Form 3160-3
(June 2015)

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

# APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☐ DRILL ☐ REENTER

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

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

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

8. Lease Name and Well No.

**[319775]**

2. Name of Operator **[215099]**

9. API Well No. **30-025-50143**

3a. Address

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

10. Field and Pool, or Exploratory **[998180]**

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

At surface

At proposed prod. zone

11. Sec., T. R. M. or Blk. and Survey or Area

14. Distance in miles and direction from nearest town or post office*

12. County or Parish

13. State

| 15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) | 16. No of acres in lease | 17. Spacing Unit dedicated to this well |
|---|---|---|
| 18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. | 19. Proposed Depth | 20. BLM/BIA Bond No. in file |
| 21. Elevations (Show whether DF, KDB, RT, GL, etc.) | 22. Approximate date work will start* | 23. Estimated duration |

## 24. Attachments

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

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

| 25. Signature | Name *(Printed/Typed)* | Date |
|---|---|---|
| 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.

**NGMP Rec 05/04/2022**

KZ
**05/13/2022**

**SL**

APPROVED WITH CONDITIONS

(Continued on page 2)

*(Instructions on page 2)

**Approval Date: 05/11/2021**

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

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

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

☐ AMENDED REPORT

# WELL LOCATION AND ACREAGE DEDICATION PLAT

| 1 API Number | 2 Pool Code | 3 Pool Name |
|---|---|---|
| 30-025 -50143 | 98180 | WC-025 G-09 S253309P; UPR WOLFCAMP |

| 4 Property Code | 5 Property Name | 6 Well Number |
|---|---|---|
| 319775 | VACA DRAW 20-17 FEDERAL | 46H |
| **7 OGRID No.** | **8 Operator Name** | **9 Elevation** |
| 215099 | CIMAREX ENERGY CO. | 3406.1' |

## 10 Surface Location

| UL or lot no. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| O | 20 | 25S | 33E | | 330 | SOUTH | 2060 | EAST | LEA |

## 11 Bottom Hole Location If Different From Surface

| UL or lot no. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| B | 17 | 25S | 33E | | 100 | NORTH | 1992 | EAST | LEA |

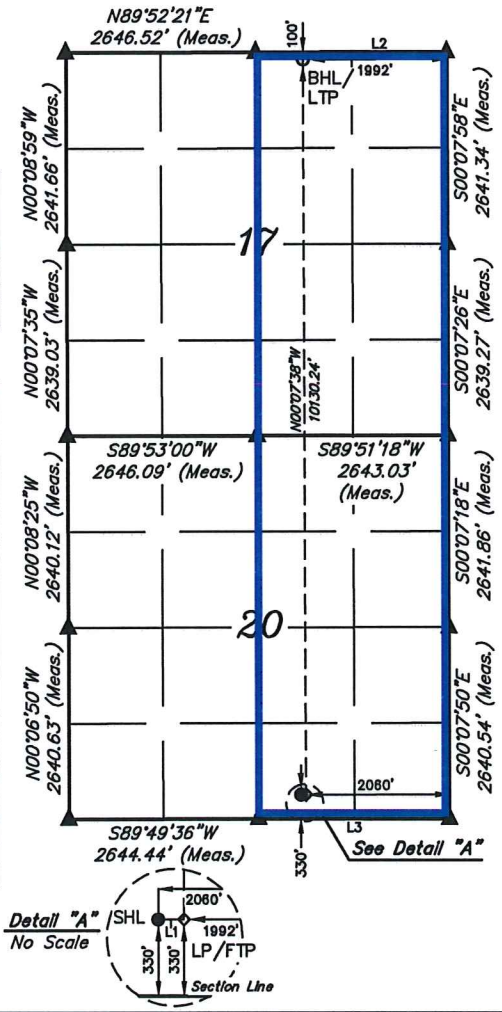
| 12 Dedicated Acres | 13 Joint or Infill | 14 Consolidation Code | 15 Order No. |
|---|---|---|---|
| 640 | | | |

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

16

● = SURFACE HOLE LOCATION
◇ = LANDING POINT/FIRST TAKE POINT
○ = BOTTOM HOLE LOCATION/ LAST TAKE POINT
▲ = SECTION CORNER LOCATED

2000' 1000' 0' 2000'
SCALE
DRAWN BY: C.IVIE 08-08-19




| LINE TABLE | | |
|---|---|---|
| LINE | DIRECTION | LENGTH |
| L1 | N89°52'38"E | 68.10' |
| L2 | N89°52'03"E | 2643.50' |
| L3 | S89°58'49"W | 2644.60' |

| NAD 83 (SURFACE HOLE LOCATION) |
|---|
| LATITUDE = 32°06'35.06" (32.109738°) |
| LONGITUDE = 103°35'32.72" (103.592422°) |
| NAD 27 (SURFACE HOLE LOCATION) |
| LATITUDE = 32°06'34.61" (32.109613°) |
| LONGITUDE = 103°35'31.02" (103.591950°) |
| STATE PLANE NAD 83 (N.M. EAST) |
| N: 404447.51' E: 770740.15' |
| STATE PLANE NAD 27 (N.M. EAST) |
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NOTE:
- Distances referenced on plat to section lines are perpendicular.
- Basis of Bearing is a Transverse Mercator Projection with a Central Meridian of W103°53'00"

Detail "A" No Scale




## 17 OPERATOR CERTIFICATION

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

1-10-2020
Signature Date

Hope Knauls
Printed Name

hknauls@cimarex.com
E-mail Address

## 18 SURVEYOR CERTIFICATION

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

July 25, 2018
Date of Survey
Signature and Seal of Professional Surveyor:


Certificate Number:

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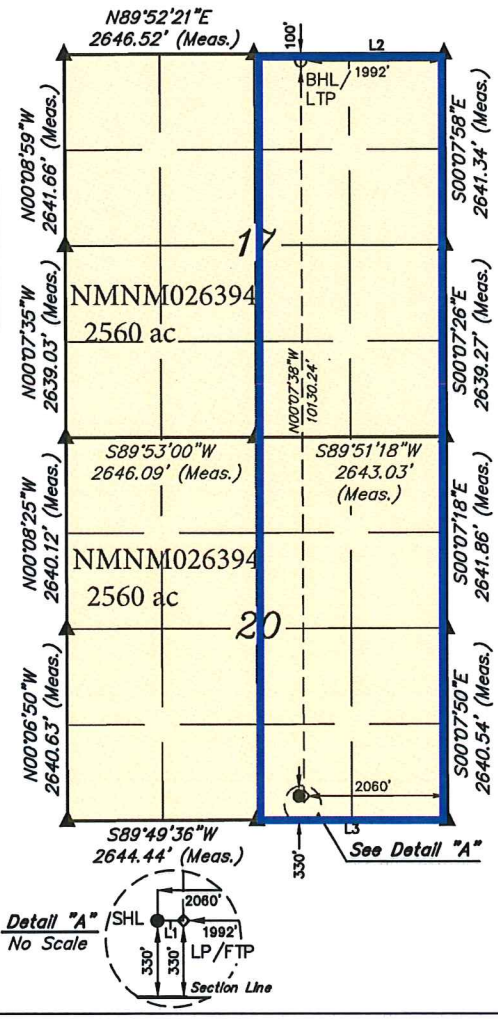


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Signature 1-10-2020 Date

Hope Knauls
Printed Name

hknauls@cimarex.com
E-mail Address

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July 25, 2018
Date of Survey
Signature and Seal of Professional Surveyor:


Certificate Number:

# PECOS DISTRICT
# DRILLING CONDITIONS OF APPROVAL

| | |
|---|---|
| **OPERATOR'S NAME:** | **Cimarex Energy** |
| **LEASE NO.:** | **NMNM0026394** |
| **LOCATION:** | Section 20, T.25 S., R.33 E., NMPM |
| **COUNTY:** | Lea County, New Mexico |

| | |
|---|---|
| **WELL NAME & NO.:** | Vaca Draw 20-17 Fed 46H |
| **SURFACE HOLE FOOTAGE:** | 330'/S & 2060'/E |
| **BOTTOM HOLE FOOTAGE** | 100'/N & 1992'/E |

COA

| | | | |
|---|---|---|---|
| H2S | ○ Yes | ◉ No | |
| Potash | ◉ None | ○ Secretary | ○ R-111-P |
| Cave/Karst Potential | ◉ Low | ○ Medium | ○ High |
| Cave/Karst Potential | ○ Critical | | |
| Variance | ○ None | ◉ Flex Hose | ○ Other |
| Wellhead | ○ Conventional | ◉ Multibowl | ○ Both |
| Other | ☐ 4 String Area | ☐ Capitan Reef | ☐ WIPP |
| Other | ☐ Fluid Filled | ☐ Cement Squeeze | ☐ Pilot Hole |
| Special Requirements | ☐ Water Disposal | ☐ COM | ☐ 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

1. The **10-3/4** inch surface casing shall be set at approximately **1050** feet (a minimum of 25 feet (Lea County) into the Rustler Anhydrite and above the salt) and cemented to the surface.

    a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
    b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8**



 **Approval Date: 05/11/2021**

**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.

2. The minimum required fill of cement behind the **7-5/8** 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.
  **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.**

**A variance for annular clearance is approve between 7 5/8" x 5 1/2".**

3. The minimum required fill of cement behind the **5-1/2** x **5** inch production casing is:
   - Cement should tie-back at least **200 feet** into previous casing string. 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. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M)** psi.
a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
c. Manufacturer representative shall install the test plug for the initial BOP test.

d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

# GENERAL REQUIREMENTS

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

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

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

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

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

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

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

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

A. CASING

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

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

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

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

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

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

7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a

larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

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

B. PRESSURE CONTROL

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

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

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

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

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

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

    a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been

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

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

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

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

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

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

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

h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test

does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

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

D. WASTE MATERIAL AND FLUIDS

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

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

**ZS050621**

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# Application Data Report
05/11/2021

**APD ID:** 10400038353
**Submission Date:** 01/25/2019
**Operator Name:** CIMAREX ENERGY COMPANY
**Well Name:** VACA DRAW 20-17 FEDERAL
**Well Number:** 46H
**Well Type:** CONVENTIONAL GAS WELL
**Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

## Section 1 - General

**APD ID:** 10400038353
**Tie to previous NOS?** Y
**Submission Date:** 01/25/2019
**BLM Office:** CARLSBAD
**User:** Amithy Crawford
**Title:** Regulatory Analyst
**Federal/Indian APD:** FED
**Is the first lease penetrated for production Federal or Indian?** FED
**Lease number:** NMNM0026394
**Lease Acres:**
**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:** CIMAREX ENERGY COMPANY
**Operator letter of designation:**

## Operator Info

**Operator Organization Name:** CIMAREX ENERGY COMPANY
**Operator Address:** 600 N MARIENFELD STREET ST SUITE 600
**Zip:** 79701
**Operator PO Box:**
**Operator City:** MIDLAND
**State:** TX
**Operator Phone:** (432)571-7800
**Operator Internet Address:** tstathem@cimarex.com

## 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:** VACA DRAW 20-17 FEDERAL
**Well Number:** 46H
**Well API Number:**
**Field/Pool or Exploratory?** Field and Pool
**Field Name:** WILDCAT
**Pool Name:** UPPER WOLFCAMP
**Is the proposed well in an area containing other mineral resources?** USEABLE WATER

**Operator Name:** CIMAREX ENERGY COMPANY

**Well Name:** VACA DRAW 20-17 FEDERAL **Well Number:** 46H

**Is the proposed well in an area containing other mineral resources?** USEABLE WATER

**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:** VACA DRAW 20-17 FED **Number:** W2E2 PAD

**Well Class:** HORIZONTAL **Number of Legs:** 1

**Well Work Type:** Drill

**Well Type:** CONVENTIONAL GAS WELL

**Describe Well Type:**

**Well sub-Type:** INFILL

**Describe sub-type:**

**Distance to town:** 26 Miles **Distance to nearest well:** 20 FT **Distance to lease line:** 330 FT

**Reservoir well spacing assigned acres Measurement:** 640 Acres

**Well plat:** Vaca_Draw_20_17_Fed_46H_C102_20200110084402.pdf

Vaca_Draw_20_17_Fed_46H_C102_BLM_Lease_20200110084403.pdf

**Well work start Date:** 12/01/2019 **Duration:** 30 DAYS

## Section 3 - Well Location Table

**Survey Type:** RECTANGULAR

**Describe Survey Type:**

**Datum:** NAD83 **Vertical Datum:** NAVD88

**Survey number:** 23782 **Reference Datum:**

| Wellbore | NS-Foot | NS Indicator | EW-Foot | EW Indicator | Twsp | Range | Section | Aliquot/Lot/Tract | Latitude | Longitude | County | State | Meridian | Lease Type | Lease Number | Elevation | MD | TVD | Will this well produce from this lease? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SHL Leg #1 | 330 | FSL | 2060 | FEL | 25S | 33E | 20 | Aliquot SWSW | 32.109738 | -103.592422 | LEA | NEW MEXICO | NEW MEXICO | F | NMNM 26394 | 3406 | 0 | 0 | |
| KOP Leg #1 | 332 | FSL | 2060 | FEL | 25S | 33E | 20 | Aliquot SWSW | 32.109739 | -103.592422 | LEA | NEW MEXICO | NEW MEXICO | F | NMNM 26394 | -8393 | 11799 | 11799 | |

**Operator Name:** CIMAREX ENERGY COMPANY

**Well Name:** VACA DRAW 20-17 FEDERAL **Well Number:** 46H

| Wellbore | NS-Foot | NS Indicator | EW-Foot | EW Indicator | Twsp | Range | Section | Aliquot/Lot/Tract | Latitude | Longitude | County | State | Meridian | Lease Type | Lease Number | Elevation | MD | TVD | Will this well produce from this lease? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PPP Leg #1-1 | 332 | FSL | 2060 | FEL | 25S | 33E | 17 | Aliquot SWSW | 32.109739 | -103.592422 | LEA | NEW MEXICO | NEW MEXICO | F | NMNM 26394 | -8393 | 11799 | 11799 | |
| EXIT Leg #1 | 100 | FNL | 1992 | FEL | 25S | 33E | 17 | Lot O | 32.137579 | -103.592186 | LEA | NEW MEXICO | NEW MEXICO | F | NMNM 26394 | -8914 | 22218 | 12320 | |
| BHL Leg #1 | 100 | FNL | 1992 | FEL | 25S | 33E | 17 | Lot O | 32.137579 | -103.592186 | LEA | NEW MEXICO | NEW MEXICO | F | NMNM 26394 | -8914 | 22218 | 12320 | |

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# Drilling Plan Data Report
05/11/2021

**APD ID:** 10400038353
**Submission Date:** 01/25/2019
**Operator Name:** CIMAREX ENERGY COMPANY
**Well Name:** VACA DRAW 20-17 FEDERAL
**Well Number:** 46H
**Well Type:** CONVENTIONAL GAS WELL
**Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

## Section 1 - Geologic Formations

| Formation ID | Formation Name | Elevation | True Vertical Depth | Measured Depth | Lithologies | Mineral Resources | Producing Formation |
|---|---|---|---|---|---|---|---|
| 1501774 | 2ND BONE SPRING LIME | 3300 | 1 | 1 | | USEABLE WATER | N |
| 380416 | RUSTLER | 3464 | 935 | 935 | | USEABLE WATER | N |
| 380417 | TOP SALT | 2166 | 1298 | 1298 | | NONE | N |
| 380418 | BASE OF SALT | -1250 | 4714 | 4714 | | NONE | N |
| 380427 | LAMAR | -1445 | 4909 | 4909 | | NONE | N |
| 380429 | BELL CANYON | -1473 | 4937 | 4937 | | NONE | N |
| 380423 | CHERRY CANYON | -2526 | 5990 | 5990 | | OIL | N |
| 380421 | BRUSHY CANYON | -4072 | 7536 | 7536 | | NATURAL GAS, OIL | Y |
| 380422 | BONE SPRING | -5568 | 9032 | 9032 | | NATURAL GAS, OIL | N |
| 380424 | UPPER AVALON SHALE | -5848 | 9312 | 9312 | | NATURAL GAS, OIL | N |
| 380425 | BONE SPRING 1ST | -6547 | 10011 | 10011 | | NATURAL GAS, OIL | N |
| 380426 | BONE SPRING 2ND | -6759 | 10223 | 10223 | | NATURAL GAS, OIL | N |
| 633342 | BONE SPRING 3RD | -7607 | 11071 | 11071 | | NATURAL GAS, OIL | N |
| 633343 | WOLFCAMP | -8725 | 12189 | 12189 | | NATURAL GAS, OIL | Y |

## Section 2 - Blowout Prevention

**Operator Name:** CIMAREX ENERGY COMPANY

**Well Name:** VACA DRAW 20-17 FEDERAL **Well Number:** 46H

**Pressure Rating (PSI):** 5M **Rating Depth:** 22218

**Equipment:** A BOP consisting of three rams, including one blind ram and two pipe rams and one annular preventer. An accumulator that meets the requirements in Onshore Order #2 for the pressure rating of the BOP stack. A rotating head may be installed as needed. A Kelly clock will be installed and maintained in operable condition and a drill string safety valve in the open position will be available on the rig floor.
**Requesting Variance?** YES

**Variance request:** Co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached. The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used. Variance to include Hammer Union connections on lines downstream of the buffer tank only.Cimarex requests a 5M annular variance for the 10M BOP system. See attached procedure.
**Testing Procedure:** A multi-bowl wellhead system will be utilized. After running the 10-3/4" surface casing, a 13 5/8" BOP/BOPE system with a minimum working pressure of 5000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 5000 psi test. Annular will be tested to 100%. 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 5000 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.
**Choke Diagram Attachment:**

Vaca_Draw_20_17_Fed_46H_Choke_5M_20200203091431.pdf

**BOP Diagram Attachment:**

Vaca_Draw_20_17_Fed_46H_BOP_5M_6_3_4_20200916101759.pdf

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**Pressure Rating (PSI):** 5M **Rating Depth:** 12449

**Equipment:** A BOP consisting of three rams, including one blind ram and two pipe rams and one annular preventer. An accumulator that meets the requirements in Onshore Order #2 for the pressure rating of the BOP stack. A rotating head may be installed as needed. A Kelly clock will be installed and maintained in operable condition and a drill string safety valve in the open position will be available on the rig floor.
**Requesting Variance?** YES

**Variance request:** Co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached. The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used. Variance to include Hammer Union connections on lines downstream of the buffer tank only. Cimarex requests a 5M annular variance for the 10M BOP system. See attached procedure.
**Testing Procedure:** A multi-bowl wellhead system will be utilized. After running the 10-3/4" surface casing, a 13 5/8" BOP/BOPE system with a minimum working pressure of 5000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 5000 psi test. Annular will be tested to 100%. 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 5000 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.
**Choke Diagram Attachment:**

**Operator Name:** CIMAREX ENERGY COMPANY

**Well Name:** VACA DRAW 20-17 FEDERAL **Well Number:** 46H

Vaca_Draw_20_17_Fed_46H_Choke_5M_20200203090924.pdf

**BOP Diagram Attachment:**

Vaca_Draw_20_17_Fed_46H_BOP_5M_9_7_8_20200916101629.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 | 14.75 | 10.75 | NEW | API | N | 0 | 985 | 0 | 985 | | | 985 | J-55 | 40.5 | BUTT | 3.51 | 6.94 | BUOY | 15.77 | BUOY | 15.77 |
| 2 | PRODUCTION | 6.75 | 5.5 | NEW | API | Y | 0 | 11750 | 0 | 11750 | | | 11750 | L-80 | 20 | LT&C | 1.38 | 1.43 | BUOY | 1.88 | BUOY | 1.88 |
| 3 | INTERMEDIATE | 9.875 | 7.625 | NEW | NON API | N | 0 | 12449 | 0 | 12276 | | | 12449 | OTHER | 29.7 | OTHER - TMK FJ | 2.36 | 1.14 | BUOY | 1.82 | BUOY | 1.82 |
| 4 | PRODUCTION | 6.75 | 5.0 | NEW | API | Y | 11750 | 22218 | 11750 | 12320 | | | 10468 | P-110 | 18 | BUTT | 2 | 2.02 | BUOY | 56.53 | BUOY | 56.53 |

**Casing Attachments**

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

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

Vaca_Draw_20_17_Fed_46H_Casing_Assumptions_20210412125854.pdf

**Operator Name:** CIMAREX ENERGY COMPANY

**Well Name:** VACA DRAW 20-17 FEDERAL **Well Number:** 46H

**Casing Attachments**

**Casing ID:** 2 **String Type:** PRODUCTION

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

Vaca_Draw_20_17_Tapered_Casing_Specs_20210119075426.pdf

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

Vaca_Draw_20_17_Fed_46H_Casing_Assumptions_20210412125914.pdf

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

**Inspection Document:**

**Spec Document:**

Vaca_Draw_20_17_Fed_46H__Spec_Sheet_for_L80_7.625_Inter_Csg_20200203100005.pdf

**Tapered String Spec:**

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

Vaca_Draw_20_17_Fed_46H_Casing_Assumptions_20210412125933.pdf

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

Vaca_Draw_20_17_Tapered_Casing_Specs_20210119075730.pdf

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

Vaca_Draw_20_17_Fed_46H_Casing_Assumptions_20210412125946.pdf

## Section 4 - Cement

**Operator Name:** CIMAREX ENERGY COMPANY

**Well Name:** VACA DRAW 20-17 FEDERAL **Well Number:** 46H

| 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 | 0 | 0 |
| SURFACE | Lead | | 0 | 985 | 332 | 1.72 | 13.5 | 571 | 50 | Class C | Bentonite |
| SURFACE | Tail | | 0 | 985 | 156 | 1.34 | 14.8 | 208 | 25 | Class C | LCM |
| INTERMEDIATE | Lead | 4900 | 0 | 4900 | 580 | 3.64 | 10.3 | 2111 | 47 | Tuned Light | LCM |
| INTERMEDIATE | Tail | | 4900 | 12449 | 198 | 1.36 | 12.9 | 269 | 47 | 35:65 (PozC) | salt, bentonite, |
| INTERMEDIATE | Lead | 4900 | 4900 | 12449 | 794 | 1.88 | 12.9 | 1492 | 40 | 35:65 Poz C | salt, bentonite |
| PRODUCTION | Lead | | 0 | 22218 | 812 | 1.34 | 14.8 | 1088 | 25 | Class C | LCM |
| PRODUCTION | Tail | | 0 | 22218 | 837 | 1.3 | 14.2 | 1088 | 25 | 50:50 (POZ H) | Salt, Bentonite,Fluid Loss, Dispersant, SMS |

## Section 5 - Circulating Medium

**Mud System Type:** Closed

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

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

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

**Describe what will be on location to control well or mitigate other conditions:** Sufficient mud materials will be kept on location at all times in order to combat lost circulation or unexpected kicks. In order to run DSTs, open hole logs, and casing, the viscosity and water loss may have to be adjusted in order to meet these needs.
**Describe the mud monitoring system utilized:** PVT/Pason/Visual Monitoring

## Circulating Medium Table

**Operator Name:** CIMAREX ENERGY COMPANY

**Well Name:** VACA DRAW 20-17 FEDERAL **Well Number:** 46H

| Top Depth | Bottom Depth | Mud Type | Min Weight (lbs/gal) | Max Weight (lbs/gal) | Density (lbs/cu ft) | Gel Strength (lbs/100 sqft) | PH | Viscosity (CP) | Salinity (ppm) | Filtration (cc) | Additional Characteristics |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 985 | SPUD MUD | 8.3 | 8.8 | | | | | | | |
| 985 | 12449 | OTHER : Brine Diesel Emulsion | 9 | 9.5 | | | | | | | |
| 12449 | 22218 | OIL-BASED MUD | 10 | 10.5 | | | | | | | |

## Section 6 - Test, Logging, Coring

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

No DST Planned

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

CNL,DS,GR

**Coring operation description for the well:**

N/A

## Section 7 - Pressure

**Anticipated Bottom Hole Pressure:** 6726 **Anticipated Surface Pressure:** 4015.6

**Anticipated Bottom Hole Temperature(F):** 190

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

**Describe:**

Lost circulation may be encountered in the Delaware mountain group. Abnormal pressure as well as hole stability issues may be encountered in the Wolfcamp.

**Contingency Plans geoharzards description:**

Lost circulation material will be available, as well as additional drilling fluid along with the fluid volume in the drilling rig pit system. Drilling fluid can be mixed on location or mixed in vendor mud plant and trucked to location if needed. Sufficient barite will be available to maintain appropriate mud weight for the Wolfcamp interval.

**Contingency Plans geohazards attachment:**

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

**Hydrogen sulfide drilling operations plan:**

Vaca_Draw_20_17_Fed_46H_H2S_Plan_20200112105323.pdf

**Operator Name:** CIMAREX ENERGY COMPANY

**Well Name:** VACA DRAW 20-17 FEDERAL **Well Number:** 46H

## Section 8 - Other Information

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

Vaca_Draw_20_17_Fed_46H_Directional_Plan_20200112105348.pdf

Vaca_Draw_20_17_Fed_46H_AC_Report_20200112105349.pdf

**Other proposed operations facets description:**

**Other proposed operations facets attachment:**

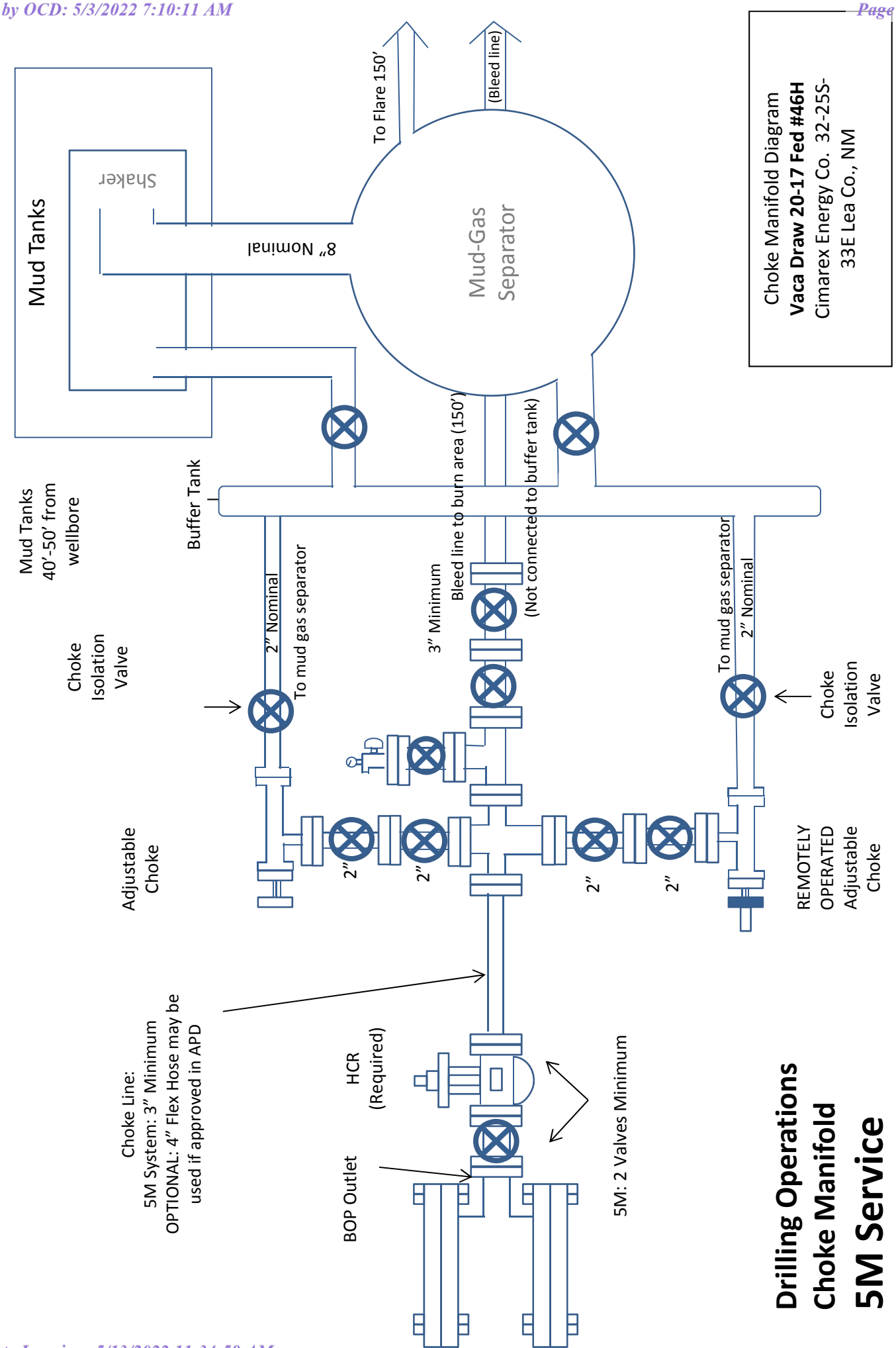
Vaca_Draw_20_17_Fed_46H_Gas_Capture_20200112105422.pdf

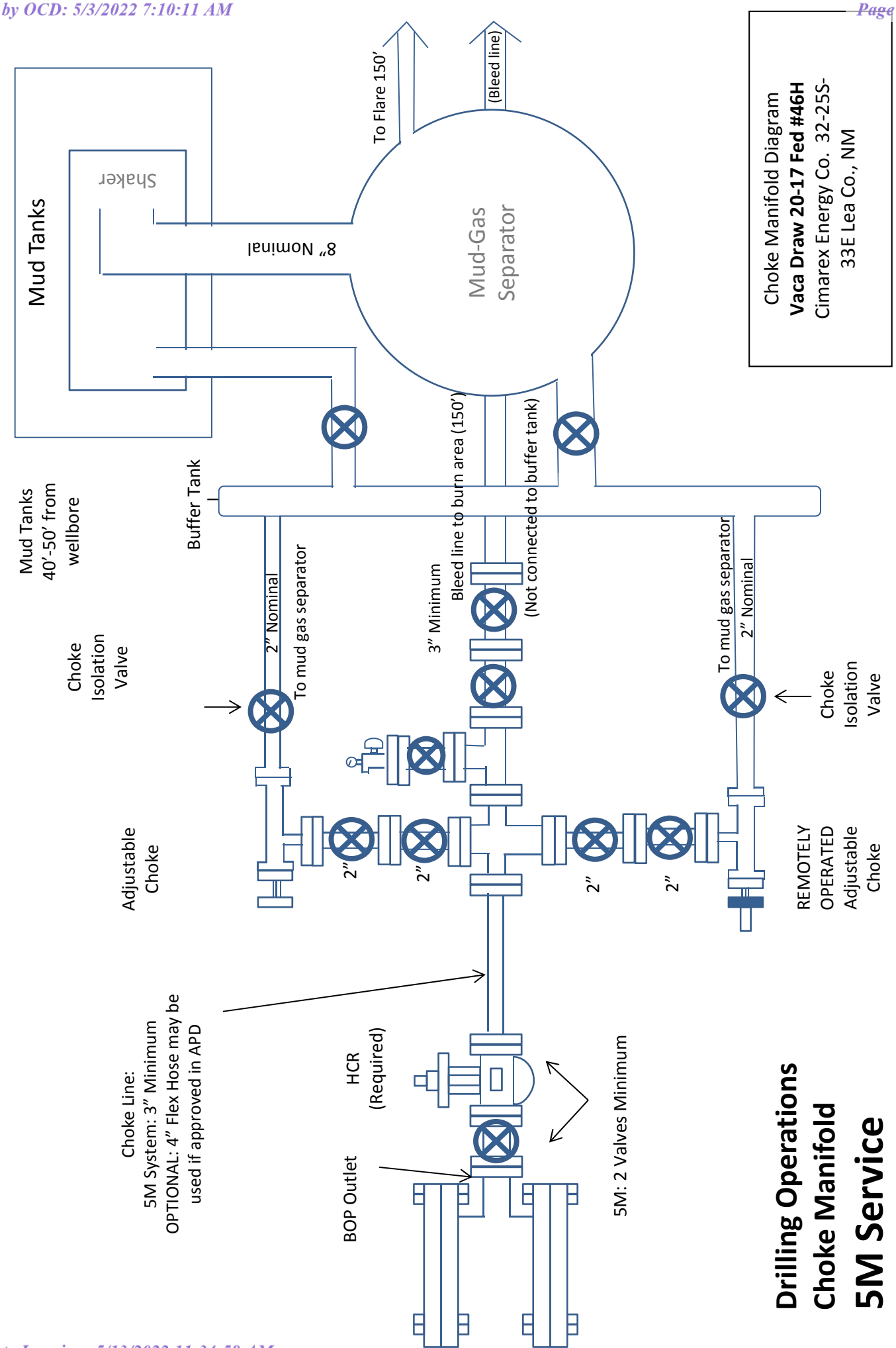
Vaca_Draw_20_17_Fed_46H_Flex_Hose_20200112105506.pdf

Vaca_Draw_20_17_Fed_46H_Drilling_Plan_20210412130028.pdf

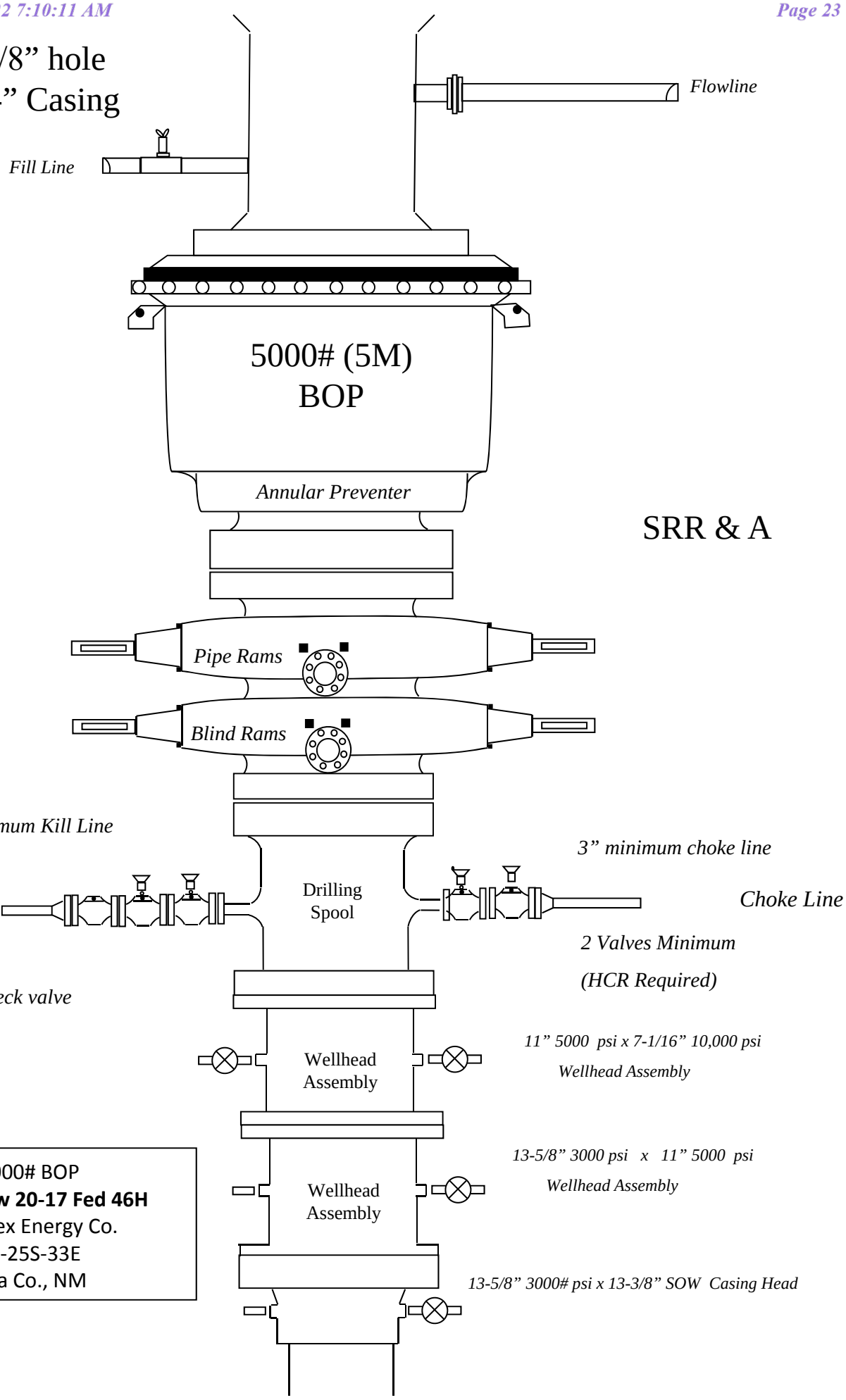
**Other Variance attachment:**

Vaca_Draw_20_17_Fed_46H_Multibowl_Wellhead_20210119075913.pdf


Mud Tanks
Shaker
8" Nominal
Mud-Gas Separator
To Flare 150'
(Bleed line)
Choke Manifold Diagram
Vaca Draw 20-17 Fed #46H
Cimarex Energy Co. 32-25S-33E Lea Co., NM
Mud Tanks 40'-50' from wellbore
Buffer Tank
Choke Isolation Valve
2" Nominal
To mud gas separator
3" Minimum
Bleed line to burn area (150')
(Not connected to buffer tank)
To mud gas separator
2" Nominal
Choke Isolation Valve
Adjustable Choke
2"
2"
2"
2"
REMOTELY OPERATED Adjustable Choke
Choke Line:
5M System: 3" Minimum
OPTIONAL: 4" Flex Hose may be used if approved in APD
HCR (Required)
BOP Outlet
5M: 2 Valves Minimum
Drilling Operations
Choke Manifold
5M Service


Mud Tanks
Shaker
8" Nominal
Mud-Gas Separator
To Flare 150'
(Bleed line)
Choke Manifold Diagram
Vaca Draw 20-17 Fed #46H
Cimarex Energy Co. 32-25S-33E Lea Co., NM
Mud Tanks 40'-50' from wellbore
Buffer Tank
Choke Isolation Valve
2" Nominal
To mud gas separator
3" Minimum
Bleed line to burn area (150')
(Not connected to buffer tank)
To mud gas separator
2" Nominal
Choke Isolation Valve
Adjustable Choke
2"
2"
2"
2"
REMOTELY OPERATED Adjustable Choke
Choke Line:
5M System: 3" Minimum
OPTIONAL: 4" Flex Hose may be used if approved in APD
HCR (Required)
BOP Outlet
5M: 2 Valves Minimum
Drilling Operations
Choke Manifold
5M Service

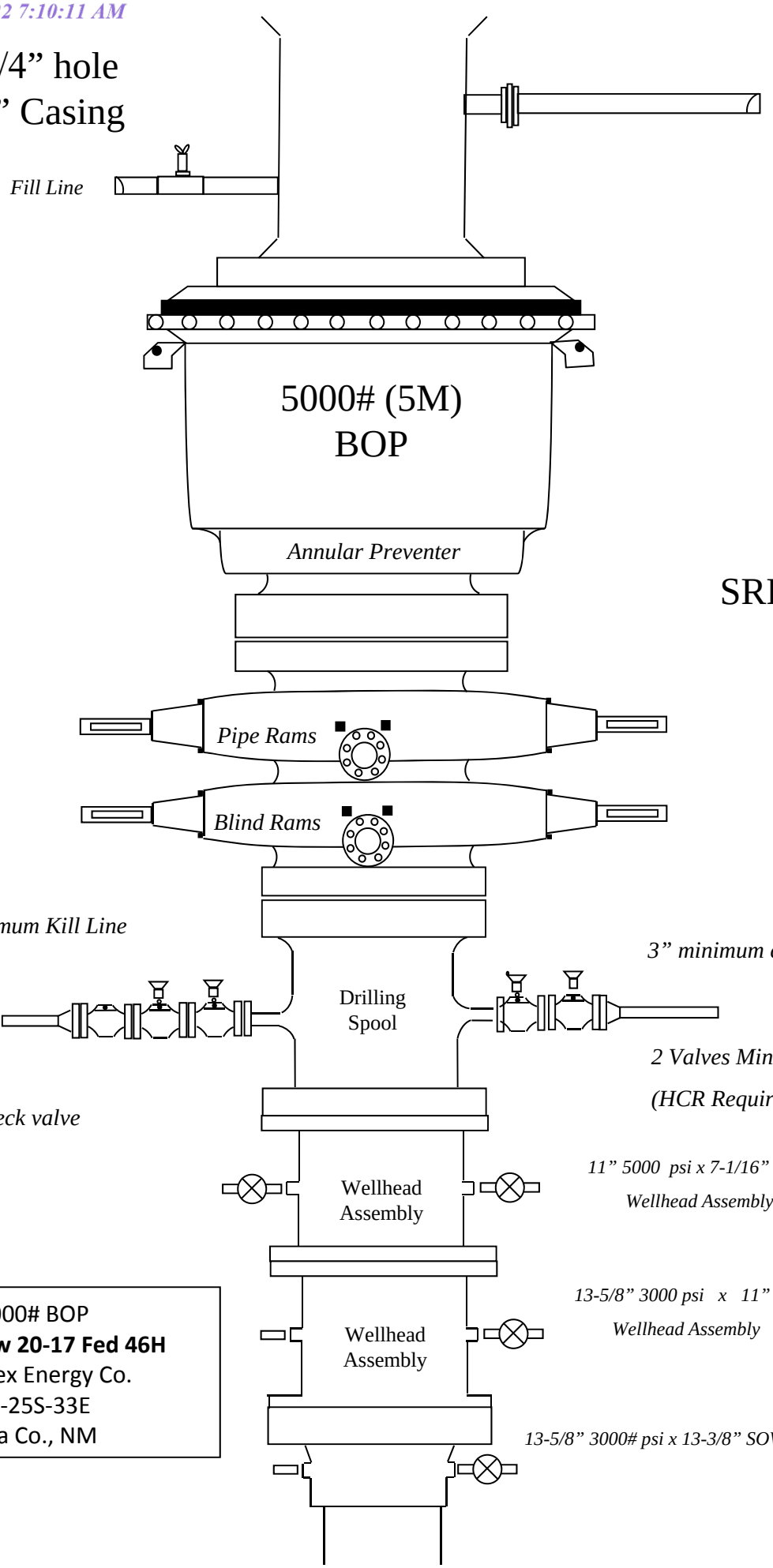
# Drilling 9 7/8” hole below 10 3/4” Casing




SRR & A

5000# BOP
**Vaca Draw 20-17 Fed 46H**
Cimarex Energy Co.
20-25S-33E
Lea Co., NM

# Drilling 6 3/4” hole below 7 5/8” Casing




SRR & A

5000# BOP
**Vaca Draw 20-17 Fed 46H**
Cimarex Energy Co.
20-25S-33E
Lea Co., NM

# PERFORMANCE DATA

**TMK UP ULTRA™ FJ** **7.625 in** **29.70 lbs/ft** **L80 HC**
**Technical Data Sheet**

## Tubular Parameters

| | | | | | |
|---|---|---|---|---|---|
| Size | 7.625 | in | Minimum Yield | 80,000 | psi |
| Nominal Weight | 29.70 | lbs/ft | Minimum Tensile | 95,000 | psi |
| Grade | L80 HC | | Yield Load | 683,000 | lbs |
| PE Weight | 29.04 | lbs/ft | Tensile Load | 811,000 | lbs |
| Wall Thickness | 0.375 | in | Min. Internal Yield Pressure | 6,890 | psi |
| Nominal ID | 6.875 | in | Collapse Pressure | 5,510 | psi |
| Drift Diameter | 6.750 | in | | | |
| Nom. Pipe Body Area | 8.541 | in² | | | |

## Connection Parameters

| | | |
|---|---|---|
| Connection OD | 7.625 | in |
| Connection ID | 6.881 | in |
| Make-Up Loss | 4.022 | in |
| Critical Section Area | 5.316 | in² |
| Tension Efficiency | 62.2 | % |
| Compression Efficiency | 62.2 | % |
| Yield Load In Tension | 425,000 | lbs |
| Min. Internal Yield Pressure | 6,890 | psi |
| Collapse Pressure | 5,510 | psi |
| Uniaxial Bending | 30 | °/ 100 ft |

## Make-Up Torques

| | | |
|---|---|---|
| Min. Make-Up Torque | 13,200 | ft-lbs |
| Opt. Make-Up Torque | 14,700 | ft-lbs |
| Max. Make-Up Torque | 16,200 | ft-lbs |
| Operating Torque | 13,200 | ft-lbs |
| Yield Torque | 23,500 | ft-lbs |

**Printed on: August-27-2018**

**NOTE:**
**The content of this Technical Data Sheet is for general information only and does not guarantee performance or imply fitness for a particular purpose, which only a competent drilling professional can determine considering the specific installation and operation parameters. Information that is printed or downloaded is no longer controlled by TMK IPSCO and might not be the latest information. Anyone using the information herein does so at their own risk. To verify that you have the latest TMK IPSCO technical information, please contact TMK IPSCO Technical Sales toll-free at 1-888-258-2000.**

TMK IPSCO

## 5.5” 20# L80 LT&C

Burst-14530 psi
Collapse-14540
Tension-729000 lbs/ft

## 5” 18# P110 BT&C

Burst-13940
Collapse-13470
Tension-580000/ body 388000/ joint

## 5.5” 20# L80 LT&C

Burst-14530 psi
Collapse-14540
Tension-729000 lbs/ft

## 5” 18# P110 BT&C

Burst-13940
Collapse-13470
Tension-580000/ body 388000/ joint

# Vaca Draw 20-17 Fed 46H

Casing Assumptions

| Hole Size | Casing Depth From | Casing Depth To | Setting Depth TVD | Casing Size | Weight (lb/ft) | Grade | Conn. | SF Collapse | SF Burst | SF Tension |
|---|---|---|---|---|---|---|---|---|---|---|
| 14 3/4 | 0 | 985 | 985 | 10-3/4" | 40.50 | J-55 | BT&C | 3.51 | 6.94 | 15.77 |
| 9 7/8 | 0 | 12449 | 12276 | 7-5/8" | 29.70 | L-80 HC | TMK FJ | 2.36 | 1.14 | 1.82 |
| 6 3/4 | 0 | 11750 | 11750 | 5-1/2" | 20.00 | L-80 | LT&C | 1.38 | 1.43 | 1.88 |
| 6 3/4 | 11750 | 22218 | 12320 | 5" | 18.00 | P-110 | BT&C | 2.00 | 2.02 | 56.53 |
| | | | | | BLM Minimum Safety Factor | | | 1.125 | 1 | 1.6 Dry<br>1.8 Wet |

# Vaca Draw 20-17 Fed 46H

Casing Assumptions

| Hole Size | Casing Depth From | Casing Depth To | Setting Depth TVD | Casing Size | Weight (lb/ft) | Grade | Conn. | SF Collapse | SF Burst | SF Tension |
|---|---|---|---|---|---|---|---|---|---|---|
| 14 3/4 | 0 | 985 | 985 | 10-3/4" | 40.50 | J-55 | BT&C | 3.51 | 6.94 | 15.77 |
| 9 7/8 | 0 | 12449 | 12276 | 7-5/8" | 29.70 | L-80 HC | TMK FJ | 2.36 | 1.14 | 1.82 |
| 6 3/4 | 0 | 11750 | 11750 | 5-1/2" | 20.00 | L-80 | LT&C | 1.38 | 1.43 | 1.88 |
| 6 3/4 | 11750 | 22218 | 12320 | 5" | 18.00 | P-110 | BT&C | 2.00 | 2.02 | 56.53 |
| | | | | | BLM Minimum Safety Factor | | | 1.125 | 1 | 1.6 Dry<br>1.8 Wet |

# Vaca Draw 20-17 Fed 46H

Casing Assumptions

| Hole Size | Casing Depth From | Casing Depth To | Setting Depth TVD | Casing Size | Weight (lb/ft) | Grade | Conn. | SF Collapse | SF Burst | SF Tension |
|---|---|---|---|---|---|---|---|---|---|---|
| 14 3/4 | 0 | 985 | 985 | 10-3/4" | 40.50 | J-55 | BT&C | 3.51 | 6.94 | 15.77 |
| 9 7/8 | 0 | 12449 | 12276 | 7-5/8" | 29.70 | L-80 HC | TMK FJ | 2.36 | 1.14 | 1.82 |
| 6 3/4 | 0 | 11750 | 11750 | 5-1/2" | 20.00 | L-80 | LT&C | 1.38 | 1.43 | 1.88 |
| 6 3/4 | 11750 | 22218 | 12320 | 5" | 18.00 | P-110 | BT&C | 2.00 | 2.02 | 56.53 |
| | | | | | BLM Minimum Safety Factor | | | 1.125 | 1 | 1.6 Dry<br>1.8 Wet |

# Vaca Draw 20-17 Fed 46H

Casing Assumptions

| Hole Size | Casing Depth From | Casing Depth To | Setting Depth TVD | Casing Size | Weight (lb/ft) | Grade | Conn. | SF Collapse | SF Burst | SF Tension |
|---|---|---|---|---|---|---|---|---|---|---|
| 14 3/4 | 0 | 985 | 985 | 10-3/4" | 40.50 | J-55 | BT&C | 3.51 | 6.94 | 15.77 |
| 9 7/8 | 0 | 12449 | 12276 | 7-5/8" | 29.70 | L-80 HC | TMK FJ | 2.36 | 1.14 | 1.82 |
| 6 3/4 | 0 | 11750 | 11750 | 5-1/2" | 20.00 | L-80 | LT&C | 1.38 | 1.43 | 1.88 |
| 6 3/4 | 11750 | 22218 | 12320 | 5" | 18.00 | P-110 | BT&C | 2.00 | 2.02 | 56.53 |
| | | | | | BLM Minimum Safety Factor | | | 1.125 | 1 | 1.6 Dry<br>1.8 Wet |

Hydrogen Sulfide Drilling Operations Plan
**Vaca Draw 20-17 Federal 46H**
Cimarex Energy Co.
UL: O, Sec. 20, 25S, 33E
Lea Co., NM

1 All Company and Contract personnel admitted on location must be trained by a qualified H2S safety instructor to the following:

A. Characteristics of $H_2S$
B. Physical effects and hazards
C. Principal and operation of H2S detectors, warning system and briefing areas.
D. Evacuation procedure, routes and first aid.
E. Proper use of safety equipment & life support systems
F. Essential personnel meeting Medical Evaluation criteria will receive additional training on the proper use of 30 minute pressure demand air packs.

$H_2S$ Detection and Alarm Systems:

A. H2S sensors/detectors to be located on the drilling rig floor, in the base of the sub structure/cellar area, on the mud pits in the shale shaker area. Additional H2S detectors may play placed as deemed necessary.

B. An audio alarm system will be installed on the derrick floor and in the top doghouse.

3 Windsock and/or wind streamers:

A. Windsock at mudpit area should be high enough to be visible.
B. Windsock on the rig floor and / or top doghouse should be high enough to be visible.

4 Condition Flags and Signs

A. Warning sign on access road to location.
B. Flags to be displayed on sign at entrance to location. Green flag indicates normal safe condition. Yellow flag indicates potential pressure and danger. Red flag indicates danger ($H_2S$ present in dangerous concentration). Only H2S trained and certified personnel admitted to location.

5 Well control equipment:

A. See exhibit "E-1"

6 Communication:

A. While working under masks chalkboards will be used for communication.
B. Hand signals will be used where chalk board is inappropriate.
C. Two way radio will be used to communicate off location in case of emergency help is required. In most cases cellular telephones will be available at most drilling foreman's trailer or living quarters.

7 Drillstem Testing:
No DSTs r cores are planned at this time.

8 Drilling contractor supervisor will be required to be familiar with the effects $H_2S$ has on tubular goods and other mechanical equipment.

9 If H2S is encountered, mud system will be altered if necessary to maintain control of formation. A mud gas separator will be brought into service along with H2S scavengers if necessary.

$H_2S$ Contingency Plan
**Vaca Draw 20-17 Federal 46H**
Cimarex Energy Co.
UL: O, Sec. 20, 25S, 33E
Lea Co., NM

**Emergency Procedures**

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

« Isolate the area and prevent entry by other persons into the 100 ppm ROE.
« Evacuate any public places encompassed by the 100 ppm ROE.
« Be equipped with $H_2S$ monitors and air packs in order to control the release.
« Use the "buddy system" to ensure no injuries occur during the 432-620-1975
« Take precautions to avoid personal injury during this operation.
« Contact operator and/or local officials to aid in operation. See list of phone numbers attached.
« Have received training in the:
  · Detection of $H_2S$, and
  · Measures for protection against the gas,
  · Equipment used for protection and emergency response.

**Ignition of Gas Source**

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

**Characteristics of $H_2S$ and $SO_2$**

Please see attached International Chemical Safety Cards.

**Contacting Authorities**

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

$H_2S$ Contingency Plan Emergency Contacts
**Vaca Draw 20-17 Federal 46H**
Cimarex Energy Co.
UL: O, Sec. 20, 25S, 33E
Lea Co., NM

| **Company Office** | | | |
|---|---|---|---|
| Cimarex Energy Co. of Colorado<br>Co. Office and After-Hours Menu | 800-969-4789 | | |

**Key Personnel**

| **Name** | **Title** | **Office** | **Mobile** |
|---|---|---|---|
| Larry Seigrist | Drilling Manager | 432-620-1934 | 580-243-8485 |
| Charlie Pritchard | Drilling Superintendent | 432-620-1975 | 432-238-7084 |
| Roy Shirley | Construction Superintendent | | 432-634-2136 |

| **Artesia** | | | |
|---|---|---|---|
| Ambulance | 911 | | |
| State Police | 575-746-2703 | | |
| City Police | 575-746-2703 | | |
| Sheriff's Office | 575-746-9888 | | |
| **Fire Department** | **575-746-2701** | | |
| Local Emergency Planning Committee | 575-746-2122 | | |
| New Mexico Oil Conservation Division | 575-748-1283 | | |

| **Carlsbad** | | | |
|---|---|---|---|
| Ambulance | 911 | | |
| State Police | 575-885-3137 | | |
| City Police | 575-885-2111 | | |
| Sheriff's Office | 575-887-7551 | | |
| **Fire Department** | **575-887-3798** | | |
| Local Emergency Planning Committee | 575-887-6544 | | |
| US Bureau of Land Management | 575-887-6544 | | |

| **Santa Fe** | | | |
|---|---|---|---|
| New Mexico Emergency Response Commission (Santa Fe) | 505-476-9600 | | |
| New Mexico Emergency Response Commission (Santa Fe) 24 Hrs | 505-827-9126 | | |
| New Mexico State Emergency Operations Center | 505-476-9635 | | |

| **National** | | | |
|---|---|---|---|
| National Emergency Response Center (Washington, D.C.) | 800-424-8802 | | |

| **Medical** | | | |
|---|---|---|---|
| Flight for Life - 4000 24th St.; Lubbock, TX | 806-743-9911 | | |
| Aerocare - R3, Box 49F; Lubbock, TX | 806-747-8923 | | |
| Med Flight Air Amb - 2301 Yale Blvd S.E., #D3; Albuquerque, NM | 505-842-4433 | | |
| SB Air Med Service - 2505 Clark Carr Loop S.E.; Albuquerque, NM | 505-842-4949 | | |

| **Other** | | | |
|---|---|---|---|
| Boots & Coots IWC | 800-256-9688 | or | 281-931-8884 |
| Cudd Pressure Control | 432-699-0139 | or | 432-563-3356 |
| Halliburton | 575-746-2757 | | |
| B.J. Services | 575-746-3569 | | |

Schlumberger

# Cimarex Vaca Draw 20-17 Federal #46H Rev0 RM 12Sept19 Proposal
## Geodetic Report
**(Non-Def Plan)**

CIMAREX

| | | | |
|---|---|---|---|
| **Report Date:** | October 04, 2019 - 04:27 PM | **Survey / DLS Computation:** | Minimum Curvature / Lubinski |
| **Client:** | Cimarex Energy | **Vertical Section Azimuth:** | 359.634 ° (Grid North) |
| **Field:** | NM Lea County (NAD 83) | **Vertical Section Origin:** | 0.000 ft, 0.000 ft |
| **Structure / Slot:** | Cimarex Vaca Draw 20-17 Federal #46H / New Slot | **TVD Reference Datum:** | RKB |
| **Well:** | Vaca Draw 20-17 Federal #46H | **TVD Reference Elevation:** | 3432.100 ft above MSL |
| **Borehole:** | Vaca Draw 20-17 Federal #46H | **Seabed / Ground Elevation:** | 3406.100 ft above MSL |
| **UWI / API#:** | Unknown / Unknown | **Magnetic Declination:** | 6.611 ° |
| **Survey Name:** | Cimarex Vaca Draw 20-17 Federal #46H Rev0 RM 12Sept19 | **Total Gravity Field Strength:** | 998.4316mgn (9.80665 Based) |
| **Survey Date:** | September 12, 2019 | **Gravity Model:** | GARM |
| **Tort / AHD / DDI / ERD Ratio:** | 93.061 ° / 10138.122 ft / 6.231 / 0.823 | **Total Magnetic Field Strength:** | 47739.051 nT |
| **Coordinate Reference System:** | NAD83 New Mexico State Plane, Eastern Zone, US Feet | **Magnetic Dip Angle:** | 59.707 ° |
| **Location Lat / Long:** | N 32° 6' 35.05698", W 103° 35' 32.71750" | **Declination Date:** | October 04, 2019 |
| **Location Grid N/E Y/X:** | N 404447.510 ftUS, E 770740.150 ftUS | **Magnetic Declination Model:** | HDGM 2019 |
| **CRS Grid Convergence Angle:** | 0.3938 ° | **North Reference:** | Grid North |
| **Grid Scale Factor:** | 0.99996936 | **Grid Convergence Used:** | 0.3938 ° |
| **Version / Patch:** | 2.10.782.0 | **Total Corr Mag North->Grid North:** | 6.2172 ° |
| | | **Local Coord Referenced To:** | Well Head |

| Comments | MD (ft) | Incl (°) | Azim Grid (°) | TVD (ft) | VSEC (ft) | NS (ft) | EW (ft) | DLS (°/100ft) | Northing (ftUS) | Easting (ftUS) | Latitude (N/S ° ' ") | Longitude (E/W ° ' ") |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SHL [330' FSL, 2060' FEL] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | N/A | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 100.00 | 0.00 | 20.13 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 200.00 | 0.00 | 20.13 | 200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 300.00 | 0.00 | 20.13 | 300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 400.00 | 0.00 | 20.13 | 400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 500.00 | 0.00 | 20.13 | 500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 600.00 | 0.00 | 20.13 | 600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 700.00 | 0.00 | 20.13 | 700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 800.00 | 0.00 | 20.13 | 800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 900.00 | 0.00 | 20.13 | 900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| *Rustler* | *935.00* | *0.00* | *20.13* | *935.00* | *0.00* | *0.00* | *0.00* | *0.00* | *404447.51* | *770740.15* | *N 32 6 35.06* | *W 103 35 32.72* |
| | 1000.00 | 0.00 | 20.13 | 1000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 1100.00 | 0.00 | 20.13 | 1100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 1200.00 | 0.00 | 20.13 | 1200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| *Top of Salt* | *1298.00* | *0.00* | *20.13* | *1298.00* | *0.00* | *0.00* | *0.00* | *0.00* | *404447.51* | *770740.15* | *N 32 6 35.06* | *W 103 35 32.72* |
| | 1300.00 | 0.00 | 20.13 | 1300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 1400.00 | 0.00 | 20.13 | 1400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 1500.00 | 0.00 | 20.13 | 1500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 1600.00 | 0.00 | 20.13 | 1600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 1700.00 | 0.00 | 20.13 | 1700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 1800.00 | 0.00 | 20.13 | 1800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 1900.00 | 0.00 | 20.13 | 1900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 2000.00 | 0.00 | 20.13 | 2000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 2100.00 | 0.00 | 20.13 | 2100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 2200.00 | 0.00 | 20.13 | 2200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 2300.00 | 0.00 | 20.13 | 2300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 2400.00 | 0.00 | 20.13 | 2400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 2500.00 | 0.00 | 20.13 | 2500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 2600.00 | 0.00 | 20.13 | 2600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 2700.00 | 0.00 | 20.13 | 2700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 2800.00 | 0.00 | 20.13 | 2800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 2900.00 | 0.00 | 20.13 | 2900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 3000.00 | 0.00 | 20.13 | 3000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 3100.00 | 0.00 | 20.13 | 3100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 3200.00 | 0.00 | 20.13 | 3200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 3300.00 | 0.00 | 20.13 | 3300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 3400.00 | 0.00 | 20.13 | 3400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 3500.00 | 0.00 | 20.13 | 3500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 3600.00 | 0.00 | 20.13 | 3600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 3700.00 | 0.00 | 20.13 | 3700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 3800.00 | 0.00 | 20.13 | 3800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 3900.00 | 0.00 | 20.13 | 3900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 4000.00 | 0.00 | 20.13 | 4000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 4100.00 | 0.00 | 20.13 | 4100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 4200.00 | 0.00 | 20.13 | 4200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 4300.00 | 0.00 | 20.13 | 4300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 4400.00 | 0.00 | 20.13 | 4400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 4500.00 | 0.00 | 20.13 | 4500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 4600.00 | 0.00 | 20.13 | 4600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 4700.00 | 0.00 | 20.13 | 4700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| *Base of Salt* | *4714.00* | *0.00* | *20.13* | *4714.00* | *0.00* | *0.00* | *0.00* | *0.00* | *404447.51* | *770740.15* | *N 32 6 35.06* | *W 103 35 32.72* |
| | 4800.00 | 0.00 | 20.13 | 4800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 4900.00 | 0.00 | 20.13 | 4900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| *Lamar* | *4909.00* | *0.00* | *20.13* | *4909.00* | *0.00* | *0.00* | *0.00* | *0.00* | *404447.51* | *770740.15* | *N 32 6 35.06* | *W 103 35 32.72* |
| *Bell Canyon* | *4937.00* | *0.00* | *20.13* | *4937.00* | *0.00* | *0.00* | *0.00* | *0.00* | *404447.51* | *770740.15* | *N 32 6 35.06* | *W 103 35 32.72* |
| | 5000.00 | 0.00 | 20.13 | 5000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 5100.00 | 0.00 | 20.13 | 5100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 5200.00 | 0.00 | 20.13 | 5200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 5300.00 | 0.00 | 20.13 | 5300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 5400.00 | 0.00 | 20.13 | 5400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 5500.00 | 0.00 | 20.13 | 5500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 5600.00 | 0.00 | 20.13 | 5600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 5700.00 | 0.00 | 20.13 | 5700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 5800.00 | 0.00 | 20.13 | 5800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 5900.00 | 0.00 | 20.13 | 5900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| *Cherry Canyon* | *5990.00* | *0.00* | *20.13* | *5990.00* | *0.00* | *0.00* | *0.00* | *0.00* | *404447.51* | *770740.15* | *N 32 6 35.06* | *W 103 35 32.72* |
| | 6000.00 | 0.00 | 20.13 | 6000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 6100.00 | 0.00 | 20.13 | 6100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 6200.00 | 0.00 | 20.13 | 6200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 6300.00 | 0.00 | 20.13 | 6300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 6400.00 | 0.00 | 20.13 | 6400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 6500.00 | 0.00 | 20.13 | 6500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 6600.00 | 0.00 | 20.13 | 6600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 6700.00 | 0.00 | 20.13 | 6700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 6800.00 | 0.00 | 20.13 | 6800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 6900.00 | 0.00 | 20.13 | 6900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 7000.00 | 0.00 | 20.13 | 7000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 7100.00 | 0.00 | 20.13 | 7100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |

| Comments | MD (ft) | Incl (°) | Azim Grid (°) | TVD (ft) | VSEC (ft) | NS (ft) | EW (ft) | DLS (°/100ft) | Northing (ftUS) | Easting (ftUS) | Latitude (N/S ° ' ") | Longitude (E/W ° ' ") |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 7200.00 | 0.00 | 20.13 | 7200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 7300.00 | 0.00 | 20.13 | 7300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 7400.00 | 0.00 | 20.13 | 7400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 7500.00 | 0.00 | 20.13 | 7500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| *Brushy Canyon* | *7536.00* | *0.00* | *20.13* | *7536.00* | *0.00* | *0.00* | *0.00* | *0.00* | *404447.51* | *770740.15* | *N 32 6 35.06* | *W 103 35 32.72* |
| | 7600.00 | 0.00 | 20.13 | 7600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 7700.00 | 0.00 | 20.13 | 7700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 7800.00 | 0.00 | 20.13 | 7800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 7900.00 | 0.00 | 20.13 | 7900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 8000.00 | 0.00 | 20.13 | 8000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 8100.00 | 0.00 | 20.13 | 8100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 8200.00 | 0.00 | 20.13 | 8200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 8300.00 | 0.00 | 20.13 | 8300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 8400.00 | 0.00 | 20.13 | 8400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 8500.00 | 0.00 | 20.13 | 8500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 8600.00 | 0.00 | 20.13 | 8600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 8700.00 | 0.00 | 20.13 | 8700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 8800.00 | 0.00 | 20.13 | 8800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 8900.00 | 0.00 | 20.13 | 8900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 9000.00 | 0.00 | 20.13 | 9000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| *Bone Spring Lime* | *9032.00* | *0.00* | *20.13* | *9032.00* | *0.00* | *0.00* | *0.00* | *0.00* | *404447.51* | *770740.15* | *N 32 6 35.06* | *W 103 35 32.72* |
| *Leonard Shale* | *9087.00* | *0.00* | *20.13* | *9087.00* | *0.00* | *0.00* | *0.00* | *0.00* | *404447.51* | *770740.15* | *N 32 6 35.06* | *W 103 35 32.72* |
| | 9100.00 | 0.00 | 20.13 | 9100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 9200.00 | 0.00 | 20.13 | 9200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 9300.00 | 0.00 | 20.13 | 9300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| *Avalon Shale* | *9312.00* | *0.00* | *20.13* | *9312.00* | *0.00* | *0.00* | *0.00* | *0.00* | *404447.51* | *770740.15* | *N 32 6 35.06* | *W 103 35 32.72* |
| | 9400.00 | 0.00 | 20.13 | 9400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 9500.00 | 0.00 | 20.13 | 9500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 9600.00 | 0.00 | 20.13 | 9600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 9700.00 | 0.00 | 20.13 | 9700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 9800.00 | 0.00 | 20.13 | 9800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 9900.00 | 0.00 | 20.13 | 9900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 10000.00 | 0.00 | 20.13 | 10000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| *1st Bone Spring Sand* | *10011.00* | *0.00* | *20.13* | *10011.00* | *0.00* | *0.00* | *0.00* | *0.00* | *404447.51* | *770740.15* | *N 32 6 35.06* | *W 103 35 32.72* |
| | 10100.00 | 0.00 | 20.13 | 10100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 10200.00 | 0.00 | 20.13 | 10200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| *2nd Bone Spring Carb* | *10223.00* | *0.00* | *20.13* | *10223.00* | *0.00* | *0.00* | *0.00* | *0.00* | *404447.51* | *770740.15* | *N 32 6 35.06* | *W 103 35 32.72* |
| | 10300.00 | 0.00 | 20.13 | 10300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 10400.00 | 0.00 | 20.13 | 10400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 10500.00 | 0.00 | 20.13 | 10500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| *2nd Bone Spring Sand* | *10583.00* | *0.00* | *20.13* | *10583.00* | *0.00* | *0.00* | *0.00* | *0.00* | *404447.51* | *770740.15* | *N 32 6 35.06* | *W 103 35 32.72* |
| | 10600.00 | 0.00 | 20.13 | 10600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 10700.00 | 0.00 | 20.13 | 10700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 10800.00 | 0.00 | 20.13 | 10800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 10900.00 | 0.00 | 20.13 | 10900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 11000.00 | 0.00 | 20.13 | 11000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| *3rd Bone Spring Carb* | *11071.00* | *0.00* | *20.13* | *11071.00* | *0.00* | *0.00* | *0.00* | *0.00* | *404447.51* | *770740.15* | *N 32 6 35.06* | *W 103 35 32.72* |
| | 11100.00 | 0.00 | 20.13 | 11100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 11200.00 | 0.00 | 20.13 | 11200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 11300.00 | 0.00 | 20.13 | 11300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 11400.00 | 0.00 | 20.13 | 11400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 11500.00 | 0.00 | 20.13 | 11500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 11600.00 | 0.00 | 20.13 | 11600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 11700.00 | 0.00 | 20.13 | 11700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| *3rd Bone Spring Sand* | *11722.00* | *0.00* | *20.13* | *11722.00* | *0.00* | *0.00* | *0.00* | *0.00* | *404447.51* | *770740.15* | *N 32 6 35.06* | *W 103 35 32.72* |
| KOP - Build 12°/100' DLS | 11799.43 | 0.00 | 20.13 | 11799.43 | 0.00 | 0.00 | 0.00 | 0.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 11800.00 | 0.07 | 20.13 | 11800.00 | 0.00 | 0.00 | 0.00 | 12.00 | 404447.51 | 770740.15 | N 32 6 35.06 | W 103 35 32.72 |
| | 11900.00 | 12.07 | 20.13 | 11899.26 | 9.89 | 9.91 | 3.63 | 12.00 | 404457.42 | 770743.78 | N 32 6 35.15 | W 103 35 32.67 |
| | 12000.00 | 24.07 | 20.13 | 11994.15 | 38.89 | 38.98 | 14.28 | 12.00 | 404486.49 | 770754.43 | N 32 6 35.44 | W 103 35 32.55 |
| Build & Turn 12°/100' DLS | 12091.09 | 35.00 | 20.13 | 12073.29 | 80.89 | 81.08 | 29.71 | 12.00 | 404528.58 | 770769.86 | N 32 6 35.86 | W 103 35 32.37 |
| | 12100.00 | 35.93 | 19.22 | 12080.54 | 85.74 | 85.94 | 31.45 | 12.00 | 404533.45 | 770771.60 | N 32 6 35.91 | W 103 35 32.35 |
| | 12200.00 | 46.74 | 11.27 | 12155.57 | 149.28 | 149.59 | 48.29 | 12.00 | 404597.10 | 770788.44 | N 32 6 36.53 | W 103 35 32.14 |
| *Wolfcamp* | *12251.61* | *52.49* | *8.23* | *12189.00* | *187.96* | *188.32* | *54.90* | *12.00* | *404635.82* | *770795.05* | *N 32 6 36.92* | *W 103 35 32.06* |
| | 12300.00 | 57.93 | 5.78 | 12216.60 | 227.36 | 227.74 | 59.72 | 12.00 | 404675.25 | 770799.87 | N 32 6 37.31 | W 103 35 32.01 |
| | 12400.00 | 69.31 | 1.51 | 12260.97 | 316.56 | 316.99 | 65.24 | 12.00 | 404764.49 | 770805.38 | N 32 6 38.19 | W 103 35 31.93 |
| Build 4°/100' DLS | 12449.68 | 75.00 | 359.63 | 12276.19 | 363.83 | 364.26 | 65.69 | 12.00 | 404811.75 | 770805.84 | N 32 6 38.66 | W 103 35 31.92 |
| | 12500.00 | 77.01 | 359.63 | 12288.36 | 412.65 | 413.08 | 65.38 | 4.00 | 404860.57 | 770805.53 | N 32 6 39.14 | W 103 35 31.92 |
| *Wolfcamp Y SS* | *12567.65* | *79.72* | *359.63* | *12302.00* | *478.90* | *479.32* | *64.96* | *4.00* | *404926.82* | *770805.11* | *N 32 6 39.80* | *W 103 35 31.92* |
| | 12600.00 | 81.01 | 359.63 | 12307.41 | 510.80 | 511.22 | 64.76 | 4.00 | 404958.71 | 770804.90 | N 32 6 40.11 | W 103 35 31.92 |
| | 12700.00 | 85.01 | 359.63 | 12319.58 | 610.03 | 610.46 | 64.12 | 4.00 | 405057.95 | 770804.27 | N 32 6 41.09 | W 103 35 31.92 |
| | 12800.00 | 89.01 | 359.63 | 12324.79 | 709.88 | 710.30 | 63.48 | 4.00 | 405157.78 | 770803.63 | N 32 6 42.08 | W 103 35 31.92 |
| *Wolfcamp Y Target* | *12823.86* | *89.97* | *359.63* | *12325.00* | *733.73* | *734.15* | *63.33* | *4.00* | *405181.64* | *770803.48* | *N 32 6 42.32* | *W 103 35 31.92* |
| Landing Point | 12825.45 | 90.03 | 359.63 | 12325.00 | 735.32 | 735.74 | 63.32 | 4.00 | 405183.23 | 770803.47 | N 32 6 42.33 | W 103 35 31.92 |
| *Wolfcamp Y Target* | *12825.51* | *90.03* | *359.63* | *12325.00* | *735.39* | *735.81* | *63.32* | *0.00* | *405183.29* | *770803.47* | *N 32 6 42.33* | *W 103 35 31.92* |
| | 12900.00 | 90.03 | 359.63 | 12324.96 | 809.88 | 810.29 | 62.85 | 0.00 | 405257.78 | 770802.99 | N 32 6 43.07 | W 103 35 31.92 |
| | 13000.00 | 90.03 | 359.63 | 12324.91 | 909.88 | 910.29 | 62.21 | 0.00 | 405357.77 | 770802.35 | N 32 6 44.06 | W 103 35 31.92 |
| | 13100.00 | 90.03 | 359.63 | 12324.85 | 1009.88 | 1010.29 | 61.57 | 0.00 | 405457.77 | 770801.72 | N 32 6 45.05 | W 103 35 31.92 |
| | 13200.00 | 90.03 | 359.63 | 12324.80 | 1109.88 | 1110.29 | 60.93 | 0.00 | 405557.76 | 770801.08 | N 32 6 46.04 | W 103 35 31.92 |
| | 13300.00 | 90.03 | 359.63 | 12324.75 | 1209.88 | 1210.29 | 60.29 | 0.00 | 405657.76 | 770800.44 | N 32 6 47.03 | W 103 35 31.92 |
| | 13400.00 | 90.03 | 359.63 | 12324.69 | 1309.88 | 1310.28 | 59.65 | 0.00 | 405757.75 | 770799.80 | N 32 6 48.02 | W 103 35 31.92 |
| | 13500.00 | 90.03 | 359.63 | 12324.64 | 1409.88 | 1410.28 | 59.01 | 0.00 | 405857.75 | 770799.16 | N 32 6 49.01 | W 103 35 31.92 |
| | 13600.00 | 90.03 | 359.63 | 12324.59 | 1509.88 | 1510.28 | 58.37 | 0.00 | 405957.74 | 770798.52 | N 32 6 50.00 | W 103 35 31.92 |
| | 13700.00 | 90.03 | 359.63 | 12324.53 | 1609.88 | 1610.28 | 57.74 | 0.00 | 406057.73 | 770797.88 | N 32 6 50.99 | W 103 35 31.92 |
| | 13800.00 | 90.03 | 359.63 | 12324.48 | 1709.88 | 1710.28 | 57.10 | 0.00 | 406157.73 | 770797.24 | N 32 6 51.98 | W 103 35 31.92 |
| | 13900.00 | 90.03 | 359.63 | 12324.43 | 1809.88 | 1810.27 | 56.46 | 0.00 | 406257.72 | 770796.61 | N 32 6 52.97 | W 103 35 31.92 |
| | 14000.00 | 90.03 | 359.63 | 12324.37 | 1909.88 | 1910.27 | 55.82 | 0.00 | 406357.72 | 770795.97 | N 32 6 53.96 | W 103 35 31.92 |
| | 14100.00 | 90.03 | 359.63 | 12324.32 | 2009.88 | 2010.27 | 55.18 | 0.00 | 406457.71 | 770795.33 | N 32 6 54.95 | W 103 35 31.92 |
| | 14200.00 | 90.03 | 359.63 | 12324.27 | 2109.88 | 2110.27 | 54.54 | 0.00 | 406557.71 | 770794.69 | N 32 6 55.93 | W 103 35 31.91 |
| | 14300.00 | 90.03 | 359.63 | 12324.22 | 2209.88 | 2210.26 | 53.90 | 0.00 | 406657.70 | 770794.05 | N 32 6 56.92 | W 103 35 31.91 |
| | 14400.00 | 90.03 | 359.63 | 12324.16 | 2309.88 | 2310.26 | 53.26 | 0.00 | 406757.70 | 770793.41 | N 32 6 57.91 | W 103 35 31.91 |
| | 14500.00 | 90.03 | 359.63 | 12324.11 | 2409.88 | 2410.26 | 52.63 | 0.00 | 406857.69 | 770792.77 | N 32 6 58.90 | W 103 35 31.91 |
| | 14600.00 | 90.03 | 359.63 | 12324.06 | 2509.88 | 2510.26 | 51.99 | 0.00 | 406957.69 | 770792.14 | N 32 6 59.89 | W 103 35 31.91 |
| | 14700.00 | 90.03 | 359.63 | 12324.00 | 2609.88 | 2610.26 | 51.35 | 0.00 | 407057.68 | 770791.50 | N 32 7 0.88 | W 103 35 31.91 |
| | 14800.00 | 90.03 | 359.63 | 12323.95 | 2709.88 | 2710.25 | 50.71 | 0.00 | 407157.68 | 770790.86 | N 32 7 1.87 | W 103 35 31.91 |
| | 14900.00 | 90.03 | 359.63 | 12323.90 | 2809.88 | 2810.25 | 50.07 | 0.00 | 407257.67 | 770790.22 | N 32 7 2.86 | W 103 35 31.91 |
| | 15000.00 | 90.03 | 359.63 | 12323.84 | 2909.88 | 2910.25 | 49.43 | 0.00 | 407357.67 | 770789.58 | N 32 7 3.85 | W 103 35 31.91 |
| | 15100.00 | 90.03 | 359.63 | 12323.79 | 3009.88 | 3010.25 | 48.79 | 0.00 | 407457.66 | 770788.94 | N 32 7 4.84 | W 103 35 31.91 |

| Comments | MD (ft) | Incl (°) | Azim Grid (°) | TVD (ft) | VSEC (ft) | NS (ft) | EW (ft) | DLS (°/100ft) | Northing (ftUS) | Easting (ftUS) | Latitude (N/S ° ' ") | Longitude (E/W ° ' ") |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15200.00 | 90.03 | 359.63 | 12323.74 | 3109.88 | 3110.25 | 48.15 | 0.00 | 407557.65 | 770788.30 | N 32 7 5.83 | W 103 35 31.91 |
| | 15300.00 | 90.03 | 359.63 | 12323.68 | 3209.88 | 3210.24 | 47.52 | 0.00 | 407657.65 | 770787.66 | N 32 7 6.82 | W 103 35 31.91 |
| | 15400.00 | 90.03 | 359.63 | 12323.63 | 3309.88 | 3310.24 | 46.88 | 0.00 | 407757.64 | 770787.03 | N 32 7 7.81 | W 103 35 31.91 |
| | 15500.00 | 90.03 | 359.63 | 12323.58 | 3409.88 | 3410.24 | 46.24 | 0.00 | 407857.64 | 770786.39 | N 32 7 8.80 | W 103 35 31.91 |
| | 15600.00 | 90.03 | 359.63 | 12323.52 | 3509.88 | 3510.24 | 45.60 | 0.00 | 407957.63 | 770785.75 | N 32 7 9.79 | W 103 35 31.91 |
| | 15700.00 | 90.03 | 359.63 | 12323.47 | 3609.88 | 3610.24 | 44.96 | 0.00 | 408057.63 | 770785.11 | N 32 7 10.78 | W 103 35 31.91 |
| | 15800.00 | 90.03 | 359.63 | 12323.42 | 3709.88 | 3710.23 | 44.32 | 0.00 | 408157.62 | 770784.47 | N 32 7 11.77 | W 103 35 31.91 |
| | 15900.00 | 90.03 | 359.63 | 12323.36 | 3809.88 | 3810.23 | 43.68 | 0.00 | 408257.62 | 770783.83 | N 32 7 12.76 | W 103 35 31.91 |
| | 16000.00 | 90.03 | 359.63 | 12323.31 | 3909.88 | 3910.23 | 43.04 | 0.00 | 408357.61 | 770783.19 | N 32 7 13.75 | W 103 35 31.90 |
| | 16100.00 | 90.03 | 359.63 | 12323.26 | 4009.88 | 4010.23 | 42.41 | 0.00 | 408457.61 | 770782.55 | N 32 7 14.74 | W 103 35 31.90 |
| | 16200.00 | 90.03 | 359.63 | 12323.20 | 4109.88 | 4110.23 | 41.77 | 0.00 | 408557.60 | 770781.92 | N 32 7 15.73 | W 103 35 31.90 |
| | 16300.00 | 90.03 | 359.63 | 12323.15 | 4209.88 | 4210.22 | 41.13 | 0.00 | 408657.60 | 770781.28 | N 32 7 16.71 | W 103 35 31.90 |
| | 16400.00 | 90.03 | 359.63 | 12323.10 | 4309.88 | 4310.22 | 40.49 | 0.00 | 408757.59 | 770780.64 | N 32 7 17.70 | W 103 35 31.90 |
| | 16500.00 | 90.03 | 359.63 | 12323.04 | 4409.88 | 4410.22 | 39.85 | 0.00 | 408857.59 | 770780.00 | N 32 7 18.69 | W 103 35 31.90 |
| | 16600.00 | 90.03 | 359.63 | 12322.99 | 4509.88 | 4510.22 | 39.21 | 0.00 | 408957.58 | 770779.36 | N 32 7 19.68 | W 103 35 31.90 |
| | 16700.00 | 90.03 | 359.63 | 12322.94 | 4609.88 | 4610.22 | 38.57 | 0.00 | 409057.58 | 770778.72 | N 32 7 20.67 | W 103 35 31.90 |
| | 16800.00 | 90.03 | 359.63 | 12322.88 | 4709.88 | 4710.21 | 37.93 | 0.00 | 409157.57 | 770778.08 | N 32 7 21.66 | W 103 35 31.90 |
| | 16900.00 | 90.03 | 359.63 | 12322.83 | 4809.88 | 4810.21 | 37.30 | 0.00 | 409257.56 | 770777.44 | N 32 7 22.65 | W 103 35 31.90 |
| | 17000.00 | 90.03 | 359.63 | 12322.78 | 4909.88 | 4910.21 | 36.66 | 0.00 | 409357.56 | 770776.81 | N 32 7 23.64 | W 103 35 31.90 |
| | 17100.00 | 90.03 | 359.63 | 12322.72 | 5009.88 | 5010.21 | 36.02 | 0.00 | 409457.55 | 770776.17 | N 32 7 24.63 | W 103 35 31.90 |
| | 17200.00 | 90.03 | 359.63 | 12322.67 | 5109.88 | 5110.21 | 35.38 | 0.00 | 409557.55 | 770775.53 | N 32 7 25.62 | W 103 35 31.90 |
| | 17300.00 | 90.03 | 359.63 | 12322.62 | 5209.88 | 5210.20 | 34.74 | 0.00 | 409657.54 | 770774.89 | N 32 7 26.61 | W 103 35 31.90 |
| | 17400.00 | 90.03 | 359.63 | 12322.57 | 5309.88 | 5310.20 | 34.10 | 0.00 | 409757.54 | 770774.25 | N 32 7 27.60 | W 103 35 31.90 |
| | 17500.00 | 90.03 | 359.63 | 12322.51 | 5409.88 | 5410.20 | 33.46 | 0.00 | 409857.53 | 770773.61 | N 32 7 28.59 | W 103 35 31.90 |
| | 17600.00 | 90.03 | 359.63 | 12322.46 | 5509.88 | 5510.20 | 32.82 | 0.00 | 409957.53 | 770772.97 | N 32 7 29.58 | W 103 35 31.90 |
| | 17700.00 | 90.03 | 359.63 | 12322.41 | 5609.88 | 5610.20 | 32.19 | 0.00 | 410057.52 | 770772.33 | N 32 7 30.57 | W 103 35 31.89 |
| | 17800.00 | 90.03 | 359.63 | 12322.35 | 5709.88 | 5710.19 | 31.55 | 0.00 | 410157.52 | 770771.70 | N 32 7 31.56 | W 103 35 31.89 |
| | 17900.00 | 90.03 | 359.63 | 12322.30 | 5809.88 | 5810.19 | 30.91 | 0.00 | 410257.51 | 770771.06 | N 32 7 32.55 | W 103 35 31.89 |
| | 18000.00 | 90.03 | 359.63 | 12322.25 | 5909.87 | 5910.19 | 30.27 | 0.00 | 410357.51 | 770770.42 | N 32 7 33.54 | W 103 35 31.89 |
| | 18100.00 | 90.03 | 359.63 | 12322.19 | 6009.87 | 6010.19 | 29.63 | 0.00 | 410457.50 | 770769.78 | N 32 7 34.53 | W 103 35 31.89 |
| | 18200.00 | 90.03 | 359.63 | 12322.14 | 6109.87 | 6110.18 | 28.99 | 0.00 | 410557.50 | 770769.14 | N 32 7 35.52 | W 103 35 31.89 |
| | 18300.00 | 90.03 | 359.63 | 12322.09 | 6209.87 | 6210.18 | 28.35 | 0.00 | 410657.49 | 770768.50 | N 32 7 36.51 | W 103 35 31.89 |
| | 18400.00 | 90.03 | 359.63 | 12322.03 | 6309.87 | 6310.18 | 27.71 | 0.00 | 410757.48 | 770767.86 | N 32 7 37.49 | W 103 35 31.89 |
| | 18500.00 | 90.03 | 359.63 | 12321.98 | 6409.87 | 6410.18 | 27.08 | 0.00 | 410857.48 | 770767.22 | N 32 7 38.48 | W 103 35 31.89 |
| | 18600.00 | 90.03 | 359.63 | 12321.93 | 6509.87 | 6510.18 | 26.44 | 0.00 | 410957.47 | 770766.59 | N 32 7 39.47 | W 103 35 31.89 |
| | 18700.00 | 90.03 | 359.63 | 12321.87 | 6609.87 | 6610.17 | 25.80 | 0.00 | 411057.47 | 770765.95 | N 32 7 40.46 | W 103 35 31.89 |
| | 18800.00 | 90.03 | 359.63 | 12321.82 | 6709.87 | 6710.17 | 25.16 | 0.00 | 411157.46 | 770765.31 | N 32 7 41.45 | W 103 35 31.89 |
| | 18900.00 | 90.03 | 359.63 | 12321.77 | 6809.87 | 6810.17 | 24.52 | 0.00 | 411257.46 | 770764.67 | N 32 7 42.44 | W 103 35 31.89 |
| | 19000.00 | 90.03 | 359.63 | 12321.71 | 6909.87 | 6910.17 | 23.88 | 0.00 | 411357.45 | 770764.03 | N 32 7 43.43 | W 103 35 31.89 |
| | 19100.00 | 90.03 | 359.63 | 12321.66 | 7009.87 | 7010.17 | 23.24 | 0.00 | 411457.45 | 770763.39 | N 32 7 44.42 | W 103 35 31.89 |
| | 19200.00 | 90.03 | 359.63 | 12321.61 | 7109.87 | 7110.16 | 22.60 | 0.00 | 411557.44 | 770762.75 | N 32 7 45.41 | W 103 35 31.89 |
| | 19300.00 | 90.03 | 359.63 | 12321.55 | 7209.87 | 7210.16 | 21.97 | 0.00 | 411657.44 | 770762.11 | N 32 7 46.40 | W 103 35 31.89 |
| | 19400.00 | 90.03 | 359.63 | 12321.50 | 7309.87 | 7310.16 | 21.33 | 0.00 | 411757.43 | 770761.48 | N 32 7 47.39 | W 103 35 31.89 |
| | 19500.00 | 90.03 | 359.63 | 12321.45 | 7409.87 | 7410.16 | 20.69 | 0.00 | 411857.43 | 770760.84 | N 32 7 48.38 | W 103 35 31.88 |
| | 19600.00 | 90.03 | 359.63 | 12321.39 | 7509.87 | 7510.16 | 20.05 | 0.00 | 411957.42 | 770760.20 | N 32 7 49.37 | W 103 35 31.88 |
| | 19700.00 | 90.03 | 359.63 | 12321.34 | 7609.87 | 7610.15 | 19.41 | 0.00 | 412057.42 | 770759.56 | N 32 7 50.36 | W 103 35 31.88 |
| | 19800.00 | 90.03 | 359.63 | 12321.29 | 7709.87 | 7710.15 | 18.77 | 0.00 | 412157.41 | 770758.92 | N 32 7 51.35 | W 103 35 31.88 |
| | 19900.00 | 90.03 | 359.63 | 12321.23 | 7809.87 | 7810.15 | 18.13 | 0.00 | 412257.41 | 770758.28 | N 32 7 52.34 | W 103 35 31.88 |
| | 20000.00 | 90.03 | 359.63 | 12321.18 | 7909.87 | 7910.15 | 17.49 | 0.00 | 412357.40 | 770757.64 | N 32 7 53.33 | W 103 35 31.88 |
| | 20100.00 | 90.03 | 359.63 | 12321.13 | 8009.87 | 8010.15 | 16.86 | 0.00 | 412457.39 | 770757.00 | N 32 7 54.32 | W 103 35 31.88 |
| | 20200.00 | 90.03 | 359.63 | 12321.07 | 8109.87 | 8110.14 | 16.22 | 0.00 | 412557.39 | 770756.37 | N 32 7 55.31 | W 103 35 31.88 |
| | 20300.00 | 90.03 | 359.63 | 12321.02 | 8209.87 | 8210.14 | 15.58 | 0.00 | 412657.38 | 770755.73 | N 32 7 56.30 | W 103 35 31.88 |
| | 20400.00 | 90.03 | 359.63 | 12320.97 | 8309.87 | 8310.14 | 14.94 | 0.00 | 412757.38 | 770755.09 | N 32 7 57.29 | W 103 35 31.88 |
| | 20500.00 | 90.03 | 359.63 | 12320.91 | 8409.87 | 8410.14 | 14.30 | 0.00 | 412857.37 | 770754.45 | N 32 7 58.27 | W 103 35 31.88 |
| | 20600.00 | 90.03 | 359.63 | 12320.86 | 8509.87 | 8510.14 | 13.66 | 0.00 | 412957.37 | 770753.81 | N 32 7 59.26 | W 103 35 31.88 |
| | 20700.00 | 90.03 | 359.63 | 12320.81 | 8609.87 | 8610.13 | 13.02 | 0.00 | 413057.36 | 770753.17 | N 32 8 0.25 | W 103 35 31.88 |
| | 20800.00 | 90.03 | 359.63 | 12320.76 | 8709.87 | 8710.13 | 12.38 | 0.00 | 413157.36 | 770752.53 | N 32 8 1.24 | W 103 35 31.88 |
| | 20900.00 | 90.03 | 359.63 | 12320.70 | 8809.87 | 8810.13 | 11.74 | 0.00 | 413257.35 | 770751.89 | N 32 8 2.23 | W 103 35 31.88 |
| | 21000.00 | 90.03 | 359.63 | 12320.65 | 8909.87 | 8910.13 | 11.11 | 0.00 | 413357.35 | 770751.26 | N 32 8 3.22 | W 103 35 31.88 |
| | 21100.00 | 90.03 | 359.63 | 12320.60 | 9009.87 | 9010.13 | 10.47 | 0.00 | 413457.34 | 770750.62 | N 32 8 4.21 | W 103 35 31.88 |
| | 21200.00 | 90.03 | 359.63 | 12320.54 | 9109.87 | 9110.12 | 9.83 | 0.00 | 413557.34 | 770749.98 | N 32 8 5.20 | W 103 35 31.87 |
| | 21300.00 | 90.03 | 359.63 | 12320.49 | 9209.87 | 9210.12 | 9.19 | 0.00 | 413657.33 | 770749.34 | N 32 8 6.19 | W 103 35 31.87 |
| | 21400.00 | 90.03 | 359.63 | 12320.44 | 9309.87 | 9310.12 | 8.55 | 0.00 | 413757.33 | 770748.70 | N 32 8 7.18 | W 103 35 31.87 |
| | 21500.00 | 90.03 | 359.63 | 12320.38 | 9409.87 | 9410.12 | 7.91 | 0.00 | 413857.32 | 770748.06 | N 32 8 8.17 | W 103 35 31.87 |
| | 21600.00 | 90.03 | 359.63 | 12320.33 | 9509.87 | 9510.11 | 7.27 | 0.00 | 413957.31 | 770747.42 | N 32 8 9.16 | W 103 35 31.87 |
| | 21700.00 | 90.03 | 359.63 | 12320.28 | 9609.87 | 9610.11 | 6.63 | 0.00 | 414057.31 | 770746.78 | N 32 8 10.15 | W 103 35 31.87 |
| | 21800.00 | 90.03 | 359.63 | 12320.22 | 9709.87 | 9710.11 | 6.00 | 0.00 | 414157.30 | 770746.15 | N 32 8 11.14 | W 103 35 31.87 |
| | 21900.00 | 90.03 | 359.63 | 12320.17 | 9809.87 | 9810.11 | 5.36 | 0.00 | 414257.30 | 770745.51 | N 32 8 12.13 | W 103 35 31.87 |
| | 22000.00 | 90.03 | 359.63 | 12320.12 | 9909.87 | 9910.11 | 4.72 | 0.00 | 414357.29 | 770744.87 | N 32 8 13.12 | W 103 35 31.87 |
| | 22100.00 | 90.03 | 359.63 | 12320.06 | 10009.87 | 10010.10 | 4.08 | 0.00 | 414457.29 | 770744.23 | N 32 8 14.11 | W 103 35 31.87 |
| | 22200.00 | 90.03 | 359.63 | 12320.01 | 10109.87 | 10110.10 | 3.44 | 0.00 | 414557.28 | 770743.59 | N 32 8 15.10 | W 103 35 31.87 |
| Cimarex Vaca Draw 20-17 Federal #46H - PBHL [100' FNL, 1992' FEL] | 22218.95 | 90.03 | 359.63 | 12320.00 | 10128.82 | 10129.05 | 3.32 | 0.00 | 414576.23 | 770743.47 | N 32 8 15.28 | W 103 35 31.87 |

**Survey Type:** Non-Def Plan

**Survey Error Model:** ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma

**Survey Program:**

| Description | Part | MD From (ft) | MD To (ft) | EOU Freq (ft) | Hole Size (in) | Casing Diameter (in) | Expected Max Inclination (deg) | Survey Tool Type | Borehole / Survey |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 0.000 | 26.000 | 1/100.000 | 30.000 | 30.000 | | NAL_MWD_IFR1+MS-Depth Only | Vaca Draw 20-17 Federal #46H / Cimarex Vaca Draw 20-17 |
| | 1 | 26.000 | 22218.948 | 1/100.000 | 30.000 | 30.000 | | NAL_MWD_IFR1+MS | Federal #46H Rev0 RM 12Sept19 Vaca Draw 20-17 Federal #46H / Cimarex Vaca Draw 20-17 |

Schlumberger

CIMAREX

# Cimarex Vaca Draw 20-17 Federal #46H Rev0 RM 12Sept19 Anti-Collision Summary Report

| | | | |
|---|---|---|---|
| **Analysis Date-24hr Time:** | October 07, 2019 - 09:44 | **Analysis Method:** | 3D Least Distance |
| **Client:** | Cimarex Energy | **Reference Trajectory:** | Cimarex Vaca Draw 20-17 Federal #46H Rev0 RM 12Sept19 (Non-Def Plan) |
| **Field:** | NM Lea County (NAD 83) | **Depth Interval:** | Every 10.00 Measured Depth (ft) |
| **Structure:** | Cimarex Vaca Draw 20-17 Federal #46H | **Rule Set:** | NAL Procedure: D&M AntiCollision Standard S002 |
| **Slot:** | New Slot | **Min Pts:** | All local minima indicated. |
| **Well:** | Vaca Draw 20-17 Federal #46H | **Version / Patch:** | 2.10.782.0 |
| **Borehole:** | Vaca Draw 20-17 Federal #46H | **Database \ Project:** | US1153APP452.dir.slb.com\drilling-NM Lea County 2.10 |
| **Scan MD Range:** | 0.00ft ~ 22218.95ft | | |

**Trajectory Error Model:** ISCWSA0 3-D 95.000% Confidence 2.7955 sigma, for subject well. For offset wells, error model version is specified with each well respectively.

**Offset Trajectories Summary**

**Offset Selection Criteria**

Wellhead distance scan: Not performed!

Selection filters: Definitive Surveys - Definitive Plans - Definitive surveys exclude definitive plans - All Non-Def Surveys when no Def-Survey is set in a borehole - All Non-Def Plans when no Def-Plan is set in a borehole

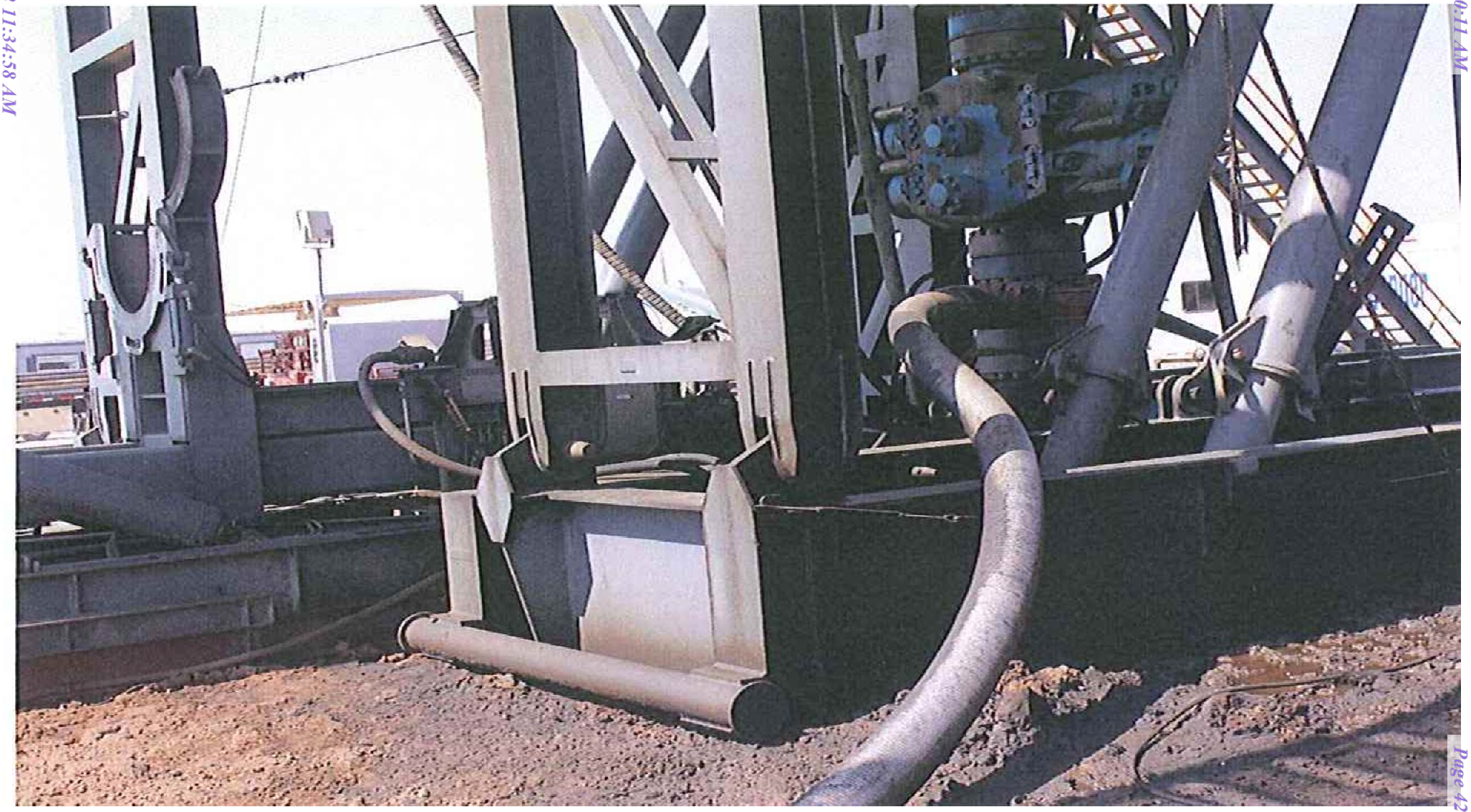
| Offset Trajectory | Separation | | | Allow | Sep. | Controlling | Reference Trajectory | | Risk Level | | | Alert | Status |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ct-Ct (ft) | MAS (ft) | EOU (ft) | Dev. (ft) | Fact. | Rule | MD (ft) | TVD (ft) | Alert | Minor | Major | | |
| Results highlighted: Sep-Factor separation <= 1.50 ft | | | | | | | | | | | | | |
| EOG Vaca Draw 20 Federal #1 (Offset) Plugged Inc Only 0ft-14200ft (Def Survey) | | | | | | | | | | | | | Fail Major |
| | 3328.05 | 32.81 | 3325.55 | 3295.25 | N/A | MAS = 10.00 (m) | 0.00 | 0.00 | | | | Surface | |
| | 3328.03 | 32.81 | 3325.40 | 3295.22 | 25648.17 | MAS = 10.00 (m) | 20.00 | 20.00 | | | | MinPts | |
| | 3328.03 | 32.81 | 3325.29 | 3295.22 | 13718.78 | MAS = 10.00 (m) | 26.00 | 26.00 | | | | WRP | |
| | 3325.63 | 35.27 | 3301.29 | 3290.36 | 152.10 | OSF1.50 | 700.00 | 700.00 | | | | MinPt-CtCt | |
| | 3329.67 | 137.02 | 3237.49 | 3192.65 | 37.10 | OSF1.50 | 2660.00 | 2660.00 | | | | MinPt-CtCt | |
| | 3329.77 | 231.90 | 3174.34 | 3097.87 | 21.76 | OSF1.50 | 4480.00 | 4480.00 | | | | MinPt-CtCt | |
| | 3327.39 | 380.08 | 3073.16 | 2947.31 | 13.21 | OSF1.50 | 7320.00 | 7320.00 | | | | MinPt-CtCt | |
| | 3325.79 | 441.17 | 3030.84 | 2884.62 | 11.36 | OSF1.50 | 8490.00 | 8490.00 | | | | MinPt-CtCt | |
| | 3315.39 | 557.31 | 2943.00 | 2758.08 | 8.96 | OSF1.50 | 10700.00 | 10700.00 | | | | MinPt-CtCt | |
| | 3317.73 | 564.50 | 2940.56 | 2753.23 | 8.85 | OSF1.50 | 10910.00 | 10910.00 | | | | MINPT-O-EOU | |
| | 3320.76 | 568.16 | 2941.14 | 2752.59 | 8.80 | OSF1.50 | 11020.00 | 11020.00 | | | | MinPt-O-ADP | |
| | 2130.15 | 644.61 | 1698.76 | 1485.54 | 4.98 | OSF1.50 | 13270.00 | 12324.76 | OSF<5.00 | | | Enter Alert | |
| | 639.90 | 648.28 | 205.41 | -8.38 | 1.48 | OSF1.50 | 14830.00 | 12323.93 | | OSF<1.50 | | Enter Minor | |
| | 434.81 | 649.45 | -0.19 | -214.64 | 1.00 | OSF1.50 | 15100.00 | 12323.79 | | | OSF<1.00 | Enter Major | |
| | 338.30 | 649.09 | -95.35 | -310.79 | 0.78 | OSF1.50 | 15370.00 | 12323.65 | | | | MinPts | |
| | 430.83 | 647.34 | -1.56 | -216.51 | 1.00 | OSF1.50 | 15640.00 | 12323.50 | | | OSF>1.00 | Exit Major | |
| | 642.97 | 645.47 | 211.82 | -2.51 | 1.49 | OSF1.50 | 15920.00 | 12323.35 | | OSF>1.50 | | Exit Minor | |
| | 2133.70 | 644.49 | 1703.21 | 1489.22 | 4.98 | OSF1.50 | 17480.00 | 12322.52 | OSF>5.00 | | | Exit Alert | |
| | 6853.73 | 647.78 | 6421.04 | 6205.95 | 15.93 | OSF1.50 | 22218.95 | 12320.00 | | | | TD | |
| Cimarex Vaca Draw 20-17 Federal #47H Rev0 RM 12Sept19 (Non-Def Plan) | | | | | | | | | | | | | Fail Minor |
| | 20.00 | 16.50 | 17.50 | 3.50 | N/A | MAS = 5.03 (m) | 0.00 | 0.00 | CtCt<=15m<15.00 | | | Enter Alert | |
| | 20.00 | 16.50 | 17.50 | 3.50 | 78767.70 | MAS = 5.03 (m) | 26.00 | 26.00 | | | | WRP | |
| | 20.00 | 20.01 | 5.83 | 0.00 | 1.50 | OSF1.50 | 1920.00 | 1920.00 | | OSF<1.50 | | Enter Minor | |
| | 20.00 | 25.38 | 2.25 | -5.38 | 1.15 | OSF1.50 | 2490.00 | 2490.00 | | | | MinPt-CtCt | |
| | 20.02 | 25.54 | 2.16 | -5.52 | 1.14 | OSF1.50 | 2510.00 | 2510.00 | | | | MinPts | |
| | 20.07 | 25.60 | 2.17 | -5.53 | 1.14 | OSF1.50 | 2520.00 | 2520.00 | | | | MinPt-O-ADP | |
| | 26.13 | 26.45 | 7.67 | -0.31 | 1.48 | OSF1.50 | 2690.00 | 2690.00 | | OSF>1.50 | | Exit Minor | |
| | 91.67 | 29.25 | 71.33 | 62.42 | 5.00 | OSF1.50 | 3280.00 | 3280.00 | OSF>5.00 | | | Exit Alert | |
| | 416.58 | 126.89 | 331.15 | 289.69 | 4.99 | OSF1.50 | 14080.00 | 12324.33 | OSF<5.00 | | | Enter Alert | |
| | 415.94 | 360.57 | 174.73 | 55.37 | 1.73 | OSF1.50 | 22218.95 | 12320.00 | | | | MinPts | |
| Cimarex Vaca Draw 20-17 Federal #48H Rev0 RM 12Sept19 (Non-Def Plan) | | | | | | | | | | | | | Warning Alert |
| | 40.02 | 32.50 | 37.52 | 7.52 | N/A | MAS = 9.91 (m) | 0.00 | 0.00 | CtCt<=15m<15.00 | | | Enter Alert | |
| | 40.00 | 32.50 | 37.50 | 7.50 | N/A | MAS = 9.91 (m) | 26.00 | 26.00 | | | | WRP | |
| | 40.00 | 32.50 | 23.45 | 7.50 | 2.67 | MAS = 9.91 (m) | 2300.00 | 2300.00 | | | | MinPts | |
| | 40.01 | 32.50 | 23.41 | 7.51 | 2.66 | MAS = 9.91 (m) | 2310.00 | 2310.00 | | | | MINPT-O-EOU | |
| | 40.26 | 32.50 | 23.52 | 7.75 | 2.65 | MAS = 9.91 (m) | 2340.00 | 2340.00 | | | | MinPt-O-SF | |
| | 79.79 | 32.50 | 61.70 | 47.29 | 4.96 | MAS = 9.91 (m) | 2790.00 | 2790.00 | OSF>5.00 | | | Exit Alert | |
| | 830.88 | 104.61 | 760.31 | 726.27 | 12.17 | OSF1.50 | 12825.45 | 12325.00 | | | | MinPt-CtCt | |
| | 830.88 | 251.14 | 662.63 | 579.75 | 5.00 | OSF1.50 | 18720.00 | 12321.86 | OSF<5.00 | | | Enter Alert | |
| | 830.89 | 358.73 | 590.90 | 472.15 | 3.49 | OSF1.50 | 22218.95 | 12320.00 | | | | MinPts | |
| Cimarex Vaca Draw 20-17 Federal #43H Rev3 IP 13Aug19 (Def Plan) | | | | | | | | | | | | | Warning Alert |
| | 99.98 | 32.81 | 97.48 | 67.17 | N/A | MAS = 10.00 (m) | 0.00 | 0.00 | | | | Surface | |
| | 99.98 | 32.81 | 97.47 | 67.17 | 24373.88 | MAS = 10.00 (m) | 26.00 | 26.00 | | | | WRP | |
| | 99.98 | 32.81 | 77.95 | 67.17 | 4.99 | MAS = 10.00 (m) | 3170.00 | 3170.00 | OSF<5.00 | | | Enter Alert | |
| | 99.98 | 85.06 | 42.44 | 14.92 | 1.77 | OSF1.50 | 8820.00 | 8820.00 | | | | MinPt-CtCt | |
| | 99.98 | 85.15 | 42.38 | 14.83 | 1.77 | OSF1.50 | 8830.00 | 8830.00 | | | | MINPT-O-EOU | |
| | 100.05 | 85.23 | 42.40 | 14.82 | 1.77 | OSF1.50 | 8840.00 | 8840.00 | | | | MinPts | |
| | 236.21 | 72.95 | 186.75 | 163.27 | 4.98 | OSF1.50 | 9270.00 | 9270.00 | OSF>5.00 | | | Exit Alert | |
| | 2959.85 | 132.14 | 2870.92 | 2827.71 | 34.22 | OSF1.50 | 16360.00 | 12323.12 | | | | MinPt-CtCt | |
| | 2967.14 | 311.00 | 2758.97 | 2656.14 | 14.41 | OSF1.50 | 22218.95 | 12320.00 | | | | MinPts | |
| Final Surveys - Cimarex Vaca Draw 20-17 Federal #4H ST01 MWD 0ft-22279ft (Surcon Corrected) (Def Survey) | | | | | | | | | | | | | Warning Alert |
| | 1280.08 | 32.81 | 1278.39 | 1247.28 | N/A | MAS = 10.00 (m) | 0.00 | 0.00 | | | | MinPts | |
| | 1280.11 | 32.81 | 1278.38 | 1247.30 | 51369.83 | MAS = 10.00 (m) | 26.00 | 26.00 | | | | WRP | |
| | 1280.18 | 32.81 | 1278.36 | 1247.37 | 10449.64 | MAS = 10.00 (m) | 60.00 | 60.00 | | | | MINPT-O-EOU | |
| | 355.17 | 66.67 | 309.78 | 288.50 | 8.28 | OSF1.50 | 9180.00 | 9180.00 | | | | MinPt-CtCt | |
| | 355.21 | 66.79 | 309.74 | 288.42 | 8.26 | OSF1.50 | 9200.00 | 9200.00 | | | | MINPT-O-EOU | |
| | 355.27 | 66.85 | 309.76 | 288.42 | 8.26 | OSF1.50 | 9210.00 | 9210.00 | | | | MinPt-O-ADP | |
| | 362.76 | 70.86 | 314.58 | 291.90 | 7.93 | OSF1.50 | 9850.00 | 9850.00 | | | | MinPt-CtCt | |
| | 362.96 | 71.48 | 314.37 | 291.48 | 7.87 | OSF1.50 | 9950.00 | 9950.00 | | | | MINPT-O-EOU | |
| | 363.45 | 72.38 | 314.26 | 291.07 | 7.78 | OSF1.50 | 10090.00 | 10090.00 | | | | MINPT-O-EOU | |

| Offset Trajectory | Separation | | | Allow | Sep. | Controlling | Reference Trajectory | | Risk Level | | | Alert | Status |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ct-Ct (ft) | MAS (ft) | EOU (ft) | Dev. (ft) | Fact. | Rule | MD (ft) | TVD (ft) | Alert | Minor | Major | | |
| | 363.61 | 72.57 | 314.29 | 291.04 | 7.76 | OSF1.50 | 10120.00 | 10120.00 | | | | MinPt-O-ADP | |
| | 365.45 | 74.18 | 315.06 | 291.27 | 7.62 | OSF1.50 | 10370.00 | 10370.00 | | | | MINPT-O-EOU | |
| | 365.73 | 74.50 | 315.12 | 291.22 | 7.59 | OSF1.50 | 10420.00 | 10420.00 | | | | MinPt-O-ADP | |
| | 366.72 | 77.19 | 314.33 | 289.53 | 7.34 | OSF1.50 | 10840.00 | 10840.00 | | | | MinPt-CtCt | |
| | 366.76 | 77.32 | 314.29 | 289.45 | 7.33 | OSF1.50 | 10860.00 | 10860.00 | | | | MINPT-O-EOU | |
| | 366.81 | 77.38 | 314.29 | 289.43 | 7.32 | OSF1.50 | 10870.00 | 10870.00 | | | | MinPt-O-ADP | |
| | 369.53 | 78.29 | 316.41 | 291.25 | 7.29 | OSF1.50 | 11020.00 | 11020.00 | | | | MinPt-O-SF | |
| | 413.64 | 83.71 | 356.95 | 329.93 | 7.61 | OSF1.50 | 11910.00 | 11909.01 | | | | MinPt-CtCt | |
| | 413.66 | 83.79 | 356.92 | 329.87 | 7.60 | OSF1.50 | 11920.00 | 11918.72 | | | | MinPts | |
| | 414.32 | 84.02 | 357.43 | 330.31 | 7.59 | OSF1.50 | 11950.00 | 11947.52 | | | | MinPt-O-SF | |
| | 413.34 | 84.63 | 356.05 | 328.71 | 7.51 | OSF1.50 | 12060.00 | 12047.26 | | | | MinPt-CtCt | |
| | 413.38 | 84.72 | 356.03 | 328.66 | 7.50 | OSF1.50 | 12070.00 | 12055.75 | | | | MinPts | |
| | 415.67 | 85.44 | 357.84 | 330.24 | 7.48 | OSF1.50 | 12170.00 | 12134.39 | | | | MinPt-O-SF | |
| | 392.83 | 91.29 | 331.11 | 301.53 | 6.60 | OSF1.50 | 12880.00 | 12324.97 | | | | MinPt-CtCt | |
| | 393.01 | 91.62 | 331.07 | 301.38 | 6.58 | OSF1.50 | 12910.00 | 12324.96 | | | | MINPT-O-EOU | |
| | 393.75 | 92.59 | 331.17 | 301.17 | 6.52 | OSF1.50 | 12990.00 | 12324.91 | | | | MinPt-O-ADP | |
| | 399.71 | 94.87 | 335.62 | 304.85 | 6.45 | OSF1.50 | 13180.00 | 12324.81 | | | | MinPt-O-SF | |
| | 422.15 | 121.18 | 340.53 | 300.97 | 5.30 | OSF1.50 | 14610.00 | 12324.05 | | | | MinPt-CtCt | |
| | 422.36 | 121.74 | 340.37 | 300.62 | 5.28 | OSF1.50 | 14640.00 | 12324.03 | | | | MINPT-O-EOU | |
| | 422.51 | 121.93 | 340.39 | 300.59 | 5.28 | OSF1.50 | 14650.00 | 12324.03 | | | | MinPt-O-ADP | |
| | 423.93 | 129.16 | 337.00 | 294.78 | 4.99 | OSF1.50 | 14960.00 | 12323.86 | OSF<5.00 | | | Enter Alert | |
| | 421.74 | 134.19 | 331.45 | 287.55 | 4.78 | OSF1.50 | 15180.00 | 12323.75 | | | | MinPt-CtCt | |
| | 421.99 | 135.01 | 331.15 | 286.98 | 4.75 | OSF1.50 | 15220.00 | 12323.73 | | | | MINPT-O-EOU | |
| | 422.32 | 135.43 | 331.21 | 286.90 | 4.74 | OSF1.50 | 15240.00 | 12323.71 | | | | MinPt-O-ADP | |
| | 422.67 | 142.40 | 326.91 | 280.27 | 4.51 | OSF1.50 | 15520.00 | 12323.57 | | | | MinPt-CtCt | |
| | 419.22 | 160.81 | 311.18 | 258.41 | 3.95 | OSF1.50 | 16250.00 | 12323.18 | | | | MinPt-CtCt | |
| | 407.49 | 192.97 | 278.00 | 214.52 | 3.19 | OSF1.50 | 17440.00 | 12322.54 | | | | MinPt-CtCt | |
| | 408.92 | 201.64 | 273.65 | 207.28 | 3.06 | OSF1.50 | 17750.00 | 12322.38 | | | | MinPt-CtCt | |
| | 409.47 | 207.32 | 270.41 | 202.15 | 2.98 | OSF1.50 | 17950.00 | 12322.27 | | | | MinPt-CtCt | |
| | 409.80 | 208.52 | 269.95 | 201.28 | 2.97 | OSF1.50 | 18000.00 | 12322.25 | | | | MINPT-O-EOU | |
| | 412.14 | 211.84 | 270.07 | 200.30 | 2.94 | OSF1.50 | 18120.00 | 12322.18 | | | | MINPT-O-EOU | |
| | 419.50 | 226.49 | 267.67 | 193.01 | 2.79 | OSF1.50 | 18630.00 | 12321.91 | | | | MinPt-CtCt | |
| | 420.02 | 228.50 | 266.85 | 191.52 | 2.77 | OSF1.50 | 18710.00 | 12321.87 | | | | MINPT-O-EOU | |
| | 420.40 | 228.96 | 266.92 | 191.44 | 2.77 | OSF1.50 | 18730.00 | 12321.86 | | | | MinPt-O-ADP | |
| | 417.69 | 249.10 | 250.79 | 168.59 | 2.53 | OSF1.50 | 19430.00 | 12321.48 | | | | MinPt-CtCt | |
| | 399.14 | 261.38 | 224.03 | 137.76 | 2.30 | OSF1.50 | 19860.00 | 12321.26 | | | | MinPt-CtCt | |
| | 399.55 | 262.58 | 223.65 | 136.97 | 2.29 | OSF1.50 | 19910.00 | 12321.23 | | | | MINPT-O-EOU | |
| | 400.43 | 263.58 | 223.86 | 136.85 | 2.29 | OSF1.50 | 19950.00 | 12321.21 | | | | MinPt-O-ADP | |
| | 403.00 | 265.61 | 225.08 | 137.39 | 2.28 | OSF1.50 | 20030.00 | 12321.17 | | | | MinPt-O-SF | |
| | 423.74 | 292.92 | 227.63 | 130.82 | 2.18 | OSF1.50 | 20950.00 | 12320.68 | | | | MinPt-CtCt | |
| | 418.47 | 303.47 | 215.32 | 114.99 | 2.07 | OSF1.50 | 21310.00 | 12320.48 | | | | MinPt-CtCt | |
| | 419.85 | 307.89 | 213.76 | 111.96 | 2.05 | OSF1.50 | 21470.00 | 12320.40 | | | | MINPT-O-EOU | |
| | 421.17 | 309.47 | 214.02 | 111.70 | 2.05 | OSF1.50 | 21530.00 | 12320.37 | | | | MinPt-O-ADP | |
| | 419.65 | 330.17 | 198.70 | 89.48 | 1.91 | OSF1.50 | 22218.95 | 12320.00 | | | | MinPts | |
| Hankamer Curtis Bass-Federal #1 (Offset) Plugged Blind 0ft-5074ft (Def Survey) | | | | | | | | | | | | | Warning Alert |
| | 4293.24 | 32.81 | 4290.74 | 4260.43 | N/A | MAS = 10.00 (m) | 0.00 | 0.00 | | | | Surface | |
| | 4293.24 | 32.81 | 4288.13 | 4260.43 | 1644.81 | MAS = 10.00 (m) | 26.00 | 26.00 | | | | WRP | |
| | 4293.24 | 1291.30 | 3431.53 | 3001.93 | 4.99 | OSF1.50 | 4150.00 | 4150.00 | OSF<5.00 | | | Enter Alert | |
| | 4293.24 | 1580.52 | 3238.72 | 2712.71 | 4.08 | OSF1.50 | 5070.00 | 5070.00 | | | | MinPt-CtCt | |
| | 4293.24 | 1582.12 | 3237.66 | 2711.11 | 4.07 | OSF1.50 | 5080.00 | 5080.00 | | | | MinPts | |
| | 4755.36 | 1428.95 | 3801.90 | 3326.42 | 5.00 | OSF1.50 | 7120.00 | 7120.00 | OSF>5.00 | | | Exit Alert | |
| | 7392.89 | 320.30 | 7178.52 | 7072.59 | 34.88 | OSF1.50 | 14930.00 | 12323.88 | | | | MinPt-O-ADP | |
| | 7308.26 | 218.34 | 7161.87 | 7089.92 | 50.77 | OSF1.50 | 15450.00 | 12323.60 | | | | MINPT-O-EOU | |
| | 7248.03 | 96.32 | 7182.99 | 7151.71 | 115.84 | OSF1.50 | 16390.00 | 12323.10 | | | | MinPt-CtCt | |
| | 7310.50 | 236.86 | 7151.76 | 7073.65 | 46.77 | OSF1.50 | 17340.00 | 12322.60 | | | | MINPT-O-EOU | |
| | 7394.34 | 337.54 | 7168.48 | 7056.80 | 33.09 | OSF1.50 | 17850.00 | 12322.33 | | | | MinPt-O-ADP | |
| | 9303.41 | 1006.44 | 8631.61 | 8296.97 | 13.90 | OSF1.50 | 22218.95 | 12320.00 | | | | MinPt-O-SF | |
| Final Surveys - Cimarex Vaca Draw 20-17 Federal #45H 0ft-19226ft (Surcon Corrected) (Def Survey) | | | | | | | | | | | | | Pass |
| | 72.10 | 32.81 | 70.29 | 39.29 | N/A | MAS = 10.00 (m) | 0.00 | 0.00 | | | | MinPts | |
| | 72.10 | 32.81 | 70.29 | 39.29 | 30174.26 | MAS = 10.00 (m) | 26.00 | 26.00 | | | | WRP | |
| | 63.05 | 32.81 | 56.80 | 30.24 | 13.78 | MAS = 10.00 (m) | 1060.00 | 1060.00 | | | | MINPT-O-EOU | |
| | 58.90 | 32.81 | 49.05 | 26.09 | 6.98 | MAS = 10.00 (m) | 1880.00 | 1880.00 | | | | MinPts | |
| | 57.43 | 32.81 | 45.71 | 24.63 | 5.54 | MAS = 10.00 (m) | 2260.00 | 2260.00 | | | | MinPts | |
| | 57.50 | 32.81 | 45.67 | 24.69 | 5.49 | MAS = 10.00 (m) | 2280.00 | 2280.00 | | | | MINPT-O-EOU | |
| | 58.40 | 32.81 | 46.30 | 25.59 | 5.43 | MAS = 10.00 (m) | 2330.00 | 2330.00 | | | | MinPt-O-SF | |
| | 829.48 | 58.96 | 789.66 | 770.52 | 21.63 | OSF1.50 | 8340.00 | 8340.00 | | | | MinPt-O-ADP | |
| | 830.81 | 60.74 | 789.80 | 770.07 | 21.01 | OSF1.50 | 8630.00 | 8630.00 | | | | MINPT-O-EOU | |
| | 830.98 | 62.33 | 788.91 | 768.64 | 20.47 | OSF1.50 | 8880.00 | 8880.00 | | | | MinPt-CtCt | |
| | 831.02 | 62.46 | 788.86 | 768.56 | 20.42 | OSF1.50 | 8900.00 | 8900.00 | | | | MinPts | |
| | 839.83 | 64.22 | 796.51 | 775.62 | 20.06 | OSF1.50 | 9170.00 | 9170.00 | | | | MinPt-O-SF | |
| | 3015.11 | 140.18 | 2921.14 | 2874.92 | 32.60 | OSF1.50 | 16590.00 | 12323.00 | | | | MinPt-CtCt | |
| | 3015.94 | 142.52 | 2920.41 | 2873.41 | 32.07 | OSF1.50 | 16700.00 | 12322.94 | | | | MINPT-O-EOU | |
| | 3018.44 | 145.37 | 2921.01 | 2873.06 | 31.46 | OSF1.50 | 16820.00 | 12322.87 | | | | MinPt-O-ADP | |
| | 3026.44 | 160.95 | 2918.62 | 2865.49 | 28.46 | OSF1.50 | 17330.00 | 12322.60 | | | | MINPT-O-EOU | |
| | 3028.43 | 163.31 | 2919.04 | 2865.12 | 28.07 | OSF1.50 | 17430.00 | 12322.55 | | | | MinPt-O-ADP | |
| | 3038.64 | 178.86 | 2918.89 | 2859.78 | 25.69 | OSF1.50 | 17940.00 | 12322.28 | | | | MINPT-O-EOU | |
| | 3043.57 | 190.55 | 2916.02 | 2853.02 | 24.14 | OSF1.50 | 18330.00 | 12322.07 | | | | MINPT-O-EOU | |
| | 3046.04 | 197.43 | 2913.90 | 2848.61 | 23.31 | OSF1.50 | 18550.00 | 12321.95 | | | | MINPT-O-EOU | |
| | 3046.48 | 197.97 | 2913.98 | 2848.51 | 23.25 | OSF1.50 | 18580.00 | 12321.94 | | | | MinPt-O-ADP | |
| | 3050.23 | 209.28 | 2910.20 | 2840.95 | 22.01 | OSF1.50 | 18920.00 | 12321.76 | | | | MinPt-CtCt | |
| | 3048.19 | 215.46 | 2904.04 | 2832.73 | 21.36 | OSF1.50 | 19130.00 | 12321.64 | | | | MinPt-CtCt | |
| | 3052.03 | 222.39 | 2903.26 | 2829.64 | 20.72 | OSF1.50 | 19400.00 | 12321.50 | | | | MINPT-O-EOU | |
| | 3055.43 | 230.41 | 2901.31 | 2825.02 | 20.02 | OSF1.50 | 19660.00 | 12321.36 | | | | MINPT-O-EOU | |
| | 3056.32 | 231.47 | 2901.49 | 2824.85 | 19.93 | OSF1.50 | 19710.00 | 12321.34 | | | | MinPt-O-ADP | |
| | 3025.34 | 252.53 | 2856.47 | 2772.81 | 18.07 | OSF1.50 | 20370.00 | 12320.98 | | | | MinPt-CtCt | |
| | 3022.52 | 266.75 | 2844.18 | 2755.78 | 17.09 | OSF1.50 | 20840.00 | 12320.73 | | | | MinPt-CtCt | |
| | 3023.65 | 269.96 | 2843.16 | 2753.68 | 16.89 | OSF1.50 | 20980.00 | 12320.66 | | | | MINPT-O-EOU | |
| | 3039.54 | 307.15 | 2834.26 | 2732.40 | 14.91 | OSF1.50 | 22218.95 | 12320.00 | | | | MinPts | |
| Cimarex Vaca Draw 20-17 Federal #44H MWD 0ft-Update (Non-Def Survey) | | | | | | | | | | | | | Pass |
| | 84.84 | 32.81 | 83.03 | 52.03 | N/A | MAS = 10.00 (m) | 0.00 | 0.00 | | | | Surface | |
| | 84.83 | 32.81 | 83.02 | 52.02 | 43628.95 | MAS = 10.00 (m) | 26.00 | 26.00 | | | | WRP | |
| | 83.35 | 32.81 | 77.09 | 50.54 | 18.32 | MAS = 10.00 (m) | 1060.00 | 1060.00 | | | | MINPT-O-EOU | |
| | 83.25 | 32.81 | 75.82 | 50.44 | 14.12 | MAS = 10.00 (m) | 1340.00 | 1340.00 | | | | MinPts | |
| | 83.92 | 32.81 | 73.95 | 51.11 | 9.88 | MAS = 10.00 (m) | 1870.00 | 1870.00 | | | | MINPT-O-EOU | |
| | 86.20 | 32.81 | 74.51 | 53.39 | 8.43 | MAS = 10.00 (m) | 2300.00 | 2300.00 | | | | MINPT-O-EOU | |

| Offset Trajectory | Separation | | | Allow | Sep. | Controlling | Reference Trajectory | | Risk Level | | | Alert | Status |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ct-Ct (ft) | MAS (ft) | EOU (ft) | Dev. (ft) | Fact. | Rule | MD (ft) | TVD (ft) | Alert | Minor | Major | | |
| | 76.74 | 32.81 | 61.91 | 43.93 | 5.70 | MAS = 10.00 (m) | 2990.00 | 2990.00 | | | | MinPts | |
| | 76.76 | 32.81 | 61.89 | 43.95 | 5.68 | MAS = 10.00 (m) | 3000.00 | 3000.00 | | | | MINPT-O-EOU | |
| | 78.41 | 32.81 | 63.03 | 45.60 | 5.59 | MAS = 10.00 (m) | 3110.00 | 3110.00 | | | | MinPt-O-SF | |
| | 473.87 | 66.81 | 428.81 | 407.06 | 10.86 | OSF1.50 | 9730.00 | 9730.00 | | | | MinPt-CtCt | |
| | 473.87 | 66.87 | 428.78 | 407.00 | 10.85 | OSF1.50 | 9740.00 | 9740.00 | | | | MinPts | |
| | 474.20 | 66.98 | 429.04 | 407.23 | 10.84 | OSF1.50 | 9760.00 | 9760.00 | | | | MinPt-O-SF | |
| | 3084.25 | 62.01 | 3042.40 | 3022.24 | 76.47 | OSF1.50 | 14680.00 | 12324.01 | | | | MinPt-O-SF | |
| | 9793.35 | 84.87 | 9736.25 | 9708.47 | 176.26 | OSF1.50 | 22218.95 | 12320.00 | | | | TD | |
| Cimarex Vaca Draw 20-17 Federal #44H Rev6 kFc 28Sep19 (Def Plan) | | | | | | | | | | | | | Pass |
| | 84.84 | 32.81 | 83.03 | 52.03 | N/A | MAS = 10.00 (m) | 0.00 | 0.00 | | | | Surface | |
| | 84.83 | 32.81 | 83.02 | 52.02 | 43628.96 | MAS = 10.00 (m) | 26.00 | 26.00 | | | | WRP | |
| | 83.35 | 32.81 | 77.09 | 50.54 | 18.32 | MAS = 10.00 (m) | 1060.00 | 1060.00 | | | | MINPT-O-EOU | |
| | 83.25 | 32.81 | 75.82 | 50.44 | 14.12 | MAS = 10.00 (m) | 1340.00 | 1340.00 | | | | MinPts | |
| | 83.92 | 32.81 | 73.95 | 51.11 | 9.88 | MAS = 10.00 (m) | 1870.00 | 1870.00 | | | | MINPT-O-EOU | |
| | 86.20 | 32.81 | 74.51 | 53.39 | 8.43 | MAS = 10.00 (m) | 2300.00 | 2300.00 | | | | MINPT-O-EOU | |
| | 76.74 | 32.81 | 61.91 | 43.93 | 5.70 | MAS = 10.00 (m) | 2990.00 | 2990.00 | | | | MinPts | |
| | 76.76 | 32.81 | 61.89 | 43.95 | 5.68 | MAS = 10.00 (m) | 3000.00 | 3000.00 | | | | MINPT-O-EOU | |
| | 78.41 | 32.81 | 63.03 | 45.60 | 5.59 | MAS = 10.00 (m) | 3110.00 | 3110.00 | | | | MinPt-O-SF | |
| | 482.21 | 68.16 | 435.94 | 414.05 | 10.96 | OSF1.50 | 9780.00 | 9780.00 | | | | MinPts | |
| | 482.81 | 68.32 | 436.43 | 414.49 | 10.95 | OSF1.50 | 9810.00 | 9810.00 | | | | MinPt-O-SF | |
| | 2312.21 | 159.13 | 2205.29 | 2153.09 | 22.12 | OSF1.50 | 17190.00 | 12322.68 | | | | MinPt-CtCt | |
| | 2329.50 | 312.68 | 2120.22 | 2016.82 | 11.25 | OSF1.50 | 22218.95 | 12320.00 | | | | MinPts | |
| Cimarex Vaca Draw 20-17 Federal #43H MWD 0ft-Update (Non-Def Survey) | | | | | | | | | | | | | Pass |
| | 99.98 | 32.81 | 98.17 | 67.17 | N/A | MAS = 10.00 (m) | 0.00 | 0.00 | | | | Surface | |
| | 99.97 | 32.81 | 98.15 | 67.16 | 14437.41 | MAS = 10.00 (m) | 26.00 | 26.00 | | | | WRP | |
| | 95.03 | 32.81 | 88.76 | 62.22 | 20.87 | MAS = 10.00 (m) | 1060.00 | 1060.00 | | | | MinPts | |
| | 101.20 | 32.81 | 94.48 | 68.39 | 20.21 | MAS = 10.00 (m) | 1100.00 | 1100.00 | | | | MinPt-O-SF | |
| | 15109.10 | 156.87 | 15003.92 | 14952.23 | 146.14 | OSF1.50 | 22218.95 | 12320.00 | | | | MinPt-O-SF | |
| Final Surveys - Cimarex Vaca Draw 20-17 Federal #4H MWD 0ft-12228ft (Surcon Corrected) (Def Survey) | | | | | | | | | | | | | Pass |
| | 1280.08 | 32.81 | 1277.58 | 1247.28 | N/A | MAS = 10.00 (m) | 0.00 | 0.00 | | | | MinPts | |
| | 1280.11 | 32.81 | 1277.58 | 1247.30 | 51337.60 | MAS = 10.00 (m) | 26.00 | 26.00 | | | | WRP | |
| | 1280.18 | 32.81 | 1277.56 | 1247.37 | 10443.08 | MAS = 10.00 (m) | 60.00 | 60.00 | | | | MINPT-O-EOU | |
| | 355.17 | 67.60 | 308.85 | 287.56 | 8.26 | OSF1.50 | 9180.00 | 9180.00 | | | | MinPt-CtCt | |
| | 355.21 | 67.73 | 308.81 | 287.49 | 8.24 | OSF1.50 | 9200.00 | 9200.00 | | | | MINPT-O-EOU | |
| | 355.27 | 67.79 | 308.82 | 287.48 | 8.24 | OSF1.50 | 9210.00 | 9210.00 | | | | MinPt-O-ADP | |
| | 362.76 | 71.79 | 313.65 | 290.97 | 7.91 | OSF1.50 | 9850.00 | 9850.00 | | | | MinPt-CtCt | |
| | 362.96 | 72.42 | 313.43 | 290.54 | 7.85 | OSF1.50 | 9950.00 | 9950.00 | | | | MINPT-O-EOU | |
| | 363.45 | 73.31 | 313.33 | 290.14 | 7.76 | OSF1.50 | 10090.00 | 10090.00 | | | | MINPT-O-EOU | |
| | 363.55 | 73.43 | 313.35 | 290.11 | 7.74 | OSF1.50 | 10110.00 | 10110.00 | | | | MinPt-O-ADP | |
| | 365.41 | 75.03 | 314.14 | 290.38 | 7.61 | OSF1.50 | 10360.00 | 10360.00 | | | | MINPT-O-EOU | |
| | 365.73 | 75.42 | 314.20 | 290.31 | 7.57 | OSF1.50 | 10420.00 | 10420.00 | | | | MinPt-O-ADP | |
| | 366.72 | 78.11 | 313.41 | 288.61 | 7.32 | OSF1.50 | 10840.00 | 10840.00 | | | | MinPt-CtCt | |
| | 366.76 | 78.24 | 313.36 | 288.53 | 7.31 | OSF1.50 | 10860.00 | 10860.00 | | | | MINPT-O-EOU | |
| | 366.81 | 78.30 | 313.37 | 288.51 | 7.30 | OSF1.50 | 10870.00 | 10870.00 | | | | MinPt-O-ADP | |
| | 369.53 | 79.20 | 315.49 | 290.33 | 7.27 | OSF1.50 | 11020.00 | 11020.00 | | | | MinPt-O-SF | |
| | 493.22 | 84.73 | 435.63 | 408.49 | 9.03 | OSF1.50 | 12040.00 | 12029.95 | | | | MinPt-O-SF | |
| | 10095.14 | 87.09 | 10036.24 | 10008.04 | 178.97 | OSF1.50 | 22218.95 | 12320.00 | | | | TD | |
| Cimarex Vaca Draw 20-17 Federal #71H Rev4 RM 19Jul19 (Def Plan) | | | | | | | | | | | | | Pass |
| | 1690.89 | 32.81 | 1689.08 | 1658.08 | N/A | MAS = 10.00 (m) | 0.00 | 0.00 | | | | Surface | |
| | 1690.86 | 32.81 | 1689.05 | 1658.05 | N/A | MAS = 10.00 (m) | 10.00 | 10.00 | | | | MinPts | |
| | 1690.86 | 32.81 | 1689.05 | 1658.05 | N/A | MAS = 10.00 (m) | 26.00 | 26.00 | | | | WRP | |
| | 1084.52 | 79.67 | 1030.41 | 1004.85 | 21.16 | OSF1.50 | 9560.00 | 9560.00 | | | | MinPt-CtCt | |
| | 1084.63 | 80.07 | 1030.26 | 1004.56 | 21.05 | OSF1.50 | 9610.00 | 9610.00 | | | | MINPT-O-EOU | |
| | 1084.83 | 80.30 | 1030.30 | 1004.53 | 20.99 | OSF1.50 | 9640.00 | 9640.00 | | | | MinPt-O-ADP | |
| | 1092.64 | 81.87 | 1037.08 | 1010.77 | 20.71 | OSF1.50 | 9880.00 | 9880.00 | | | | MinPt-O-SF | |
| | 2461.99 | 109.63 | 2388.30 | 2352.36 | 34.23 | OSF1.50 | 15380.00 | 12323.64 | | | | MinPt-CtCt | |
| | 2483.50 | 315.75 | 2272.40 | 2167.75 | 11.86 | OSF1.50 | 22218.95 | 12320.00 | | | | MinPts | |
| Cimarex Vaca Draw 20-17 Federal #60H Rev0 RM 12Sept19 (Non-Def Plan) | | | | | | | | | | | | | Pass |
| | 1219.88 | 32.81 | 1217.38 | 1187.07 | N/A | MAS = 10.00 (m) | 0.00 | 0.00 | | | | Surface | |
| | 1219.85 | 32.81 | 1217.35 | 1187.04 | N/A | MAS = 10.00 (m) | 26.00 | 26.00 | | | | WRP | |
| | 1219.85 | 42.40 | 1190.75 | 1177.45 | 45.77 | OSF1.50 | 4300.00 | 4300.00 | | | | MinPt-CtCt | |
| | 1219.90 | 42.61 | 1190.66 | 1177.29 | 45.53 | OSF1.50 | 4330.00 | 4330.00 | | | | MinPts | |
| | 1239.86 | 44.22 | 1209.55 | 1195.64 | 44.49 | OSF1.50 | 4720.00 | 4720.00 | | | | MinPt-O-SF | |
| | 1619.80 | 87.45 | 1560.67 | 1532.35 | 28.56 | OSF1.50 | 10940.00 | 10940.00 | | | | MinPt-CtCt | |
| | 1619.86 | 87.61 | 1560.63 | 1532.26 | 28.51 | OSF1.50 | 10960.00 | 10960.00 | | | | MINPT-O-EOU | |
| | 1619.94 | 87.68 | 1560.65 | 1532.26 | 28.48 | OSF1.50 | 10970.00 | 10970.00 | | | | MinPt-O-ADP | |
| | 1627.82 | 88.80 | 1567.79 | 1539.02 | 28.25 | OSF1.50 | 11150.00 | 11150.00 | | | | MinPt-O-SF | |
| | 1977.90 | 347.77 | 1745.22 | 1630.13 | 8.58 | OSF1.50 | 22218.95 | 12320.00 | | | | MinPts | |
| Cimarex Vaca Draw 20-17 Federal #61H Rev0 RM 12Sept19 (Non-Def Plan) | | | | | | | | | | | | | Pass |
| | 1239.86 | 32.81 | 1237.36 | 1207.05 | N/A | MAS = 10.00 (m) | 0.00 | 0.00 | | | | Surface | |
| | 1239.84 | 32.81 | 1237.34 | 1207.03 | N/A | MAS = 10.00 (m) | 26.00 | 26.00 | | | | WRP | |
| | 1239.84 | 32.81 | 1225.19 | 1207.03 | 101.84 | MAS = 10.00 (m) | 2000.00 | 2000.00 | | | | MinPts | |
| | 1239.86 | 32.81 | 1225.11 | 1207.05 | 101.01 | MAS = 10.00 (m) | 2020.00 | 2020.00 | | | | MINPT-O-EOU | |
| | 1616.07 | 49.25 | 1582.40 | 1566.82 | 51.78 | OSF1.50 | 5720.00 | 5720.00 | | | | MinPt-O-SF | |
| | 1619.80 | 86.82 | 1561.09 | 1532.98 | 28.77 | OSF1.50 | 10370.00 | 10370.00 | | | | MinPt-CtCt | |
| | 1620.04 | 87.94 | 1560.58 | 1532.10 | 28.40 | OSF1.50 | 10500.00 | 10500.00 | | | | MINPT-O-EOU | |
| | 1620.18 | 88.10 | 1560.61 | 1532.07 | 28.35 | OSF1.50 | 10520.00 | 10520.00 | | | | MinPt-O-ADP | |
| | 1632.79 | 90.15 | 1571.86 | 1542.64 | 27.90 | OSF1.50 | 10820.00 | 10820.00 | | | | MinPt-O-SF | |
| | 2167.09 | 342.99 | 1937.60 | 1824.10 | 9.54 | OSF1.50 | 22218.95 | 12320.00 | | | | MinPts | |
| Cimarex Vaca Draw 20-17 Federal #74H Rev0 RM 12Sept19 (Non-Def Plan) | | | | | | | | | | | | | Pass |
| | 1769.81 | 32.81 | 1767.31 | 1737.00 | N/A | MAS = 10.00 (m) | 0.00 | 0.00 | | | | Surface | |
| | 1769.78 | 32.81 | 1767.28 | 1736.97 | N/A | MAS = 10.00 (m) | 10.00 | 10.00 | | | | MinPts | |
| | 1769.78 | 32.81 | 1767.28 | 1736.97 | N/A | MAS = 10.00 (m) | 26.00 | 26.00 | | | | WRP | |
| | 1246.87 | 361.22 | 1004.97 | 885.65 | 5.21 | OSF1.50 | 22218.95 | 12320.00 | | | | MinPts | |

| Offset Trajectory | Separation | | | Allow | Sep. | Controlling | Reference Trajectory | | Risk Level | | | Alert | Status |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ct-Ct (ft) | MAS (ft) | EOU (ft) | Dev. (ft) | Fact. | Rule | MD (ft) | TVD (ft) | Alert | Minor | Major | | |
| Cimarex Vaca Draw 20-17 Federal #72H Rev6 kFc 28Sep19 (Def Plan) | | | | | | | | | | | | | Pass |
| | 1710.88 | 32.81 | 1709.07 | 1678.07 | N/A | MAS = 10.00 (m) | 0.00 | 0.00 | | | | Surface | |
| | 1710.85 | 32.81 | 1709.04 | 1678.04 | N/A | MAS = 10.00 (m) | 10.00 | 10.00 | | | | MinPts | |
| | 1710.85 | 32.81 | 1709.04 | 1678.04 | N/A | MAS = 10.00 (m) | 26.00 | 26.00 | | | | WRP | |
| | 1687.89 | 32.81 | 1673.04 | 1655.09 | 129.31 | MAS = 10.00 (m) | 2790.00 | 2790.00 | | | | MinPts | |
| | 1688.31 | 32.81 | 1672.41 | 1655.50 | 119.73 | MAS = 10.00 (m) | 3040.00 | 3040.00 | | | | MINPT-O-EOU | |
| | 1625.90 | 46.22 | 1594.45 | 1579.68 | 55.00 | OSF1.50 | 6620.00 | 6620.00 | | | | MinPt-CtCt | |
| | 1625.98 | 46.46 | 1594.37 | 1579.53 | 54.70 | OSF1.50 | 6660.00 | 6660.00 | | | | MINPT-O-EOU | |
| | 1626.04 | 46.52 | 1594.38 | 1579.52 | 54.63 | OSF1.50 | 6670.00 | 6670.00 | | | | MinPt-O-ADP | |
| | 1633.00 | 53.05 | 1596.99 | 1579.94 | 47.84 | OSF1.50 | 7670.00 | 7670.00 | | | | MinPt-CtCt | |
| | 1629.48 | 61.32 | 1587.73 | 1568.16 | 41.57 | OSF1.50 | 8810.00 | 8810.00 | | | | MinPt-CtCt | |
| | 1629.49 | 61.38 | 1587.70 | 1568.11 | 41.52 | OSF1.50 | 8820.00 | 8820.00 | | | | MINPT-O-EOU | |
| | 1629.54 | 61.45 | 1587.71 | 1568.09 | 41.48 | OSF1.50 | 8830.00 | 8830.00 | | | | MinPt-O-ADP | |
| | 1645.91 | 62.82 | 1603.18 | 1583.09 | 40.90 | OSF1.50 | 9100.00 | 9100.00 | | | | MinPt-O-SF | |
| | 3324.92 | 226.64 | 3172.99 | 3098.28 | 22.23 | OSF1.50 | 19140.00 | 12321.64 | | | | MinPt-CtCt | |
| | 3344.21 | 320.73 | 3129.55 | 3023.48 | 15.75 | OSF1.50 | 22218.95 | 12320.00 | | | | MinPts | |
| Cimarex Vaca Draw 20-17 Federal #72H Surveys 0ft to update (Non-Def Survey) | | | | | | | | | | | | | Pass |
| | 1710.88 | 32.81 | 1709.07 | 1678.07 | N/A | MAS = 10.00 (m) | 0.00 | 0.00 | | | | Surface | |
| | 1710.85 | 32.81 | 1709.04 | 1678.04 | N/A | MAS = 10.00 (m) | 10.00 | 10.00 | | | | MinPts | |
| | 1710.85 | 32.81 | 1709.04 | 1678.04 | N/A | MAS = 10.00 (m) | 26.00 | 26.00 | | | | WRP | |
| | 1687.89 | 32.81 | 1673.04 | 1655.09 | 129.31 | MAS = 10.00 (m) | 2790.00 | 2790.00 | | | | MinPts | |
| | 1688.31 | 32.81 | 1672.41 | 1655.50 | 119.73 | MAS = 10.00 (m) | 3040.00 | 3040.00 | | | | MINPT-O-EOU | |
| | 1625.90 | 46.22 | 1594.45 | 1579.68 | 55.00 | OSF1.50 | 6620.00 | 6620.00 | | | | MinPt-CtCt | |
| | 1625.98 | 46.46 | 1594.37 | 1579.53 | 54.70 | OSF1.50 | 6660.00 | 6660.00 | | | | MINPT-O-EOU | |
| | 1626.04 | 46.52 | 1594.38 | 1579.52 | 54.63 | OSF1.50 | 6670.00 | 6670.00 | | | | MinPt-O-ADP | |
| | 1633.00 | 53.05 | 1596.99 | 1579.94 | 47.84 | OSF1.50 | 7670.00 | 7670.00 | | | | MinPt-CtCt | |
| | 1630.14 | 60.20 | 1589.36 | 1569.93 | 41.90 | OSF1.50 | 8750.00 | 8750.00 | | | | MinPt-CtCt | |
| | 1630.19 | 60.34 | 1589.33 | 1569.86 | 41.81 | OSF1.50 | 8770.00 | 8770.00 | | | | MINPT-O-EOU | |
| | 1630.25 | 60.40 | 1589.34 | 1569.85 | 41.76 | OSF1.50 | 8780.00 | 8780.00 | | | | MinPt-O-ADP | |
| | 1646.65 | 62.13 | 1604.61 | 1584.51 | 40.93 | OSF1.50 | 9100.00 | 9100.00 | | | | MinPt-O-SF | |
| | 4132.86 | 75.41 | 4081.99 | 4057.45 | 84.19 | OSF1.50 | 15080.00 | 12323.80 | | | | MinPt-O-SF | |
| | 10031.28 | 98.48 | 9965.03 | 9932.80 | 155.62 | OSF1.50 | 22218.95 | 12320.00 | | | | TD | |
| Cimarex Vaca Draw 20-17 Federal #75H Rev0 RM 12Sept19 (Non-Def Plan) | | | | | | | | | | | | | Pass |
| | 1789.81 | 32.81 | 1787.31 | 1757.00 | N/A | MAS = 10.00 (m) | 0.00 | 0.00 | | | | Surface | |
| | 1789.78 | 32.81 | 1787.28 | 1756.97 | N/A | MAS = 10.00 (m) | 10.00 | 10.00 | | | | MinPts | |
| | 1789.78 | 32.81 | 1787.28 | 1756.97 | N/A | MAS = 10.00 (m) | 26.00 | 26.00 | | | | WRP | |
| | 1789.14 | 47.56 | 1756.60 | 1741.58 | 59.48 | OSF1.50 | 4890.00 | 4890.00 | | | | MinPt-O-SF | |
| | 1661.80 | 107.12 | 1589.45 | 1554.67 | 23.85 | OSF1.50 | 12825.45 | 12325.00 | | | | MinPt-CtCt | |
| | 1661.80 | 362.44 | 1419.25 | 1299.36 | 6.92 | OSF1.50 | 22218.95 | 12320.00 | | | | MinPts | |
| Cimarex Vaca Draw 20-17 Federal #71H MWD 0ft-Update (Non-Def Survey) | | | | | | | | | | | | | Pass |
| | 1690.89 | 32.81 | 1689.08 | 1658.08 | N/A | MAS = 10.00 (m) | 0.00 | 0.00 | | | | Surface | |
| | 1690.86 | 32.81 | 1689.05 | 1658.05 | N/A | MAS = 10.00 (m) | 10.00 | 10.00 | | | | MinPts | |
| | 1690.86 | 32.81 | 1689.05 | 1658.06 | 678478.24 | MAS = 10.00 (m) | 26.00 | 26.00 | | | | WRP | |
| | 1691.20 | 32.81 | 1688.94 | 1658.39 | 3727.67 | MAS = 10.00 (m) | 150.00 | 150.00 | | | | MINPT-O-EOU | |
| | 1688.07 | 32.81 | 1681.12 | 1655.26 | 328.11 | MAS = 10.00 (m) | 1080.00 | 1080.00 | | | | MinPts | |
| | 2000.62 | 32.81 | 1989.92 | 1967.81 | 224.90 | MAS = 10.00 (m) | 2150.00 | 2150.00 | | | | MinPt-O-SF | |
| | 11200.02 | 32.81 | 11183.12 | 11167.21 | 742.13 | MAS = 10.00 (m) | 12200.00 | 12155.57 | | | | MinPt-O-SF | |
| | 15178.14 | 158.90 | 15071.61 | 15019.24 | 144.91 | OSF1.50 | 22218.95 | 12320.00 | | | | MinPt-O-SF | |
| Final Surveys - Cimarex Vaca Draw 20-17 Federal #73H 0ft-19583ft (Surcon Corrected) (Def Survey) | | | | | | | | | | | | | Pass |
| | 1730.87 | 32.81 | 1729.06 | 1698.06 | N/A | MAS = 10.00 (m) | 0.00 | 0.00 | | | | Surface | |
| | 1730.84 | 32.81 | 1729.03 | 1698.03 | N/A | MAS = 10.00 (m) | 10.00 | 10.00 | | | | MinPt-O-SF | |
| | 1730.84 | 32.81 | 1729.03 | 1698.03 | N/A | MAS = 10.00 (m) | 26.00 | 26.00 | | | | WRP | |
| | 1730.54 | 32.81 | 1727.61 | 1697.73 | 1547.09 | MAS = 10.00 (m) | 300.00 | 300.00 | | | | MinPts | |
| | 1729.80 | 32.81 | 1724.59 | 1697.00 | 507.74 | MAS = 10.00 (m) | 810.00 | 810.00 | | | | MinPts | |
| | 1729.97 | 32.81 | 1724.40 | 1697.16 | 460.14 | MAS = 10.00 (m) | 900.00 | 900.00 | | | | MINPT-O-EOU | |
| | 1814.49 | 32.95 | 1791.97 | 1781.54 | 86.87 | OSF1.50 | 4670.00 | 4670.00 | | | | MinPt-CtCt | |
| | 1814.59 | 33.21 | 1791.90 | 1781.38 | 86.18 | OSF1.50 | 4710.00 | 4710.00 | | | | MINPT-O-EOU | |
| | 1814.70 | 33.33 | 1791.93 | 1781.37 | 85.84 | OSF1.50 | 4730.00 | 4730.00 | | | | MinPt-O-ADP | |
| | 1791.13 | 50.06 | 1757.24 | 1741.06 | 55.32 | OSF1.50 | 7280.00 | 7280.00 | | | | MinPt-CtCt | |
| | 1791.57 | 51.06 | 1757.02 | 1740.51 | 54.23 | OSF1.50 | 7430.00 | 7430.00 | | | | MINPT-O-EOU | |
| | 1792.12 | 51.86 | 1757.03 | 1740.26 | 53.38 | OSF1.50 | 7550.00 | 7550.00 | | | | MINPT-O-EOU | |
| | 1792.45 | 52.26 | 1757.10 | 1740.19 | 52.96 | OSF1.50 | 7610.00 | 7610.00 | | | | MinPt-O-ADP | |
| | 1800.47 | 61.87 | 1758.70 | 1738.59 | 44.73 | OSF1.50 | 9060.00 | 9060.00 | | | | MinPts | |
| | 1748.21 | 65.47 | 1704.03 | 1682.74 | 41.02 | OSF1.50 | 9580.00 | 9580.00 | | | | MinPt-CtCt | |
| | 1748.22 | 65.54 | 1703.99 | 1682.67 | 40.97 | OSF1.50 | 9590.00 | 9590.00 | | | | MINPT-O-EOU | |
| | 1748.26 | 65.61 | 1703.99 | 1682.66 | 40.93 | OSF1.50 | 9600.00 | 9600.00 | | | | MinPt-O-ADP | |
| | 1759.53 | 66.71 | 1714.55 | 1692.83 | 40.47 | OSF1.50 | 9810.00 | 9810.00 | | | | MinPt-O-SF | |
| | 2984.52 | 119.24 | 2904.51 | 2865.28 | 38.01 | OSF1.50 | 15570.00 | 12323.54 | | | | MinPt-CtCt | |
| | 2984.86 | 120.25 | 2904.18 | 2864.61 | 37.70 | OSF1.50 | 15630.00 | 12323.51 | | | | MINPT-O-EOU | |
| | 2985.13 | 120.58 | 2904.24 | 2864.56 | 37.60 | OSF1.50 | 15650.00 | 12323.50 | | | | MinPt-O-ADP | |
| | 2981.90 | 127.98 | 2896.07 | 2853.92 | 35.36 | OSF1.50 | 15890.00 | 12323.37 | | | | MinPt-CtCt | |
| | 2974.62 | 158.47 | 2868.46 | 2816.15 | 28.42 | OSF1.50 | 16970.00 | 12322.79 | | | | MinPt-CtCt | |
| | 2975.49 | 161.09 | 2867.58 | 2814.39 | 27.96 | OSF1.50 | 17090.00 | 12322.73 | | | | MINPT-O-EOU | |
| | 2976.39 | 162.15 | 2867.77 | 2814.23 | 27.78 | OSF1.50 | 17140.00 | 12322.70 | | | | MinPt-O-ADP | |
| | 2977.19 | 171.74 | 2862.18 | 2805.44 | 26.22 | OSF1.50 | 17430.00 | 12322.55 | | | | MinPt-CtCt | |
| | 2975.04 | 184.33 | 2851.64 | 2790.71 | 24.40 | OSF1.50 | 17860.00 | 12322.32 | | | | MinPt-CtCt | |
| | 2960.76 | 202.04 | 2825.55 | 2758.72 | 22.14 | OSF1.50 | 18470.00 | 12322.00 | | | | MinPt-CtCt | |
| | 2961.16 | 203.33 | 2825.09 | 2757.83 | 22.00 | OSF1.50 | 18540.00 | 12321.96 | | | | MINPT-O-EOU | |
| | 2961.61 | 203.87 | 2825.18 | 2757.74 | 21.95 | OSF1.50 | 18570.00 | 12321.94 | | | | MinPt-O-ADP | |
| | 2963.51 | 205.65 | 2825.90 | 2757.86 | 21.77 | OSF1.50 | 18650.00 | 12321.90 | | | | MinPt-O-ADP | |
| | 2965.83 | 219.30 | 2819.12 | 2746.53 | 20.42 | OSF1.50 | 19060.00 | 12321.68 | | | | MinPt-CtCt | |
| | 2964.79 | 229.68 | 2811.16 | 2735.11 | 19.48 | OSF1.50 | 19410.00 | 12321.50 | | | | MinPt-CtCt | |
| | 2962.38 | 239.43 | 2802.25 | 2722.95 | 18.67 | OSF1.50 | 19740.00 | 12321.32 | | | | MinPt-CtCt | |
| | 2963.03 | 250.19 | 2795.72 | 2712.84 | 17.87 | OSF1.50 | 20100.00 | 12321.13 | | | | MinPt-CtCt | |
| | 2964.02 | 253.15 | 2794.74 | 2710.87 | 17.66 | OSF1.50 | 20230.00 | 12321.06 | | | | MINPT-O-EOU | |
| | 2964.93 | 260.55 | 2790.71 | 2704.38 | 17.16 | OSF1.50 | 20450.00 | 12320.94 | | | | MinPt-CtCt | |
| | 2916.57 | 291.64 | 2721.63 | 2624.94 | 15.07 | OSF1.50 | 21500.00 | 12320.38 | | | | MinPt-CtCt | |
| | 2917.12 | 293.19 | 2721.14 | 2623.93 | 15.00 | OSF1.50 | 21580.00 | 12320.34 | | | | MINPT-O-EOU | |
| | 2917.78 | 293.97 | 2721.28 | 2623.81 | 14.96 | OSF1.50 | 21620.00 | 12320.32 | | | | MinPt-O-ADP | |
| | 2929.04 | 301.72 | 2727.38 | 2627.32 | 14.63 | OSF1.50 | 21920.00 | 12320.16 | | | | MinPt-O-ADP | |
| | 2945.77 | 308.20 | 2739.79 | 2637.57 | 14.40 | OSF1.50 | 22218.95 | 12320.00 | | | | MinPt-O-SF | |

Co-Flex Hose
**Vaca Draw 20-17 Fed 46H**
Cimarex Energy Co.
20-25S-33E
Lea Co., NM



Co-Flex Hose Hydrostatic Test
**Vaca Draw 20-17 Fed 46H**
Cimarex Energy Co.
20-25S-33E
Lea Co., NM

Midwest Hose & Specialty, Inc.

# INTERNAL HYDROSTATIC TEST REPORT

| Customer: | P.O. Number: |
|---|---|
| Oderco Inc | odyd-271 |

## HOSE SPECIFICATIONS

| Type: | Hose Length: |
|---|---|
| Stainless Steel Armor Choke & Kill Hose | 45'ft. |

| I.D. | O.D. |
|---|---|
| 4 INCHES | 9 INCHES |

| WORKING PRESSURE | TEST PRESSURE | BURST PRESSURE |
|---|---|---|
| 10,000 PSI | 15,000 PSI | 0 PSI |

## COUPLINGS

| Stem Part No. | Ferrule No. |
|---|---|
| OKC<br>OKC | OKC<br>OKC |
| Type of Coupling: Swage-It | |

## PROCEDURE

*Hose assembly pressure tested with water at ambient temperature.*

| TIME HELD AT TEST PRESSURE | ACTUAL BURST PRESSURE: |
|---|---|
| 15 MIN. | 0 PSI |

| Hose Assembly Serial Number: | Hose Serial Number: |
|---|---|
| 79793 | OKC |

Comments:

| Date: | Tested: | Approved: |
|---|---|---|
| 3/8/2011 | A. Jaime Sanchez | |

Midwest Hose & Specialty, Inc.

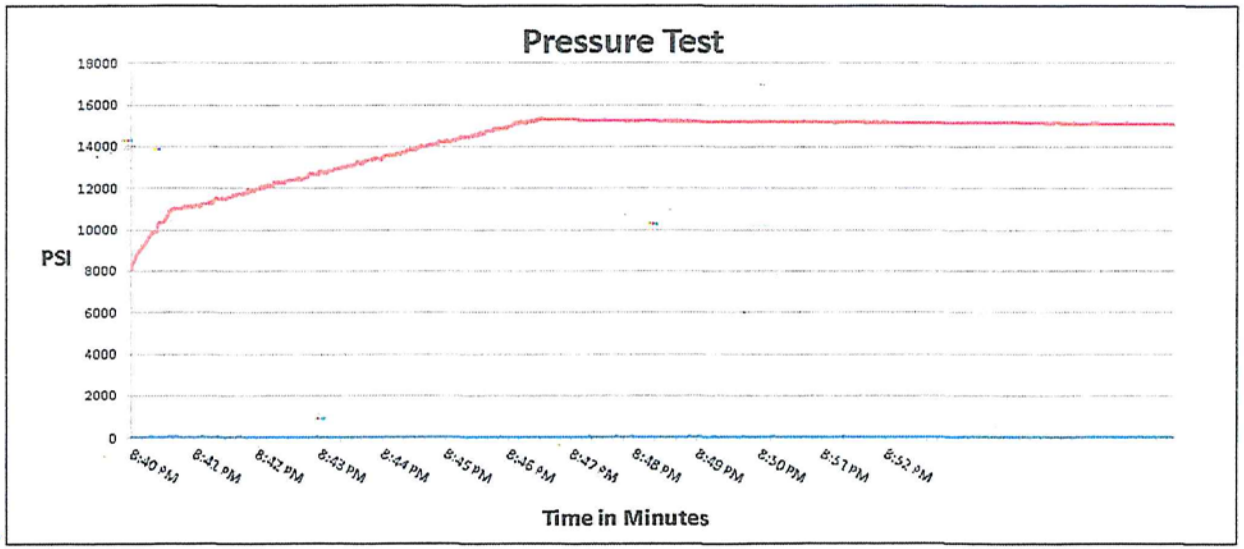
# Internal Hydrostatic Test Graph

March 3, 2011

**Customer:** Houston

**Pick Ticket #:** 94260

| Hose Specifications | | Verification | |
|---|---|---|---|
| Hose Type | Length | Type of Fitting | Coupling Method |
| C & K | 45' | 4 1/16 10K | Swage |
| I.D. | O.D. | Die Size | Final O.D. |
| 4" | 6.09" | 6.38" | 6.25" |
| Working Pressure | Burst Pressure | Hose Serial # | Hose Assembly Serial # |
| 10000 PSI | Standard Safety Multiplier Applies | 5544 | 79793 |




| Test Pressure | Time Held at Test Pressure | Actual Burst Pressure | Peak Pressure |
|---|---|---|---|
| 15000 PSI | 11 Minutes | | 15483 PSI |

**Comments:** Hose assembly pressure tested with water at ambient temperature.

**Tested By:** *Zac Mcconnell*

**Approved By:** *Kim Thomas*

Co-Flex Hose Hydrostatic Test
**Vaca Draw 20-17 Fed 46H**
Cimarex Energy Co.
20-25S-33E
Lea Co., NM

Co-Flex Hose
**Vaca Draw 20-17 Fed 46H**
Cimarex Energy Co.
20-25S-33E
Lea Co., NM

Midwest Hose
& Specialty, Inc.

## Certificate of Conformity

| Customer: | PO |
|---|---|
| DEM | ODYD-271 |

**SPECIFICATIONS**

| Sales Order | Dated: |
|---|---|
| 79793 | 3/8/2011 |

We hereby cerify that the material supplied for the referenced purchase order to be true according to the requirements of the purchase order and current industry standards

Supplier:
Midwest Hose & Specialty, Inc.
10640 Tanner Road
Houston, Texas 77041

**Comments:**

| Approved: | Date: |
|---|---|
| Jamal Garcia | 3/8/2011 |

Midwest Hose & Specialty, Inc.

Co-Flex Hose
**Vaca Draw 20-17 Fed 46H**
Cimarex Energy Co.
20-25S-33E
Lea Co., NM

# Specification Sheet
# Choke & Kill Hose

The Midwest Hose & Specialty Choke & Kill hose is manufactured with only premium componets.The reinforcement cables, inner liner and cover are made of the highest quality material to handle the tough drilling applications of today's industry. The end connections are available with API flanges, API male threads, hubs, hammer unions or other special fittings upon request. Hose assembly is manufactured to API 7K. This assembly is wrapped with fire resistant vermculite coated fiberglass insulation, rated at 2000 degrees with stainless steel armor cover.

| | |
|---|---|
| **Working Pressure:** | 5,000 or 10,000 psi working pressure |
| **Test Pressure:** | 10,000 or 15,000 psi test pressure |
| **Reinforcement:** | Multiple steel cables |
| **Cover:** | Stainless Steel Armor |
| **Inner Tube:** | Petroleum resistant, Abrasion resistant |
| **End Fitting:** | API flanges, API male threads, threaded or butt weld hammer unions, unibolt and other special connections |
| **Maximum Length:** | 110 Feet |
| **ID:** | 2-1/2", 3", 3-1/2", 4" |
| **Operating Temperature:** | -22 deg F to +180 deg F (-30 deg C to +82 deg C) |

P.O. Box 96558 – 1421 S.E. 29th St. Oklahoma City, OK 73143 * (405) 670-6718 * Fax: (405) 670-6816

## 1. Geological Formations

TVD of target 12,320
MD at TD 22,218

Pilot Hole TD N/A
Deepest expected fresh water

| Formation | Depth (TVD) from KB | Water/Mineral Bearing/Target Zone | Hazards |
|---|---|---|---|
| Rustler | 935 | Usable Water | |
| Top of Salt | 1298 | N/A | |
| Base of Salt | 4714 | N/A | |
| Lamar | 4909 | N/A | |
| Bell Canyon | 4937 | N/A | |
| Cherry Canyon | 5990 | Hydrocarbons | |
| Brushy Canyon | 7536 | Hydrocarbons | |
| Bone Spring | 9032 | Hydrocarbons | |
| Upper Avalon Shale | 9312 | Hydrocarbons | |
| 1st Bone Spring | 10011 | Hydrocarbons | |
| 2nd Bone Spring | 10223 | Hydrocarbons | |
| 3rd Bone Spring | 11071 | Hydrocarbons | |
| Wolfcamp | 12189 | Hydrocarbons | |

## 2. Casing Program

| Hole Size | Casing Depth From | Casing Depth To | Setting Depth TVD | Casing Size | Weight (lb/ft) | Grade | Conn. | SF Collapse | SF Burst | SF Tension |
|---|---|---|---|---|---|---|---|---|---|---|
| 14 3/4 | 0 | 985 | 985 | 10-3/4" | 40.50 | J-55 | BT&C | 3.51 | 6.94 | 15.77 |
| 9 7/8 | 0 | 12449 | 12276 | 7-5/8" | 29.70 | L-80 HC | TMK FJ | 2.36 | 1.14 | 1.82 |
| 6 3/4 | 0 | 11750 | 11750 | 5-1/2" | 20.00 | L-80 | LT&C | 1.38 | 1.43 | 1.88 |
| 6 3/4 | 11750 | 22218 | 12320 | 5" | 18.00 | P-110 | BT&C | 2.00 | 2.02 | 56.53 |
| | | | | | BLM Minimum Safety Factor | | | 1.125 | 1 | 1.6 Dry<br>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

Request Variance for 5-1/2" x 7-5/8" annular clearance. The portion that does not meet clearance will not be cemented

| | 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. | Y |
| 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 |
| Is AC Report included? | N |

### 3. Cementing Program

| Casing | # Sks | Wt. lb/gal | Yld ft3/sack | H2O gal/sk | 500# Comp. Strength (hours) | Slurry Description |
|---|---|---|---|---|---|---|
| **Surface** | 332 | 13.50 | 1.72 | 9.15 | 15.5 | Lead: Class C + Bentonite |
| | 156 | 14.80 | 1.34 | 6.32 | 9.5 | Tail: Class C + LCM |
| | | | | | | |
| **Intermediate Stage 1** | 580 | 10.30 | 3.64 | 22.18 | | Lead: Tuned Light + LCM |
| | 198 | 14.80 | 1.36 | 6.57 | 9.5 | Tail: Class C + Retarder |
| | | | | | | |
| **Intermediate Stage 2** | 794 | 12.90 | 1.88 | 9.65 | 12 | Lead: 35:65 (Poz:C) + Salt + Bentonite |
| | | | | | | |
| **Production** | 812 | 14.80 | 1.34 | 6.32 | 9.5 | Tail: Class C + LCM |
| | 837 | 14.20 | 1.30 | 5.86 | 14:30 | Tail: 50:50 (Poz:H) + Salt + Bentonite + Fluid Loss + Dispersant + SMS |
| | | | | | | |

DV tool with possible annular casing packer as needed is proposed at a depth of +/- 4,900'.

| Casing String | TOC | % Excess |
|---|---|---|
| Surface | 0 | 42 |
| Intermediate Stage 1 | 4900 | 47 |
| Intermediate Stage 2 | 0 | 40 |
| Production | 12000 | 25 |
| Production | 12000 | 25 |

Cimarex request the ability to perform casing integrity tests after plug bump of cement job.

## 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 |
|---|---|---|---|---|---|
| 9 7/8 | 13 5/8 | 5M | Annular | X | 5M |
| | | | Blind Ram | X | |
| | | | Pipe Ram | | |
| | | | Double Ram | X | |
| | | | Other | | |
| 6 3/4 | 13 5/8 | 5M | Annular | X | 5M |
| | | | Blind Ram | | |
| | | | 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.

| | | |
|---|---|---|
| X | Formation integrity test will be performed per Onshore Order #2.<br>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 985' | FW Spud Mud | 8.30 - 8.80 | 30-32 | N/C |
| 985' to 12449' | Brine Diesel Emulsion | 9.00 - 9.50 | 30-35 | N/C |
| 12449' to 22218' | OBM | 10.00 - 10.50 | 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.

The Brine Emulsion is completely saturated brine fluid that ties diesel into itself to lower the weight of the fluid. The drilling fluid is completely salt saturated.

| | |
|---|---|
| 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 | |
|---|---|
| | Will run GR/CNL fromTD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM. |
| | No logs are planned based on well control or offset log information. |
| | Drill stem test? |
| | Coring? |

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

## 7. Drilling Conditions

| Condition | |
|---|---|
| BH Pressure at deepest TVD | 6726 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. | |
| X | H2S is present |
| X | H2S plan is attached |

## 8. Other Facets of Operation

## 9. Wellhead

A multi-bowl wellhead system will be utilized.

After running the 10-3/4" surface casing, a 13 5/8" BOP/BOPE system with a minimum working pressure of 5000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 5000 psi test. Annular will be tested to 100%. 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 5000 psi.

All casing strings will be tested as per Onshore Order No.2 to atleast 0.22 psi/ft or 1,500 whichever is greater and not to exceed 70% of casing burst.

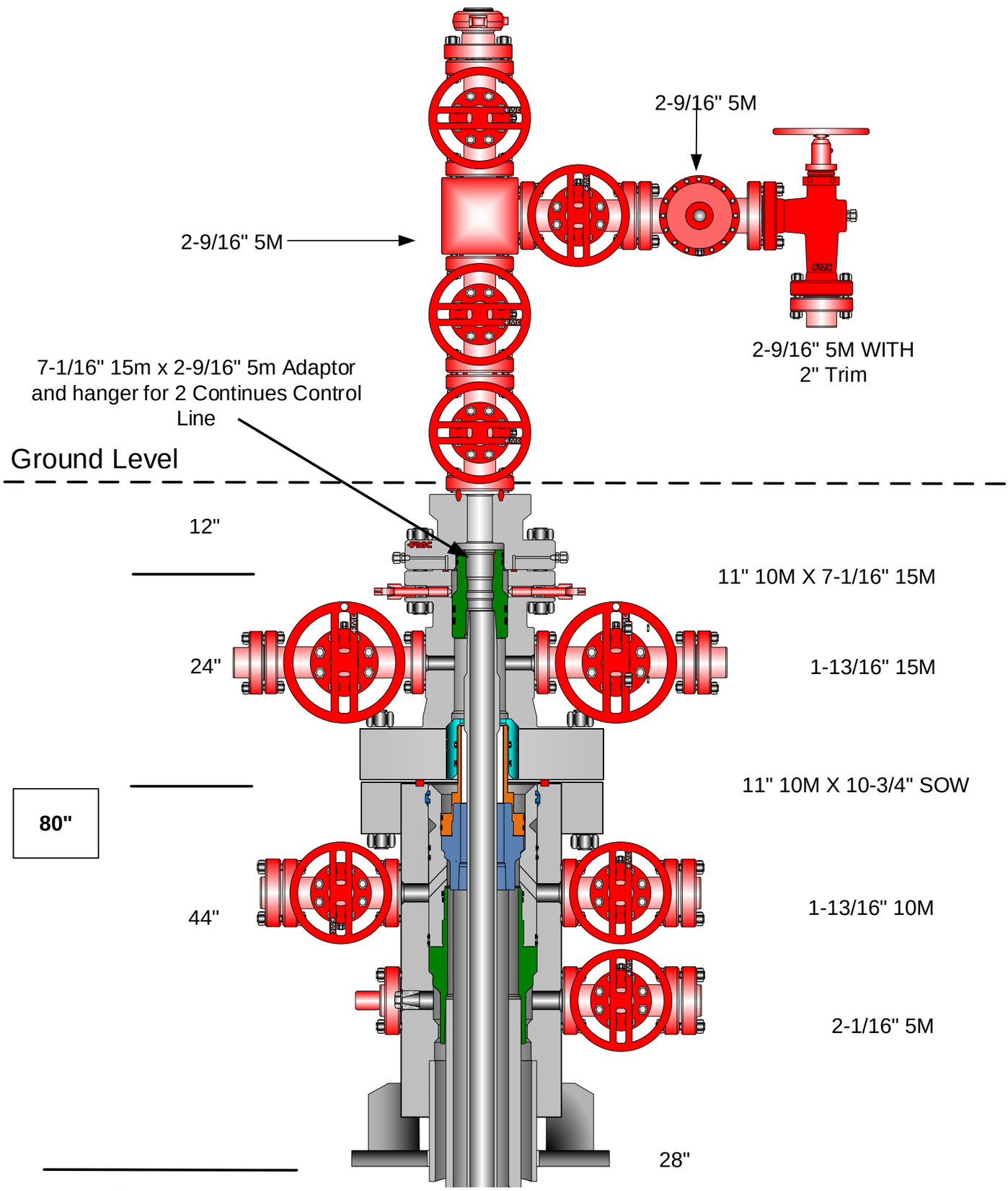
If well conditions dictate conventional slips will be set and BOPE will be tested to appropriate pressures based on permitted pressure requirements.

CIMAREX

**Vaca Draw 20-17 Federal 46H**
**LEA CO., NM**

CACTUS FOR SERVICE
WEARBUSHING
IN CASING HEAD &
CASING SPOOL

# Multi-bowl Wellhead Diagram




**2. Casing Program**

| Hole Size | Casing Depth From | Casing Depth To | Setting Depth TVD | Casing Size | Weight (lb/ft) | Grade | Conn. | SF Collapse | SF Burst | SF Tension |
|---|---|---|---|---|---|---|---|---|---|---|
| 14 3/4 | 0 | 985 | 985 | 10-3/4" | 40.50 | J-55 | BT&C | 3.51 | 6.94 | 15.77 |
| 9 7/8 | 0 | 12449 | 12276 | 7-5/8" | 29.70 | L-HC | TMK FJ | 2.36 | 1.14 | 1.82 |
| 6 3/4 | 0 | 11750 | 11750 | 5-1/2" | 20.00 | L-80 | LT&C | 1.38 | 1.43 | 1.88 |
| 6 3/4 | 11750 | 22218 | 12320 | 5" | 18.00 | P-110 | BT&C | 2.00 | 2.02 | 56.53 |
| | | | | | | | BLM Minimum Safety Factor | 1.125 | 1 | 1.6 Dry<br>1.8 Wet |

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

# SUPO Data Report
05/11/2021

**APD ID:** 10400038353
**Submission Date:** 01/25/2019

**Operator Name:** CIMAREX ENERGY COMPANY

**Well Name:** VACA DRAW 20-17 FEDERAL
**Well Number:** 46H

**Well Type:** CONVENTIONAL GAS WELL
**Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

## Section 1 - Existing Roads

**Will existing roads be used?** YES

**Existing Road Map:**

Vaca_Draw_20_17_Fed_W2E2_Pad_Existing_Road_20200129151516.pdf

**Existing Road Purpose:** ACCESS

**Row(s) Exist?** NO

### ROW ID(s)

**ID:**

**Do the existing roads need to be improved?** NO

**Existing Road Improvement Description:**

**Existing Road Improvement Attachment:**

## Section 2 - New or Reconstructed Access Roads

**Will new roads be needed?** NO

## Section 3 - Location of Existing Wells

**Existing Wells Map?** YES

**Attach Well map:**

Vaca_Draw_20_17_Fed_W2E2_Pad_Mile_Radius_Existing_Wells_20200113153700.pdf

**Operator Name:** CIMAREX ENERGY COMPANY

**Well Name:** VACA DRAW 20-17 FEDERAL **Well Number:** 46H

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

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

**Production Facilities description:** 500x 560' pad was staked with the BLM for construction and uses Vaca Draw 20-17 Zone 1 CTB and Vaca Draw 20-17 Zone 2 CTB. Road: Please see Exhibit A for 18,566' existing road - Bulkline: 2039.86' of 1- 12" buried steel oil bulk line, 1-12" Steel gas bulk line, 1-12" buried steel swd line, 1-8" buried steel gas lift lines will be constructed along the proposed road buried in the same 60' trench. Please see Attachment M for route.
**Production Facilities map:**

Vaca_Draw_20_17_Fed_East_Zone_2_CTB_Battery_Layout_20200113153752.pdf
Vaca_Draw_20_17_Fed_East_Zone_1_CTB_Battery_Layout_20200113153756.pdf
Vaca_Draw_20_17_Fed_W2E2_Pad_Flow_Gas_lift_ROW_20200206130756.pdf

## Section 5 - Location and Types of Water Supply

### Water Source Table

**Water source type:** MUNICIPAL

**Water source use type:** SURFACE CASING
INTERMEDIATE/PRODUCTION CASING

**Source latitude:** **Source longitude:**

**Source datum:**

**Water source permit type:** WATER RIGHT

**Permit Number:**

**Water source transport method:** TRUCKING
PIPELINE

**Source land ownership:** STATE

**Source transportation land ownership:** STATE

**Water source volume (barrels):** 5000 **Source volume (acre-feet):** 0.6444655

**Source volume (gal):** 210000

**Operator Name:** CIMAREX ENERGY COMPANY

**Well Name:** VACA DRAW 20-17 FEDERAL **Well Number:** 46H

**Water source and transportation map:**

Vaca_Draw_20_17_Fed_W2E2_Pad_Drilling_Water_Route_20200113154150.pdf

**Water source comments:**

**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:**

**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

**Using any construction materials:** YES

**Construction Materials description:** Caliche will be obtained from the actual well site if available. If not available onsite caliche will be obtained for a pit located in Sec.16-25S-32E Lea, NM.

**Construction Materials source location attachment:**

## Section 7 - Methods for Handling Waste

**Waste type:** SEWAGE

**Waste content description:** Human Waste

**Amount of waste:** 300 gallons

**Waste disposal frequency :** Weekly

**Safe containment description:** Waste will be properly contined and disposed of properly at a state approved disopal facility.

**Safe containmant attachment:**

**Operator Name:** CIMAREX ENERGY COMPANY

**Well Name:** VACA DRAW 20-17 FEDERAL **Well Number:** 46H

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

**Disposal location description:** : A licensed 3rd party contractor will be used to haul and dispose human waste.

**Waste type:** DRILLING

**Waste content description:** Drilling Fluids, drill cuttings, water and other waste produced from the well during drilling operations.
**Amount of waste:** 15000 barrels

**Waste disposal frequency :** Weekly

**Safe containment description:** N/A

**Safe containmant attachment:**

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

**Disposal location description:** Haul to R360 commercial disposal

**Waste type:** GARBAGE

**Waste content description:** garbage & trash produced during drilling & completion operations

**Amount of waste:** 32500 pounds

**Waste disposal frequency :** Weekly

**Safe containment description:** N/A

**Safe containmant attachment:**

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

**Disposal location description:** Windmill Spraying Service hauls trash to Lea County Landfill

## 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:** CIMAREX ENERGY COMPANY

**Well Name:** VACA DRAW 20-17 FEDERAL **Well Number:** 46H

## Cuttings Area

**Cuttings Area being used?** NO

**Are you storing cuttings on location?** NO

**Description of cuttings location**

**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:**

Vaca_Draw_20_17_Fed_46H_Wellsite_Layout_20200113160824.pdf

**Comments:**

## Section 10 - Plans for Surface Reclamation

**Type of disturbance:** New Surface Disturbance **Multiple Well Pad Name:** VACA DRAW 20-17 FED

**Multiple Well Pad Number:** W2E2 PAD

**Recontouring attachment:**

Vaca_Draw_20_17_Fed_W2E2_Pad_Interim_Reclaimation_20200129154221.pdf

**Drainage/Erosion control construction:** To control and prevent potentially contaminated precipitation from leaving the pad site, a perimeter berm and settlement pond will be installed. Contaminated water will be removed from pond, stored in waste tanks, and disposed of at a state approved facility. Standing water or puddles will not be allowed. Drainage ditches would be established and maintained on the pad and along access roads to divert water away from operations. Natural drainage areas disturbed during construction would be re-contoured to near original condition prior to construction. Erosion Control Best Management Practices would be used where necessary and consist of seeding, fiber rolls, water bars, silt fences, and temporary diversion dikes. Areas disturbed during construction that are no longer needed for operations would be obliterated, re-contoured to near original condition prior to construction. Erosion Control Best Management Practices would be used where necessary and consist of seeding, fiber rolls, water bars, silt fences, and temporary diversion dikes. Areas disturbed during construction that are no longer needed for operations would be obliterated, re-contoured, and reclaimed to near

**Operator Name:** CIMAREX ENERGY COMPANY

**Well Name:** VACA DRAW 20-17 FEDERAL **Well Number:** 46H

original condition to re-establish natural drainage.

**Drainage/Erosion control reclamation:** All disturbed and re-contoured areas would be reseeded according to specifications. Approved seed mixtures would be certified weed free and consist of grasses, forbs, or shrubs similar to the surrounding area. Compacted soil areas may need to be obliterated and reclaimed to near natural conditions by re-contouring all slopes to facilitate and re-establish natural drainage.

**Well pad proposed disturbance (acres):** 7.296
**Road proposed disturbance (acres):** 0
**Powerline proposed disturbance (acres):** 0
**Pipeline proposed disturbance (acres):** 2.8
**Other proposed disturbance (acres):** 10.5
**Total proposed disturbance:** 20.596

**Well pad interim reclamation (acres):** 3.746
**Road interim reclamation (acres):** 0
**Powerline interim reclamation (acres):** 0
**Pipeline interim reclamation (acres):** 0
**Other interim reclamation (acres):** 0
**Total interim reclamation:** 3.746

**Well pad long term disturbance (acres):** 3.55
**Road long term disturbance (acres):** 0
**Powerline long term disturbance (acres):** 0
**Pipeline long term disturbance (acres):** 0
**Other long term disturbance (acres):** 0
**Total long term disturbance:** 3.55

**Disturbance Comments:** Bulk line: 2039.86' Access Road: 18,566'. We have been working on engineering solutions to reduce our footprint in the section to lower cost, disturbance, and our economic hurdle for other marginal benches within the section to increase our total mineral recovery. It turns out that simply changing our flowline / well approach and moving our separation to our drilling pads significantly reduces our foot print and cost. By placing our separation on our drill pads we can use 6-12 Group lines to gather the separated oil gas and water from the entire section instead of using up to 90 flowlines to move production to the tank batteries for separation. The Group line ability to gather the entire section helps us eliminate 2 batteries per section by simply utilizing the group line approach.
**Reconstruction method:** After well plugging, all disturbed areas would be returned to the original contour or a contour that blends with the surrounding landform including roads unless the surface owner requests that they be left intact. In consultation with the surface owners it will be determined if any gravel or similar materials used to reinforce an area are to be removed, buried, or left in place during final reclamation. Salvaged topsoil, if any, would be re-spread evenly over the surfaces to be re-vegetated. As necessary, the soil surface would be prepared to provide a seedbed for re-establishment of desirable vegetation. Site preparation may include gouging, scarifying, dozer track-walking, mulching, or fertilizing. Reclamation, Re-vegetation, and Drainage: All disturbed and re-contoured areas would be reseeded using techniques outlined under Phase I and II of this plan or as specified by the land owner. Approved seed mixtures would be certified weed free and consist of grasses, forbs, or shrubs similar to the surrounding area. Compacted soil areas may need to be obliterated and reclaimed to near natural conditions by re-contouring all slopes to facilitate and re-establish natural drainage.
**Topsoil redistribution:** Salvaged topsoil, if any, would be re-spread evenly over the surfaces to be re-vegetated.

**Soil treatment:** As necessary, the soil surface would be prepared to provide a seedbed for re-establishment of desirable vegetation. Site preparation may include gouging, scarifying, dozer track-walking, mulching or fertilizing.
**Existing Vegetation at the well pad:**

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

**Existing Vegetation Community at the road:**

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

**Existing Vegetation Community at the pipeline:**

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

**Operator Name:** CIMAREX ENERGY COMPANY

**Well Name:** VACA DRAW 20-17 FEDERAL **Well Number:** 46H

**Existing Vegetation Community at other disturbances:**

**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 Summary

**Total pounds/Acre:**

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

**Seed reclamation attachment:**

## Operator Contact/Responsible Official Contact Info

**First Name:** Amithy **Last Name:** Crawford

**Phone:** (432)620-1909 **Email:** acrawford@cimarex.com

**Seedbed prep:**

**Seed BMP:**

**Seed method:**

**Existing invasive species?** NO

**Existing invasive species treatment description:**

**Existing invasive species treatment attachment:**

**Weed treatment plan description:** na

**Weed treatment plan attachment:**

**Operator Name:** CIMAREX ENERGY COMPANY

**Well Name:** VACA DRAW 20-17 FEDERAL **Well Number:** 46H

**Monitoring plan description:** na

**Monitoring plan attachment:**

**Success standards:** na

**Pit closure description:** na

**Pit closure attachment:**

## Section 11 - Surface Ownership

**Disturbance type:** WELL PAD

**Describe:**

**Surface Owner:** PRIVATE OWNERSHIP

**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:**

**Operator Name:** CIMAREX ENERGY COMPANY

**Well Name:** VACA DRAW 20-17 FEDERAL **Well Number:** 46H

**Fee Owner:** Hughes Property LLC **Fee Owner Address:**

**Phone:** (575)961-3217 **Email:**

**Surface use plan certification:** YES

**Surface use plan certification document:**

Vaca_Draw_20_17_Fed_46H_Surface_Use_agreement_20200204135106.pdf

**Surface access agreement or bond:** Agreement

**Surface Access Agreement Need description:** Private surface owner info is attached. Please see attachment

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

**BLM Surface Access Bond number:**

**USFS Surface access bond number:**

**Disturbance type:** PIPELINE

**Describe:**

**Surface Owner:** BUREAU OF LAND MANAGEMENT,PRIVATE OWNERSHIP

**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:**

**Operator Name:** CIMAREX ENERGY COMPANY

**Well Name:** VACA DRAW 20-17 FEDERAL **Well Number:** 46H

**Fee Owner:** Hughes Property LLC **Fee Owner Address:**

**Phone:** (575)361-3217 **Email:**

**Surface use plan certification:** YES

**Surface use plan certification document:**

Vaca_Draw_20_17_Fed_46H_Surface_Use_agreement_20200204135205.pdf

**Surface access agreement or bond:** Agreement

**Surface Access Agreement Need description:** Private surface owner info is attached. Please see attachment

**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,PRIVATE OWNERSHIP

**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:**

**Operator Name:** CIMAREX ENERGY COMPANY

**Well Name:** VACA DRAW 20-17 FEDERAL **Well Number:** 46H

**Fee Owner:** Hughes Property LLC **Fee Owner Address:**

**Phone:** (575)361-3217 **Email:**

**Surface use plan certification:** YES

**Surface use plan certification document:**

Vaca_Draw_20_17_Fed_46H_Surface_Use_agreement_20200204135544.pdf

**Surface access agreement or bond:** Agreement

**Surface Access Agreement Need description:** Private surface owner info is attached. Please see attachment

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

**BLM Surface Access Bond number:**

**USFS Surface access bond number:**

## Section 12 - Other Information

**Right of Way needed?** YES **Use APD as ROW?** YES

**ROW Type(s):** 281001 ROW - ROADS,288100 ROW – O&G Pipeline,288101 ROW – O&G Facility Sites,289001 ROW-O&G Well Pad,Other

## ROW Applications

**SUPO Additional Information:**

**Use a previously conducted onsite?** YES

**Previous Onsite information:** Onsite with BLM( Jeff Robertson) and Cimarex Barry Hunt on July 24, 2018

## Other SUPO Attachment

Vaca_Draw_20_17_Fed_W2E2_Pad_Flow_Gas_lift_ROW_20200129155500.pdf
Vaca_Draw_20_17_Fed_W2E2_Pad_Road_Description_20200129155550.pdf
Vaca_Draw_20_17_Fed_W2E2_Pad_Public_Access_20200129155646.pdf
Vaca_Draw_20_17_Fed_W2E2__Well_list_20200210102159.docx
Vaca_Draw_20_17_Fed_46H_Supo_Plan_20200224151725.pdf

AFMSS

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

# PWD Data Report

05/11/2021

**APD ID:** 10400038353 **Submission Date:** 01/25/2019

**Operator Name:** CIMAREX ENERGY COMPANY

**Well Name:** VACA DRAW 20-17 FEDERAL **Well Number:** 46H

**Well Type:** CONVENTIONAL GAS WELL **Well Work Type:** Drill

## 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:**

**Decribe 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:**

**Operator Name:** CIMAREX ENERGY COMPANY

**Well Name:** VACA DRAW 20-17 FEDERAL **Well Number:** 46H

**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 disturbance (acres):** **PWD surface owner:**

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

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

**Unlined pit specifications:**

**Precipitated solids disposal:**

**Decribe 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?**

**Operator Name:** CIMAREX ENERGY COMPANY

**Well Name:** VACA DRAW 20-17 FEDERAL **Well Number:** 46H

**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):**

**Operator Name:** CIMAREX ENERGY COMPANY

**Well Name:** VACA DRAW 20-17 FEDERAL **Well Number:** 46H

**Other PWD type description:**

**Other PWD type attachment:**

**Have other regulatory requirements been met?**

**Other regulatory requirements attachment:**

AFMSS

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

# Bond Info Data Report

05/11/2021

**APD ID:** 10400038353

**Submission Date:** 01/25/2019

**Operator Name:** CIMAREX ENERGY COMPANY

**Well Name:** VACA DRAW 20-17 FEDERAL

**Well Number:** 46H

**Well Type:** CONVENTIONAL GAS WELL

**Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

## Bond Information

**Federal/Indian APD:** FED

**BLM Bond number:** NMB001188

**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:**

State of New Mexico
Energy, Minerals and Natural Resources Department

Submit Electronically
Via E-permitting

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

# NATURAL GAS MANAGEMENT PLAN

This Natural Gas Management Plan must be submitted with each Application for Permit to Drill (APD) for a new or recompleted well.

## Section 1 – Plan Description
**Effective May 25, 2021**

**I. Operator:** Cimarex Energy Company **OGRID:** 215099 **Date:** 5 / 3 / 2022

**II.Type:** ☒ Original ☐ Amendment due to ☐ 19.15.27.9.D(6)(a) NMAC ☐ 19.15.27.9.D(6)(b) NMAC ☐ Other.

If Other, please describe: _____

**III. Well(s):** Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

| Well Name | API | ULSTR | Footages | Anticipated Oil BBL/D | Anticipated Gas MCF/D | Anticipated Produced Water BBL/D |
|---|---|---|---|---|---|---|
| Vaca Draw 20-14 Fed 46H | 30-025-50143 | O, Sec 20, T25S, 33E | 330 FSL/ 2060 FEL | 1900 | 2850 | 3500 |

**IV. Central Delivery Point Name:** Vaca Draw 20-17 5H CTB CDP Sales [See 19.15.27.9(D)(1) NMAC]

**V. Anticipated Schedule:** Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

| Well Name | API | Spud Date | TD Reached Date | Completion Commencement Date | Initial Flow Back Date | First Production Date |
|---|---|---|---|---|---|---|
| Vaca Draw 20-17 Fed 46H | 30-025-50143 | 10/1/2022 | 12/1/2022 | 3/1/2023 | 5/1/2023 | 5/1/2023 |

**VI. Separation Equipment:** ☒ Attach a complete description of how Operator will size separation equipment to optimize gas capture.

**VII. Operational Practices:** ☒ Attach a complete description of the actions Operator will take to comply with the requirements of Subsection A through F of 19.15.27.8 NMAC.

**VIII. Best Management Practices:** ☒ Attach a complete description of Operator's best management practices to minimize venting during active and planned maintenance.

# Section 2 – Enhanced Plan

**EFFECTIVE APRIL 1, 2022**

Beginning April 1, 2022, an operator that is not in compliance with its statewide natural gas capture requirement for the applicable reporting area must complete this section.

☒ Operator certifies that it is not required to complete this section because Operator is in compliance with its statewide natural gas capture requirement for the applicable reporting area.

**IX. Anticipated Natural Gas Production:**

| Well | API | Anticipated Average Natural Gas Rate MCF/D | Anticipated Volume of Natural Gas for the First Year MCF |
|---|---|---|---|
| | | | |
| | | | |

**X. Natural Gas Gathering System (NGGS):**

| Operator | System | ULSTR of Tie-in | Anticipated Gathering Start Date | Available Maximum Daily Capacity of System Segment Tie-in |
|---|---|---|---|---|
| | | | | |
| | | | | |

**XI. Map.** ☐ Attach an accurate and legible map depicting the location of the well(s), the anticipated pipeline route(s) connecting the production operations to the existing or planned interconnect of the natural gas gathering system(s), and the maximum daily capacity of the segment or portion of the natural gas gathering system(s) to which the well(s) will be connected.

**XII. Line Capacity.** The natural gas gathering system ☐ will ☐ will not have capacity to gather 100% of the anticipated natural gas production volume from the well prior to the date of first production.

**XIII. Line Pressure.** Operator ☐ does ☐ does not anticipate that its existing well(s) connected to the same segment, or portion, of the natural gas gathering system(s) described above will continue to meet anticipated increases in line pressure caused by the new well(s).

☐ Attach Operator's plan to manage production in response to the increased line pressure.

**XIV. Confidentiality:** ☐ Operator asserts confidentiality pursuant to Section 71-2-8 NMSA 1978 for the information provided in Section 2 as provided in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and attaches a full description of the specific information for which confidentiality is asserted and the basis for such assertion.

## Section 3 - Certifications

**Effective May 25, 2021**

Operator certifies that, after reasonable inquiry and based on the available information at the time of submittal:

☒ Operator will be able to connect the well(s) to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system; or

☐ Operator will not be able to connect to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system. ***If Operator checks this box, Operator will select one of the following:***

**Well Shut-In.** ☐ Operator will shut-in and not produce the well until it submits the certification required by Paragraph (4) of Subsection D of 19.15.27.9 NMAC; or

**Venting and Flaring Plan.** ☐ Operator has attached a venting and flaring plan that evaluates and selects one or more of the potential alternative beneficial uses for the natural gas until a natural gas gathering system is available, including:

- **(a)** power generation on lease;
- **(b)** power generation for grid;
- **(c)** compression on lease;
- **(d)** liquids removal on lease;
- **(e)** reinjection for underground storage;
- **(f)** reinjection for temporary storage;
- **(g)** reinjection for enhanced oil recovery;
- **(h)** fuel cell production; and
- **(i)** other alternative beneficial uses approved by the division.

## Section 4 - Notices

1. If, at any time after Operator submits this Natural Gas Management Plan and before the well is spud:

**(a)** Operator becomes aware that the natural gas gathering system it planned to connect the well(s) to has become unavailable or will not have capacity to transport one hundred percent of the production from the well(s), no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised venting and flaring plan containing the information specified in Paragraph (5) of Subsection D of 19.15.27.9 NMAC; or

**(b)** Operator becomes aware that it has, cumulatively for the year, become out of compliance with its baseline natural gas capture rate or natural gas capture requirement, no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised Natural Gas Management Plan for each well it plans to spud during the next 90 days containing the information specified in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and shall file an update for each Natural Gas Management Plan until Operator is back in compliance with its baseline natural gas capture rate or natural gas capture requirement.

2. OCD may deny or conditionally approve an APD if Operator does not make a certification, fails to submit an adequate venting and flaring plan which includes alternative beneficial uses for the anticipated volume of natural gas produced, or if OCD determines that Operator will not have adequate natural gas takeaway capacity at the time a well will be spud.

**I certify that, after reasonable inquiry, the statements in and attached to this Natural Gas Management Plan are true and correct to the best of my knowledge and acknowledge that a false statement may be subject to civil and criminal penalties under the Oil and Gas Act.**

| | |
|---|---|
| Signature: | Sarah Jordan |
| Printed Name: | Sarah Jordan |
| Title: | Regulatory Analyst |
| E-mail Address: | sarah.jordan@coterra.com |
| Date: | 5/3/2022 |
| Phone: | 432/620-1909 |

| **OIL CONSERVATION DIVISION**<br>**(Only applicable when submitted as a standalone form)** |
|---|
| Approved By: |
| Title: |
| Approval Date: |
| Conditions of Approval: |

***From State of New Mexico, Natural Gas Management Plan***

**VI. Separation Equipment:** Attach a complete description of how Operator will size separation equipment to optimize gas capture.

**XEC Standard Response**

Standard facility gas process flow begins at the inlet separator. These vessels are designed based off of forecasted rates and residence times in accordance with, and often greater than, API 12J. The separated gas is then routed to an additional separation vessel (ie sales scrubber) in order to extract liquids that may have carried over or developed due to the decrease in pressure. The sales scrubber is sized based on API 521. From the sales scrubber, the gas leaves the facility and enters the gas midstream gathering network.

# Cimarex
# VII. Operational Practices

Cimarex values the sustainable development of New Mexico's natural resources. Venting and flaring of natural gas is a source of waste in the industry, and Cimarex will ensure that its values are aligned with those of NMOCD. As such, Cimarex plans to take pointed steps to ensure compliance with Subsection A through F of 19.15.27.8 NMAC.

Specifically, below are the steps Cimarex will plan to follow under routine well commissioning and operations.

1. Capture or combust natural gas during drilling operations where technically feasible, using the best industry practices and control technologies.
    a. All flares during these operations will be a minimum of 100ft away from the nearest surface-hole location.
2. All gas present during post-completion drill-out and flow back will be routed through separation equipment, and, if technically feasible, flare unsellable vapors rather than vent. Lastly, formal sales separator commissioning to process well-stream fluids and send gas to a gas flow line/collection system or use the gas for on-site fuel or beneficial usage, gas as soon as is safe and technically feasible.
3. Cimarex will ensure the flare or combustion equipment is properly sized to handle expected flow rates, ensure this equipment is equipped with an automatic or continuous ignition source, and ensure this equipment is designed for proper combustion efficiency.
4. If Cimarex must flare because gas is not meeting pipeline specifications, Cimarex will limit flaring to <60 days, analyze gas composition at least twice per week, and route gas into a gathering pipeline as soon as pipeline specifications are met.
5. Under routine production operations, Cimarex will not flare/vent unless:
    a. Venting or flaring occurs due to an emergency or equipment malfunction.
    b. Venting or flaring occurs as a result of unloading practices, and an operator is onsite (or within 30 minutes of drive time and posts contact information at the wellsite) until the end of unloading practice.
    c. The venting or flaring occurs during automated plungerlift operations, in which case the Cimarex operator will work to optimize the plungerlift system to minimize venting/flaring.
    d. The venting or flaring occurs during downhole well maintenance, in which case Cimarex will work to minimize venting or flaring operations to the extent that it does not pose a risk to safe operations.
    e. The well is an exploratory well, the division has approved the well as an exploratory well, venting or flaring is limited to 12 months, as approved by the division, and venting/flaring does not cause Cimarex to breach its State-wide 98% gas capture requirement.
    f. Venting or flaring occurs because the stock tanks or other low-pressure vessels are being gauged, sampled, or liquids are being loaded out.
    g. The venting or flaring occurs because pressurized vessels are being maintained and are being blown-down or depressurized.
    h. Venting or flaring occurs as a result of normal dehydration unit operations.

i. Venting or flaring occurs as a result of bradenhead testing.
j. Venting or flaring occurs as a result of normal compressor operations, including general compressor operations, compressor engines and turbines.
k. Venting or flaring occurs as a result of a packer leakage test.
l. Venting or flaring occurs as a result of a production test lasting less than 24 hours unless otherwise approved by the division.
m. Venting or flaring occurs as a result of new equipment commissioning and is necessary to purge impurities from the pipeline or production equipment.

6. Cimarex will maintain its equipment in accordance with its Operations and Maintenance Program, to ensure venting or flaring events are minimized and that equipment is properly functioning.
7. Cimarex will install automatic tank gauging equipment on all production facilities constructed after May 25, 2021, to ensure minimal emissions from tank gauging practices.
8. By November 25, 2022, all Cimarex facilities equipped with flares or combustors will be equipped with continuous pilots or automatic igniters, and technology to ensure proper function, i.e. thermocouple, fire-eye, etc…
9. Cimarex will perform AVO (audio, visual, olfactory) facility inspections in accordance with NMOCD requirements. Specifically, Cimarex will:
    a. Perform weekly inspections during the first year of production, and so long as production is greater than 60 MCFD.
    b. If production is less than 60 MCFD, Cimarex will perform weekly AVO inspections when an operator is present on location, and inspections at least once per calendar month with at least 20 calendar days between inspections.
10. Cimarex will measure or estimate the volume of vented, flared or beneficially used natural gas, regardless of the reason or authorization for such venting or flaring.
11. On all facilities constructed after May 25, 2021, Cimarex will install metering where feasible and in accordance with available technology and best engineering practices, in an effort to measure how much gas could have been vented or flared.
    a. In areas where metering is not technically feasible, such as low-pressure/low volume venting or flaring applications, engineering estimates will be used such that the methodology could be independently verified.
12. Cimarex will fulfill the division's requirements for reporting and filing of venting or flaring that exceeds 50 MCF in volume or last eight hours or more cumulatively within any 24-hour period.

**VIII. Best Management Practices to minimize venting during active and planned maintenance**

Cimarex strives to ensure minimal venting occurs during active and planned maintenance activities. Below is a description of common maintenance practices, and the steps Cimarex takes to limit venting exposure.

- **Workovers:**
  - Always strive to kill well when performing downhole maintenance.
  - If vapors or trapped pressure is present and must be relieved then:
    - Initial blowdown to production facility:
      - Route vapors to LP flare if possible/applicable
    - Blowdown to portable gas buster tank:
      - Vent to existing or portable flare if applicable.

- **Stock tank servicing:**
  - Minimize time spent with thief hatches open.
  - When cleaning or servicing via manway, suck tank bottoms to ensure minimal volatiles exposed to atmosphere.
    - Connect vacuum truck to low pressure flare while cleaning bottoms to limit venting.
  - Isolate the vent lines and overflows on the tank being serviced from other tanks.

- **Pressure vessel/compressor servicing and associated blowdowns:**
  - Route to flare where possible.
  - Blow vessel down to minimum available pressure via pipeline, prior to venting vessel.
  - Preemptively changing anodes to reduce failures and extended corrosion related servicing.
  - When cleaning or servicing via manway, suck vessel bottoms to ensure minimal volatiles exposed to atmosphere.

- **Flare/combustor maintenance:**
  - Minimize downtime by coordinating with vendor and Cimarex staff travel logistics.
  - Utilizing preventative and predictive maintenance programs to replace high wear components before failure.
  - Because the flare/combustor is the primary equipment used to limit venting practices, ensure flare/combustor is properly maintained and fully operational at all times via routine maintenance, temperature telemetry, onsite visual inspections.

*The Cimarex expectation is to limit all venting exposure. Equipment that may not be listed on this document is still expected to be maintained and associated venting during such maintenance minimized.*

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

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



## CONDITIONS

| Operator: | OGRID: |
|---|---|
| CIMAREX ENERGY CO.<br>600 N. Marienfeld Street<br>Midland, TX 79701 | 215099 |
| | Action Number:<br>37147 |
| | Action Type:<br>[C-101] BLM - Federal/Indian Land Lease (Form 3160-3) |

**CONDITIONS**

| Created By | Condition | Condition Date |
|---|---|---|
| pkautz | Will require a File As Drilled C-102 and a Directional Survey with the C-104 | 5/13/2022 |
| pkautz | Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string | 5/13/2022 |
| pkautz | Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system | 5/13/2022 |
| pkautz | Cement is required to circulate on both surface and intermediate1 strings of casing | 5/13/2022 |