Form 3160-3
(June 2015)

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

# APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
NMNM0024368A

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.
RED HILLS UNIT
36H (300545)

2. Name of Operator
CIMAREX ENERGY COMPANY OF COLORADO (162683)

9. API Well No.
30-025-46995

3a. Address
600 N. Marienfeld St., Suite 600 Midland TX 79701

3b. Phone No. *(include area code)*
(432)620-1936

10. Field and Pool, or Exploratory
RUSSELL / BONE SPRING WC (97994)

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

At surface NWNW / 439 FNL / 510 FWL / LAT 32.093098 / LONG -103.584132

At proposed prod. zone SWSW / 100 FSL / 1170 FWL / LAT 32.065556 / LONG -103.581999

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 33 / T25S / R33E / NMP

| 14. Distance in miles and direction from nearest town or post office* | 12. County or Parish | 13. State |
|---|---|---|
| 23 miles | LEA | NM |

| 15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) | 16. No of acres in lease | 17. Spacing Unit dedicated to this well |
|---|---|---|
| 439 feet | 160 | 640 |

| 18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. | 19. Proposed Depth | 20. BLM/BIA Bond No. in file |
|---|---|---|
| 20 feet | 9940 feet / 19980 feet | FED: NMB001187 |

| 21. Elevations (Show whether DF, KDB, RT, GL, etc.) | 22. Approximate date work will start* | 23. Estimated duration |
|---|---|---|
| 3378 feet | 04/01/2019 | 30 days |

## 24. Attachments

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

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

| 25. Signature | Name *(Printed/Typed)* | Date |
|---|---|---|
| (Electronic Submission) | Amithy Crawford / Ph: (432)620-1909 | 09/04/2018 |
| Title: Regulatory Analyst | | |
| Approved by *(Signature)* (Electronic Submission) | Name *(Printed/Typed)* Christopher Walls / Ph: (575)234-2234 | Date 12/08/2019 |
| Title: Petroleum Engineer | Office: CARLSBAD | |

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

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

GCP Rec 12/11/19

KA 12/12/19

APPROVED WITH CONDITIONS

Approval Date: 12/08/2019

(Continued on page 2)

*(Instructions on page 2)

# PECOS DISTRICT
# DRILLING CONDITIONS OF APPROVAL

| | |
|---|---|
| **OPERATOR'S NAME:** | **CIMAREX ENERGY COMPANY** |
| **LEASE NO.:** | **NMNM024368A** |
| **LOCATION:** | **Section. 33.,T25S.,R.33E., NMP** |
| **COUNTY:** | **LEA County, New Mexico** |

| | |
|---|---|
| **WELL NAME & NO.:** | **36H- RED HILLS UNIT** |
| **SURFACE HOLE FOOTAGE:** | **439'/N & 510'/W** |
| **BOTTOM HOLE FOOTAGE** | **100'/S & 1170'/W** |

**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 **13-3/8** inch surface casing shall be set at approximately **976** 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 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.

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

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

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

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

   - Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification. **Excess cement calculates to 14%, additional cement might be required.**

## C. PRESSURE CONTROL

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

2. 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 **2000 (2M)** psi. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the intermediate casing shoe shall be **3000 (3M)** psi.

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

e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

**D. SPECIAL REQUIREMENT (S)**

**Unit Wells**

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

**Commercial Well Determination**

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

# 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.
**JJP10202019**

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BUREAU OF LAND MANAGEMENT

# Operator Certification Data Report

12/09/2019

## Operator Certification

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

**NAME:** Amithy Crawford **Signed on:** 09/04/2018

**Title:** Regulatory Analyst

**Street Address:**

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

**Phone:** (432)620-1909

**Email address:** acrawford@cimarex.com

## Field Representative

**Representative Name:**

**Street Address:**

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

**Phone:**

**Email address:**

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BUREAU OF LAND MANAGEMENT

# Application Data Report

12/09/2019

**APD ID:** 10400033434 **Submission Date:** 09/04/2018

**Operator Name:** CIMAREX ENERGY COMPANY OF COLORADO

**Well Name:** RED HILLS UNIT **Well Number:** 36H

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

Highlighted data reflects the most recent changes

Show Final Text

## Section 1 - General

**APD ID:** 10400033434 **Tie to previous NOS?** Y **Submission Date:** 09/04/2018

**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:** NMNM0024368A **Lease Acres:** 160

**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 OF COLORADO

**Operator letter of designation:**

## Operator Info

**Operator Organization Name:** CIMAREX ENERGY COMPANY OF COLORADO

**Operator Address:** 600 N. Marienfeld St., Suite 600 **Zip:** 79701

**Operator PO Box:**

**Operator City:** Midland **State:** TX

**Operator Phone:** (432)620-1936

**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:** RED HILLS UNIT **Well Number:** 36H **Well API Number:**

**Field/Pool or Exploratory?** Field and Pool **Field Name:** RUSSELL **Pool Name:** BONE SPRING WC

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

**Operator Name:** CIMAREX ENERGY COMPANY OF COLORADO

**Well Name:** RED HILLS UNIT **Well Number:** 36H

**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? YES New surface disturbance? N

**Type of Well Pad:** MULTIPLE WELL **Multiple Well Pad Name:** RED HILLS UNIT **Number:** W2W2 PAD

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

**Well Work Type:** Drill

**Well Type:** CONVENTIONAL GAS WELL

**Describe Well Type:**

**Well sub-Type:** EXPLORATORY (WILDCAT)

**Describe sub-type:**

**Distance to town:** 23 Miles **Distance to nearest well:** 20 FT **Distance to lease line:** 439 FT

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

**Well plat:** Red_Hills_Unit_36H_C102_Plat_20180831103123.pdf

**Well work start Date:** 04/01/2019 **Duration:** 30 DAYS

## Section 3 - Well Location Table

**Survey Type:** RECTANGULAR

**Describe Survey Type:**

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

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

| Wellbore | NS-Foot | NS Indicator | EW-Foot | EW Indicator | Twsp | Range | Section | Aliquot/Lot/Tract | Latitude | Longitude | County | State | Meridian | Lease Type | Lease Number | Elevation | MD | TVD | Will this well produce |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SHL Leg #1 | 439 | FNL | 510 | FWL | 25S | 33E | 33 | Aliquot NWNW | 32.093098 | -103.584132 | LEA | NEW MEXICO | NEW MEXICO | F | NMNM 002436 8A | 3378 | 0 | 0 | |
| KOP Leg #1 | 439 | FNL | 510 | FWL | 25S | 33E | 33 | Aliquot NWNW | 32.093098 | -103.584132 | LEA | NEW MEXICO | NEW MEXICO | F | NMNM 002436 8A | -6084 | 9510 | 9462 | |
| PPP Leg | 1320 | FSL | 1170 | FWL | 25S | 33E | 33 | Aliquot SWS | 32.083336 | -103.5819 | LEA | NEW MEXI | NEW MEXI | F | NMNM 000579 | -656 | 13500 | 9940 | |

**Operator Name:** CIMAREX ENERGY COMPANY OF COLORADO

**Well Name:** RED HILLS UNIT **Well Number:** 36H

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PPP Leg #1-2 | 2640 | FSL | 1170 | FWL | 25S | 33E | 33 | Aliquot NWSW | 32.086939 | -103.5819528 | LEA | NEW MEXICO | NEW MEXICO | F | NMNM 000579 2A | -6562 | 12200 | 9940 | |
| EXIT Leg #1 | 0 | FSL | 1170 | FWL | 25S | 33E | 33 | Aliquot SWSW | 32.079794 | -103.5819694 | LEA | NEW MEXICO | NEW MEXICO | F | NMNM 000579 2 | -6562 | 14800 | 9940 | |
| BHL Leg #1 | 100 | FSL | 1170 | FWL | 26S | 33E | 4 | Aliquot SWSW | 32.065556 | -103.581999 | LEA | NEW MEXICO | NEW MEXICO | F | NMNM 089425 | -6562 | 19980 | 9940 | |

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

# Drilling Plan Data Report

12/09/2019

**APD ID:** 10400033434 **Submission Date:** 09/04/2018

**Operator Name:** CIMAREX ENERGY COMPANY OF COLORADO

**Well Name:** RED HILLS UNIT **Well Number:** 36H

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

Highlighted data reflects the most recent changes

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## Section 1 - Geologic Formations

| Formation ID | Formation Name | Elevation | True Vertical Depth | Measured Depth | Lithologies | Mineral Resources | Producing Formation |
|---|---|---|---|---|---|---|---|
| 1 | RUSTLER | 3378 | 939 | 939 | | USEABLE WATER | N |
| 2 | TOP SALT | 2111 | 1267 | 1267 | | NONE | N |
| 3 | BASE OF SALT | -1319 | 4697 | 4697 | | NONE | N |
| 4 | LAMAR | -1528 | 4906 | 4906 | | NONE | N |
| 5 | BELL CANYON | -1554 | 4932 | 4932 | | NATURAL GAS,OIL | N |
| 6 | CHERRY CANYON | -2649 | 6027 | 6027 | | NATURAL GAS,OIL | N |
| 7 | BRUSHY CANYON | -4213 | 7591 | 7591 | | NATURAL GAS,OIL | N |
| 8 | BONE SPRING | -5646 | 9024 | 9024 | | NATURAL GAS,OIL | Y |
| 9 | WOLFCAMP | -8762 | 12140 | 12140 | | NATURAL GAS,OIL | N |

## Section 2 - Blowout Prevention

**Pressure Rating (PSI):** 2M **Rating Depth:** 976

**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.

Testing Procedure: A multi-bowl wellhead system will be utilized. After running the 13-3/8" surface casing, a 13 5/8" BOP/BOPE system with a minimum working pressure of 2000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 2000 psi test. Annular will be tested to 50% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2. The multi-bowl wellhead will be installed by vendors 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. BOP/BOPE test will be

**Operator Name:** CIMAREX ENERGY COMPANY OF COLORADO

**Well Name:** RED HILLS UNIT **Well Number:** 36H

intermediate casing. After installation the pack-off and lower flange will be pressure tested to 2000 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:**

Red_Hills_Unit_36H_Choke_2M3M_20180831103222.pdf

**BOP Diagram Attachment:**

Red_Hills_Unit_36H_BOP_2M_20180831103233.pdf

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**Pressure Rating (PSI):** 3M **Rating Depth:** 19980

**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.

Testing Procedure: A multi-bowl wellhead system will be utilized. After running the 13-3/8" surface casing a 13 5/8" 3M BOPE system with a minimum working pressure of 3000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 3000 psi test. Annular will be tested to 50% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2. The multi-bowl wellhead will be installed by vendor's representative. A copy of the installation instructions has been sent to the BLM field office. The wellhead will be installed by a third-party welder while being monitored by the wellhead vendor representative. All BOP equipment will be tested utilizing a conventional test plug. Not a cup or J-packer type. A solid steel body pack-off will be utilized after running and cementing the intermediate casing. After installation the pack-off and lower flange will be pressure tested to 3000 psi. The surface casing string will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater. The casing string utilizing steel body pack-off will be tested to 70% of casing burst. If well conditions dictate conventional slips will be set and BOPE will be tested to appropriate pressures based on permitted pressure requirements.

**Choke Diagram Attachment:**

Red_Hills_Unit_36H_Choke_2M3M_20180831103248.pdf

**BOP Diagram Attachment:**

Red_Hills_Unit_36H_BOP_3M_20180831103256.pdf

---

**Operator Name:** CIMAREX ENERGY COMPANY OF COLORADO

**Well Name:** RED HILLS UNIT **Well Number:** 36H

## Section 3 - Casing

| Casing ID | String Type | Hole Size | Csg Size | Condition | Standard | Tapered String | Top Set MD | Bottom Set MD | Top Set TVD | Bottom Set TVD | Top Set MSL | Bottom Set MSL | Calculated casing length MD | Grade | Weight | Joint Type | Collapse SF | Burst SF | Joint SF Type | Joint SF | Body SF Type | Body SF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SURFACE | 17.5 | 13.375 | NEW | NON API | N | 0 | 976 | 0 | 976 | 0 | 976 | 976 | H-40 | 48 | ST&C | 1.66 | 3.87 | BUOY | 6.87 | BUOY | 6.87 |
| 2 | INTERMEDIATE | 12.25 | 9.625 | NEW | API | N | 0 | 4908 | 0 | 4908 | 0 | 4908 | 4908 | J-55 | 36 | LT&C | 1.15 | 1.35 | BUOY | 2.56 | BUOY | 2.56 |
| 3 | PRODUCTION | 8.75 | 5.5 | NEW | API | N | 0 | 9510 | 0 | 9510 | 0 | 9510 | 9510 | L-80 | 17 | LT&C | 1.38 | 1.7 | BUOY | 2 | BUOY | 2 |
| 4 | PRODUCTION | 8.75 | 5.5 | NEW | API | N | 9510 | 19980 | 9510 | 9940 | 9510 | 19980 | 10470 | L-80 | 17 | BUTT | 1.32 | 1.63 | BUOY | 54.31 | BUOY | 54.31 |

**Casing Attachments**

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

**Inspection Document:**

**Spec Document:**

Red_Hills_Unit_36H_Casing_Assumptions_20190913090138.pdf

13_38_Hybrid_Casing_Specs_20190917142427.pdf

**Tapered String Spec:**

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

Red_Hills_Unit_36H_Casing_Assumptions_20190913090215.pdf

**Operator Name:** CIMAREX ENERGY COMPANY OF COLORADO

**Well Name:** RED HILLS UNIT **Well Number:** 36H

**Casing Attachments**

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

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

Red_Hills_Unit_36H_Casing_Assumptions_20190913090234.pdf

**Casing ID:** 3 **String Type:** PRODUCTION

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

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

Red_Hills_Unit_36H_Casing_Assumptions_20190913090325.pdf

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

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

Red_Hills_Unit_36H_Casing_Assumptions_20190913090357.pdf

## Section 4 - Cement

**Operator Name:** CIMAREX ENERGY COMPANY OF COLORADO

**Well Name:** RED HILLS UNIT **Well Number:** 36H

| String Type | Lead/Tail | Stage Tool Depth | Top MD | Bottom MD | Quantity(sx) | Yield | Density | Cu Ft | Excess% | Cement type | Additives |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SURFACE | Lead | | 0 | 976 | 410 | 1.72 | 13.5 | 704 | 50 | Class C | Bentonite |
| SURFACE | Tail | | 0 | 976 | 195 | 1.34 | 14.8 | 260 | 25 | Class C | LCM |
| INTERMEDIATE | Lead | | 0 | 4908 | 933 | 1.88 | 12.9 | 1754 | 50 | 35:65 (Poz:C) | Salt, Bentonite |
| INTERMEDIATE | Tail | | 0 | 4908 | 287 | 1.34 | 14.8 | 384 | 25 | Class C | LCM |
| PRODUCTION | Lead | | 0 | 13986 | 437 | 3.45 | 10.5 | 1507 | 25 | NeoCem | n/a |
| PRODUCTION | Tail | | 0 | 9510 | 2239 | 1.3 | 14.2 | 2910 | 25 | 50:50 (Poz:H) | Salt, Bentonite, Fluid Loss, Dispersant, SMC |
| PRODUCTION | Lead | | 0 | 13986 | 437 | 3.45 | 10.5 | 1507 | 25 | NeoCem | n/a |
| PRODUCTION | Tail | | 9510 | 13986 | 2239 | 1.3 | 14.2 | 2910 | 25 | 50:50 (Poz:H) | Salt, Bentonite, Fluid Loss, Dispersant, SMC |

## 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

| 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 | 976 | SPUD MUD | 8.3 | 8.8 | | | | | | | |

**Operator Name:** CIMAREX ENERGY COMPANY OF COLORADO

**Well Name:** RED HILLS UNIT **Well Number:** 36H

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 976 | 4908 | SALT SATURATED | 9.7 | 10.2 | | | | | | | |
| 4908 | 19980 | OTHER : FW/Cut Brine | 8.7 | 9.2 | | | | | | | |

## 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:**

[redacted]

**Coring operation description for the well:**

n/a

## Section 7 - Pressure

**Anticipated Bottom Hole Pressure:** 4755 **Anticipated Surface Pressure:** 2568.19

**Anticipated Bottom Hole Temperature(F):** 169

**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:**

Red_Hills_Unit_36H_H2S_Plan_20180831104021.pdf

**Operator Name:** CIMAREX ENERGY COMPANY OF COLORADO

**Well Name:** RED HILLS UNIT **Well Number:** 36H

## Section 8 - Other Information

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

Red_Hills_Unit_36H_AC_Report_20180831104035.pdf

Red_Hills_Unit_36H_Directional_Plan_20180831104036.pdf

**Other proposed operations facets description:**

**Other proposed operations facets attachment:**

Red_Hills_Unit_36H_Drilling_Plan_20180831104103.pdf

Red_Hills_Unit_36H_Flex_Hose_20180831104112.pdf

Red_Hills_Unit_36H_Gas_Capture_Plan_20180831104118.pdf

Red_Hills_Unit_36H_Multibowl_Wellhead_20180831104123.pdf

Red_Hills_Unit_36H_Multibowl_Procedure_20180831104122.pdf

**Other Variance attachment:**

Hydrogen Sulfide Drilling Operations Plan
**Red Hills Unit 36H**
Cimarex Energy Co.
UL: D, Sec. 33, 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
**Red Hills Unit 36H**
Cimarex Energy Co.
UL: D, Sec. 33, 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

**Red Hills Unit 36H**

Cimarex Energy Co.

UL: D, Sec. 33, 25S, 33E

Lea Co., NM

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

**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

# Cimarex Red Hills Unit#36H Rev0 RM 27Aug18 Anti-Collision Summary Report

| | | | |
|---|---|---|---|
| **Analysis Date-24hr Time:** | August 29, 2018 - 11:21 | **Analysis Method:** | 3D Least Distance |
| **Client:** | Cimarex Energy | **Reference Trajectory:** | Cimarex Red Hills Unit#36H Rev0 RM 27Aug18 (Non-Def Plan) |
| **Field:** | NM Lea County (NAD 83) | **Depth Interval:** | Every 10.00 Measured Depth (ft) |
| **Structure:** | Cimarex Red Hills Unit #36H | **Rule Set:** | NAL Procedure: D&M AntiCollision Standard S002 |
| **Slot:** | New Slot | **Min Pts:** | All local minima indicated. |
| **Well:** | Red Hills Unit #36H | **Version / Patch:** | 2.10.740.0 |
| **Borehole:** | Red Hills Unit #36H | **Database \ Project:** | US1153APP452.dir.slb.com\drilling-NM Lea County 2.10 |
| **Scan MD Range:** | 0.00ft ~ 19979.52ft | | |

**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

**Cimarex Red Hills Unit#36H Rev0 RM 27Aug18 (Non-Def Plan)** — Warning Alert

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 19.96 | 16.47 | 17.46 | 3.49 | N/A | MAS = 5.02 (m) | 0.00 | 0.00 | CtCt<=15m<15.00 | Enter Alert |
| 19.96 | 16.47 | 17.46 | 3.49 | 26193.02 | MAS = 5.02 (m) | 26.00 | 26.00 | | WRP |
| 19.96 | 16.47 | 8.43 | 3.49 | 1.93 | MAS = 5.02 (m) | 1500.00 | 1500.00 | | MinPts |
| 20.10 | 16.69 | 8.14 | 3.41 | 1.86 | OSF1.50 | 1600.00 | 1599.98 | | MINPT-O-EOU |
| 20.17 | 16.77 | 8.16 | 3.40 | 1.86 | OSF1.50 | 1620.00 | 1619.96 | | MinPt-O-ADP |
| 20.30 | 16.88 | 8.21 | 3.42 | 1.86 | OSF1.50 | 1650.00 | 1649.93 | | MinPt-O-SF |
| 70.78 | 23.01 | 54.60 | 47.77 | 4.99 | OSF1.50 | 2670.00 | 2661.22 | OSF>5.00 | Exit Alert |
| 471.81 | 73.40 | 422.04 | 398.40 | 9.93 | OSF1.50 | 9510.25 | 9462.54 | | MinPts |
| 471.79 | 73.38 | 422.04 | 398.42 | 9.93 | OSF1.50 | 9540.00 | 9492.27 | | MINPT-O-EOU |
| 468.18 | 68.68 | 421.56 | 399.50 | 10.55 | OSF1.50 | 10170.00 | 9931.50 | | MinPt-O-ADP |
| 468.00 | 68.50 | 421.50 | 399.50 | 10.58 | OSF1.50 | 10230.00 | 9939.04 | | MinPt-O-ADP |
| 467.96 | 68.45 | 421.49 | 399.51 | 10.59 | OSF1.50 | 10250.00 | 9939.89 | | MINPT-O-EOU |
| 467.93 | 68.31 | 421.56 | 399.62 | 10.61 | OSF1.50 | 10320.00 | 9940.00 | | MinPt-CtCt |
| 467.93 | 142.36 | 372.19 | 325.57 | 4.99 | OSF1.50 | 14280.00 | 9940.00 | OSF<5.00 | Enter Alert |
| 467.94 | 317.74 | 255.28 | 150.20 | 2.21 | OSF1.50 | 19979.52 | 9940.00 | | MinPts |

**Cimarex Red Hills Unit#36H Rev0 RM 27Aug18 (Non-Def Plan)** — Warning Alert

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 39.98 | 32.49 | 37.48 | 7.50 | N/A | MAS = 9.90 (m) | 0.00 | 0.00 | CtCt<=15m<15.00 | Enter Alert |
| 39.98 | 32.49 | 37.48 | 7.50 | 42177.33 | MAS = 9.90 (m) | 26.00 | 26.00 | | WRP |
| 39.98 | 32.49 | 28.45 | 7.50 | 4.15 | MAS = 9.90 (m) | 1500.00 | 1500.00 | | MinPts |
| 40.05 | 32.49 | 28.42 | 7.56 | 4.11 | MAS = 9.90 (m) | 1520.00 | 1520.00 | | MINPT-O-EOU |
| 40.58 | 32.49 | 28.73 | 8.09 | 4.08 | MAS = 9.90 (m) | 1560.00 | 1560.00 | | MinPt-O-SF |
| 54.01 | 32.49 | 41.14 | 21.52 | 4.97 | MAS = 9.90 (m) | 1790.00 | 1789.50 | OSF>5.00 | Exit Alert |
| 813.25 | 57.04 | 774.39 | 756.21 | 22.30 | OSF1.50 | 6546.42 | 6500.00 | | MinPt-O-SF |
| 840.36 | 77.04 | 788.16 | 763.32 | 16.86 | OSF1.50 | 9510.25 | 9462.54 | | 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 | | |
| | 839.88 | 71.64 | 791.29 | 768.24 | 18.17 | OSF1.50 | 10290.00 | 9940.00 | | | | MinPt-CtCt | |
| | 839.89 | 253.86 | 669.81 | 586.03 | 5.00 | OSF1.50 | 17970.00 | 9940.00 | OSF<5.00 | | | Enter Alert | |
| | 839.89 | 317.04 | 627.69 | 522.84 | 3.99 | OSF1.50 | 19979.52 | 9940.00 | | | | MinPts | |
| Cimarex Red Hills Unit #36H Rev0 RM 27Aug18 (Non-Def Plan) | | | | | | | | | | | | | Warning Alert |
| | 1514.41 | 32.81 | 1511.91 | 1481.60 | N/A | MAS = 10.00 (m) | 0.00 | 0.00 | | | | Surface | |
| | 1514.34 | 32.81 | 1511.83 | 1481.53 | 226068.67 | MAS = 10.00 (m) | 10.00 | 10.00 | | | | MinPt-O-SF | |
| | 1514.32 | 32.81 | 1511.82 | 1481.52 | N/A | MAS = 10.00 (m) | 26.00 | 26.00 | | | | WRP | |
| | 497.32 | 51.90 | 461.60 | 445.42 | 15.26 | OSF1.50 | 6870.00 | 6822.30 | | | | MinPt-O-SF | |
| | 496.78 | 51.84 | 461.10 | 444.94 | 15.27 | OSF1.50 | 6910.00 | 6862.29 | | | | MinPt-O-SF | |
| | 495.95 | 68.20 | 449.36 | 427.75 | 11.40 | OSF1.50 | 9550.00 | 9502.24 | | | | MinPt-O-SF | |
| | 494.11 | 67.97 | 447.68 | 426.15 | 11.39 | OSF1.50 | 9600.00 | 9551.76 | | | | MinPt-O-SF | |
| | 420.42 | 64.33 | 376.32 | 356.09 | 10.30 | OSF1.50 | 10340.00 | 9940.00 | | | | MinPt-O-SF | |
| | 420.00 | 64.21 | 375.97 | 355.78 | 10.31 | OSF1.50 | 10380.00 | 9940.00 | | | | MinPt-O-ADP | |
| | 419.96 | 64.18 | 375.96 | 355.79 | 10.32 | OSF1.50 | 10390.00 | 9940.00 | | | | MINPT-O-EOU | |
| | 419.95 | 64.14 | 375.97 | 355.80 | 10.32 | OSF1.50 | 10400.00 | 9940.00 | | | | MinPt-CtCt | |
| | 420.24 | 128.81 | 333.16 | 291.43 | 4.99 | OSF1.50 | 13840.00 | 9940.00 | OSF<5.00 | | | Enter Alert | |
| | 420.25 | 318.26 | 206.86 | 101.99 | 1.99 | OSF1.50 | 19979.52 | 9940.00 | | | | MinPts | |
| Cimarex Red Hills Unit #48H Rev0 RM 27Aug18 (Non-Def Plan) | | | | | | | | | | | | | Warning Alert |
| | 1534.41 | 32.81 | 1531.91 | 1501.60 | N/A | MAS = 10.00 (m) | 0.00 | 0.00 | | | | Surface | |
| | 1534.33 | 32.81 | 1531.83 | 1501.53 | 203952.61 | MAS = 10.00 (m) | 10.00 | 10.00 | | | | MinPt-O-SF | |
| | 1534.32 | 32.81 | 1531.82 | 1501.51 | N/A | MAS = 10.00 (m) | 26.00 | 26.00 | | | | WRP | |
| | 892.92 | 81.92 | 837.25 | 811.00 | 16.95 | OSF1.50 | 9580.00 | 9532.04 | | | | MinPt-O-SF | |
| | 843.71 | 77.80 | 790.75 | 765.91 | 16.92 | OSF1.50 | 10270.00 | 9940.00 | | | | MinPt-O-SF | |
| | 840.16 | 77.02 | 787.72 | 763.14 | 17.03 | OSF1.50 | 10460.00 | 9940.00 | | | | MinPt-O-ADP | |
| | 840.11 | 76.96 | 787.70 | 763.15 | 17.04 | OSF1.50 | 10480.00 | 9940.00 | | | | MINPT-O-EOU | |
| | 840.05 | 254.62 | 669.21 | 585.43 | 4.99 | OSF1.50 | 18050.00 | 9940.00 | OSF<5.00 | | | Enter Alert | |
| | 840.05 | 315.00 | 628.95 | 525.05 | 4.03 | OSF1.50 | 19979.52 | 9940.00 | | | | MinPts | |
| Cimarex Red Hills Unit #17H MWD Final (Surcon Corrected) (Def Survey) | | | | | | | | | | | | | Pass |
| | 84.84 | 32.81 | 82.34 | 52.03 | N/A | MAS = 10.00 (m) | 0.00 | 0.00 | | | | Surface | |
| | 84.79 | 32.81 | 82.29 | 51.98 | 21867.26 | MAS = 10.00 (m) | 26.00 | 26.00 | | | | WRP | |
| | 70.84 | 32.81 | 60.82 | 38.03 | 9.08 | MAS = 10.00 (m) | 1840.00 | 1839.20 | | | | MinPts | |
| | 70.85 | 32.81 | 60.81 | 38.05 | 9.06 | MAS = 10.00 (m) | 1850.00 | 1849.13 | | | | MINPT-O-EOU | |
| | 71.48 | 32.81 | 61.30 | 38.67 | 8.99 | MAS = 10.00 (m) | 1910.00 | 1908.60 | | | | MinPt-O-SF | |
| | 811.96 | 40.62 | 784.05 | 771.34 | 31.85 | OSF1.50 | 7040.00 | 6992.29 | | | | MinPt-CtCt | |
| | 812.05 | 40.90 | 783.95 | 771.15 | 31.62 | OSF1.50 | 7120.00 | 7072.29 | | | | MINPT-O-EOU | |
| | 812.18 | 41.05 | 783.98 | 771.13 | 31.50 | OSF1.50 | 7160.00 | 7112.29 | | | | MinPt-O-ADP | |
| | 815.47 | 45.91 | 784.03 | 769.56 | 28.09 | OSF1.50 | 8410.00 | 8362.29 | | | | MinPt-CtCt | |
| | 815.70 | 46.97 | 783.55 | 768.73 | 27.43 | OSF1.50 | 8640.00 | 8592.29 | | | | MinPt-CtCt | |
| | 816.16 | 47.85 | 783.42 | 768.30 | 26.91 | OSF1.50 | 8820.00 | 8772.29 | | | | MINPT-O-EOU | |
| | 816.47 | 48.32 | 783.42 | 768.15 | 26.65 | OSF1.50 | 8910.00 | 8862.29 | | | | MINPT-O-EOU | |
| | 816.76 | 48.67 | 783.48 | 768.09 | 26.45 | OSF1.50 | 8980.00 | 8932.29 | | | | MinPt-O-ADP | |
| | 817.35 | 49.29 | 783.66 | 768.06 | 26.12 | OSF1.50 | 9110.00 | 9062.29 | | | | MINPT-O-EOU | |
| | 817.58 | 49.57 | 783.70 | 768.01 | 25.98 | OSF1.50 | 9170.00 | 9122.29 | | | | MinPt-O-ADP | |
| | 819.19 | 51.20 | 784.23 | 767.99 | 25.15 | OSF1.50 | 9510.25 | 9462.54 | | | | MinPt-O-SF | |
| | 816.57 | 51.15 | 781.64 | 765.42 | 25.10 | OSF1.50 | 9600.00 | 9551.76 | | | | MinPt-O-SF | |
| | 774.71 | 49.10 | 741.14 | 725.61 | 24.85 | OSF1.50 | 9940.00 | 9836.57 | | | | MinPt-O-SF | |
| | 768.92 | 48.53 | 735.73 | 720.39 | 24.98 | OSF1.50 | 10040.00 | 9890.10 | | | | MinPt-O-ADP | |

| 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 | | |
| | 768.88 | 48.48 | 735.73 | 720.40 | 25.00 | OSF1.50 | 10050.00 | 9894.45 | | | | MinPts | |
| | 2542.71 | 123.68 | 2459.42 | 2419.03 | 31.44 | OSF1.50 | 13720.00 | 9940.00 | | | | MinPt-CtCt | |
| | 2543.31 | 125.41 | 2458.87 | 2417.90 | 31.01 | OSF1.50 | 13800.00 | 9940.00 | | | | MINPT-O-EOU | |
| | 2544.05 | 126.28 | 2459.03 | 2417.77 | 30.80 | OSF1.50 | 13840.00 | 9940.00 | | | | MinPt-O-ADP | |
| | 2552.91 | 136.63 | 2460.99 | 2416.28 | 28.52 | OSF1.50 | 14180.00 | 9940.00 | | | | MINPT-O-EOU | |
| | 2553.87 | 137.76 | 2461.19 | 2416.11 | 28.29 | OSF1.50 | 14230.00 | 9940.00 | | | | MinPt-O-ADP | |
| | 2555.23 | 144.93 | 2457.78 | 2410.30 | 26.88 | OSF1.50 | 14440.00 | 9940.00 | | | | MinPt-CtCt | |
| | 2556.78 | 155.65 | 2452.18 | 2401.13 | 25.02 | OSF1.50 | 14800.00 | 9940.00 | | | | MinPt-CtCt | |
| | 2557.63 | 158.25 | 2451.30 | 2399.38 | 24.61 | OSF1.50 | 14910.00 | 9940.00 | | | | MINPT-O-EOU | |
| | 2557.96 | 163.07 | 2448.42 | 2394.89 | 23.87 | OSF1.50 | 15050.00 | 9940.00 | | | | MinPt-CtCt | |
| | 2549.91 | 185.30 | 2425.55 | 2364.61 | 20.90 | OSF1.50 | 15800.00 | 9940.00 | | | | MinPt-CtCt | |
| | 2549.85 | 190.38 | 2422.09 | 2359.47 | 20.34 | OSF1.50 | 15970.00 | 9940.00 | | | | MinPt-CtCt | |
| | 2551.62 | 197.11 | 2419.38 | 2354.51 | 19.65 | OSF1.50 | 16220.00 | 9940.00 | | | | MINPT-O-EOU | |
| | 2553.77 | 199.70 | 2419.80 | 2354.06 | 19.41 | OSF1.50 | 16320.00 | 9940.00 | | | | MinPt-O-ADP | |
| | 2550.79 | 217.54 | 2404.93 | 2333.25 | 17.78 | OSF1.50 | 16880.00 | 9940.00 | | | | MinPt-CtCt | |
| | 2551.45 | 219.60 | 2404.22 | 2331.85 | 17.61 | OSF1.50 | 16970.00 | 9940.00 | | | | MINPT-O-EOU | |
| | 2553.49 | 223.09 | 2403.93 | 2330.40 | 17.35 | OSF1.50 | 17090.00 | 9940.00 | | | | MINPT-O-EOU | |
| | 2555.15 | 225.09 | 2404.25 | 2330.05 | 17.20 | OSF1.50 | 17170.00 | 9940.00 | | | | MinPt-O-ADP | |
| | 2568.28 | 246.59 | 2403.05 | 2321.69 | 15.77 | OSF1.50 | 17850.00 | 9940.00 | | | | MinPt-CtCt | |
| | 2568.18 | 252.29 | 2399.15 | 2315.89 | 15.41 | OSF1.50 | 18040.00 | 9940.00 | | | | MinPt-CtCt | |
| | 2567.23 | 263.35 | 2390.83 | 2303.88 | 14.75 | OSF1.50 | 18410.00 | 9940.00 | | | | MinPt-CtCt | |
| | 2566.81 | 280.14 | 2379.22 | 2286.67 | 13.85 | OSF1.50 | 18970.00 | 9940.00 | | | | MinPt-CtCt | |
| | 2566.64 | 291.85 | 2371.25 | 2274.80 | 13.29 | OSF1.50 | 19360.00 | 9940.00 | | | | MinPt-CtCt | |
| | 2566.73 | 301.13 | 2365.15 | 2265.61 | 12.88 | OSF1.50 | 19670.00 | 9940.00 | | | | MinPt-CtCt | |
| | 2566.92 | 303.43 | 2363.80 | 2263.49 | 12.78 | OSF1.50 | 19760.00 | 9940.00 | | | | MINPT-O-EOU | |
| | 2567.04 | 303.56 | 2363.83 | 2263.48 | 12.78 | OSF1.50 | 19770.00 | 9940.00 | | | | MinPt-O-ADP | |
| | 2571.46 | 304.70 | 2367.49 | 2266.75 | 12.75 | OSF1.50 | 19890.00 | 9940.00 | | | | MinPt-O-SF | |
| | 2578.39 | 305.14 | 2374.13 | 2273.25 | 12.77 | OSF1.50 | 19979.52 | 9940.00 | | | | TD | |
| Cimarex Red Hills Unit #16H<br>MWD Final (Surcon Corrected)<br>(Def Survey) | | | | | | | | | | | | | Pass |
| | 100.05 | 32.81 | 97.55 | 67.24 | N/A | MAS = 10.00 (m) | 0.00 | 0.00 | | | | Surface | |
| | 100.03 | 32.81 | 97.53 | 67.22 | 289938.82 | MAS = 10.00 (m) | 10.00 | 10.00 | | | | MinPts | |
| | 100.03 | 32.81 | 97.53 | 67.22 | 35986.66 | MAS = 10.00 (m) | 26.00 | 26.00 | | | | WRP | |
| | 100.72 | 32.81 | 97.22 | 67.91 | 98.05 | MAS = 10.00 (m) | 250.00 | 250.00 | | | | MINPT-O-EOU | |
| | 105.05 | 32.81 | 99.22 | 72.24 | 30.87 | MAS = 10.00 (m) | 770.00 | 770.00 | | | | MINPT-O-EOU | |
| | 91.07 | 32.81 | 80.79 | 58.26 | 11.38 | MAS = 10.00 (m) | 2100.00 | 2096.76 | | | | MinPts | |
| | 91.07 | 32.81 | 80.76 | 58.26 | 11.34 | MAS = 10.00 (m) | 2110.00 | 2106.66 | | | | MINPT-O-EOU | |
| | 93.67 | 32.81 | 82.99 | 60.86 | 11.15 | MAS = 10.00 (m) | 2240.00 | 2235.40 | | | | MinPt-O-SF | |
| | 710.46 | 47.14 | 678.20 | 663.32 | 23.79 | OSF1.50 | 8770.00 | 8722.29 | | | | MinPt-O-SF | |
| | 1029.99 | 37.43 | 1004.20 | 992.56 | 44.12 | OSF1.50 | 10620.00 | 9940.00 | | | | MinPt-CtCt | |
| | 1029.99 | 37.48 | 1004.17 | 992.51 | 44.06 | OSF1.50 | 10630.00 | 9940.00 | | | | MINPT-O-EOU | |
| | 1030.11 | 37.63 | 1004.19 | 992.48 | 43.88 | OSF1.50 | 10650.00 | 9940.00 | | | | MinPt-O-ADP | |
| | 1045.32 | 46.07 | 1013.78 | 999.26 | 35.91 | OSF1.50 | 11220.00 | 9940.00 | | | | MinPt-CtCt | |
| | 1044.47 | 50.92 | 1009.69 | 993.55 | 32.28 | OSF1.50 | 11460.00 | 9940.00 | | | | MinPt-CtCt | |
| | 1031.52 | 78.16 | 978.58 | 953.36 | 20.40 | OSF1.50 | 12550.00 | 9940.00 | | | | MinPt-CtCt | |
| | 1031.64 | 84.24 | 974.65 | 947.40 | 18.89 | OSF1.50 | 12770.00 | 9940.00 | | | | MinPt-CtCt | |
| | 1027.56 | 96.56 | 962.36 | 931.01 | 16.35 | OSF1.50 | 13210.00 | 9940.00 | | | | MinPt-CtCt | |
| | 1027.97 | 97.66 | 962.03 | 930.31 | 16.16 | OSF1.50 | 13260.00 | 9940.00 | | | | MINPT-O-EOU | |
| | 1028.33 | 98.10 | 962.10 | 930.23 | 16.10 | OSF1.50 | 13280.00 | 9940.00 | | | | MinPt-O-ADP | |
| | 1029.08 | 98.81 | 962.37 | 930.27 | 15.99 | OSF1.50 | 13310.00 | 9940.00 | | | | MinPt-O-ADP | |
| | 1035.07 | 104.59 | 964.51 | 930.48 | 15.17 | OSF1.50 | 13510.00 | 9940.00 | | | | MinPt-O-ADP | |
| | 1036.64 | 130.43 | 948.86 | 906.22 | 12.13 | OSF1.50 | 14390.00 | 9940.00 | | | | MinPt-CtCt | |
| | 1038.96 | 144.00 | 942.13 | 894.96 | 10.99 | OSF1.50 | 14870.00 | 9940.00 | | | | 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 | | |
| | 1044.73 | 153.22 | 941.74 | 891.50 | 10.37 | OSF1.50 | 15170.00 | 9940.00 | | | | MinPt-CtCt | |
| | 1043.12 | 166.61 | 931.21 | 876.51 | 9.51 | OSF1.50 | 15620.00 | 9940.00 | | | | MinPt-CtCt | |
| | 1043.18 | 169.85 | 929.11 | 873.33 | 9.33 | OSF1.50 | 15730.00 | 9940.00 | | | | MinPt-CtCt | |
| | 1043.99 | 172.39 | 928.23 | 871.60 | 9.20 | OSF1.50 | 15830.00 | 9940.00 | | | | MINPT-O-EOU | |
| | 1044.35 | 172.93 | 928.23 | 871.42 | 9.17 | OSF1.50 | 15850.00 | 9940.00 | | | | MINPT-O-EOU | |
| | 1039.15 | 195.68 | 907.86 | 843.47 | 8.05 | OSF1.50 | 16600.00 | 9940.00 | | | | MinPt-CtCt | |
| | 1039.39 | 196.50 | 907.56 | 842.89 | 8.02 | OSF1.50 | 16640.00 | 9940.00 | | | | MINPT-O-EOU | |
| | 1039.55 | 196.70 | 907.59 | 842.85 | 8.01 | OSF1.50 | 16650.00 | 9940.00 | | | | MinPt-O-ADP | |
| | 1045.23 | 204.23 | 908.24 | 841.00 | 7.75 | OSF1.50 | 16890.00 | 9940.00 | | | | MinPt-CtCt | |
| | 1045.74 | 206.85 | 907.01 | 838.90 | 7.66 | OSF1.50 | 16990.00 | 9940.00 | | | | MINPT-O-EOU | |
| | 1046.12 | 207.28 | 907.11 | 838.85 | 7.64 | OSF1.50 | 17010.00 | 9940.00 | | | | MinPt-O-ADP | |
| | 1054.45 | 214.72 | 910.47 | 839.73 | 7.44 | OSF1.50 | 17260.00 | 9940.00 | | | | MinPt-O-ADP | |
| | 1058.87 | 236.45 | 900.40 | 822.42 | 6.77 | OSF1.50 | 17970.00 | 9940.00 | | | | MinPt-CtCt | |
| | 1058.43 | 242.77 | 895.75 | 815.66 | 6.59 | OSF1.50 | 18180.00 | 9940.00 | | | | MinPt-CtCt | |
| | 1058.89 | 244.14 | 895.30 | 814.75 | 6.56 | OSF1.50 | 18240.00 | 9940.00 | | | | MINPT-O-EOU | |
| | 1059.27 | 244.58 | 895.38 | 814.69 | 6.55 | OSF1.50 | 18260.00 | 9940.00 | | | | MinPt-O-ADP | |
| | 1016.51 | 270.90 | 835.07 | 745.60 | 5.67 | OSF1.50 | 19120.00 | 9940.00 | | | | MinPt-CtCt | |
| | 1016.93 | 272.03 | 834.74 | 744.90 | 5.65 | OSF1.50 | 19170.00 | 9940.00 | | | | MINPT-O-EOU | |
| | 1017.31 | 272.46 | 834.84 | 744.85 | 5.64 | OSF1.50 | 19190.00 | 9940.00 | | | | MinPt-O-ADP | |
| | 1025.95 | 278.89 | 839.19 | 747.06 | 5.55 | OSF1.50 | 19410.00 | 9940.00 | | | | MinPt-O-ADP | |
| | 1046.71 | 289.33 | 852.99 | 757.38 | 5.46 | OSF1.50 | 19790.00 | 9940.00 | | | | MinPt-O-SF | |
| | 1073.50 | 284.02 | 883.32 | 789.48 | 5.71 | OSF1.50 | 19979.52 | 9940.00 | | | | TD | |
| Cimarex Red Hills Unit #5H (Offset) Gyro Oft-12606ft (Def Survey) | | | | | | | | | | | | Pass | |
| | 1270.57 | 32.81 | 1268.07 | 1237.76 | N/A | MAS = 10.00 (m) | 0.00 | 0.00 | | | | Surface | |
| | 1270.50 | 32.81 | 1267.99 | 1237.69 | 219677.58 | MAS = 10.00 (m) | 10.00 | 10.00 | | | | MinPt-O-SF | |
| | 1270.49 | 32.81 | 1267.99 | 1237.68 | N/A | MAS = 10.00 (m) | 26.00 | 26.00 | | | | WRP | |
| | 1270.31 | 32.81 | 1266.51 | 1237.50 | 973.04 | MAS = 10.00 (m) | 350.00 | 350.00 | | | | MinPts | |
| | 1264.31 | 32.81 | 1254.32 | 1231.50 | 168.46 | MAS = 10.00 (m) | 1640.00 | 1639.94 | | | | MinPts | |
| | 1264.39 | 32.81 | 1254.24 | 1231.58 | 164.99 | MAS = 10.00 (m) | 1700.00 | 1699.84 | | | | MINPT-O-EOU | |
| | 1497.59 | 42.79 | 1468.23 | 1454.80 | 55.67 | OSF1.50 | 6546.42 | 6500.00 | | | | MinPt-O-SF | |
| | 1560.97 | 54.51 | 1523.80 | 1506.46 | 44.95 | OSF1.50 | 9440.00 | 9392.29 | | | | MINPT-O-EOU | |
| | 1561.07 | 54.63 | 1523.81 | 1506.43 | 44.84 | OSF1.50 | 9460.00 | 9412.29 | | | | MinPt-O-ADP | |
| | 417.68 | 54.42 | 380.56 | 363.25 | 11.99 | OSF1.50 | 11230.00 | 9940.00 | | | | MinPt-O-SF | |
| | 412.22 | 53.08 | 376.00 | 359.14 | 12.15 | OSF1.50 | 11290.00 | 9940.00 | | | | MinPts | |
| | 412.16 | 52.84 | 376.10 | 359.32 | 12.21 | OSF1.50 | 11300.00 | 9940.00 | | | | MinPt-CtCt | |
| | 8691.32 | 52.98 | 8655.17 | 8638.34 | 258.19 | OSF1.50 | 19979.52 | 9940.00 | | | | TD | |
| Cimarex Red Hills Unit #47H Rev0 RM 27Aug18 (Non-Def Plan) | | | | | | | | | | | | Pass | |
| | 1554.36 | 32.81 | 1551.86 | 1521.55 | N/A | MAS = 10.00 (m) | 0.00 | 0.00 | | | | Surface | |
| | 1554.28 | 32.81 | 1551.78 | 1521.48 | 200195.81 | MAS = 10.00 (m) | 10.00 | 10.00 | | | | MinPt-O-SF | |
| | 1554.27 | 32.81 | 1551.77 | 1521.46 | N/A | MAS = 10.00 (m) | 26.00 | 26.00 | | | | WRP | |
| | 1472.31 | 42.76 | 1442.95 | 1429.55 | 54.85 | OSF1.50 | 5250.00 | 5216.17 | | | | MinPt-O-SF | |
| | 1291.61 | 51.22 | 1256.51 | 1240.38 | 39.97 | OSF1.50 | 6800.00 | 6752.35 | | | | MinPt-O-SF | |
| | 1288.01 | 67.47 | 1242.08 | 1220.54 | 29.84 | OSF1.50 | 9550.00 | 9502.24 | | | | MinPt-O-SF | |
| | 1259.90 | 63.61 | 1216.53 | 1196.29 | 31.06 | OSF1.50 | 10360.00 | 9940.00 | | | | MinPt-O-ADP | |
| | 1259.87 | 63.57 | 1216.52 | 1196.30 | 31.08 | OSF1.50 | 10370.00 | 9940.00 | | | | MINPT-O-EOU | |
| | 1259.83 | 63.47 | 1216.55 | 1196.36 | 31.13 | OSF1.50 | 10400.00 | 9940.00 | | | | MinPt-CtCt | |
| | 1259.94 | 317.49 | 1047.31 | 942.45 | 5.99 | OSF1.50 | 19979.52 | 9940.00 | | | | MinPts | |

Schlumberger

CIMAREX

# Cimarex Red Hills Unit#36H Rev0 RM 27Aug18 Proposal Geodetic Report

**(Non-Def Plan)**

| | | | |
|---|---|---|---|
| **Report Date:** | August 28, 2018 - 02:52 PM | **Survey / DLS Computation:** | Minimum Curvature / Lubinski |
| **Client:** | Cimarex Energy | **Vertical Section Azimuth:** | 179.705 ° (Grid North) |
| **Field:** | NM Lea County (NAD 83) | **Vertical Section Origin:** | 0.000 ft, 0.000 ft |
| **Structure / Slot:** | Cimarex Red Hills Unit #36H / New Slot | **TVD Reference Datum:** | RKB |
| **Well:** | Red Hills Unit #36H | **TVD Reference Elevation:** | 3404.200 ft above MSL |
| **Borehole:** | Red Hills Unit #36H | **Seabed / Ground Elevation:** | 3378.200 ft above MSL |
| **UWI / API#:** | Unknown / Unknown | **Magnetic Declination:** | 6.731 ° |
| **Survey Name:** | Cimarex Red Hills Unit#36H Rev0 RM 27Aug18 | **Total Gravity Field Strength:** | 998.4328mgn (9.80665 Based) |
| **Survey Date:** | August 10, 2018 | **Gravity Model:** | GARM |
| **Tort / AHD / DDI / ERD Ratio:** | 105.982 ° / 10898.386 ft / 6.366 / 1.096 | **Total Magnetic Field Strength:** | 47832.539 nT |
| **Coordinate Reference System:** | NAD83 New Mexico State Plane, Eastern Zone, US Feet | **Magnetic Dip Angle:** | 59.741 ° |
| **Location Lat / Long:** | N 32° 5' 35.15231", W 103° 35' 2.87383" | **Declination Date:** | August 28, 2018 |
| **Location Grid N/E Y/X:** | N 398411.760 ftUS, E 773349.020 ftUS | **Magnetic Declination Model:** | HDGM 2018 |
| **CRS Grid Convergence Angle:** | 0.3981 ° | **North Reference:** | Grid North |
| **Grid Scale Factor:** | 0.99997074 | **Grid Convergence Used:** | 0.3981 ° |
| **Version / Patch:** | 2.10.740.0 | **Total Corr Mag North->Grid North:** | 6.3330 ° |
| | | **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 [439' FNL, 510' FWL] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | N/A | 398411.76 | 773349.02 | N 32 5 35.15 | W 103 35 2.87 |
| | 100.00 | 0.00 | 75.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 398411.76 | 773349.02 | N 32 5 35.15 | W 103 35 2.87 |
| | 200.00 | 0.00 | 75.00 | 200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 398411.76 | 773349.02 | N 32 5 35.15 | W 103 35 2.87 |
| | 300.00 | 0.00 | 75.00 | 300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 398411.76 | 773349.02 | N 32 5 35.15 | W 103 35 2.87 |
| | 400.00 | 0.00 | 75.00 | 400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 398411.76 | 773349.02 | N 32 5 35.15 | W 103 35 2.87 |
| | 500.00 | 0.00 | 75.00 | 500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 398411.76 | 773349.02 | N 32 5 35.15 | W 103 35 2.87 |
| | 600.00 | 0.00 | 75.00 | 600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 398411.76 | 773349.02 | N 32 5 35.15 | W 103 35 2.87 |
| | 700.00 | 0.00 | 75.00 | 700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 398411.76 | 773349.02 | N 32 5 35.15 | W 103 35 2.87 |
| | 800.00 | 0.00 | 75.00 | 800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 398411.76 | 773349.02 | N 32 5 35.15 | W 103 35 2.87 |
| | 900.00 | 0.00 | 75.00 | 900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 398411.76 | 773349.02 | N 32 5 35.15 | W 103 35 2.87 |
| | 1000.00 | 0.00 | 75.00 | 1000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 398411.76 | 773349.02 | N 32 5 35.15 | W 103 35 2.87 |
| | 1100.00 | 0.00 | 75.00 | 1100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 398411.76 | 773349.02 | N 32 5 35.15 | W 103 35 2.87 |
| | 1200.00 | 0.00 | 75.00 | 1200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 398411.76 | 773349.02 | N 32 5 35.15 | W 103 35 2.87 |
| | 1300.00 | 0.00 | 75.00 | 1300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 398411.76 | 773349.02 | N 32 5 35.15 | W 103 35 2.87 |
| | 1400.00 | 0.00 | 75.00 | 1400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 398411.76 | 773349.02 | N 32 5 35.15 | W 103 35 2.87 |
| Nudge 2°/100' DLS | 1500.00 | 0.00 | 75.00 | 1500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 398411.76 | 773349.02 | N 32 5 35.15 | W 103 35 2.87 |
| | 1600.00 | 2.00 | 75.00 | 1599.98 | -0.44 | 0.45 | 1.69 | 2.00 | 398412.21 | 773350.71 | N 32 5 35.16 | W 103 35 2.85 |
| | 1700.00 | 4.00 | 75.00 | 1699.84 | -1.77 | 1.81 | 6.74 | 2.00 | 398413.57 | 773355.76 | N 32 5 35.17 | W 103 35 2.80 |
| | 1800.00 | 6.00 | 75.00 | 1799.45 | -3.98 | 4.06 | 15.16 | 2.00 | 398415.82 | 773364.18 | N 32 5 35.19 | W 103 35 2.70 |
| Hold Nudge | 1899.56 | 7.99 | 75.00 | 1898.27 | -7.06 | 7.20 | 26.87 | 2.00 | 398418.96 | 773375.89 | N 32 5 35.22 | W 103 35 2.56 |
| | 1900.00 | 7.99 | 75.00 | 1898.70 | -7.08 | 7.22 | 26.93 | 0.00 | 398418.98 | 773375.95 | N 32 5 35.22 | W 103 35 2.56 |
| | 2000.00 | 7.99 | 75.00 | 1997.73 | -10.61 | 10.81 | 40.36 | 0.00 | 398422.57 | 773389.38 | N 32 5 35.26 | W 103 35 2.40 |
| | 2100.00 | 7.99 | 75.00 | 2096.76 | -14.13 | 14.41 | 53.79 | 0.00 | 398426.17 | 773402.81 | N 32 5 35.29 | W 103 35 2.25 |
| | 2200.00 | 7.99 | 75.00 | 2195.79 | -17.66 | 18.01 | 67.22 | 0.00 | 398429.77 | 773416.23 | N 32 5 35.33 | W 103 35 2.09 |
| | 2300.00 | 7.99 | 75.00 | 2294.82 | -21.19 | 21.61 | 80.64 | 0.00 | 398433.37 | 773429.66 | N 32 5 35.36 | W 103 35 1.93 |
| | 2400.00 | 7.99 | 75.00 | 2393.85 | -24.72 | 25.21 | 94.07 | 0.00 | 398436.97 | 773443.09 | N 32 5 35.40 | W 103 35 1.78 |
| | 2500.00 | 7.99 | 75.00 | 2492.88 | -28.25 | 28.80 | 107.50 | 0.00 | 398440.56 | 773456.52 | N 32 5 35.43 | W 103 35 1.62 |

| 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 ° ' ") |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2600.00 | 7.99 | 75.00 | 2591.90 | -31.78 | 32.40 | 120.93 | 0.00 | 398444.16 | 773469.94 | N 32 5 35.46 | W 103 35 1.47 |
| | 2700.00 | 7.99 | 75.00 | 2690.93 | -35.31 | 36.00 | 134.36 | 0.00 | 398447.76 | 773483.37 | N 32 5 35.50 | W 103 35 1.31 |
| | 2800.00 | 7.99 | 75.00 | 2789.96 | -38.84 | 39.60 | 147.79 | 0.00 | 398451.36 | 773496.80 | N 32 5 35.53 | W 103 35 1.15 |
| | 2900.00 | 7.99 | 75.00 | 2888.99 | -42.37 | 43.20 | 161.21 | 0.00 | 398454.96 | 773510.23 | N 32 5 35.57 | W 103 35 1.00 |
| | 3000.00 | 7.99 | 75.00 | 2988.02 | -45.90 | 46.80 | 174.64 | 0.00 | 398458.55 | 773523.66 | N 32 5 35.60 | W 103 35 0.84 |
| | 3100.00 | 7.99 | 75.00 | 3087.05 | -49.42 | 50.39 | 188.07 | 0.00 | 398462.15 | 773537.08 | N 32 5 35.64 | W 103 35 0.68 |
| | 3200.00 | 7.99 | 75.00 | 3186.08 | -52.95 | 53.99 | 201.50 | 0.00 | 398465.75 | 773550.51 | N 32 5 35.67 | W 103 35 0.53 |
| | 3300.00 | 7.99 | 75.00 | 3285.11 | -56.48 | 57.59 | 214.93 | 0.00 | 398469.35 | 773563.94 | N 32 5 35.71 | W 103 35 0.37 |
| | 3400.00 | 7.99 | 75.00 | 3384.14 | -60.01 | 61.19 | 228.36 | 0.00 | 398472.95 | 773577.37 | N 32 5 35.74 | W 103 35 0.21 |
| | 3500.00 | 7.99 | 75.00 | 3483.16 | -63.54 | 64.79 | 241.78 | 0.00 | 398476.54 | 773590.80 | N 32 5 35.78 | W 103 35 0.06 |
| | 3600.00 | 7.99 | 75.00 | 3582.19 | -67.07 | 68.38 | 255.21 | 0.00 | 398480.14 | 773604.22 | N 32 5 35.81 | W 103 34 59.90 |
| | 3700.00 | 7.99 | 75.00 | 3681.22 | -70.60 | 71.98 | 268.64 | 0.00 | 398483.74 | 773617.65 | N 32 5 35.85 | W 103 34 59.75 |
| | 3800.00 | 7.99 | 75.00 | 3780.25 | -74.13 | 75.58 | 282.07 | 0.00 | 398487.34 | 773631.08 | N 32 5 35.88 | W 103 34 59.59 |
| | 3900.00 | 7.99 | 75.00 | 3879.28 | -77.66 | 79.18 | 295.50 | 0.00 | 398490.94 | 773644.51 | N 32 5 35.92 | W 103 34 59.43 |
| | 4000.00 | 7.99 | 75.00 | 3978.31 | -81.18 | 82.78 | 308.93 | 0.00 | 398494.53 | 773657.94 | N 32 5 35.95 | W 103 34 59.28 |
| | 4100.00 | 7.99 | 75.00 | 4077.34 | -84.71 | 86.37 | 322.35 | 0.00 | 398498.13 | 773671.36 | N 32 5 35.98 | W 103 34 59.12 |
| | 4200.00 | 7.99 | 75.00 | 4176.37 | -88.24 | 89.97 | 335.78 | 0.00 | 398501.73 | 773684.79 | N 32 5 36.02 | W 103 34 58.96 |
| | 4300.00 | 7.99 | 75.00 | 4275.40 | -91.77 | 93.57 | 349.21 | 0.00 | 398505.33 | 773698.22 | N 32 5 36.05 | W 103 34 58.81 |
| | 4400.00 | 7.99 | 75.00 | 4374.43 | -95.30 | 97.17 | 362.64 | 0.00 | 398508.93 | 773711.65 | N 32 5 36.09 | W 103 34 58.65 |
| | 4500.00 | 7.99 | 75.00 | 4473.45 | -98.83 | 100.77 | 376.07 | 0.00 | 398512.52 | 773725.08 | N 32 5 36.12 | W 103 34 58.49 |
| | 4600.00 | 7.99 | 75.00 | 4572.48 | -102.36 | 104.37 | 389.50 | 0.00 | 398516.12 | 773738.50 | N 32 5 36.16 | W 103 34 58.34 |
| | 4700.00 | 7.99 | 75.00 | 4671.51 | -105.89 | 107.96 | 402.93 | 0.00 | 398519.72 | 773751.93 | N 32 5 36.19 | W 103 34 58.18 |
| | 4800.00 | 7.99 | 75.00 | 4770.54 | -109.42 | 111.56 | 416.35 | 0.00 | 398523.32 | 773765.36 | N 32 5 36.23 | W 103 34 58.03 |
| | 4900.00 | 7.99 | 75.00 | 4869.57 | -112.95 | 115.16 | 429.78 | 0.00 | 398526.92 | 773778.79 | N 32 5 36.26 | W 103 34 57.87 |
| | 5000.00 | 7.99 | 75.00 | 4968.60 | -116.47 | 118.76 | 443.21 | 0.00 | 398530.51 | 773792.22 | N 32 5 36.30 | W 103 34 57.71 |
| | 5100.00 | 7.99 | 75.00 | 5067.63 | -120.00 | 122.36 | 456.64 | 0.00 | 398534.11 | 773805.64 | N 32 5 36.33 | W 103 34 57.56 |
| | 5200.00 | 7.99 | 75.00 | 5166.66 | -123.53 | 125.95 | 470.07 | 0.00 | 398537.71 | 773819.07 | N 32 5 36.37 | W 103 34 57.40 |
| | 5300.00 | 7.99 | 75.00 | 5265.69 | -127.06 | 129.55 | 483.50 | 0.00 | 398541.31 | 773832.50 | N 32 5 36.40 | W 103 34 57.24 |
| | 5400.00 | 7.99 | 75.00 | 5364.71 | -130.59 | 133.15 | 496.92 | 0.00 | 398544.91 | 773845.93 | N 32 5 36.44 | W 103 34 57.09 |
| | 5500.00 | 7.99 | 75.00 | 5463.74 | -134.12 | 136.75 | 510.35 | 0.00 | 398548.50 | 773859.36 | N 32 5 36.47 | W 103 34 56.93 |
| | 5600.00 | 7.99 | 75.00 | 5562.77 | -137.65 | 140.35 | 523.78 | 0.00 | 398552.10 | 773872.78 | N 32 5 36.51 | W 103 34 56.77 |
| | 5700.00 | 7.99 | 75.00 | 5661.80 | -141.18 | 143.94 | 537.21 | 0.00 | 398555.70 | 773886.21 | N 32 5 36.54 | W 103 34 56.62 |
| | 5800.00 | 7.99 | 75.00 | 5760.83 | -144.71 | 147.54 | 550.64 | 0.00 | 398559.30 | 773899.64 | N 32 5 36.57 | W 103 34 56.46 |
| | 5900.00 | 7.99 | 75.00 | 5859.86 | -148.23 | 151.14 | 564.07 | 0.00 | 398562.90 | 773913.07 | N 32 5 36.61 | W 103 34 56.31 |
| | 6000.00 | 7.99 | 75.00 | 5958.89 | -151.76 | 154.74 | 577.49 | 0.00 | 398566.49 | 773926.50 | N 32 5 36.64 | W 103 34 56.15 |
| | 6100.00 | 7.99 | 75.00 | 6057.92 | -155.29 | 158.34 | 590.92 | 0.00 | 398570.09 | 773939.92 | N 32 5 36.68 | W 103 34 55.99 |
| | 6200.00 | 7.99 | 75.00 | 6156.95 | -158.82 | 161.94 | 604.35 | 0.00 | 398573.69 | 773953.35 | N 32 5 36.71 | W 103 34 55.84 |
| | 6300.00 | 7.99 | 75.00 | 6255.98 | -162.35 | 165.53 | 617.78 | 0.00 | 398577.29 | 773966.78 | N 32 5 36.75 | W 103 34 55.68 |
| | 6400.00 | 7.99 | 75.00 | 6355.00 | -165.88 | 169.13 | 631.21 | 0.00 | 398580.89 | 773980.21 | N 32 5 36.78 | W 103 34 55.52 |
| | 6500.00 | 7.99 | 75.00 | 6454.03 | -169.41 | 172.73 | 644.64 | 0.00 | 398584.48 | 773993.64 | N 32 5 36.82 | W 103 34 55.37 |
| Drop to Vertical 2°/100' DLS | 6546.42 | 7.99 | 75.00 | 6500.00 | -171.05 | 174.40 | 650.87 | 0.00 | 398586.15 | 773999.87 | N 32 5 36.83 | W 103 34 55.29 |
| | 6600.00 | 6.92 | 75.00 | 6553.13 | -172.81 | 176.20 | 657.58 | 2.00 | 398587.95 | 774006.58 | N 32 5 36.85 | W 103 34 55.22 |
| | 6700.00 | 4.92 | 75.00 | 6652.59 | -175.43 | 178.87 | 667.55 | 2.00 | 398590.62 | 774016.55 | N 32 5 36.88 | W 103 34 55.10 |
| | 6800.00 | 2.92 | 75.00 | 6752.35 | -177.16 | 180.64 | 674.15 | 2.00 | 398592.39 | 774023.15 | N 32 5 36.89 | W 103 34 55.02 |
| | 6900.00 | 0.92 | 75.00 | 6852.29 | -178.01 | 181.50 | 677.38 | 2.00 | 398593.26 | 774026.38 | N 32 5 36.90 | W 103 34 54.99 |
| Hold Vertical | 6945.98 | 0.00 | 75.00 | 6898.27 | -178.11 | 181.60 | 677.74 | 2.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 7000.00 | 0.00 | 75.00 | 6952.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 7100.00 | 0.00 | 75.00 | 7052.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 7200.00 | 0.00 | 75.00 | 7152.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 7300.00 | 0.00 | 75.00 | 7252.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 7400.00 | 0.00 | 75.00 | 7352.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 7500.00 | 0.00 | 75.00 | 7452.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 7600.00 | 0.00 | 75.00 | 7552.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 7700.00 | 0.00 | 75.00 | 7652.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 7800.00 | 0.00 | 75.00 | 7752.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 7900.00 | 0.00 | 75.00 | 7852.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 8000.00 | 0.00 | 75.00 | 7952.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 8100.00 | 0.00 | 75.00 | 8052.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |

| 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 ° ' ") |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 8200.00 | 0.00 | 75.00 | 8152.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 8300.00 | 0.00 | 75.00 | 8252.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 8400.00 | 0.00 | 75.00 | 8352.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 8500.00 | 0.00 | 75.00 | 8452.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 8600.00 | 0.00 | 75.00 | 8552.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 8700.00 | 0.00 | 75.00 | 8652.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 8800.00 | 0.00 | 75.00 | 8752.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 8900.00 | 0.00 | 75.00 | 8852.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 9000.00 | 0.00 | 75.00 | 8952.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 9100.00 | 0.00 | 75.00 | 9052.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 9200.00 | 0.00 | 75.00 | 9152.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 9300.00 | 0.00 | 75.00 | 9252.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 9400.00 | 0.00 | 75.00 | 9352.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 9500.00 | 0.00 | 75.00 | 9452.29 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| KOP - Build 12°/100' DLS | 9510.25 | 0.00 | 75.00 | 9462.54 | -178.11 | 181.60 | 677.74 | 0.00 | 398593.35 | 774026.74 | N 32 5 36.90 | W 103 34 54.98 |
| | 9600.00 | 10.77 | 179.70 | 9551.76 | -169.70 | 173.19 | 677.78 | 12.00 | 398584.94 | 774026.78 | N 32 5 36.82 | W 103 34 54.98 |
| | 9700.00 | 22.77 | 179.70 | 9647.33 | -140.90 | 144.39 | 677.93 | 12.00 | 398556.14 | 774026.93 | N 32 5 36.53 | W 103 34 54.98 |
| | 9800.00 | 34.77 | 179.70 | 9734.83 | -92.85 | 96.35 | 678.18 | 12.00 | 398508.10 | 774027.18 | N 32 5 36.06 | W 103 34 54.98 |
| | 9900.00 | 46.77 | 179.70 | 9810.42 | -27.67 | 31.16 | 678.51 | 12.00 | 398442.92 | 774027.51 | N 32 5 35.41 | W 103 34 54.98 |
| | 10000.00 | 58.77 | 179.70 | 9870.81 | 51.81 | -48.31 | 678.92 | 12.00 | 398363.45 | 774027.92 | N 32 5 34.63 | W 103 34 54.99 |
| | 10100.00 | 70.77 | 179.70 | 9913.36 | 142.10 | -138.61 | 679.39 | 12.00 | 398273.16 | 774028.39 | N 32 5 33.73 | W 103 34 54.99 |
| | 10200.00 | 82.77 | 179.70 | 9936.20 | 239.27 | -235.77 | 679.89 | 12.00 | 398176.00 | 774028.89 | N 32 5 32.77 | W 103 34 54.99 |
| Avalon Landing Point | 10260.25 | 90.00 | 179.70 | 9940.00 | 299.36 | -295.86 | 680.20 | 12.00 | 398115.91 | 774029.20 | N 32 5 32.18 | W 103 34 54.99 |
| | 10300.00 | 90.00 | 179.70 | 9940.00 | 339.11 | -335.61 | 680.40 | 0.00 | 398076.16 | 774029.40 | N 32 5 31.78 | W 103 34 54.99 |
| | 10400.00 | 90.00 | 179.70 | 9940.00 | 439.11 | -435.61 | 680.92 | 0.00 | 397976.16 | 774029.92 | N 32 5 30.80 | W 103 34 54.99 |
| | 10500.00 | 90.00 | 179.70 | 9940.00 | 539.11 | -535.61 | 681.43 | 0.00 | 397876.17 | 774030.43 | N 32 5 29.81 | W 103 34 55.00 |
| | 10600.00 | 90.00 | 179.70 | 9940.00 | 639.11 | -635.61 | 681.95 | 0.00 | 397776.17 | 774030.95 | N 32 5 28.82 | W 103 34 55.00 |
| | 10700.00 | 90.00 | 179.70 | 9940.00 | 739.11 | -735.61 | 682.46 | 0.00 | 397676.18 | 774031.46 | N 32 5 27.83 | W 103 34 55.00 |
| | 10800.00 | 90.00 | 179.70 | 9940.00 | 839.11 | -835.60 | 682.98 | 0.00 | 397576.18 | 774031.98 | N 32 5 26.84 | W 103 34 55.00 |
| | 10900.00 | 90.00 | 179.70 | 9940.00 | 939.11 | -935.60 | 683.49 | 0.00 | 397476.19 | 774032.49 | N 32 5 25.85 | W 103 34 55.00 |
| | 11000.00 | 90.00 | 179.70 | 9940.00 | 1039.11 | -1035.60 | 684.01 | 0.00 | 397376.19 | 774033.01 | N 32 5 24.86 | W 103 34 55.01 |
| | 11100.00 | 90.00 | 179.70 | 9940.00 | 1139.11 | -1135.60 | 684.52 | 0.00 | 397276.20 | 774033.52 | N 32 5 23.87 | W 103 34 55.01 |
| | 11200.00 | 90.00 | 179.70 | 9940.00 | 1239.11 | -1235.60 | 685.04 | 0.00 | 397176.20 | 774034.04 | N 32 5 22.88 | W 103 34 55.01 |
| | 11300.00 | 90.00 | 179.70 | 9940.00 | 1339.11 | -1335.60 | 685.55 | 0.00 | 397076.20 | 774034.55 | N 32 5 21.89 | W 103 34 55.01 |
| | 11400.00 | 90.00 | 179.70 | 9940.00 | 1439.11 | -1435.60 | 686.07 | 0.00 | 396976.21 | 774035.07 | N 32 5 20.90 | W 103 34 55.02 |
| | 11500.00 | 90.00 | 179.70 | 9940.00 | 1539.11 | -1535.60 | 686.58 | 0.00 | 396876.21 | 774035.58 | N 32 5 19.91 | W 103 34 55.02 |
| | 11600.00 | 90.00 | 179.70 | 9940.00 | 1639.11 | -1635.59 | 687.10 | 0.00 | 396776.22 | 774036.10 | N 32 5 18.92 | W 103 34 55.02 |
| | 11700.00 | 90.00 | 179.70 | 9940.00 | 1739.11 | -1735.59 | 687.61 | 0.00 | 396676.22 | 774036.61 | N 32 5 17.93 | W 103 34 55.02 |
| | 11800.00 | 90.00 | 179.70 | 9940.00 | 1839.11 | -1835.59 | 688.13 | 0.00 | 396576.23 | 774037.13 | N 32 5 16.94 | W 103 34 55.02 |
| | 11900.00 | 90.00 | 179.70 | 9940.00 | 1939.11 | -1935.59 | 688.64 | 0.00 | 396476.23 | 774037.64 | N 32 5 15.95 | W 103 34 55.03 |
| | 12000.00 | 90.00 | 179.70 | 9940.00 | 2039.11 | -2035.59 | 689.16 | 0.00 | 396376.24 | 774038.16 | N 32 5 14.96 | W 103 34 55.03 |
| | 12100.00 | 90.00 | 179.70 | 9940.00 | 2139.11 | -2135.59 | 689.67 | 0.00 | 396276.24 | 774038.67 | N 32 5 13.97 | W 103 34 55.03 |
| | 12200.00 | 90.00 | 179.70 | 9940.00 | 2239.11 | -2235.59 | 690.19 | 0.00 | 396176.24 | 774039.18 | N 32 5 12.98 | W 103 34 55.03 |
| | 12300.00 | 90.00 | 179.70 | 9940.00 | 2339.11 | -2335.58 | 690.70 | 0.00 | 396076.25 | 774039.70 | N 32 5 11.99 | W 103 34 55.03 |
| | 12400.00 | 90.00 | 179.70 | 9940.00 | 2439.11 | -2435.58 | 691.22 | 0.00 | 395976.25 | 774040.21 | N 32 5 11.00 | W 103 34 55.04 |
| | 12500.00 | 90.00 | 179.70 | 9940.00 | 2539.11 | -2535.58 | 691.73 | 0.00 | 395876.26 | 774040.73 | N 32 5 10.01 | W 103 34 55.04 |
| | 12600.00 | 90.00 | 179.70 | 9940.00 | 2639.11 | -2635.58 | 692.25 | 0.00 | 395776.26 | 774041.24 | N 32 5 9.03 | W 103 34 55.04 |
| | 12700.00 | 90.00 | 179.70 | 9940.00 | 2739.11 | -2735.58 | 692.76 | 0.00 | 395676.27 | 774041.76 | N 32 5 8.04 | W 103 34 55.04 |
| | 12800.00 | 90.00 | 179.70 | 9940.00 | 2839.11 | -2835.58 | 693.28 | 0.00 | 395576.27 | 774042.27 | N 32 5 7.05 | W 103 34 55.04 |
| | 12900.00 | 90.00 | 179.70 | 9940.00 | 2939.11 | -2935.58 | 693.79 | 0.00 | 395476.28 | 774042.79 | N 32 5 6.06 | W 103 34 55.05 |
| | 13000.00 | 90.00 | 179.70 | 9940.00 | 3039.11 | -3035.58 | 694.31 | 0.00 | 395376.28 | 774043.30 | N 32 5 5.07 | W 103 34 55.05 |
| | 13100.00 | 90.00 | 179.70 | 9940.00 | 3139.11 | -3135.57 | 694.82 | 0.00 | 395276.28 | 774043.82 | N 32 5 4.08 | W 103 34 55.05 |
| | 13200.00 | 90.00 | 179.70 | 9940.00 | 3239.11 | -3235.57 | 695.34 | 0.00 | 395176.29 | 774044.33 | N 32 5 3.09 | W 103 34 55.05 |
| | 13300.00 | 90.00 | 179.70 | 9940.00 | 3339.11 | -3335.57 | 695.85 | 0.00 | 395076.29 | 774044.85 | N 32 5 2.10 | W 103 34 55.06 |
| | 13400.00 | 90.00 | 179.70 | 9940.00 | 3439.11 | -3435.57 | 696.37 | 0.00 | 394976.30 | 774045.36 | N 32 5 1.11 | W 103 34 55.06 |
| | 13500.00 | 90.00 | 179.70 | 9940.00 | 3539.11 | -3535.57 | 696.88 | 0.00 | 394876.30 | 774045.88 | N 32 5 0.12 | W 103 34 55.06 |
| | 13600.00 | 90.00 | 179.70 | 9940.00 | 3639.11 | -3635.57 | 697.39 | 0.00 | 394776.31 | 774046.39 | N 32 4 59.13 | W 103 34 55.06 |

| 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 ° ' ") |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 13700.00 | 90.00 | 179.70 | 9940.00 | 3739.11 | -3735.57 | 697.91 | 0.00 | 394676.31 | 774046.91 | N 32 4 58.14 | W 103 34 55.06 |
| | 13800.00 | 90.00 | 179.70 | 9940.00 | 3839.11 | -3835.56 | 698.42 | 0.00 | 394576.32 | 774047.42 | N 32 4 57.15 | W 103 34 55.07 |
| | 13900.00 | 90.00 | 179.70 | 9940.00 | 3939.11 | -3935.56 | 698.94 | 0.00 | 394476.32 | 774047.94 | N 32 4 56.16 | W 103 34 55.07 |
| | 14000.00 | 90.00 | 179.70 | 9940.00 | 4039.11 | -4035.56 | 699.45 | 0.00 | 394376.32 | 774048.45 | N 32 4 55.17 | W 103 34 55.07 |
| | 14100.00 | 90.00 | 179.70 | 9940.00 | 4139.11 | -4135.56 | 699.97 | 0.00 | 394276.33 | 774048.97 | N 32 4 54.18 | W 103 34 55.07 |
| | 14200.00 | 90.00 | 179.70 | 9940.00 | 4239.11 | -4235.56 | 700.48 | 0.00 | 394176.33 | 774049.48 | N 32 4 53.19 | W 103 34 55.07 |
| | 14300.00 | 90.00 | 179.70 | 9940.00 | 4339.11 | -4335.56 | 701.00 | 0.00 | 394076.34 | 774050.00 | N 32 4 52.20 | W 103 34 55.08 |
| | 14400.00 | 90.00 | 179.70 | 9940.00 | 4439.11 | -4435.56 | 701.51 | 0.00 | 393976.34 | 774050.51 | N 32 4 51.21 | W 103 34 55.08 |
| | 14500.00 | 90.00 | 179.70 | 9940.00 | 4539.11 | -4535.56 | 702.03 | 0.00 | 393876.35 | 774051.03 | N 32 4 50.22 | W 103 34 55.08 |
| | 14600.00 | 90.00 | 179.70 | 9940.00 | 4639.11 | -4635.55 | 702.54 | 0.00 | 393776.35 | 774051.54 | N 32 4 49.23 | W 103 34 55.08 |
| | 14700.00 | 90.00 | 179.70 | 9940.00 | 4739.11 | -4735.55 | 703.06 | 0.00 | 393676.36 | 774052.06 | N 32 4 48.25 | W 103 34 55.09 |
| | 14800.00 | 90.00 | 179.70 | 9940.00 | 4839.11 | -4835.55 | 703.57 | 0.00 | 393576.36 | 774052.57 | N 32 4 47.26 | W 103 34 55.09 |
| | 14900.00 | 90.00 | 179.70 | 9940.00 | 4939.11 | -4935.55 | 704.09 | 0.00 | 393476.36 | 774053.09 | N 32 4 46.27 | W 103 34 55.09 |
| | 15000.00 | 90.00 | 179.70 | 9940.00 | 5039.11 | -5035.55 | 704.60 | 0.00 | 393376.37 | 774053.60 | N 32 4 45.28 | W 103 34 55.09 |
| | 15100.00 | 90.00 | 179.70 | 9940.00 | 5139.11 | -5135.55 | 705.12 | 0.00 | 393276.37 | 774054.12 | N 32 4 44.29 | W 103 34 55.09 |
| | 15200.00 | 90.00 | 179.70 | 9940.00 | 5239.11 | -5235.55 | 705.63 | 0.00 | 393176.38 | 774054.63 | N 32 4 43.30 | W 103 34 55.10 |
| | 15300.00 | 90.00 | 179.70 | 9940.00 | 5339.11 | -5335.54 | 706.15 | 0.00 | 393076.38 | 774055.15 | N 32 4 42.31 | W 103 34 55.10 |
| | 15400.00 | 90.00 | 179.70 | 9940.00 | 5439.11 | -5435.54 | 706.66 | 0.00 | 392976.39 | 774055.66 | N 32 4 41.32 | W 103 34 55.10 |
| | 15500.00 | 90.00 | 179.70 | 9940.00 | 5539.11 | -5535.54 | 707.18 | 0.00 | 392876.39 | 774056.18 | N 32 4 40.33 | W 103 34 55.10 |
| | 15600.00 | 90.00 | 179.70 | 9940.00 | 5639.11 | -5635.54 | 707.69 | 0.00 | 392776.40 | 774056.69 | N 32 4 39.34 | W 103 34 55.10 |
| | 15700.00 | 90.00 | 179.70 | 9940.00 | 5739.11 | -5735.54 | 708.21 | 0.00 | 392676.40 | 774057.21 | N 32 4 38.35 | W 103 34 55.11 |
| | 15800.00 | 90.00 | 179.70 | 9940.00 | 5839.11 | -5835.54 | 708.72 | 0.00 | 392576.40 | 774057.72 | N 32 4 37.36 | W 103 34 55.11 |
| | 15900.00 | 90.00 | 179.70 | 9940.00 | 5939.11 | -5935.54 | 709.24 | 0.00 | 392476.41 | 774058.24 | N 32 4 36.37 | W 103 34 55.11 |
| | 16000.00 | 90.00 | 179.70 | 9940.00 | 6039.11 | -6035.54 | 709.75 | 0.00 | 392376.41 | 774058.75 | N 32 4 35.38 | W 103 34 55.11 |
| | 16100.00 | 90.00 | 179.70 | 9940.00 | 6139.11 | -6135.53 | 710.27 | 0.00 | 392276.42 | 774059.27 | N 32 4 34.39 | W 103 34 55.11 |
| | 16200.00 | 90.00 | 179.70 | 9940.00 | 6239.11 | -6235.53 | 710.78 | 0.00 | 392176.42 | 774059.78 | N 32 4 33.40 | W 103 34 55.12 |
| | 16300.00 | 90.00 | 179.70 | 9940.00 | 6339.11 | -6335.53 | 711.30 | 0.00 | 392076.43 | 774060.29 | N 32 4 32.41 | W 103 34 55.12 |
| | 16400.00 | 90.00 | 179.70 | 9940.00 | 6439.11 | -6435.53 | 711.81 | 0.00 | 391976.43 | 774060.81 | N 32 4 31.42 | W 103 34 55.12 |
| | 16500.00 | 90.00 | 179.70 | 9940.00 | 6539.11 | -6535.53 | 712.33 | 0.00 | 391876.44 | 774061.32 | N 32 4 30.43 | W 103 34 55.12 |
| | 16600.00 | 90.00 | 179.70 | 9940.00 | 6639.11 | -6635.53 | 712.84 | 0.00 | 391776.44 | 774061.84 | N 32 4 29.44 | W 103 34 55.13 |
| | 16700.00 | 90.00 | 179.70 | 9940.00 | 6739.11 | -6735.53 | 713.36 | 0.00 | 391676.44 | 774062.35 | N 32 4 28.45 | W 103 34 55.13 |
| | 16800.00 | 90.00 | 179.70 | 9940.00 | 6839.11 | -6835.52 | 713.87 | 0.00 | 391576.45 | 774062.87 | N 32 4 27.46 | W 103 34 55.13 |
| | 16900.00 | 90.00 | 179.70 | 9940.00 | 6939.11 | -6935.52 | 714.39 | 0.00 | 391476.45 | 774063.38 | N 32 4 26.48 | W 103 34 55.13 |
| | 17000.00 | 90.00 | 179.70 | 9940.00 | 7039.11 | -7035.52 | 714.90 | 0.00 | 391376.46 | 774063.90 | N 32 4 25.49 | W 103 34 55.13 |
| | 17100.00 | 90.00 | 179.70 | 9940.00 | 7139.11 | -7135.52 | 715.42 | 0.00 | 391276.46 | 774064.41 | N 32 4 24.50 | W 103 34 55.14 |
| | 17200.00 | 90.00 | 179.70 | 9940.00 | 7239.11 | -7235.52 | 715.93 | 0.00 | 391176.47 | 774064.93 | N 32 4 23.51 | W 103 34 55.14 |
| | 17300.00 | 90.00 | 179.70 | 9940.00 | 7339.11 | -7335.52 | 716.45 | 0.00 | 391076.47 | 774065.44 | N 32 4 22.52 | W 103 34 55.14 |
| | 17400.00 | 90.00 | 179.70 | 9940.00 | 7439.11 | -7435.52 | 716.96 | 0.00 | 390976.48 | 774065.96 | N 32 4 21.53 | W 103 34 55.14 |
| | 17500.00 | 90.00 | 179.70 | 9940.00 | 7539.11 | -7535.52 | 717.48 | 0.00 | 390876.48 | 774066.47 | N 32 4 20.54 | W 103 34 55.14 |
| | 17600.00 | 90.00 | 179.70 | 9940.00 | 7639.11 | -7635.51 | 717.99 | 0.00 | 390776.48 | 774066.99 | N 32 4 19.55 | W 103 34 55.15 |
| | 17700.00 | 90.00 | 179.70 | 9940.00 | 7739.11 | -7735.51 | 718.51 | 0.00 | 390676.49 | 774067.50 | N 32 4 18.56 | W 103 34 55.15 |
| | 17800.00 | 90.00 | 179.70 | 9940.00 | 7839.11 | -7835.51 | 719.02 | 0.00 | 390576.49 | 774068.02 | N 32 4 17.57 | W 103 34 55.15 |
| | 17900.00 | 90.00 | 179.70 | 9940.00 | 7939.11 | -7935.51 | 719.54 | 0.00 | 390476.50 | 774068.53 | N 32 4 16.58 | W 103 34 55.15 |
| | 18000.00 | 90.00 | 179.70 | 9940.00 | 8039.11 | -8035.51 | 720.05 | 0.00 | 390376.50 | 774069.05 | N 32 4 15.59 | W 103 34 55.15 |
| | 18100.00 | 90.00 | 179.70 | 9940.00 | 8139.11 | -8135.51 | 720.57 | 0.00 | 390276.51 | 774069.56 | N 32 4 14.60 | W 103 34 55.16 |
| | 18200.00 | 90.00 | 179.70 | 9940.00 | 8239.11 | -8235.51 | 721.08 | 0.00 | 390176.51 | 774070.08 | N 32 4 13.61 | W 103 34 55.16 |
| | 18300.00 | 90.00 | 179.70 | 9940.00 | 8339.11 | -8335.50 | 721.60 | 0.00 | 390076.52 | 774070.59 | N 32 4 12.62 | W 103 34 55.16 |
| | 18400.00 | 90.00 | 179.70 | 9940.00 | 8439.11 | -8435.50 | 722.11 | 0.00 | 389976.52 | 774071.11 | N 32 4 11.63 | W 103 34 55.16 |
| | 18500.00 | 90.00 | 179.70 | 9940.00 | 8539.11 | -8535.50 | 722.62 | 0.00 | 389876.52 | 774071.62 | N 32 4 10.64 | W 103 34 55.17 |
| | 18600.00 | 90.00 | 179.70 | 9940.00 | 8639.11 | -8635.50 | 723.14 | 0.00 | 389776.53 | 774072.14 | N 32 4 9.65 | W 103 34 55.17 |
| | 18700.00 | 90.00 | 179.70 | 9940.00 | 8739.11 | -8735.50 | 723.65 | 0.00 | 389676.53 | 774072.65 | N 32 4 8.66 | W 103 34 55.17 |
| | 18800.00 | 90.00 | 179.70 | 9940.00 | 8839.11 | -8835.50 | 724.17 | 0.00 | 389576.54 | 774073.17 | N 32 4 7.67 | W 103 34 55.17 |
| | 18900.00 | 90.00 | 179.70 | 9940.00 | 8939.11 | -8935.50 | 724.68 | 0.00 | 389476.54 | 774073.68 | N 32 4 6.68 | W 103 34 55.17 |
| | 19000.00 | 90.00 | 179.70 | 9940.00 | 9039.11 | -9035.50 | 725.20 | 0.00 | 389376.55 | 774074.20 | N 32 4 5.70 | W 103 34 55.18 |
| | 19100.00 | 90.00 | 179.70 | 9940.00 | 9139.11 | -9135.49 | 725.71 | 0.00 | 389276.55 | 774074.71 | N 32 4 4.71 | W 103 34 55.18 |
| | 19200.00 | 90.00 | 179.70 | 9940.00 | 9239.11 | -9235.49 | 726.23 | 0.00 | 389176.56 | 774075.23 | N 32 4 3.72 | W 103 34 55.18 |
| | 19300.00 | 90.00 | 179.70 | 9940.00 | 9339.11 | -9335.49 | 726.74 | 0.00 | 389076.56 | 774075.74 | N 32 4 2.73 | W 103 34 55.18 |
| | 19400.00 | 90.00 | 179.70 | 9940.00 | 9439.11 | -9435.49 | 727.26 | 0.00 | 388976.56 | 774076.26 | N 32 4 1.74 | W 103 34 55.18 |
| | 19500.00 | 90.00 | 179.70 | 9940.00 | 9539.11 | -9535.49 | 727.77 | 0.00 | 388876.57 | 774076.77 | N 32 4 0.75 | W 103 34 55.19 |

| 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 ° ' ") |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 19600.00 | 90.00 | 179.70 | 9940.00 | 9639.11 | -9635.49 | 728.29 | 0.00 | 388776.57 | 774077.29 | N 32 3 59.76 | W 103 34 55.19 |
| | 19700.00 | 90.00 | 179.70 | 9940.00 | 9739.11 | -9735.49 | 728.80 | 0.00 | 388676.58 | 774077.80 | N 32 3 58.77 | W 103 34 55.19 |
| | 19800.00 | 90.00 | 179.70 | 9940.00 | 9839.11 | -9835.48 | 729.32 | 0.00 | 388576.58 | 774078.32 | N 32 3 57.78 | W 103 34 55.19 |
| | 19900.00 | 90.00 | 179.70 | 9940.00 | 9939.11 | -9935.48 | 729.83 | 0.00 | 388476.59 | 774078.83 | N 32 3 56.79 | W 103 34 55.19 |
| Cimarex Red Hills Unit #36H - PBHL [100' FSL, 1170' FWL] | 19979.52 | 90.00 | 179.70 | 9940.00 | 10018.63 | -10015.00 | 730.24 | 0.00 | 388397.07 | 774079.24 | N 32 3 56.00 | W 103 34 55.20 |

**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 | Red Hills Unit #36H / Cimarex Red Hills Unit#36H Rev0 RM 27Aug18 |
| | 1 | 26.000 | 19979.520 | 1/100.000 | 30.000 | 30.000 | | NAL_MWD_IFR1+MS | Red Hills Unit #36H / Cimarex Red Hills Unit#36H Rev0 RM |

Schlumberger

# Cimarex Energy Rev 0

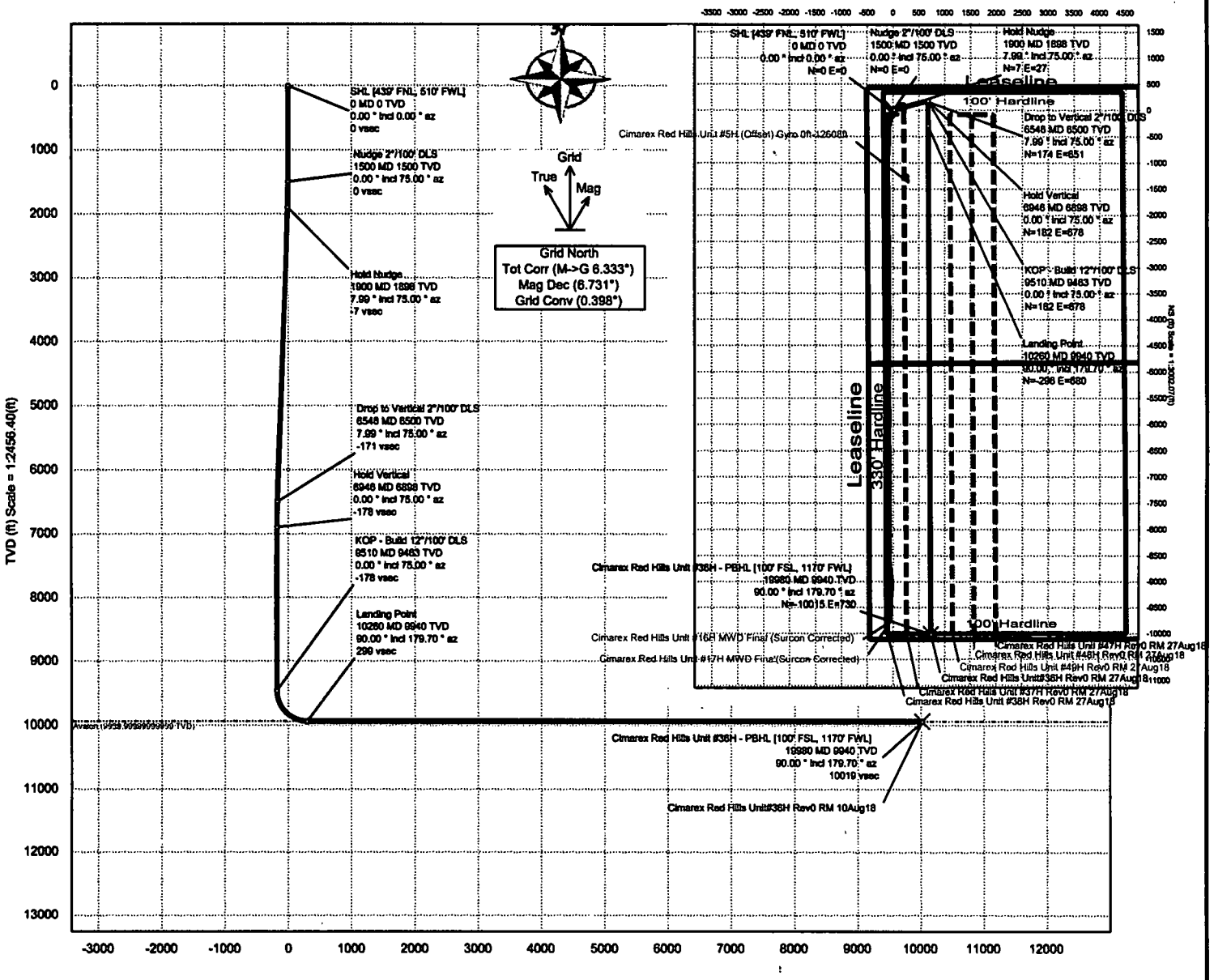
CIMAREX

| Borehole: | Well: | Field: | Structure: |
|---|---|---|---|
| Red Hills Unit #36H | Red Hills Unit #36H | NM Lea County (NAD 83) | Cimarex Red Hills Unit #36H |

| Gravity & Magnetic Parameters | | | | | Surface Location | NAD83 New Mexico State Plane, Eastern Zone, US Feet | | | | Miscellaneous | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model: | HDGM 2018 | Dip: | 59.741° | Date: | 23-Aug-2018 | Lat: | N 32 8 35.15 | Northing: | 388411.76SUS | Grid Conv: | 0.3981° | Slot: | New Slot |
| MagDec: | 6.731° | FS: | 47832.638nT | Gravity FS: | 998.433mgn (9.80665 Based) | Lon: | W 103 35 2.87 | Easting: | 773348.02SUS | Scale Fact: | 0.99997074 | Plan: | Cimarex Red Hills Unit#36H Rev0 RM 27Aug18 |

TVD Ref: RKB(3404.23 above MSL)

EW (ft) Scale = 1:3002.07(ft)




Vertical Section (ft) Azim = 179.71° Scale = 1:2456.40(ft) Origin = 0N/-S, 0E/-W

## Critical Points

| Critical Point | MD | INCL | AZIM | TVD | VSEC | N(+)/S(-) | E(+)/W(-) | DLS |
|---|---|---|---|---|---|---|---|---|
| SHL [439' FNL, 510' FWL] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| Nudge 2°/100' DLS | 1500.00 | 0.00 | 75.00 | 1500.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hold Nudge | 1899.56 | 7.99 | 75.00 | 1898.27 | -7.06 | 7.20 | 26.87 | 2.00 |
| Drop to Vertical 2°/100' DLS | 6548.42 | 7.99 | 75.00 | 6500.00 | -171.05 | 174.40 | 650.87 | 0.00 |
| Hold Vertical | 6945.98 | 0.00 | 75.00 | 6898.27 | -178.11 | 181.60 | 677.74 | 2.00 |
| KOP - Build 12°/100' DLS | 9510.25 | 0.00 | 75.00 | 9462.54 | -178.11 | 181.60 | 677.74 | 0.00 |
| Landing Point | 10260.25 | 90.00 | 179.70 | 9940.00 | 299.36 | -295.68 | 680.20 | 12.00 |
| Avalon | 10260.25 | 90.00 | 179.70 | 9940.00 | 299.36 | -295.68 | 680.20 | 12.00 |
| Cimarex Red Hills Unit #36H - PBHL [100' FSL, 1170' FWL] | 19979.52 | 90.00 | 179.70 | 9940.00 | 10018.63 | -10015.00 | 730.24 | 0.00 |

## 1. Geological Formations

TVD of target 9,940
MD at TD 19,980

Pilot Hole TD N/A
Deepest expected fresh water

| Formation | Depth (TVD) from KB | Water/Mineral Bearing/Target Zone | Hazards |
|---|---|---|---|
| Rustler | 939 | N/A | |
| Top Salt | 1267 | N/A | |
| Base Salt | 4697 | N/A | |
| Lamar | 4906 | N/A | |
| Bell Canyon | 4932 | N/A | |
| Cherry Canyon | 6027 | N/A | |
| Brushy Canyon | 7591 | Hydrocarbons | |
| Top Bone Spring | 9024 | Hydrocarbons | |
| Bone Spring Target | 9940 | Hydrocarbons | |
| Wolfcamp | 12140 | Hydrocarbons | |

## 2. Casing Program

| Hole Size | Casing Depth From | Casing Depth To | Casing Size | Weight (lb/ft) | Grade | Conn. | SF Collapse | SF Burst | SF Tension |
|---|---|---|---|---|---|---|---|---|---|
| 17 1/2 | 0 | 976 | 13-3/8" | 48.00 | H-40/J-55 Hybrid | ST&C | 1.66 | 3.87 | 6.87 |
| 12 1/4 | 0 | 4908 | 9-5/8" | 36.00 | J-55 | LT&C | 1.15 | 1.35 | 2.56 |
| 8 3/4 | 0 | 9510 | 5-1/2" | 17.00 | L-80 | LT&C | 1.38 | 1.70 | 2.00 |
| 8 3/4 | 9510 | 19980 | 5-1/2" | 17.00 | L-80 | BT&C | 1.32 | 1.63 | 54.31 |
| | | | | 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

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

### 3. Cementing Program

| Casing | # Sks | Wt. lb/gal | Yld ft3/sack | H2O gal/sk | 500# Comp. Strength (hours) | Slurry Description |
|---|---|---|---|---|---|---|
| **Surface** | 410 | 13.50 | 1.72 | 9.15 | 15.5 | Lead: Class C + Bentonite |
| | 195 | 14.80 | 1.34 | 6.32 | 9.5 | Tail: Class C + LCM |
| | | | | | | |
| **Intermediate** | 933 | 12.90 | 1.88 | 9.65 | 12 | Lead: 35:65 (Poz:C) + Salt + Bentonite |
| | 287 | 14.80 | 1.34 | 6.32 | 9.5 | Tail: Class C + LCM |
| | | | | | | |
| **Production** | 437 | 10.50 | 3.45 | 22.18 | N/A | Lead: NeoCem |
| | 2239 | 14.20 | 1.30 | 5.86 | 14:30 | Tail: 50:50 (Poz:H) + Salt + Bentonite + Fluid Loss + Dispersant + SMS |
| | | | | | | |

| Casing String | TOC | % Excess |
|---|---|---|
| Surface | 0 | 42 |
| Intermediate | 0 | 49 |
| Production | 4708 | 15 |

## 4. Pressure Control Equipment

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

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

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

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

| | | |
|---|---|---|
| | Formation integrity test will be performed per Onshore Order #2.<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 976' | FW Spud Mud | 8.30 - 8.80 | 30-32 | N/C |
| 976' to 4908' | Brine Water | 9.70 - 10.20 | 30-32 | N/C |
| 4908' to 19980' | FW/Cut Brine | 8.70 - 9.20 | 30-32 | N/C |

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

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

## 6. Logging and Testing Procedures

| Logging, Coring and Testing | |
|---|---|
| X | 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 | 4755 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 13-3/8" surface casing, a 13 5/8" BOP/BOPE system with a minimum working pressure of 3000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 3000 psi test. Annular will be tested to 50% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2.

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

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

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

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

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

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

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

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# PWD Data Report

12/09/2019

**APD ID:** 10400033434 **Submission Date:** 09/04/2018

**Operator Name:** CIMAREX ENERGY COMPANY OF COLORADO

**Well Name:** RED HILLS UNIT **Well Number:** 36H

**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 OF COLORADO

**Well Name:** RED HILLS UNIT **Well Number:** 36H

**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 OF COLORADO

**Well Name:** RED HILLS UNIT **Well Number:** 36H

**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):**

**Operator Name:** CIMAREX ENERGY COMPANY OF COLORADO

**Well Name:** RED HILLS UNIT **Well Number:** 36H

**Other PWD type description:**

**Other PWD type attachment:**

**Have other regulatory requirements been met?**

**Other regulatory requirements attachment:**

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# Bond Info Data Report

12/09/2019

**APD ID:** 10400033434 **Submission Date:** 09/04/2018

**Operator Name:** CIMAREX ENERGY COMPANY OF COLORADO

**Well Name:** RED HILLS UNIT **Well Number:** 36H

**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:** NMB001187

**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:**