

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: ☐ DRILL ☐ REENTER 1b. Type of Well: ☐ Oil Well ☐ Gas Well ☐ Other 1c. Type of Completion: ☐ Hydraulic Fracturing ☐ Single Zone ☐ 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.
2. Name of Operator		9. API Well No. 30-015-49159
3a. Address	3b. Phone No. (include area code)	10. Field and Pool, or Exploratory
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.

(Continued on page 2)

*(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 30-015 49159	² Pool Code 98220	³ Pool Name Purple Sage Wolfcamp Gas
⁴ Property Code 321482	⁵ Property Name RIVERBEND 12-13 FEDERAL COM	⁶ Well Number 2H
⁷ OGRID No. 215099	⁸ Operator Name CIMAREX ENERGY CO.	⁹ Elevation 2934.6'

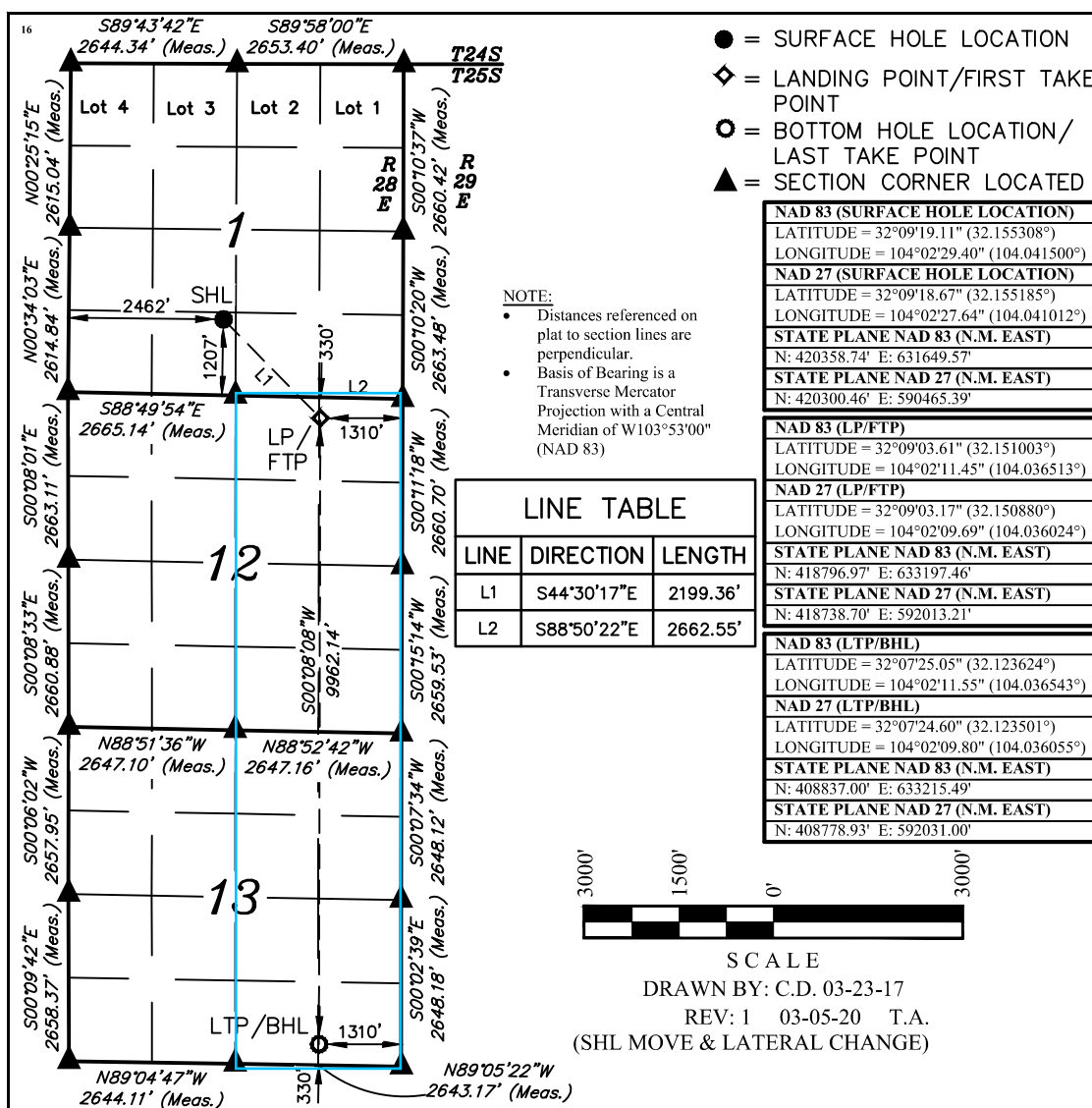
¹⁰ Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
N	1	25S	28E		1207	SOUTH	2462	WEST	EDDY

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
P	13	25S	28E		330	SOUTH	1310	EAST	EDDY
¹² Dedicated Acres 640	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.



¹⁷ OPERATOR
CERTIFICATION

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

Amithy Crawford 6/23/20
Signature Date

Amithy Crawford
Printed Name

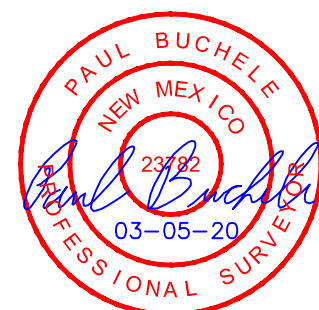
acrawford@cimarex.com
E-mail Address

¹⁸ SURVEYOR
CERTIFICATION

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

DECEMBER 12, 2017

Date of Survey
Signature and Seal of Professional Surveyor:



Certificate Number:

State of New Mexico
Energy, Minerals and Natural Resources Department

Submit Electronically
Via E-permitting

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

NATURAL GAS MANAGEMENT PLAN

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

Section 1 – Plan Description Effective May 25, 2021

I. Operator: Cimarex Energy Company **OGRID:** 215099 **Date:** 11 / 30 / 2021

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
Riverbend 12-13 Fed Com 1H		N, 1, 25S, 28E	1327 FSL, 2444 FWL	1550	4500	5000
Riverbend 12-13 Fed Com 2H		N, 1, 25S, 28E	1207, FSL, 2462 FWL	1550	4500	5000

IV. Central Delivery Point Name: Riverbend 12-13 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
Riverbend 12-13 Fed Com 1H		12/01/2022	12/14/2022	12/16/2022	12/30/2022	01/02/2023
Riverbend 12-13 Fed Com 2H		12/15/2022	12/29/2022	01/02/2023	01/16/2023	01/18/2023

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: Kanicia Schlichting
Title: Regulatory Analyst
E-mail Address: kschlichting@cimarex.com
Date: 11/30/21
Phone: 432-571-7894
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.

1. Geological Formations

TVD of target 9,762

Pilot Hole TD N/A

MD at TD 21,144

Deepest expected fresh water

Formation	Depth (TVD) from KB	Water/Mineral Bearing/Target Zone	Hazards
Rustler	464	N/A	
Salado	1926	N/A	
Castille	2487	N/A	
Bell Canyon	2680	Hydrocarbons	
Cherry Canyon	3668	Hydrocarbons	
Brushy Canyon	5267	Hydrocarbons	
Bone Spring	6400	Hydrocarbons	
Bone Spring A Shale	6514	Hydrocarbons	
Bone Spring C Shale	7055	Hydrocarbons	
1st Bone Spring	8146	Hydrocarbons	
2nd Bone Spring	8802	Hydrocarbons	
3rd Bone Spring	9264	Hydrocarbons	
Wolfcamp	9642	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	475	475	13-3/8"	48.00	H-40/J-55 Hybrid	ST&C	3.40	7.96	14.12
12 1/4	0	2660	2660	9-5/8"	36.00	J-55	LT&C	1.43	2.49	4.73
8 3/4	0	8607	8607	7"	26.00	L-80	LT&C	1.34	1.80	2.02
8 3/4	8607	10221	9713	7"	26.00	P-110	BT&C	1.37	2.19	28.86
6	8607	21144	9762	4-1/2"	11.60	P-110	LT&C	1.36	1.91	20.82
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., Riverbend 12-13 Federal Com 2H

	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?	N

3. Cementing Program

Casing	# Sk	Wt. lb/gal	Yld ft ³ /sack	H ₂ O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surface	106	13.50	1.72	9.15	15.5	Lead: Class C + Bentonite
	195	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Intermediate	509	12.90	1.88	9.65	12	Lead: 35:65 (Poz:C) + Salt + Bentonite
	160	14.20	1.30	5.86	14:30	Tail: 50:50 (Poz:H) + Salt + Bentonite + Fluid Loss + Dispersant + SMS
Production	779	13.50	1.72	9.15	15.5	Lead: Class C + Bentonite
	87	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Completion System	810	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	34
Intermediate	0	49
Production	2460	25
Completion System	10021	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	50% of working pressure
			Blind Ram		2M
			Pipe Ram		
			Double Ram	X	
			Other		
8 3/4	13 5/8	3M	Annular	X	50% of working pressure
			Blind Ram		3M
			Pipe Ram		
			Double Ram	X	
			Other		
6	13 5/8	5M	Annular	X	50% of working pressure
			Blind Ram		5M
			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.	
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 475'	FW Spud Mud	8.30 - 8.80	30-32	N/C
475' to 2660'	Brine Water	9.70 - 10.20	30-32	N/C
2660' to 10221'	FW/Cut Brine	8.50 - 9.00	30-32	N/C
10596' to 21144'	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	
X	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
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7. Drilling Conditions

Condition	
BH Pressure at deepest TVD	5583 psi
Abnormal Temperature	No

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

X	H ₂ S is present
X	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 50% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2.

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

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

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

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



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

Operator Certification Data Report

07/26/2021

Operator Certification

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

NAME: Amithy Crawford**Signed on:** 08/30/2017**Title:** Regulatory Analyst**Street Address:** 600 N MARIENFELD STE 600**City:** MIDLAND**State:** TX**Zip:** 79701**Phone:** (432)620-1909**Email address:** acrawford@cimarex.com

Field Representative

Representative Name:**Street Address:****City:****State:****Zip:****Phone:****Email address:**



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

Application Data Report

07/26/2021

APD ID: 10400019949

Submission Date: 08/30/2017

Highlighted data
reflects the most
recent changes

Operator Name: CIMAREX ENERGY COMPANY

Well Name: RIVERBEND 12-13 FEDERAL COM

Well Number: 2H

[Show Final Text](#)

Well Type: CONVENTIONAL GAS WELL

Well Work Type: Drill

Section 1 - General

APD ID: 10400019949

Tie to previous NOS? Y

Submission Date: 08/30/2017

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: NMNM088128

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:

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: RIVERBEND 12-13 FEDERAL COM

Well Number: 2H

Well API Number:

Field/Pool or Exploratory? Field and Pool

Field Name: PURPLE SAGE
WOLFCAMP

Pool Name: PURPLE SAGE
WOLFCAMP GAS

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

Operator Name: CIMAREX ENERGY COMPANY**Well Name:** RIVERBEND 12-13 FEDERAL COM**Well Number:** 2H**Is the proposed well in an area containing other mineral resources?** USEABLE WATER,NATURAL GAS,OIL**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:****Number:** W2E2**Well Class:** HORIZONTAL

RIVERBEND 12-13 FEDERAL

Number of Legs:**Well Work Type:** Drill**Well Type:** CONVENTIONAL GAS WELL**Describe Well Type:****Well sub-Type:** EXPLORATORY (WILDCAT)**Describe sub-type:****Distance to town:** 5.1 Miles**Distance to nearest well:** 20 FT**Distance to lease line:** 1327 FT**Reservoir well spacing assigned acres Measurement:** 640 Acres**Well plat:** Riverbend_12_13_Federal_Com_2H_C102_20200623084607.pdf**Well work start Date:** 06/01/2020**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	1207	FSL	2462	FWL	25S	28E	1	Aliquot SESW	32.155308	-104.0415	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 88128	2933	0	0	
KOP Leg #1	354	FSL	1479	FEL	25S	28E	1	Aliquot SESE	32.15295	-104.036728	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 16104	-6629	9728	9562	
PPP Leg #1-1	330	FNL	1310	FEL	25S	28E	12	Aliquot NENE	32.151003	-104.036513	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 16104	-7041	10659	9974	

Operator Name: CIMAREX ENERGY COMPANY**Well Name:** RIVERBEND 12-13 FEDERAL COM**Well Number:** 2H

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?
EXIT Leg #1	330	FSL	1310	FEL	25S	28E	13	Aliquot SESE	32.123624	- 104.036543	EDD Y	NEW MEXICO	NEW MEXICO	F	NMNM 16104	- 7042	20620	9975	
BHL Leg #1	330	FSL	1310	FEL	25S	28E	13	Aliquot SESE	32.123624	- 104.036543	EDD Y	NEW MEXICO	NEW MEXICO	F	NMNM 16104	- 7042	20620	9975	



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

Drilling Plan Data Report

07/26/2021

APD ID: 10400019949

Submission Date: 08/30/2017

Highlighted data
reflects the most
recent changes

Operator Name: CIMAREX ENERGY COMPANY

Well Name: RIVERBEND 12-13 FEDERAL COM

Well Number: 2H

[Show Final Text](#)

Well Type: CONVENTIONAL GAS WELL

Well Work Type: Drill

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
107112	RUSTLER	2933	464	464		USEABLE WATER	N
107119	SALADO	1007	1926	1926		NONE	N
107114	CASTILE	446	2487	2487		NONE	N
107115	BELL CANYON	253	2680	2680		NATURAL GAS, OIL	N
107116	CHERRY CANYON	-735	3668	3668		NATURAL GAS, OIL	N
107120	BRUSHY CANYON	-2334	5267	5267		NATURAL GAS, OIL	N
107121	BONE SPRING	-3467	6400	6400		NATURAL GAS, OIL	N
107109	BONE SPRING A ZONE	-3581	6514	6514		NATURAL GAS, OIL	N
107110	BONE SPRING C ZONE	-4122	7055	7055		NATURAL GAS, OIL	N
107111	BONE SPRING 1ST	-5213	8146	8146		NATURAL GAS, OIL	N
107113	BONE SPRING 2ND	-5869	8802	8802		NATURAL GAS, OIL	N
107117	BONE SPRING 3RD	-6331	9264	9264		NATURAL GAS, OIL	N
107118	WOLFCAMP	-6709	9642	9642		NATURAL GAS, OIL	Y

Section 2 - Blowout Prevention

Operator Name: CIMAREX ENERGY COMPANY**Well Name:** RIVERBEND 12-13 FEDERAL COM**Well Number:** 2H**Pressure Rating (PSI):** 2M**Rating Depth:** 475

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: BOP's will be tested by an independent service company. The ram preventers, choke manifold, and safety valves will be tested as follows: Prior to drilling out the surface casing, BOPE pressure tests will be 250 psi low and 2000 psi high. Prior to drilling out the intermediate casing, BOPE pressure tests will be 250 psi low and 5000 psi high. Prior to drilling out the production casing, BOPE pressure tests will be 250 psi low and 10,000 psi high. The Annular Preventer will be tested to 250 psi low and 1500 psi high prior to drilling out the surface casing, 250 psi low and 2500 psi high prior to drilling out the intermediate casing, 250 psi low and 5000 psi high prior to drilling out the production casing. The System may be upgraded to a higher pressure but still tested to the working pressures listed. If the system is upgraded all the components installed will be functional and tested.

Choke Diagram Attachment:

Riverbend_12_13_Fed_Com_2H_Choke_2M3M_08-17-2017.pdf

BOP Diagram Attachment:

Riverbend_12_13_Fed_Com_2H_BOP_2M_08-17-2017.pdf

Pressure Rating (PSI): 3M**Rating Depth:** 2660

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: BOP's will be tested by an independent service company. The ram preventers, choke manifold, and safety valves will be tested as follows: Prior to drilling out the surface casing, BOPE pressure tests will be 250 psi low and 2000 psi high. Prior to drilling out the intermediate casing, BOPE pressure tests will be 250 psi low and 5000 psi high. Prior to drilling out the production casing, BOPE pressure tests will be 250 psi low and 10,000 psi high. The Annular Preventer will be tested to 250 psi low and 1500 psi high prior to drilling out the surface casing, 250 psi low and 2500 psi high prior to drilling out the intermediate casing, 250 psi low and 5000 psi high prior to drilling out the production casing. The System may be upgraded to a higher pressure but still tested to the working pressures listed. If the system is upgraded all the components installed will be functional and tested.

Choke Diagram Attachment:

Riverbend_12_13_Fed_Com_2H_Choke_2M3M_08-17-2017.pdf

BOP Diagram Attachment:

Riverbend_12_13_Fed_Com_2H_BOP_3M_08-17-2017.pdf

Operator Name: CIMAREX ENERGY COMPANY**Well Name:** RIVERBEND 12-13 FEDERAL COM**Well Number:** 2H**Pressure Rating (PSI):** 5M**Rating Depth:** 21144

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: BOP's will be tested by an independent service company. The ram preventers, choke manifold, and safety valves will be tested as follows: Prior to drilling out the surface casing, BOPE pressure tests will be 250 psi low and 2000 psi high. Prior to drilling out the intermediate casing, BOPE pressure tests will be 250 psi low and 5000 psi high. Prior to drilling out the production casing, BOPE pressure tests will be 250 psi low and 10,000 psi high. The Annular Preventer will be tested to 250 psi low and 1500 psi high prior to drilling out the surface casing, 250 psi low and 2500 psi high prior to drilling out the intermediate casing, 250 psi low and 5000 psi high prior to drilling out the production casing. The System may be upgraded to a higher pressure but still tested to the working pressures listed. If the system is upgraded all the components installed will be functional and tested.

Choke Diagram Attachment:

Riverbend_12_13_Fed_Com_2H_Choke_5M_08-17-2017.pdf

BOP Diagram Attachment:

Riverbend_12_13_Fed_Com_2H_BOP_5M_08-17-2017.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	475	0	475	-6829	-7304	475	OTHER	48	ST&C	3.4	7.96	BUOY	14.12	BUOY	14.12
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	2660	0	2660	-6829	-9489	2660	J-55	36	LT&C	1.43	2.49	BUOY	4.73	BUOY	4.73
3	PRODUCTION	8.75	7.0	NEW	API	N	0	8607	0	8607	-6829	-16044	8607	L-80	26	LT&C	1.34	1.8	BUOY	2.02	BUOY	2.02
4	PRODUCTION	8.75	7.0	NEW	API	N	8607	10221	8607	9713	-16044	-18348	1614	P-110	26	BUTT	1.37	2.19	BUOY	28.86	BUOY	28.86
5	COMPLETION SYSTEM	6	4.5	NEW	API	N	8607	21144	8607	9762	-16044	-28270	12537	P-110	11.6	LT&C	1.36	1.91	BUOY	20.82	BUOY	20.82

Operator Name: CIMAREX ENERGY COMPANY**Well Name:** RIVERBEND 12-13 FEDERAL COM**Well Number:** 2H**Casing Attachments**

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

Riverbend_12_13_Fed_Com_2H_Spec_Sheet_20190515152220.pdf

Tapered String Spec:**Casing Design Assumptions and Worksheet(s):**Riverbend_12_13_Fed_Com_2H_Casing_Assumptions_20200403162933.pdf

Casing ID: 2 **String Type:** INTERMEDIATE**Inspection Document:****Spec Document:****Tapered String Spec:****Casing Design Assumptions and Worksheet(s):**Riverbend_12_13_Fed_Com_2H_Casing_Assumptions_20200403163004.pdf

Casing ID: 3 **String Type:** PRODUCTION**Inspection Document:****Spec Document:****Tapered String Spec:****Casing Design Assumptions and Worksheet(s):**Riverbend_12_13_Fed_Com_2H_Casing_Assumptions_20200403163106.pdf

Operator Name: CIMAREX ENERGY COMPANY**Well Name:** RIVERBEND 12-13 FEDERAL COM**Well Number:** 2H**Casing Attachments****Casing ID:** 4 **String Type:** PRODUCTION**Inspection Document:****Spec Document:****Tapered String Spec:****Casing Design Assumptions and Worksheet(s):**

Riverbend_12_13_Fed_Com_2H_Casing_Assumptions_20200403163219.pdf

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

Riverbend_12_13_Fed_Com_2H_Casing_Assumptions_20200403163335.pdf

Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	475	106	1.72	13.5	182	34	Class C	Bentonite
SURFACE	Tail		0	475	195	1.34	14.8	261	34	Class C	LCM
INTERMEDIATE	Lead		0	2660	509	1.88	12.9	956	50	35:65 (poz:C)	Salt, Bentonite
INTERMEDIATE	Tail		0	2660	160	1.3	14.2	209	25	50:50 (poz:H)	Salt, Bentonite, Fluid Loss, Dispersant, SMS
PRODUCTION	Lead		0	1022 1	779	1.72	13.5	1339	25	Class C	Bentonite

Operator Name: CIMAREX ENERGY COMPANY**Well Name:** RIVERBEND 12-13 FEDERAL COM**Well Number:** 2H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
PRODUCTION	Tail		0	1022 1	87	1.34	14.8	116	25	Class C	LCM
PRODUCTION	Lead		0	1022 1	779	1.72	13.5	1339	25	Class C	Bentonite
PRODUCTION	Tail		0	1022 1	87	1.34	14.8	116	25	Class C	LCM
COMPLETION SYSTEM	Lead		8607	2114 4	810	1.3	14.2	1053	10	50:50 (Poz:H)	Salt, Bentonite, Fluid Loss, Dispersant, SMS

Section 5 - Circulating Medium

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

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

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

Circulating Medium Table

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	475	SPUD MUD	8.3	8.8							
2660	1022 1	OTHER : FW/Cut Brine	8.5	9							
475	2660	SALT SATURATED	9.7	10.2							
1022 1	2114 4	OIL-BASED MUD	10.5	11							

Operator Name: CIMAREX ENERGY COMPANY**Well Name:** RIVERBEND 12-13 FEDERAL COM**Well Number:** 2H

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: 5583**Anticipated Surface Pressure:** 3435.36**Anticipated Bottom Hole Temperature(F):** 167**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:**

Riverbend_12_13_Fed_Com_2H_H2S_Plan_08-17-2017.pdf

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Riverbend_12_13_Fed_Com_2H_Directional_Survey_20200128083019.pdf

Riverbend_12_13_Fed_Com_2H_AC_Report_20200128083027.pdf

Other proposed operations facets description:**Other proposed operations facets attachment:**

Riverbend_12_13_Fed_Com_2H_1_Drilling_Plan_20200409121641.pdf

Other Variance attachment:

Riverbend_12_13_Fed_Com_2H_Flex_Hose_08-17-2017.pdf

Riverbend_12_13_Federal_Com_2H_Multibowl_20200403164554.pdf



Cimarex Riverbend 12-13 Federal Com #2H Rev1 RM 16Jan20 Proposal

Geodetic Report

(Non-Def Plan)



Report Date: January 17, 2020 - 10:46 AM Client: Cimarex Field: NM Eddy County (NAD 83) Structure / Slot: Cimarex Riverbend 12-13 Federal Com #2H / Cimarex Riverbend 12-13 Federal Com #2H Well: Cimarex Riverbend 12-13 Federal Com #2H Borehole: Original Borehole UWI / API#: Unknown / Unknown Survey Name: Cimarex Riverbend 12-13 Federal Com #2H Rev1 RM 16Jan20 Survey Date: January 17, 2020 Tort / AHD / DDI / ERD Ratio: 105.950 ° / 13454.896 ft / 6.490 / 1.378 Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet Location Lat / Long: N 32° 9' 20.30460", W 104° 2' 29.83614" Location Grid N/E Y/X: N 420479.460 ftUS, E 631611.880 ftUS CRS Grid Convergence Angle: 0.1553 ° Grid Scale Factor: 0.99991842 Version / Patch: 2.10.787.0	Survey / DLS Computation: Minimum Curvature / Lubinski Vertical Section Azimuth: 179.892 ° (Grid North) Vertical Section Origin: 0.000 ft, 0.000 ft TVD Reference Datum: RKB TVD Reference Elevation: 2959.100 ft above MSL Seabed / Ground Elevation: 2933.100 ft above MSL Magnetic Declination: 6.949 ° Total Gravity Field Strength: 998.4601mgn (9.80665 Based) Gravity Model: GARM Total Magnetic Field Strength: 47812.506 nT Magnetic Dip Angle: 59.844 ° Declination Date: January 17, 2020 Magnetic Declination Model: HDGM 2019 North Reference: Grid North Grid Convergence Used: 0.1553 ° Total Corr Mag North->Grid North: 6.7934 ° Local Coord Referenced To: Well Head	
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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 [1327' FSL, 2424' FWL]	0.00	0.00	169.05	0.00	0.00	0.00	0.00	N/A	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
Marker MudLine	26.00	0.00	100.00	26.00	0.00	0.00	0.00	0.00	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
	100.00	0.00	100.00	100.00	0.00	0.00	0.00	0.00	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
	200.00	0.00	100.00	200.00	0.00	0.00	0.00	0.00	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
	300.00	0.00	100.00	300.00	0.00	0.00	0.00	0.00	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
	400.00	0.00	100.00	400.00	0.00	0.00	0.00	0.00	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
Rustler	464.00	0.00	100.00	464.00	0.00	0.00	0.00	0.00	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
	500.00	0.00	100.00	500.00	0.00	0.00	0.00	0.00	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
	600.00	0.00	100.00	600.00	0.00	0.00	0.00	0.00	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
	700.00	0.00	100.00	700.00	0.00	0.00	0.00	0.00	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
	800.00	0.00	100.00	800.00	0.00	0.00	0.00	0.00	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
	900.00	0.00	100.00	900.00	0.00	0.00	0.00	0.00	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
	1000.00	0.00	100.00	1000.00	0.00	0.00	0.00	0.00	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
	1100.00	0.00	100.00	1100.00	0.00	0.00	0.00	0.00	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
	1200.00	0.00	100.00	1200.00	0.00	0.00	0.00	0.00	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
	1300.00	0.00	100.00	1300.00	0.00	0.00	0.00	0.00	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
	1400.00	0.00	100.00	1400.00	0.00	0.00	0.00	0.00	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
	1500.00	0.00	100.00	1500.00	0.00	0.00	0.00	0.00	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
	1600.00	0.00	100.00	1600.00	0.00	0.00	0.00	0.00	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
	1700.00	0.00	100.00	1700.00	0.00	0.00	0.00	0.00	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
	1800.00	0.00	100.00	1800.00	0.00	0.00	0.00	0.00	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
	1900.00	0.00	100.00	1900.00	0.00	0.00	0.00	0.00	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
Salado	1926.00	0.00	100.00	1926.00	0.00	0.00	0.00	0.00	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
Nudge 2"/100' DLS	2000.00	0.00	100.00	2000.00	0.00	0.00	0.00	0.00	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
	2100.00	2.00	100.00	2099.98	0.31	-0.30	1.72	2.00	420479.16	631613.60	N 32 9 20.30 W 104 2 29.82	
	2200.00	4.00	100.00	2199.84	1.22	-1.21	6.87	2.00	420478.25	631618.75	N 32 9 20.29 W 104 2 29.76	
	2300.00	6.00	100.00	2299.45	2.75	-2.73	15.46	2.00	420476.74	631627.33	N 32 9 20.28 W 104 2 29.66	
	2400.00	8.00	100.00	2398.70	4.89	-4.84	27.46	2.00	420474.62	631639.33	N 32 9 20.26 W 104 2 29.52	
Castille	2489.38	9.79	100.00	2487.00	7.32	-7.24	41.06	2.00	420472.22	631652.94	N 32 9 20.23 W 104 2 29.36	
	2500.00	10.00	100.00	2497.47	7.64	-7.56	42.86	2.00	420471.90	631654.74	N 32 9 20.23 W 104 2 29.34	
	2600.00	12.00	100.00	2595.62	10.99	-10.87	61.65	2.00	420468.59	631673.53	N 32 9 20.20 W 104 2 29.12	
Bell Canyon	2686.55	13.73	100.00	2680.00	14.37	-14.22	80.63	2.00	420465.24	631692.50	N 32 9 20.16 W 104 2 28.90	
	2700.00	14.00	100.00	2693.06	14.93	-14.78	83.80	2.00	420464.68	631695.68	N 32 9 20.16 W 104 2 28.86	
	2800.00	16.00	100.00	2789.64	19.48	-19.27	109.29	2.00	420460.19	631721.16	N 32 9 20.11 W 104 2 28.57	
Hold Nudge	2861.95	17.24	100.00	2849.00	22.59	-22.35	126.74	2.00	420457.11	631738.61	N 32 9 20.08 W 104 2 28.36	
	2900.00	17.24	100.00	2885.34	24.57	-24.31	137.85	0.00	420455.16	631749.71	N 32 9 20.06 W 104 2 28.23	
	3000.00	17.24	100.00	2980.85	29.77	-29.45	167.03	0.00	420450.01	631778.90	N 32 9 20.01 W 104 2 27.89	
	3100.00	17.24	100.00	3076.36	34.97	-34.60	196.22	0.00	420444.86	631808.08	N 32 9 19.96 W 104 2 27.55	
	3200.00	17.24	100.00	3171.87	40.17	-39.74	225.40	0.00	420439.72	631837.26	N 32 9 19.91 W 104 2 27.22	
	3300.00	17.24	100.00	3267.38	45.37	-44.89	254.59	0.00	420434.57	631866.45	N 32 9 19.85 W 104 2 26.88	
	3400.00	17.24	100.00	3362.88	50.57	-50.04	283.77	0.00	420429.43	631895.63	N 32 9 19.80 W 104 2 26.54	
	3500.00	17.24	100.00	3458.39	55.77	-55.18	312.96	0.00	420424.28	631924.81	N 32 9 19.75 W 104 2 26.20	
	3600.00	17.24	100.00	3553.90	60.97	-60.33	342.14	0.00	420419.14	631954.00	N 32 9 19.70 W 104 2 25.86	
	3700.00	17.24	100.00	3649.41	66.18	-65.48	371.33	0.00	420413.99	631983.18	N 32 9 19.65 W 104 2 25.52	
Cherry Canyon	3719.47	17.24	100.00	3668.00	67.19	-66.48	377.01	0.00	420412.99	631988.86	N 32 9 19.64 W 104 2 25.45	
	3800.00	17.24	100.00	3744.91	71.38	-70.62	400.52	0.00	420408.84	632012.36	N 32 9 19.60 W 104 2 25.18	
	3900.00	17.24	100.00	3840.42	76.58	-75.77	429.70	0.00	420403.70	632041.55	N 32 9 19.54 W 104 2 24.84	
	4000.00	17.24	100.00	3935.93	81.78	-80.91	458.89	0.00	420398.55	632070.73	N 32 9 19.49 W 104 2 24.50	
	4100.00	17.24	100.00	4031.44	86.98	-86.06	488.07	0.00	420393.41	632099.91	N 32 9 19.44 W 104 2 24.16	
	4200.00	17.24	100.00	4126.94	92.18	-91.21	517.26	0.00	420388.26	632129.09	N 32 9 19.39 W 104 2 23.82	
	4300.00	17.24	100.00	4222.45	97.38	-96.35	546.44	0.00	420383.12	632158.28	N 32 9 19.34 W 104 2 23.48	
	4400.00	17.24	100.00	4317.96	102.58	-101.50	575.63	0.00	420377.97	632187.46	N 32 9 19.28 W 104 2 23.14	
	4500.00	17.24	100.00	4413.47	107.79	-106.65	604.81	0.00	420372.82	632216.64	N 32 9 19.23 W 104 2 22.80	
	4600.00	17.24	100.00	4508.98	112.99	-111.79	634.00	0.00	420367.68	632245.83	N 32 9 19.18 W 104 2 22.47	
	4700.00	17.24	100.00	4604.48	118.19	-116.94	663.19	0.00	420362.53	632275.01	N 32 9 19.13 W 104 2 22.13	
	4800.00	17.24	100.00	4699.99	123.39	-122.08	692.37	0.00	420357.39	632304.19	N 32 9 19.08 W 104 2 21.79	
	4900.00	17.24	100.00	4795.50	128.59	-127.23	721.56	0.00	420352.24	632333.38	N 32 9 19.03 W 104 2 21.45	
	5000.00	17.24	100.00	4891.01	133.79	-132.38	750.74	0.00	420347.09	632362.56	N 32 9 18.97 W 104 2 21.11	
	5100.00	17.24	100.00	4986.51	138.99	-137.52	779.93	0.00	420341.95	632391.74	N 32 9 18.92 W 104 2 20.77	
	5200.00	17.24	100.00	5082.02	144.19	-142.67	809.11	0.00	420336.80	632420.93	N 32 9 18.87 W 104 2 20.43	
	5300.00	17.24	100.00	5177.53	149.39	-147.81	838.30	0.00	420331.66	632450.11	N 32 9 18.82 W 104 2 20.09	
Brushy Canyon	5393.68	17.24	100.00	5267.00	154.27	-152.64	865.64	0.00	420326.84	632477.45	N 32 9 18.77 W 104 2 19.77	
	5400.00	17.24	100.00	5273.04	154.60	-152.96	867.48	0.00	420326.51	632479.29	N 32 9 18.77 W 104 2 19.75	
	5500.00	17.24	100.00	5368.54	159.80	-158.11	896.67	0.00	420321.37	632508.48	N 32 9 18.72 W 104 2 19.41	
	5600.00	17.24	100.00	5464.05	165.00	-163.25	925.86	0.00	420316.22	632537.66	N 32 9 18.66 W 104 2 19.07	
	5700.00	17.24	100.00	5559.56	170.20	-168.40	955.04	0.00	420311.07	632566.84	N 32 9 18.61 W 104 2 18.73	
	5800.00	17.24	100.00	5655.07	175.40	-173.55	984.23	0.00	420305.93	632596.03	N 32 9 18.56 W 104 2 18.39	
	5900.00	17.24	100.00	5750.58	180.60	-178.69	1013.41	0.00	420300.78	632625.21	N 32 9 18.51 W 104 2 18.05	
	6000.00	17.24	100.00	5846.08	185.80	-183.84	1042.60	0.00	420295.64	632654.39	N 32 9 18.46 W 104 2 17.71	
	6100.00	17.24	100.00	5941.59	191.00	-188.98	1071.78	0.00	420290.49	632683.57	N 32 9 18.41 W 104 2 17.38	
	6200.00	17.24	100.00	6037.10	196.21	-194.13	1100.97	0.00	420285.35	632712.76	N 32 9 18.35 W 104 2 17.04	
	6300.00	17.24	100.00	6132.61	201.41	-199.28	1130.16	0.00	420280.20	632741.94	N 32 9 18.30 W 104 2 16.70	

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 Lower	6328.68	17.24	100.00	6160.00	202.90	-200.75	1138.53	0.00	420278.72	632750.31	N 32 9 18.29 W 104 2 16.60	
	6400.00	17.24	100.00	6228.11	206.61	-204.42	1159.34	0.00	420275.05	632771.12	N 32 9 18.25 W 104 2 16.36	
	6500.00	17.24	100.00	6323.62	211.81	-209.57	1188.53	0.00	420269.91	632800.31	N 32 9 18.20 W 104 2 16.02	
Bone Spring	6579.97	17.24	100.00	6400.00	215.97	-213.68	1211.87	0.00	420265.79	632823.65	N 32 9 18.16 W 104 2 15.75	
	6600.00	17.24	100.00	6419.13	217.01	-214.72	1217.71	0.00	420264.76	632829.49	N 32 9 18.15 W 104 2 15.68	
Bone Spring "A" Shale	6699.33	17.24	100.00	6514.00	222.18	-219.83	1246.70	0.00	420259.65	632858.48	N 32 9 18.10 W 104 2 15.34	
	6700.00	17.24	100.00	6514.64	222.21	-219.86	1246.90	0.00	420259.62	632858.67	N 32 9 18.10 W 104 2 15.34	
	6800.00	17.24	100.00	6610.14	227.41	-225.01	1276.08	0.00	420254.47	632887.86	N 32 9 18.04 W 104 2 15.00	
	6900.00	17.24	100.00	6705.65	232.61	-230.15	1305.27	0.00	420249.33	632917.04	N 32 9 17.99 W 104 2 14.66	
	7000.00	17.24	100.00	6801.16	237.82	-235.30	1334.45	0.00	420244.18	632946.22	N 32 9 17.94 W 104 2 14.32	
	7100.00	17.24	100.00	6896.67	243.02	-240.45	1363.64	0.00	420239.03	632975.41	N 32 9 17.89 W 104 2 13.98	
	7200.00	17.24	100.00	6992.17	248.22	-245.59	1392.83	0.00	420233.89	633004.59	N 32 9 17.84 W 104 2 13.64	
Bone Spring "C" Shale	7265.78	17.24	100.00	7055.00	251.64	-248.98	1412.02	0.00	420230.50	633023.79	N 32 9 17.80 W 104 2 13.42	
	7300.00	17.24	100.00	7087.68	253.42	-250.74	1422.01	0.00	420228.74	633033.77	N 32 9 17.79 W 104 2 13.30	
	7400.00	17.24	100.00	7183.19	258.62	-255.89	1451.20	0.00	420223.60	633062.96	N 32 9 17.73 W 104 2 12.96	
	7500.00	17.24	100.00	7278.70	263.82	-261.03	1480.38	0.00	420218.45	633092.14	N 32 9 17.68 W 104 2 12.62	
1st Bone Spring Ss	7564.19	17.24	100.00	7340.00	267.16	-264.33	1499.12	0.00	420215.15	633110.87	N 32 9 17.65 W 104 2 12.41	
	7600.00	17.24	100.00	7374.21	269.02	-266.18	1509.57	0.00	420213.30	633121.32	N 32 9 17.63 W 104 2 12.29	
	7700.00	17.24	100.00	7469.71	274.22	-271.32	1538.75	0.00	420208.16	633150.50	N 32 9 17.58 W 104 2 11.95	
	7800.00	17.24	100.00	7565.22	279.42	-276.47	1567.94	0.00	420203.01	633179.69	N 32 9 17.53 W 104 2 11.61	
	7900.00	17.24	100.00	7660.73	284.63	-281.62	1597.12	0.00	420197.87	633208.87	N 32 9 17.47 W 104 2 11.27	
	8000.00	17.24	100.00	7756.24	289.83	-286.76	1626.31	0.00	420192.72	633238.05	N 32 9 17.42 W 104 2 10.93	
	8100.00	17.24	100.00	7851.74	295.03	-291.91	1655.50	0.00	420187.58	633267.24	N 32 9 17.37 W 104 2 10.59	
	8200.00	17.24	100.00	7947.25	300.23	-297.05	1684.68	0.00	420182.43	633296.42	N 32 9 17.32 W 104 2 10.25	
	8300.00	17.24	100.00	8042.76	305.43	-302.20	1713.87	0.00	420177.28	633325.60	N 32 9 17.27 W 104 2 9.91	
	8400.00	17.24	100.00	8138.27	310.63	-307.35	1743.05	0.00	420172.14	633354.79	N 32 9 17.22 W 104 2 9.57	
2nd Bone Spring Ss	8408.10	17.24	100.00	8146.00	311.05	-307.76	1745.42	0.00	420171.72	633357.15	N 32 9 17.21 W 104 2 9.54	
	8500.00	17.24	100.00	8233.77	315.83	-312.49	1772.24	0.00	420166.99	633383.97	N 32 9 17.16 W 104 2 9.23	
	8600.00	17.24	100.00	8329.28	321.03	-317.64	1801.42	0.00	420161.85	633413.15	N 32 9 17.11 W 104 2 8.89	
	8700.00	17.24	100.00	8424.79	326.24	-322.79	1830.61	0.00	420156.70	633442.34	N 32 9 17.06 W 104 2 8.55	
	8800.00	17.24	100.00	8520.30	331.44	-327.93	1859.79	0.00	420151.56	633471.52	N 32 9 17.01 W 104 2 8.21	
	8900.00	17.24	100.00	8615.81	336.64	-333.08	1888.98	0.00	420146.41	633500.70	N 32 9 16.96 W 104 2 7.87	
	9000.00	17.24	100.00	8711.31	341.84	-338.22	1918.17	0.00	420141.26	633529.89	N 32 9 16.91 W 104 2 7.54	
2nd Bs Ss Lower	9094.95	17.24	100.00	8802.00	346.78	-343.11	1945.88	0.00	420136.38	633557.60	N 32 9 16.86 W 104 2 7.21	
	9100.00	17.24	100.00	8806.82	347.04	-343.37	1947.35	0.00	420136.12	633559.07	N 32 9 16.85 W 104 2 7.20	
	9200.00	17.24	100.00	8902.33	352.24	-348.52	1976.54	0.00	420130.97	633588.25	N 32 9 16.80 W 104 2 6.86	
	9300.00	17.24	100.00	8997.84	357.44	-353.66	2005.72	0.00	420125.83	633617.44	N 32 9 16.75 W 104 2 6.52	
	9400.00	17.24	100.00	9093.34	362.64	-358.81	2034.91	0.00	420120.68	633646.62	N 32 9 16.70 W 104 2 6.18	
	9500.00	17.24	100.00	9188.85	367.85	-363.96	2064.09	0.00	420115.53	633675.80	N 32 9 16.65 W 104 2 5.84	
3rd Bone Spring Ss	9578.68	17.24	100.00	9264.00	371.94	-368.00	2087.06	0.00	420111.49	633698.76	N 32 9 16.61 W 104 2 5.57	
	9600.00	17.24	100.00	9284.36	373.05	-369.10	2093.28	0.00	420110.39	633704.98	N 32 9 16.60 W 104 2 5.50	
KOP - Build 12"/100' DLS	9607.16	17.24	100.00	9291.20	373.42	-369.47	2095.37	0.00	420110.02	633707.08	N 32 9 16.59 W 104 2 5.47	
	9700.00	23.39	127.29	9378.41	387.07	-383.06	2123.66	12.00	420096.43	633735.37	N 32 9 16.46 W 104 2 5.15	
	9800.00	32.95	142.88	9466.59	420.96	-416.90	2155.98	12.00	420062.59	633767.68	N 32 9 16.12 W 104 2 4.77	
Build & Turn 12"/100' DLS	9819.70	35.00	145.00	9482.92	429.88	-425.80	2162.46	12.00	420053.69	633774.16	N 32 9 16.03 W 104 2 4.70	
	9900.00	42.00	155.68	9545.80	473.37	-469.25	2186.79	12.00	420010.25	633798.48	N 32 9 15.60 W 104 2 4.41	
	10000.00	51.72	165.37	9614.18	542.14	-537.97	2210.56	12.00	419941.53	633822.26	N 32 9 14.92 W 104 2 4.14	
Wolfcamp A	10047.51	56.58	169.07	9642.00	579.69	-575.51	2219.04	12.00	419904.00	633830.74	N 32 9 14.55 W 104 2 4.04	
Wolfcamp X Sandstone	10092.04	61.21	172.17	9665.00	617.31	-613.11	2225.23	12.00	419866.40	633836.93	N 32 9 14.18 W 104 2 3.97	
	10100.00	62.05	172.69	9668.78	624.25	-620.06	2226.15	12.00	419859.45	633837.85	N 32 9 14.11 W 104 2 3.96	
	10200.00	72.69	178.71	9707.23	716.14	-711.93	2232.87	12.00	419767.59	633844.57	N 32 9 13.20 W 104 2 3.89	
Build 4"/100' DLS	10221.42	75.00	179.89	9713.19	736.71	-732.50	2233.12	12.00	419747.02	633844.82	N 32 9 13.00 W 104 2 3.88	
	10300.00	78.14	179.89	9731.44	813.13	-808.92	2233.27	4.00	419670.61	633844.96	N 32 9 12.24 W 104 2 3.89	
Wolfcamp Y Sandstone	10350.85	80.18	179.89	9741.00	863.07	-858.86	2233.36	4.00	419620.67	633845.06	N 32 9 11.75 W 104 2 3.89	
	10400.00	82.14	179.89	9748.55	911.63	-907.42	2233.45	4.00	419572.11	633845.15	N 32 9 11.26 W 104 2 3.89	
	10500.00	86.14	179.89	9758.76	1011.09	-1006.88	2233.64	4.00	419472.66	633845.33	N 32 9 10.28 W 104 2 3.89	
	10596.42	90.00	179.89	9762.00	1107.44	-1103.23	2233.82	4.00	419376.32	633845.52	N 32 9 9.33 W 104 2 3.89	
	10600.00	90.00	179.89	9762.00	1111.02	-1106.81	2233.83	0.00	419372.74	633845.52	N 32 9 9.29 W 104 2 3.89	
	10700.00	90.00	179.89	9762.00	1211.02	-1206.81	2234.02	0.00	419272.75	633845.71	N 32 9 8.30 W 104 2 3.89	
	10800.00	90.00	179.89	9762.00	1311.02	-1306.81	2234.21	0.00	419172.76	633845.90	N 32 9 7.31 W 104 2 3.89	
Section 1-12 Crossing	10856.20	90.00	179.89	9762.00	1367.22	-1363.01	2234.31	0.00	419116.57	633846.01	N 32 9 6.76 W 104 2 3.89	
	10900.00	90.00	179.89	9762.00	1411.02	-1406.81	2234.39	0.00	419072.77	633846.09	N 32 9 6.32 W 104 2 3.89	
	11000.00	90.00	179.89	9762.00	1511.02	-1506.81	2234.58	0.00	418972.78	633846.28	N 32 9 5.33 W 104 2 3.89	
	11100.00	90.00	179.89	9762.00	1611.02	-1606.81	2234.77	0.00	418872.79	633846.46	N 32 9 4.34 W 104 2 3.89	
First Legal Take Point (330' Hardline)	11186.30	90.00	179.89	9762.00	1697.32	-1693.11	2234.93	0.00	418786.49	633846.63	N 32 9 3.49 W 104 2 3.89	
	11200.00	90.00	179.89	9762.00	1711.02	-1706.81	2234.96	0.00	418772.79	633846.65	N 32 9 3.35 W 104 2 3.89	
	11300.00	90.00	179.89	9762.00	1811.02	-1806.81	2235.15	0.00	418672.80	633846.84	N 32 9 2.37 W 104 2 3.90	
	11400.00	90.00	179.89	9762.00	1911.02	-1906.81	2235.34	0.00	418572.81	633847.03	N 32 9 1.38 W 104 2 3.90	
	11500.00	90.00	179.89	9762.00	2011.02	-2006.81	2235.53	0.00	418472.82	633847.22	N 32 9 0.39 W 104 2 3.90	
	11600.00	90.00	179.89	9762.00	2111.02	-2106.81	2235.71	0.00	418372.83	633847.41	N 32 8 59.40 W 104 2 3.90	
	11700.00	90.00	179.89	9762.00	2211.02	-2206.81	2235.90	0.00	418272.84	633847.60	N 32 8 58.41 W 104 2 3.90	
	11800.00	90.00	179.89	9762.00	2311.02	-2306.81	2236.09	0.00	418172.85	633847.78	N 32 8 57.42 W 104 2 3.90	
	11900.00	90.00	179.89	9762.00	2411.02	-2406.81	2236.28	0.00	418072.85	633847.97	N 32 8 56.43 W 104 2 3.90	
	12000.00	90.00	179.89	9762.00	2511.02	-2506.81	2236.47	0.00	417972.86	633848.16	N 32 8 55.44 W 104 2 3.90	
	12100.00	90.00	179.89	9762.00	2611.02	-2606.81	2236.66	0.00	417872.87	633848.35	N 32 8 54.45 W 104 2 3.90	
	12200.00	90.00	179.89	9762.								

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 ° ' ")
	14100.00	90.00	179.89	9762.00	4611.02	-4606.80	2240.42	0.00	415873.04	633852.12	N 32 8 34.66	W 104 2 3.92
	14200.00	90.00	179.89	9762.00	4711.02	-4706.80	2240.61	0.00	415773.05	633852.31	N 32 8 33.67	W 104 2 3.93
	14300.00	90.00	179.89	9762.00	4811.02	-4806.80	2240.80	0.00	415673.06	633852.49	N 32 8 32.68	W 104 2 3.93
	14400.00	90.00	179.89	9762.00	4911.02	-4906.80	2240.99	0.00	415573.07	633852.68	N 32 8 31.69	W 104 2 3.93
	14500.00	90.00	179.89	9762.00	5011.02	-5006.80	2241.18	0.00	415473.08	633852.87	N 32 8 30.70	W 104 2 3.93
	14600.00	90.00	179.89	9762.00	5111.02	-5106.80	2241.37	0.00	415373.08	633853.06	N 32 8 29.71	W 104 2 3.93
	14700.00	90.00	179.89	9762.00	5211.02	-5206.80	2241.56	0.00	415273.09	633853.25	N 32 8 28.72	W 104 2 3.93
	14800.00	90.00	179.89	9762.00	5311.02	-5306.80	2241.74	0.00	415173.10	633853.44	N 32 8 27.73	W 104 2 3.93
	14900.00	90.00	179.89	9762.00	5411.02	-5406.80	2241.93	0.00	415073.11	633853.62	N 32 8 26.74	W 104 2 3.93
	15000.00	90.00	179.89	9762.00	5511.02	-5506.80	2242.12	0.00	414973.12	633853.81	N 32 8 25.75	W 104 2 3.93
	15100.00	90.00	179.89	9762.00	5611.02	-5606.80	2242.31	0.00	414873.13	633854.00	N 32 8 24.76	W 104 2 3.93
	15200.00	90.00	179.89	9762.00	5711.02	-5706.80	2242.50	0.00	414773.14	633854.19	N 32 8 23.77	W 104 2 3.94
	15300.00	90.00	179.89	9762.00	5811.02	-5806.80	2242.69	0.00	414673.14	633854.38	N 32 8 22.78	W 104 2 3.94
	15400.00	90.00	179.89	9762.00	5911.02	-5906.80	2242.87	0.00	414573.15	633854.57	N 32 8 21.79	W 104 2 3.94
	15500.00	90.00	179.89	9762.00	6011.02	-6006.80	2243.06	0.00	414473.16	633854.76	N 32 8 20.81	W 104 2 3.94
	15600.00	90.00	179.89	9762.00	6111.02	-6106.80	2243.25	0.00	414373.17	633854.94	N 32 8 19.82	W 104 2 3.94
	15700.00	90.00	179.89	9762.00	6211.02	-6206.80	2243.44	0.00	414273.18	633855.13	N 32 8 18.83	W 104 2 3.94
	15800.00	90.00	179.89	9762.00	6311.02	-6306.80	2243.63	0.00	414173.19	633855.32	N 32 8 17.84	W 104 2 3.94
	15900.00	90.00	179.89	9762.00	6411.02	-6406.80	2243.82	0.00	414073.20	633855.51	N 32 8 16.85	W 104 2 3.94
	16000.00	90.00	179.89	9762.00	6511.02	-6506.80	2244.00	0.00	413973.20	633855.70	N 32 8 15.86	W 104 2 3.94
	16100.00	90.00	179.89	9762.00	6611.02	-6606.80	2244.19	0.00	413873.21	633855.89	N 32 8 14.87	W 104 2 3.95
Section 12-13 Crossing	16176.30	90.00	179.89	9762.00	6687.32	-6683.10	2244.34	0.00	413796.92	633856.03	N 32 8 14.11	W 104 2 3.95
	16200.00	90.00	179.89	9762.00	6711.02	-6706.80	2244.38	0.00	413773.22	633856.07	N 32 8 13.88	W 104 2 3.95
	16300.00	90.00	179.89	9762.00	6811.02	-6806.80	2244.57	0.00	413673.23	633856.26	N 32 8 12.89	W 104 2 3.95
	16400.00	90.00	179.89	9762.00	6911.02	-6906.80	2244.76	0.00	413573.24	633856.45	N 32 8 11.90	W 104 2 3.95
	16500.00	90.00	179.89	9762.00	7011.02	-7006.80	2244.95	0.00	413473.25	633856.64	N 32 8 10.91	W 104 2 3.95
	16600.00	90.00	179.89	9762.00	7111.02	-7106.80	2245.14	0.00	413373.26	633856.83	N 32 8 9.92	W 104 2 3.95
	16700.00	90.00	179.89	9762.00	7211.02	-7206.80	2245.32	0.00	413273.26	633857.02	N 32 8 8.93	W 104 2 3.95
	16800.00	90.00	179.89	9762.00	7311.02	-7306.80	2245.51	0.00	413173.27	633857.20	N 32 8 7.94	W 104 2 3.95
	16900.00	90.00	179.89	9762.00	7411.02	-7406.80	2245.70	0.00	413073.28	633857.39	N 32 8 6.95	W 104 2 3.95
	17000.00	90.00	179.89	9762.00	7511.02	-7506.80	2245.89	0.00	412973.29	633857.58	N 32 8 5.96	W 104 2 3.95
	17100.00	90.00	179.89	9762.00	7611.02	-7606.80	2246.08	0.00	412873.30	633857.77	N 32 8 4.97	W 104 2 3.96
	17200.00	90.00	179.89	9762.00	7711.02	-7706.80	2246.27	0.00	412773.31	633857.96	N 32 8 3.98	W 104 2 3.96
	17300.00	90.00	179.89	9762.00	7811.02	-7806.80	2246.45	0.00	412673.32	633858.15	N 32 8 2.99	W 104 2 3.96
	17400.00	90.00	179.89	9762.00	7911.02	-7906.80	2246.64	0.00	412573.32	633858.34	N 32 8 2.00	W 104 2 3.96
	17500.00	90.00	179.89	9762.00	8011.02	-8006.80	2246.83	0.00	412473.33	633858.52	N 32 8 1.01	W 104 2 3.96
	17600.00	90.00	179.89	9762.00	8111.02	-8106.80	2247.02	0.00	412373.34	633858.71	N 32 8 0.03	W 104 2 3.96
	17700.00	90.00	179.89	9762.00	8211.02	-8206.80	2247.21	0.00	412273.35	633858.90	N 32 7 59.04	W 104 2 3.96
	17800.00	90.00	179.89	9762.00	8311.02	-8306.80	2247.40	0.00	412173.36	633859.09	N 32 7 58.05	W 104 2 3.96
	17900.00	90.00	179.89	9762.00	8411.02	-8406.80	2247.59	0.00	412073.37	633859.28	N 32 7 57.06	W 104 2 3.96
	18000.00	90.00	179.89	9762.00	8511.02	-8506.80	2247.77	0.00	411973.38	633859.47	N 32 7 56.07	W 104 2 3.96
	18100.00	90.00	179.89	9762.00	8611.02	-8606.80	2247.96	0.00	411873.38	633859.65	N 32 7 55.08	W 104 2 3.97
	18200.00	90.00	179.89	9762.00	8711.02	-8706.80	2248.15	0.00	411773.39	633859.84	N 32 7 54.09	W 104 2 3.97
	18300.00	90.00	179.89	9762.00	8811.02	-8806.80	2248.34	0.00	411673.40	633860.03	N 32 7 53.10	W 104 2 3.97
	18400.00	90.00	179.89	9762.00	8911.02	-8906.80	2248.53	0.00	411573.41	633860.22	N 32 7 52.11	W 104 2 3.97
	18500.00	90.00	179.89	9762.00	9011.02	-9006.79	2248.72	0.00	411473.42	633860.41	N 32 7 51.12	W 104 2 3.97
	18600.00	90.00	179.89	9762.00	9111.02	-9106.79	2248.90	0.00	411373.43	633860.60	N 32 7 50.13	W 104 2 3.97
	18700.00	90.00	179.89	9762.00	9211.02	-9206.79	2249.09	0.00	411273.43	633860.78	N 32 7 49.14	W 104 2 3.97
	18800.00	90.00	179.89	9762.00	9311.02	-9306.79	2249.28	0.00	411173.44	633860.97	N 32 7 48.15	W 104 2 3.97
	18900.00	90.00	179.89	9762.00	9411.02	-9406.79	2249.47	0.00	411073.45	633861.16	N 32 7 47.16	W 104 2 3.97
	19000.00	90.00	179.89	9762.00	9511.02	-9506.79	2249.66	0.00	410973.46	633861.35	N 32 7 46.17	W 104 2 3.98
	19100.00	90.00	179.89	9762.00	9611.02	-9606.79	2249.85	0.00	410873.47	633861.54	N 32 7 45.18	W 104 2 3.98
	19200.00	90.00	179.89	9762.00	9711.02	-9706.79	2250.03	0.00	410773.48	633861.73	N 32 7 44.19	W 104 2 3.98
	19300.00	90.00	179.89	9762.00	9811.02	-9806.79	2250.22	0.00	410673.49	633861.92	N 32 7 43.20	W 104 2 3.98
	19400.00	90.00	179.89	9762.00	9911.02	-9906.79	2250.41	0.00	410573.49	633862.10	N 32 7 42.21	W 104 2 3.98
	19500.00	90.00	179.89	9762.00	10011.02	-10006.79	2250.60	0.00	410473.50	633862.29	N 32 7 41.22	W 104 2 3.98
	19600.00	90.00	179.89	9762.00	10111.02	-10106.79	2250.79	0.00	410373.51	633862.48	N 32 7 40.23	W 104 2 3.98
	19700.00	90.00	179.89	9762.00	10211.02	-10206.79	2250.98	0.00	410273.52	633862.67	N 32 7 39.24	W 104 2 3.98
	19800.00	90.00	179.89	9762.00	10311.02	-10306.79	2251.17	0.00	410173.53	633862.86	N 32 7 38.26	W 104 2 3.98
	19900.00	90.00	179.89	9762.00	10411.02	-10406.79	2251.35	0.00	410073.54	633863.05	N 32 7 37.27	W 104 2 3.98
	20000.00	90.00	179.89	9762.00	10511.02	-10506.79	2251.54	0.00	409973.55	633863.23	N 32 7 36.28	W 104 2 3.99
	20100.00	90.00	179.89	9762.00	10611.02	-10606.79	2251.73	0.00	409873.55	633863.42	N 32 7 35.29	W 104 2 3.99
	20200.00	90.00	179.89	9762.00	10711.02	-10706.79	2251.92	0.00	409773.56	633863.61	N 32 7 34.30	W 104 2 3.99
	20300.00	90.00	179.89	9762.00	10811.02	-10806.79	2252.11	0.00	409673.57	633863.80	N 32 7 33.31	W 104 2 3.99
	20400.00	90.00	179.89	9762.00	10911.02	-10906.79	2252.30	0.00	409573.58	633863.99	N 32 7 32.32	W 104 2 3.99
	20500.00	90.00	179.89	9762.00	11011.02	-11006.79	2252.48	0.00	409473.59	633864.18	N 32 7 31.33	W 104 2 3.99
	20600.00	90.00	179.89	9762.00	11111.02	-11106.79	2252.67	0.00	409373.60	633864.36	N 32 7 30.34	W 104 2 3.99
	20700.00	90.00	179.89	9762.00	11211.02	-11206.79	2252.86	0.00	409273.61	633864.55	N 32 7 29.35	W 104 2 3.99
	20800.00	90.00	179.89	9762.00	11311.02	-11306.79	2253.05	0.00	409173.61	633864.74	N 32 7 28.36	W 104 2 3.99
	20900.00	90.00	179.89	9762.00	11411.02	-11406.79	2253.24	0.00	409073.62	633864.93	N 32 7 27.37	W 104 2 3.99
	21000.00	90.00	179.89	9762.00	11511.02	-11506.79	2253.43	0.00	408973.63	633865.12	N 32 7 26.38	W 104 2 4.00
	21100.00	90.00	179.89	9762.00	11611.02	-11606.79	2253.61	0.00	408873.64	633865.31	N 32 7 25.39	W 104 2 4.00
Wolfcamp Y Horz Target Cimarex Riverbend 12-13 Federal Com #2H-PBHL [330' FSL 660' FEL]	21144.25	90.00	179.89	9762.00	11655.27	-11651.04	2253.70	0.00	408829.39	633865.39	N 32 7 24.95	W 104 2 4.00

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	Original Borehole / Cimarex Riverbend 12-13 Federal Com #2H Rev1 RM 16Jan20
	1	26.000	21144.253	1/100.000	17.500	13.375		NAL_MWD_IFR1+MS	Original Borehole / Cimarex Riverbend 12-13 Federal Com



Cimarex Riverbend 12-13 Federal Com #2H Rev1 RM 16Jan20 Proposal Geodetic Report (Non-Def Plan)



Report Date: January 17, 2020 - 10:46 AM Client: Cimarex Field: NM Eddy County (NAD 83) Structure / Slot: Cimarex Riverbend 12-13 Federal Com #2H / Cimarex Riverbend 12-13 Federal Com #2H Well: Cimarex Riverbend 12-13 Federal Com #2H Borehole: Original Borehole UWI / API#: Unknown / Unknown Survey Name: Cimarex Riverbend 12-13 Federal Com #2H Rev1 RM 16Jan20 Survey Date: January 17, 2020 Tort / AHD / DDI / ERD Ratio: 105.950 ° / 13454.896 ft / 6.490 / 1.378 Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet Location Lat / Long: N 32° 9' 20.30460", W 104° 2' 29.83614" Location Grid N/E Y/X: N 420479.460 ftUS, E 631611.880 ftUS CRS Grid Convergence Angle: 0.1553 ° Grid Scale Factor: 0.99991842 Version / Patch: 2.10.787.0	Survey / DLS Computation: Minimum Curvature / Lubinski Vertical Section Azimuth: 179.892 ° (Grid North) Vertical Section Origin: 0.000 ft, 0.000 ft TVD Reference Datum: RKB TVD Reference Elevation: 2959.100 ft above MSL Seabed / Ground Elevation: 2933.100 ft above MSL Magnetic Declination: 6.949 ° Total Gravity Field Strength: 998.4601mgn (9.80665 Based) Gravity Model: GARM Total Magnetic Field Strength: 47812.506 nT Magnetic Dip Angle: 59.844 ° Declination Date: January 17, 2020 Magnetic Declination Model: HDGM 2019 North Reference: Grid North Grid Convergence Used: 0.1553 ° Total Corr Mag North->Grid North: 6.7934 ° Local Coord Referenced To: Well Head
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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 [1327' FSL, 2424' FWL]	0.00	0.00	169.05	0.00	0.00	0.00	0.00	N/A	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
Nudge 2"/100'	2000.00	0.00	100.00	2000.00	0.00	0.00	0.00	0.00	420479.46	631611.88	N 32 9 20.30 W 104 2 29.84	
DLS	2861.95	17.24	100.00	2849.00	22.59	-22.35	126.74	2.00	420457.11	631738.61	N 32 9 20.08 W 104 2 28.36	
Hold Nudge	9607.16	17.24	100.00	9291.20	373.42	-369.47	2095.37	0.00	420110.02	633707.08	N 32 9 16.59 W 104 2 5.47	
KOP - Build												
12"/100' DLS	9819.70	35.00	145.00	9482.92	429.88	-425.80	2162.46	12.00	420053.69	633774.16	N 32 9 16.03 W 104 2 4.70	
Build & Turn												
12"/100' DLS	10221.42	75.00	179.89	9713.19	736.71	-732.50	2233.12	12.00	419747.02	633844.82	N 32 9 13.00 W 104 2 3.88	
Build 4"/100'	10596.42	90.00	179.89	9762.00	1107.44	-1103.23	2233.82	4.00	419376.32	633845.52	N 32 9 9.33 W 104 2 3.89	
DLS												
Landing Point												
Cimarex												
Riverbend 12-13												
Federal Com	21144.25	90.00	179.89	9762.00	11655.27	-11651.04	2253.70	0.00	408829.39	633865.39	N 32 7 24.95 W 104 2 4.00	
#2H-PBHL [330'												
FSL 660' FEL]												

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	Original Borehole / Cimarex Riverbend 12-13 Federal Com #2H Rev1 RM 16Jan20
	1	26.000	21144.253	1/100.000	17.500	13.375		NAL_MWD_IFR1+MS	Original Borehole / Cimarex Riverbend 12-13 Federal Com



Cimarex

Rev 1



Borehole:	Well:	Field:	Structure:
Original Borehole	Cimarex Riverbend 12-13 Federal Com #2H	NM Eddy County (NAD 83)	Cimarex Riverbend 12-13 Federal Com #2H

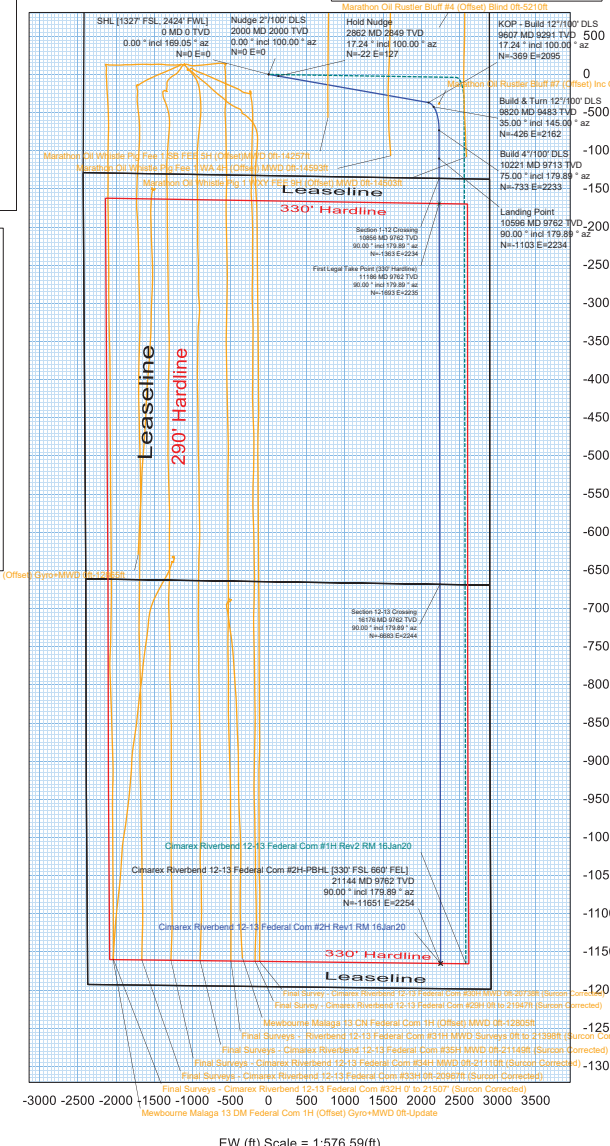
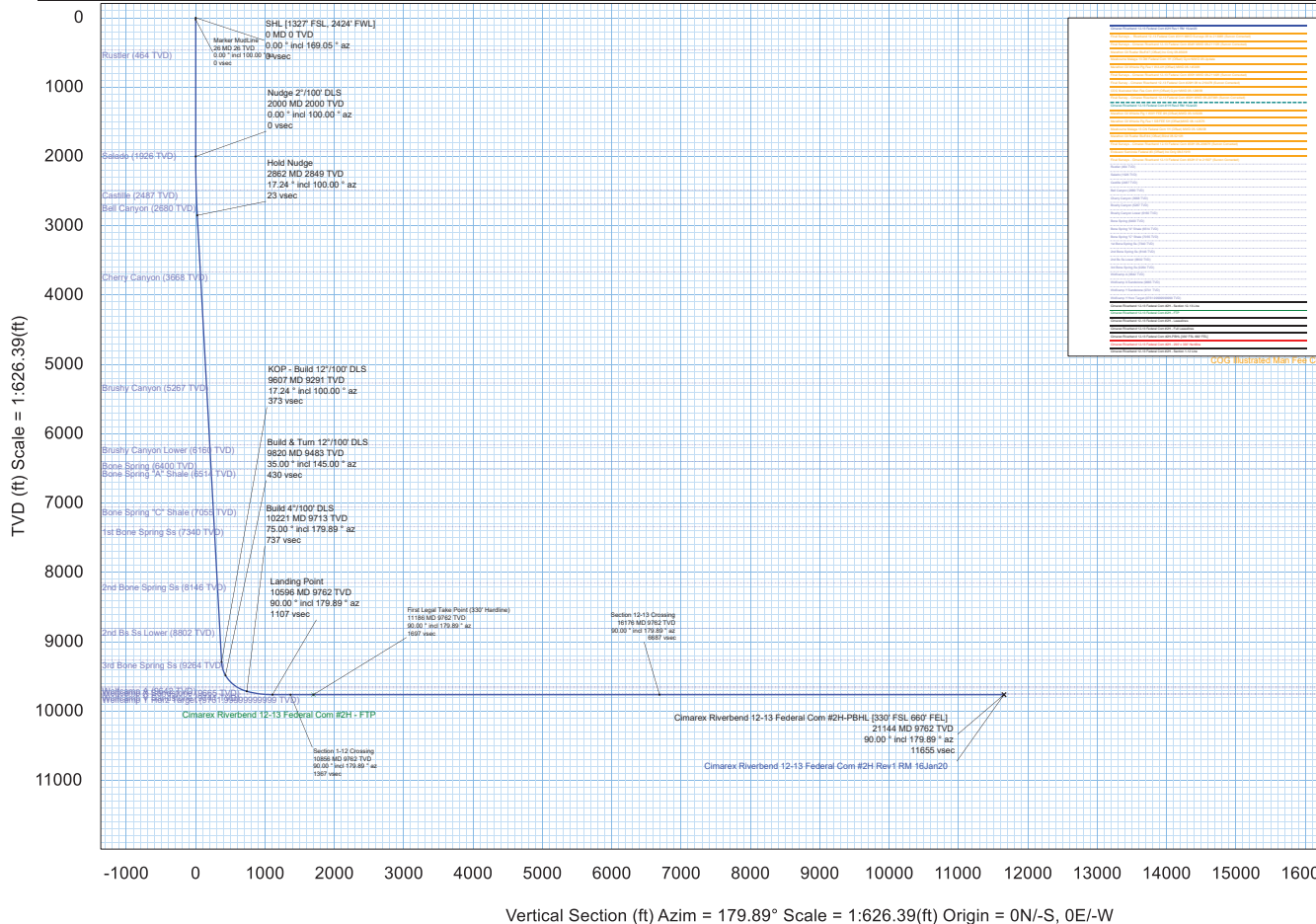
Gravity & Magnetic Parameters	Dip:	59.844°	Date:	17-Jan-2020	Surface Location	NAD83 New Mexico State Plane, Eastern Zone, US Feet	Grid Conv:	0.1553°	Miscellaneous
Model: HDGM 2019	FS:	47812.506NT	Gravity FS:	998.46mgN (9.80665 Based)	Lat: N 32 9 20.30	Northings: 420479.46RUS	Scale Fact:	0.99991842	Cimarex Riverbend 12-13 Federal Com #2H
MagDec: 6.949°					Long: W 104 2 29.84	Easting: 631611.88RUS			TVD Ref: RKB(2959.1ft above MSL)

Critical Point	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DLS
SHL [1327' FSL 2424' FWL]	0.00	0.00	169.05	0.00	0.00	0.00	0.00	0.00
Marker MudLine	26.00	0.00	100.00	26.00	0.00	0.00	0.00	0.00
Rustler	464.00	0.00	100.00	464.00	0.00	0.00	0.00	0.00
Salado	1026.00	0.00	100.00	1026.00	0.00	0.00	0.00	0.00
Nudge 2"/100' DLS	2000.00	0.00	100.00	2000.00	0.00	0.00	0.00	0.00
Castille	2489.38	9.79	100.00	2487.00	7.32	-7.24	41.06	2.00
Bell Canyon	2686.55	13.73	100.00	2680.00	14.37	-14.22	80.63	2.00
Hold Nudge	2861.95	17.24	100.00	2849.00	22.59	-22.35	126.74	2.00
Cherry Canyon	3719.47	17.24	100.00	3668.00	67.19	-66.46	377.01	0.00
Brushy Canyon	5393.68	17.24	100.00	5267.00	154.27	-152.64	865.64	0.00
Brushy Canyon Lower	6328.68	17.24	100.00	6160.00	202.90	-200.75	1136.53	0.00
Bone Spring	6576.97	17.24	100.00	6400.00	215.97	-213.68	1211.87	0.00
Bone Spring "A" Shale	6899.33	17.24	100.00	6514.00	222.18	-219.83	1246.70	0.00
Bone Spring "C" Shale	7265.78	17.24	100.00	7055.00	251.64	-248.98	1412.02	0.00
1st Bone Spring Ss	7594.19	17.24	100.00	7340.00	287.16	-284.33	1699.12	0.00
2nd Bone Spring Ss	8408.10	17.24	100.00	8146.00	311.05	-307.76	1745.42	0.00
2nd Bn Ss Lower	9094.95	17.24	100.00	8802.00	346.78	-343.11	1945.88	0.00
3rd Bone Spring Ss	9576.68	17.24	100.00	9264.00	371.94	-368.00	2087.06	0.00
KOP - Build 12"/100' DLS	9607.16	17.24	100.00	9291.20	373.42	-369.47	2095.37	0.00
Build & Turn 12"/100' DLS	9819.70	35.00	145.00	9482.92	429.88	-425.80	2162.46	12.00
Wolfcamp A	10047.51	56.58	169.07	9642.00	579.69	-575.51	2219.04	12.00
Wolfcamp X Sandstone	10092.04	61.21	172.17	9665.00	617.31	-613.11	2225.23	12.00
Build 4"/100' DLS	10221.42	75.00	179.89	9713.19	736.71	-732.50	2233.12	12.00
Wolfcamp Y Sandstone	10350.85	80.18	179.89	9741.00	863.07	-858.86	2233.36	4.00
Landing Point	10596.42	90.00	179.89	9762.00	1107.44	-1103.23	2233.82	4.00
Section 1-12 Crossing	10856.20	90.00	179.89	9762.00	1367.22	-1363.01	2234.31	0.00
First Legal Take Point (330' Hardline)	11185.30	90.00	179.89	9762.00	1697.32	-1693.11	2234.93	0.00
Section 12-13 Crossing	16176.30	90.00	179.89	9762.00	6687.32	-6683.10	2244.34	0.00
Section 12-13 Crossing	21144.25	90.00	179.89	9762.00	11655.27	-11651.04	2253.70	0.00
Wolfcamp F Sandstone	2144.25	90.00	179.89	9762.00	11655.27	-11651.04	2253.70	0.00
Wolfcamp G Sandstone	NaN	NaN	NaN	9806.00	11655.27	-11651.04	2253.70	0.00
Wolfcamp H Sandstone	NaN	NaN	NaN	10194.00	11655.27	-11651.04	2253.70	0.00

Grid North
Tot Corr (M->G 6.793")
Mag Dec (6.949")
Grid Conv (0.155")

CONTROLLED
Drawn ref: 16-Jan-20
Copy number: 1 of 3
Date: 17-Jan-2020

1	Client	
2	Client	
3	Office	
4	Office	





Cimarex Riverbend 12-13 Federal Com #2H Rev1 RM 16Jan20 Anti-Collision Summary Report

Analysis Date-24hr Time: January 17, 2020 - 10:46

Client: Cimarex

Field: NM Eddy County (NAD 83)

Structure: Cimarex Riverbend 12-13 Federal Com #2H

Slot: Cimarex Riverbend 12-13 Federal Com #2H

Well: Cimarex Riverbend 12-13 Federal Com #2H

Borehole: Original Borehole

Scan MD Range: 0.00ft ~ 21144.25ft

Analysis Method: 3D Least Distance

Reference Trajectory: Cimarex Riverbend 12-13 Federal Com #2H Rev1 RM 16Jan20 (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.COMIDRILLING-NM Eddy County 2.10

Trajectory Error Model: ISCSA0 3-D 95.000% Confidence 2.7955 sigma, for subject well. For offset wells, error model version is specified with each well respectively.

Offset Trajectories Summary

Offset Selection Criteria

Wellhead distance scan: Not performed!

Selection filters: Definitive Surveys - Definitive Plans - Definitive surveys exclude definitive plans

- All Non-Def Surveys when no Def-Survey is set in a borehole - All Non-Def Plans when no Def-Plan is set in a borehole

Offset Trajectory	Separation			Allow 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

Marathon Oil Rustler Bluff #4 (Offset) Blind Off-5210ft (Def Survey)													
	2316.79	32.81	2315.66	2283.98	N/A	MAS = 10.00 (m)	0.00	0.00					Surface
	2316.30	32.81	2315.11	2283.50	39244.70	MAS = 10.00 (m)	26.00	26.00					MinPt-O-SF
	2300.98	694.00	1837.94	1606.99	4.98	OSF1.50	2310.00	2309.40	OSF<5.00				Enter Alert
	1592.01	1593.25	529.24	-1.24	1.50	OSF1.50	5290.00	5167.98		OSF<1.50			Enter Minor
	1537.40	1614.31	460.58	-76.91	1.43	OSF1.50	5570.00	5435.40					MinPt-O-ADP
	1536.25	1613.15	460.20	-76.90	1.43	OSF1.50	5580.00	5444.95					MinPt-O-SF
	1533.17	1609.26	459.73	-76.09	1.43	OSF1.50	5610.00	5473.60					MINPT-O-EOU
	1526.55	1583.13	470.54	-56.58	1.45	OSF1.50	5750.00	5607.31					MinPt-CtCt
	1534.67	1537.76	508.94	-3.09	1.50	OSF1.50	5910.00	5760.13		OSF>1.50			Exit Minor
	2466.74	743.29	1970.84	1723.46	4.98	OSF1.50	7690.00	7460.16	OSF>5.00				Exit Alert
	6355.41	1150.29	5588.17	5205.12	8.29	OSF1.50	13370.00	9762.00					MinPt-O-SF
	13064.23	1527.78	12045.33	11536.45	12.84	OSF1.50	21144.25	9762.00					TD

Cimarex Riverbend 12-13 Federal Com #1H Rev2 RM 16Jan20 (Def Plan)													
	20.00	16.25	18.71	3.74	N/A	MAS = 4.95 (m)	0.00	0.00	CtCt<=15m<15.00				Enter Alert
	20.00	16.25	18.71	3.74	84204.56	MAS = 4.95 (m)	26.00	26.00					WRP
	20.00	17.57	7.86	2.43	1.72	OSF1.50	1790.00	1790.00					MinPt-CtCt
	20.01	17.73	7.76	2.28	1.71	OSF1.50	1810.00	1810.00					MINPT-O-EOU
	20.07	17.80	7.77	2.26	1.71	OSF1.50	1820.00	1820.00					MinPts
	60.34	19.10	47.18	41.24	4.97	OSF1.50	2480.00	2477.76	OSF>5.00				Exit Alert
	80.85	20.95	66.45	59.90	6.07	OSF1.50	2930.00	2914.00					MinPt-O-ADP
	102.35	31.62	80.84	70.73	5.00	OSF1.50	4030.00	3964.58	OSF<5.00				Enter Alert
	146.69	46.63	115.17	100.05	4.81	OSF1.50	5280.00	5158.43					MinPt-O-SF
	330.39	100.02	263.28	230.37	5.00	OSF1.50	9460.00	9150.65	OSF>5.00				Exit Alert
	1155.04	347.45	922.97	807.59	5.00	OSF1.50	20970.00	9762.00	OSF<5.00				Enter Alert
	1155.04	352.84	919.40	802.22	4.92	OSF1.50	21144.25	9762.00					MinPts

Marathon Oil Whistle Pig 1 WXY FEE 9H (Offset) MWD Off: 14503ft (Def Survey)													
	4232.95	32.81	4231.82	4200.14	N/A	MAS = 10.00 (m)	0.00	0.00					Surface
	4232.91	32.81	4231.77	4200.10	847847.59	MAS = 10.00 (m)	10.00	10.00					MinPt-O-SF
	4232.89	32.81	4231.76	4200.08	N/A	MAS = 10.00 (m)	20.00	20.00					MINPT-O-EOU
	4232.89	32.81	4231.76	4200.08	N/A	MAS = 10.00 (m)	26.00	26.00					MinPts
	4232.94	32.81	4231.73	4200.13	54628.42	MAS = 10.00 (m)	60.00	60.00					MINPT-O-EOU
	4235.01	32.81	4232.77	4202.20	3819.45	MAS = 10.00 (m)	310.00	310.00					MINPT-O-EOU
	4230.94	32.81	4226.35	4198.14	1220.24	MAS = 10.00 (m)	820.00	820.00					MinPts
	4231.06	32.81	4226.24	4198.25	1146.87	MAS = 10.00 (m)	870.00	870.00					MINPT-O-EOU
	4262.74	32.81	4252.74	4229.93	480.39	MAS = 10.00 (m)	2100.00	2099.98					MinPt-O-SF
	4233.08	32.81	4220.74	4200.27	377.47	MAS = 10.00 (m)	3310.00	3276.93					MinPts
	4233.13	32.81	4220.70	4200.32	374.72	MAS = 10.00 (m)	3330.00	3296.03					MINPT-O-EOU
	560.28	172.19	444.54	388.10	4.94	OSF1.50	9740.00	9414.61	OSF<5.00				Enter Alert
	350.04	239.42	188.97	110.62	2.21	OSF1.50	10320.00	9735.41					MinPt-CtCt
	352.66	248.43	185.55	104.23	2.14	OSF1.50	10460.00	9755.51					MINPT-O-EOU
	355.48	251.80	186.10	103.68	2.13	OSF1.50	10520.00	9759.96					MinPt-O-ADP
	360.17	255.78	188.14	104.39	2.12	OSF1.50	10596.42	9762.00	OSF>5.00				MinPt-O-SF
	603.69	187.31	476.73	416.38	4.95	OSF1.50	11060.00	9762.00					Exit Alert
	10575.31	89.00	10515.60	10486.31	180.50	OSF1.50	21144.25	9762.00					TD

Marathon Oil Rustler Bluff #7 (Offset) Inc Only Off-6500ft (Def Survey)													
	2265.54	32.81	2264.41	2232.73	N/A	MAS = 10.00 (m)	0.00	0.00					Surface
	2265.07	32.81	2263.88	2232.26	40198.44	MAS = 10.00 (m)	26.00	26.00					MinPt-O-SF
	2264.90	32.81	2263.64	2232.09	18291.94	MAS = 10.00 (m)	60.00	60.00					MinPts
	2265.22	68.31	2219.30	2196.90	50.55	OSF1.50	1440.00	1440.00					MinPt-CtCt
	1067.65	322.53	851.80	745.13	4.99	OSF1.50	6470.00	6294.97	OSF<5.00				Enter Alert
	953.98	332.82	731.21	621.16	4.32	OSF1.50	6890.00	6696.10					MinPt-O-SF
	946.02	328.44	726.18	617.58	4.34	OSF1.50	6960.00	6762.96					MinPt-O-ADP
	944.69	326.85	725.91	617.83	4.36	OSF1.50	6980.00	6782.06					MINPT-O-EOU
	943.21	322.23	727.53	620.98	4.41	OSF1.50	7030.00	6829.81					MinPt-CtCt
	967.84	291.98	772.45	675.86	5.00	OSF1.50	7250.00	7039.93	OSF>5.00				Exit Alert
	4503.04	245.39	4339.07	4257.65	27.69	OSF1.50	13030.00	9762.00					MinPt-O-SF
	11721.28	333.29	11498.71	11387.99	52.93	OSF1.50	21144.25	9762.00					TD

Marathon Oil Whistle Pig Fee 1 WA 4H (Offset) MWD Off: 14593ft (Def Survey)													
	4202.79	32.81	4201.66	4169.98	N/A	MAS = 10.00 (m)	0.00	0.00					Surface
	4202.75	32.81	4201.62	4169.94	911106.73	MAS = 10.00 (m)	10.00	10.00					MinPt-O-SF
	4202.74	32.81	4201.60	4169.93	N/A	MAS = 10.00 (m)	20.00	20.00					MinPts

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level			Alert	Status
	Cl-Cl (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major		
4202.74	32.81	4201.60	4169.93	N/A		MAS = 10.00 (m)	26.00	26.00				WRP	
4202.77	32.81	4201.58	4169.96	77396.88		MAS = 10.00 (m)	50.00	50.00				MINPT-O-EQU	
4204.78	32.81	4202.56	4171.98	3856.35		MAS = 10.00 (m)	300.00	300.00				MINPT-O-EQU	
4215.14	32.81	4208.63	4182.33	783.04		MAS = 10.00 (m)	1230.00	1230.00				MINPT-O-EQU	
4207.27	32.81	4197.30	4174.46	475.93		MAS = 10.00 (m)	2100.00	2099.98				MinPt-O-SF	
4039.94	33.54	4017.20	4006.39	186.90		OSF1.50	5190.00	5072.47				MinPt-O-SF	
4040.03	33.79	4017.13	4006.24	185.51		OSF1.50	5220.00	5101.12				MINPT-O-EQU	
4040.18	33.95	4017.16	4006.22	184.59		OSF1.50	5240.00	5120.22				MinPt-O-ADP	
653.18	120.44	572.51	532.74	8.20		OSF1.50	10560.00	9761.54				MinPts	
653.22	120.50	572.51	532.72	8.19		OSF1.50	10570.00	9761.76				MinPt-O-ADP	
653.44	120.55	572.70	532.89	8.19		OSF1.50	10580.00	9761.91				MinPt-O-SF	
10605.51	69.10	10559.07	10536.41	234.01		OSF1.50	21144.25	9762.00				TD	

Final Survey - Cimarex
Riverbend 12-13 Federal Com
#29H Off to 21947ft (Surcon
Corrected) (Def Survey)

Pass

1029.24	32.81	1027.95	996.43	N/A		MAS = 10.00 (m)	0.00	0.00				Surface	
1029.23	32.81	1027.93	996.42	80806.68		MAS = 10.00 (m)	26.00	26.00				WRP	
1026.55	32.81	1023.43	993.75	576.24		MAS = 10.00 (m)	440.00	440.00				MINPT-O-EQU	
1023.74	32.81	1019.21	990.94	300.79		MAS = 10.00 (m)	790.00	790.00				MinPts	
1024.05	32.81	1019.05	991.24	264.85		MAS = 10.00 (m)	890.00	890.00				MINPT-O-EQU	
1028.90	32.81	1018.75	996.09	113.98		MAS = 10.00 (m)	2090.00	2089.99				MinPts	
1028.91	32.81	1018.74	996.10	113.74		MAS = 10.00 (m)	2100.00	2099.98				MinPts	
1808.33	54.47	1771.68	1753.87	50.72		OSF1.50	7790.00	7555.67				MinPt-O-SF	
1968.99	58.33	1929.76	1910.66	51.51		OSF1.50	8380.00	8119.17				MinPt-O-SF	
2243.27	65.41	2199.32	2177.86	52.23		OSF1.50	9260.00	8959.63				MinPt-O-SF	
2330.99	67.85	2285.41	2263.14	52.34		OSF1.50	9560.00	9246.16				MinPt-O-SF	
2643.20	80.90	2588.94	2562.30	49.60		OSF1.50	10630.00	9762.00				MinPts	
2654.12	84.61	2597.39	2569.52	47.59		OSF1.50	10780.00	9762.00				MinPts	
2650.61	101.73	2582.46	2548.88	39.45		OSF1.50	11590.00	9762.00				MinPt-CiCt	
2650.79	102.28	2582.27	2548.50	39.24		OSF1.50	11630.00	9762.00				MINPT-O-EQU	
2651.14	102.70	2582.34	2548.44	39.08		OSF1.50	11660.00	9762.00				MinPt-O-ADP	
2652.53	105.34	2581.97	2547.19	38.11		OSF1.50	11750.00	9762.00				MinPt-CiCt	
2652.67	111.70	2577.88	2540.98	35.93		OSF1.50	12020.00	9762.00				MinPt-CiCt	
2653.13	113.07	2577.42	2540.06	35.49		OSF1.50	12100.00	9762.00				MINPT-O-EQU	
2653.72	113.75	2577.55	2539.96	35.29		OSF1.50	12140.00	9762.00				MinPt-O-ADP	
2655.81	116.61	2577.74	2539.20	34.44		OSF1.50	12250.00	9762.00				MINPT-O-EQU	
2657.19	118.23	2578.04	2538.95	33.98		OSF1.50	12330.00	9762.00				MinPt-O-ADP	
2652.58	132.04	2564.24	2520.55	30.35		OSF1.50	12830.00	9762.00				MinPt-CiCt	
2655.30	140.50	2561.31	2514.81	28.54		OSF1.50	13150.00	9762.00				MinPt-CiCt	
2656.05	145.81	2558.51	2510.23	27.50		OSF1.50	13350.00	9762.00				MinPt-CiCt	
2639.94	171.57	2525.23	2468.37	23.21		OSF1.50	14290.00	9762.00				MinPt-CiCt	
2642.93	179.81	2522.72	2463.11	22.16		OSF1.50	14610.00	9762.00				MINPT-O-EQU	
2643.33	180.30	2522.80	2463.03	22.10		OSF1.50	14640.00	9762.00				MinPt-O-ADP	
2655.47	190.88	2527.92	2464.64	20.97		OSF1.50	15010.00	9762.00				MINPT-O-EQU	
2656.34	191.87	2528.10	2464.47	20.87		OSF1.50	15060.00	9762.00				MinPt-O-ADP	
2640.34	223.18	2491.22	2417.16	17.82		OSF1.50	16100.00	9762.00				MinPt-CiCt	
2640.65	224.14	2490.89	2416.50	17.74		OSF1.50	16160.00	9762.00				MINPT-O-EQU	
2641.06	224.62	2490.98	2416.44	17.71		OSF1.50	16190.00	9762.00				MinPt-O-ADP	
2641.80	225.60	2491.07	2416.20	17.64		OSF1.50	16230.00	9762.00				MINPT-O-EQU	
2644.27	230.78	2490.12	2413.54	17.26		OSF1.50	16390.00	9762.00				MINPT-O-EQU	
2644.87	231.48	2490.22	2413.39	17.21		OSF1.50	16430.00	9762.00				MinPt-O-ADP	
2644.89	260.28	2471.04	2384.61	15.29		OSF1.50	17370.00	9762.00				MinPt-CiCt	
2643.02	275.96	2458.72	2367.06	14.41		OSF1.50	17900.00	9762.00				MinPt-CiCt	
2643.29	276.78	2458.45	2366.52	14.37		OSF1.50	17950.00	9762.00				MINPT-O-EQU	
2644.90	281.24	2457.08	2363.66	14.15		OSF1.50	18110.00	9762.00				MINPT-O-EQU	
2645.75	282.25	2457.25	2363.50	14.10		OSF1.50	18160.00	9762.00				MinPt-O-ADP	
2651.80	294.48	2455.15	2357.31	13.55		OSF1.50	18570.00	9762.00				MINPT-O-EQU	
2655.49	299.27	2455.04	2356.21	13.35		OSF1.50	18750.00	9762.00				MinPt-O-ADP	
2653.28	327.92	2434.34	2325.36	12.17		OSF1.50	19650.00	9762.00				MinPt-CiCt	
2653.72	329.21	2433.93	2324.52	12.12		OSF1.50	19720.00	9762.00				MINPT-O-EQU	
2654.15	329.73	2434.00	2324.42	12.11		OSF1.50	19750.00	9762.00				MinPt-O-ADP	
2648.90	353.21	2413.19	2295.78	11.28		OSF1.50	20490.00	9762.00				MinPt-CiCt	
2649.69	355.86	2412.12	2293.83	11.20		OSF1.50	20610.00	9762.00				MINPT-O-EQU	
2650.15	356.41	2412.22	2293.74	11.18		OSF1.50	20640.00	9762.00				MinPt-O-ADP	
2660.40	363.59	2417.68	2296.81	11.00		OSF1.50	20920.00	9762.00				MINPT-O-EQU	
2663.88	371.72	2415.73	2292.15	10.77		OSF1.50	21144.25	9762.00				MinPts	

Endeavor Seminole Federal #3
(Offset) Inc Only Off-5191ft (Def
Survey)

Pass

1134.18	32.81	1133.05	1101.38	N/A		MAS = 10.00 (m)	0.00	0.00				Surface	
1133.62	32.81	1132.42	1100.81	16634.87		MAS = 10.00 (m)	20.00	20.00				MinPt-O-SF	
1133.52	32.81	1132.32	1100.71	17561.64		MAS = 10.00 (m)	26.00	26.00				WRP	
1133.48	32.81	1132.19	1100.59	7810.33		MAS = 10.00 (m)	50.00	50.00				MinPts	
1119.66	101.58	1051.56	1018.08	16.70		OSF1.50	1930.00	1930.00				MinPt-CiCt	
1032.73	199.94	899.05	832.79	7.78		OSF1.50	3830.00	3773.57				MinPt-CiCt	
1035.61	208.66	896.13	826.95	7.48		OSF1.50	4030.00	3964.58				MINPT-O-EQU	
1039.20	212.91	896.88	826.29	7.35		OSF1.50	4130.00	4060.09				MinPt-O-ADP	
1145.10	269.83	964.84	875.27	6.39		OSF1.50	5340.00	5215.73				MinPt-O-SF	
6489.18	198.87	6356.22	6290.31	49.22		OSF1.50	12870.00	9762.00				MinPt-O-SF	
13506.65	266.84	13328.38	13239.81	76.24		OSF1.50	21144.25	9762.00				TD	

Final Surveys - Riverbend 12-
13 Federal Com #31H MWD
Surveys Off to 21398ft (Surcon
Corrected) (Def Survey)

Pass

1093.49	32.81	1092.21	1060.68	N/A		MAS = 10.00 (m)	0.00	0.00				MinPts	
1093.49	32.81	1092.20	1060.69	114520.68		MAS = 10.00 (m)	26.00	26.00				WRP	
1034.25	32.81	1024.13	1001.44	115.05		MAS = 10.00 (m)	2100.00	2099.98				MinPt-O-SF	
1034.13	32.81	1024.02	1001.32	115.27		MAS = 10.00 (m)	2130.00	2129.96				MinPts	
1050.89	32.81	1040.89	1018.08	116.99		MAS = 10.00 (m)	2570.00	2566.25				MinPt-O-SF	
1058.16	32.81	1048.10	1025.35	116.94		MAS = 10.00 (m)	2630.00	2624.93				MinPt-O-SF	
1073.26	32.81	1063.09	1040.45	117.13		MAS = 10.00 (m)	2730.00	2722.13				MinPt-O-SF	
2228.76	52.81	2193.22	2175.96	64.53		OSF1.50	7980.00	7737.13				MinPt-O-SF	
2706.86	69.02	2660.51	2637.84	59.69		OSF1.50	9600.00	9284.36				MinPt-O-ADP	
2737.93	71.51	2689.92	2666.42	58.24		OSF1.50	9760.00	9432.28				MinPt-O-SF	
2794.33	73.74	2744.84	2720.58	57.53		OSF1.50	10020.00	9626.28				MinPt-O-SF	
2790.62	81.99	2735.64	2708.64	51.66		OSF1.50	10850.00	9762.00				MinPt-CiCt	
2790.81	82.53	2735.46	2708.28	51.32		OSF1.50	10900.00	9762.00				MINPT-O-EQU	
2791.08	82.87	2735.51	2708.21	51.11		OSF1.50	10930.00	9762.00				MinPt-O-ADP	
2783.61	108.05	2711.24	2675.55	38.98		OSF1.50	12150.00	9762.00				MinPt-CiCt	

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level			Alert	Status
	Cl-Cl (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major		
2783.78	108.55	2711.09	2675.24	38.81		OSF1.50	12190.00	9762.00				MINPT-O-EOU	
2784.71	109.63	2711.30	2675.08	38.43		OSF1.50	12260.00	9762.00				MinPt-O-ADP	
2775.77	166.17	2664.66	2609.60	25.20		OSF1.50	14400.00	9762.00				MinPt-CtCt	
2776.08	167.06	2664.38	2609.02	25.06		OSF1.50	14460.00	9762.00				MINPT-O-EOU	
2777.68	170.20	2663.89	2607.49	24.61		OSF1.50	14580.00	9762.00				MINPT-O-EOU	
2778.13	170.72	2663.99	2607.41	24.54		OSF1.50	14610.00	9762.00				MinPt-O-ADP	
2783.12	180.13	2662.70	2602.98	23.29		OSF1.50	14900.00	9762.00				MinPt-CtCt	
2783.14	190.06	2656.11	2593.08	22.07		OSF1.50	15250.00	9762.00				MinPt-CtCt	
2778.91	222.34	2630.35	2556.57	18.82		OSF1.50	16380.00	9762.00				MinPt-CtCt	
2780.24	227.60	2628.18	2552.64	18.40		OSF1.50	16600.00	9762.00				MINPT-O-EOU	
2780.17	252.47	2611.53	2527.70	16.58		OSF1.50	17420.00	9762.00				MinPt-CtCt	
2780.41	259.99	2606.75	2520.42	16.10		OSF1.50	17680.00	9762.00				MinPt-CtCt	
2754.77	297.69	2555.98	2457.08	13.92		OSF1.50	18960.00	9762.00				MinPt-CtCt	
2751.34	314.59	2541.29	2436.76	13.16		OSF1.50	19530.00	9762.00				MinPt-CtCt	
2750.62	340.04	2523.59	2410.58	12.16		OSF1.50	20390.00	9762.00				MinPt-CtCt	
2751.17	345.96	2520.20	2405.20	11.96		OSF1.50	20590.00	9762.00				MinPt-CtCt	
2752.83	361.38	2511.58	2391.44	11.45		OSF1.50	21110.00	9762.00				MinPts	
2753.09	361.37	2511.85	2391.72	11.45		OSF1.50	21144.25	9762.00				TD	

Final Survey - Cimarex
Riverbend 12-13 Federal Com
#30H MWD 0ft-20738ft (Surcon
Corrected) (Def Survey)

Pass

1049.23	32.81	1047.94	1016.42	N/A	MAS = 10.00 (m)	0.00	0.00	MinPts
1049.26	32.81	1047.96	1016.45	80143.82	MAS = 10.00 (m)	26.00	26.00	WRP
1049.29	32.81	1047.95	1016.48	20408.48	MAS = 10.00 (m)	40.00	40.00	MINPT-O-EOU
1053.83	32.81	1046.14	1021.02	160.51	MAS = 10.00 (m)	1520.00	1520.00	MinPts
1053.88	32.81	1046.09	1021.07	158.29	MAS = 10.00 (m)	1540.00	1540.00	MINPT-O-EOU
1057.68	32.81	1047.70	1024.87	119.43	MAS = 10.00 (m)	2090.00	2089.99	MinPts
1057.73	32.81	1047.73	1024.92	119.20	MAS = 10.00 (m)	2100.00	2099.98	MinPt-O-SF
2159.98	60.97	2118.99	2099.01	54.02	OSF1.50	8580.00	8310.18	MinPt-O-SF
2258.58	63.58	2215.86	2195.01	54.13	OSF1.50	8950.00	8663.56	MinPt-O-SF
2283.86	70.68	2236.40	2213.17	49.15	OSF1.50	9260.00	8959.63	MinPt-CtCt
2283.92	70.88	2236.33	2213.04	49.02	OSF1.50	9280.00	8978.73	MINPT-O-EOU
2284.01	70.97	2236.35	2213.04	48.96	OSF1.50	9290.00	8988.29	MinPt-O-ADP
2307.53	73.35	2258.29	2234.18	47.83	OSF1.50	9607.16	9291.20	MinPt-O-SF
2378.84	73.03	2329.81	2305.81	49.53	OSF1.50	10330.00	9737.29	MinPts
2384.21	98.54	2318.19	2285.67	36.65	OSF1.50	11900.00	9762.00	MinPt-CtCt
2373.80	129.58	2287.08	2244.21	27.68	OSF1.50	13220.00	9762.00	MinPt-CtCt
2373.17	133.95	2283.54	2239.22	26.76	OSF1.50	13390.00	9762.00	MinPt-CtCt
2370.88	147.54	2272.20	2223.35	24.26	OSF1.50	13900.00	9762.00	MinPt-CtCt
2371.06	148.04	2272.03	2223.01	24.17	OSF1.50	13940.00	9762.00	MINPT-O-EOU
2371.27	148.29	2272.08	2222.98	24.14	OSF1.50	13960.00	9762.00	MinPt-O-ADP
2375.97	201.26	2241.47	2174.71	17.79	OSF1.50	15830.00	9762.00	MinPt-CtCt
2371.33	223.31	2222.13	2148.02	15.99	OSF1.50	16600.00	9762.00	MinPt-CtCt
2370.98	228.55	2218.29	2142.44	15.62	OSF1.50	16780.00	9762.00	MinPt-CtCt
2370.78	233.18	2214.95	2137.55	15.31	OSF1.50	16940.00	9762.00	MinPt-CtCt
2370.82	238.10	2211.76	2132.73	14.99	OSF1.50	17110.00	9762.00	MinPt-CtCt
2369.37	250.07	2202.32	2119.30	14.26	OSF1.50	17520.00	9762.00	MinPt-CtCt
2366.91	265.90	2189.31	2101.01	13.40	OSF1.50	18060.00	9762.00	MinPt-CtCt
2365.05	271.76	2183.55	2093.29	13.10	OSF1.50	18260.00	9762.00	MinPt-CtCt
2365.18	272.08	2183.47	2093.10	13.08	OSF1.50	18290.00	9762.00	MINPT-O-EOU
2365.28	272.19	2183.49	2093.09	13.08	OSF1.50	18300.00	9762.00	MinPt-O-ADP
2375.71	285.67	2184.94	2090.05	12.51	OSF1.50	18730.00	9762.00	MinPt-CtCt
2376.81	294.17	2180.37	2082.64	12.16	OSF1.50	19020.00	9762.00	MinPt-CtCt
2375.13	305.05	2171.43	2070.08	11.71	OSF1.50	19390.00	9762.00	MinPt-CtCt
2375.32	309.78	2168.47	2065.54	11.53	OSF1.50	19550.00	9762.00	MinPt-CtCt
2367.65	330.48	2147.00	2037.17	10.77	OSF1.50	20250.00	9762.00	MinPt-CtCt
2370.69	348.01	2138.35	2022.68	10.24	OSF1.50	20880.00	9762.00	MINPT-O-EOU
2372.17	349.80	2138.64	2022.37	10.20	OSF1.50	20960.00	9762.00	MinPt-O-ADP
2372.40	356.19	2134.61	2016.21	10.01	OSF1.50	21090.00	9762.00	MinPt-O-SF
2372.33	356.17	2134.55	2016.16	10.01	OSF1.50	21100.00	9762.00	MinPt-O-ADP
2372.30	356.14	2134.55	2016.16	10.02	OSF1.50	21110.00	9762.00	MinPts
2372.52	355.98	2134.87	2016.53	10.02	OSF1.50	21144.25	9762.00	TD

Final Surveys - Cimarex
Riverbend 12-13 Federal Com
#35H MWD 0ft-21149ft (Surcon
Corrected) (Def Survey)

Pass

1113.39	32.81	1112.10	1080.58	N/A	MAS = 10.00 (m)	0.00	0.00	MinPts
1113.40	32.81	1112.10	1080.59	113378.00	MAS = 10.00 (m)	26.00	26.00	WRP
1113.99	32.81	1111.37	1081.18	835.69	MAS = 10.00 (m)	300.00	300.00	MINPT-O-EOU
1111.41	32.81	1106.50	1078.60	293.94	MAS = 10.00 (m)	870.00	870.00	MinPts
1111.45	32.81	1106.46	1078.64	288.22	MAS = 10.00 (m)	890.00	890.00	MINPT-O-EOU
1112.36	32.81	1105.12	1079.56	181.86	MAS = 10.00 (m)	1420.00	1420.00	MinPts
1112.75	32.81	1104.90	1079.94	165.32	MAS = 10.00 (m)	1560.00	1560.00	MINPT-O-EOU
1111.44	32.81	1101.47	1078.63	125.65	MAS = 10.00 (m)	2080.00	2079.99	MinPts
1111.54	32.81	1101.53	1078.79	125.19	MAS = 10.00 (m)	2100.00	2099.98	MinPt-O-SF
2940.55	64.98	2896.90	2875.57	68.90	OSF1.50	9010.00	8720.86	MinPt-CtCt
2940.64	65.11	2896.83	2875.47	68.70	OSF1.50	9030.00	8739.97	MinPts
2999.32	69.31	2952.79	2930.01	65.82	OSF1.50	9607.16	9291.20	MinPt-O-SF
3139.90	69.06	3093.53	3070.84	69.17	OSF1.50	10320.00	9735.41	MinPt-O-SF
3166.46	84.68	3109.67	3081.77	56.73	OSF1.50	11270.00	9762.00	MinPt-CtCt
3158.45	100.47	3091.14	3057.98	47.61	OSF1.50	12020.00	9762.00	MinPt-CtCt
3158.66	101.10	3090.93	3057.56	47.31	OSF1.50	12070.00	9762.00	MINPT-O-EOU
3159.45	102.40	3090.85	3057.05	46.72	OSF1.50	12140.00	9762.00	MINPT-O-EOU
3143.89	113.58	3067.84	3030.31	41.87	OSF1.50	12570.00	9762.00	MinPt-CtCt
3143.95	113.73	3067.80	3030.21	41.81	OSF1.50	12590.00	9762.00	MINPT-O-EOU
3144.01	113.80	3067.81	3030.21	41.79	OSF1.50	12600.00	9762.00	MinPt-O-ADP
3170.48	129.96	3083.52	3040.53	36.86	OSF1.50	13260.00	9762.00	MINPT-O-EOU
3166.78	150.82	3065.89	3015.95	31.69	OSF1.50	14000.00	9762.00	MinPt-CtCt
3153.24	179.70	3033.21	2973.64	26.46	OSF1.50	15040.00	9762.00	MinPt-CtCt
3147.01	192.43	3018.40	2954.58	24.65	OSF1.50	15490.00	9762.00	MinPt-CtCt
3147.31	193.35	3018.10	2953.99	24.54	OSF1.50	15550.00	9762.00	MINPT-O-EOU
3147.69	193.76	3018.19	2953.93	24.48	OSF1.50	15580.00	9762.00	MinPt-O-ADP
3159.57	202.34	3024.35	2957.23	23.53	OSF1.50	15930.00	9762.00	MinPt-O-ADP
3166.74	220.40	3019.42	2946.25	21.63	OSF1.50	16510.00	9762.00	MINPT-O-EOU
3161.96	238.84	3002.41	2923.12	19.93	OSF1.50	17100.00	9762.00	MinPt-CtCt
3162.20	239.57	3002.16	2922.63	19.87	OSF1.50	17150.00	9762.00	MINPT-O-EOU
3162.55	240.00	3002.22	2922.55	19.84	OSF1.50	17180.00	9762.00	MinPt-O-ADP
3144.09	278.89	2957.84	2865.20	16.96	OSF1.50	18460.00	9762.00	MinPt-CtCt
3137.09	295.02	2940.08	2842.06	16.00	OSF1.50	19010.00	9762.00	MinPt-CtCt

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level			Alert	Status
	Cl-Cl (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major		
3137.06		300.86	2936.15	2836.19	15.69	OSF1.50	19210.00	9762.00				MinPt-CiCl	
3137.08		303.85	2934.13	2833.17	15.53	OSF1.50	19310.00	9762.00				MinPt-CiCl	
3137.83		306.56	2933.13	2831.27	15.40	OSF1.50	19440.00	9762.00				MINPT-O-EQU	
3138.28		307.08	2933.23	2831.20	15.37	OSF1.50	19470.00	9762.00				MinPt-O-ADP	
3135.82		328.11	2916.75	2807.71	14.37	OSF1.50	20130.00	9762.00				MinPt-CiCl	
3136.09		328.81	2916.56	2807.28	14.34	OSF1.50	20180.00	9762.00				MINPT-O-EQU	
3133.49		338.31	2907.62	2795.18	13.93	OSF1.50	20470.00	9762.00				MinPt-CiCl	
3133.69		338.82	2907.48	2794.87	13.91	OSF1.50	20510.00	9762.00				MINPT-O-EQU	
3133.91		339.07	2907.54	2794.84	13.90	OSF1.50	20530.00	9762.00				MinPt-O-ADP	
3138.85		343.28	2909.66	2795.56	13.75	OSF1.50	20710.00	9762.00				MinPts	
3144.34		348.81	2911.47	2795.53	13.56	OSF1.50	20880.00	9762.00				MINPT-O-EQU	
3144.55		349.11	2911.49	2795.44	13.55	OSF1.50	20890.00	9762.00				MinPt-O-ADP	
3153.32		354.25	2916.83	2799.07	13.39	OSF1.50	21144.25	9762.00				MinPt-O-SF	

Final Surveys - Cimarex
Riverbend 12-13 Federal Com
#34H MWD Off-21110ft (Surcon
Corrected) (Def Survey)

Pass

1133.29	32.81	1132.01	1100.48	N/A	MAS = 10.00 (m)	0.00	0.00	Surface
1133.29	32.81	1131.99	1100.48	87778.62	MAS = 10.00 (m)	26.00	26.00	WRP
1131.90	32.81	1128.91	1099.09	665.12	MAS = 10.00 (m)	440.00	440.00	MINPT-O-EQU
1131.68	32.81	1128.43	1098.87	532.02	MAS = 10.00 (m)	530.00	530.00	MinPts
1131.97	32.81	1128.24	1099.16	435.44	MAS = 10.00 (m)	630.00	630.00	MINPT-O-EQU
1130.20	32.81	1123.09	1097.39	189.00	MAS = 10.00 (m)	1350.00	1350.00	MinPts
1130.88	32.81	1122.42	1098.07	154.13	MAS = 10.00 (m)	1620.00	1620.00	MINPT-O-EQU
1140.06	32.81	1129.76	1107.25	124.21	MAS = 10.00 (m)	2100.00	2099.98	MinPt-O-SF
1162.03	32.81	1151.64	1129.22	125.48	MAS = 10.00 (m)	2310.00	2309.49	MinPt-O-SF
1439.48	32.81	1427.77	1406.67	134.54	MAS = 10.00 (m)	3240.00	3210.07	MinPt-O-SF
3436.26	69.19	3389.79	3367.07	75.59	OSF1.50	9470.00	9160.20	MinPt-O-ADP
3464.98	70.71	3417.50	3394.27	74.59	OSF1.50	9700.00	9378.41	MinPt-O-SF
3567.31	83.95	3511.02	3483.36	64.48	OSF1.50	11110.00	9762.00	MinPt-CiCl
3545.39	127.21	3460.26	3418.18	42.12	OSF1.50	13030.00	9762.00	MinPt-CiCl
3545.68	128.07	3459.97	3417.61	41.84	OSF1.50	13090.00	9762.00	MINPT-O-EQU
3546.05	128.50	3460.05	3417.55	41.70	OSF1.50	13120.00	9762.00	MinPt-O-ADP
3550.85	134.31	3460.90	3416.51	39.93	OSF1.50	13340.00	9762.00	MINPT-O-EQU
3551.78	135.44	3461.16	3416.34	39.61	OSF1.50	13400.00	9762.00	MinPt-O-ADP
3560.41	150.21	3459.94	3410.20	35.78	OSF1.50	13900.00	9762.00	MinPt-CiCl
3562.74	160.85	3455.18	3401.90	33.42	OSF1.50	14290.00	9762.00	MinPt-CiCl
3543.65	187.62	3418.24	3356.03	28.47	OSF1.50	15250.00	9762.00	MinPt-CiCl
3543.93	188.48	3417.95	3355.45	28.34	OSF1.50	15310.00	9762.00	MINPT-O-EQU
3544.86	190.03	3417.84	3354.83	28.12	OSF1.50	15380.00	9762.00	MINPT-O-EQU
3547.71	196.37	3416.47	3351.34	27.23	OSF1.50	15600.00	9762.00	MINPT-O-EQU
3546.46	203.04	3410.78	3343.42	26.32	OSF1.50	15790.00	9762.00	MinPt-CiCl
3546.75	203.91	3410.49	3342.85	26.21	OSF1.50	15850.00	9762.00	MINPT-O-EQU
3546.99	204.18	3410.54	3342.81	26.18	OSF1.50	15870.00	9762.00	MinPt-O-ADP
3545.91	210.43	3405.29	3335.47	25.39	OSF1.50	16050.00	9762.00	MinPt-CiCl
3546.08	210.92	3405.14	3335.17	25.33	OSF1.50	16090.00	9762.00	MINPT-O-EQU
3546.30	211.15	3405.20	3335.14	25.30	OSF1.50	16110.00	9762.00	MinPt-O-ADP
3540.24	239.99	3379.92	3300.25	22.21	OSF1.50	17070.00	9762.00	MinPt-CiCl
3540.68	241.12	3379.60	3299.56	22.11	OSF1.50	17140.00	9762.00	MINPT-O-EQU
3541.09	241.61	3379.69	3299.49	22.07	OSF1.50	17170.00	9762.00	MinPt-O-ADP
3526.44	268.77	3346.93	3257.67	19.75	OSF1.50	18050.00	9762.00	MinPt-CiCl
3526.65	269.46	3346.68	3257.19	19.70	OSF1.50	18100.00	9762.00	MINPT-O-EQU
3526.87	269.73	3346.72	3257.14	19.68	OSF1.50	18120.00	9762.00	MinPt-O-ADP
3527.65	276.98	3342.67	3250.68	19.17	OSF1.50	18330.00	9762.00	MinPt-CiCl
3528.17	281.95	3339.87	3246.21	18.83	OSF1.50	18500.00	9762.00	MinPt-CiCl
3527.09	293.21	3331.29	3233.88	18.10	OSF1.50	18880.00	9762.00	MinPt-CiCl
3527.46	294.36	3330.90	3233.11	18.03	OSF1.50	18950.00	9762.00	MINPT-O-EQU
3527.86	294.84	3330.97	3233.02	18.00	OSF1.50	18980.00	9762.00	MinPt-O-ADP
3528.64	299.37	3328.73	3229.27	17.73	OSF1.50	19090.00	9762.00	MinPt-CiCl
3530.41	306.54	3325.72	3223.87	17.33	OSF1.50	19330.00	9762.00	MinPt-CiCl
3531.47	312.17	3323.03	3219.30	17.02	OSF1.50	19520.00	9762.00	MinPt-CiCl
3526.03	331.08	3304.98	3194.95	16.02	OSF1.50	20150.00	9762.00	MinPt-CiCl
3520.63	344.23	3290.82	3176.40	15.38	OSF1.50	20590.00	9762.00	MinPt-CiCl
3520.78	344.76	3290.62	3176.03	15.36	OSF1.50	20630.00	9762.00	MINPT-O-EQU
3520.98	345.00	3290.65	3175.98	15.35	OSF1.50	20650.00	9762.00	MinPt-O-ADP
3528.51	352.07	3293.47	3176.44	15.07	OSF1.50	20910.00	9762.00	MinPts
3537.20	356.76	3299.03	3180.44	14.91	OSF1.50	21144.25	9762.00	MinPts

Final Surveys - Cimarex
Riverbend 12-13 Federal Com
#33H Off-20967ft (Surcon
Corrected) (Def Survey)

Pass

1153.21	32.81	1151.92	1120.40	N/A	MAS = 10.00 (m)	0.00	0.00	MinPts
1153.22	32.81	1151.92	1120.41	104200.25	MAS = 10.00 (m)	26.00	26.00	WRP
1153.82	32.81	1151.63	1121.01	1287.74	MAS = 10.00 (m)	230.00	230.00	MINPT-O-EQU
1156.30	32.81	1151.87	1123.50	367.27	MAS = 10.00 (m)	750.00	750.00	MinPts
1156.40	32.81	1151.74	1123.60	341.76	MAS = 10.00 (m)	800.00	800.00	MINPT-O-EQU
1149.80	32.81	1140.11	1116.99	136.62	MAS = 10.00 (m)	1900.00	1900.00	MinPts
1149.86	32.81	1140.03	1117.06	134.40	MAS = 10.00 (m)	1930.00	1930.00	MINPT-O-EQU
1154.06	32.81	1143.62	1121.25	125.94	MAS = 10.00 (m)	2100.00	2099.98	MinPt-O-SF
1488.93	32.81	1477.02	1456.13	139.97	MAS = 10.00 (m)	3180.00	3152.77	MinPt-O-SF
1598.28	32.81	1585.45	1565.47	138.41	MAS = 10.00 (m)	3420.00	3381.98	MinPt-O-SF
1644.57	32.81	1631.42	1611.76	138.54	MAS = 10.00 (m)	3520.00	3477.49	MinPt-O-SF
1713.95	32.81	1700.31	1681.14	138.66	MAS = 10.00 (m)	3670.00	3620.75	MinPt-O-SF
1782.99	32.81	1768.77	1750.18	137.72	MAS = 10.00 (m)	3820.00	3764.02	MinPt-O-SF
3817.48	68.28	3771.54	3749.21	85.45	OSF1.50	9607.16	9291.20	MinPt-O-SF
3820.56	70.83	3772.91	3749.72	82.38	OSF1.50	9620.00	9303.44	MinPt-O-ADP
3837.62	71.21	3789.72	3766.41	82.29	OSF1.50	9700.00	9378.41	MinPt-O-SF
3923.37	72.39	3874.68	3850.98	82.75	OSF1.50	10250.00	9720.31	MinPt-CiCl
3923.38	72.42	3874.67	3850.96	82.71	OSF1.50	10260.00	9722.67	MINPT-O-EQU
3923.41	72.45	3874.65	3850.95	82.67	OSF1.50	10270.00	9724.97	MinPt-O-ADP
3960.07	80.61	3905.90	3879.46	74.86	OSF1.50	11010.00	9762.00	MINPT-O-EQU
3960.40	81.09	3905.91	3879.31	74.41	OSF1.50	11020.00	9762.00	MinPt-O-ADP
3924.12	119.18	3844.24	3804.94	49.91	OSF1.50	12710.00	9762.00	MinPt-CiCl
3924.45	120.21	3843.88	3804.24	49.48	OSF1.50	12780.00	9762.00	MINPT-O-EQU
3924.81	120.65	3843.94	3804.15	49.30	OSF1.50	12810.00	9762.00	MinPt-O-ADP
3926.33	122.12	3844.49	3804.21	48.73	OSF1.50	12890.00	9762.00	MinPt-O-ADP
3919.66	180.48	3798.91	3739.18	32.80	OSF1.50	14980.00	9762.00	MinPt-CiCl
3926.84	195.17	3796.30	3731.67	30.37	OSF1.50	15550.00	9762.00	MINPT-O-EQU
3929.61	201.24	3795.02	3728.37	29.47	OSF1.50	15750.00	9762.00	MINPT-O-EQU
3930.24	201.95	3795.18	3728.29	29.37	OSF1.50	15790.00	9762.00	MinPt-O-ADP

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level			Alert	Status
	Cl-Cl (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major		
3923.57		259.60	3750.07	3663.97	22.78	OSF1.50	17720.00	9762.00				MinPt-CiCl	
3923.96		260.77	3749.68	3663.19	22.68	OSF1.50	17790.00	9762.00				MINPT-O-EOU	
3924.51		261.43	3749.76	3663.07	22.62	OSF1.50	17830.00	9762.00				MinPt-O-ADP	
3930.45		270.04	3749.99	3660.41	21.93	OSF1.50	18130.00	9762.00				MINPT-O-EOU	
3902.58		341.69	3674.35	3560.88	17.19	OSF1.50	20490.00	9762.00				MinPt-CiCl	
3903.43		344.08	3673.61	3559.34	17.07	OSF1.50	20610.00	9762.00				MINPT-O-EOU	
3904.25		345.07	3673.78	3559.18	17.03	OSF1.50	20660.00	9762.00				MinPt-O-ADP	
3905.34		346.17	3674.13	3559.16	16.98	OSF1.50	20710.00	9762.00				MinPt-O-ADP	
3914.96		357.82	3675.99	3557.14	16.47	OSF1.50	21080.00	9762.00				MINPT-O-EOU	
3916.14		359.47	3676.06	3556.67	16.39	OSF1.50	21144.25	9762.00				MinPts	

Final Surveys - Cimarex
Riverbend 12-13 Federal Com
#32H 0' to 21507' (Surcon
Corrected) (Def Survey)

Pass

1173.08	32.81	1171.79	1140.27	N/A	MAS = 10.00 (m)	0.00	0.00					Surface	
1173.08	32.81	1171.78	1140.27	97687.53	MAS = 10.00 (m)	26.00	26.00					WRP	
1162.96	32.81	1158.35	1130.15	334.72	MAS = 10.00 (m)	780.00	780.00					MinPts	
1162.98	32.81	1158.33	1130.17	330.18	MAS = 10.00 (m)	790.00	790.00					MINPT-O-EOU	
1278.65	32.81	1267.98	1245.84	133.94	MAS = 10.00 (m)	2090.00	2089.99					MinPt-O-SF	
1789.07	32.81	1776.57	1756.26	155.69	MAS = 10.00 (m)	3480.00	3439.29					MinPt-O-SF	
4233.74	71.65	4185.64	4162.08	89.84	OSF1.50	9520.00	9207.95					MinPt-O-ADP	
4286.36	73.32	4237.15	4213.04	88.87	OSF1.50	9819.70	9482.92					MinPt-O-SF	
4303.42	73.61	4254.02	4229.81	88.88	OSF1.50	9900.00	9545.80					MinPt-O-SF	
4336.08	74.29	4286.23	4261.79	88.70	OSF1.50	10230.00	9715.39					MinPt-CiCl	
4336.12	74.38	4286.21	4261.74	88.59	OSF1.50	10250.00	9720.31					MINPT-O-EOU	
4336.17	74.43	4286.22	4261.74	88.54	OSF1.50	10260.00	9722.67					MinPt-O-ADP	
4339.90	76.01	4288.90	4263.89	86.75	OSF1.50	10450.00	9754.52					MinPt-O-ADP	
4341.23	81.20	4286.77	4260.03	81.16	OSF1.50	10800.00	9762.00					MinPt-CiCl	
4341.77	82.38	4286.55	4259.39	79.99	OSF1.50	10900.00	9762.00					MINPT-O-EOU	
4334.84	106.28	4263.66	4228.56	61.74	OSF1.50	12090.00	9762.00					MinPt-CiCl	
4335.32	107.74	4263.17	4227.58	60.90	OSF1.50	12180.00	9762.00					MINPT-O-EOU	
4334.01	118.35	4254.79	4215.67	55.38	OSF1.50	12600.00	9762.00					MinPt-CiCl	
4319.75	141.04	4225.40	4178.72	46.26	OSF1.50	13490.00	9762.00					MinPt-CiCl	
4317.42	170.02	4203.74	4147.39	38.30	OSF1.50	14560.00	9762.00					MinPt-CiCl	
4311.27	201.30	4176.75	4109.97	32.28	OSF1.50	15670.00	9762.00					MinPt-CiCl	
4308.56	217.65	4163.13	4090.91	29.82	OSF1.50	16240.00	9762.00					MinPt-CiCl	
4311.77	224.54	4161.75	4087.23	28.92	OSF1.50	16530.00	9762.00					MINPT-O-EOU	
4315.50	230.93	4161.22	4084.57	28.14	OSF1.50	16750.00	9762.00					MINPT-O-EOU	
4316.05	231.75	4161.22	4084.29	28.05	OSF1.50	16780.00	9762.00					MINPT-O-EOU	
4321.51	238.76	4162.01	4082.76	27.26	OSF1.50	17040.00	9762.00					MinPt-O-ADP	
4291.13	287.12	4099.39	4004.01	22.49	OSF1.50	18610.00	9762.00					MinPt-CiCl	
4291.62	288.53	4098.94	4003.09	22.38	OSF1.50	18690.00	9762.00					MINPT-O-EOU	
4292.20	289.22	4099.06	4002.98	22.33	OSF1.50	18730.00	9762.00					MinPt-O-ADP	
4297.98	312.04	4089.62	3985.94	20.72	OSF1.50	19450.00	9762.00					MinPt-CiCl	
4296.80	323.30	4080.94	3973.50	19.99	OSF1.50	19830.00	9762.00					MinPt-CiCl	
4292.38	340.59	4064.94	3951.74	18.95	OSF1.50	20410.00	9762.00					MinPt-CiCl	
4291.97	348.00	4059.64	3943.97	18.55	OSF1.50	20660.00	9762.00					MinPt-CiCl	
4291.65	356.69	4053.53	3934.96	18.09	OSF1.50	20950.00	9762.00					MinPt-CiCl	
4291.67	360.63	4050.92	3931.04	17.90	OSF1.50	21080.00	9762.00					MinPt-CiCl	
4291.74	360.96	4050.77	3930.78	17.88	OSF1.50	21110.00	9762.00					MINPT-O-EOU	
4291.81	361.05	4050.78	3930.76	17.88	OSF1.50	21120.00	9762.00					MinPt-O-ADP	
4292.07	361.26	4050.91	3930.81	17.87	OSF1.50	21144.25	9762.00					MinPt-O-SF	

Marathon Oil Whistle Pig Fee 1
SB FEE 5H (Offset)MWD Off-
14257ft (Def Survey)

Pass

4217.79	32.81	4216.66	4184.98	N/A	MAS = 10.00 (m)	0.00	0.00					Surface	
4217.75	32.81	4216.61	4184.94	841786.07	MAS = 10.00 (m)	10.00	10.00					MinPt-O-SF	
4217.73	32.81	4216.60	4184.92	N/A	MAS = 10.00 (m)	20.00	20.00					MINPT-O-EOU	
4217.73	32.81	4216.60	4184.92	N/A	MAS = 10.00 (m)	26.00	26.00					MinPts	
4217.81	32.81	4216.55	4185.00	32137.46	MAS = 10.00 (m)	80.00	80.00					MINPT-O-EOU	
4217.96	32.81	4216.55	4185.15	14994.32	MAS = 10.00 (m)	120.00	120.00					MINPT-O-EOU	
4218.89	32.81	4216.26	4186.09	2805.61	MAS = 10.00 (m)	390.00	390.00					MinPts	
4219.02	32.81	4216.11	4186.21	2370.00	MAS = 10.00 (m)	450.00	450.00					MINPT-O-EOU	
4215.49	32.81	4208.47	4182.68	715.84	MAS = 10.00 (m)	1380.00	1380.00					MinPts	
4215.91	32.81	4207.68	4183.10	593.17	MAS = 10.00 (m)	1640.00	1640.00					MINPT-O-EOU	
4224.13	32.81	4213.91	4191.32	464.22	MAS = 10.00 (m)	2100.00	2099.98					MinPt-O-SF	
4115.01	32.81	4093.26	4082.20	199.62	MAS = 10.00 (m)	4340.00	4260.66					MinPts	
4115.13	32.81	4093.17	4082.32	197.46	MAS = 10.00 (m)	4380.00	4298.86					MINPT-O-EOU	
1303.11	209.01	1163.40	1094.11	9.39	OSF1.50	9360.00	9055.14					MinPt-CiCl	
1303.79	210.79	1162.88	1093.00	9.32	OSF1.50	9400.00	9093.34					MINPT-O-EOU	
1304.15	211.22	1162.96	1092.93	9.30	OSF1.50	9410.00	9102.89					MinPt-O-ADP	
1320.18	216.74	1175.31	1103.44	9.18	OSF1.50	9570.00	9255.71					MinPt-O-SF	
11185.56	112.62	11110.10	11072.94	150.48	OSF1.50	21144.25	9762.00					TD	

COG Illustrated Man Fee Com
#1H (Offset) Gyro+MWD Off-
12865ft (Def Survey)

Pass

2124.55	32.81	2122.57	2091.74	N/A	MAS = 10.00 (m)	0.00	0.00					MinPts	
2124.55	32.81	2122.57	2091.74	N/A	MAS = 10.00 (m)	10.00	10.00					MINPT-O-EOU	
2124.56	32.81	2122.56	2091.75	159022.93	MAS = 10.00 (m)	26.00	26.00					WRP	
2124.67	32.81	2122.51	2091.86	11860.33	MAS = 10.00 (m)	80.00	80.00					MINPT-O-EOU	
2125.17	32.81	2122.16	2092.36	2059.36	MAS = 10.00 (m)	240.00	240.00					MINPT-O-EOU	
2152.14	32.81	2140.22	2119.34	218.49	MAS = 10.00 (m)	2000.00	2000.00					MinPt-O-SF	
2149.58	32.81	2137.63	2116.77	215.75	MAS = 10.00 (m)	2100.00	2099.98					MinPt-O-SF	
2149.16	32.81	2137.30	2116.35	217.64	MAS = 10.00 (m)	2150.00	2149.93					MINPT-O-EOU	
2149.14	32.81	2137.30	2116.34	218.05	MAS = 10.00 (m)	2160.00	2159.92					MinPts	
2193.25	32.81	2181.85	2160.44	232.63	MAS = 10.00 (m)	2780.00	2770.40					MinPt-O-SF	
3464.68	56.50	3426.36	3408.18	95.27	OSF1.50	8300.00	8042.76					MinPt-O-SF	
3514.46	57.27	3475.63	3457.20	95.39	OSF1.50	8450.00	8186.02					MinPt-O-SF	
4021.27	88.24	3961.78	3933.03	69.89	OSF1.50	12090.00	9762.00					MinPt-CiCl	
4021.84	89.90	3961.24	3931.94	68.58	OSF1.50	12180.00	9762.00					MINPT-O-EOU	
4022.47	90.64	3961.38	3931.83	68.02	OSF1.50	12220.00	9762.00					MinPt-O-ADP	
4048.89	119.23	3968.74	3929.66	51.77	OSF1.50	12880.00	9762.00					MINPT-O-EOU	
4050.49	121.26	3968.99	3929.23	50.91	OSF1.50	12950.00	9762.00					MinPt-O-ADP	
4064.67	134.98	3974.06	3929.74	45.84	OSF1.50	13280.00	9762.00					MinPts	
4113.78	172.50	3998.12	3941.28	36.17	OSF1.50	14000.00	9762.00					MINPT-O-EOU	
4116.15	175.14	3998.73	3941.01	35.64	OSF1.50	14080.00	9762.00					MinPt-O-ADP	
4129.51	186.56	4004.48	3942.95	33.54	OSF1.50	14370.00	9762.00					MINPT-O-EOU	
4130.00	187.08	4004.62	3942.92	33.45	OSF1.50	14380.00	9762.00					MinPt-O-ADP	
4147.33	196.48	4015.67	3950.83	31.97	OSF1.50	14640.00	9762.00					MinPts	

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level			Alert	Status
	Cl-Cl (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major		
4173.56	216.86	4028.33	3956.71	29.12		OSF1.50	14980.00	9762.00				MINPT-O-EQU	
4176.10	220.58	4028.33	3955.51	28.64		OSF1.50	15030.00	9762.00				MINPT-O-EQU	
4182.77	230.26	4028.61	3952.51	27.47		OSF1.50	15180.00	9762.00				MINPT-O-EQU	
4183.15	230.81	4028.62	3952.34	27.41		OSF1.50	15190.00	9762.00				MinPt-O-ADP	
4193.21	240.64	4032.13	3952.58	26.34		OSF1.50	15400.00	9762.00				MinPts	
4202.97	255.07	4032.26	3947.90	24.90		OSF1.50	15640.00	9762.00				MINPT-O-EQU	
4203.30	255.45	4032.34	3947.85	24.86		OSF1.50	15650.00	9762.00				MinPt-O-ADP	
4219.95	268.18	4040.50	3951.77	23.77		OSF1.50	15980.00	9762.00				MinPts	
4222.18	269.96	4041.54	3952.22	23.62		OSF1.50	16020.00	9762.00				MinPt-O-SF	
6823.04	193.13	6693.62	6629.91	53.53		OSF1.50	21144.25	9762.00				TD	

Mewbourne Malaga 13 CN
Federal Com 1H (Offset) MWD
Off-12805ft (Def Survey)

Pass

6908.96	32.81	6906.98	6876.15	N/A		MAS = 10.00 (m)	0.00	0.00				Surface	
6908.84	32.81	6906.84	6876.03	522947.19		MAS = 10.00 (m)	26.00	26.00				WRP	
6991.43	32.81	6882.88	6858.68	1039.47		MAS = 10.00 (m)	1450.00	1450.00				MinPts	
6991.72	32.81	6882.55	6858.91	971.92		MAS = 10.00 (m)	1540.00	1540.00				MINPT-O-EQU	
6997.60	32.81	6885.42	6864.79	675.89		MAS = 10.00 (m)	2560.00	2556.44				MinPt-O-SF	
6990.71	32.81	6841.79	6827.90	404.99		MAS = 10.00 (m)	4630.00	4537.63				MinPts	
6961.08	32.81	6841.55	6828.28	390.93		MAS = 10.00 (m)	4740.00	4642.69				MINPT-O-EQU	
2990.27	213.27	2847.42	2776.99	21.21		OSF1.50	18460.00	9762.00				MinPt-CtCt	
2966.57	262.19	2791.12	2704.38	17.09		OSF1.50	19610.00	9762.00				MinPt-CtCt	
2967.35	277.78	2781.51	2689.57	16.13		OSF1.50	19960.00	9762.00				MinPt-CtCt	
2967.83	279.27	2781.00	2688.57	16.04		OSF1.50	20030.00	9762.00				MINPT-O-EQU	
2969.86	282.31	2781.00	2687.56	15.88		OSF1.50	20130.00	9762.00				MINPT-O-EQU	
2973.13	290.40	2778.87	2682.73	15.45		OSF1.50	20290.00	9762.00				MINPT-O-EQU	
2946.60	329.10	2726.54	2617.50	13.50		OSF1.50	21070.00	9762.00				MinPts	
2947.59	329.02	2727.59	2618.57	13.51		OSF1.50	21144.25	9762.00				TD	

Mewbourne Malaga 13 DM
Federal Com 1H (Offset)
Gyro-MWD Off-Update (Def Survey)

Pass

6447.97	32.81	6445.99	6415.16	N/A		MAS = 10.00 (m)	0.00	0.00				Surface	
6447.81	32.81	6445.82	6415.01	364742.62		MAS = 10.00 (m)	26.00	26.00				MinPt-O-SF	
6447.77	32.81	6445.79	6414.96	120867.05		MAS = 10.00 (m)	50.00	50.00				MinPts	
6447.82	32.81	6443.65	6415.02	2931.74		MAS = 10.00 (m)	500.00	500.00				MinPts	
6435.10	32.81	6426.98	6402.29	1047.17		MAS = 10.00 (m)	1320.00	1320.00				MinPts	
6435.19	32.81	6426.87	6402.36	1013.99		MAS = 10.00 (m)	1370.00	1370.00				MINPT-O-EQU	
6448.30	32.81	6437.15	6415.49	703.53		MAS = 10.00 (m)	2100.00	2099.98				MinPt-O-SF	
3925.46	139.86	3831.56	3785.60	42.68		OSF1.50	16020.00	9762.00				MinPt-CtCt	
3925.54	140.12	3831.46	3785.42	42.60		OSF1.50	16050.00	9762.00				MINPT-O-EQU	
3925.61	140.21	3831.48	3785.40	42.58		OSF1.50	16060.00	9762.00				MinPt-O-ADP	
3963.37	143.83	3866.82	3819.54	41.89		OSF1.50	16590.00	9762.00				MinPt-O-SF	
4132.44	172.68	4016.66	3959.75	36.29		OSF1.50	17370.00	9762.00				MinPts	
4151.10	180.21	4030.30	3970.88	34.92		OSF1.50	17520.00	9762.00				MinPts	
4163.70	188.61	4037.31	3975.10	33.45		OSF1.50	17650.00	9762.00				MinPt-O-ADP	
4201.34	200.27	4067.17	4001.07	31.77		OSF1.50	18020.00	9762.00				MinPt-O-ADP	
4289.01	242.28	4126.82	4046.72	26.76		OSF1.50	18780.00	9762.00				MinPts	
4415.51	299.58	4215.16	4115.96	22.25		OSF1.50	20030.00	9762.00				MINPT-O-EQU	
4418.47	303.49	4215.49	4114.99	21.97		OSF1.50	20080.00	9762.00				MinPt-O-ADP	
4461.20	318.96	4247.89	4142.22	21.10		OSF1.50	20590.00	9762.00				MinPts	
4493.48	336.37	4268.57	4157.11	20.15		OSF1.50	20910.00	9762.00				MinPts	
4496.32	343.15	4266.89	4153.17	19.76		OSF1.50	20940.00	9762.00				MinPts	
4505.65	350.84	4271.10	4154.82	19.36		OSF1.50	21070.00	9762.00				MINPT-O-EQU	
4508.06	353.71	4271.60	4154.35	19.22		OSF1.50	21110.00	9762.00				MinPt-O-ADP	
4510.09	354.80	4272.90	4155.29	19.17		OSF1.50	21144.25	9762.00				MinPt-O-SF	

PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Cimarex Energy Company
LEASE NO.:	NMNM088128
WELL NAME & NO.:	Riverbend 12-13 Federal Com 2H
SURFACE HOLE FOOTAGE:	1207'/S & 2462'/W
BOTTOM HOLE FOOTAGE:	330'/S & 1310'/E
LOCATION:	Section 1, T.25 S., R.28 E., NMPM
COUNTY:	Eddy County, New Mexico

COA

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

A. HYDROGEN SULFIDE

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

B. CASING

1. The **13-3/8 inch** surface casing shall be set at approximately **475 feet** (a minimum of **70 feet (Eddy 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.
2. The minimum required fill of cement behind the **9-5/8 inch** intermediate casing and shall be set at approximately **2,660 feet** 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.
 - ❖ In High Cave/Karst Areas if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.
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.
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.

The production liner has an excess of 10%. Additional cement may be 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 **2000 (2M) psi**.

3. 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 intermediate casing shoe shall be **3000 (3M)** psi.
4. 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 production 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.

YJ (07/27/2020)

Riverbend 12-13 Fed Com 2H

Cimarex Energy Co.

UL: N, Sec. 1, 25S, 28E

Eddy 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
Riverbend 12-13 Fed Com 2H
Cimarex Energy Co.
UL: N, Sec. 1, 25S, 28E
Eddy 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 Contacts**Riverbend 12-13 Fed Com 2H**

Cimarex Energy Co.

UL: N, Sec. 1, 25S, 28E

Eddy 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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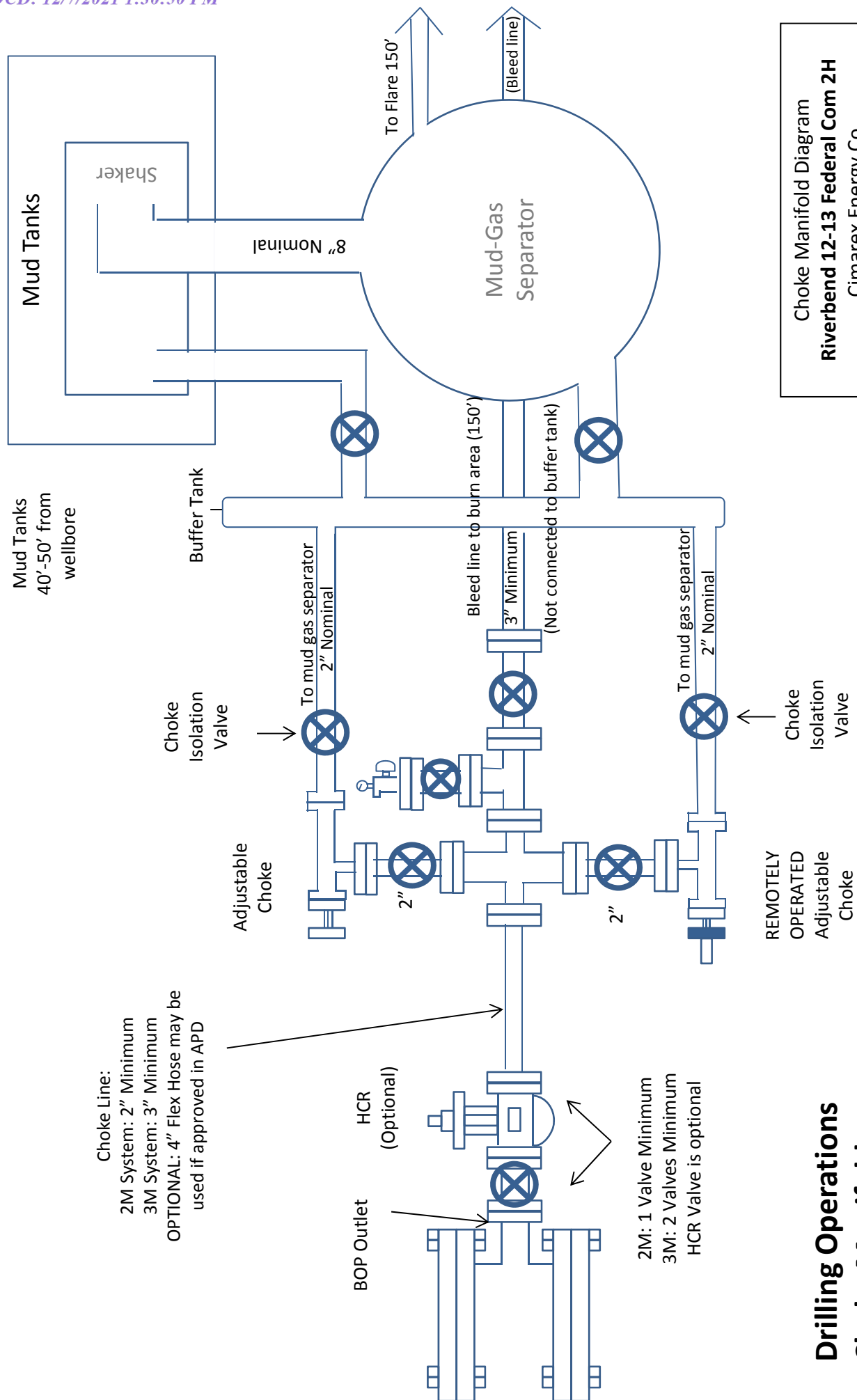
Medical

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

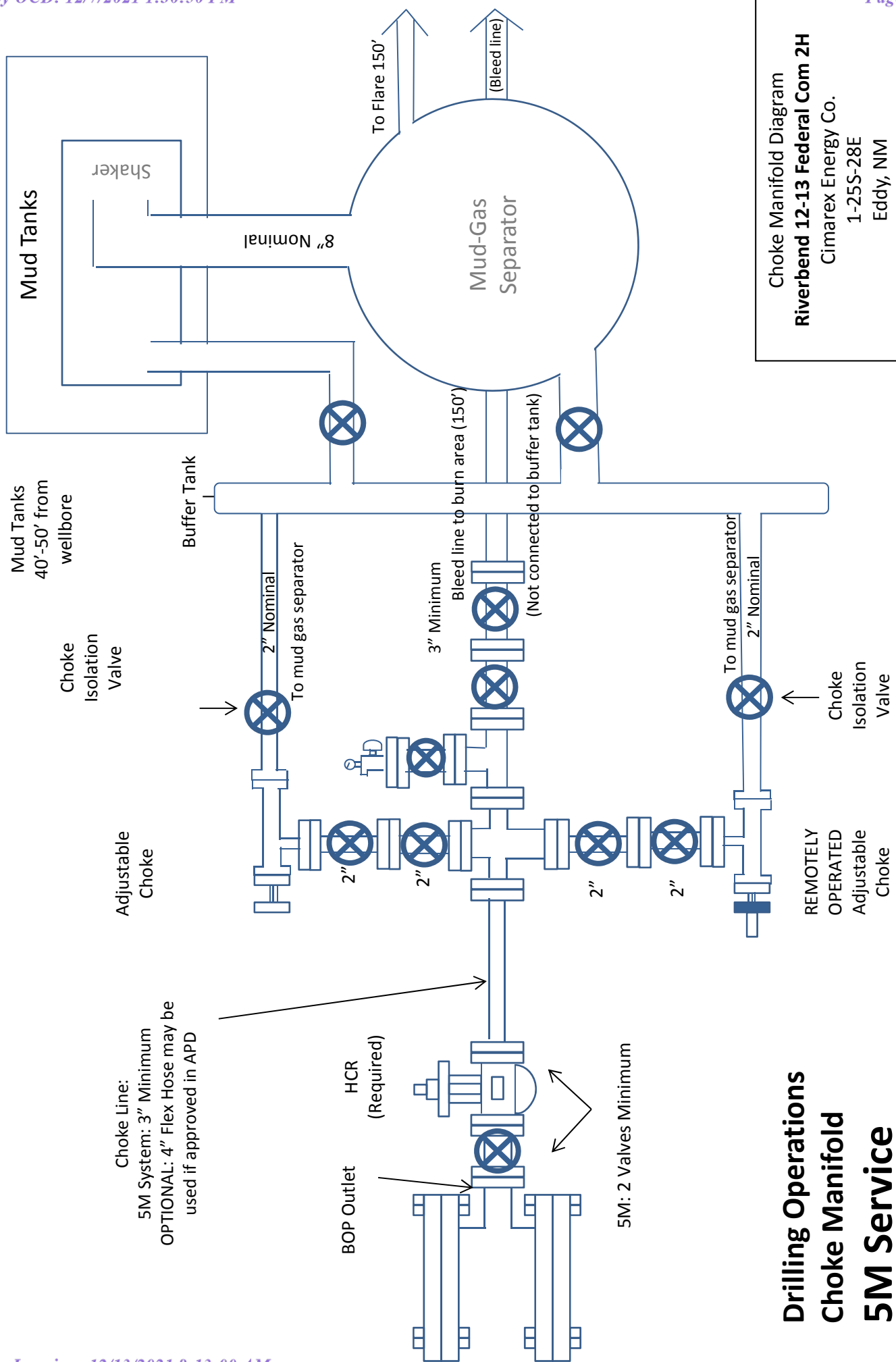
Boots & Coots IWC	800-256-9688	or	281-931-8884
Cudd Pressure Control	432-699-0139	or	432-563-3356
Halliburton	575-746-2757		
B.J. Services	575-746-3569		

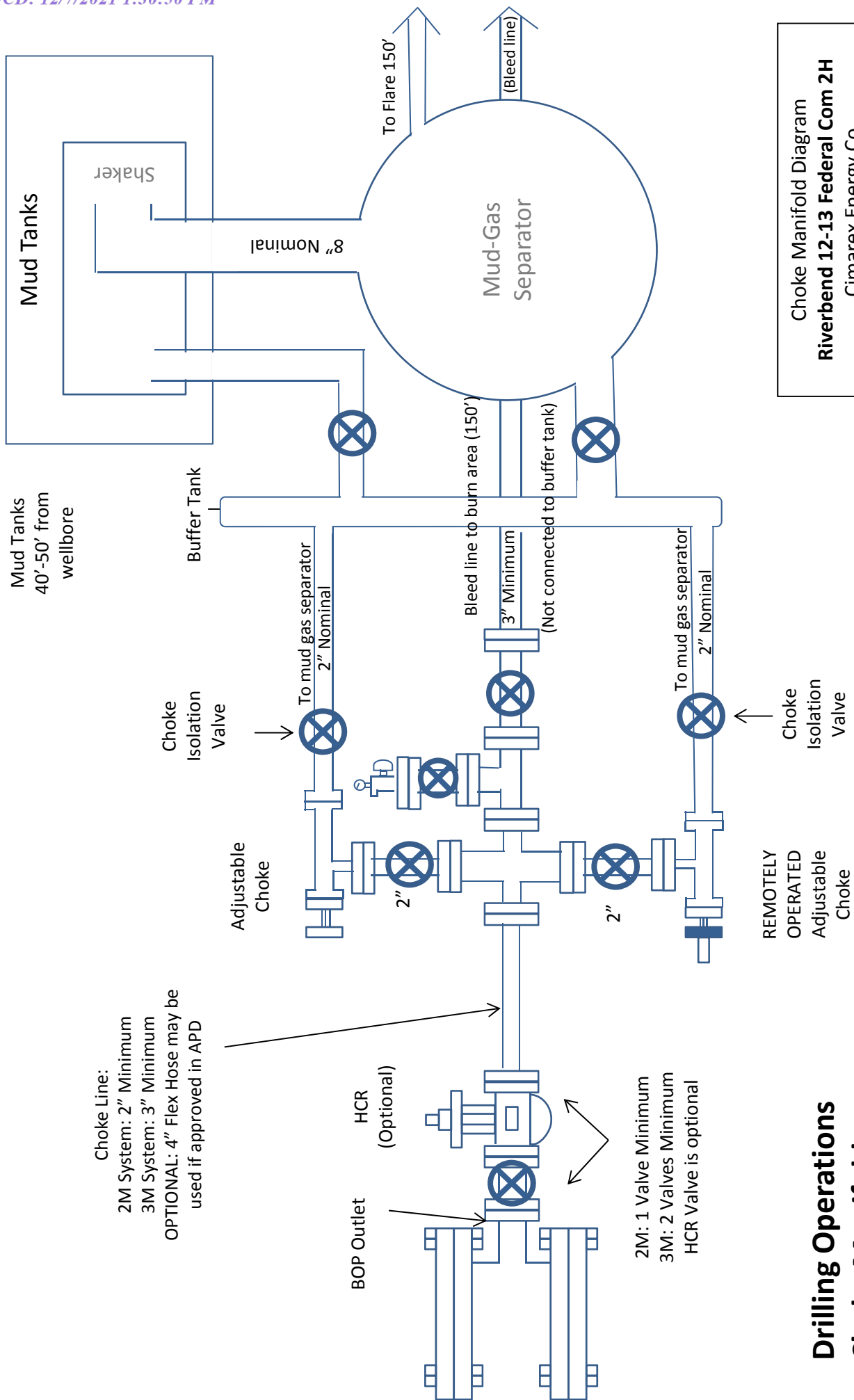
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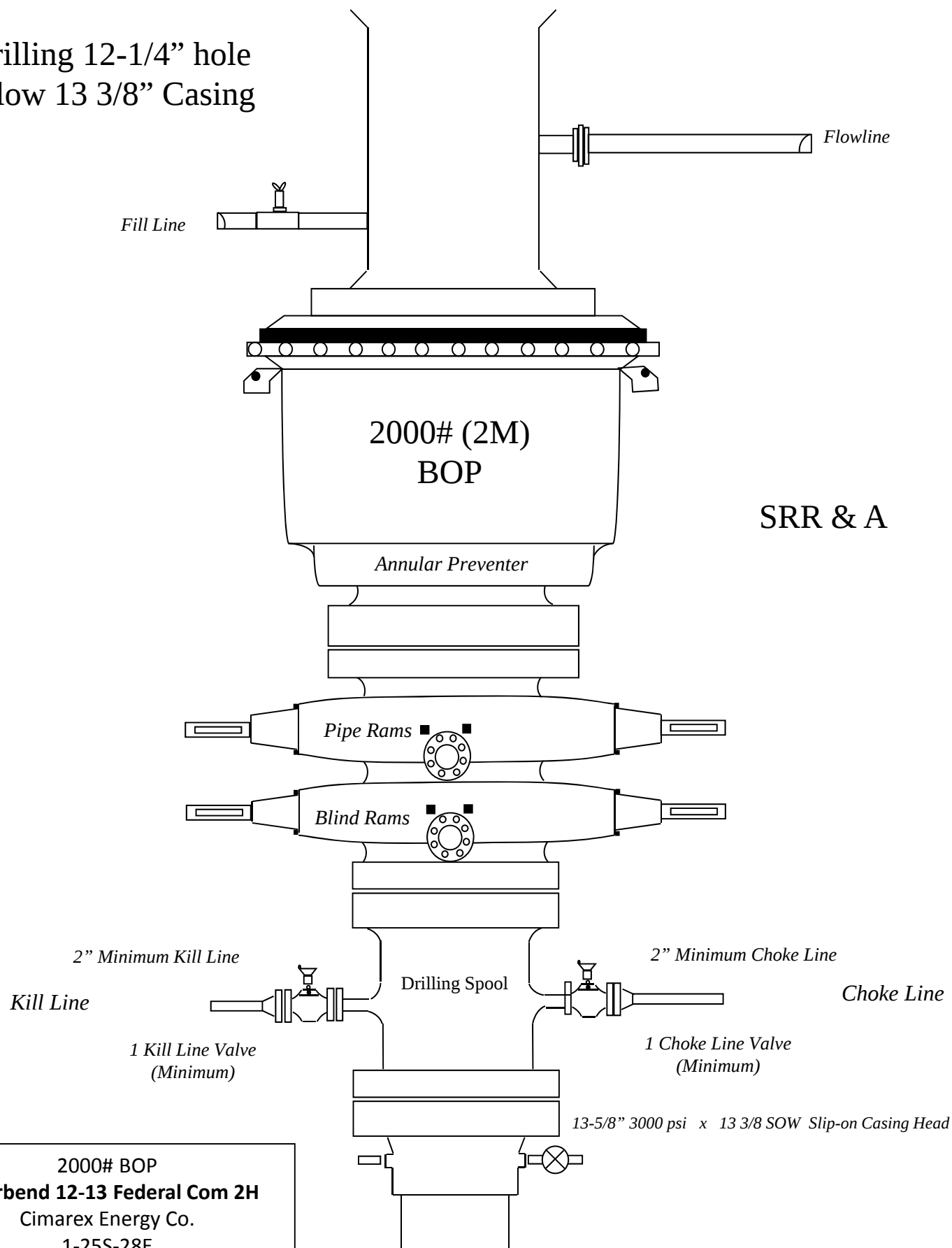
Choke Manifold Diagram
Riverbend 12-13 Federal Com 2H
 Cimarex Energy Co.
 1-25S-28E
 Eddy, NM

**Drilling Operations
 Choke Manifold
 2M/3M Service**





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



2000# BOP
Riverbend 12-13 Federal Com 2H
Cimarex Energy Co.
1-25S-28E
Eddy, NM

Drilling 6" hole below 7"
Casing

Fill Line

Flowline

5000# (5M)
BOP

Annular Preventer

SRR & A

Pipe Rams

Blind Rams

2" Minimum Kill Line

Kill Line

Drilling
Spool

3" minimum choke line

Choke Line

2 Valves Minimum
(HCR Required)

2 Valves and a check valve

Wellhead
Assembly

11" 5000 psi x 7-1/16" 10,000 psi
Wellhead Assembly

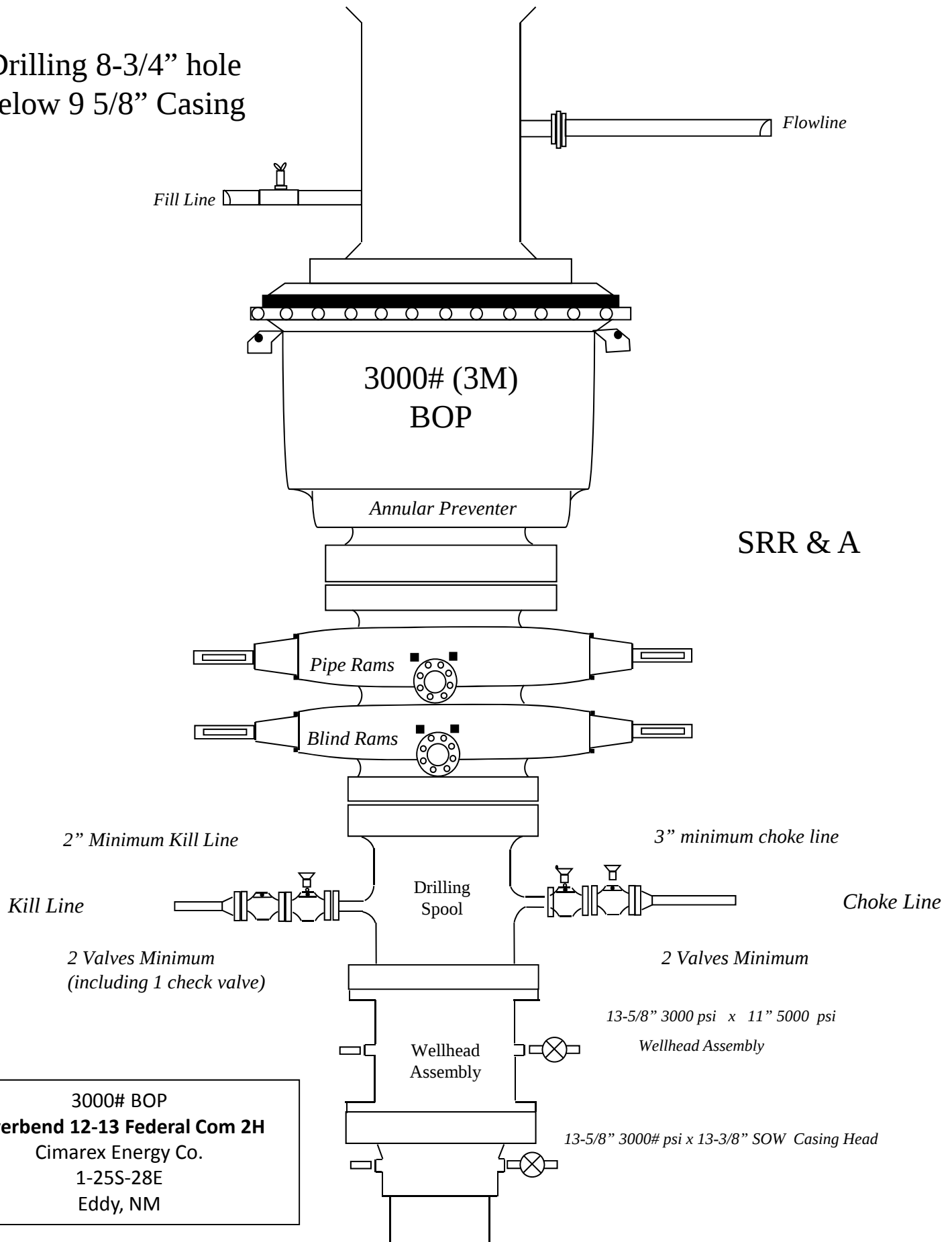
Wellhead
Assembly

13-5/8" 3000 psi x 11" 5000 psi
Wellhead Assembly

13-5/8" 3000# psi x 13-3/8" SOW Casing Head

5000# BOP
Riverbend 12-13 Federal Com 2H
Cimarex Energy Co.
1-25S-28E
Eddy, NM

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





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

Bond Info Data Report

07/26/2021

APD ID: 10400019949

Submission Date: 08/30/2017

Highlighted data
reflects the most
recent changes

Operator Name: CIMAREX ENERGY COMPANY

Well Name: RIVERBEND 12-13 FEDERAL COM

Well Number: 2H

[Show Final Text](#)

Well Type: CONVENTIONAL GAS 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:

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 65435

CONDITIONS

Operator: CIMAREX ENERGY CO. 600 N. Marienfeld Street Midland, TX 79701	OGRID:
	215099
	Action Number: 65435
	Action Type: [C-101] BLM - Federal/Indian Land Lease (Form 3160-3)

CONDITIONS

Created By	Condition	Condition Date
kpickford	Operator has multiple wells in violation of 5.9 for financial assurance. Operator MUST be in compliance with 5.9 prior to any C-104 approval.	12/13/2021
kpickford	Surface casing must be set 25' below top of Rustler Anhydrite in order to seal off protectable water	12/13/2021
kpickford	Notify OCD 24 hours prior to casing & cement	12/13/2021
kpickford	Will require a File As Drilled C-102 and a Directional Survey with the C-104	12/13/2021
kpickford	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	12/13/2021
kpickford	Cement is required to circulate on both surface and intermediate1 strings of casing	12/13/2021
kpickford	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	12/13/2021