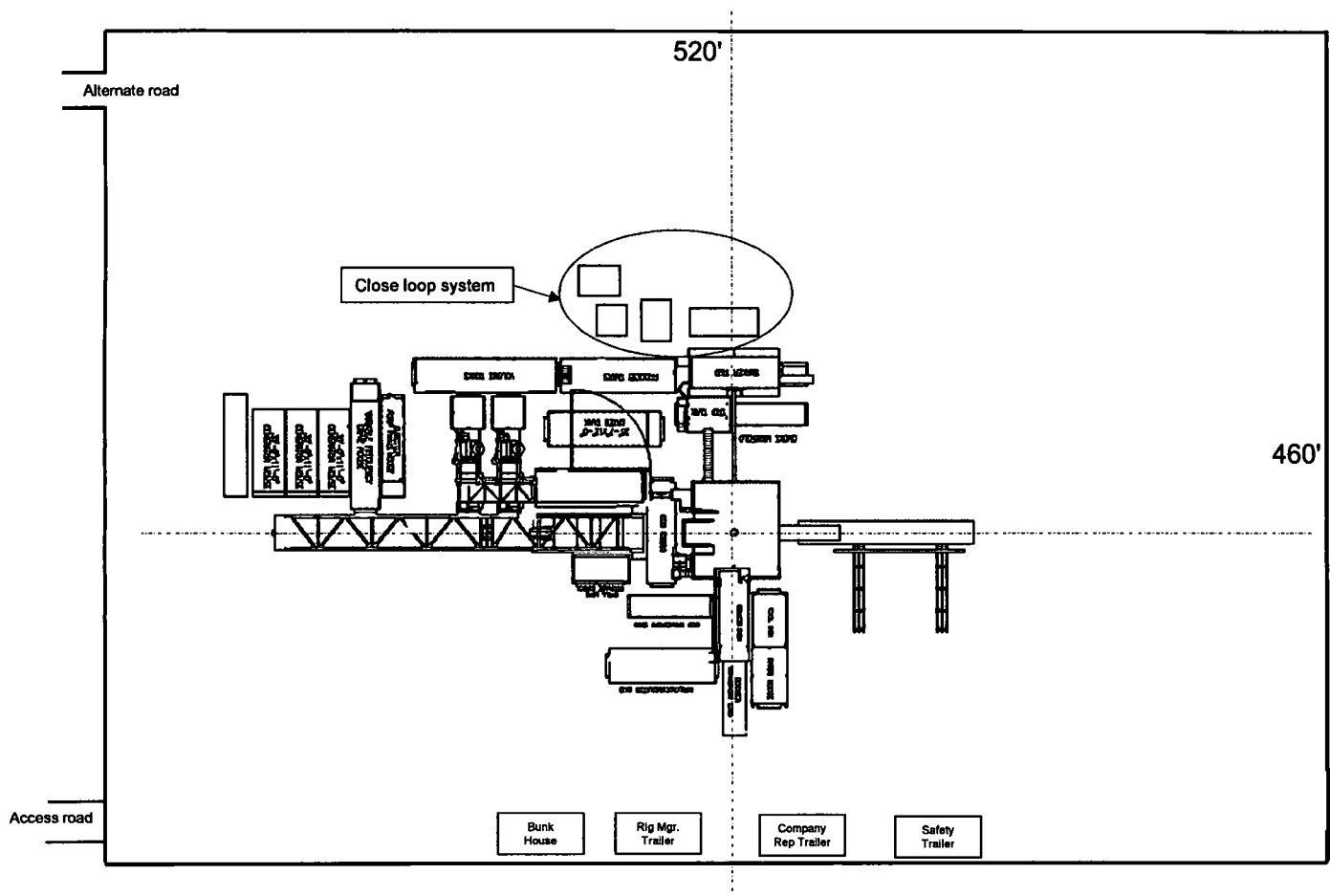
Database: Midland District  
Company: Marathon Oil Permian, LLC  
Project: Lea County, NM (NAD27)  
Site: Mammoth Fed Com 26-34-1 TB  
Well: #10H  
Wellbore: OH  
Design: Plan #1

Local Co-ordinate Reference: Well TB #10H - Slot TB#10H  
TVD Reference: KB = 26.5' @ 3307.50usft (H&P 498)  
MD Reference: KB = 26.5' @ 3307.50usft (H&P 498)  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature

Plan Annotations

| Measured<br>Depth<br>(usft) | Vertical<br>Depth<br>(usft) | Local Coordinates |                 | Comment                       |
|-----------------------------|-----------------------------|-------------------|-----------------|-------------------------------|
|                             |                             | +N/-S<br>(usft)   | +E/-W<br>(usft) |                               |
| 2,000.00                    | 2,000.00                    | 0.00              | 0.00            | KOP - NUDGE                   |
| 2,100.00                    | 2,099.99                    | -0.87             | 0.00            | HOLD                          |
| 2,300.00                    | 2,299.96                    | -4.36             | 0.00            | BUILD 2.0° / 100              |
| 2,876.60                    | 2,872.16                    | -39.48            | 52.09           | EOB - HOLD                    |
| 5,626.60                    | 5,562.06                    | -325.36           | 547.24          | DROP 2.0° / 100               |
| 6,226.60                    | 6,157.68                    | -356.66           | 601.46          | EOD - HOLD                    |
| 11,989.92                   | 11,921.00                   | -356.66           | 601.46          | Curve KOP - Build 10.0° / 100 |
| 12,894.92                   | 12,493.94                   | 214.18            | 691.87          | EOC - HOLD                    |
| 12,949.92                   | 12,493.46                   | 268.50            | 700.47          | TURN                          |
| 13,424.90                   | 12,489.30                   | 741.61            | 735.63          | HOLD                          |
| 22,645.87                   | 12,408.83                   | 9,961.89          | 655.17          | TD at 22645.87                |
| 22,690.87                   | 12,408.61                   | 10,006.88         | 654.49          | TD + 45' VS                   |

**MARATHON OIL - FLEX III PAD** (Closed Loop System)



### **Batch Drilling Plan**

- **Marathon Oil Permian LLC. respectfully requests the option to “batch” drill sections of a well with intentions of returning to the well for later completion.**
- **When it is determined that the use of a “batch” drilling process to increase overall efficiency and reduce rig time on location, the following steps will be utilized to ensure compliant well control before releasing drilling rig during the batch process.**
- **Succeeding a successful cement job, fluid levels will be monitored in both the annulus and casing string to be verified static.**
- **A mandrel hanger packoff will be ran and installed in the multi-bowl wellhead isolating and creating a barrier on the annulus. This packoff will be tested to 5,000 PSI validating the seals.**
- **At this point the well is secure and the drilling adapter will be removed from the wellhead.**
- **A 13-5/8” 5M temporary abandonment cap will be installed on the wellhead by stud and nut flange. The seals of the TA cap will then be pressure tested to 5,000 PSI.**
- **The drilling rig will skid to the next well on the pad to continue the batch drilling process.**
- **When returning to the well with the TA cap, the TA cap will be removed and the BOP will be nipped up on the wellhead.**
- **A BOP test will then be conducted according to Onshore Order #2 and drilling operations will resume on the subject well.**

### **Request for Surface Rig**

- **Marathon Oil Permian LLC. Requests the option to contract a surface rig to drill, set surface casing and cement on the subject well. If the timing between rigs is such that Marathon Oil Permian LLC. would not be able to preset the surface section, the primary drilling rig will drill the well in its entirety per the APD.**

### **Batch Drilling Plan**

- Marathon Oil Permian LLC. respectfully requests the option to "batch" drill sections of a well with intentions of returning to the well for later completion.
- When it is determined that the use of a "batch" drilling process to increase overall efficiency and reduce rig time on location, the following steps will be utilized to ensure compliant well control before releasing drilling rig during the batch process.
- Succeeding a successful cement job, fluid levels will be monitored in both the annulus and casing string to be verified static.
- A mandrel hanger packoff will be ran and installed in the multi-bowl wellhead isolating and creating a barrier on the annulus. This packoff will be tested to 5,000 PSI validating the seals.
- At this point the well is secure and the drilling adapter will be removed from the wellhead.
- A 13-5/8" 5M temporary abandonment cap will be installed on the wellhead by stud and nut flange. The seals of the TA cap will then be pressure tested to 5,000 PSI.
- The drilling rig will skid to the next well on the pad to continue the batch drilling process.
- When returning to the well with the TA cap, the TA cap will be removed and the BOP will be nipped up on the wellhead.
- A BOP test will then be conducted according to Onshore Order #2 and drilling operations will resume on the subject well.

### **Request for Surface Rig**

- Marathon Oil Permian LLC. Requests the option to contract a surface rig to drill, set surface casing and cement on the subject well. If the timing between rigs is such that Marathon Oil Permian LLC. would not be able to preset the surface section, the primary drilling rig will drill the well in its entirety per the APD.



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

## SUPO Data Report

06/12/2019

APD ID: 10400032518

Submission Date: 07/31/2018

Operator Name: MARATHON OIL PERMIAN LLC

Well Name: MAMMOTH FED COM 26 34 1 TB

Well Number: 10H

Well Type: OIL WELL

Well Work Type: Drill



[Show Final Text](#)

### Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map:

SUPO\_1\_\_MAMMOTH\_FED\_COM\_26\_34\_1\_Pad\_\_Vacinity\_and\_Existing\_Roads\_Plat\_20180730101332.pdf

Existing Road Purpose: ACCESS,FLUID TRANSPORT

Row(s) Exist? NO

ROW ID(s)

ID:

Do the existing roads need to be improved? NO

Existing Road Improvement Description:

Existing Road Improvement Attachment:

### Section 2 - New or Reconstructed Access Roads

Will new roads be needed? YES

New Road Map:

SUPO\_2\_\_MAMMOTH\_FED\_COM\_26\_34\_1\_Pad\_\_New\_and\_Reconstructed\_Access\_Road\_Plat\_20190123112534.pdf

SUPO\_2\_\_MARATHON\_FEDERAL\_26\_34\_1\_\_Sec\_12\_\_NM\_LE\_0001.00160\_REV1\_CERT\_IMPROV\_EX\_LEASE\_RD\_20190123112539.pdf

SUPO\_2\_\_MAMMOTH\_FEDERAL\_26\_34\_1\_\_Sec\_1\_\_NM\_LE\_0001.00260\_REV1\_CERT\_BLM\_IMP\_EX\_LEASE\_RD\_20190123112546.pdf

SUPO\_2\_\_MAMMOTH\_FEDERAL\_26\_34\_1\_\_1\_\_2\_\_7\_\_10\_\_11\_\_NM\_LE\_0001.00060\_REV0\_CERT\_BLM\_PROP\_LEASE\_RD\_20190123112552.pdf

New road type: LOCAL

Length: 1010.3

Feet

Width (ft.): 30

Max slope (%): 3

Max grade (%): 3

Army Corp of Engineers (ACOE) permit required? NO

ACOE Permit Number(s):

New road travel width: 20

New road access erosion control: The access road will have a small low water crossing at the point of leaving the existing lease road to allow for continued drainage along existing lease road. The new road will be crowned to allow proper water

**Operator Name:** MARATHON OIL PERMIAN LLC

**Well Name:** MAMMOTH FED COM 26 34 1 TB

**Well Number:** 10H

drainage and ditching will be constructed on both sides of the access road along with proper compaction to prevent water and wind erosion. All ditching areas will be seeded with BLM approved seed mix to prevent water erosion.

**New road access plan or profile prepared?** NO

**New road access plan attachment:**

**Access road engineering design?** NO

**Access road engineering design attachment:**

**Access surfacing type:** OTHER

**Access topsoil source:** ONSITE

**Access surfacing type description:** 6" of compacted caliche will be used as surface material

**Access onsite topsoil source depth:** 6

**Offsite topsoil source description:**

**Onsite topsoil removal process:** The topsoil will be stripped during construction activities, spread out on edge of road, and will be seeded during the interim reclamation of the well pad.

**Access other construction information:**

**Access miscellaneous information:**

**Number of access turnouts:**

**Access turnout map:**

### Drainage Control

**New road drainage crossing:** OTHER

**Drainage Control comments:** Crowning and ditching (both sides) shall be constructed on the access road driving surface. The road crown shall have a grade of approximately 2%. The road shall conform to cross section and plans for typical road construction found in the BLM Gold Book.

**Road Drainage Control Structures (DCS) description:** No DCS's will be needed.

**Road Drainage Control Structures (DCS) attachment:**

### Access Additional Attachments

**Additional Attachment(s):**

### Section 3 - Location of Existing Wells

**Existing Wells Map?** YES

**Attach Well map:**

SUPO\_3\_\_MAMMOTH\_FED\_COM\_26\_34\_1\_Pad\_\_Existing\_Wells\_Map\_20180727082904.pdf

**Existing Wells description:**

**Operator Name:** MARATHON OIL PERMIAN LLC

**Well Name:** MAMMOTH FED COM 26 34 1 TB

**Well Number:** 10H

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

**Submit or defer a Proposed Production Facilities plan?** SUBMIT

**Production Facilities description:** Proposed Central Tank Battery (CTB) is proposed on the south (405'5" by 60') and east (159' by 60') side of the proposed well pad to allow for maximum interim reclamation of the well pad. - A CA will be required for this proposed well. - No permanent open top tanks will be used. - Open vent exhaust stacks will be modified to prevent birds or bats from entering, discourage perching, roosting, and nesting. - All chemical and fuel secondary containments will be covered for birds, wildlife, and livestock protection. The fluids will be disposed of as needed to prevent possible overflow. - The proposed CTB will have a secondary containment 1.5 times the holding capacity of largest storage tank plus freeboard to account for precipitation. - All above ground structures not subject to safety requirements will be painted a flat non-reflective shale green for blending with the surrounding environment. - At this time, the proposed CTB will have oil and water truck hauled from the facility. **Pipelines/Flowlines:** All flowlines transporting production from wells to the facility will remain on the pad; therefore, no further disturbance or ROW will be required. **Powerlines:** No power-lines will be needed. The power to the equipment will be provided via a natural gas generator.

**Production Facilities map:**

SUPO\_4\_\_Mammoth\_Fed\_1H\_\_2H\_\_7H\_\_10H\_\_11H\_Site\_Plan\_20180727082919.pdf

#### Section 5 - Location and Types of Water Supply

##### Water Source Table

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

**Describe type:**

**Source latitude:** 32.1889

**Source datum:** NAD83

**Water source permit type:** PRIVATE CONTRACT

**Source land ownership:** PRIVATE

**Water source transport method:** PIPELINE

**Source transportation land ownership:** PRIVATE

**Water source volume (barrels):** 147500

**Source volume (gal):** 6195000

**Water source type:** GW WELL

**Source longitude:** -103.40435

**Source volume (acre-feet):** 19.011732

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

**Describe type:**

**Source latitude:** 32.081768

**Source datum:** NAD83

**Water source permit type:** PRIVATE CONTRACT

**Source land ownership:** PRIVATE

**Water source type:** GW WELL

**Source longitude:** -103.35456



**Operator Name:** MARATHON OIL PERMIAN LLC

**Well Name:** MAMMOTH FED COM 26 34 1 TB

**Well Number:** 10H

**Water source transport method:** PIPELINE

**Source transportation land ownership:** PRIVATE

**Water source volume (barrels):** 147500

**Source volume (acre-feet):** 19.011732

**Source volume (gal):** 6195000

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

**Water source type:** GW WELL

**Describe type:**

**Source longitude:** -103.405334

**Source latitude:** 32.030895

**Source datum:** NAD83

**Water source permit type:** PRIVATE CONTRACT

**Source land ownership:** PRIVATE

**Water source transport method:** PIPELINE

**Source transportation land ownership:** PRIVATE

**Water source volume (barrels):** 147500

**Source volume (acre-feet):** 19.011732

**Source volume (gal):** 6195000

**Water source and transportation map:**

SUPO\_5\_\_MAMMOTH\_FED\_COM\_26\_34\_1\_Pad\_\_Water\_Source\_Map\_20180727084309.pdf

**Water source comments:** One of the above choices will be utilized for the water supply for the proposed wells. Private ground water wells will supply water to existing fresh water ponds located in different locations that will be utilized for drilling operations pending demand and availability. The fresh water line will run parallel to the existing disturbance and will stay within 10' of the access road. Location and Types of Water Supply • All Fresh water will be obtained from a private water source. • 1st proposed (pond in Section 34,T25S,R35E) will be utilized for fresh water. A temporary 10" expanding pipe transfer line will run South from pond along lease rd. then turn West along proposed access road approx. 3.2 Miles. LAT 32.081767 LONG -103.354562 • 2nd proposed ( pond in Section 19,T26S-R35E will be utilized for fresh water. A temporary 10" expanding pipe transfer line will run East from pond along access rd. Then turn North along proposed access road approx. 3.4 Miles. LAT 32.030896 LONG -103.405332 • 3rd proposed pond(Black Mountain in Section 30,T24S-R35E will be utilized for fresh water. A temporary 10" expanding pipe transfer line will run North from pond along access rd. then East along proposed access road approx. 4.28 Miles. LAT 32.188901 LONG -103.404347 Fresh water line will run parallel to existing disturbance and will stay within 10' of access road. Proposed water suppliers: Madera Brad Beckem Rockhouse  
**New water well? NO**

**New Water Well Info**

**Well latitude:**

**Well Longitude:**

**Well datum:**

**Well target aquifer:**

**Est. depth to top of aquifer(ft):**

**Est thickness of aquifer:**

**Aquifer comments:**

**Aquifer documentation:**

**Well depth (ft):**

**Well casing type:**

**Operator Name:** MARATHON OIL PERMIAN LLC

**Well Name:** MAMMOTH FED COM 26 34 1 TB

**Well Number:** 10H

**Well casing outside diameter (in.):**

**Well casing inside diameter (in.):**

**New water well casing?**

**Used casing source:**

**Drilling method:**

**Drill material:**

**Grout material:**

**Grout depth:**

**Casing length (ft.):**

**Casing top depth (ft.):**

**Well Production type:**

**Completion Method:**

**Water well additional information:**

**State appropriation permit:**

**Additional information attachment:**

### Section 6 - Construction Materials

**Construction Materials description:** Caliche will be used to construct well pad and roads. Material will be purchased from the nearest federal, state, or private permitted pit. • Source 1 - Caliche will be used to construct well pad and roads. Material will be purchased from private land owner Brad Beckham ( 575-390-2076 ) caliche pit located in SEC19 , T26S , R35E , Lea County , NM.GPS Lat. 32. 0224475 N , Long. -103.40438 W • Source 2 - Caliche will be used to construct well pad and roads. Material will be purchased from BLM , caliche pit located in Sec 7 , T26S , R34E, Lea County, NM. Gps Lat. 32.059006 N Long -103.504418 W The proposed source of construction material will be located and purchased by construction contractor. Notification shall be given to BLM at (575) 234-5909 at least 3 working days prior to commencing construction of well pad or related infrastructure.

**Construction Materials source location attachment:**

SUPO\_6\_\_MAMMOTH\_FED\_COM\_26\_34\_1\_Pad\_\_Caliche\_Source\_Map\_20180727084251.pdf

### Section 7 - Methods for Handling Waste

**Waste type:** DRILLING

**Waste content description:** Drilling fluids and produced oil and water from the well during drilling operations.

**Amount of waste:** 1000 barrels

**Waste disposal frequency :** Daily

**Safe containment description:** Lined Steel Tanks

**Safe containmant attachment:**

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

**Disposal type description:**

**Disposal location description:** Waste will be stored safely and disposed of properly in an NMOCD approved disposal facility.

**Waste type:** GARBAGE

**Waste content description:** Garbage and trash (solid waste).

**Amount of waste:** 1200 pounds

**Waste disposal frequency :** Weekly

**Safe containment description:** All garbage will be stored in secure containers with lids.

**Operator Name:** MARATHON OIL PERMIAN LLC

**Well Name:** MAMMOTH FED COM 26 34 1 TB

**Well Number:** 10H

**Safe containmant attachment:**

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

**Disposal type description:**

**Disposal location description:** All garbage will be collected and disposed of properly at a State approved disposal facility.

**Waste type:** SEWAGE

**Waste content description:** Human waste and grey water.

**Amount of waste:** 600                      barrels

**Waste disposal frequency :** Weekly

**Safe containment description:** Portable toilets and sewage tanks.

**Safe containmant attachment:**

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

**Disposal type description:**

**Disposal location description:** All sewage waste will be managed by a third party and disposed of properly at a State approved disposal facility.

**Waste type:** COMPLETIONS/STIMULATION

**Waste content description:** Oil and water from drilling operations.

**Amount of waste:** 1000                      barrels

**Waste disposal frequency :** Daily

**Safe containment description:** Steel Tanks

**Safe containmant attachment:**

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

**Disposal type description:**

**Disposal location description:** Waste will be stored safely and disposed of properly in an NMOCD approved disposal facility.

**Reserve Pit**

**Reserve Pit being used?** NO

**Temporary disposal of produced water into reserve pit?**

**Reserve pit length (ft.)**                      **Reserve pit width (ft.)**

**Reserve pit depth (ft.)**    **Reserve pit volume (cu. yd.)**

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

**Reserve pit liner**

**Reserve pit liner specifications and installation description**

**Operator Name:** MARATHON OIL PERMIAN LLC

**Well Name:** MAMMOTH FED COM 26 34 1 TB

**Well Number:** 10H

### Cuttings Area

**Cuttings Area being used?** NO

**Are you storing cuttings on location?** YES

**Description of cuttings location** The well will be drilled utilizing a closed loop system. Drill cutting will be properly disposed of into steel tanks and taken to a State approved disposal facility.

**Cuttings area length (ft.)**

**Cuttings area width (ft.)**

**Cuttings area depth (ft.)**

**Cuttings area volume (cu. yd.)**

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

**WCuttings area liner**

**Cuttings area liner specifications and installation description**

### Section 8 - Ancillary Facilities

**Are you requesting any Ancillary Facilities?:** NO

**Ancillary Facilities attachment:**

**Comments:**

### Section 9 - Well Site Layout

**Well Site Layout Diagram:**

SUPO\_9\_\_MAMMOTH\_FED\_COM\_26\_34\_1\_Pad\_\_Well\_Pad\_Plat\_\_acres\_\_20180727084521.pdf

SUPO\_9\_\_MAMMOTH\_FED\_COM\_26\_34\_1\_Pad\_\_Well\_Location\_Plat\_\_feet\_\_20180727084512.pdf

**Comments:** Attached: Well Pad Plat and Well Location Plat. Exterior well pad dimensions are 520' by 460'. Slope is minimal not requiring a cut and fill plat. Note this pad will have 5 total wells, see Well Pad Surface Plat. Interior well pad dimensions from first point of entry (well head) are: From west-270', north-180', east-250', south-280'. Topsoil will be placed on the west (30' x 290'), north (30' x 520') and east (30' x 430') sides of the pad. (0.85 acres) Total short-term disturbance needed for this 5 well pad is 5.49 acres, long term disturbance is 3.84 acres. IR will be completed on the northern portion of the west side, the whole north side, and northern portion of the east side totaling 1.65 acres.

**Operator Name:** MARATHON OIL PERMIAN LLC

**Well Name:** MAMMOTH FED COM 26 34 1 TB

**Well Number:** 10H

## Section 10 - Plans for Surface Reclamation

**Type of disturbance:** New Surface Disturbance

**Multiple Well Pad Name:** MAMMOTH FED COM 26 34 1

**Multiple Well Pad Number:** 298-1

**Recontouring attachment:**

SUPO\_10\_\_MAMMOTH\_FED\_COM\_26\_34\_1\_Pad\_\_IR\_Plat\_20190123112607.pdf

**Drainage/Erosion control construction:** During construction, BMP will be used to control erosion, runoff and siltation of surrounding area.

**Drainage/Erosion control reclamation:** BMP's will be used to control erosion, runoff and siltation of surrounding area. All areas reclaimed will be ripped across the slope to prevent water erosion. The reclaimed areas will be will have a berm constructed against pad edge to prevent water erosion.

|  |   |   |
|--|---|---|
| <b>Well pad proposed disturbance (acres):</b> 5.49 | <b>Well pad interim reclamation (acres):</b> 1.65 | <b>Well pad long term disturbance (acres):</b> 3.84 |
| <b>Road proposed disturbance (acres):</b> 0.76     | <b>Road interim reclamation (acres):</b> 0.2319   | <b>Road long term disturbance (acres):</b> 0.5281   |
| <b>Powerline proposed disturbance (acres):</b> 0   | <b>Powerline interim reclamation (acres):</b> 0   | <b>Powerline long term disturbance (acres):</b> 0   |
| <b>Pipeline proposed disturbance (acres):</b> 0    | <b>Pipeline interim reclamation (acres):</b> 0    | <b>Pipeline long term disturbance (acres):</b> 0    |
| <b>Other proposed disturbance (acres):</b> 0.85    | <b>Other interim reclamation (acres):</b> 0.85    | <b>Other long term disturbance (acres):</b> 0       |
| <b>Total proposed disturbance:</b> 7.1             | <b>Total interim reclamation:</b> 2.7319          | <b>Total long term disturbance:</b> 4.3681          |

### Disturbance Comments:

**Reconstruction method:** IR - Well pad and ditch banks FR - all disturbances after plugging of all wells on pad

**Reclamation Objectives** • The objective of interim reclamation is to restore vegetative cover and a portion of the landform sufficient to maintain healthy, biologically active topsoil; control erosion; and minimize habitat and forage loss, visual impact, and weed infestation, during the life of the well or facilities. • The BLM will be notified at least 3 days prior to commencement of any reclamation procedures. • If circumstances allow, interim reclamation and/or final reclamation actions will be completed no later than 6 months from when the final well on the location has been completed or plugged. We will gain written permission from the BLM if more time is needed. • Reclamation will be performed by using the following procedures: For Interim Reclamation: • Within 6 months of first production, the well location and surrounding areas will be cleared of, and maintained free of, all materials, trash, and equipment not required for production. A plan will be submitted showing where interim reclamation will be completed in order to allow for safe operations, protection of the environment outside of drilled well, and following best management practices found in the BLM "Gold Book". • Current plans for interim reclamation include reducing the pad size to approximately 8.83 acres from the proposed size of 14.42 acres. • In areas planned for interim reclamation, all the surfacing material will be removed and returned to the original mineral pit or recycled to repair or build roads and well pads. • The areas planned for interim reclamation will then be recontoured to the original contour if feasible, or if not feasible, to an interim contour that blends with the surrounding topography as much as possible. Where applicable, the fill material of the well pad will be backfilled into the cut to bring the area back to the original contour. The interim cut and fill slopes prior to re-seeding will not be steeper than a 3:1 ratio, unless the adjacent native topography is steeper. Note: Constructed slopes may be much steeper during drilling, but will be recontoured to the above ratios during interim reclamation. • Topsoil will be evenly respread and aggressively revegetated over the entire disturbed area not needed for all-weather operations including cuts & fills. To seed the area, the proper BLM seed mixture free of noxious weeds, will be used. • Proper erosion control methods will be used on the area to control erosion, runoff and siltation of the surrounding area. • The interim reclamation will be monitored periodically to ensure that vegetation has reestablished. For Final Reclamation: • Prior to final reclamation procedures, the well pad, road, and surrounding area will be cleared of material, trash, and equipment. • All surfacing material will be removed and returned to the original mineral pit or recycled to repair or build roads and well pads. • All disturbed areas, including roads, pipelines, pads, production facilities, and interim reclaimed areas will be recontoured to the contour existing prior to initial construction or a contour that blends in distinguishably with the surrounding landscape. Topsoil that

**Operator Name:** MARATHON OIL PERMIAN LLC

**Well Name:** MAMMOTH FED COM 26 34 1 TB

**Well Number:** 10H

was spread over the interim reclamation areas will be stockpiled prior to recontouring. The topsoil will be redistributed evenly over the entire disturbed site to ensure successful revegetation. • After all the disturbed areas have been properly prepared; the areas will be seeded with the proper BLM LPC seed mixture free of noxious weeds. • Proper erosion control methods will be used on the entire area to control erosion, runoff and siltation of the surrounding area.

**Topsoil redistribution:** Topsoil will be stockpiled until interim reclamation. Topsoil and subsoil (fill) will be piled separately. The topsoil will be evenly distributed across all reclaimed areas, ripped across the slopes, and seed accordingly.

**Soil treatment:** The topsoil will be seeded after being spread across IR area. During final reclamation, Marathon will grab and evenly redistribute topsoil across the entire disturbed area (disc plowing if needed) area and seed accordingly.

**Existing Vegetation at the well pad:** Mesquite, shinnery oak, sand dropseed, and sage.

**Existing Vegetation at the well pad attachment:**

**Existing Vegetation Community at the road:** Mesquite, shinnery oak, sand dropseed, and sage.

**Existing Vegetation Community at the road attachment:**

**Existing Vegetation Community at the pipeline:** N/A

**Existing Vegetation Community at the pipeline attachment:**

**Existing Vegetation Community at other disturbances:** N/A

**Existing Vegetation Community at other disturbances attachment:**

**Non native seed used?** NO

**Non native seed description:**

**Seedling transplant description:**

**Will seedlings be transplanted for this project?** NO

**Seedling transplant description attachment:**

**Will seed be harvested for use in site reclamation?** NO

**Seed harvest description:**

**Seed harvest description attachment:**

## Seed Management

### Seed Table

**Seed type:** OTHER

**Seed source:** COMMERCIAL

**Seed name:** BLM Sandy LPC Mix

**Source name:**

**Source address:**

**Source phone:**

**Seed cultivar:** Broadcast

**Operator Name:** MARATHON OIL PERMIAN LLC

**Well Name:** MAMMOTH FED COM 26 34 1 TB

**Well Number:** 10H

**Seed use location:** WELL PAD

**PLS pounds per acre:** 38

**Proposed seeding season:** AUTUMN

| Seed Summary |             |
|--------------|-------------|
| Seed Type    | Pounds/Acre |
| OTHER        | 38          |

**Total pounds/Acre:** 38

**Seed reclamation attachment:**

**Operator Contact/Responsible Official Contact Info**

**First Name:**

**Last Name:**

**Phone:**

**Email:**

**Seedbed prep:** Rip native topsoil stockpiled during construction activities across the slope.

**Seed BMP:**

**Seed method:**

**Existing invasive species?** NO

**Existing invasive species treatment description:**

**Existing invasive species treatment attachment:**

**Weed treatment plan description:** Marathon Oil will control weeds per Federal, County and State regulations by contracting a certified third party sprayer.

**Weed treatment plan attachment:**

**Monitoring plan description:** Marathon Oil will monitor all disturbed areas and lease roads leading to well pad monthly for weeds through routine inspections.

**Monitoring plan attachment:**

**Success standards:** Maintain all disturbed areas as per Gold Book Standards.

**Pit closure description:** N/A

**Pit closure attachment:**

**Section 11 - Surface Ownership**

**Disturbance type:** WELL PAD

**Describe:**

**Surface Owner:** BUREAU OF LAND MANAGEMENT

**Other surface owner description:**

**BIA Local Office:**

**BOR Local Office:**

**COE Local Office:**

**Operator Name:** MARATHON OIL PERMIAN LLC

**Well Name:** MAMMOTH FED COM 26 34 1 TB

**Well Number:** 10H

**DOD Local Office:**

**NPS Local Office:**

**State Local Office:**

**Military Local Office:**

**USFWS Local Office:**

**Other Local Office:**

**USFS Region:**

**USFS Forest/Grassland:**

**USFS Ranger District:**

**Fee Owner:** Mark McCloy

**Fee Owner Address:** P.O. Box 1076 Jal, NM 88252

**Phone:** (732)940-4459

**Email:**

**Surface use plan certification:** YES

**Surface use plan certification document:**

**Surface access agreement or bond:** Agreement

**Surface Access Agreement Need description:** See attached statement

**Surface Access Bond BLM or Forest Service:**

**BLM Surface Access Bond number:**

**USFS Surface access bond number:**

**Disturbance type:** EXISTING ACCESS ROAD

**Describe:**

**Surface Owner:** BUREAU OF LAND MANAGEMENT

**Other surface owner description:**

**BIA Local Office:**

**BOR Local Office:**

**COE Local Office:**

**DOD Local Office:**

**NPS Local Office:**

**State Local Office:**

**Military Local Office:**

**USFWS Local Office:**



**Operator Name:** MARATHON OIL PERMIAN LLC

**Well Name:** MAMMOTH FED COM 26 34 1 TB

**Well Number:** 10H

**Other Local Office:**

**USFS Region:**

**USFS Forest/Grassland:**

**USFS Ranger District:**

**Disturbance type:** NEW ACCESS ROAD

**Describe:**

**Surface Owner:** BUREAU OF LAND MANAGEMENT

**Other surface owner description:**

**BIA Local Office:**

**BOR Local Office:**

**COE Local Office:**

**DOD Local Office:**

**NPS Local Office:**

**State Local Office:**

**Military Local Office:**

**USFWS Local Office:**

**Other Local Office:**

**USFS Region:**

**USFS Forest/Grassland:**

**USFS Ranger District:**

## Section 12 - Other Information

**Right of Way needed?** NO

**Use APD as ROW?**

**ROW Type(s):**

### ROW Applications

**SUPO Additional Information:** Isolated population area and shinnery oak area, low karst potential, East Rattlesnake Flat grazing allotment, falls inside the Permian PA.

**Operator Name:** MARATHON OIL PERMIAN LLC

**Well Name:** MAMMOTH FED COM 26 34 1 TB

**Well Number:** 10H

**Use a previously conducted onsite?** YES

**Previous Onsite information:** Performed 04/26/2018. Marathon Oil Attendees: Nancy Pohl BLM Attendee: Colleen Cepero-Rios

**Other SUPO Attachment**



U.S. Department of the Interior  
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## PWD Data Report

06/12/2019

### Section 1 - General

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

### Section 2 - Lined Pits

Would you like to utilize Lined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit specifications:

Pit liner description:

Pit liner manufacturers information:

Precipitated solids disposal:

Describe precipitated solids disposal:

Precipitated solids disposal permit:

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule attachment:

Lined pit reclamation description:

Lined pit reclamation attachment:

Leak detection system description:

Leak detection system attachment:

Lined pit Monitor description:

Lined pit Monitor attachment:

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

Is the reclamation bond a rider under the BLM bond?

Lined pit bond number:

Lined pit bond amount:

Additional bond information attachment:

### **Section 3 - Unlined Pits**

**Would you like to utilize Unlined Pit PWD options? NO**

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:**

**PWD disturbance (acres):**

**Unlined pit PWD on or off channel:**

**Unlined pit PWD discharge volume (bbl/day):**

**Unlined pit specifications:**

**Precipitated solids disposal:**

**Describe precipitated solids disposal:**

**Precipitated solids disposal permit:**

**Unlined pit precipitated solids disposal schedule:**

**Unlined pit precipitated solids disposal schedule attachment:**

**Unlined pit reclamation description:**

**Unlined pit reclamation attachment:**

**Unlined pit Monitor description:**

**Unlined pit Monitor attachment:**

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

**Beneficial use user confirmation:**

**Estimated depth of the shallowest aquifer (feet):**

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

**TDS lab results:**

**Geologic and hydrologic evidence:**

**State authorization:**

**Unlined Produced Water Pit Estimated percolation:**

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

**Is the reclamation bond a rider under the BLM bond?**

**Unlined pit bond number:**

**Unlined pit bond amount:**

**Additional bond information attachment:**

### **Section 4 - Injection**

**Would you like to utilize Injection PWD options? NO**

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:**

**PWD disturbance (acres):**

**Injection PWD discharge volume (bbl/day):**

**Injection well mineral owner:**

**Injection well type:**

**Injection well number:**

**Injection well name:**

**Assigned injection well API number?**

**Injection well API number:**

**Injection well new surface disturbance (acres):**

**Minerals protection information:**

**Mineral protection attachment:**

**Underground Injection Control (UIC) Permit?**

**UIC Permit attachment:**

### **Section 5 - Surface Discharge**

**Would you like to utilize Surface Discharge PWD options? NO**

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:**

**PWD disturbance (acres):**

**Surface discharge PWD discharge volume (bbl/day):**

**Surface Discharge NPDES Permit?**

**Surface Discharge NPDES Permit attachment:**

**Surface Discharge site facilities information:**

**Surface discharge site facilities map:**

### **Section 6 - Other**

**Would you like to utilize Other PWD options? NO**

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:**

**PWD disturbance (acres):**

**Other PWD discharge volume (bbl/day):**

**Other PWD type description:**

**Other PWD type attachment:**

**Have other regulatory requirements been met?**

**Other regulatory requirements attachment:**



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

## **Bond Info Data Report**

06/12/2019

### **Bond Information**

**Federal/Indian APD: FED**

**BLM Bond number: NMB001555**

**BIA Bond number:**

**Do you have a reclamation bond? NO**

**Is the reclamation bond a rider under the BLM bond?**

**Is the reclamation bond BLM or Forest Service?**

**BLM reclamation bond number:**

**Forest Service reclamation bond number:**

**Forest Service reclamation bond attachment:**

**Reclamation bond number:**

**Reclamation bond amount:**

**Reclamation bond rider amount:**

**Additional reclamation bond information attachment:**