

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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

SUNDRY NOTICES AND REPORTS ON WELLS
Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE - Other instructions on page 2

HOBBS OCD
FEB 26 2018
RECEIVED

| | | |
|--|---|---|
| 1. Type of Well <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other | | 5. Lease Serial No. NMNM05792 |
| 2. Name of Operator CIMAREX ENERGY COMPANY OF CO | | 6. If Indian, Allottee or Tribe Name |
| / Contact: ARICKA EASTERLING E-Mail: aeasterling@cimarex.com | | 7. If Unit or CA/Agreement, Name and/or No. NMNM71019X |
| 3a. Address 202 S CHEYENNE AVE. SUITE 1000 TULSA, OK 74103 | 3b. Phone No. (include area code) Ph: 918.560.7060 | 8. Well Name and No. RED HILLS UNIT 16H |
| 4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Sec 33 T25S R33E NWNW 506FNL 584FWL ← ? 32.053800 N Lat, 103.345438 W Lon | | 9. API Well No. 30-025-42324-00-X1 |
| | | 10. Field and Pool or Exploratory Area WC-025 G06 S253329D |
| | | 11. County or Parish, State LEA COUNTY, NM |

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

| TYPE OF SUBMISSION | TYPE OF ACTION | | | |
|--|---|---|--|---|
| <input checked="" type="checkbox"/> Notice of Intent | <input type="checkbox"/> Acidize | <input type="checkbox"/> Deepen | <input type="checkbox"/> Production (Start/Resume) | <input type="checkbox"/> Water Shut-Off |
| <input type="checkbox"/> Subsequent Report | <input type="checkbox"/> Alter Casing | <input type="checkbox"/> Hydraulic Fracturing | <input type="checkbox"/> Reclamation | <input type="checkbox"/> Well Integrity |
| <input type="checkbox"/> Final Abandonment Notice | <input type="checkbox"/> Casing Repair | <input type="checkbox"/> New Construction | <input type="checkbox"/> Recomplete | <input checked="" type="checkbox"/> Other |
| | <input type="checkbox"/> Change Plans | <input type="checkbox"/> Plug and Abandon | <input type="checkbox"/> Temporarily Abandon | Change to Original A PD |
| | <input type="checkbox"/> Convert to Injection | <input type="checkbox"/> Plug Back | <input type="checkbox"/> Water Disposal | |

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

Cimarex respectfully request approval to change the drilling plan (casing, cement & mud) for the above referenced well. Please see attached drilling plan.

Carlsbad Field Office
OCD Hobbs

**SEE ATTACHED FOR
CONDITIONS OF APPROVAL**

| | |
|--|--------------------------|
| 14. I hereby certify that the foregoing is true and correct. Electronic Submission #391836 verified by the BLM Well Information System For CIMAREX ENERGY COMPANY OF CO, sent to the Hobbs Committed to AFMSS for processing by PRISCILLA PEREZ on 11/07/2017 (18PP0213SE) | |
| Name (Printed/Typed) ARICKA EASTERLING | Title REGULATORY ANALYST |
| Signature (Electronic Submission) | Date 10/13/2017 |

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

| | | |
|---|---------------------------------|------------------------|
| Approved By <u>ZOTA STEVENS</u> | Title <u>PETROLEUM ENGINEER</u> | Date <u>02/15/2018</u> |
| Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon. | | Office <u>Hobbs</u> |

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.

1. Geological Formations

TVD of target 9,285
MD at TD 18,773

Pilot Hole TD N/A
Deepest expected fresh water

| Formation | Depth (TVD) from KB | Water/Mineral Bearing/Target Zone | Hazards |
|---------------------|---------------------|-----------------------------------|---------|
| Groundwater | 185 | N/A | |
| Rustler | 995 | N/A | |
| Salt | 1140 | N/A | |
| Castille | 3380 | N/A | |
| Lamar | 4900 | N/A | |
| Bell Canyon | 4945 | N/A | |
| Cherry Canyon | 6190 | N/A | |
| Brushy Canyon | 7485 | N/A | |
| Bone Spring | 9045 | Hydrocarbons | |
| U. Avalon (Leonard) | 9080 | Hydrocarbons | |
| L. Avalon | 9680 | Hydrocarbons | |

2. Casing Program

| Hole Size | Casing Depth From | Casing Depth To | Casing Size | Weight (lb/ft) | Grade | Conn. | SF Collapse | SF Burst | SF Tension |
|---------------------------|-------------------|---------------------|-------------|----------------|------------------|-------|-------------|----------|--------------------|
| 17 1/2 | 0 | 1000 <i>1040</i> | 13-3/8" | 48.00 | H-40/J-55 Hybrid | ST&C | 1.62 | 3.78 | 6.71 |
| 12 1/4 | 0 | 4850 | 9-5/8" | 40.00 | J-55 | LT&C | 1.24 | 1.21 | 2.68 |
| 8 3/4 | 0 | 8747 | 5-1/2" | 17.00 | L-80 | LT&C | 1.50 | 1.85 | 2.14 |
| 8 3/4 | 8747 | 18773 | 5-1/2" | 17.00 | L-80 | BT&C | 1.42 | 1.74 | 43.41 |
| BLM Minimum Safety Factor | | | | | | | 1.125 | 1 | 1.6 Dry 1.8 Wet |

TVD was used on all calculations.

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? | N |
| Is well within the designated 4 string boundary. | N |
| Is well located in SOPA but not in R-111-P? | N |
| If yes, are the first 2 strings cemented to surface and 3rd string cement tied back 500' into previous casing? | N |
| Is well located in R-111-P and SOPA? | N |
| If yes, are the first three strings cemented to surface? | N |
| Is 2nd string set 100' to 600' below the base of salt? | N |
| Is well located in high Cave/Karst? | N |
| If yes, are there two strings cemented to surface? | N |
| (For 2 string wells) If yes, is there a contingency casing if lost circulation occurs? | N |

| | |
|--|---|
| Is well located in critical Cave/Karst? | N |
| If yes, are there three strings cemented to surface? | N |

3. Cementing Program

| Casing | # Sks | Wt. lb/gal | Yld ft ³ /sack | H ₂ O gal/sk | 500# Comp. Strength (hours) | Slurry Description |
|--------------|-------|------------|---------------------------|-------------------------|-----------------------------|--|
| Surface | 424 | 13.50 | 1.72 | 9.15 | 15.5 | Lead: Class C + Bentonite |
| | 195 | 14.80 | 1.34 | 6.32 | 9.5 | Tail: Class C + LCM |
| | | | | | | |
| Intermediate | 921 | 12.90 | 1.88 | 9.65 | 12 | Lead: 35:65 (Poz:C) + Salt + Bentonite |
| | 283 | 14.80 | 1.34 | 6.32 | 9.5 | Tail: Class C + LCM |
| | | | | | | |
| Production | 686 | 10.30 | 3.64 | 22.18 | | Lead: Tuned Light + LCM |
| | 2144 | 14.20 | 1.30 | 5.86 | 14:30 | Tail: 50:50 (Poz:H) + Salt + Bentonite + Fluid Loss + Dispersant + SMS |
| | | | | | | |

| Casing String | TOC | % Excess |
|---------------|-----|----------|
| Surface | | 43 |
| Intermediate | | 44 |
| Production | | 14 |

4. Pressure Control Equipment

| | |
|--|--|
| | A variance is requested for the use of a diverter on the surface casing. See attached for schematic. |
|--|--|

| BOP installed and tested before drilling which hole? | Size | Min Required WP | Type | | Tested To |
|--|--------|-----------------|------------|---|-------------------------|
| 12 1/4 | 13 5/8 | 2M | Annular | X | 50% of working pressure |
| | | | Blind Ram | | 2M |
| | | | Pipe Ram | X | |
| | | | Double Ram | X | |
| | | | Other | | |
| 8 3/4 | 13 5/8 | 3M | Annular | X | 50% of working pressure |
| | | | Blind Ram | | 3M |
| | | | Pipe Ram | X | |
| | | | Double Ram | X | |
| | | | Other | | |

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 and floor 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. |
| X | 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? |

5. Mud Program

| Depth | Type | Weight (ppg) | Viscosity | Water Loss |
|-----------------------------|---------------|---------------|-----------|------------|
| 0' to 1000' ¹⁰⁴⁰ | FW Spud Mud | 8.30 - 8.80 | 30-32 | N/C |
| 1000' to 4850' | Brine Water | 12.40 - 12.90 | 30-32 | N/C |
| 4850' to 18773' | Oil Based Mud | 8.70 - 9.20 | 50-70 | N/C |

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

| | |
|---|-----------------------------|
| What will be used to monitor the loss or gain of fluid? | PVT/Pason/Visual Monitoring |
|---|-----------------------------|

6. Logging and Testing Procedures

| Logging, Coring and Testing | |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM. |
| <input type="checkbox"/> | No logs are planned based on well control or offset log information. |
| <input type="checkbox"/> | Drill stem test? |
| <input type="checkbox"/> | Coring? |

| Additional Logs Planned | Interval |
|-------------------------|----------|
| | |

7. Drilling Conditions

| Condition | |
|----------------------------|----------|
| BH Pressure at deepest TVD | 4441 psi |
| Abnormal Temperature | No |

Hydrogen Sulfide (H2S) monitors will be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.

| | |
|-------------------------------------|----------------------|
| <input checked="" type="checkbox"/> | H2S is present |
| <input checked="" type="checkbox"/> | H2S plan is attached |

8. Other Facets of Operation

9. Wellhead

A multi-bowl wellhead system will be utilized.

After running the 13-3/8" surface casing, a 13 5/8" BOP/BOPE system with a minimum working pressure of 3000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 3000 psi test. Annular will be tested to 50% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2.

The multi-bowl wellhead will be installed by vendor's representative. A copy of the installation instructions has been sent to the BLM field office.

The wellhead will be installed by a third-party welder while being monitored by the wellhead vendor representative.

All BOP equipment will be tested utilizing a conventional test plug. Not a cup or J-packer type.

A solid steel body pack-off will be utilized after running and cementing the intermediate casing. After installation the pack-off and lower flange will be pressure tested to 3000 psi.

The surface casing string will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater.

The casing string utilizing steel body pack-off will be tested to 70% of casing burst.

If well conditions dictate conventional slips will be set and BOPE will be tested to appropriate pressures based on permitted pressure requirements.

PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

| | |
|------------------------------|--|
| OPERATOR'S NAME: | CIMAREX ENERGY COMPANY OF CO |
| LEASE NO.: | NMNM05792 |
| WELL NAME & NO.: | RED HILLS UNIT 16H |
| SURFACE HOLE FOOTAGE: | 506' FNL & 584' FWL |
| BOTTOM HOLE FOOTAGE: | 330' FSL & 380' FWL |
| LOCATION: | Section 33, T. 25 S., R 33 E., NMPM |
| COUNTY: | Eddy 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 checked="" type="radio"/> Multibowl | <input type="radio"/> Both |
| Other | <input type="checkbox"/> 4 String Area | <input type="checkbox"/> Capitan Reef | <input type="checkbox"/> WIPP |

A. Hydrogen Sulfide

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

B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately **1040** 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.

Operator shall filled 1/3rd intermediate casing with fluid while running casing to maintain collapse safety factor.

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

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

- a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.
 - b. Second stage above DV tool: Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Additional cement maybe required. Excess calculates to 23%.**
3. The minimum required fill of cement behind the 5-1/2 inch production casing is:
 - c. Cement should tie-back at least 200 feet into previous casing string. Operator shall provide method of verification. **Additional cement maybe required. Excess calculates to 15%.**

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).
2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **3000 (3M) psi.**

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)

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

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
 - a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
 - b. When the operator proposes to set surface casing with Spudder Rig
 - Notify the BLM when moving in and removing the Spudder Rig.
 - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
 - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.
3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.
2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.

3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.
5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
6. **On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.**
7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.

3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.
4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
 - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
 - c. Manufacturer representative shall install the test plug for the initial BOP test.
 - d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
 - e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
 - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).
 - b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).
 - c. The tests shall be done by an independent service company utilizing a test plug. The results of the test shall be reported to the appropriate BLM office.
 - d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE.

If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.

- e. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.
- f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes. This test shall be performed prior to the test at full stack pressure.
- g. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

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

D. WASTE MATERIAL AND FLUIDS

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

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

Waste Minimization Plan (WMP)

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

ZS 021518

| 13 3/8 | surface csg in a | 17 1/2 | inch hole. | Design Factors | | | | SURFACE | |
|--|------------------|----------------|------------------|----------------|------------------|-----------------|-----------|------------|--------------------|
| Segment | #/ft | Grade | Coupling | Joint | Collapse | Burst | Length | Weight | |
| "A" | 48.00 | h 40 | ST&C | 6.45 | 1.62 | 0.53 | 1,040 | 49,920 | |
| "B" | | | | | | | 0 | 0 | |
| w/8.4#/g mud, 30min Sfc Csg Test psig: 757 | | | | Tail Cmt | does not | circ to sfc. | Totals: | 1,040 | 49,920 |
| Comparison of Proposed to Minimum Required Cement Volumes | | | | | | | | | |
| Hole Size | Annular Volume | 1 Stage Cmt Sx | 1 Stage CuFt Cmt | Min Cu Ft | 1 Stage % Excess | Drilling Mud Wt | Calc MASP | Req'd BOPE | Min Dist Hole-Cplg |
| 17 1/2 | 0.6946 | 619 | 991 | 777 | 27 | 8.80 | 2183 | 3M | 1.56 |

Burst Frac Gradient(s) for Segment(s) A, B = , b All > 0.70, OK.

| 9 5/8 | casing inside the | 13 3/8 | | Design Factors | | | | INTERMEDIATE | |
|---|-------------------|----------------|------------------|----------------|----------------------|-----------------|-----------|--------------|--------------------|
| Segment | #/ft | Grade | Coupling | Joint | Collapse | Burst | Length | Weight | |
| "A" | 40.00 | J 55 | LT&C | 2.68 | 0.79 | 0.89 | 4,850 | 194,000 | |
| "B" | | | | | | | 0 | 0 | |
| w/8.4#/g mud, 30min Sfc Csg Test psig: | | | | | | | Totals: | 4,850 | 194,000 |
| The cement volume(s) are intended to achieve a top of | | | | 0 | ft from surface or a | | 1040 | overlap. | |
| Hole Size | Annular Volume | 1 Stage Cmt Sx | 1 Stage CuFt Cmt | Min Cu Ft | 1 Stage % Excess | Drilling Mud Wt | Calc MASP | Req'd BOPE | Min Dist Hole-Cplg |
| 12 1/4 | 0.3132 | 1204 | 2111 | 1604 | 32 | 12.90 | 2395 | 3M | 0.81 |

Burst Frac Gradient(s) for Segment(s): A, B, C, D = 0.81, b, c, d All > 0.70, OK. **ALT. COLLAPSE SF= 0.79*1.5 = .79*1.5 = 1.185**

| 5 1/2 | casing inside the | 9 5/8 | | Design Factors | | | | PRODUCTION | | |
|---|-------------------|----------------|------------------|----------------|----------------------|---------------------------------|-----------|------------|--------------------|------|
| Segment | #/ft | Grade | Coupling | Joint | Collapse | Burst | Length | Weight | | |
| "A" | 17.00 | L 80 | LT&C | 2.14 | 1.5 | 1.74 | 8,747 | 148,699 | | |
| "B" | 17.00 | L 80 | BUTT | 5.26 | 1.26 | 1.74 | 10,026 | 170,442 | | |
| w/8.4#/g mud, 30min Sfc Csg Test psig: 1,366 | | | | | | | Totals: | 18,773 | 319,141 | |
| B would be: | | | | 43.41 | 1.42 | if it were a vertical wellbore. | | | | |
| No Pilot Hole Planned | | | | MTD | Max VTD | Csg VD | Curve KOP | Dogleg° | Severity° | MEOC |
| | | | | 18773 | 9285 | 9285 | 8747 | 90 | 11 | 9544 |
| The cement volume(s) are intended to achieve a top of | | | | 4650 | ft from surface or a | | 200 | overlap. | | |
| Hole Size | Annular Volume | 1 Stage Cmt Sx | 1 Stage CuFt Cmt | Min Cu Ft | 1 Stage % Excess | Drilling Mud Wt | Calc MASP | Req'd BOPE | Min Dist Hole-Cplg | |
| 8 3/4 | 0.2526 | 2830 | 5284 | 3575 | 48 | 9.20 | | | 1.35 | |

Class 'H' tail cmt yld > 1.20