

Form 3160-3
(June 2015)FORM APPROVED
OMB No. 1004-0137
Expires: January 31, 2018

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

1a. Type of work: <input type="checkbox"/> DRILL <input type="checkbox"/> REENTER 1b. Type of Well: <input type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other 1c. Type of Completion: <input type="checkbox"/> Hydraulic Fracturing <input type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		5. Lease Serial No. 6. If Indian, Allottee or Tribe Name 7. If Unit or CA Agreement, Name and No. 8. Lease Name and Well No. <div style="text-align: center; font-weight: bold; font-size: 1.2em;">[319775]</div>
2. Name of Operator <div style="text-align: center; font-weight: bold; font-size: 1.2em;">[215099]</div>		9. API Well No. <div style="text-align: center; font-weight: bold; font-size: 1.2em;">30-025-50176</div>
3a. Address	3b. Phone No. (include area code)	10. Field and Pool, or Exploratory <div style="text-align: center; font-weight: bold; font-size: 1.2em;">[97994]</div>
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface At proposed prod. zone		11. Sec., T. R. M. or Blk. and Survey or Area
14. Distance in miles and direction from nearest town or post office*		12. County or Parish 13. State
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)	16. No of acres in lease	17. Spacing Unit dedicated to this well
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	19. Proposed Depth	20. BLM/BIA Bond No. in file
21. Elevations (Show whether DF, KDB, RT, GL, etc.)	22. Approximate date work will start*	23. Estimated duration
24. Attachments		

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

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

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

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

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

NGMP Rec 05/03/2022

SL

(Continued on page 2)



Approval Date: 05/26/2021

KZ
05/27/2022

*(Instructions on page 2)

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

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

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-025 50176	² Pool Code 97994	³ Pool Name WC-025 G-06 S253329D; Upper Bone Spring
⁴ Property Code 319775	⁵ Property Name VACA DRAW 20-17 FEDERAL	⁶ Well Number 15H
⁷ OGRID No. 215099	⁸ Operator Name CIMAREX ENERGY CO.	⁹ Elevation 3423.1'

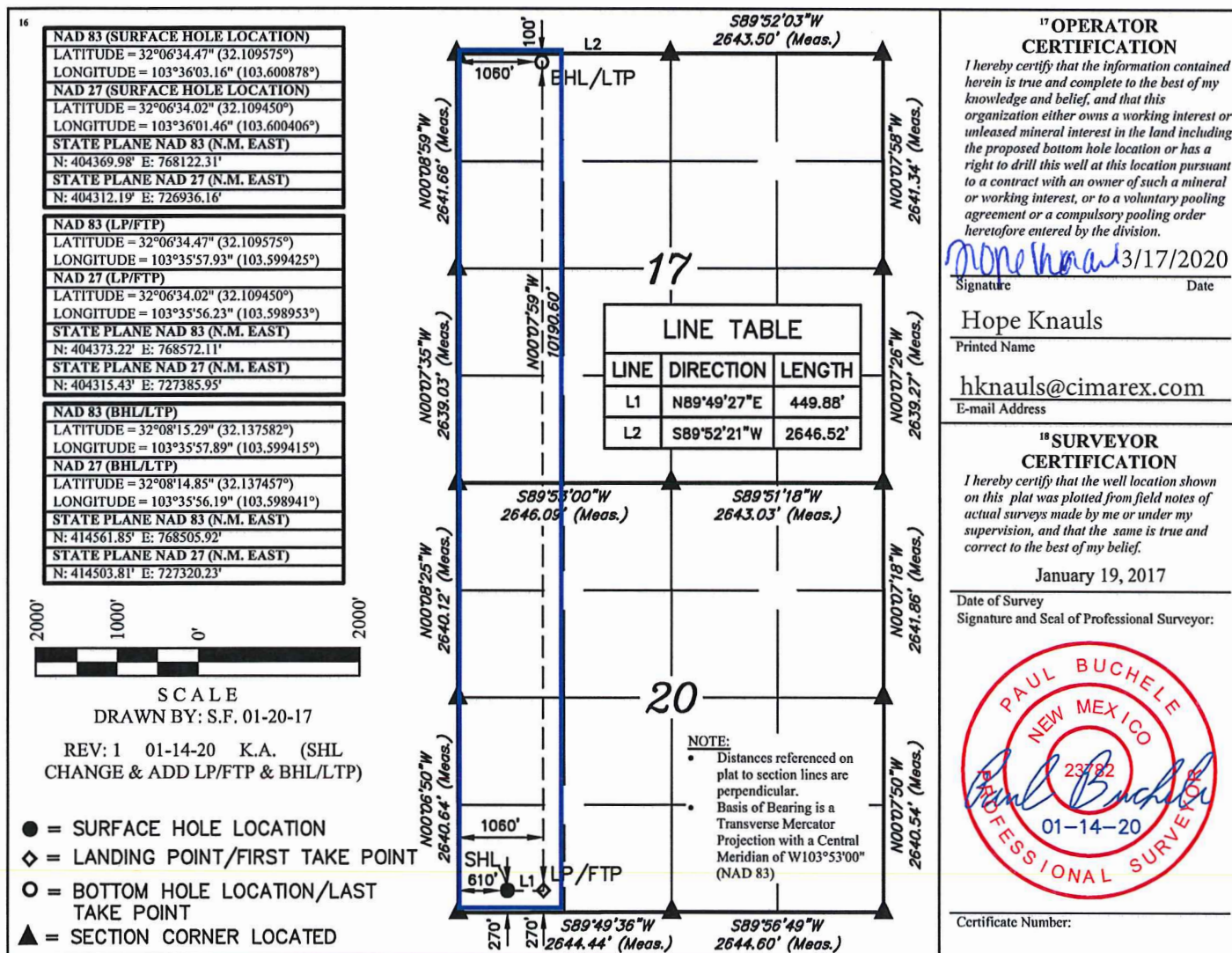
¹⁰ Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	20	25S	33E		270	SOUTH	610	WEST	LEA

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	17	25S	33E		100	NORTH	1060	WEST	LEA
¹² Dedicated Acres 320	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.						

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



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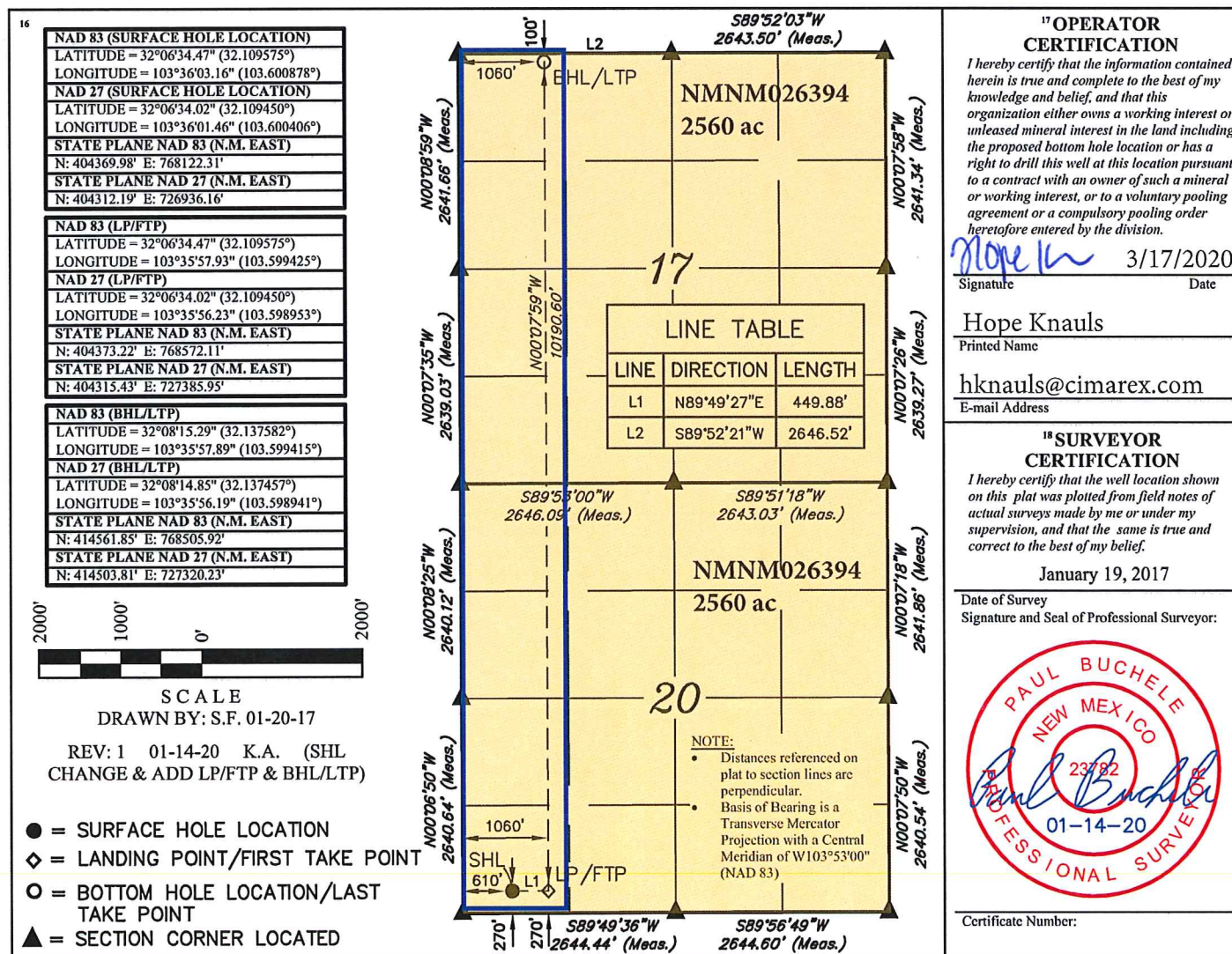
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PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

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

WELL NAME & NO.:	Vaca Draw 20-17 Fed 15H
SURFACE HOLE FOOTAGE:	270'/S& 610'/W
BOTTOM HOLE FOOTAGE:	100'/N & 1060'/W

COA

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

A. HYDROGEN SULFIDE

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

B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately **1080** 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 1/3rd 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 **7** inch production casing is:
 - Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification. **Excess calculates to 10%. Additional cement maybe needed.**
4. The minimum required fill of cement behind the **4-1/2** inch production liner is:
 - Cement should tie-back **100 feet** into the previous casing. Operator shall provide method of verification. **Excess calculates to 10%. Additional cement maybe needed.**

C. PRESSURE CONTROL

1. **Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).**
2. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M) psi**.
 - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
 - c. Manufacturer representative shall install the test plug for the initial BOP test.

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

D. SPECIAL REQUIREMENT (S)

Communitization Agreement

- The operator will submit a Communitization Agreement to the Santa Fe Office, 301 Dinosaur Trail Santa Fe, New Mexico 87508, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

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 integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours.

WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.

4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.
5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.
7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.
3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.
4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:

- a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
 - c. Manufacturer representative shall install the test plug for the initial BOP test.
 - d. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
 - e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
 - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).
 - b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).
 - c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).

- d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
- e. The results of the test shall be reported to the appropriate BLM office.
- f. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.
- g. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.
- h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

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

D. WASTE MATERIAL AND FLUIDS

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

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

ZS050621



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

Application Data Report

05/27/2021

APD ID: 10400037874**Submission Date:** 01/15/2019

Highlighted data
reflects the most
recent changes

Operator Name: CIMAREX ENERGY COMPANY**Well Name:** VACA DRAW 20-17 FEDERAL**Well Number:** 15H[Show Final Text](#)**Well Type:** OIL WELL**Well Work Type:** Drill

Section 1 - General

APD ID: 10400037874**Tie to previous NOS?** Y**Submission Date:** 01/15/2019**BLM Office:** CARLSBAD**User:** Amithy Crawford**Title:** Regulatory Analyst**Federal/Indian APD:** FED**Is the first lease penetrated for production Federal or Indian?** FED**Lease number:** NMNM0026394**Lease Acres:****Surface access agreement in place?****Allotted?****Reservation:****Agreement in place?** NO**Federal or Indian agreement:****Agreement number:****Agreement name:****Keep application confidential?** YES**Permitting Agent?** NO**APD Operator:** CIMAREX ENERGY COMPANY**Operator letter of designation:**

Operator Info

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

Section 2 - Well Information

Well in Master Development Plan? NO**Master Development Plan name:****Well in Master SUPO?** NO**Master SUPO name:****Well in Master Drilling Plan?** NO**Master Drilling Plan name:****Well Name:** VACA DRAW 20-17 FEDERAL**Well Number:** 15H**Well API Number:****Field/Pool or Exploratory?** Field and Pool**Field Name:** BONE SPRING**Pool Name:** UPPER BONE
SPRING**Is the proposed well in an area containing other mineral resources?** USEABLE WATER

Operator Name: CIMAREX ENERGY COMPANY**Well Name:** VACA DRAW 20-17 FEDERAL**Well Number:** 15H**Is the proposed well in an area containing other mineral resources?** USEABLE WATER**Is the proposed well in a Helium production area?** N**Use Existing Well Pad?** NO**New surface disturbance?****Type of Well Pad:** MULTIPLE WELL**Multiple Well Pad Name:** VACA **Number:** W2W2 PAD

DRAW 20-17 FED

Well Class: HORIZONTAL**Number of Legs:** 1**Well Work Type:** Drill**Well Type:** OIL WELL**Describe Well Type:****Well sub-Type:** INFILL**Describe sub-type:****Distance to town:** 27 Miles**Distance to nearest well:** 20 FT**Distance to lease line:** 270 FT**Reservoir well spacing assigned acres Measurement:** 320 Acres**Well plat:** Vaca_Draw_20_17_Fed_15H___C102_20200323122856.pdf

Vaca_Draw_20_17_Fed_15H___BLM_C102_20200323122924.pdf

Well work start Date: 07/06/2020**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 from this lease?
SHL Leg #1	270	FSL	610	FW L	25S	33E	20	Aliquot SWS W	32.10957 5	- 103.6008 78	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 26394	346 9	0	0	
KOP Leg #1	271	FSL	106 1	FW L	25S	33E	20	Aliquot SWS W	32.13844 4	- 103.6484 944	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 26394	- 605 3	954 7	952 2	

Operator Name: CIMAREX ENERGY COMPANY**Well Name:** VACA DRAW 20-17 FEDERAL**Well Number:** 15H

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this lease?
PPP Leg #1-1	272	FSL	1061	FWL	25S	33E	20	Aliquot NWSW	32.145011	- 103.6485306	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 26394	- 6106	9600	9575	
EXIT Leg #1	100	FNL	1060	FWL	25S	33E	17	Aliquot NWNW	32.137582	- 103.599415	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 26394	- 6531	20009	10000	
BHL Leg #1	100	FNL	1060	FWL	25S	33E	17	Aliquot NENW	32.137582	- 103.599415	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 26394	- 6531	20009	10000	



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

Drilling Plan Data Report

05/27/2021

APD ID: 10400037874

Submission Date: 01/15/2019

Highlighted data
reflects the most
recent changes

Operator Name: CIMAREX ENERGY COMPANY

Well Name: VACA DRAW 20-17 FEDERAL

Well Number: 15H

[Show Final Text](#)

Well Type: OIL WELL

Well Work Type: Drill

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
371671	RUSTLER	3462	1001	1001		USEABLE WATER	N
371672	TOP SALT	2121	1341	1341		NONE	N
371673	BASE OF SALT	-1233	4695	4695		NONE	N
371683	BELL CANYON	-1507	4969	4969		NONE	N
371684	CHERRY CANYON	-2586	6048	6048		OIL	N
371678	BRUSHY CANYON	-4063	7525	7525		NATURAL GAS, OIL	N
371676	BONE SPRING	-5652	9114	9114		NATURAL GAS, OIL	N
371677	UPPER AVALON SHALE	-5897	9359	9359		NATURAL GAS, OIL	Y
371679	BONE SPRING 1ST	-6622	10084	10084		NATURAL GAS, OIL	N

Section 2 - Blowout Prevention

Pressure Rating (PSI): 2M

Rating Depth: 4933

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 5000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 5000 psi test. Annular will be tested to 100% 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

Operator Name: CIMAREX ENERGY COMPANY**Well Name:** VACA DRAW 20-17 FEDERAL**Well Number:** 15H

intermediate casing. After installation the pack-off and lower flange will be pressure tested to 5000 psi. Slips will be utilized after running and cementing the production casing. After installation of the slips and wellhead on the production casing, a 13 5/8" BOP/BOPE system with a minimum working pressure of 5000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 5000 psi test. Annular will be tested to 100% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2. The surface casing string will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater. The casing string utilizing steel body pack-off will be tested to 70% of casing burst. If well conditions dictate conventional slips will be set and BOPE will be tested to appropriate pressures based on permitted pressure requirements.

Choke Diagram Attachment:

Vaca_Draw_20_17_Fed_15H_Choke_2M3M_20200409072215.pdf

BOP Diagram Attachment:

Vaca_Draw_20_17_Fed_15H_BOP_2M_20200409072244.pdf

Pressure Rating (PSI): 3M**Rating Depth:** 10150

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 5000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 5000 psi test. Annular will be tested to 100% 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 5000 psi. Slips will be utilized after running and cementing the production casing. After installation of the slips and wellhead on the production casing, a 13 5/8" BOP/BOPE system with a minimum working pressure of 5000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 5000 psi test. Annular will be tested to 100% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2. The surface casing string will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater. The casing string utilizing steel body pack-off will be tested to 70% of casing burst. If well conditions dictate conventional slips will be set and BOPE will be tested to appropriate pressures based on permitted pressure requirements.

Choke Diagram Attachment:

Vaca_Draw_20_17_Fed_15H_Choke_2M3M_20200409072338.pdf

BOP Diagram Attachment:

Vaca_Draw_20_17_Fed_15H_BOP_3M_20200409072407.pdf

Operator Name: CIMAREX ENERGY COMPANY**Well Name:** VACA DRAW 20-17 FEDERAL**Well Number:** 15H**Pressure Rating (PSI):** 5M**Rating Depth:** 20009

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 5000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 5000 psi test. Annular will be tested to 100% 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 5000 psi. Slips will be utilized after running and cementing the production casing. After installation of the slips and wellhead on the production casing, a 13 5/8" BOP/BOPE system with a minimum working pressure of 5000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 5000 psi test. Annular will be tested to 100% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2. The surface casing string will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater. The casing string utilizing steel body pack-off will be tested to 70% of casing burst. If well conditions dictate conventional slips will be set and BOPE will be tested to appropriate pressures based on permitted pressure requirements.

Choke Diagram Attachment:

Vaca_Draw_20_17_Fed_15H_Choke_5M_20200409072700.pdf

BOP Diagram Attachment:

Vaca_Draw_20_17_Fed_15H_BOP_5M_20200409072714.pdf

Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	SURFACE	17.5	13.375	NEW	NON API	N	0	1051	0	1051			1051	H-40	48	ST&C	1.63	3.8	BUOY	6.38	BUOY	6.38
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	4933	0	4933			4933	J-55	40	BUTT	1.44	1.5	BUOY	3.19	BUOY	3.19
3	PRODUCTION	8.75	7.0	NEW	API	N	0	8647	0	8647	0		8647	L-80	29	LT&C	1.73	2.02	BUOY	2.26	BUOY	2.26
4	PRODUCTION	8.75	7.0	NEW	API	N	8647	10150	8647	9975			1503	N-80	26	LT&C	1.16	1.55	BUOY	15.03	BUOY	15.03

Operator Name: CIMAREX ENERGY COMPANY**Well Name:** VACA DRAW 20-17 FEDERAL**Well Number:** 15H

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
5	COMPLETION SYSTEM	6	4.5	NEW	API	N	8547	20009	8547	10000			11462	P-110	13.5	BUTT	1.87	2.17	BUOY	21.51	BUOY	21.51

Casing Attachments**Casing ID:** 1 **String Type:** SURFACE**Inspection Document:****Spec Document:**

Vaca_Draw_20_17_Fed_15H_Spec_Sheet_20200409073127.pdf

Tapered String Spec:**Casing Design Assumptions and Worksheet(s):**

Vaca_Draw_20_17_Fed_15H_Casing_Assumptions_20200409073219.pdf

Casing ID: 2 **String Type:** INTERMEDIATE**Inspection Document:****Spec Document:****Tapered String Spec:****Casing Design Assumptions and Worksheet(s):**

Vaca_Draw_20_17_Fed_15H_Casing_Assumptions_20200409073414.pdf

Operator Name: CIMAREX ENERGY COMPANY**Well Name:** VACA DRAW 20-17 FEDERAL**Well Number:** 15H**Casing Attachments**

Casing ID: 3 **String Type:** PRODUCTION**Inspection Document:****Spec Document:****Tapered String Spec:****Casing Design Assumptions and Worksheet(s):**Vaca_Draw_20_17_Fed_15H_Casing_Assumptions_20200409073612.pdf

Casing ID: 4 **String Type:** PRODUCTION**Inspection Document:****Spec Document:****Tapered String Spec:****Casing Design Assumptions and Worksheet(s):**Vaca_Draw_20_17_Fed_15H_Casing_Assumptions_20200409073903.pdf

Casing ID: 5 **String Type:** COMPLETION SYSTEM**Inspection Document:****Spec Document:****Tapered String Spec:****Casing Design Assumptions and Worksheet(s):**Vaca_Draw_20_17_Fed_15H_Casing_Assumptions_20200916150757.pdf

Section 4 - Cement

Operator Name: CIMAREX ENERGY COMPANY**Well Name:** VACA DRAW 20-17 FEDERAL**Well Number:** 15H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
PRODUCTION	Lead		0	0	0	0	0	0	0	0	0

SURFACE	Lead		0	1051	509	1.72	13.5	875	50	Class C	Bentonite
SURFACE	Tail		0	1051	137	1.34	14.8	183	25	Class C	LCM
INTERMEDIATE	Lead		0	4933	935	1.88	12.9	1756	50	35:65 (Poz:C)	Salt, Bentonite
INTERMEDIATE	Tail		0	4933	289	1.34	14.8	386	25	Class C	LCM
PRODUCTION	Lead		0	1015 0	247	3.64	10.3	899	25	Tuned Light	LCM
PRODUCTION	Tail		0	1015 0	88	1.3	14.2	114	25	50:50 (PozH)	Salt, Bentonite, fluid loss, dispersant, sms
COMPLETION SYSTEM	Lead		8547	2000 9	733	1.3	14.2	952	10	50:50 (POZ H)	Salt Benontie Fluid Loss Dispersant SMS

Section 5 - Circulating Medium

Mud System Type: Closed**Will an air or gas system be Used?** NO**Description of the equipment for the circulating system in accordance with Onshore Order #2:****Diagram of the equipment for the circulating system in accordance with Onshore Order #2:**

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

Describe the mud monitoring system utilized: PVT/Pason/Visual Monitoring

Circulating Medium Table

Operator Name: CIMAREX ENERGY COMPANY**Well Name:** VACA DRAW 20-17 FEDERAL**Well Number:** 15H

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	1051	OTHER : Fresh Water	7.83	8.33							
1051	4933	OTHER : Brine water	9.8	10.3							
4933	10150	OTHER : Cut Brine or OBM	8.5	9							
10150	20009	OIL-BASED MUD	10.5	11							

Section 6 - Test, Logging, Coring

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

No DST Planned

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

CNL,DS,GR

Coring operation description for the well:

N/A

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 5720

Anticipated Surface Pressure: 3520

Anticipated Bottom Hole Temperature(F): 170

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 geohazards description:

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

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

Vaca_Draw_20_17_Fed_15H_H2S_Plan_20200409081942.pdf

Operator Name: CIMAREX ENERGY COMPANY

Well Name: VACA DRAW 20-17 FEDERAL

Well Number: 15H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Vaca_Draw_20_17_Fed_15H_AC_Report_20200409082022.pdf

Vaca_Draw_20_17_Fed_15H_Directional_Survey_20200409082023.pdf

Other proposed operations facets description:

Other proposed operations facets attachment:

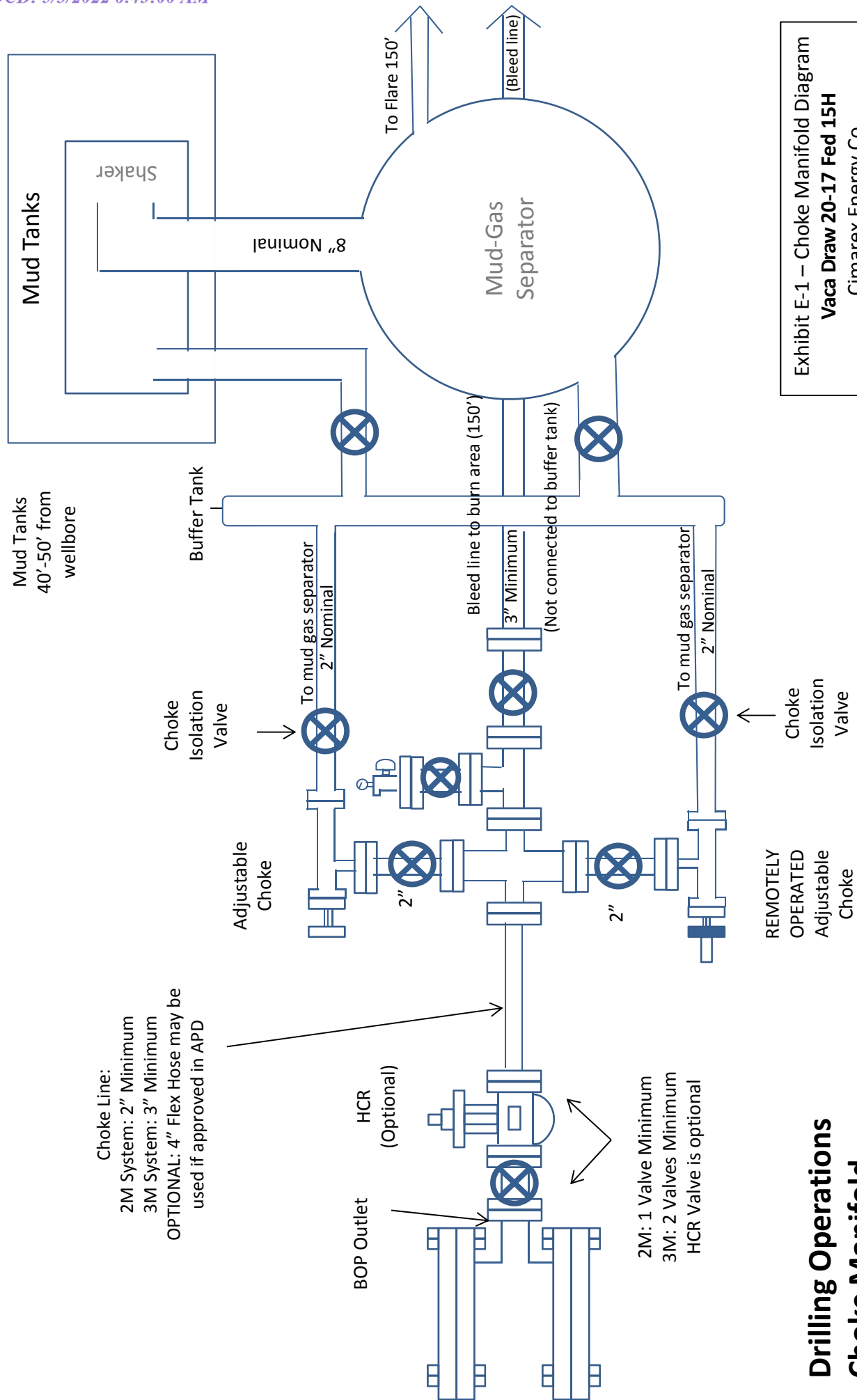
Vaca_Draw_20_17_Fed_15H_Flex_Hose_20200409082143.pdf

Vaca_Draw_20_17_Fed_15H_Gas_Capture_Plan_20200409082144.pdf

Vaca_Draw_20_17_Fed_15H_Drilling_Plan_20210412124146.pdf

Other Variance attachment:

Vaca_Draw_20_17_Fed_15H_Multibowl_wellhead_20200409082227.pdf



Drilling Operations Choke Manifold 2M/3M Service

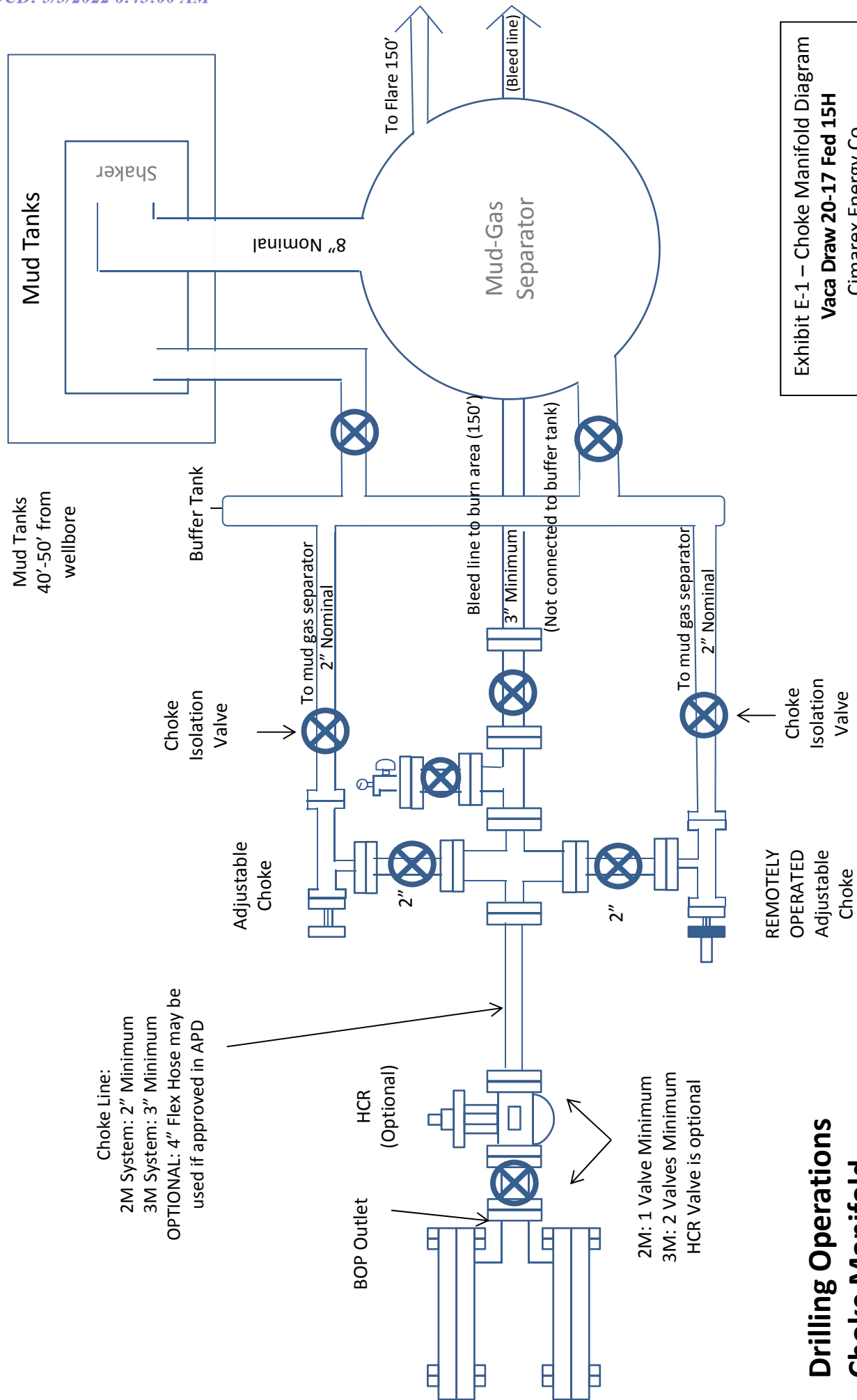
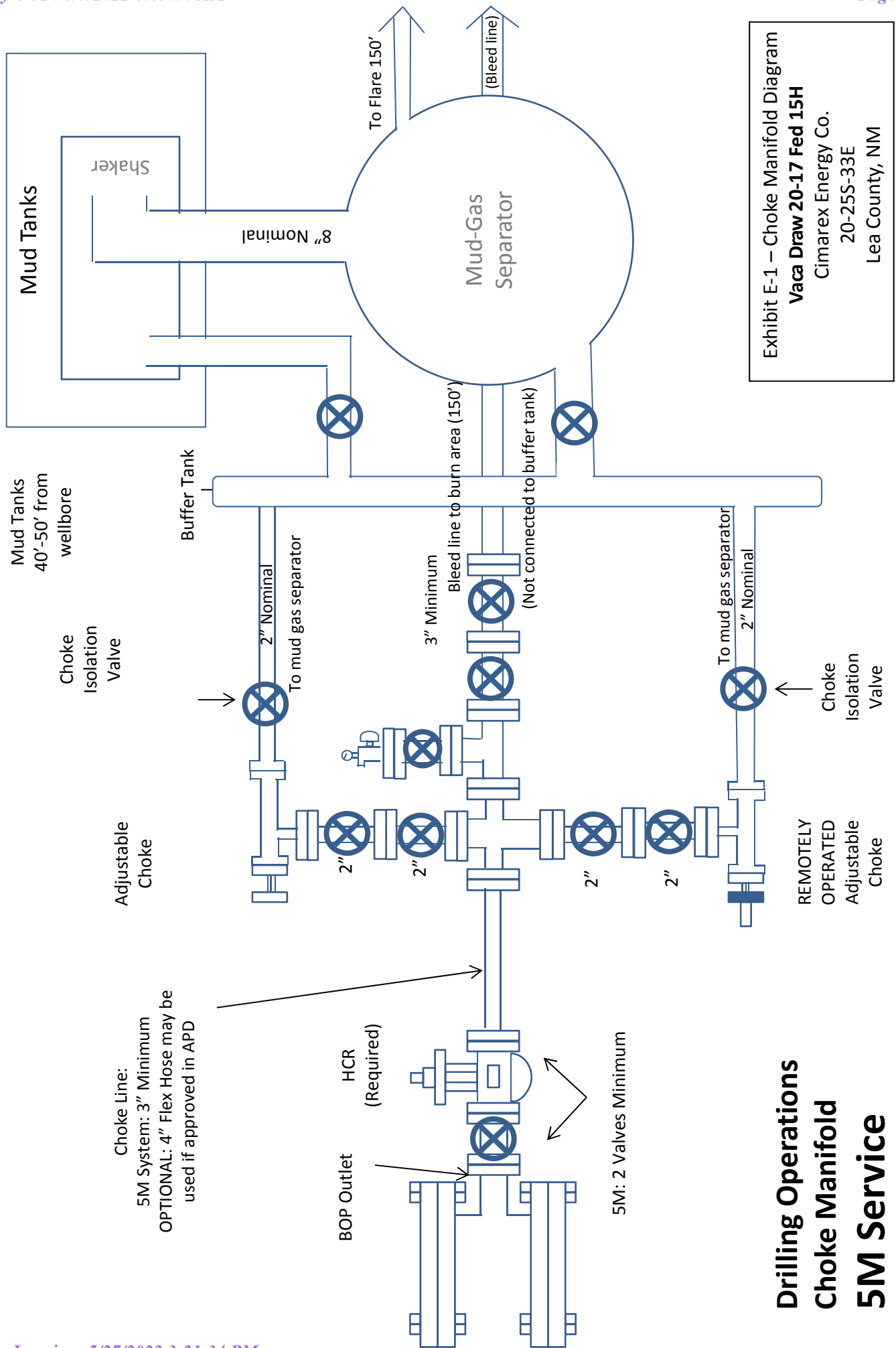


Exhibit E-1 – Choke Manifold Diagram
Vaca Draw 20-17 Fed 15H
 Cimarex Energy Co.
 20-25S-33E
 Lea County, NM

Drilling Operations Choke Manifold 2M/3M Service



Drilling 12-1/4" hole
below 13 3/8" Casing

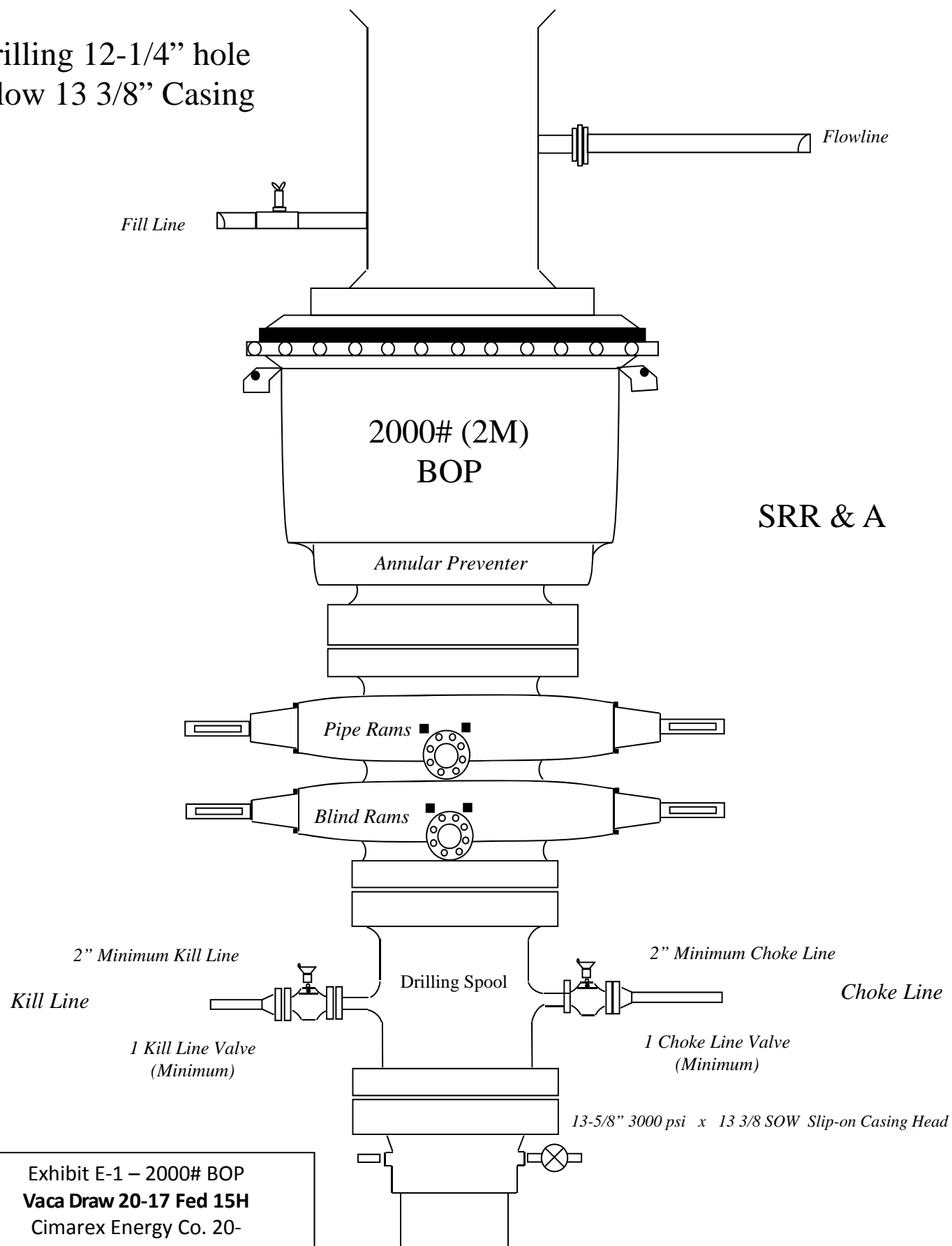
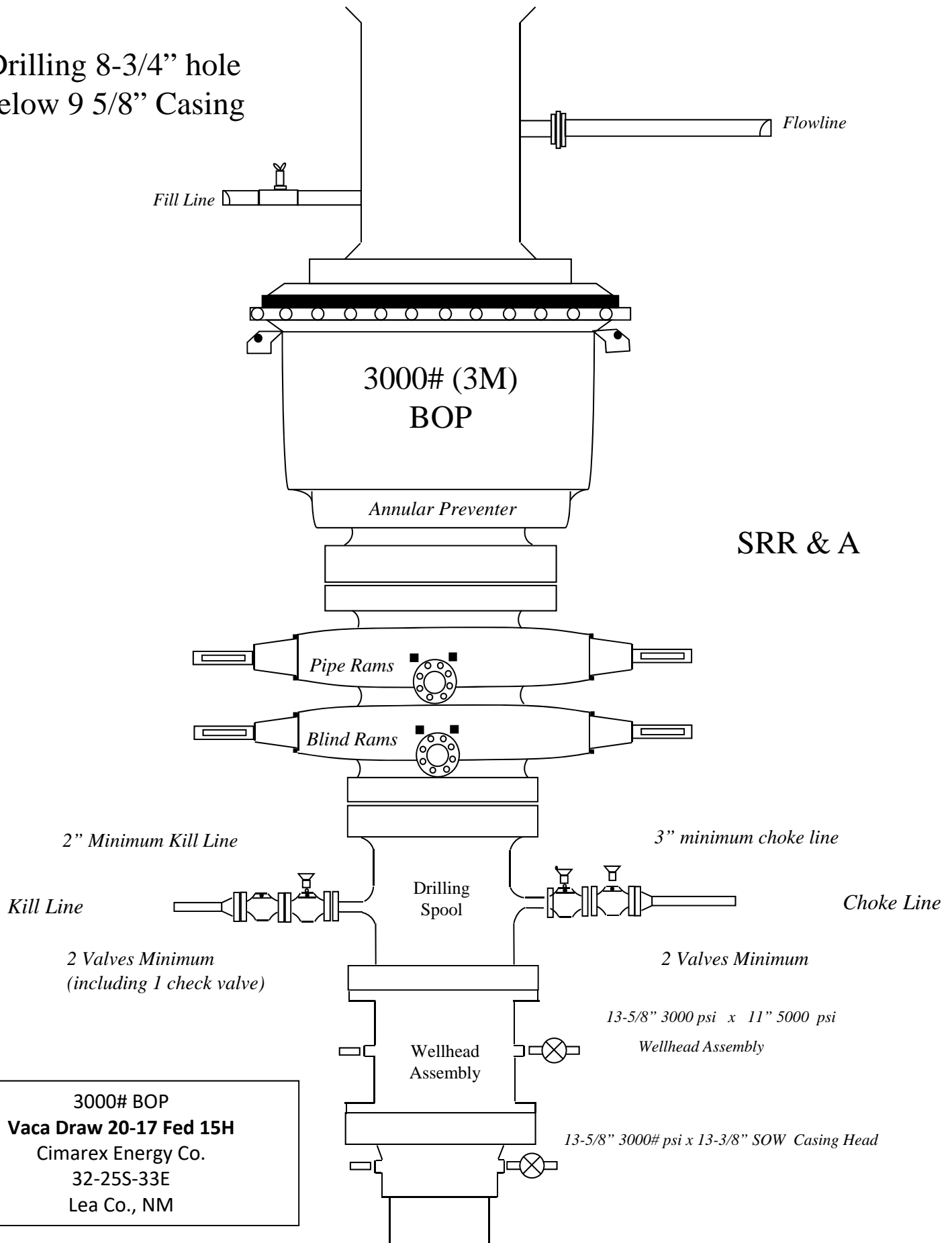


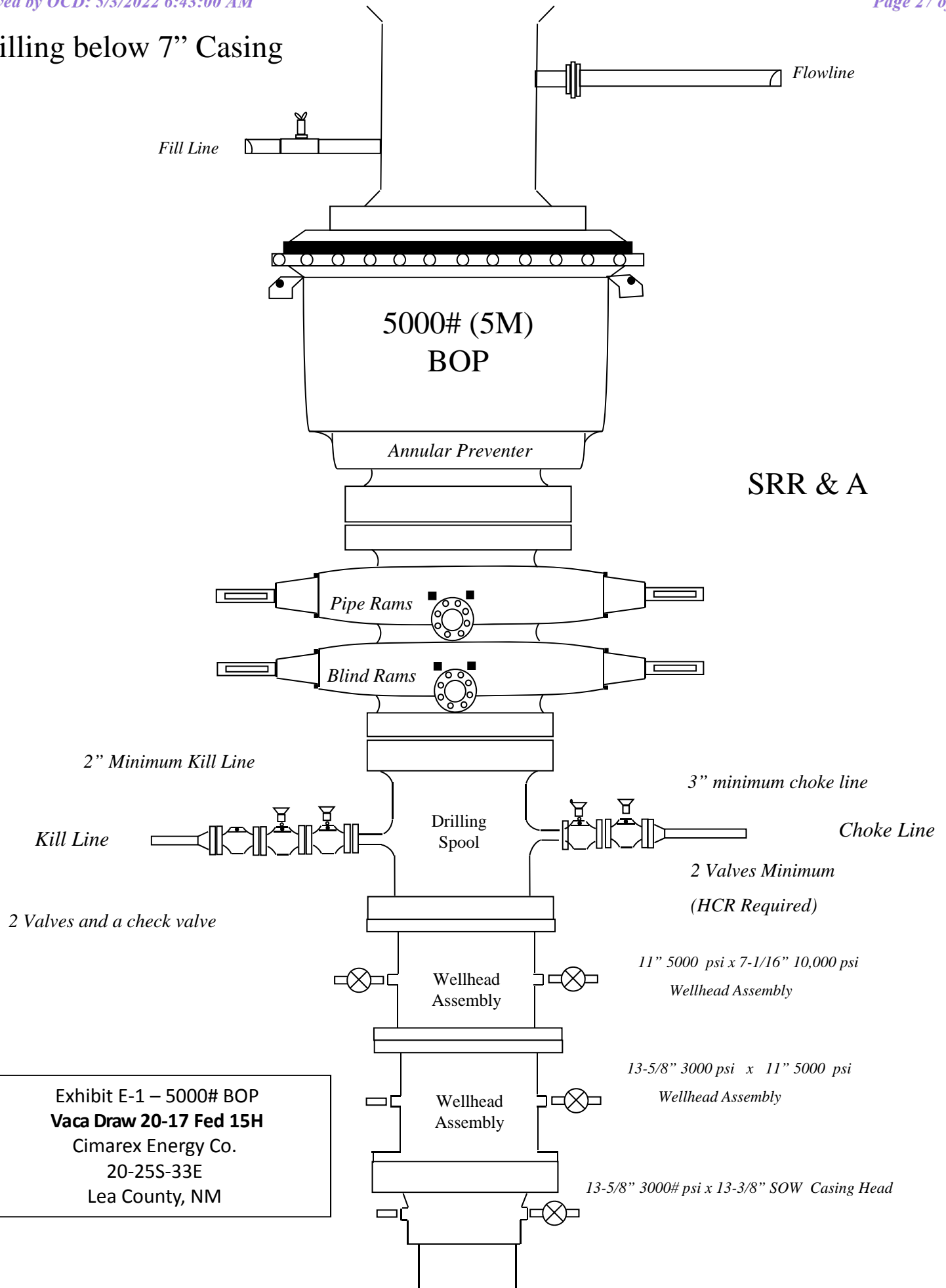
Exhibit E-1 – 2000# BOP
Vaca Draw 20-17 Fed 15H
Cimarex Energy Co. 20-
25S-33E
Lea County, NM

Drilling 8-3/4" hole
below 9 5/8" Casing



3000# BOP
Vaca Draw 20-17 Fed 15H
Cimarex Energy Co.
32-25S-33E
Lea Co., NM

Drilling below 7" Casing



[Print](#)



Vaca Draw 20-17 Fed #15H

Surface Casing Spec Sheet

OCTG Performance Data

Casing Performance

Availability: ERW

Pipe Body Geometry

Outside Diameter:	13.375 in	Inside Diameter:	12.715 in
Wall Thickness:	0.330 in	Cross Section Area:	13.524 sq in
Nominal Weight:	48.00 lb/ft	Drift Diameter:	12.559 in
Plain End Weight:	46.02 lb/ft	Alternate Drift Diameter:	-

Pipe Body Performance

Grade:	H40	Collapse Strength (ERW):	740 psi
Pipe Body Yield Strength:	541000 lbf	Collapse Strength (SMLS):	-

SC Connection

Connection Geometry

	Optimum	Minimum	Maximum
Make Up Torque:	3220 lb·ft	2420 lb·ft	4030 lb·ft
Coupling Outside Diameter:	14.375 in		

Connection Performance

Grade:	H40	Minimum Internal Yield Pressure:	1730 psi
Joint Strength:	322000 lbf		

LC Connection

Connection Geometry

	Optimum	Minimum	Maximum
Make Up Torque:	-	-	-
Coupling Outside Diameter:	14.375 in		

Connection Performance

Grade:	H40	Minimum Internal Yield Pressure:	-
Joint Strength:	-		

BC Connection

Connection Geometry

	Optimum	Minimum	Maximum
Make Up Torque:	-	-	-
Coupling Outside Diameter:	14.375 in		

Connection Performance

Grade:	H40	Minimum Internal Yield Pressure:	-
Joint Strength:	-		

PE Connection

Connection Geometry

	Optimum	Minimum	Maximum
Make Up Torque:	-	-	-
Coupling Outside Diameter:	14.375 in		

Connection Performance

Grade:	H40	Minimum Internal Yield Pressure:	1730 psi
Joint Strength:	-		

Vaca Draw 20-17 Fed 15H

Casing Assumptions

2. Casing Program

Hole Size	Casing Depth From	Casing Depth To	Setting Depth TVD	Casing Size	Weight (lb/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17 1/2	0	1051	1051	13-3/8"	48.00	H-40/J-55 Hybrid	ST&C	1.63	3.80	6.38
12 1/4	0	4933	4933	9-5/8"	40.00	J-55	BT&C	1.44	1.50	3.19
8 3/4	0	8647	8647	7"	29.00	L-80	LT&C	1.73	2.02	2.26
8 3/4	8647	10150	9975	7"	26.00	N-80	LT&C	1.16	1.55	15.03
6	8547	20009	10000	4-1/2"	13.50	P-110	BT&C	1.87	2.17	21.51
BLM Minimum Safety Factor								1.125	1	1.6 Dry 1.8 Wet

TVD was used on all calculations.

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

Vaca Draw 20-17 Fed 15H

Casing Assumptions

2. Casing Program

Hole Size	Casing Depth From	Casing Depth To	Setting Depth TVD	Casing Size	Weight (lb/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17 1/2	0	1051	1051	13-3/8"	48.00	H-40/J-55 Hybrid	ST&C	1.63	3.80	6.38
12 1/4	0	4933	4933	9-5/8"	40.00	J-55	BT&C	1.44	1.50	3.19
8 3/4	0	8647	8647	7"	29.00	L-80	LT&C	1.73	2.02	2.26
8 3/4	8647	10150	9975	7"	26.00	N-80	LT&C	1.16	1.55	15.03
6	8547	20009	10000	4-1/2"	13.50	P-110	BT&C	1.87	2.17	21.51
BLM Minimum Safety Factor								1.125	1	1.6 Dry 1.8 Wet

TVD was used on all calculations.

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

Vaca Draw 20-17 Fed 15H Casing Assumptions

2. Casing Program

Hole Size	Casing Depth From	Casing Depth To	Setting Depth TVD	Casing Size	Weight (lb/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17 1/2	0	1051	1051	13-3/8"	48.00	H-40/J-55 Hybrid	ST&C	1.63	3.80	6.38
12 1/4	0	4933	4933	9-5/8"	40.00	J-55	BT&C	1.44	1.50	3.19
8 3/4	0	8647	8647	7"	29.00	L-80	LT&C	1.73	2.02	2.26
8 3/4	8647	10150	9975	7"	26.00	N-80	LT&C	1.16	1.55	15.03
6	8547	20009	10000	4-1/2"	13.50	P-110	BT&C	1.87	2.17	21.51
BLM Minimum Safety Factor								1.125	1	1.6 Dry 1.8 Wet

TVD was used on all calculations.
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

Vaca Draw 20-17 Fed 15H

Casing Assumptions

2. Casing Program

Hole Size	Casing Depth From	Casing Depth To	Setting Depth TVD	Casing Size	Weight (lb/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17 1/2	0	1051	1051	13-3/8"	48.00	H-40/J-55 Hybrid	ST&C	1.63	3.80	6.38
12 1/4	0	4933	4933	9-5/8"	40.00	J-55	BT&C	1.44	1.50	3.19
8 3/4	0	8647	8647	7"	29.00	L-80	LT&C	1.73	2.02	2.26
8 3/4	8647	10150	9975	7"	26.00	N-80	LT&C	1.16	1.55	15.03
6	8547	20009	10000	4-1/2"	13.50	P-110	BT&C	1.87	2.17	21.51
BLM Minimum Safety Factor								1.125	1	1.6 Dry 1.8 Wet

TVD was used on all calculations.

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

Vaca Draw 20-17 Fed 15H

Casing Assumptions

2. Casing Program

Hole Size	Casing Depth From	Casing Depth To	Setting Depth TVD	Casing Size	Weight (lb/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17 1/2	0	1051	1051	13-3/8"	48.00	H-40/J-55 Hybrid	ST&C	1.63	3.80	6.38
12 1/4	0	4933	4933	9-5/8"	40.00	J-55	BT&C	1.44	1.50	3.19
8 3/4	0	8647	8647	7"	29.00	L-80	LT&C	1.73	2.02	2.26
8 3/4	8647	10150	9975	7"	26.00	N-80	LT&C	1.16	1.55	15.03
6	8547	20009	10000	4-1/2"	13.50	P-110	BT&C	1.87	2.17	21.51
BLM Minimum Safety Factor								1.125	1	1.6 Dry 1.8 Wet

TVD was used on all calculations.

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

Hydrogen Sulfide Drilling Operations Plan

Vaca Draw 20-17 Federal 15H

Cimarex Energy Co.

UL: M, Sec. 20, 25S, 33E

Lea Co., NM

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

H₂S 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 be 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 (H₂S 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 or cores are planned at this time.
- 8 Drilling contractor supervisor will be required to be familiar with the effects H₂S 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.

H₂S Contingency Plan
Vaca Draw 20-17 Federal 15H
Cimarex Energy Co.
UL: M, Sec. 20, 25S, 33E
Lea Co., NM

Emergency Procedures

In the event of a release of gas containing H₂S, 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 H₂S 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 H₂S, 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 (SO₂). 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 H₂S and SO₂

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).

H₂S Contingency Plan Emergency Contact
 s Vaca Draw 20-17 Federal 15H
 Cimarex Energy Co.
 UL: M, Sec. 20, 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
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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		

Cimarex Vaca Draw 20-17 Federal #15H Rev0 RM 20Jan20 Anti-Collision Summary Report

Analysis Date-24hr Time: January 21, 2020 - 08:54
Client: Cimarex Energy
Field: NM Lea County (NAD 83)
Structure: Cimarex Vaca Draw 20-17 Federal #15H
Slot: New Slot
Well: Vaca Draw 20-17 Federal #15H
Borehole: Vaca Draw 20-17 Federal #15H
Scan MD Range: 0.00ft ~ 20009.05ft

Analysis Method: 3D Least Distance
Reference Trajectory: Cimarex Vaca Draw 20-17 Federal #15H Rev0 RM 20Jan20 (Non-Def Plan)
Depth Interval: Every 10.00 Measured Depth (ft)
Rule Set: NAL Procedure: D&M AntiCollision Standard S002
Min Pts: All local minima indicated.
Version / Patch: 2.10.787.0
Database \ Project: us1153APP452.DIR.SLB.COMDRILLING-NM Lea County 2.10

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:

Selection filters:

Restricted within 61019.55 ft

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 Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level			Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major		

Results highlighted: Sep-Factor separation <= 1.50 ft

Cimarex Vaca Draw 20-17
Federal #30H Rev0 RM
19Sept18 (Non-Def Plan)

Fail Major

663.38	32.81	661.40	630.57	N/A	MAS = 10.00 (m)	0.00	0.00					Surface
663.38	32.81	661.40	630.57	N/A	MAS = 10.00 (m)	26.00	26.00					WRP
219.40	67.61	173.49	151.80	5.00	OSF1.50	8160.00	8135.46	OSF<5.00				Enter Alert
219.40	78.53	166.21	140.87	4.28	OSF1.50	9480.00	9455.46					MinPt-CtCt
161.72	81.61	106.46	80.11	3.02	OSF1.50	10370.00	10000.00					MinPt-CtCt
161.73	162.01	52.86	-0.29	1.50	OSF1.50	13800.00	10000.00		OSF<1.50			Enter Minor
161.73	241.61	-0.20	-79.88	1.00	OSF1.50	16460.00	10000.00			OSF<1.00		Enter Major
161.74	352.39	-74.05	-190.66	0.68	OSF1.50	20009.05	10000.00					MinPts

Cimarex Vaca Draw 20-17
Federal #29H Rev0 RM
19Sept18 (Non-Def Plan)

Fail Minor

643.45	32.81	641.47	610.64	N/A	MAS = 10.00 (m)	0.00	0.00					Surface
643.44	32.81	641.47	610.64	N/A	MAS = 10.00 (m)	26.00	26.00					WRP
114.14	36.48	89.01	77.66	4.92	OSF1.50	4980.00	4965.80	OSF<5.00				Enter Alert
63.15	40.16	35.72	22.99	2.40	OSF1.50	5430.00	5412.98					MinPt-CtCt
63.18	40.25	35.69	22.94	2.40	OSF1.50	5440.00	5422.92					MinPts
63.29	40.33	35.74	22.96	2.40	OSF1.50	5450.00	5432.85					MinPt-O-SF
143.58	44.69	113.13	98.90	4.97	OSF1.50	6040.00	6019.16	OSF>5.00				Exit Alert
272.62	62.70	230.16	209.92	6.69	OSF1.50	9500.00	9475.46					MINPT-O-EQU
272.69	62.77	230.18	209.92	6.68	OSF1.50	9510.00	9485.46					MinPt-O-ADP
275.12	63.45	232.16	211.67	6.67	OSF1.50	9620.00	9595.17					MinPt-O-SF
271.17	82.75	215.35	188.43	5.00	OSF1.50	11220.00	10000.00	OSF<5.00				Enter Alert
271.16	271.45	89.53	-0.29	1.50	OSF1.50	17700.00	10000.00		OSF<1.50			Enter Minor

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level			Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major		
	271.15	344.62	40.75	-73.46	1.18	OSF1.50	20009.05	10000.00				MinPts	

Cimarex Vaca Draw 20-17
Federal #14H Rev0 RM
20Jan20 (Non-Def Plan)

Warning Alert

19.99	16.25	18.70	3.74	N/A	MAS = 4.95 (m)	0.00	0.00	CtCt<=15m<15.00	Enter Alert
19.99	16.25	18.70	3.74	10523.25	MAS = 4.95 (m)	26.00	26.00		WRP
19.99	19.45	6.59	0.54	1.54	OSF1.50	1990.00	1990.00		MinPt-CtCt
20.01	19.62	6.50	0.39	1.53	OSF1.50	2010.00	2010.00		MINPT-O-EOU
20.07	19.69	6.51	0.38	1.53	OSF1.50	2020.00	2020.00		MinPts
72.77	22.95	57.04	49.81	4.95	OSF1.50	2710.00	2709.81	OSF>5.00	Exit Alert
601.97	45.90	570.94	556.06	20.19	OSF1.50	6523.87	6500.00		MinPt-O-SF
620.06	68.09	574.24	551.97	13.89	OSF1.50	9660.00	9634.41		MINPT-O-EOU
620.19	68.25	574.26	551.94	13.86	OSF1.50	9680.00	9653.75		MinPt-O-ADP
625.25	69.44	578.53	555.81	13.73	OSF1.50	9830.00	9789.19		MinPt-O-SF
688.34	207.56	549.54	480.79	5.00	OSF1.50	15570.00	10000.00	OSF<5.00	Enter Alert
688.34	346.24	457.08	342.10	2.99	OSF1.50	20009.05	10000.00		MinPts

Cimarex Vaca Draw 20-17
Federal #16H Rev0 RM
20Jan20 (Non-Def Plan)

Warning Alert

20.03	16.28	18.75	3.75	N/A	MAS = 4.96 (m)	0.00	0.00	CtCt<=15m<15.00	Enter Alert
20.03	16.28	18.74	3.75	N/A	MAS = 4.96 (m)	26.00	26.00		WRP
20.03	19.54	6.57	0.49	1.54	OSF1.50	2000.00	2000.00		MinPt-CtCt
20.05	19.62	6.54	0.43	1.54	OSF1.50	2010.00	2010.00		MINPT-O-EOU
20.10	19.69	6.55	0.41	1.53	OSF1.50	2020.00	2020.00		MinPts
71.90	22.61	56.39	49.29	4.97	OSF1.50	2580.00	2579.99	OSF>5.00	Exit Alert
199.14	49.11	165.97	150.03	6.21	OSF1.50	6523.87	6500.00		MinPt-O-SF
212.07	58.53	172.62	153.54	5.52	OSF1.50	8970.00	8945.46		MINPT-O-EOU
212.14	58.60	172.64	153.53	5.52	OSF1.50	8980.00	8955.46		MinPt-O-ADP
213.29	59.11	173.45	154.18	5.50	OSF1.50	9040.00	9015.46		MinPt-O-SF
693.01	208.89	553.32	484.12	5.00	OSF1.50	16200.00	10000.00	OSF<5.00	Enter Alert
693.01	326.06	475.21	366.95	3.19	OSF1.50	20009.05	10000.00		MinPts

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #8H MWD
0ft-22328ft (Surcon Corrected)
(Def Survey)

Warning Alert

116.66	32.81	115.53	83.85	N/A	MAS = 10.00 (m)	0.00	0.00		Surface
116.61	32.81	115.48	83.80	58849.16	MAS = 10.00 (m)	26.00	26.00		WRP
116.16	32.81	113.98	83.35	110.10	MAS = 10.00 (m)	280.00	280.00		MinPts
115.01	32.81	110.18	82.20	30.83	MAS = 10.00 (m)	820.00	820.00		MinPts
115.42	32.81	110.09	82.61	27.22	MAS = 10.00 (m)	970.00	970.00		MINPT-O-EOU
118.82	32.81	109.18	86.01	13.84	MAS = 10.00 (m)	1900.00	1900.00		MinPts
118.84	32.81	109.17	86.03	13.79	MAS = 10.00 (m)	1910.00	1910.00		MINPT-O-EOU
122.60	32.81	112.42	89.80	13.41	MAS = 10.00 (m)	2060.00	2060.00		MinPt-O-SF
82.18	32.81	64.72	49.37	4.98	MAS = 10.00 (m)	4860.00	4846.55	OSF<5.00	Enter Alert
52.99	32.81	30.81	20.18	2.47	MAS = 10.00 (m)	6090.00	6068.84		MinPts
53.13	33.08	30.69	20.05	2.44	OSF1.50	6160.00	6138.41		MINPT-O-EOU
53.55	33.59	30.77	19.95	2.42	OSF1.50	6250.00	6227.84		MinPt-O-ADP
53.94	33.88	30.97	20.06	2.42	OSF1.50	6300.00	6277.53		MinPt-O-SF
134.30	41.20	106.45	93.10	4.98	OSF1.50	8560.00	8535.46	OSF>5.00	Exit Alert
152.82	46.75	121.27	106.07	4.99	OSF1.50	9660.00	9634.41	OSF<5.00	Enter Alert
145.88	47.22	114.03	98.67	4.71	OSF1.50	9780.00	9746.33		MinPts
145.96	47.25	114.08	98.71	4.71	OSF1.50	9790.00	9755.11		MinPt-O-SF

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level			Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major		
154.39	47.63	122.26	106.76	4.94		OSF1.50	9870.00	9821.39	OSF>5.00			Exit Alert	
2361.61	73.10	2312.55	2288.51	49.10		OSF1.50	12350.00	10000.00				MINPT-O-EOU	
2363.38	77.95	2311.08	2285.43	46.04		OSF1.50	12510.00	10000.00				MinPt-CtCt	
2364.59	86.92	2306.31	2277.67	41.26		OSF1.50	12820.00	10000.00				MinPt-CtCt	
2364.07	98.60	2298.00	2265.46	36.31		OSF1.50	13220.00	10000.00				MinPt-CtCt	
2363.90	104.20	2294.10	2259.69	34.34		OSF1.50	13410.00	10000.00				MinPt-CtCt	
2362.48	118.64	2283.06	2243.84	30.11		OSF1.50	13900.00	10000.00				MinPt-CtCt	
2360.24	126.03	2275.89	2234.21	28.30		OSF1.50	14150.00	10000.00				MinPt-CtCt	
2361.07	128.37	2275.16	2232.70	27.79		OSF1.50	14240.00	10000.00				MINPT-O-EOU	
2362.96	131.92	2274.69	2231.04	27.06		OSF1.50	14360.00	10000.00				MINPT-O-EOU	
2364.52	133.80	2274.99	2230.72	26.69		OSF1.50	14430.00	10000.00				MinPt-O-ADP	
2352.94	161.75	2244.78	2191.20	21.95		OSF1.50	15350.00	10000.00				MinPt-CtCt	
2353.68	163.81	2244.15	2189.87	21.67		OSF1.50	15430.00	10000.00				MINPT-O-EOU	
2354.55	164.83	2244.33	2189.72	21.55		OSF1.50	15470.00	10000.00				MinPt-O-ADP	
2398.60	182.34	2276.71	2216.26	19.83		OSF1.50	16040.00	10000.00				MinPt-CtCt	
2397.69	191.31	2269.83	2206.39	18.89		OSF1.50	16340.00	10000.00				MinPt-CtCt	
2398.86	193.93	2269.24	2204.93	18.64		OSF1.50	16440.00	10000.00				MINPT-O-EOU	
2400.43	198.48	2267.78	2201.95	18.22		OSF1.50	16580.00	10000.00				MinPt-CtCt	
2401.30	201.10	2266.91	2200.20	17.99		OSF1.50	16680.00	10000.00				MINPT-O-EOU	
2385.18	222.74	2236.36	2162.44	16.13		OSF1.50	17390.00	10000.00				MinPt-CtCt	
2381.29	229.45	2228.00	2151.85	15.63		OSF1.50	17610.00	10000.00				MinPt-CtCt	
2372.11	246.25	2207.61	2125.85	14.50		OSF1.50	18170.00	10000.00				MinPt-CtCt	
2372.84	248.55	2206.81	2124.28	14.37		OSF1.50	18260.00	10000.00				MINPT-O-EOU	
2371.91	257.87	2199.67	2114.04	13.84		OSF1.50	18560.00	10000.00				MinPt-CtCt	
2372.63	259.89	2199.04	2112.73	13.74		OSF1.50	18640.00	10000.00				MINPT-O-EOU	
2371.23	268.35	2192.00	2102.88	13.30		OSF1.50	18910.00	10000.00				MinPt-CtCt	
2350.30	298.36	2151.06	2051.93	11.85		OSF1.50	19910.00	10000.00				MinPt-CtCt	
2350.99	301.01	2149.99	2049.98	11.75		OSF1.50	20009.05	10000.00				MinPts	

Cimarex Vaca Draw 20-17
Federal #6H MWD
Final(Surcon Corrected) (Def
Survey)

Warning Alert

121.63	32.81	119.65	88.82	N/A	MAS = 10.00 (m)	0.00	0.00	Surface
121.61	32.81	119.62	88.80	20612.93	MAS = 10.00 (m)	26.00	26.00	WRP
109.83	32.81	101.15	77.03	16.09	MAS = 10.00 (m)	1570.00	1570.00	MinPts
111.02	32.81	100.00	78.21	12.06	MAS = 10.00 (m)	2070.00	2070.00	MINPT-O-EOU
116.76	32.81	103.19	83.95	9.90	MAS = 10.00 (m)	2600.00	2599.98	MinPt-O-SF
111.28	32.81	97.69	78.47	9.41	MAS = 10.00 (m)	3000.00	2998.21	MinPts
112.99	32.81	99.12	80.18	9.33	MAS = 10.00 (m)	3140.00	3137.33	MinPt-O-SF
478.99	34.31	455.46	444.68	22.13	OSF1.50	7140.00	7115.46	MinPt-CtCt
479.07	34.61	455.34	444.47	21.93	OSF1.50	7230.00	7205.46	MINPT-O-EOU
479.16	34.71	455.36	444.45	21.87	OSF1.50	7260.00	7235.46	MinPt-O-ADP
493.70	41.31	465.50	452.39	18.75	OSF1.50	8770.00	8745.46	MinPt-O-SF
928.91	37.77	903.07	891.14	38.85	OSF1.50	9797.08	9761.27	MinPt-O-SF
1012.24	37.75	986.41	974.49	42.37	OSF1.50	10070.00	9947.01	MinPt-O-SF
998.86	41.25	970.70	957.60	38.07	OSF1.50	10610.00	10000.00	MinPt-CtCt
998.92	41.46	970.62	957.47	37.88	OSF1.50	10630.00	10000.00	MINPT-O-EOU
999.01	41.56	970.64	957.45	37.79	OSF1.50	10640.00	10000.00	MinPt-O-ADP
1011.09	49.27	977.58	961.81	32.01	OSF1.50	11040.00	10000.00	MINPT-O-EOU
1012.42	51.25	977.59	961.17	30.76	OSF1.50	11130.00	10000.00	MINPT-O-EOU
1012.73	51.60	977.67	961.13	30.56	OSF1.50	11150.00	10000.00	MinPt-O-ADP
1005.13	64.60	961.40	940.52	24.03	OSF1.50	11700.00	10000.00	MinPt-CtCt
1005.31	65.33	961.10	939.99	23.76	OSF1.50	11740.00	10000.00	MINPT-O-EOU
1005.59	65.69	961.14	939.90	23.63	OSF1.50	11760.00	10000.00	MinPt-O-ADP

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level			Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major		
985.22	94.85	921.33	890.37	15.88		OSF1.50	12820.00	10000.00				MinPt-CtCt	
985.33	95.17	921.22	890.15	15.83		OSF1.50	12840.00	10000.00				MINPT-O-EOU	
985.45	95.33	921.23	890.11	15.80		OSF1.50	12850.00	10000.00				MinPt-O-ADP	
1000.75	120.92	919.47	879.83	12.60		OSF1.50	13720.00	10000.00				MinPt-CtCt	
998.71	140.51	904.38	858.20	10.79		OSF1.50	14390.00	10000.00				MinPt-CtCt	
999.38	142.71	903.58	856.67	10.63		OSF1.50	14480.00	10000.00				MINPT-O-EOU	
1001.57	154.30	898.05	847.27	9.84		OSF1.50	14860.00	10000.00				MinPt-CtCt	
999.58	167.91	886.98	831.67	9.02		OSF1.50	15320.00	10000.00				MinPt-CtCt	
1000.17	180.21	879.37	819.96	8.40		OSF1.50	15740.00	10000.00				MinPt-CtCt	
1000.40	185.53	876.06	814.87	8.16		OSF1.50	15920.00	10000.00				MinPt-CtCt	
993.89	228.33	841.01	765.56	6.57		OSF1.50	17360.00	10000.00				MinPt-CtCt	
1003.62	258.13	830.87	745.49	5.87		OSF1.50	18350.00	10000.00				MinPt-CtCt	
993.29	299.58	792.91	693.71	5.00		OSF1.50	19730.00	10000.00	OSF<5.00			Enter Alert	
992.95	300.86	791.72	692.09	4.97		OSF1.50	19780.00	10000.00				MinPts	
995.45	300.29	794.60	695.17	5.00		OSF1.50	19850.00	10000.00	OSF>5.00			Exit Alert	
1019.16	293.90	822.56	725.26	5.23		OSF1.50	20009.05	10000.00				TD	

Cimarex Vaca Draw 20-17
Federal #5H Final
MWD(Surcon Corrected) (Def
Survey)

Warning Alert

119.97	32.81	117.99	87.16	N/A	MAS = 10.00 (m)	0.00	0.00					Surface	
119.96	32.81	117.98	87.15	283923.30	MAS = 10.00 (m)	26.00	26.00					WRP	
119.93	32.81	117.43	87.12	225.35	MAS = 10.00 (m)	160.00	160.00					MinPts	
120.26	32.81	117.18	87.45	108.12	MAS = 10.00 (m)	280.00	280.00					MINPT-O-EOU	
121.56	32.81	116.46	88.75	38.34	MAS = 10.00 (m)	760.00	760.00					MinPts	
121.96	32.81	115.94	89.15	29.70	MAS = 10.00 (m)	950.00	950.00					MINPT-O-EOU	
127.15	32.81	116.41	94.34	14.29	MAS = 10.00 (m)	2030.00	2030.00					MinPts	
127.53	32.81	116.09	94.72	13.27	MAS = 10.00 (m)	2180.00	2180.00					MINPT-O-EOU	
127.91	32.81	114.79	95.10	11.30	MAS = 10.00 (m)	2700.00	2699.84					MinPts	
128.02	32.81	114.88	95.21	11.29	MAS = 10.00 (m)	2740.00	2739.72					MinPt-O-SF	
480.30	32.81	458.82	447.49	24.53	MAS = 10.00 (m)	5950.00	5929.72					MinPt-O-SF	
580.21	39.76	553.05	540.46	22.96	OSF1.50	8400.00	8375.46					MinPt-CtCt	
580.23	40.37	552.66	539.86	22.59	OSF1.50	8530.00	8505.46					MinPt-CtCt	
580.51	41.23	552.36	539.28	22.11	OSF1.50	8710.00	8685.46					MINPT-O-EOU	
580.59	41.32	552.38	539.27	22.06	OSF1.50	8730.00	8705.46					MinPt-O-ADP	
586.70	44.81	556.16	541.88	20.48	OSF1.50	9420.00	9395.46					MinPts	
588.68	45.27	557.84	543.41	20.33	OSF1.50	9520.00	9495.46					MinPt-O-SF	
676.86	68.06	630.83	608.80	15.32	OSF1.50	11290.00	10000.00					MinPt-CtCt	
677.09	68.61	630.69	608.48	15.20	OSF1.50	11320.00	10000.00					MINPT-O-EOU	
677.24	68.79	630.72	608.45	15.16	OSF1.50	11330.00	10000.00					MinPt-O-ADP	
676.75	88.44	617.13	588.31	11.71	OSF1.50	12130.00	10000.00					MinPt-CtCt	
677.24	90.30	616.38	586.94	11.47	OSF1.50	12210.00	10000.00					MINPT-O-EOU	
677.78	90.96	616.48	586.81	11.39	OSF1.50	12240.00	10000.00					MinPt-O-ADP	
675.29	113.49	598.97	561.80	9.06	OSF1.50	13060.00	10000.00					MinPt-CtCt	
675.73	114.69	598.60	561.03	8.97	OSF1.50	13110.00	10000.00					MINPT-O-EOU	
676.11	115.17	598.68	560.95	8.93	OSF1.50	13130.00	10000.00					MinPt-O-ADP	
674.32	156.89	569.07	517.43	6.51	OSF1.50	14580.00	10000.00					MinPt-CtCt	
675.73	163.26	566.23	512.47	6.27	OSF1.50	14800.00	10000.00					MinPt-CtCt	
667.65	200.66	533.22	466.99	5.03	OSF1.50	16070.00	10000.00					MinPt-CtCt	
668.03	201.95	532.74	466.08	5.00	OSF1.50	16120.00	10000.00	OSF<5.00				Enter Alert	
672.48	214.89	528.56	457.59	4.72	OSF1.50	16560.00	10000.00					MINPT-O-EOU	
677.28	223.23	527.80	454.05	4.58	OSF1.50	16840.00	10000.00					MINPT-O-EOU	
680.00	228.30	527.14	451.70	4.49	OSF1.50	17010.00	10000.00					MINPT-O-EOU	
681.47	232.75	525.65	448.72	4.42	OSF1.50	17150.00	10000.00					MinPt-CtCt	

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level			Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major		
682.65	235.68	524.87	446.97	4.37		OSF1.50	17260.00	10000.00				MINPT-O-EOU	
672.36	278.12	486.28	394.23	3.64		OSF1.50	18670.00	10000.00				MinPt-CtCt	
674.98	283.99	485.00	390.99	3.58		OSF1.50	18880.00	10000.00				MINPT-O-EOU	
682.70	293.85	486.15	388.86	3.50		OSF1.50	19210.00	10000.00				MINPT-O-EOU	
683.13	294.37	486.22	388.76	3.49		OSF1.50	19230.00	10000.00				MinPt-O-ADP	
685.62	295.90	487.69	389.72	3.49		OSF1.50	19300.00	10000.00				MinPt-O-SF	
675.79	311.26	467.62	364.52	3.27		OSF1.50	19780.00	10000.00				MinPts	
714.01	296.87	515.44	417.15	3.62		OSF1.50	20009.05	10000.00				TD	

Cimarex Vaca Draw 20-17
Federal #31H Rev0 RM
19Sept18 (Non-Def Plan)

Warning Alert

683.29	32.81	681.31	650.48	N/A	MAS = 10.00 (m)	0.00	0.00					Surface	
683.29	32.81	681.31	650.48	N/A	MAS = 10.00 (m)	26.00	26.00					WRP	
683.29	32.81	669.14	650.48	56.01	MAS = 10.00 (m)	2000.00	2000.00					MinPts	
683.33	32.81	669.09	650.52	55.58	MAS = 10.00 (m)	2020.00	2020.00					MINPT-O-EOU	
722.20	32.81	705.96	689.40	50.48	MAS = 10.00 (m)	2600.00	2599.98					MinPt-O-SF	
568.96	45.98	537.57	522.97	19.41	OSF1.50	6840.00	6815.46					MinPt-O-SF	
568.95	63.75	525.72	505.20	13.81	OSF1.50	9480.00	9455.46					MinPt-CtCt	
569.04	64.06	525.61	504.99	13.74	OSF1.50	9520.00	9495.46					MINPT-O-EOU	
569.11	64.13	525.63	504.98	13.73	OSF1.50	9530.00	9505.46					MinPt-O-ADP	
568.82	71.14	520.67	497.68	12.32	OSF1.50	10360.00	10000.00					MinPt-CtCt	
568.83	172.36	453.20	396.47	4.99	OSF1.50	14370.00	10000.00	OSF<5.00				Enter Alert	
568.84	348.90	335.52	219.95	2.45	OSF1.50	20009.05	10000.00					MinPts	

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #7H MWD
0ft-22544ft (Surcon Corrected)
(Def Survey)

Pass

100.03	32.81	98.85	67.22	N/A	MAS = 10.00 (m)	0.00	0.00					Surface	
99.97	32.81	98.79	67.16	10710.29	MAS = 10.00 (m)	26.00	26.00					WRP	
80.83	32.81	73.09	48.02	11.93	MAS = 10.00 (m)	1450.00	1450.00					MinPts	
80.92	32.81	73.03	48.12	11.67	MAS = 10.00 (m)	1490.00	1490.00					MINPT-O-EOU	
81.46	32.81	73.03	48.65	10.90	MAS = 10.00 (m)	1620.00	1620.00					MINPT-O-EOU	
93.37	32.81	81.72	60.57	8.71	MAS = 10.00 (m)	2350.00	2350.00					MinPt-O-SF	
97.37	32.81	85.28	64.56	8.72	MAS = 10.00 (m)	2450.00	2450.00					MinPt-O-SF	
69.96	32.81	56.71	37.15	5.65	MAS = 10.00 (m)	3350.00	3346.01					MinPts	
69.98	32.81	56.69	37.17	5.63	MAS = 10.00 (m)	3370.00	3365.89					MINPT-O-EOU	
66.28	32.81	52.42	33.47	5.09	MAS = 10.00 (m)	3720.00	3713.70					MinPts	
66.28	32.81	52.40	33.47	5.08	MAS = 10.00 (m)	3730.00	3723.63					MINPT-O-EOU	
66.43	32.81	52.51	33.63	5.08	MAS = 10.00 (m)	3750.00	3743.51					MinPt-O-SF	
269.92	36.28	245.38	233.64	11.45	OSF1.50	7800.00	7775.46					MinPt-CtCt	
269.96	36.40	245.34	233.56	11.41	OSF1.50	7830.00	7805.46					MINPT-O-EOU	
269.99	36.44	245.35	233.55	11.40	OSF1.50	7840.00	7815.46					MinPt-O-ADP	
270.40	37.24	245.22	233.16	11.16	OSF1.50	8020.00	7995.46					MINPT-O-EOU	
270.66	37.88	245.06	232.78	10.98	OSF1.50	8160.00	8135.46					MINPT-O-EOU	
270.69	37.92	245.07	232.78	10.97	OSF1.50	8170.00	8145.46					MinPt-O-ADP	
294.60	45.36	264.02	249.25	9.94	OSF1.50	9660.00	9634.41					MinPt-CtCt	
294.63	45.46	263.97	249.16	9.91	OSF1.50	9680.00	9653.75					MINPT-O-EOU	
294.67	45.52	263.97	249.15	9.90	OSF1.50	9690.00	9663.33					MinPt-O-ADP	
296.11	45.91	265.16	250.20	9.87	OSF1.50	9760.00	9728.47					MinPt-O-SF	
2537.67	76.46	2486.37	2461.21	50.41	OSF1.50	12360.00	10000.00					MINPT-O-EOU	
2539.04	78.05	2486.68	2460.99	49.40	OSF1.50	12420.00	10000.00					MinPt-O-ADP	
2543.30	89.46	2483.33	2453.84	43.10	OSF1.50	12790.00	10000.00					MinPt-CtCt	
2542.08	100.25	2474.92	2441.83	38.40	OSF1.50	13160.00	10000.00					MinPt-CtCt	

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level			Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major		
2542.83	102.50	2474.17	2440.33	37.56		OSF1.50	13250.00	10000.00				MINPT-O-EOU	
2542.96	106.34	2471.73	2436.61	36.19		OSF1.50	13370.00	10000.00				MinPt-CtCt	
2543.46	107.73	2471.31	2435.73	35.73		OSF1.50	13430.00	10000.00				MINPT-O-EOU	
2543.85	108.19	2471.39	2435.65	35.58		OSF1.50	13450.00	10000.00				MinPt-O-ADP	
2548.13	112.66	2472.69	2435.47	34.21		OSF1.50	13600.00	10000.00				MINPT-O-EOU	
2548.74	113.39	2472.83	2435.36	34.00		OSF1.50	13630.00	10000.00				MinPt-O-ADP	
2553.51	127.29	2468.32	2426.22	30.31		OSF1.50	14080.00	10000.00				MinPt-CtCt	
2552.07	131.13	2464.32	2420.94	29.40		OSF1.50	14210.00	10000.00				MinPt-CtCt	
2552.57	132.55	2463.88	2420.02	29.09		OSF1.50	14270.00	10000.00				MINPT-O-EOU	
2553.17	133.24	2464.01	2419.92	28.95		OSF1.50	14300.00	10000.00				MinPt-O-ADP	
2582.61	176.49	2464.63	2406.12	22.06		OSF1.50	15730.00	10000.00				MinPt-CtCt	
2581.92	182.14	2460.16	2399.78	21.37		OSF1.50	15920.00	10000.00				MinPt-CtCt	
2582.31	196.16	2451.21	2386.16	19.84		OSF1.50	16390.00	10000.00				MinPt-CtCt	
2579.69	210.32	2439.14	2369.37	18.48		OSF1.50	16860.00	10000.00				MinPt-CtCt	
2578.39	225.27	2427.88	2353.12	17.24		OSF1.50	17360.00	10000.00				MinPt-CtCt	
2572.89	254.11	2403.16	2318.78	15.24		OSF1.50	18320.00	10000.00				MinPt-CtCt	
2573.67	259.83	2400.13	2313.85	14.91		OSF1.50	18510.00	10000.00				MinPt-CtCt	
2573.88	267.92	2394.94	2305.96	14.46		OSF1.50	18780.00	10000.00				MinPt-CtCt	
2571.59	281.11	2383.85	2290.48	13.76		OSF1.50	19220.00	10000.00				MinPt-CtCt	
2570.07	290.11	2376.33	2279.95	13.33		OSF1.50	19520.00	10000.00				MinPt-CtCt	
2570.10	294.36	2373.54	2275.75	13.14		OSF1.50	19660.00	10000.00				MinPt-CtCt	
2570.15	300.70	2369.35	2269.45	12.86		OSF1.50	19870.00	10000.00				MinPt-CtCt	
2570.39	304.85	2366.82	2265.54	12.68		OSF1.50	20009.05	10000.00				MinPts	

Cimarex Vaca Draw 20-17
Federal #1H Surcon 0ft-12740
(Def Survey)

Pass

121.62	32.81	119.64	88.81	462384.75	MAS = 10.00 (m)	0.00	0.00	MinPts
121.64	32.81	119.65	88.83	13615.55	MAS = 10.00 (m)	26.00	26.00	WRP
121.70	32.81	119.64	88.89	1505.54	MAS = 10.00 (m)	50.00	50.00	MINPT-O-EOU
156.90	32.81	143.80	124.09	13.93	MAS = 10.00 (m)	2600.00	2599.98	MinPt-O-SF
726.17	40.93	698.22	685.23	27.89	OSF1.50	8420.00	8395.46	MINPT-O-EOU
726.52	41.41	698.25	685.11	27.56	OSF1.50	8520.00	8495.46	MinPt-O-ADP
721.52	47.95	688.89	673.57	23.48	OSF1.50	9890.00	9836.73	MinPt-CtCt
721.54	48.01	688.87	673.53	23.45	OSF1.50	9900.00	9844.19	MinPts
726.16	48.65	693.06	677.51	23.28	OSF1.50	10000.00	9910.52	MinPt-O-SF
10105.98	50.42	10071.71	10055.56	312.91	OSF1.50	20009.05	10000.00	TD

Cimarex Vaca Draw 20-17
Federal #1H ST01 0ft-21966ft
(Def Survey)

Pass

121.62	32.81	120.49	88.81	465665.87	MAS = 10.00 (m)	0.00	0.00	MinPts
121.64	32.81	120.50	88.83	13712.14	MAS = 10.00 (m)	26.00	26.00	WRP
121.70	32.81	120.49	88.89	1516.21	MAS = 10.00 (m)	50.00	50.00	MINPT-O-EOU
156.90	32.81	144.65	124.09	14.01	MAS = 10.00 (m)	2600.00	2599.98	MinPt-O-SF
726.17	40.09	699.07	686.08	27.92	OSF1.50	8420.00	8395.46	MINPT-O-EOU
726.52	40.56	699.10	685.96	27.60	OSF1.50	8520.00	8495.46	MinPt-O-ADP
721.52	47.10	689.74	674.41	23.51	OSF1.50	9890.00	9836.73	MinPt-CtCt
721.54	47.16	689.72	674.37	23.47	OSF1.50	9900.00	9844.19	MinPts
726.16	47.80	693.91	678.36	23.30	OSF1.50	10000.00	9910.52	MinPt-O-SF
2485.09	87.18	2426.60	2397.92	43.30	OSF1.50	12550.00	10000.00	MinPt-CtCt
2486.03	89.74	2425.83	2396.29	42.07	OSF1.50	12650.00	10000.00	MINPT-O-EOU
2487.58	91.57	2426.15	2396.01	41.24	OSF1.50	12720.00	10000.00	MinPt-O-ADP
2497.38	101.41	2429.40	2395.97	37.34	OSF1.50	13060.00	10000.00	MinPt-O-ADP
2498.06	108.77	2425.17	2389.29	34.80	OSF1.50	13300.00	10000.00	MinPt-CtCt
2484.89	124.45	2401.55	2360.44	30.21	OSF1.50	13840.00	10000.00	MinPt-CtCt

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level			Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)		Minor	Major		
2485.52	126.41	2400.87	2359.11	29.75		OSF1.50	13920.00	10000.00				MINPT-O-EOU	
2486.36	127.39	2401.06	2358.97	29.53		OSF1.50	13960.00	10000.00				MinPt-O-ADP	
2490.55	135.36	2399.94	2355.20	27.82		OSF1.50	14210.00	10000.00				MinPt-CtCt	
2491.67	138.81	2398.75	2352.85	27.13		OSF1.50	14340.00	10000.00				MINPT-O-EOU	
2492.72	140.11	2398.93	2352.61	26.89		OSF1.50	14390.00	10000.00				MinPt-O-ADP	
2506.00	155.27	2402.11	2350.73	24.38		OSF1.50	14880.00	10000.00				MinPt-CtCt	
2505.89	161.84	2397.62	2344.05	23.38		OSF1.50	15100.00	10000.00				MinPt-CtCt	
2506.10	180.02	2385.71	2326.08	21.00		OSF1.50	15710.00	10000.00				MinPt-CtCt	
2490.98	194.23	2361.11	2296.74	19.34		OSF1.50	16190.00	10000.00				MinPt-CtCt	
2491.07	197.19	2359.23	2293.87	19.05		OSF1.50	16290.00	10000.00				MinPt-CtCt	
2491.44	198.34	2358.84	2293.11	18.94		OSF1.50	16340.00	10000.00				MINPT-O-EOU	
2491.80	198.78	2358.90	2293.02	18.90		OSF1.50	16360.00	10000.00				MinPt-O-ADP	
2522.12	222.39	2373.48	2299.73	17.09		OSF1.50	17130.00	10000.00				MinPt-CtCt	
2522.17	227.76	2369.95	2294.41	16.69		OSF1.50	17310.00	10000.00				MinPt-CtCt	
2500.41	253.41	2331.09	2247.00	14.86		OSF1.50	18170.00	10000.00				MinPt-CtCt	
2499.54	258.56	2326.79	2240.98	14.56		OSF1.50	18340.00	10000.00				MinPt-CtCt	
2489.51	280.54	2302.10	2208.96	13.36		OSF1.50	19070.00	10000.00				MinPt-CtCt	
2490.67	284.28	2300.78	2206.40	13.19		OSF1.50	19210.00	10000.00				MINPT-O-EOU	
2492.00	285.83	2301.07	2206.17	13.12		OSF1.50	19270.00	10000.00				MinPt-O-ADP	
2492.93	288.34	2300.32	2204.59	13.01		OSF1.50	19330.00	10000.00				MinPt-CtCt	
2493.41	289.73	2299.87	2203.67	12.95		OSF1.50	19390.00	10000.00				MINPT-O-EOU	
2493.78	290.18	2299.95	2203.60	12.94		OSF1.50	19410.00	10000.00				MinPt-O-ADP	
2495.06	301.86	2293.45	2193.21	12.44		OSF1.50	19780.00	10000.00				MinPt-CtCt	
2495.27	302.46	2293.25	2192.81	12.42		OSF1.50	19810.00	10000.00				MINPT-O-EOU	
2495.42	302.65	2293.28	2192.77	12.41		OSF1.50	19820.00	10000.00				MinPt-O-ADP	
2504.94	305.30	2301.04	2199.65	12.35		OSF1.50	20000.00	10000.00				MinPt-O-SF	
2505.76	305.39	2301.79	2200.38	12.35		OSF1.50	20009.05	10000.00				TD	

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #13H
MWD 0ft-22542ft (Surcon
Corrected) (Def Survey)

Pass

134.20	32.81	132.22	101.40	N/A	MAS = 10.00 (m)	0.00	0.00	Surface
134.16	32.81	132.18	101.35	61197.28	MAS = 10.00 (m)	26.00	26.00	WRP
133.84	32.81	131.19	101.03	196.07	MAS = 10.00 (m)	190.00	190.00	MINPT-O-EOU
132.73	32.81	129.34	99.93	58.22	MAS = 10.00 (m)	550.00	550.00	MinPts
132.94	32.81	129.12	100.14	48.96	MAS = 10.00 (m)	640.00	640.00	MINPT-O-EOU
161.17	32.81	152.24	128.36	20.52	MAS = 10.00 (m)	1680.00	1680.00	MinPt-O-SF
287.04	32.81	272.87	254.23	21.92	MAS = 10.00 (m)	3580.00	3574.57	MinPts
287.06	32.81	272.86	254.25	21.88	MAS = 10.00 (m)	3590.00	3584.51	MINPT-O-EOU
296.52	32.81	274.88	263.71	14.41	MAS = 10.00 (m)	5800.00	5780.66	MinPts
296.58	32.81	274.81	263.78	14.31	MAS = 10.00 (m)	5830.00	5810.47	MINPT-O-EOU
297.11	34.08	274.01	263.02	13.47	OSF1.50	6150.00	6128.47	MinPt-CtCt
297.15	34.22	273.96	262.93	13.42	OSF1.50	6170.00	6148.34	MINPT-O-EOU
297.21	34.29	273.97	262.92	13.39	OSF1.50	6180.00	6158.28	MinPt-O-ADP
309.91	36.70	285.06	273.21	13.02	OSF1.50	6523.87	6500.00	MinPt-O-SF
574.60	50.27	540.71	524.33	17.50	OSF1.50	9770.00	9737.44	MinPt-CtCt
574.62	50.32	540.69	524.30	17.49	OSF1.50	9780.00	9746.33	MinPts
577.06	50.74	542.86	526.32	17.41	OSF1.50	9870.00	9821.39	MinPt-O-SF
2595.29	74.25	2545.46	2521.04	53.12	OSF1.50	12420.00	10000.00	MINPT-O-EOU
2597.08	76.40	2545.81	2520.68	51.64	OSF1.50	12500.00	10000.00	MinPt-O-ADP
2616.97	93.93	2554.03	2523.05	42.22	OSF1.50	13090.00	10000.00	MinPt-CtCt
2617.77	96.27	2553.26	2521.50	41.19	OSF1.50	13180.00	10000.00	MINPT-O-EOU
2623.47	109.73	2549.99	2513.74	36.17	OSF1.50	13640.00	10000.00	MINPT-O-EOU

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level			Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major		
2619.91	125.15	2536.15	2494.76	31.64		OSF1.50	14150.00	10000.00				MinPt-CtCt	
2617.14	133.18	2528.03	2483.97	29.69		OSF1.50	14420.00	10000.00				MinPt-CtCt	
2617.82	135.18	2527.37	2482.64	29.25		OSF1.50	14500.00	10000.00				MINPT-O-EOU	
2617.66	147.14	2519.24	2470.52	26.85		OSF1.50	14890.00	10000.00				MinPt-CtCt	
2605.45	176.33	2487.57	2429.12	22.28		OSF1.50	15870.00	10000.00				MinPt-CtCt	
2604.67	183.21	2482.20	2421.45	21.43		OSF1.50	16100.00	10000.00				MinPt-CtCt	
2605.47	194.59	2475.41	2410.88	20.18		OSF1.50	16480.00	10000.00				MinPt-CtCt	
2606.55	198.70	2473.75	2407.85	19.77		OSF1.50	16630.00	10000.00				MINPT-O-EOU	
2607.84	200.28	2473.99	2407.55	19.62		OSF1.50	16690.00	10000.00				MinPt-O-ADP	
2602.30	221.55	2454.27	2380.75	17.69		OSF1.50	17380.00	10000.00				MinPt-CtCt	
2600.87	230.83	2446.66	2370.05	16.97		OSF1.50	17690.00	10000.00				MinPt-CtCt	
2586.80	257.24	2414.98	2329.56	15.14		OSF1.50	18570.00	10000.00				MinPt-CtCt	
2586.76	262.63	2411.35	2324.13	14.82		OSF1.50	18750.00	10000.00				MinPt-CtCt	
2581.75	296.26	2383.92	2285.49	13.11		OSF1.50	19870.00	10000.00				MinPt-CtCt	
2581.32	300.66	2380.55	2280.66	12.92		OSF1.50	20009.05	10000.00				MinPts	

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #2H MWD
0ft-22179ft (Surcon Corrected)
(Def Survey)

Pass

1305.37	32.81	1304.35	1272.56	N/A	MAS = 10.00 (m)	0.00	0.00					Surface	
1305.35	32.81	1304.33	1272.54	N/A	MAS = 10.00 (m)	10.00	10.00					MinPts	
1305.35	32.81	1304.33	1272.54	N/A	MAS = 10.00 (m)	26.00	26.00					WRP	
1305.83	32.81	1299.57	1273.02	249.11	MAS = 10.00 (m)	1240.00	1240.00					MinPts	
1305.15	32.81	1294.92	1272.34	141.66	MAS = 10.00 (m)	2020.00	2020.00					MinPts	
1305.49	32.81	1294.43	1272.68	130.00	MAS = 10.00 (m)	2190.00	2190.00					MINPT-O-EOU	
947.71	35.08	923.83	912.63	42.23	OSF1.50	6600.00	6575.75					MinPt-O-SF	
940.52	34.23	917.20	906.28	43.01	OSF1.50	6790.00	6765.46					MinPts	
940.49	34.20	917.20	906.30	43.06	OSF1.50	6800.00	6775.46					MinPt-CtCt	
985.29	44.59	955.10	940.70	34.16	OSF1.50	9310.00	9285.46					MINPT-O-EOU	
985.85	45.44	955.09	940.41	33.52	OSF1.50	9500.00	9475.46					MINPT-O-EOU	
985.95	45.56	955.11	940.39	33.43	OSF1.50	9530.00	9505.46					MinPt-O-ADP	
983.56	46.85	951.87	936.71	32.40	OSF1.50	9840.00	9797.42					MinPt-CtCt	
983.59	46.90	951.86	936.69	32.37	OSF1.50	9850.00	9805.54					MinPts	
997.42	48.11	964.92	949.31	31.90	OSF1.50	10070.00	9947.01					MinPt-O-SF	
2560.43	69.64	2513.67	2490.79	55.92	OSF1.50	12290.00	10000.00					MINPT-O-EOU	
2561.13	70.41	2513.85	2490.71	55.31	OSF1.50	12320.00	10000.00					MinPt-O-ADP	
2563.65	76.06	2512.61	2487.58	51.20	OSF1.50	12510.00	10000.00					MinPt-CtCt	
2564.68	79.21	2511.54	2485.47	49.16	OSF1.50	12630.00	10000.00					MINPT-O-EOU	
2566.45	84.09	2510.07	2482.37	46.31	OSF1.50	12790.00	10000.00					MinPt-CtCt	
2567.29	86.69	2509.17	2480.60	44.91	OSF1.50	12890.00	10000.00					MINPT-O-EOU	
2568.35	87.99	2509.37	2480.36	44.26	OSF1.50	12940.00	10000.00					MinPt-O-ADP	
2576.55	112.49	2501.23	2464.06	34.65	OSF1.50	13770.00	10000.00					MinPt-CtCt	
2581.97	150.82	2481.09	2431.15	25.84	OSF1.50	15070.00	10000.00					MinPt-CtCt	
2582.55	152.60	2480.49	2429.95	25.54	OSF1.50	15140.00	10000.00					MINPT-O-EOU	
2583.36	153.60	2480.63	2429.76	25.38	OSF1.50	15180.00	10000.00					MinPt-O-ADP	
2588.43	159.76	2481.60	2428.67	24.44	OSF1.50	15370.00	10000.00					MinPt-CtCt	
2581.91	177.90	2462.98	2404.00	21.88	OSF1.50	15980.00	10000.00					MinPt-CtCt	
2583.40	185.62	2459.33	2397.78	20.98	OSF1.50	16250.00	10000.00					MINPT-O-EOU	
2584.22	186.64	2459.47	2397.58	20.87	OSF1.50	16290.00	10000.00					MinPt-O-ADP	
2589.52	191.14	2461.76	2398.38	20.42	OSF1.50	16440.00	10000.00					MINPT-O-EOU	
2591.06	192.82	2462.18	2398.23	20.25	OSF1.50	16500.00	10000.00					MinPt-O-ADP	
2596.68	205.55	2459.32	2391.13	19.03	OSF1.50	16920.00	10000.00					MINPT-O-EOU	
2591.98	220.33	2444.76	2371.64	17.72	OSF1.50	17400.00	10000.00					MinPt-CtCt	

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level			Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major		
2592.63		222.65	2443.86	2369.97	17.54	OSF1.50	17490.00	10000.00				MINPT-O-EOU	
2593.45		223.64	2444.03	2369.82	17.47	OSF1.50	17530.00	10000.00				MinPt-O-ADP	
2590.46		237.08	2432.08	2353.38	16.45	OSF1.50	17960.00	10000.00				MinPt-CtCt	
2591.61		240.26	2431.10	2351.34	16.24	OSF1.50	18080.00	10000.00				MINPT-O-EOU	
2593.18		242.13	2431.43	2351.05	16.12	OSF1.50	18150.00	10000.00				MinPt-O-ADP	
2595.01		246.56	2430.31	2348.45	15.84	OSF1.50	18290.00	10000.00				MINPT-O-EOU	
2573.97		274.52	2390.63	2299.45	14.11	OSF1.50	19210.00	10000.00				MinPt-CtCt	
2560.33		290.18	2366.54	2270.14	13.27	OSF1.50	19730.00	10000.00				MinPt-CtCt	
2560.95		292.19	2365.83	2268.76	13.19	OSF1.50	19810.00	10000.00				MINPT-O-EOU	
2561.78		293.16	2366.01	2268.62	13.15	OSF1.50	19850.00	10000.00				MinPt-O-ADP	
2563.55		298.90	2363.96	2264.65	12.90	OSF1.50	20009.05	10000.00				MinPts	

Cimarex Vaca Draw 20-17
Federal #10H Rev0 RM
1May17 (Non-Def Plan)

Pass

1401.12	32.81	1399.15	1368.32	N/A	MAS = 10.00 (m)	0.00	0.00					Surface	
1401.10	32.81	1399.12	1368.29	N/A	MAS = 10.00 (m)	26.00	26.00					WRP	
949.98	81.00	895.13	868.98	18.11	OSF1.50	9790.00	9755.11					MinPt-CtCt	
950.03	81.14	895.08	868.88	18.08	OSF1.50	9810.00	9772.37					MINPT-O-EOU	
950.10	81.22	895.10	868.88	18.06	OSF1.50	9820.00	9780.83					MinPt-O-ADP	
955.15	82.11	899.58	873.04	17.95	OSF1.50	9950.00	9879.31					MinPt-O-SF	
2697.02	349.92	2463.09	2347.11	11.62	OSF1.50	19820.00	10000.00					MINPT-O-EOU	
2697.40	350.38	2463.15	2347.02	11.60	OSF1.50	19840.00	10000.00					MinPt-O-ADP	
2706.51	353.60	2470.12	2352.91	11.54	OSF1.50	20009.05	10000.00					MinPt-O-SF	

Cimarex Vaca Draw 20-17
Federal #11H Rev0 RM
1May17 (Non-Def Plan)

Pass

1421.11	32.81	1419.13	1388.30	N/A	MAS = 10.00 (m)	0.00	0.00					Surface	
1421.08	32.81	1419.11	1388.28	N/A	MAS = 10.00 (m)	26.00	26.00					WRP	
969.98	81.00	915.13	888.98	18.50	OSF1.50	9790.00	9755.11					MinPt-CtCt	
970.03	81.14	915.08	888.88	18.46	OSF1.50	9810.00	9772.37					MINPT-O-EOU	
970.09	81.22	915.10	888.88	18.45	OSF1.50	9820.00	9780.83					MinPt-O-ADP	
975.84	82.17	920.23	893.67	18.32	OSF1.50	9960.00	9885.88					MinPt-O-SF	
2770.89	357.99	2531.57	2412.90	11.67	OSF1.50	19820.00	10000.00					MINPT-O-EOU	
2771.26	358.46	2531.63	2412.80	11.65	OSF1.50	19840.00	10000.00					MinPt-O-ADP	
2780.12	361.74	2538.30	2418.38	11.58	OSF1.50	20009.05	10000.00					MinPt-O-SF	

Cimarex Vaca Draw 20-17
Federal #12H Rev0 RM
1May17 (Non-Def Plan)

Pass

1441.07	32.81	1439.09	1408.26	N/A	MAS = 10.00 (m)	0.00	0.00					Surface	
1441.05	32.81	1439.07	1408.24	N/A	MAS = 10.00 (m)	26.00	26.00					WRP	
989.96	81.00	935.12	908.96	18.88	OSF1.50	9790.00	9755.11					MinPt-CtCt	
990.01	81.14	935.06	908.86	18.84	OSF1.50	9810.00	9772.37					MINPT-O-EOU	
990.07	81.22	935.08	908.85	18.83	OSF1.50	9820.00	9780.83					MinPt-O-ADP	
995.70	82.17	940.09	913.53	18.70	OSF1.50	9960.00	9885.88					MinPt-O-SF	
2828.82	363.81	2585.62	2465.01	11.72	OSF1.50	19820.00	10000.00					MINPT-O-EOU	
2829.18	364.29	2585.67	2464.90	11.70	OSF1.50	19840.00	10000.00					MinPt-O-ADP	
2837.87	367.62	2592.13	2470.25	11.63	OSF1.50	20009.05	10000.00					MinPt-O-SF	

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #3H MWD
0ft-22454' (Surcon Corrected)
(Def Survey)

Pass

1325.31	32.81	1324.18	1292.50	N/A	MAS = 10.00 (m)	0.00	0.00					Surface	
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Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level			Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major		
1325.28	32.81	1324.15	1292.48	N/A		MAS = 10.00 (m)	10.00	10.00				MinPts	
1325.29	32.81	1324.16	1292.49	271883.08		MAS = 10.00 (m)	26.00	26.00				WRP	
1325.36	32.81	1324.14	1292.56	13717.54		MAS = 10.00 (m)	60.00	60.00				MINPT-O-EOU	
1321.93	32.81	1318.16	1289.13	480.10		MAS = 10.00 (m)	650.00	650.00				MinPts	
1321.97	32.81	1318.12	1289.16	467.27		MAS = 10.00 (m)	670.00	670.00				MINPT-O-EOU	
1329.09	32.81	1320.95	1296.28	186.34		MAS = 10.00 (m)	1640.00	1640.00				MinPts	
1329.22	32.81	1320.81	1296.42	179.76		MAS = 10.00 (m)	1700.00	1700.00				MINPT-O-EOU	
1370.01	32.81	1357.85	1337.20	122.90		MAS = 10.00 (m)	2600.00	2599.98				MinPt-O-SF	
1232.10	34.87	1208.47	1197.23	54.78		OSF1.50	6600.00	6575.75				MinPts	
1391.19	48.17	1358.74	1343.02	44.23		OSF1.50	9920.00	9858.68				MinPts	
1391.23	48.22	1358.74	1343.01	44.18		OSF1.50	9930.00	9865.71				MinPt-O-ADP	
1442.59	51.02	1408.23	1391.56	43.24		OSF1.50	10320.00	10000.00				MinPt-O-SF	
2914.86	79.53	2861.51	2835.33	55.65		OSF1.50	12580.00	10000.00				MinPt-CtCt	
2915.85	82.61	2860.45	2833.24	53.57		OSF1.50	12700.00	10000.00				MINPT-O-EOU	
2917.91	84.95	2860.95	2832.96	52.11		OSF1.50	12790.00	10000.00				MinPt-O-ADP	
2926.46	94.24	2863.31	2832.22	47.06		OSF1.50	13110.00	10000.00				MINPT-O-EOU	
2930.03	102.60	2861.30	2827.43	43.24		OSF1.50	13400.00	10000.00				MINPT-O-EOU	
2930.38	105.01	2860.04	2825.37	42.24		OSF1.50	13470.00	10000.00				MinPt-CtCt	
2931.94	112.22	2856.79	2819.71	39.52		OSF1.50	13730.00	10000.00				MINPT-O-EOU	
2933.00	113.49	2857.01	2819.51	39.09		OSF1.50	13780.00	10000.00				MinPt-O-ADP	
2937.33	117.52	2858.66	2819.81	37.80		OSF1.50	13920.00	10000.00				MinPt-O-ADP	
2945.18	130.06	2858.14	2815.11	34.21		OSF1.50	14340.00	10000.00				MINPT-O-EOU	
2931.37	164.53	2821.36	2766.84	26.88		OSF1.50	15490.00	10000.00				MinPt-CtCt	
2930.22	180.61	2809.49	2749.62	24.46		OSF1.50	16030.00	10000.00				MinPt-CtCt	
2931.39	188.66	2805.29	2742.73	23.42		OSF1.50	16300.00	10000.00				MinPt-CtCt	
2936.11	241.90	2774.52	2694.21	18.28		OSF1.50	18080.00	10000.00				MinPt-CtCt	
2932.10	252.97	2763.13	2679.13	17.45		OSF1.50	18450.00	10000.00				MinPt-CtCt	
2932.45	261.69	2757.67	2670.76	16.87		OSF1.50	18740.00	10000.00				MinPt-CtCt	
2933.56	268.87	2753.98	2664.69	16.42		OSF1.50	18980.00	10000.00				MinPt-CtCt	
2928.40	300.09	2728.01	2628.31	14.68		OSF1.50	20009.05	10000.00				MinPts	

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #4H MWD
Ofc-12228ft (Surcon Corrected)
(Def Survey)

Pass

1345.19	32.81	1343.21	1312.38	N/A		MAS = 10.00 (m)	0.00	0.00				Surface	
1345.16	32.81	1343.18	1312.35	348496.28		MAS = 10.00 (m)	26.00	26.00				WRP	
1343.62	32.81	1340.00	1310.81	820.29		MAS = 10.00 (m)	420.00	420.00				MinPts	
1343.70	32.81	1339.91	1310.89	739.81		MAS = 10.00 (m)	460.00	460.00				MINPT-O-EOU	
1495.54	32.81	1481.73	1462.73	126.20		MAS = 10.00 (m)	2750.00	2749.68				MinPt-O-SF	
1497.17	32.81	1483.34	1464.36	126.18		MAS = 10.00 (m)	2820.88	2820.20				MinPt-O-SF	
1496.15	32.81	1482.08	1463.34	123.62		MAS = 10.00 (m)	3080.00	3077.71				MinPts	
1496.17	32.81	1482.04	1463.36	122.99		MAS = 10.00 (m)	3110.00	3107.52				MINPT-O-EOU	
1506.48	32.81	1490.55	1473.67	107.85		MAS = 10.00 (m)	3930.00	3922.38				MinPts	
1504.42	32.81	1487.38	1471.61	99.81		MAS = 10.00 (m)	4370.00	4359.62				MinPts	
1504.44	32.81	1487.35	1471.63	99.42		MAS = 10.00 (m)	4390.00	4379.50				MINPT-O-EOU	
1515.85	32.81	1495.64	1483.04	83.01		MAS = 10.00 (m)	5240.00	5224.17				MinPts	
1515.97	32.81	1495.50	1483.16	81.87		MAS = 10.00 (m)	5300.00	5283.79				MINPT-O-EOU	
1541.15	37.54	1515.47	1503.62	64.93		OSF1.50	6523.87	6500.00				MinPts	
1542.67	37.64	1516.92	1505.03	64.81		OSF1.50	6600.00	6575.75				MinPt-O-SF	
1807.16	50.80	1772.63	1756.35	55.46		OSF1.50	9830.00	9789.19				MinPt-CtCt	
1807.17	50.89	1772.58	1756.28	55.36		OSF1.50	9850.00	9805.54				MINPT-O-EOU	
1807.20	50.94	1772.59	1756.27	55.31		OSF1.50	9860.00	9813.53				MinPt-O-ADP	
1948.24	57.08	1909.53	1891.17	52.99		OSF1.50	10640.00	10000.00				MinPt-O-SF	

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level			Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major		
	10258.06	76.15	10206.64	10181.91	207.40	OSF1.50	20009.05	10000.00				TD	

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #4H ST01
MWD 0ft-22279ft (Surcon
Corrected) (Def Survey)

Pass

1345.19	32.81	1344.02	1312.38	N/A	MAS = 10.00 (m)	0.00	0.00	Surface
1345.16	32.81	1343.98	1312.35	348704.38	MAS = 10.00 (m)	26.00	26.00	WRP
1343.62	32.81	1340.80	1310.81	820.78	MAS = 10.00 (m)	420.00	420.00	MinPts
1343.70	32.81	1340.71	1310.89	740.25	MAS = 10.00 (m)	460.00	460.00	MINPT-O-EOU
1495.54	32.81	1482.61	1462.73	125.75	MAS = 10.00 (m)	2750.00	2749.68	MinPt-O-SF
1496.15	32.81	1482.96	1463.34	123.11	MAS = 10.00 (m)	3080.00	3077.71	MinPts
1496.17	32.81	1482.91	1463.36	122.47	MAS = 10.00 (m)	3110.00	3107.52	MINPT-O-EOU
1506.48	32.81	1491.48	1473.67	107.94	MAS = 10.00 (m)	3930.00	3922.38	MinPts
1504.42	32.81	1488.29	1471.61	99.72	MAS = 10.00 (m)	4370.00	4359.62	MinPts
1504.44	32.81	1488.25	1471.63	99.31	MAS = 10.00 (m)	4390.00	4379.50	MINPT-O-EOU
1515.85	32.81	1496.56	1483.04	83.00	MAS = 10.00 (m)	5240.00	5224.17	MinPts
1515.97	32.81	1496.42	1483.16	81.86	MAS = 10.00 (m)	5300.00	5283.79	MINPT-O-EOU
1541.15	36.63	1516.39	1504.53	64.92	OSF1.50	6523.87	6500.00	MinPts
1542.67	36.73	1517.83	1505.94	64.81	OSF1.50	6600.00	6575.75	MinPt-O-SF
1807.16	49.89	1773.55	1757.27	55.47	OSF1.50	9830.00	9789.19	MinPt-CtCt
1807.17	49.97	1773.51	1757.20	55.37	OSF1.50	9850.00	9805.54	MINPT-O-EOU
1807.20	50.02	1773.51	1757.19	55.32	OSF1.50	9860.00	9813.53	MinPt-O-ADP
1948.24	56.14	1910.47	1892.11	53.02	OSF1.50	10640.00	10000.00	MinPt-O-SF
3007.02	96.76	2942.19	2910.26	47.08	OSF1.50	13110.00	10000.00	MinPt-CtCt
3008.72	151.48	2907.41	2857.24	29.98	OSF1.50	14990.00	10000.00	MinPt-CtCt
2965.26	201.86	2830.36	2763.40	22.13	OSF1.50	16690.00	10000.00	MinPt-CtCt
2965.96	203.88	2829.71	2762.08	21.92	OSF1.50	16770.00	10000.00	MINPT-O-EOU
2966.80	204.88	2829.89	2761.93	21.82	OSF1.50	16810.00	10000.00	MinPt-O-ADP
2974.01	211.28	2832.82	2762.73	21.21	OSF1.50	17030.00	10000.00	MinPt-O-ADP
2982.71	219.73	2835.90	2762.98	20.45	OSF1.50	17310.00	10000.00	MinPt-O-ADP
2997.03	228.71	2844.23	2768.32	19.73	OSF1.50	17620.00	10000.00	MINPT-O-EOU
2997.38	229.07	2844.34	2768.31	19.71	OSF1.50	17630.00	10000.00	MinPt-O-ADP
2991.74	256.14	2820.65	2735.60	17.58	OSF1.50	18510.00	10000.00	MinPt-CtCt
2993.25	260.54	2819.23	2732.71	17.29	OSF1.50	18670.00	10000.00	MINPT-O-EOU
2995.86	266.82	2817.65	2729.04	16.90	OSF1.50	18880.00	10000.00	MINPT-O-EOU
2993.04	287.62	2800.97	2705.43	15.66	OSF1.50	19560.00	10000.00	MinPt-CtCt
2997.17	300.79	2796.32	2696.38	14.99	OSF1.50	20009.05	10000.00	MinPts



Cimarex Vaca Draw 20-17 Federal #15H Rev0 RM 20Jan20 Proposal

Geodetic Report

(Non-Def Plan)



Report Date: January 21, 2020 - 08:54 AM
Client: Cimarex Energy
Field: NM Lea County (NAD 83)
Structure / Slot: Cimarex Vaca Draw 20-17 Federal #15H / New Slot
Well: Vaca Draw 20-17 Federal #15H
Borehole: Vaca Draw 20-17 Federal #15H
UWI / API#: Unknown / Unknown
Survey Name: Cimarex Vaca Draw 20-17 Federal #15H Rev0 RM 20Jan20
Survey Date: January 20, 2020
Tort / AHD / DDI / ERD Ratio: 102.835 ° / 10639.228 ft / 6.340 / 1.064
Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
Location Lat / Long: N 32° 6' 34.46684", W 103° 36' 3.15931"
Location Grid N/E Y/X: N 404369.980 ftUS, E 768122.310 ftUS
CRS Grid Convergence Angle: 0.3893 °
Grid Scale Factor: 0.999968
Version / Patch: 2.10.787.0

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 359.628 ° (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: RKB
TVD Reference Elevation: 3449.100 ft above MSL
Seabed / Ground Elevation: 3423.100 ft above MSL
Magnetic Declination: 6.583 °
Total Gravity Field Strength: 998.4291mgn (9.80665 Based)
Gravity Model: GARM
Total Magnetic Field Strength: 47707.390 nT
Magnetic Dip Angle: 59.694 °
Declination Date: January 20, 2020
Magnetic Declination Model: HDGM 2019
North Reference: Grid North
Grid Convergence Used: 0.3893 °
Total Corr Mag North->Grid North: 6.1933 °
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 [270' FSL, 610' FWL]	0.00	0.00	2.16	0.00	0.00	0.00	0.00	N/A	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
	100.00	0.00	89.62	100.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
	200.00	0.00	89.62	200.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
	300.00	0.00	89.62	300.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
	400.00	0.00	89.62	400.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
	500.00	0.00	89.62	500.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
	600.00	0.00	89.62	600.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
	700.00	0.00	89.62	700.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
	800.00	0.00	89.62	800.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
	900.00	0.00	89.62	900.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
	1000.00	0.00	89.62	1000.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
Rustler	1001.00	0.00	89.62	1001.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
	1100.00	0.00	89.62	1100.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
	1200.00	0.00	89.62	1200.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
	1300.00	0.00	89.62	1300.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
Top of Salt	1341.00	0.00	89.62	1341.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
	1400.00	0.00	89.62	1400.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
	1500.00	0.00	89.62	1500.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
	1600.00	0.00	89.62	1600.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
	1700.00	0.00	89.62	1700.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
	1800.00	0.00	89.62	1800.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
	1900.00	0.00	89.62	1900.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
	2000.00	0.00	89.62	2000.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
	2100.00	0.00	89.62	2100.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
	2200.00	0.00	89.62	2200.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
	2300.00	0.00	89.62	2300.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	
	2400.00	0.00	89.62	2400.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32 6 34.47 W 103 36 3.16	

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 ° ' ")
Nudge 2°/100' DLS	2500.00	0.00	89.62	2500.00	0.00	0.00	0.00	0.00	404369.98	768122.31	N 32	6 34.47 W 103 36 3.16
	2600.00	2.00	89.62	2599.98	0.00	0.01	1.75	2.00	404369.99	768124.06	N 32	6 34.47 W 103 36 3.14
	2700.00	4.00	89.62	2699.84	0.00	0.05	6.98	2.00	404370.03	768129.29	N 32	6 34.47 W 103 36 3.08
	2800.00	6.00	89.62	2799.45	0.00	0.10	15.69	2.00	404370.08	768138.00	N 32	6 34.47 W 103 36 2.98
Hold Nudge	2820.88	6.42	89.62	2820.20	0.00	0.12	17.95	2.00	404370.10	768140.26	N 32	6 34.47 W 103 36 2.95
	2900.00	6.42	89.62	2898.83	0.00	0.18	26.79	0.00	404370.16	768149.10	N 32	6 34.47 W 103 36 2.85
	3000.00	6.42	89.62	2998.21	0.01	0.25	37.97	0.00	404370.23	768160.28	N 32	6 34.47 W 103 36 2.72
	3100.00	6.42	89.62	3097.58	0.01	0.33	49.15	0.00	404370.31	768171.46	N 32	6 34.47 W 103 36 2.59
	3200.00	6.42	89.62	3196.95	0.01	0.40	60.33	0.00	404370.38	768182.63	N 32	6 34.47 W 103 36 2.46
	3300.00	6.42	89.62	3296.33	0.01	0.48	71.50	0.00	404370.46	768193.81	N 32	6 34.47 W 103 36 2.33
	3400.00	6.42	89.62	3395.70	0.01	0.55	82.68	0.00	404370.53	768204.99	N 32	6 34.47 W 103 36 2.20
	3500.00	6.42	89.62	3495.07	0.02	0.63	93.86	0.00	404370.61	768216.16	N 32	6 34.47 W 103 36 2.07
	3600.00	6.42	89.62	3594.45	0.02	0.70	105.03	0.00	404370.68	768227.34	N 32	6 34.47 W 103 36 1.94
	3700.00	6.42	89.62	3693.82	0.02	0.77	116.21	0.00	404370.75	768238.52	N 32	6 34.47 W 103 36 1.81
	3800.00	6.42	89.62	3793.19	0.02	0.85	127.39	0.00	404370.83	768249.69	N 32	6 34.47 W 103 36 1.68
	3900.00	6.42	89.62	3892.57	0.02	0.92	138.56	0.00	404370.90	768260.87	N 32	6 34.47 W 103 36 1.55
	4000.00	6.42	89.62	3991.94	0.03	1.00	149.74	0.00	404370.98	768272.05	N 32	6 34.47 W 103 36 1.42
	4100.00	6.42	89.62	4091.31	0.03	1.07	160.92	0.00	404371.05	768283.22	N 32	6 34.47 W 103 36 1.29
	4200.00	6.42	89.62	4190.69	0.03	1.15	172.10	0.00	404371.13	768294.40	N 32	6 34.47 W 103 36 1.16
	4300.00	6.42	89.62	4290.06	0.03	1.22	183.27	0.00	404371.20	768305.58	N 32	6 34.47 W 103 36 1.03
	4400.00	6.42	89.62	4389.43	0.03	1.30	194.45	0.00	404371.28	768316.75	N 32	6 34.47 W 103 36 0.90
	4500.00	6.42	89.62	4488.81	0.04	1.37	205.63	0.00	404371.35	768327.93	N 32	6 34.47 W 103 36 0.77
	4600.00	6.42	89.62	4588.18	0.04	1.45	216.80	0.00	404371.43	768339.11	N 32	6 34.47 W 103 36 0.64
	4700.00	6.42	89.62	4687.55	0.04	1.52	227.98	0.00	404371.50	768350.28	N 32	6 34.47 W 103 36 0.51
Base of Salt	4707.49	6.42	89.62	4695.00	0.04	1.53	228.82	0.00	404371.51	768351.12	N 32	6 34.47 W 103 36 0.50
	4800.00	6.42	89.62	4786.93	0.04	1.59	239.16	0.00	404371.57	768361.46	N 32	6 34.47 W 103 36 0.38
	4900.00	6.42	89.62	4886.30	0.04	1.67	250.33	0.00	404371.65	768372.64	N 32	6 34.47 W 103 36 0.25
Bell Canyon	4983.22	6.42	89.62	4969.00	0.05	1.73	259.64	0.00	404371.71	768381.94	N 32	6 34.47 W 103 36 0.14
	5000.00	6.42	89.62	4985.67	0.05	1.74	261.51	0.00	404371.72	768383.81	N 32	6 34.47 W 103 36 0.12
	5100.00	6.42	89.62	5085.05	0.05	1.82	272.69	0.00	404371.80	768394.99	N 32	6 34.47 W 103 35 59.99
	5200.00	6.42	89.62	5184.42	0.05	1.89	283.87	0.00	404371.87	768406.17	N 32	6 34.47 W 103 35 59.86
	5300.00	6.42	89.62	5283.79	0.05	1.97	295.04	0.00	404371.95	768417.34	N 32	6 34.47 W 103 35 59.73
	5400.00	6.42	89.62	5383.17	0.05	2.04	306.22	0.00	404372.02	768428.52	N 32	6 34.47 W 103 35 59.60
	5500.00	6.42	89.62	5482.54	0.06	2.12	317.40	0.00	404372.10	768439.70	N 32	6 34.47 W 103 35 59.47
	5600.00	6.42	89.62	5581.92	0.06	2.19	328.57	0.00	404372.17	768450.87	N 32	6 34.47 W 103 35 59.34
	5700.00	6.42	89.62	5681.29	0.06	2.27	339.75	0.00	404372.25	768462.05	N 32	6 34.47 W 103 35 59.21
	5800.00	6.42	89.62	5780.66	0.06	2.34	350.93	0.00	404372.32	768473.23	N 32	6 34.47 W 103 35 59.08
	5900.00	6.42	89.62	5880.04	0.06	2.41	362.10	0.00	404372.39	768484.40	N 32	6 34.47 W 103 35 58.95
Cherry Canyon	6000.00	6.42	89.62	5979.41	0.07	2.49	373.28	0.00	404372.47	768495.58	N 32	6 34.47 W 103 35 58.82
	6069.02	6.42	89.62	6048.00	0.07	2.54	381.00	0.00	404372.52	768503.29	N 32	6 34.47 W 103 35 58.73
	6100.00	6.42	89.62	6078.78	0.07	2.56	384.46	0.00	404372.54	768506.76	N 32	6 34.47 W 103 35 58.69
	6200.00	6.42	89.62	6178.16	0.07	2.64	395.64	0.00	404372.62	768517.93	N 32	6 34.47 W 103 35 58.56
	6300.00	6.42	89.62	6277.53	0.07	2.71	406.81	0.00	404372.69	768529.11	N 32	6 34.47 W 103 35 58.43
	6400.00	6.42	89.62	6376.90	0.07	2.79	417.99	0.00	404372.77	768540.29	N 32	6 34.47 W 103 35 58.30
	6500.00	6.42	89.62	6476.28	0.07	2.86	429.17	0.00	404372.84	768551.46	N 32	6 34.47 W 103 35 58.17
Drop to Vertical 2°/100' DLS	6523.87	6.42	89.62	6500.00	0.08	2.88	431.83	0.00	404372.86	768554.13	N 32	6 34.47 W 103 35 58.14
	6600.00	4.89	89.62	6575.75	0.08	2.93	439.34	2.00	404372.91	768561.63	N 32	6 34.47 W 103 35 58.05
	6700.00	2.89	89.62	6675.52	0.08	2.97	446.13	2.00	404372.95	768568.42	N 32	6 34.47 W 103 35 57.97
	6800.00	0.89	89.62	6775.46	0.08	3.00	449.44	2.00	404372.98	768571.73	N 32	6 34.47 W 103 35 57.93
Hold Vertical	6844.75	0.00	89.62	6820.20	0.08	3.00	449.79	2.00	404372.98	768572.08	N 32	6 34.47 W 103 35 57.93
	6900.00	0.00	89.62	6875.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32	6 34.47 W 103 35 57.93
	7000.00	0.00	89.62	6975.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32	6 34.47 W 103 35 57.93
	7100.00	0.00	89.62	7075.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32	6 34.47 W 103 35 57.93
	7200.00	0.00	89.62	7175.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32	6 34.47 W 103 35 57.93
	7300.00	0.00	89.62	7275.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32	6 34.47 W 103 35 57.93
	7400.00	0.00	89.62	7375.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32	6 34.47 W 103 35 57.93
	7500.00	0.00	89.62	7475.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32	6 34.47 W 103 35 57.93

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 ° ' ")
Brushy Canyon	7549.54	0.00	89.62	7525.00	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32 6 34.47 W 103 35 57.93	
	7600.00	0.00	89.62	7575.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32 6 34.47 W 103 35 57.93	
	7700.00	0.00	89.62	7675.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32 6 34.47 W 103 35 57.93	
	7800.00	0.00	89.62	7775.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32 6 34.47 W 103 35 57.93	
	7900.00	0.00	89.62	7875.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32 6 34.47 W 103 35 57.93	
	8000.00	0.00	89.62	7975.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32 6 34.47 W 103 35 57.93	
	8100.00	0.00	89.62	8075.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32 6 34.47 W 103 35 57.93	
	8200.00	0.00	89.62	8175.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32 6 34.47 W 103 35 57.93	
	8300.00	0.00	89.62	8275.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32 6 34.47 W 103 35 57.93	
	8400.00	0.00	89.62	8375.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32 6 34.47 W 103 35 57.93	
	8500.00	0.00	89.62	8475.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32 6 34.47 W 103 35 57.93	
	8600.00	0.00	89.62	8575.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32 6 34.47 W 103 35 57.93	
	8700.00	0.00	89.62	8675.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32 6 34.47 W 103 35 57.93	
	8800.00	0.00	89.62	8775.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32 6 34.47 W 103 35 57.93	
	8900.00	0.00	89.62	8875.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32 6 34.47 W 103 35 57.93	
	9000.00	0.00	89.62	8975.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32 6 34.47 W 103 35 57.93	
	9100.00	0.00	89.62	9075.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32 6 34.47 W 103 35 57.93	
Bone Spring Lime	9138.54	0.00	89.62	9114.00	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32 6 34.47 W 103 35 57.93	
Leonard Shale	9174.54	0.00	89.62	9150.00	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32 6 34.47 W 103 35 57.93	
	9200.00	0.00	89.62	9175.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32 6 34.47 W 103 35 57.93	
	9300.00	0.00	89.62	9275.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32 6 34.47 W 103 35 57.93	
Avalon Shale	9383.54	0.00	89.62	9359.00	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32 6 34.47 W 103 35 57.93	
	9400.00	0.00	89.62	9375.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32 6 34.47 W 103 35 57.93	
	9500.00	0.00	89.62	9475.46	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32 6 34.47 W 103 35 57.93	
KOP - Build 12°/100' DLS	9547.08	0.00	89.62	9522.54	0.08	3.00	449.79	0.00	404372.98	768572.08	N 32 6 34.47 W 103 35 57.93	
	9600.00	6.35	359.63	9575.35	3.01	5.93	449.77	12.00	404375.91	768572.06	N 32 6 34.50 W 103 35 57.93	
	9700.00	18.35	359.63	9672.85	24.36	27.28	449.63	12.00	404397.26	768571.92	N 32 6 34.71 W 103 35 57.93	
	9800.00	30.35	359.63	9763.79	65.51	68.43	449.36	12.00	404438.41	768571.66	N 32 6 35.11 W 103 35 57.93	
	9900.00	42.35	359.63	9844.19	124.68	127.60	448.98	12.00	404497.57	768571.27	N 32 6 35.70 W 103 35 57.93	
	10000.00	54.35	359.63	9910.52	199.26	202.18	448.49	12.00	404572.15	768570.79	N 32 6 36.44 W 103 35 57.93	
	10100.00	66.35	359.63	9959.90	286.01	288.93	447.93	12.00	404658.90	768570.22	N 32 6 37.30 W 103 35 57.93	
	10200.00	78.35	359.63	9990.16	381.13	384.04	447.31	12.00	404754.01	768569.61	N 32 6 38.24 W 103 35 57.93	
Lower Avalon Target Landing Point	10297.08	90.00	359.63	10000.00	477.54	480.45	446.69	12.00	404850.42	768568.98	N 32 6 39.19 W 103 35 57.93	
	10300.00	90.00	359.63	10000.00	480.46	483.37	446.67	0.00	404853.34	768568.96	N 32 6 39.22 W 103 35 57.93	
	10400.00	90.00	359.63	10000.00	580.46	583.37	446.02	0.00	404953.33	768568.31	N 32 6 40.21 W 103 35 57.93	
	10500.00	90.00	359.63	10000.00	680.46	683.37	445.37	0.00	405053.33	768567.66	N 32 6 41.20 W 103 35 57.93	
	10600.00	90.00	359.63	10000.00	780.46	783.37	444.72	0.00	405153.32	768567.01	N 32 6 42.19 W 103 35 57.93	
	10700.00	90.00	359.63	10000.00	880.46	883.37	444.07	0.00	405253.32	768566.36	N 32 6 43.18 W 103 35 57.93	
	10800.00	90.00	359.63	10000.00	980.46	983.36	443.42	0.00	405353.31	768565.71	N 32 6 44.17 W 103 35 57.93	
	10900.00	90.00	359.63	10000.00	1080.46	1083.36	442.77	0.00	405453.30	768565.07	N 32 6 45.16 W 103 35 57.93	
	11000.00	90.00	359.63	10000.00	1180.46	1183.36	442.12	0.00	405553.30	768564.42	N 32 6 46.15 W 103 35 57.93	
	11100.00	90.00	359.63	10000.00	1280.46	1283.36	441.47	0.00	405653.29	768563.77	N 32 6 47.14 W 103 35 57.93	
	11200.00	90.00	359.63	10000.00	1380.46	1383.35	440.82	0.00	405753.29	768563.12	N 32 6 48.13 W 103 35 57.92	
	11300.00	90.00	359.63	10000.00	1480.46	1483.35	440.17	0.00	405853.28	768562.47	N 32 6 49.12 W 103 35 57.92	
	11400.00	90.00	359.63	10000.00	1580.46	1583.35	439.52	0.00	405953.28	768561.82	N 32 6 50.10 W 103 35 57.92	
	11500.00	90.00	359.63	10000.00	1680.46	1683.35	438.87	0.00	406053.27	768561.17	N 32 6 51.09 W 103 35 57.92	
	11600.00	90.00	359.63	10000.00	1780.46	1783.35	438.23	0.00	406153.27	768560.52	N 32 6 52.08 W 103 35 57.92	
	11700.00	90.00	359.63	10000.00	1880.46	1883.34	437.58	0.00	406253.26	768559.87	N 32 6 53.07 W 103 35 57.92	
	11800.00	90.00	359.63	10000.00	1980.46	1983.34	436.93	0.00	406353.25	768559.22	N 32 6 54.06 W 103 35 57.92	
	11900.00	90.00	359.63	10000.00	2080.46	2083.34	436.28	0.00	406453.25	768558.57	N 32 6 55.05 W 103 35 57.92	
	12000.00	90.00	359.63	10000.00	2180.46	2183.34	435.63	0.00	406553.24	768557.92	N 32 6 56.04 W 103 35 57.92	
	12100.00	90.00	359.63	10000.00	2280.46	2283.34	434.98	0.00	406653.24	768557.27	N 32 6 57.03 W 103 35 57.92	
	12200.00	90.00	359.63	10000.00	2380.46	2383.33	434.33	0.00	406753.23	768556.62	N 32 6 58.02 W 103 35 57.92	
	12300.00	90.00	359.63	10000.00	2480.46	2483.33	433.68	0.00	406853.23	768555.98	N 32 6 59.01 W 103 35 57.92	
	12400.00	90.00	359.63	10000.00	2580.46	2583.33	433.03	0.00	406953.22	768555.33	N 32 7 0.00 W 103 35 57.92	

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 ° ' ")
	12500.00	90.00	359.63	10000.00	2680.46	2683.33	432.38	0.00	407053.22	768554.68	N 32 7 0.99 W	103 35 57.92
	12600.00	90.00	359.63	10000.00	2780.46	2783.33	431.73	0.00	407153.21	768554.03	N 32 7 1.98 W	103 35 57.92
	12700.00	90.00	359.63	10000.00	2880.46	2883.32	431.08	0.00	407253.21	768553.38	N 32 7 2.97 W	103 35 57.92
	12800.00	90.00	359.63	10000.00	2980.46	2983.32	430.43	0.00	407353.20	768552.73	N 32 7 3.96 W	103 35 57.92
	12900.00	90.00	359.63	10000.00	3080.46	3083.32	429.78	0.00	407453.19	768552.08	N 32 7 4.95 W	103 35 57.92
	13000.00	90.00	359.63	10000.00	3180.46	3183.32	429.13	0.00	407553.19	768551.43	N 32 7 5.94 W	103 35 57.92
	13100.00	90.00	359.63	10000.00	3280.46	3283.31	428.49	0.00	407653.18	768550.78	N 32 7 6.93 W	103 35 57.92
	13200.00	90.00	359.63	10000.00	3380.46	3383.31	427.84	0.00	407753.18	768550.13	N 32 7 7.92 W	103 35 57.92
	13300.00	90.00	359.63	10000.00	3480.46	3483.31	427.19	0.00	407853.17	768549.48	N 32 7 8.91 W	103 35 57.92
	13400.00	90.00	359.63	10000.00	3580.46	3583.31	426.54	0.00	407953.17	768548.83	N 32 7 9.90 W	103 35 57.92
	13500.00	90.00	359.63	10000.00	3680.46	3683.31	425.89	0.00	408053.16	768548.18	N 32 7 10.88 W	103 35 57.92
	13600.00	90.00	359.63	10000.00	3780.46	3783.30	425.24	0.00	408153.16	768547.53	N 32 7 11.87 W	103 35 57.92
	13700.00	90.00	359.63	10000.00	3880.46	3883.30	424.59	0.00	408253.15	768546.88	N 32 7 12.86 W	103 35 57.92
	13800.00	90.00	359.63	10000.00	3980.46	3983.30	423.94	0.00	408353.14	768546.24	N 32 7 13.85 W	103 35 57.92
	13900.00	90.00	359.63	10000.00	4080.46	4083.30	423.29	0.00	408453.14	768545.59	N 32 7 14.84 W	103 35 57.91
	14000.00	90.00	359.63	10000.00	4180.46	4183.30	422.64	0.00	408553.13	768544.94	N 32 7 15.83 W	103 35 57.91
	14100.00	90.00	359.63	10000.00	4280.46	4283.29	421.99	0.00	408653.13	768544.29	N 32 7 16.82 W	103 35 57.91
	14200.00	90.00	359.63	10000.00	4380.46	4383.29	421.34	0.00	408753.12	768543.64	N 32 7 17.81 W	103 35 57.91
	14300.00	90.00	359.63	10000.00	4480.46	4483.29	420.69	0.00	408853.12	768542.99	N 32 7 18.80 W	103 35 57.91
	14400.00	90.00	359.63	10000.00	4580.46	4583.29	420.04	0.00	408953.11	768542.34	N 32 7 19.79 W	103 35 57.91
	14500.00	90.00	359.63	10000.00	4680.46	4683.29	419.39	0.00	409053.11	768541.69	N 32 7 20.78 W	103 35 57.91
	14600.00	90.00	359.63	10000.00	4780.46	4783.28	418.75	0.00	409153.10	768541.04	N 32 7 21.77 W	103 35 57.91
	14700.00	90.00	359.63	10000.00	4880.46	4883.28	418.10	0.00	409253.09	768540.39	N 32 7 22.76 W	103 35 57.91
	14800.00	90.00	359.63	10000.00	4980.46	4983.28	417.45	0.00	409353.09	768539.74	N 32 7 23.75 W	103 35 57.91
	14900.00	90.00	359.63	10000.00	5080.46	5083.28	416.80	0.00	409453.08	768539.09	N 32 7 24.74 W	103 35 57.91
	15000.00	90.00	359.63	10000.00	5180.46	5183.27	416.15	0.00	409553.08	768538.44	N 32 7 25.73 W	103 35 57.91
	15100.00	90.00	359.63	10000.00	5280.46	5283.27	415.50	0.00	409653.07	768537.79	N 32 7 26.72 W	103 35 57.91
	15200.00	90.00	359.63	10000.00	5380.46	5383.27	414.85	0.00	409753.07	768537.15	N 32 7 27.71 W	103 35 57.91
	15300.00	90.00	359.63	10000.00	5480.46	5483.27	414.20	0.00	409853.06	768536.50	N 32 7 28.70 W	103 35 57.91
	15400.00	90.00	359.63	10000.00	5580.46	5583.27	413.55	0.00	409953.06	768535.85	N 32 7 29.69 W	103 35 57.91
	15500.00	90.00	359.63	10000.00	5680.46	5683.26	412.90	0.00	410053.05	768535.20	N 32 7 30.68 W	103 35 57.91
	15600.00	90.00	359.63	10000.00	5780.46	5783.26	412.25	0.00	410153.05	768534.55	N 32 7 31.66 W	103 35 57.91
	15700.00	90.00	359.63	10000.00	5880.46	5883.26	411.60	0.00	410253.04	768533.90	N 32 7 32.65 W	103 35 57.91
	15800.00	90.00	359.63	10000.00	5980.46	5983.26	410.95	0.00	410353.03	768533.25	N 32 7 33.64 W	103 35 57.91
	15900.00	90.00	359.63	10000.00	6080.46	6083.26	410.30	0.00	410453.03	768532.60	N 32 7 34.63 W	103 35 57.91
	16000.00	90.00	359.63	10000.00	6180.46	6183.25	409.65	0.00	410553.02	768531.95	N 32 7 35.62 W	103 35 57.91
	16100.00	90.00	359.63	10000.00	6280.46	6283.25	409.01	0.00	410653.02	768531.30	N 32 7 36.61 W	103 35 57.91
	16200.00	90.00	359.63	10000.00	6380.46	6383.25	408.36	0.00	410753.01	768530.65	N 32 7 37.60 W	103 35 57.91
	16300.00	90.00	359.63	10000.00	6480.46	6483.25	407.71	0.00	410853.01	768530.00	N 32 7 38.59 W	103 35 57.91
	16400.00	90.00	359.63	10000.00	6580.46	6583.25	407.06	0.00	410953.00	768529.35	N 32 7 39.58 W	103 35 57.91
	16500.00	90.00	359.63	10000.00	6680.46	6683.24	406.41	0.00	411053.00	768528.70	N 32 7 40.57 W	103 35 57.91
	16600.00	90.00	359.63	10000.00	6780.46	6783.24	405.76	0.00	411152.99	768528.06	N 32 7 41.56 W	103 35 57.90
	16700.00	90.00	359.63	10000.00	6880.46	6883.24	405.11	0.00	411252.98	768527.41	N 32 7 42.55 W	103 35 57.90
	16800.00	90.00	359.63	10000.00	6980.46	6983.24	404.46	0.00	411352.98	768526.76	N 32 7 43.54 W	103 35 57.90
	16900.00	90.00	359.63	10000.00	7080.46	7083.23	403.81	0.00	411452.97	768526.11	N 32 7 44.53 W	103 35 57.90
	17000.00	90.00	359.63	10000.00	7180.46	7183.23	403.16	0.00	411552.97	768525.46	N 32 7 45.52 W	103 35 57.90
	17100.00	90.00	359.63	10000.00	7280.46	7283.23	402.51	0.00	411652.96	768524.81	N 32 7 46.51 W	103 35 57.90
	17200.00	90.00	359.63	10000.00	7380.46	7383.23	401.86	0.00	411752.96	768524.16	N 32 7 47.50 W	103 35 57.90
	17300.00	90.00	359.63	10000.00	7480.46	7483.23	401.21	0.00	411852.95	768523.51	N 32 7 48.49 W	103 35 57.90
	17400.00	90.00	359.63	10000.00	7580.46	7583.22	400.56	0.00	411952.95	768522.86	N 32 7 49.48 W	103 35 57.90
	17500.00	90.00	359.63	10000.00	7680.46	7683.22	399.91	0.00	412052.94	768522.21	N 32 7 50.47 W	103 35 57.90
	17600.00	90.00	359.63	10000.00	7780.46	7783.22	399.27	0.00	412152.94	768521.56	N 32 7 51.46 W	103 35 57.90
	17700.00	90.00	359.63	10000.00	7880.46	7883.22	398.62	0.00	412252.93	768520.91	N 32 7 52.45 W	103 35 57.90
	17800.00	90.00	359.63	10000.00	7980.46	7983.22	397.97	0.00	412352.92	768520.26	N 32 7 53.43 W	103 35 57.90
	17900.00	90.00	359.63	10000.00	8080.46	8083.21	397.32	0.00	412452.92	768519.61	N 32 7 54.42 W	103 35 57.90
	18000.00	90.00	359.63	10000.00	8180.46	8183.21	396.67	0.00	412552.91	768518.96	N 32 7 55.41 W	103 35 57.90
	18100.00	90.00	359.63	10000.00	8280.46	8283.21	396.02	0.00	412652.91	768518.32	N 32 7 56.40 W	103 35 57.90
	18200.00	90.00	359.63	10000.00	8380.46	8383.21	395.37	0.00	412752.90	768517.67	N 32 7 57.39 W	103 35 57.90
	18300.00	90.00	359.63	10000.00	8480.46	8483.21	394.72	0.00	412852.90	768517.02	N 32 7 58.38 W	103 35 57.90

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 ° ' ")	
	18400.00	90.00	359.63	10000.00	8580.46	8583.20	394.07	0.00	412952.89	768516.37	N	32 7 59.37	W	103 35 57.90
	18500.00	90.00	359.63	10000.00	8680.46	8683.20	393.42	0.00	413052.89	768515.72	N	32 8 0.36	W	103 35 57.90
	18600.00	90.00	359.63	10000.00	8780.46	8783.20	392.77	0.00	413152.88	768515.07	N	32 8 1.35	W	103 35 57.90
	18700.00	90.00	359.63	10000.00	8880.46	8883.20	392.12	0.00	413252.87	768514.42	N	32 8 2.34	W	103 35 57.90
	18800.00	90.00	359.63	10000.00	8980.46	8983.19	391.47	0.00	413352.87	768513.77	N	32 8 3.33	W	103 35 57.90
	18900.00	90.00	359.63	10000.00	9080.46	9083.19	390.82	0.00	413452.86	768513.12	N	32 8 4.32	W	103 35 57.90
	19000.00	90.00	359.63	10000.00	9180.46	9183.19	390.18	0.00	413552.86	768512.47	N	32 8 5.31	W	103 35 57.90
	19100.00	90.00	359.63	10000.00	9280.46	9283.19	389.53	0.00	413652.85	768511.82	N	32 8 6.30	W	103 35 57.90
	19200.00	90.00	359.63	10000.00	9380.46	9383.19	388.88	0.00	413752.85	768511.17	N	32 8 7.29	W	103 35 57.90
	19300.00	90.00	359.63	10000.00	9480.46	9483.18	388.23	0.00	413852.84	768510.52	N	32 8 8.28	W	103 35 57.89
	19400.00	90.00	359.63	10000.00	9580.46	9583.18	387.58	0.00	413952.84	768509.87	N	32 8 9.27	W	103 35 57.89
	19500.00	90.00	359.63	10000.00	9680.46	9683.18	386.93	0.00	414052.83	768509.23	N	32 8 10.26	W	103 35 57.89
	19600.00	90.00	359.63	10000.00	9780.46	9783.18	386.28	0.00	414152.83	768508.58	N	32 8 11.25	W	103 35 57.89
	19700.00	90.00	359.63	10000.00	9880.46	9883.18	385.63	0.00	414252.82	768507.93	N	32 8 12.24	W	103 35 57.89
	19800.00	90.00	359.63	10000.00	9980.46	9983.17	384.98	0.00	414352.81	768507.28	N	32 8 13.23	W	103 35 57.89
	19900.00	90.00	359.63	10000.00	10080.46	10083.17	384.33	0.00	414452.81	768506.63	N	32 8 14.21	W	103 35 57.89
	20000.00	90.00	359.63	10000.00	10180.46	10183.17	383.68	0.00	414552.80	768505.98	N	32 8 15.20	W	103 35 57.89

Cimarex Vaca
Draw 20-17
Federal #15H -
PBHL [100'
FNL,1060' FWL]

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	17.500	13.375		NAL_MWD_IFR1+MS-Depth Only	Vaca Draw 20-17 Federal #15H / Cimarex Vaca Draw 20-17
	1	26.000	20009.048	1/100.000	17.500	13.375		NAL_MWD_IFR1+MS	Federal #15H Rev0 RM 20Jan20 Vaca Draw 20-17 Federal #15H / Cimarex Vaca Draw 20-17



Cimarex Energy

Rev 0



Borehole:	Vaca Draw 20-17 Federal #15H	Well:	Vaca Draw 20-17 Federal #15H	Field:	NM Lea County (NAD 83)	Structure:	Cimarex Vaca Draw 20-17 Federal #15H
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Gravity & Magnetic Parameters	Dip: 59.694°	Date: 20-Jan-2020	Surface Location	NAD83 New Mexico State Plane, Eastern Zone, US Feet	Grid Conv:	0.3893°	Miscellaneous
Model: HDGM 2019	FS: 47707.39NT	Gravity FS: 998.429mgn (8.80665 Based)	Lat: N 32 6 34.47	North: 404369.96RUS	Scale Fact: 0.999968	Plan: New Slot	TVD Ref: RKB(3449.14ft above MSL)
MagDec: 6.583°			Long: W 103 36 3.16	East: 768122.31RUS			Cimarex Vaca Draw 20-17 Federal #15H Rev0 RM 20Jan20

Critical Point	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DLS
SHL [270° FSL, 610° FWL]	0.00	0.00	2.16	0.00	0.00	0.00	0.00	0.00
Rustler	1001.00	0.00	89.62	1001.00	0.00	0.00	0.00	0.00
Top of Salt	1341.00	0.00	89.62	1341.00	0.00	0.00	0.00	0.00
Nudge 2"/100' DLS	2500.00	0.00	89.62	2500.00	0.00	0.00	0.00	0.00
Hold Nudge	2820.88	6.42	89.62	2820.20	0.00	0.12	17.95	2.00
Base of Salt	4707.49	6.42	89.62	4695.00	0.04	1.53	228.82	0.00
Bell Canyon	4983.22	6.42	89.62	4969.00	0.05	1.73	259.64	0.00
Cherry Canyon	6069.02	6.42	89.62	6048.00	0.07	2.54	381.00	0.00
Drop to Vertical 2"/100' DLS	6523.87	6.42	89.62	6500.00	0.08	2.88	431.83	0.00
Hold Vertical	6844.75	0.00	89.62	6820.20	0.08	3.00	449.79	2.00
Brushy Canyon	7549.54	0.00	89.62	7525.00	0.08	3.00	449.79	0.00
Bone Spring Lime	9138.54	0.00	89.62	9114.00	0.08	3.00	449.79	0.00
Leonard Shale	9174.54	0.00	89.62	9150.00	0.08	3.00	449.79	0.00
Avalon Shale	9393.54	0.00	89.62	9359.00	0.08	3.00	449.79	0.00
KOP - Build 12"/100' DLS	9547.08	0.00	89.62	9522.54	0.08	3.00	449.79	0.00
Landing Point	10297.08	90.00	359.63	10000.00	477.54	480.45	446.69	12.00
Base of Salt (4695 TVD)	10297.08	90.00	359.63	10000.00	477.54	480.45	446.69	12.00
Cimarex Vaca Draw 20-17 Federal #15H - PBHL (100' FNL 1060° FWL)	20009.05	90.00	359.63	10000.00	10189.51	10192.22	383.62	0.00
Wolfcamp Upper A1	NaN	NaN	NaN	12294.00	NaN	NaN	NaN	0.00
Wolfcamp Y Sand	NaN	NaN	NaN	12415.00	NaN	NaN	NaN	0.00
2nd Bone Spring Sand	NaN	NaN	NaN	10638.00	NaN	NaN	NaN	0.00
Wolfcamp Y Sand	NaN	NaN	NaN	12373.00	NaN	NaN	NaN	0.00
3rd Bone Spring Sand	NaN	NaN	NaN	11798.00	NaN	NaN	NaN	0.00
2nd Bone Spring Carb	NaN	NaN	NaN	10272.00	NaN	NaN	NaN	0.00
3rd Bone Spring Carb	NaN	NaN	NaN	11158.00	NaN	NaN	NaN	0.00
Top Wolfcamp	NaN	NaN	NaN	12269.00	NaN	NaN	NaN	0.00
1st Bone Spring Sand	NaN	NaN	NaN	10084.00	NaN	NaN	NaN	0.00

Grid North
Tot Corr (M+G 6.193°)
Mag Dec (6.583°)
Grid Conv (0.3893°)

CONTROLLED
Plan ref: Cimarex Vaca Draw 20-17 Federal #15H Rev0 RM 20Jan20
Drawing ref: 43
Date: 21-Jan-2020
C: Client
P: Project
D: Office
E: Engineer
C: Copy number: 01

TVD (ft) Scale = 1:710.00(ft)

NS (ft) Scale = 1:480.58(ft)

Vertical Section (ft) Azim = 359.63° Scale = 1:710.00(ft) Origin = 0N/-S, 0E/-W

EW (ft) Scale = 1:480.58(ft)

Exhibit F – Co-Flex Hose
Vaca Draw 20-17 Fed 15H
Cimarex Energy Co.
20-25S-33E
Lea County, NM

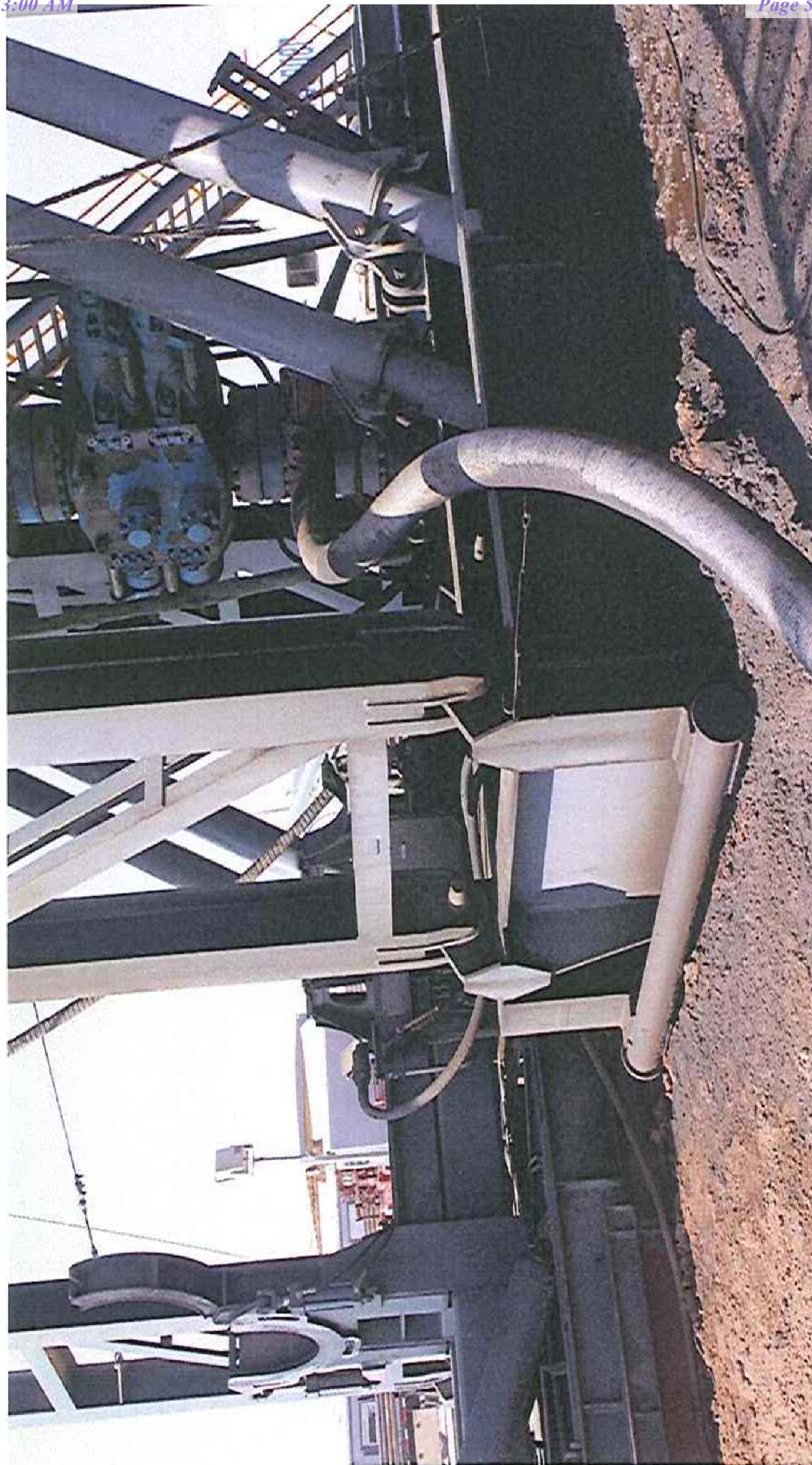


Exhibit F-1 – Co-Flex Hose Hydrostatic Test

Vaca Draw 20-17 Fed 15H

Cimarex Energy Co.

20-25S-33E

Lea County, NM



Midwest Hose
& Specialty, Inc.

INTERNAL HYDROSTATIC TEST REPORT			
Customer:		P.O. Number:	
Oderco Inc		odyd-271	
HOSE SPECIFICATIONS			
Type: Stainless Steel Armor Choke & Kill Hose		Hose Length: 45'ft.	
I.D. 4 INCHES		O.D. 9 INCHES	
WORKING PRESSURE	TEST PRESSURE	BURST PRESSURE	
10,000 PSI	15,000 PSI	0 PSI	
COUPLINGS			
Stem Part No.		Ferrule No.	
OKC OKC		OKC OKC	
Type of Coupling: Swage-It			
PROCEDURE			
<u>Hose assembly pressure tested with water at ambient temperature.</u>			
TIME HELD AT TEST PRESSURE		ACTUAL BURST PRESSURE:	
15 MIN.		0 PSI	
Hose Assembly Serial Number: 79793		Hose Serial Number: OKC	
Comments:			
Date:	Tested:	Approved:	
3/8/2011	<i>A. Joins</i>	<i>Kevin</i>	

Exhibit F-1 – Co-Flex Hose Hydrostatic Test

Vaca Draw 20-17 Fed 15H

Cimarex Energy Co.

20-25S-33E

Lea County, NM

March 3, 2011

Internal Hydrostatic Test Graph

Customer: Houston

Pick Ticket #: 94260

Midwest Hose
& Specialty, Inc.Hose Specifications

Hose Type
C & K
I.D.
4"

Working Pressure
10000 PSI

Length
45'
O.D.
6.09"

Verification

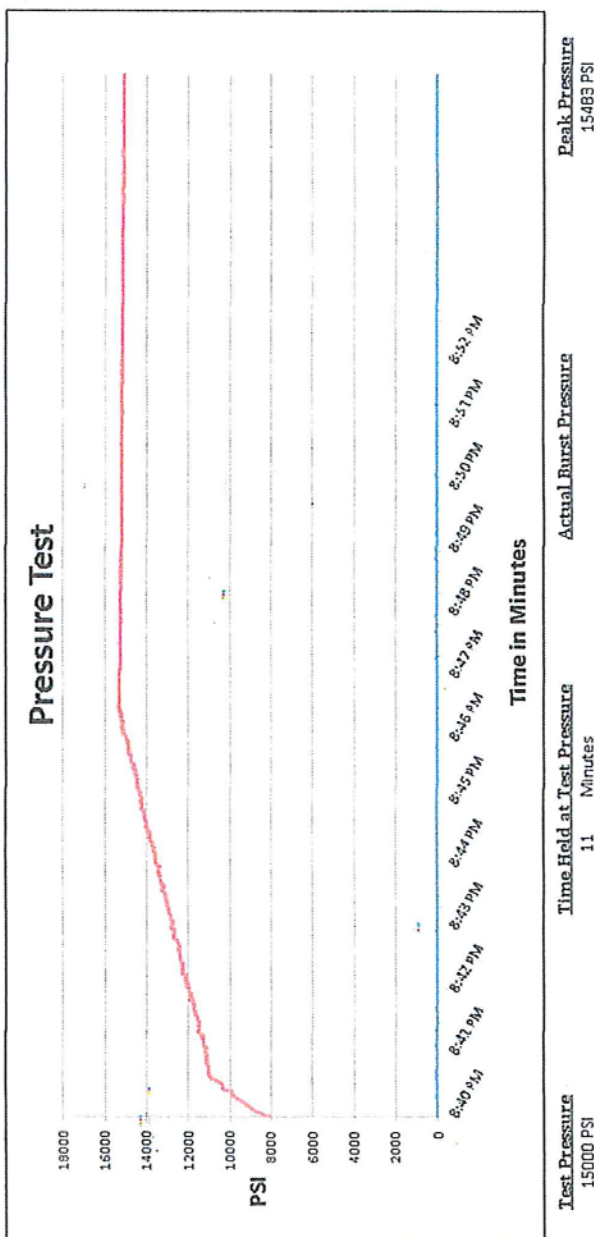
Type of Fitting
4 1/16 10K

Die Size
6.38"

Hose Serial #
5544

Coupling Method
Swage
Final O.D.
6.25"

Hose Assembly Serial #
79793

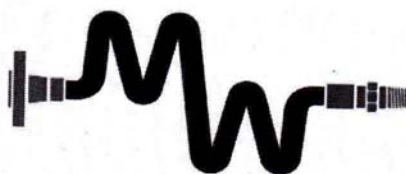


Comments: Hose assembly pressure tested with water at ambient temperature.

Tested By: Zac McConnell

Approved By: Kim Thomas

Exhibit F-2 – Co-Flex Hose
Vaca Draw 20-17 Fed 15H
Cimarex Energy Co.
20-25S-33E
Lea County, NM



Midwest Hose
& Specialty, Inc.

Certificate of Conformity

Customer:

DEM

PO

ODYD-271

SPECIFICATIONS

Sales Order

79793

Dated:

3/8/2011

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

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

Comments:

Approved:

James Garcia

Date:

3/8/2011



Exhibit F -3- Co-Flex Hose
Vaca Draw 20-17 Fed 15H
Cimarex Energy Co.
20-25S-33E
Lea County, NM

Specification Sheet Choke & Kill Hose

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

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

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

1. Geological Formations

TVD of target 10,000

Pilot Hole TD N/A

MD at TD 20,009

Deepest expected fresh water

Formation	Depth (TVD) from KB	Water/Mineral Bearing/Target Zone	Hazards
RUSTLER	1001	Usable Water	
TOP OF SALT	1341	N/A	
BASE OF SALT	4695	N/A	
BELL CANYON	4969	N/A	
CHERRY CANYON	6048	Hydrocarbons	
BRUSHY CANYON	7525	Hydrocarbons	
BONE SPRING	9114	Hydrocarbons	
UPPER AVALON SHALE	9359	Hydrocarbons	
1ST BONE SPRING	10084	Hydrocarbons	

2. Casing Program

Hole Size	Casing Depth From	Casing Depth To	Setting Depth TVD	Casing Size	Weight (lb/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17 1/2	0	1051	1051	13-3/8"	48.00	H-40/J-55 Hybrid	ST&C	1.63	3.80	6.38
12 1/4	0	4933	4933	9-5/8"	40.00	J-55	BT&C	1.44	1.50	3.19
8 3/4	0	8647	8647	7"	29.00	L-80	LT&C	1.73	2.02	2.26
8 3/4	8647	10150	9975	7"	26.00	N-80	LT&C	1.16	1.55	15.03
6	8547	20009	10000	4-1/2"	13.50	P-110	BT&C	1.87	2.17	21.51
BLM Minimum Safety Factor								1.125	1	1.6 Dry 1.8 Wet

TVD was used on all calculations.

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

Cimarex Energy Co., Vaca Draw 20-17 Federal 15H

	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	# Sk	Wt. lb/gal	Yld ft ³ /sack	H ₂ O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surface	509	13.50	1.72	9.15	15.5	Lead: Class C + Bentonite
	137	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Intermediate	935	12.90	1.88	9.65	12	Lead: 35:65 (Poz:C) + Salt + Bentonite
	289	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Production	247	10.30	3.64	22.18		Lead: Tuned Light + LCM
	88	14.20	1.30	5.86	14:30	Tail: 50:50 (Poz:H) + Salt + Bentonite + Fluid Loss + Dispersant + SMS
Completion System	733	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	45
Intermediate	0	50
Production	4733	25
Completion System	9950	10

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

4. Pressure Control Equipment

A variance is requested for the use of a diverter on the surface casing. See attached for schematic.					
BOP installed and tested before drilling which hole?	Size	Min Required WP	Type		Tested To
12 1/4	13 5/8	2M	Annular	X	2M
			Blind Ram		
			Pipe Ram		
			Double Ram	X	
			Other		
8 3/4	13 5/8	3M	Annular	X	3M
			Blind Ram		
			Pipe Ram		
			Double Ram	X	
			Other		
6	13 5/8	5M	Annular	X	5M
			Blind Ram		
			Pipe Ram	X	
			Double Ram	X	
			Other		

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

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

Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.		
X	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.	
N	Are anchors required by manufacturer?	

5. Mud Program

Depth	Type	Weight (ppg)	Viscosity	Water Loss
0' to 1051'	Fresh Water	7.83 - 8.33	28	N/C
1051' to 4933'	Brine Water	9.80 - 10.30	30-32	N/C
4933' to 10150'	Cut Brine or OBM	8.50 - 9.00	27-70	N/C
10150' to 20009'	OBM	10.50 - 11.00	50-70	N/C

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

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

6. Logging and Testing Procedures

Logging, Coring and Testing	
	Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
	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	5720 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.

	H ₂ S is present
	H ₂ S 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 5000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 5000 psi test. Annular will be tested to 100% 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.

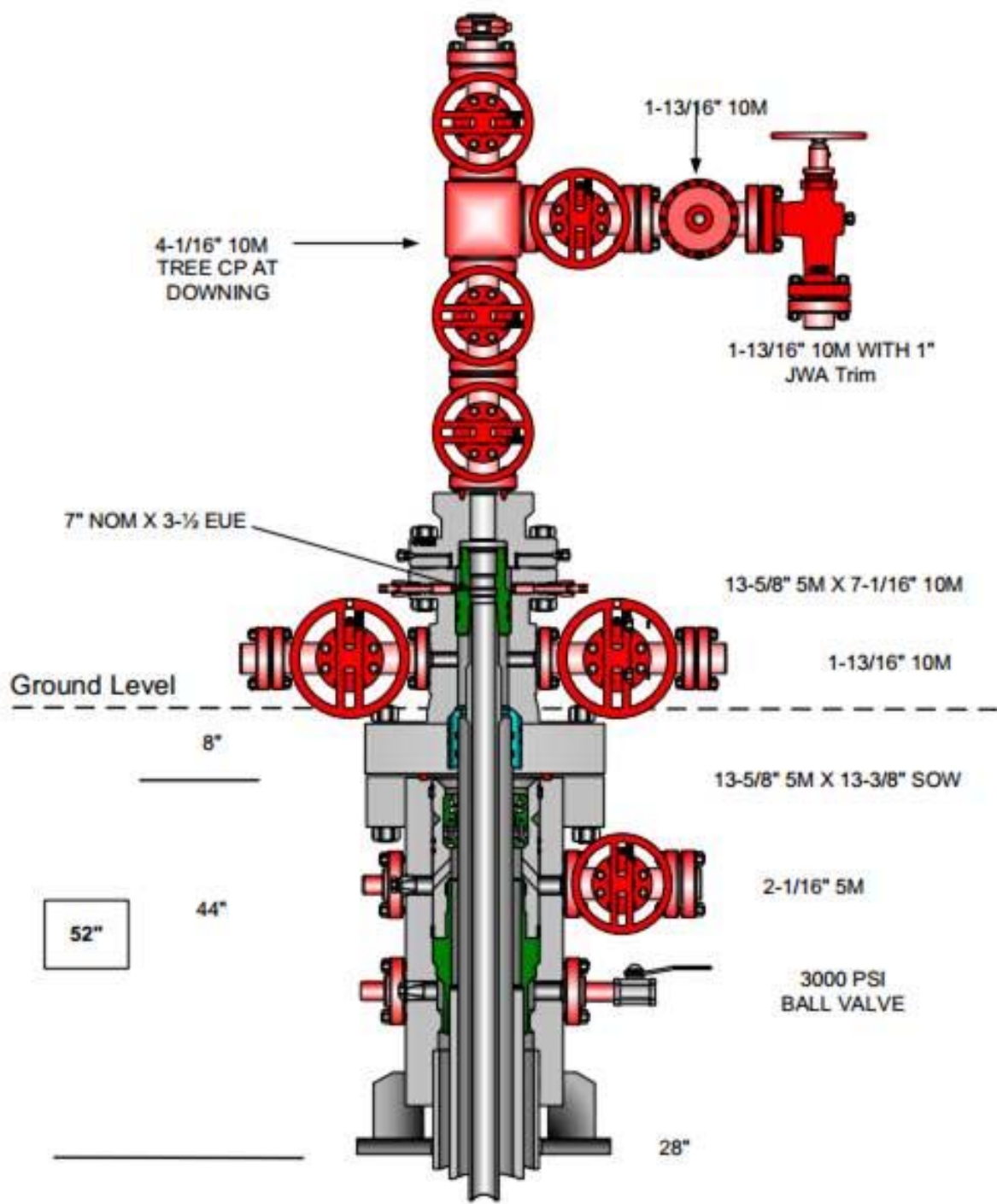
A solid steel body pack-off will be utilized after running and cementing the intermediate casing. After installation the pack-off and lower flange will be pressure tested to 5000 psi.

A solid steel body pack-off will be utilized after running and cementing the production casing. After installation the pack-off and lower flange will be pressure tested to 5000 psi.

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

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

Multi-bowl Wellhead Diagram



2. Casing Program

Hole Size	Casing Depth From	Casing Depth To	Setting Depth TVD	Casing Size	Weight (lb/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17 1/2	0	1051	1051	13-3/8"	48.00	H-40/J-55 Hybrid	ST&C	1.63	3.80	6.38
12 1/4	0	4933	4933	9-5/8"	40.00	J-55	BT&C	1.44	1.50	3.19
8 3/4	0	8647	8647	7"	29.00	L-80	LT&C	1.73	2.02	2.26
8 3/4	8647	10150	9975	7"	26.00	N-80	LT&C	1.16	1.55	15.03
6	8547	20009	10000	4-1/2"	13.50	P-110	BT&C	1.87	2.17	21.51
BLM Minimum Safety Factor								1.125	1	1.6 Dry 1.8 Wet

Multi-bowl Wellhead Diagram
Vaca Draw 20-17 Fed #15H
Cimarex Energy Co.
20-25S-33E
Lea County, NM



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

SUPO Data Report

05/27/2021

APD ID: 10400037874**Submission Date:** 01/15/2019

Highlighted data
reflects the most
recent changes

Operator Name: CIMAREX ENERGY COMPANY**Well Name:** VACA DRAW 20-17 FEDERAL**Well Number:** 15H[Show Final Text](#)**Well Type:** OIL WELL**Well Work Type:** Drill

Section 1 - Existing Roads

Will existing roads be used? YES**Existing Road Map:**

Vaca_Draw_20_17_Fed_W2W2_Existing__Access_20200916145837.pdf

Existing Road Purpose: ACCESS**Row(s) Exist?** NO**ROW ID(s)****ID:****Do the existing roads need to be improved?** NO**Existing Road Improvement Description:****Existing Road Improvement Attachment:**

Section 2 - New or Reconstructed Access Roads

Will new roads be needed? NO

Section 3 - Location of Existing Wells

Existing Wells Map? YES**Attach Well map:**

Vaca_Draw_20_17_Fed_15H_Mile_Radius_Exisiting_Wells_20200323151251.pdf

Operator Name: CIMAREX ENERGY COMPANY**Well Name:** VACA DRAW 20-17 FEDERAL**Well Number:** 15H

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

Submit or defer a Proposed Production Facilities plan? SUBMIT

Production Facilities description: 500x 560 pad was staked with the BLM for construction and uses Vaca Draw 20-17 Fed CTB and Vaca Draw 20-17 Fed West CTB will be utilized for this project. Bulkline: 683' of 6" buried steel Bulk lines will be constructed along the proposed road buried in the same 60' trench. Please see attached supo plan all battery pads and routes have been previously approved.

Production Facilities map:

Vaca_Draw_20_17_Fed_West_CTB_Layout_20200323151338.pdf

Vaca_Draw_20_17_Fed_CTB_Layout_20200323151335.pdf

Vaca_Draw_20_17_Fed_15H_Bulk_Flowline_Route_20200323151401.pdf

Section 5 - Location and Types of Water Supply

Water Source Table

Water source type: MUNICIPAL

Water source use type: SURFACE CASING
INTERMEDIATE/PRODUCTION
CASING

Source latitude: **Source longitude:****Source datum:****Water source permit type:** WATER RIGHT**Permit Number:****Water source transport method:** TRUCKING**Source land ownership:** STATE**Source transportation land ownership:** STATE**Water source volume (barrels):** 5000**Source volume (acre-feet):** 0.6444655**Source volume (gal):** 210000**Water source and transportation map:**

Vaca_Draw_20_17_Fed_W2w2_Drlg_water_route_20200916150014.pdf

Water source comments:**New water well?** NO

Operator Name: CIMAREX ENERGY COMPANY**Well Name:** VACA DRAW 20-17 FEDERAL**Well Number:** 15H

New Water Well Info

Well latitude:**Well Longitude:****Well datum:****Well target aquifer:****Est. depth to top of aquifer(ft):****Est thickness of aquifer:****Aquifer comments:****Aquifer documentation:****Well depth (ft):****Well casing type:****Well casing outside diameter (in.):****Well casing inside diameter (in.):****New water well casing?****Used casing source:****Drilling method:****Drill material:****Grout material:****Grout depth:****Casing length (ft.):****Casing top depth (ft.):****Well Production type:****Completion Method:****Water well additional information:****State appropriation permit:****Additional information attachment:**

Section 6 - Construction Materials

Using any construction materials: YES**Construction Materials description:** Caliche will be obtained from the actual well site if available. If not available onsite caliche will be obtained for a pit located in Sec.16-25S-32E Lea. NM.**Construction Materials source location attachment:**

Section 7 - Methods for Handling Waste

Waste type: DRILLING**Waste content description:** Drilling Fluids, drill cuttings, water and other waste produced from the well during drilling operations.**Amount of waste:** 15000 barrels**Waste disposal frequency :** Weekly**Safe containment description:** N/A**Safe containmant attachment:****Waste disposal type:** HAUL TO COMMERCIAL FACILITY**Disposal location ownership:** COMMERCIAL**Disposal type description:****Disposal location description:** Haul to R360 commercial disposal

Operator Name: CIMAREX ENERGY COMPANY**Well Name:** VACA DRAW 20-17 FEDERAL**Well Number:** 15H**Waste type:** SEWAGE**Waste content description:** Human waste**Amount of waste:** 300 gallons**Waste disposal frequency :** Weekly**Safe containment description:** Waste will be properly contined and disposed of properly at a state approved disopal facility.**Safe containmant attachment:****Waste disposal type:** HAUL TO COMMERCIAL FACILITY**Disposal location ownership:** PRIVATE**Disposal type description:****Disposal location description:** A licensed 3rd party contractor will be used to haul and dispose human waste to City of Toyah TX waste water facility.**Waste type:** GARBAGE**Waste content description:** garbage & trash produced during drilling & completion operations**Amount of waste:** 32500 pounds**Waste disposal frequency :** Weekly**Safe containment description:** N/A**Safe containmant attachment:****Waste disposal type:** HAUL TO COMMERCIAL FACILITY**Disposal location ownership:** COMMERCIAL**Disposal type description:****Disposal location description:** Windmill Spraying Service hauls trash to Lea County Landfill

Reserve Pit

Reserve Pit being used? NO**Temporary disposal of produced water into reserve pit?****Reserve pit length (ft.)** **Reserve pit width (ft.)****Reserve pit depth (ft.)** **Reserve pit volume (cu. yd.)****Is at least 50% of the reserve pit in cut?****Reserve pit liner****Reserve pit liner specifications and installation description**

Cuttings Area

Cuttings Area being used? NO**Are you storing cuttings on location?** NO

Operator Name: CIMAREX ENERGY COMPANY**Well Name:** VACA DRAW 20-17 FEDERAL**Well Number:** 15H**Description of cuttings location****Cuttings area length (ft.)****Cuttings area width (ft.)****Cuttings area depth (ft.)****Cuttings area volume (cu. yd.)****Is at least 50% of the cuttings area in cut?****WCuttings area liner****Cuttings area liner specifications and installation description****Section 8 - Ancillary Facilities****Are you requesting any Ancillary Facilities?:** NO**Ancillary Facilities attachment:****Comments:****Section 9 - Well Site Layout****Well Site Layout Diagram:**

Vaca_Draw_20_17_Fed_15H_Wellsite_Location_Layout_20200323152439.pdf

Comments:**Section 10 - Plans for Surface Reclamation****Type of disturbance:** New Surface Disturbance**Multiple Well Pad Name:** VACA DRAW 20-17 FED**Multiple Well Pad Number:** W2W2 PAD**Recontouring attachment:**

Vaca_Draw_20_17_Fed_W2W2_Pad_Interim_Reclamation_20200323153949.pdf

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

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

Operator Name: CIMAREX ENERGY COMPANY

Well Name: VACA DRAW 20-17 FEDERAL

Well Number: 15H

Well pad proposed disturbance (acres): 7.305	Well pad interim reclamation (acres): 3.755	Well pad long term disturbance (acres): 3.55
Road proposed disturbance (acres): 6.989	Road interim reclamation (acres): 0	Road long term disturbance (acres): 0
Powerline proposed disturbance (acres): 0	Powerline interim reclamation (acres): 0	Powerline long term disturbance (acres): 0
Pipeline proposed disturbance (acres): 0.939	Pipeline interim reclamation (acres): 0	Pipeline long term disturbance (acres): 0.939
Other proposed disturbance (acres): 8.985	Other interim reclamation (acres): 0	Other long term disturbance (acres): 8.985
Total proposed disturbance: 24.218	Total interim reclamation: 3.755	Total long term disturbance: 13.474

Disturbance Comments: Bulk line: 683' Existing Access Road: 1102.83' We have been working on engineering solutions to reduce our footprint in the section to lower cost, disturbance, and our economic hurdle for other marginal benches within the section to increase our total mineral recovery. It turns out that simply changing our flowline / well approach and moving our separation to our drilling pads significantly reduces our foot print and cost. By placing our separation on our drill pads we can use 6-12 Group lines to gather the separated oil gas and water from the entire section instead of using up to 90 flowlines to move production to the tank batteries for separation. The Group line ability to gather the entire section helps us eliminate 2 batteries per section by simply utilizing the group line approach.

Reconstruction method: After well plugging, all disturbed areas would be returned to the original contour or a contour that blends with the surrounding landform including roads unless the surface owner requests that they be left intact. In consultation with the surface owners it will be determined if any gravel or similar materials used to reinforce an area are to be removed, buried, or left in place during final reclamation. Salvaged topsoil, if any, would be re-spread evenly over the surfaces to be re-vegetated. As necessary, the soil surface would be prepared to provide a seedbed for re-establishment of desirable vegetation. Site preparation may include gouging, scarifying, dozer track-walking, mulching, or fertilizing. Reclamation, Re-vegetation, and Drainage: All disturbed and re-contoured areas would be reseeded using techniques outlined under Phase I and II of this plan or as specified by the land owner. Approved seed mixtures would be certified weed free and consist of grasses, forbs, or shrubs similar to the surrounding area. Compacted soil areas may need to be obliterated and reclaimed to near natural conditions by re-contouring all slopes to facilitate and re-establish natural drainage. **Topsoil redistribution:** The original stock piled topsoil, if any, will be spread evenly over the areas being reclaimed and the original landform will be restored for all disturbed areas including well pad, production facilities, roads, pipelines, and power line corridors as close as possible to the original topography. The location will then be seeded

Soil treatment: The soil surface would be prepared to provide a seedbed for reestablishment of desirable vegetation. Establish control of erosion and invasion of non-native plants to reestablish plant community

Existing Vegetation at the well pad:

Existing Vegetation at the well pad attachment:

Existing Vegetation Community at the road:

Existing Vegetation Community at the road attachment:

Existing Vegetation Community at the pipeline:

Existing Vegetation Community at the pipeline attachment:

Existing Vegetation Community at other disturbances:

Existing Vegetation Community at other disturbances attachment:

Non native seed used? NO

Non native seed description:

Operator Name: CIMAREX ENERGY COMPANY**Well Name:** VACA DRAW 20-17 FEDERAL**Well Number:** 15H**Seedling transplant description:****Will seedlings be transplanted for this project?** NO**Seedling transplant description attachment:****Will seed be harvested for use in site reclamation?** NO**Seed harvest description:****Seed harvest description attachment:****Seed Management****Seed Table****Seed Summary****Total pounds/Acre:****Seed Type****Pounds/Acre****Seed reclamation attachment:****Operator Contact/Responsible Official Contact Info****First Name:** Amithy**Last Name:** Crawford**Phone:** (432)620-1909**Email:** acrawford@cimarex.com**Seedbed prep:****Seed BMP:****Seed method:****Existing invasive species?** NO**Existing invasive species treatment description:****Existing invasive species treatment attachment:****Weed treatment plan description:** na**Weed treatment plan attachment:****Monitoring plan description:** na**Monitoring plan attachment:****Success standards:** na**Pit closure description:** na**Pit closure attachment:**

Operator Name: CIMAREX ENERGY COMPANY

Well Name: VACA DRAW 20-17 FEDERAL

Well Number: 15H

Section 11 - Surface Ownership

Disturbance type: WELL PAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland:

USFS Ranger District:

Disturbance type: EXISTING ACCESS ROAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

Operator Name: CIMAREX ENERGY COMPANY**Well Name:** VACA DRAW 20-17 FEDERAL**Well Number:** 15H**USFS Forest/Grassland:****USFS Ranger District:****Disturbance type:** PIPELINE**Describe:****Surface Owner:** BUREAU OF LAND MANAGEMENT**Other surface owner description:****BIA Local Office:****BOR Local Office:****COE Local Office:****DOD Local Office:****NPS Local Office:****State Local Office:****Military Local Office:****USFWS Local Office:****Other Local Office:****USFS Region:****USFS Forest/Grassland:****USFS Ranger District:**

Section 12 - Other Information

Right of Way needed? YES**Use APD as ROW?** YES**ROW Type(s):** 281001 ROW - ROADS,288100 ROW – O&G Pipeline,288101 ROW – O&G Facility Sites,289001 ROW-O&G Well Pad,Other

ROW Applications

SUPO Additional Information:

Operator Name: CIMAREX ENERGY COMPANY

Well Name: VACA DRAW 20-17 FEDERAL

Well Number: 15H

Use a previously conducted onsite? YES

Previous Onsite information: Onsite with BLM(Jeff Robertson) and Cimarex Barry Hunt on January 8,2016

Other SUPO Attachment

Vaca_Draw_20_17_Fed_15H_Road_Description_20200323160531.pdf

Vaca_Draw_20_17_Fed_15H_SUPO_20200409082958.pdf

Vaca_Draw_20_17_Fed_W2W2_Pad_1_Well_list_20200409082959.docx



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

PWD Data Report

05/27/2021

APD ID: 10400037874

Submission Date: 01/15/2019

Operator Name: CIMAREX ENERGY COMPANY

Well Name: VACA DRAW 20-17 FEDERAL

Well Number: 15H

Well Type: OIL 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:

Describe precipitated solids disposal:

Precipitated solids disposal permit:

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule attachment:

Lined pit reclamation description:

Lined pit reclamation attachment:

Leak detection system description:

Leak detection system attachment:

Operator Name: CIMAREX ENERGY COMPANY

Well Name: VACA DRAW 20-17 FEDERAL

Well Number: 15H

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:

Describe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

Unlined pit Monitor attachment:

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

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

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

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

Unlined Produced Water Pit Estimated percolation:

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

Operator Name: CIMAREX ENERGY COMPANY**Well Name:** VACA DRAW 20-17 FEDERAL**Well Number:** 15H**Is the reclamation bond a rider under the BLM bond?****Unlined pit bond number:****Unlined pit bond amount:****Additional bond information attachment:**

Section 4 - Injection

Would you like to utilize Injection PWD options? NO**Produced Water Disposal (PWD) Location:****PWD surface owner:****PWD disturbance (acres):****Injection PWD discharge volume (bbl/day):****Injection well mineral owner:****Injection well type:****Injection well number:****Injection well name:****Assigned injection well API number?****Injection well API number:****Injection well new surface disturbance (acres):****Minerals protection information:****Mineral protection attachment:****Underground Injection Control (UIC) Permit?****UIC Permit attachment:**

Section 5 - Surface Discharge

Would you like to utilize Surface Discharge PWD options? NO**Produced Water Disposal (PWD) Location:****PWD surface owner:****PWD disturbance (acres):****Surface discharge PWD discharge volume (bbl/day):****Surface Discharge NPDES Permit?****Surface Discharge NPDES Permit attachment:****Surface Discharge site facilities information:****Surface discharge site facilities map:**

Section 6 - Other

Would you like to utilize Other PWD options? NO**Produced Water Disposal (PWD) Location:****PWD surface owner:****PWD disturbance (acres):****Other PWD discharge volume (bbl/day):**

Operator Name: CIMAREX ENERGY COMPANY

Well Name: VACA DRAW 20-17 FEDERAL

Well Number: 15H

Other PWD type description:

Other PWD type attachment:

Have other regulatory requirements been met?

Other regulatory requirements attachment:



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

Bond Info Data Report

05/27/2021

APD ID: 10400037874

Submission Date: 01/15/2019

Highlighted data
reflects the most
recent changes

Operator Name: CIMAREX ENERGY COMPANY

Well Name: VACA DRAW 20-17 FEDERAL

Well Number: 15H

[Show Final Text](#)

Well Type: OIL WELL

Well Work Type: Drill

Bond Information

Federal/Indian APD: FED

BLM Bond number: NMB001188

BIA Bond number:

Do you have a reclamation bond? NO

Is the reclamation bond a rider under the BLM bond?

Is the reclamation bond BLM or Forest Service?

BLM reclamation bond number:

Forest Service reclamation bond number:

Forest Service reclamation bond attachment:

Reclamation bond number:

Reclamation bond amount:

Reclamation bond rider amount:

Additional reclamation bond information attachment:

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

Submit Electronically
Via E-permitting

NATURAL GAS MANAGEMENT PLAN

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

Section 1 – Plan Description

Effective May 25, 2021

I. Operator: Cimarex Energy Company **OGRID:** 215099 **Date:** 5 / 2 / 2022

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

If Other, please describe: _____

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

Well Name	API	ULSTR	Footages	Anticipated Oil BBL/D	Anticipated Gas MCF/D	Anticipated Produced Water BBL/D
Vaca Draw 20-17 Fed 15H	30-025-50176	M, Sec 20, T25S, 33E	270 FSL/610 FWL	1200	1800	1300

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

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

Well Name	API	Spud Date	TD Reached Date	Completion Commencement Date	Initial Flow Back Date	First Production Date
Vaca Draw 20-17 Fed 15H	30-025-50176	10/1/2022	12/1/2022	3/1/2023	5/1/2023	5/1/2023

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

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

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

Section 2 – Enhanced Plan

EFFECTIVE APRIL 1, 2022

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

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

IX. Anticipated Natural Gas Production:

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

X. Natural Gas Gathering System (NGGS):

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

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

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

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

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

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

Section 3 - Certifications

Effective May 25, 2021

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

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

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

If Operator checks this box, Operator will select one of the following:

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

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

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

Section 4 - Notices

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

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

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

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

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

Signature: 
Printed Name: Sarah Jordan
Title: Regulatory Analyst
E-mail Address: sarah.jordan@coterra.com
Date: 5/2/2022
Phone: 432/620-1909
OIL CONSERVATION DIVISION (Only applicable when submitted as a standalone form)
Approved By:
Title:
Approval Date:
Conditions of Approval:

From State of New Mexico, Natural Gas Management Plan

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

XEC Standard Response

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

Cimarex

VII. Operational Practices

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

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

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

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

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

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

- **Workovers:**
 - Always strive to kill well when performing downhole maintenance.
 - If vapors or trapped pressure is present and must be relieved then:
 - Initial blowdown to production facility:
 - Route vapors to LP flare if possible/applicable
 - Blowdown to portable gas buster tank:
 - Vent to existing or portable flare if applicable.
- **Stock tank servicing:**
 - Minimize time spent with thief hatches open.
 - When cleaning or servicing via manway, suck tank bottoms to ensure minimal volatiles exposed to atmosphere.
 - Connect vacuum truck to low pressure flare while cleaning bottoms to limit venting.
 - Isolate the vent lines and overflows on the tank being serviced from other tanks.
- **Pressure vessel/compressor servicing and associated blowdowns:**
 - Route to flare where possible.
 - Blow vessel down to minimum available pressure via pipeline, prior to venting vessel.
 - Preemptively changing anodes to reduce failures and extended corrosion related servicing.
 - When cleaning or servicing via manway, suck vessel bottoms to ensure minimal volatiles exposed to atmosphere.
- **Flare/combustor maintenance:**
 - Minimize downtime by coordinating with vendor and Cimarex staff travel logistics.
 - Utilizing preventative and predictive maintenance programs to replace high wear components before failure.
 - Because the flare/combustor is the primary equipment used to limit venting practices, ensure flare/combustor is properly maintained and fully operational at all times via routine maintenance, temperature telemetry, onsite visual inspections.

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

District I

1625 N. French Dr., Hobbs, NM 88240
 Phone:(575) 393-6161 Fax:(575) 393-0720

District II

811 S. First St., Artesia, NM 88210
 Phone:(575) 748-1283 Fax:(575) 748-9720

District III

1000 Rio Brazos Rd., Aztec, NM 87410
 Phone:(505) 334-6178 Fax:(505) 334-6170

District IV

1220 S. St Francis Dr., Santa Fe, NM 87505
 Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS

Action 103460

CONDITIONS

Operator: CIMAREX ENERGY CO. 600 N. Marienfeld Street Midland, TX 79701	OGRID: 215099
	Action Number: 103460
	Action Type: [C-101] BLM - Federal/Indian Land Lease (Form 3160-3)

CONDITIONS

Created By	Condition	Condition Date
pkautz	Will require a File As Drilled C-102 and a Directional Survey with the C-104	5/27/2022
pkautz	Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string	5/27/2022
pkautz	Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system	5/27/2022
pkautz	Cement is required to circulate on both surface and intermediate1 strings of casing	5/27/2022