

Well Name: CASCADE 29 FEDERAL	Well Location: T25S / R33E / SEC 29 / SWSW / 32.095062 / -103.60166	County or Parish/State: LEA / NM
Well Number: 211H	Type of Well: OIL WELL	Allottee or Tribe Name:
Lease Number: NMNM43562	Unit or CA Name:	Unit or CA Number:
US Well Number:	Operator: COTERRA ENERGY OPERATING CO	

Notice of Intent

Sundry ID: 2881236

Type of Submission: Notice of Intent	Type of Action: APD Change
Date Sundry Submitted: 11/03/2025	Time Sundry Submitted: 02:36
Date proposed operation will begin: 11/24/2025	

Procedure Description: Coterra Energy Operating requests the following change to the Cascade 29 Federal 211H (APD ID 10400106642): BHL change from 100 FSL 1650 FWL to 100 FSL 1640 FWL Updated C102, and directional plans are attached.

NOI Attachments

Procedure Description

CASCADE_29_FEDERAL_211H_Sundry_Submittal_11032025_20251210115541.pdf

Conditions of Approval

Specialist Review

29_25_33_M_Sundry_ID_2881236_Cascade_29_Federal_211H__20251211101221.pdf

Received by OCD: 12/16/2025 7:19:01 AM

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US Well Number:	Operator: COTERRA ENERGY OPERATING CO	

Operator

I certify that the foregoing is true and correct. 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. Electronic submission of Sundry Notices through this system satisfies regulations requiring a

Operator Electronic Signature: SHELLY BOWEN	Signed on: DEC 10, 2025 11:55 AM
Name: COTERRA ENERGY OPERATING CO	
Title: Regulatory Analyst	
Street Address: 6001 DEAUVILLE BLVD STE 300N	
City: MIDLAND	State: TX
Phone: (432) 620-1644	
Email address: DL_PBUREGULATORY@COTERRA.COM	

Field

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

BLM Point of Contact

BLM POC Name: LONG VO	BLM POC Title: Petroleum Engineer
BLM POC Phone: 5759885402	BLM POC Email Address: LVO@BLM.GOV
Disposition: Approved	Disposition Date: 12/11/2025
Signature: Long Vo	

Form 3160-5
(October 2024)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No. 1004-0220
Expires: October 31, 2027

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

5. Lease Serial No.	
6. If Indian, Allottee or Tribe Name	
7. If Unit of CA/Agreement, Name and/or No.	
8. Well Name and No.	
9. API Well No.	
10. Field and Pool or Exploratory Area	
11. Country or Parish, State	

SUBMIT IN TRIPLICATE - Other instructions on page 2

1. Type of Well		
☐ Oil Well	☐ Gas Well	☐ Other
2. Name of Operator		
3a. Address	3b. Phone No. (include area code)	
4. Location of Well (Footage, Sec., T.,R.,M., or Survey Description)		

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

TYPE OF SUBMISSION	TYPE OF ACTION				
☐ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off	
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity	
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☐ Other	
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon		
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal		

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

14. I hereby certify that the foregoing is true and correct. Name (Printed/Typed)	Title
Signature	Date

THE SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by	Title	Date
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.	Office	

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.

(Instructions on page 2)

GENERAL INSTRUCTIONS

This form is designed for submitting proposals to perform certain well operations and reports of such operations when completed as indicated on Federal and Indian lands pursuant to applicable Federal law and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local area or regional procedures and practices, are either shown below, will be issued by or may be obtained from the local Federal office.

SPECIFIC INSTRUCTIONS

Item 4 - Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult the local Federal office for specific instructions.

Item 13: Proposals to abandon a well and subsequent reports of abandonment should include such special information as is required by the local Federal office. In addition, such proposals and reports should include reasons for the abandonment; data on any former or present productive zones or other zones with present significant fluid contents not sealed off by cement or otherwise; depths (top and bottom) and method of placement of cement plugs; mud or other material placed below, between and above plugs; amount, size, method of parting of any casing, liner or tubing pulled and the depth to the top of any tubing left in the hole; method of closing top of well and date well site conditioned for final inspection looking for approval of the abandonment. If the proposal will involve **hydraulic fracturing operations**, you must comply with 43 CFR 3162.3-3, including providing information about the protection of usable water. Operators should provide the best available information about all formations containing water and their depths. This information could include data and interpretation of resistivity logs run on nearby wells. Information may also be obtained from state or tribal regulatory agencies and from local BLM offices.

NOTICES

The privacy Act of 1974 and the regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.

AUTHORITY: 30 U.S.C. 181 et seq., 351 et seq., 25 U.S.C. 396; 43 CFR 3160.

PRINCIPAL PURPOSE: The information is used to: (1) Evaluate, when appropriate, approve applications, and report completion of subsequent well operations, on a Federal or Indian lease; and (2) document for administrative use, information for the management, disposal and use of National Resource lands and resources, such as: (a) evaluating the equipment and procedures to be used during a proposed subsequent well operation and reviewing the completed well operations for compliance with the approved plan; (b) requesting and granting approval to perform those actions covered by 43 CFR 3162.3-2, 3162.3-3, and 3162.3-4; (c) reporting the beginning or resumption of production, as required by 43 CFR 3162.4-1(c) and (d) analyzing future applications to drill or modify operations in light of data obtained and methods used.

ROUTINE USES: Information from the record and/or the record will be transferred to appropriate Federal, State, local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecutions in connection with congressional inquiries or to consumer reporting agencies to facilitate collection of debts owed the Government.

EFFECT OF NOT PROVIDING THE INFORMATION: Filing of this notice and report and disclosure of the information is mandatory for those subsequent well operations specified in 43 CFR 3162.3-2, 3162.3-3, 3162.3-4.

The Paperwork Reduction Act of 1995 requires us to inform you that:

The BLM collects this information to evaluate proposed and/or completed subsequent well operations on Federal or Indian oil and gas leases.

Response to this request is mandatory.

The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

BURDEN HOURS STATEMENT: Public reporting burden for this form is estimated to average 8 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0137), Bureau Information Collection Clearance Officer (WO-630), 1849 C St., N.W., Mail Stop 401 LS, Washington, D.C. 20240

Additional Information

Location of Well

0. SHL: SWSW / 270 FSL / 370 FWL / TWSP: 25S / RANGE: 33E / SECTION: 29 / LAT: 32.095062 / LONG: -103.60166 (TVD: 0 feet, MD: 0 feet)

PPP: SWSW / 100 FSL / 330 FWL / TWSP: 25S / RANGE: 33E / SECTION: 29 / LAT: 32.094595 / LONG: -103.60179 (TVD: 0 feet, MD: 0 feet)

BHL: SESW / 100 FSL / 1650 FWL / TWSP: 25S / RANGE: 33E / SECTION: 29 / LAT: 32.094593 / LONG: -103.597528 (TVD: 0 feet, MD: 0 feet)

CONFIDENTIAL

C-102 Submit Electronically Via OCD Permitting	State of New Mexico Energy, Minerals & Natural Resources Department OIL CONSERVATION DIVISION	Revised July 9, 2024	
		Submittal Type:	☐ Initial Submittal
			☒ Amended Report
		☐ As Drilled	

WELL LOCATION INFORMATION

API Number 30-025-55532	Pool Code 97794 97903	Pool Name WC-025 G-06 S253229B; UPR BONE SPRING WC-025 G-08 S253235G; LWR BONE
Property Code 39981	Property Name CASCADE 29 FEDERAL	Well Number 211H
OGRID No. 215099	Operator Name CIMAREX ENERGY CO.	Ground Level Elevation 3401.3'
Surface Owner: ☐ State ☐ Fee ☐ Tribal ☒ Federal Mineral Owner: ☐ State ☐ Fee ☐ Tribal ☒ Federal		

Surface Location

UL M	Section 29	Township 25S	Range 33E	Lot	Ft. from N/S 270 SOUTH	Ft. from E/W 370 WEST	Latitude (NAD 83) 32.095062°	Longitude (NAD 83) -103.601660°	County LEA
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Bottom Hole Location

UL N	Section 29	Township 25S	Range 33E	Lot	Ft. from N/S 100 SOUTH	Ft. from E/W 1640 WEST	Latitude (NAD 83) 32.094593°	Longitude (NAD 83) -103.597560°	County LEA
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Dedicated Acres 320	Infill or Defining Well Infill	Defining Well API Cascade 29 20 17 301H	Overlapping Spacing Unit (Y/N) N Y	Consolidation Code O
Order Numbers.	Pending Well setbacks are under Common Ownership: ☒ Yes ☐ No			

Kick Off Point (KOP)

UL M	Section 29	Township 25S	Range 33E	Lot	Ft. from N/S 100 SOUTH	Ft. from E/W 330 WEST	Latitude (NAD 83) 32.094595°	Longitude (NAD 83) -103.601790°	County LEA
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First Take Point (FTP)

UL M	Section 29	Township 25S	Range 33E	Lot	Ft. from N/S 100 SOUTH	Ft. from E/W 330 WEST	Latitude (NAD 83) 32.094595°	Longitude (NAD 83) -103.601790°	County LEA
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Last Take Point (LTP)

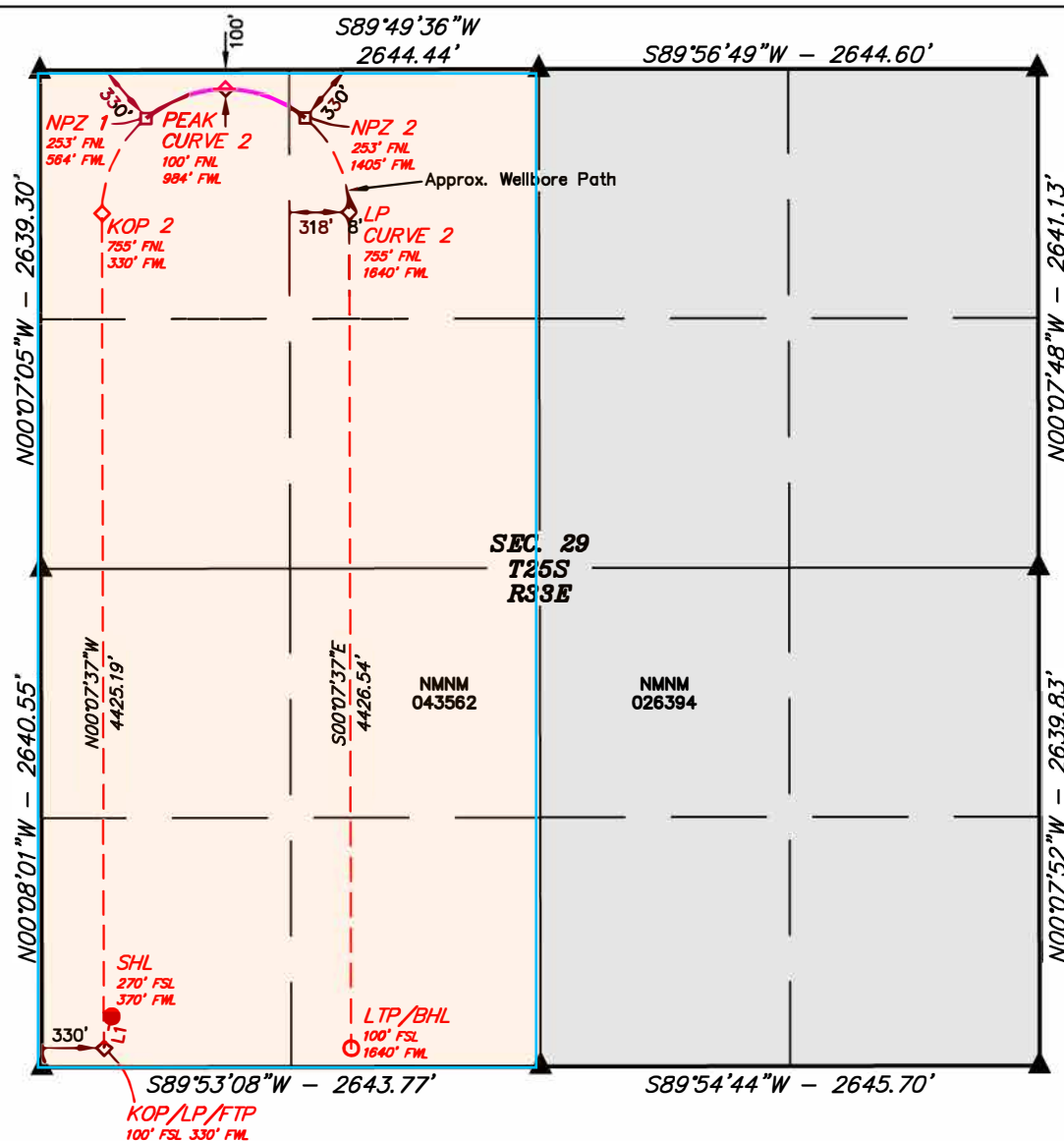
UL N	Section 29	Township 25S	Range 33E	Lot	Ft. from N/S 100 SOUTH	Ft. from E/W 1640 WEST	Latitude (NAD 83) 32.094593°	Longitude (NAD 83) -103.597560°	County LEA
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Unitized Area or Area of Uniform Interest W2 Section 29	Spacing Unit Type ☒ Horizontal ☐ Vertical	Ground Floor Elevation: 3401.3
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OPERATOR CERTIFICATIONS <i>I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and, if the well is a vertical or directional well, 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 a working interest or unleased mineral interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.</i> <i>If this well is a horizontal well, I further certify that this organization has received the consent of at least one lessee or owner of a working interest or unleased mineral interest in each tract (in the target pool or formation) in which any part of the well's completed interval will be located or obtained a compulsory pooling order from the division.</i> <i>Shelly Bowen</i> 11/3/2025 Signature Date Shelly Bowen Printed Name shelly.bowen@coterra.com Email Address	SURVEYOR CERTIFICATIONS <i>I hereby certify that the well location shown on this plat was plotted from the 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.</i>  Signature and Seal of Professional Surveyor 23782 August 26, 2025 Certificate Number Date of Survey
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Note: No allowable will be assigned to this completion until all interest have been consolidated or a non-standard unit has been approved by the division.

Property Name CASCADE 29 FEDERAL	Well Number 211H	Drawn By L.T.T. 08-19-25	Revised By REV: 2 L.T.T. 10-20-25 (WELBORE CHANGES)
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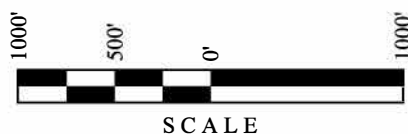
NOTE:

- Distances referenced on plat to section lines are perpendicular.
- Basis of Bearings is a Transverse Mercator Projection with a Central Meridian of W103°53'00" (NAD 83)
- Colored areas represent Federal oil and gas leases.

LINE TABLE

LINE	DIRECTION	LENGTH
L1	S13°06'29"W	174.65'

- = SURFACE HOLE LOCATION
- ◇ = KICK OFF POINT/LANDING POINT/FIRST TAKE POINT PEAK CURVE
- = NPZ POINT
- = LAST TAKE POINT/BOTTOM HOLE LOCATION
- ▲ = SECTION CORNER LOCATED
- = NON-PERFORATION ZONE



NAD 83 (SURFACE HOLE LOCATION)
LATITUDE = 32°05'42.22" (32.095062°)
LONGITUDE = -103°36'05.98" (-103.601660°)
NAD 27 (SURFACE HOLE LOCATION)
LATITUDE = 32°05'41.77" (32.094937°)
LONGITUDE = -103°36'04.28" (-103.601189°)
STATE PLANE NAD 83 (N.M. EAST)
N: 399089.06' E: 767915.79'
STATE PLANE NAD 27 (N.M. EAST)
N: 399031.40' E: 726729.39'
NAD 83 (KOP/LP/FTP)
LATITUDE = 32°05'40.54" (32.094595°)
LONGITUDE = -103°36'06.44" (-103.601790°)
NAD 27 (KOP/LP/FTP)
LATITUDE = 32°05'40.09" (32.094470°)
LONGITUDE = -103°36'04.75" (-103.601318°)
STATE PLANE NAD 83 (N.M. EAST)
N: 398918.82' E: 767876.90'
STATE PLANE NAD 27 (N.M. EAST)
N: 398861.17' E: 726690.49'
NAD 83 (KICK OFF POINT 2)
LATITUDE = 32°06'24.32" (32.106757°)
LONGITUDE = -103°36'06.42" (-103.601784°)
NAD 27 (KICK OFF POINT 2)
LATITUDE = 32°06'23.88" (32.106632°)
LONGITUDE = -103°36'04.72" (-103.601312°)
STATE PLANE NAD 83 (N.M. EAST)
N: 403343.16' E: 767848.62'
STATE PLANE NAD 27 (N.M. EAST)
N: 403285.40' E: 726662.42'
NAD 83 (NPZ 1)
LATITUDE = 32°06'29.29" (32.108137°)
LONGITUDE = -103°36'03.70" (-103.601028°)
NAD 27 (NPZ 1)
LATITUDE = 32°06'28.84" (32.108012°)
LONGITUDE = -103°36'02.00" (-103.600556°)
STATE PLANE NAD 83 (N.M. EAST)
N: 403846.80' E: 768079.29'
STATE PLANE NAD 27 (N.M. EAST)
N: 403789.03' E: 726893.11'
NAD 83 (PEAK CURVE 2)
LATITUDE = 32°06'30.81" (32.108558°)
LONGITUDE = -103°35'58.81" (-103.599670°)
NAD 27 (PEAK CURVE 2)
LATITUDE = 32°06'30.36" (32.108433°)
LONGITUDE = -103°35'57.11" (-103.599198°)
STATE PLANE NAD 83 (N.M. EAST)
N: 404002.74' E: 768498.78'
STATE PLANE NAD 27 (N.M. EAST)
N: 403944.97' E: 727312.60'
NAD 83 (NPZ 2)
LATITUDE = 32°06'29.30" (32.108138°)
LONGITUDE = -103°35'53.92" (-103.598311°)
NAD 27 (NPZ 2)
LATITUDE = 32°06'28.85" (32.108013°)
LONGITUDE = -103°35'52.22" (-103.597839°)
STATE PLANE NAD 83 (N.M. EAST)
N: 403852.86' E: 768920.47'
STATE PLANE NAD 27 (N.M. EAST)
N: 403795.09' E: 727734.28'
NAD 83 (LANDING POINT CURVE 2)
LATITUDE = 32°06'24.33" (32.106758°)
LONGITUDE = -103°35'51.19" (-103.597554°)
NAD 27 (LANDING POINT CURVE 2)
LATITUDE = 32°06'23.88" (32.106634°)
LONGITUDE = -103°35'49.50" (-103.597082°)
STATE PLANE NAD 83 (N.M. EAST)
N: 403352.59' E: 769158.36'
STATE PLANE NAD 27 (N.M. EAST)
N: 403294.83' E: 727972.15'
NAD 83 (LTP/BHL)
LATITUDE = 32°05'40.53" (32.094593°)
LONGITUDE = -103°35'51.22" (-103.597560°)
NAD 27 (LTP/BHL)
LATITUDE = 32°05'40.08" (32.094468°)
LONGITUDE = -103°35'49.52" (-103.597089°)
STATE PLANE NAD 83 (N.M. EAST)
N: 398926.91' E: 769186.65'
STATE PLANE NAD 27 (N.M. EAST)
N: 398869.26' E: 728000.23'

1. Geological Formations

TVD of target 10,705

Pilot Hole TD N/A

MD at TD 21,301

Deepest expected fresh water

Formation	Depth (TVD) from KB	Water/Mineral Bearing/Target Zone	Hazards
Rustler	890	N/A	
Top of Salt	1230	N/A	
Base of Salt/Lamar	4895	N/A	
Top Delaware Sands/Bell Canyon	4990	N/A	
Cherry Canyon	6335	N/A	
Brushy Canyon	7500	N/A	
Basal Brushy Canyon	9010	N/A	
Bone Spring Lime	9035	N/A	
Leonard	9100	N/A	
Avalon Shale	9320	N/A	
1st Bone Spring Sand	10010	Hydrocarbons	
2nd Bone Spring Shale	10232	Hydrocarbons	
2nd Bone Spring Sand	10585	Hydrocarbons	
2nd Bone Spring Sand - Target	10705	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	1050	1050	13-3/8"	48.00	H-40	ST&C	1.63	3.82	6.39
12 1/4	0	4915	4915	9-5/8"	40.00	J-55	BT&C	1.34	1.50	3.20
8 3/4	0	10119	10119							
8 3/4	10119	21301	10705	5-1/2"	20.00	P-110	BT&C	2.22	2.47	54.69
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., Cascade 29 Federal Com 211H

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

3. Cementing Program

Casing	# Sk	Wt. lb/gal	Yld ft ³ /sack	H ₂ O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surface	509	13.50	1.72	9.15	15.5	Lead: Class C + Bentonite
	136	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Intermediate	931	12.90	1.88	9.65	12	Lead: 35:65 (Poz:C) + Salt + Bentonite
	287	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Production	558	10.30	3.64	22.18	12	Lead: Tuned Light + LCM
	2251	12.90	1.88	9.65	12	Tail: 35:65 (Poz:C) + Salt + Bentonite

Casing String	TOC	% Excess
Surface	0	45
Intermediate	0	50
Production	4715	25

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

4. Pressure Control Equipment

A variance is requested for the use of a diverter on the surface casing. See attached for schematic.					
BOP installed and tested before drilling which hole?	Size	Min Required WP	Type		Tested To
12 1/4	13 5/8	10M	Annular	5M	50% of working pressure
			Blind Ram		10M
			Pipe Ram	X	
			Double Ram		
			Other		
8 3/4	13 5/8	10M	Annular	5M	50% of working pressure
			Blind Ram		10M
			Pipe Ram	X	
			Double Ram	X	
			Other		

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

5. Mud Program

Depth	Type	Weight (ppg)	Viscosity	Water Loss
0' to 1050'	Fresh Water	7.80 - 8.30	28	N/C
1050' to 4915'	Brine Water	9.80 - 10.30	30-32	N/C
4915' to 21231'	OBM	8.50 - 9.00	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
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6. Logging and Testing Procedures

Logging, Coring and Testing	
	Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
X	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	5009 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**

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

2. A packoff will be installed after running and cementing the production casing. This packoff will be tested to 10K psi.

BOPE Additional Information & Testing

1. After running the first string of casing, a 10M BOP/BOPE system with 5M annular will be installed. BOPs will be tested according to Onshore

Order #2. BOPE will be tested to full rated pressure (10K for all BOPE except the annular, which is tested to 5K). For the low test, the system will be tested to 250 psi.

2. All BOP equipment will be tested utilizing a conventional test plug.

3. A remote kill line is included in the BOPE system

4. All casing strings will be tested per Onshore Order #2, to 0.22 psi/ft or 1,500 psi, whichever is greater, not to exceed 70% of casing burst.

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

Additional Well Control Notes

1. In the event wellbore pressure encroaches to the maximum rated pressure of the annular, primary pressure control will be switched to the higher rated components (i.e., switch from annular to pipe rams) – upper pipe rams will be closed, and the annular opened in order to not exceed maximum rated pressures.



COTERRA

Rev3



Borehole:	Well:	Field:	Structure:
Cascade 29 Federal 211U	Cascade 29 Federal 211U	NM Lea County (NAD 83)	Coterra - Cascade 29 Federal Pad Lot M

Gravity & Magnetic Parameters				Surface Location				NAD83 New Mexico State Plane, Eastern Zone, US Feet				Miscellaneous			
Model:	HDGM 2025	Dip:	59.54°	Date:	09-Dec-2025	Lat:	N 32 5 42.22	Northing:	399089.06ftUS	Grid Conv:	0.3888°	Slot:	Cascade 29 Federal	TVD Ref:	RKB (3424.300 ft above MSL)
MagDec:	6.051°	FS:	47034.827nT	Gravity FS:	998.429mgn (9.80665 Based)	Lon:	W 103 36 5.98	Easting:	767915.79ftUS	Scale Fact:	0.99996789	Plan:	Coterra Cascade 29 Federal 211U Rev3 kFc 09Dec25		

Critical Point	MD	INCL	AZIM	Critical Points	TVD	VSEC	N(+)S(-)	E(+)W(-)	DLS
SHL [270°FSL, 370°FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rustler	889.60	0.00	130.76	889.60	0.00	0.00	0.00	0.00	0.00
A3 Top	1019.60	0.00	130.76	1019.60	0.00	0.00	0.00	0.00	0.00
A3 Base	1029.60	0.00	130.76	1029.60	0.00	0.00	0.00	0.00	0.00
Salado	1229.60	0.00	130.76	1229.60	0.00	0.00	0.00	0.00	0.00
Nudge, Build 2°/100ft	3000.00	0.00	130.76	3000.00	0.00	0.00	0.00	0.00	0.00
Drop 2°/100ft	3250.02	5.00	130.76	3249.70	-7.12	-7.12	-7.12	8.26	2.00
Hold	4750.97	5.00	130.76	4750.97	-92.88	-92.88	-92.88	107.74	0.00
Lamar	4890.95	2.12	130.76	4890.95	-98.72	-98.72	-98.72	114.51	0.00
Bell Canyon	4995.97	0.22	130.76	4995.97	-99.99	-99.99	-99.99	115.98	2.00
Hold	5006.99	0.00	130.76	5006.99	-100.00	-100.00	-100.00	116.00	0.00
Cherry Canyon	6340.97	0.00	130.76	6340.97	-100.00	-100.00	-100.00	116.00	0.00
Brushy Canyon	7505.97	0.00	130.76	7499.60	-100.00	-100.00	-100.00	116.00	0.00
Basal Brushy Canyon	9015.97	0.00	130.76	9009.60	-100.00	-100.00	-100.00	116.00	0.00
Bone Spring Lime	9040.97	0.00	130.76	9034.80	-100.00	-100.00	-100.00	116.00	0.00
Leonard	9105.97	0.00	130.76	9095.60	-100.00	-100.00	-100.00	116.00	0.00
Avalon	9325.97	0.00	130.76	9319.60	-100.00	-100.00	-100.00	116.00	0.00
1st BS Sand	10015.97	0.00	130.76	10009.60	-100.00	-100.00	-100.00	116.00	0.00
KOP, Build 10°/100ft	10141.99	0.00	130.76	10135.82	-100.00	-100.00	-100.00	116.00	0.00
2nd BS Shale	10238.42	9.64	348.63	10231.80	-92.06	-92.06	-92.06	114.40	10.00
2nd BS Sand	10657.92	51.59	348.63	10654.60	-112.75	-112.75	-112.75	73.22	10.00
Build 5°/100ft	10891.99	75.00	348.63	10889.05	-316.33	-316.33	-316.33	32.28	10.00
Landing Point	11218.33	90.55	353.63	10730.00	-635.16	-635.16	-635.16	-17.23	5.00
Turn 2°/100ft	11323.33	90.55	353.63	10729.99	-739.51	-739.51	-739.51	-28.88	0.00
Hold	11623.15	90.55	359.63	10726.11	-1038.66	-1038.66	-1038.66	-46.50	2.00
IFP1, Build 2°/100ft	12156.73	90.55	359.63	10721.00	-1572.20	-1572.20	-1572.20	-49.98	0.00
Hold	12158.10	90.58	359.63	10720.99	-1573.57	-1573.57	-1573.57	-49.99	2.00
TP1, Drop & Turn 8.77°/100ft	14845.02	90.58	359.63	10694.00	-4260.30	-4260.30	-4260.30	-67.17	0.00
Build & Turn 8.77°/100ft	15358.15	89.85	44.63	10692.00	-4723.50	-4723.50	-4723.50	121.22	8.77
Enter - NPZ	15408.00	89.83	49.00	10692.15	-4757.60	-4757.60	-4757.60	162.56	8.77
Hold	15671.26	89.73	89.63	10694.00	-4917.82	-4917.82	-4917.82	584.93	8.77
TP2, Drop & Turn 8.77°/100ft	15874.26	89.73	89.63	10694.02	-4917.84	-4917.84	-4917.84	584.93	0.00
Exit - NPZ	16368.00	89.25	134.63	10696.51	-4764.11	-4764.11	-4764.11	1010.16	8.77
Build & Turn 8.77°/100ft	16387.38	89.22	134.63	10699.00	-4729.49	-4729.49	-4729.49	1048.11	8.77
Build 2°/100ft	16900.45	89.30	179.63	10706.00	-4268.86	-4268.86	-4268.86	1242.40	8.77
Hold	16907.51	89.44	179.63	10706.08	-4261.60	-4261.60	-4261.60	1242.45	0.00
Cascade 29 Federal 211U - BHL [100°FSL, 1640°FWL]	21331.76	89.44	179.63	10748.00	-162.16	-162.16	-162.16	1270.90	0.00

CONTROLLED

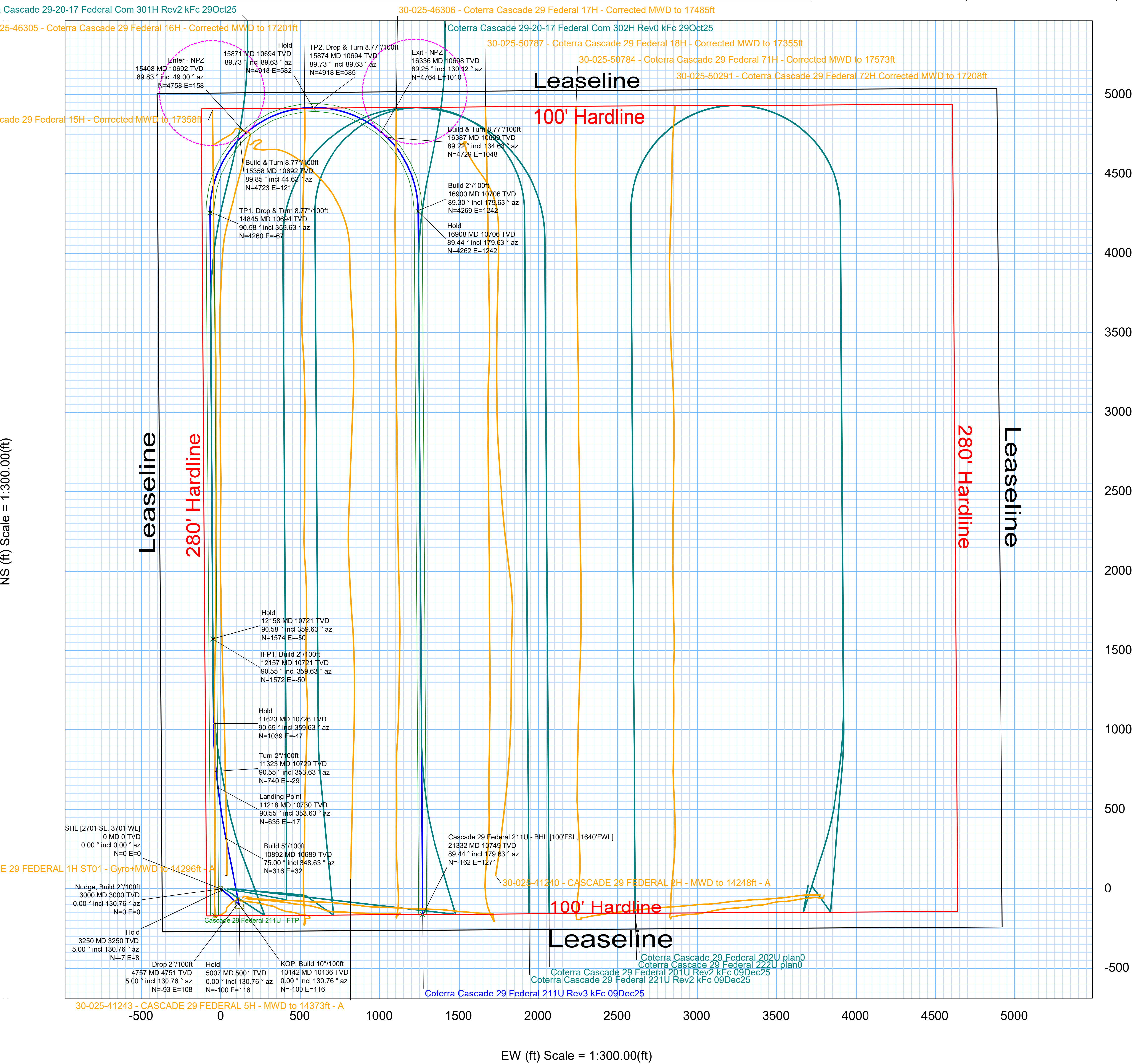
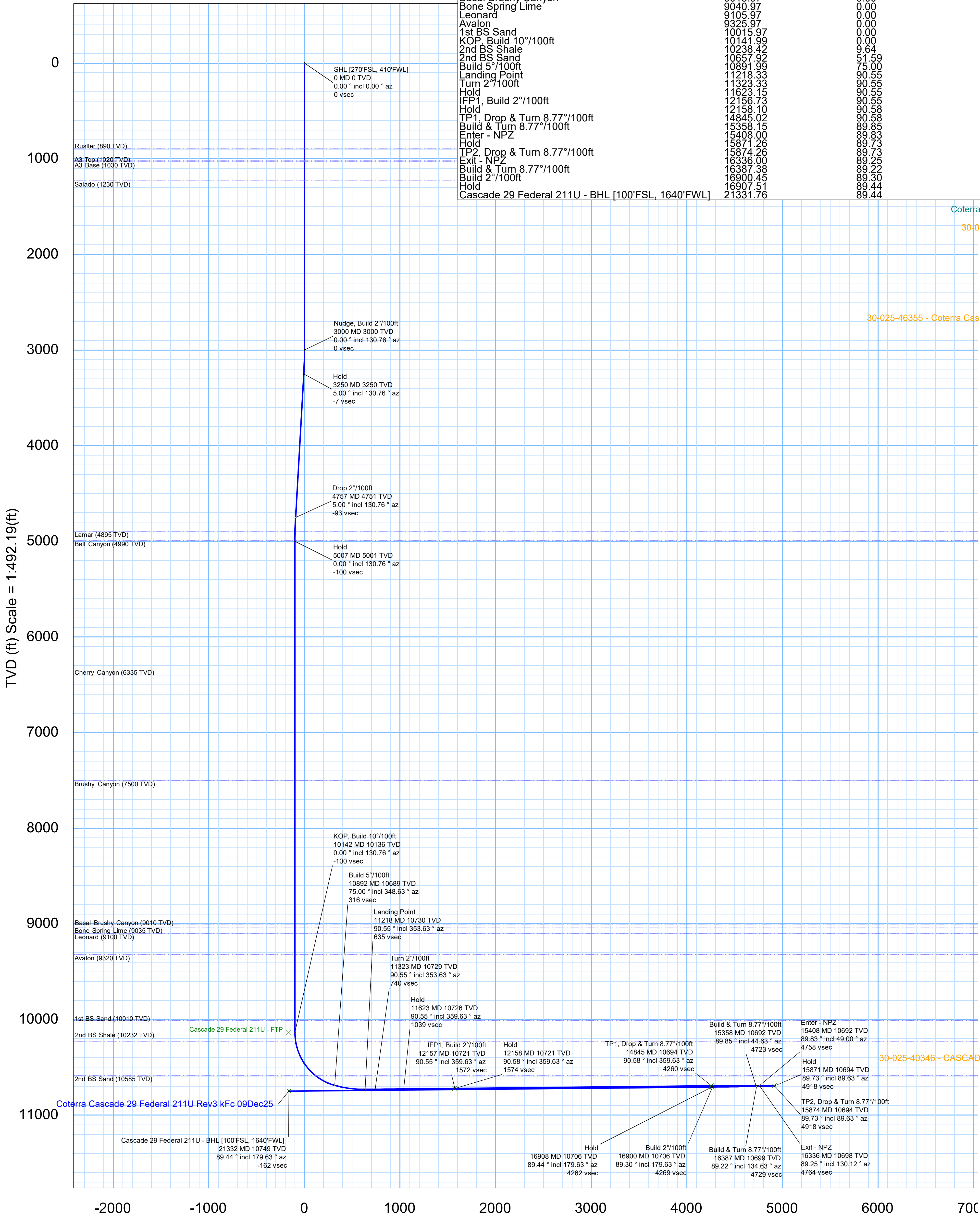
Plan ref
Drawing ref
Copy number
Date

Coterra Cascade 29 Federal 211U Rev3 kFc 09Dec25
of 3
09-Dec-2025

1	Client	
2	Client	
3	Office	
4	Office	

Copy number for

Grid North
Tot Corr (M->G 5.662°)
Mag Dec (6.051°)
Grid Conv (0.389°)





Coterra Cascade 29 Federal 211U Rev3 kFc 09Dec25 Proposal Geodetic Report

Def Plan

Report Date: December 09, 2025 - 07:29 PM (UTC 0)
Client: COTERRA
Field: NM Lea County (NAD 83)
Structure / Slot: Coterra - Cascade 29 Federal Pad Lot M / Cascade 29 Federal 211U
Well: Cascade 29 Federal 211U
Borehole: Cascade 29 Federal 211U
UBH / API#: Unknown / Unknown
Survey Name: Coterra Cascade 29 Federal 211U Rev3 kFc 09Dec25
Survey Date: December 09, 2025
Tort / AHD / DDI / ERD Ratio: 287.481' / 11013.533 ft / 6.798' / 1.025
Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
Location Lat / Long: 32°54'22.2367"N, 103°36'5.97708"W
Location Grid N/E Y/X: N 399089.060 RUS, E 767915.790 RUS
CRS Grid Convergence Angle: 0.389"
Grid Scale Factor: 0.99996789(Appplied)
Version / Patch: 2025.1.0.1

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 0.000 °(GRID North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: RKB
TVD Reference Elevation: 3424.300 ft above MSL
Sealed / Ground Elevation: 3401.300 ft above MSL
Magnetic Declination: 6.051"
Total Gravity Field Strength: 996.4291mgm (9.80665 Based)
Gravity Model: GARM
Total Magnetic Field Strength: 47034.827 nT
Magnetic Dip Angle: 59.54°
Declination Date: December 09, 2025
Magnetic Declination Model: HDGM 2025
North Reference: Grid North
Grid Convergence Used: 0.389"
Total Corr Mag North->Grid North: 5.662"
Local Coord Referenced To: Well Head

Comments	MD (ft)	Incl (°)	Azim (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	Northing (RUS)	Easting (RUS)	Latitude (°)	Longitude (°)	DLS ("/100ft)	BR ("/100ft)	TR ("/100ft)
SHL [270FSL, 370FWL]	0.00	0.00	0.00	0.00	-3,424.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029			
	100.00	0.00	130.76	100.00	-3,324.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	200.00	0.00	130.76	200.00	-3,224.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	300.00	0.00	130.76	300.00	-3,124.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	400.00	0.00	130.76	400.00	-3,024.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	500.00	0.00	130.76	500.00	-2,924.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	600.00	0.00	130.76	600.00	-2,824.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	700.00	0.00	130.76	700.00	-2,724.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	800.00	0.00	130.76	800.00	-2,624.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
Rustler	889.60	0.00	130.76	889.60	-2,534.70	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	900.00	0.00	130.76	900.00	-2,524.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	1,000.00	0.00	130.76	1,000.00	-2,424.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
A3 Top	1,019.60	0.00	130.76	1,019.60	-2,404.70	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
A3 Base	1,029.60	0.00	130.76	1,029.60	-2,394.70	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	1,100.00	0.00	130.76	1,100.00	-2,324.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	1,200.00	0.00	130.76	1,200.00	-2,224.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
Salado	1,229.60	0.00	130.76	1,229.60	-2,194.70	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	1,300.00	0.00	130.76	1,300.00	-2,124.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	1,400.00	0.00	130.76	1,400.00	-2,024.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	1,500.00	0.00	130.76	1,500.00	-1,924.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	1,600.00	0.00	130.76	1,600.00	-1,824.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	1,700.00	0.00	130.76	1,700.00	-1,724.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	1,800.00	0.00	130.76	1,800.00	-1,624.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	1,900.00	0.00	130.76	1,900.00	-1,524.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	2,000.00	0.00	130.76	2,000.00	-1,424.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	2,100.00	0.00	130.76	2,100.00	-1,324.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	2,200.00	0.00	130.76	2,200.00	-1,224.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	2,300.00	0.00	130.76	2,300.00	-1,124.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	2,400.00	0.00	130.76	2,400.00	-1,024.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	2,500.00	0.00	130.76	2,500.00	-924.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	2,600.00	0.00	130.76	2,600.00	-824.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	2,700.00	0.00	130.76	2,700.00	-724.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	2,800.00	0.00	130.76	2,800.00	-624.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	2,900.00	0.00	130.76	2,900.00	-524.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
Nudge, Build 2"/100ft	3,000.00	0.00	130.76	3,000.00	-424.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
	3,100.00	2.00	130.76	3,099.98	-324.32	-1.14	-1.14	1.32	399,087.92	767,917.11	32.09505897	-103.60165605	2.00	2.00	0.00
Hold	3,200.00	4.00	130.76	3,199.84	-224.46	-4.56	-4.56	5.29	399,084.50	767,921.08	32.09504951	-103.60164333	2.00	2.00	0.00
	3,250.02	5.00	130.76	3,249.70	-174.60	-7.12	-7.12	8.26	399,081.94	767,924.05	32.09504241	-103.60163379	2.00	2.00	0.00
	3,300.00	130.76	3,299.49	-124.61	-9.86	-9.86	-9.86	11.56	399,079.10	767,927.35	32.09503453	-103.60162319	0.00	0.00	0.00
	3,400.00	5.00	130.76	3,399.11	-75.49	-15.65	-15.65	18.16	399,073.41	767,933.95	32.09501876	-103.60160200	0.00	0.00	0.00
	3,500.00	5.00	130.76	3,498.73	-74.43	-21.35	-21.35	24.76	399,067.72	767,940.55	32.09500300	-103.60158081	0.00	0.00	0.00
	3,600.00	5.00	130.76	3,598.35	-174.05	-27.04	-27.04	31.36	399,062.02	767,947.15	32.09498723	-103.60155962	0.00	0.00	0.00
	3,700.00	5.00	130.76	3,697.97	-273.67	-32.73	-32.73	37.96	399,056.33	767,953.75	32.09497146	-103.60153843	0.00	0.00	0.00
	3,800.00	5.00	130.76	3,797.59	-373.29	-38.42	-38.42	44.57	399,050.64	767,960.35	32.09495570	-103.60151724	0.00	0.00	0.00
	3,900.00	5.00	130.76	3,897.21	-472.91	-44.11	-44.11	51.17	399,044.95	767,966.96	32.09493993	-103.60149605	0.00	0.00	0.00
	4,000.00	5.00	130.76	3,996.83	-572.53	-49.80	-49.80	57.77	399,039.26	767,973.56	32.09492417	-103.60147485	0.00	0.00	0.00
	4,100.00	5.00	130.76	4,096.45	-672.15	-55.49	-55.49	64.37	399,033.57	767,980.16	32.09490840	-103.60145366	0.00	0.00	0.00
	4,200.00	5.00	130.76	4,196.07	-771.77	-61.18	-61.18	70.97	399,027.88	767,986.76	32.09489263	-103.60143247	0.00	0.00	0.00
	4,300.00	5.00	130.76	4,295.69	-871.39	-66.87	-66.87	77.57	399,022.19	767,993.36	32.09487687	-103.60141128	0.00	0.00	0.00
	4,400.00	5.00	130.76	4,395.31	-971.01	-72.57	-72.57	84.18	399,016.50	767,999.96	32.09486110	-103.60139009	0.00	0.00	0.00
	4,500.00	5.00	130.76	4,494.93	-1,070.63	-78.26	-78.26	90.78	399,010.81	768,006.56	32.09484534	-103.60136890	0.00	0.00	0.00
	4,600.00	5.00	130.76	4,594.55	-1,170.25	-83.95	-83.95	97.38	399,005.12	768,013.17	32.09482957	-103.60134771	0.00	0.00	0.00
	4,700.00	5.00	130.76	4,694.16	-1,269.86	-89.64	-89.64	103.98	398,999.42	768,019.77	32.09481380	-103.60132651	0.00	0.00	0.00
Drop 2"/100ft	4,756.97	5.00	130.76	4,750.92	-1,326.62	-92.88	-92.88	107.74	398,996.18	768,023.53	32.09480942	-103.60131444	0.00	0.00	0.00
	4,800.00	4.14	130.76	4,793.81	-1,369.51	-95.12	-95.12	110.34	398,993.94	768,026.12	32.09479862	-103.60130611	2.00	-2.00	0.00
	4,900.00	2.14	130.76	4,893.66	-1,469.36	-98.70	-98.70	114.49	398,990.37	768,030.27	32.09478871	-103.60129279	2.00	-2.00	0.00
Lamar	4,900.95	2.12	130.76	4,894.60	-1,470.30	-98.72	-98.72	114.51	398,990.34	768,030.30	32.09478865	-103.60129270	2.00	-2.00	0.00
Bel Canyon	4,995.97	0.22	130.76	4,989.60	-1,565.30	-99.99	-99.99	115.98	398,989.08	768,031.77	32.09478514	-103.60128799	2.00	-2.00	0.00
	5,000.00	0.14	130.76	4,993.63	-1,569.33	-99.99	-99.99	115.99	398,989.07	</					

Comments	MD (ft)	Incl (°)	Azim (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	Northing (RUS)	Easting (RUS)	Latitude (°)	Longitude (°)	DLS ("100ft)	BR ("100ft)	TR ("100ft)
Bone Spring Line	9,040.97	0.00	130.76	9,034.60	5,610.30	-100.00	-100.00	116.00	398,988.06	768,031.79	32.09478510	-103.60128793	0.00	0.00	0.00
	9,100.00	0.00	130.76	9,093.63	5,669.33	-100.00	-100.00	116.00	398,988.06	768,031.79	32.09478510	-103.60128793	0.00	0.00	0.00
Leonard	9,105.97	0.00	130.76	9,099.60	5,675.30	-100.00	-100.00	116.00	398,988.06	768,031.79	32.09478510	-103.60128793	0.00	0.00	0.00
	9,200.00	0.00	130.76	9,193.63	5,769.33	-100.00	-100.00	116.00	398,988.06	768,031.79	32.09478510	-103.60128793	0.00	0.00	0.00
Avalon	9,300.00	0.00	130.76	9,293.63	5,869.33	-100.00	-100.00	116.00	398,988.06	768,031.79	32.09478510	-103.60128793	0.00	0.00	0.00
	9,325.97	0.00	130.76	9,319.60	5,895.30	-100.00	-100.00	116.00	398,988.06	768,031.79	32.09478510	-103.60128793	0.00	0.00	0.00
	9,400.00	0.00	130.76	9,393.63	5,969.33	-100.00	-100.00	116.00	398,988.06	768,031.79	32.09478510	-103.60128793	0.00	0.00	0.00
	9,500.00	0.00	130.76	9,493.63	6,069.33	-100.00	-100.00	116.00	398,988.06	768,031.79	32.09478510	-103.60128793	0.00	0.00	0.00
	9,600.00	0.00	130.76	9,593.63	6,169.33	-100.00	-100.00	116.00	398,988.06	768,031.79	32.09478510	-103.60128793	0.00	0.00	0.00
	9,700.00	0.00	130.76	9,693.63	6,269.33	-100.00	-100.00	116.00	398,988.06	768,031.79	32.09478510	-103.60128793	0.00	0.00	0.00
	9,800.00	0.00	130.76	9,793.63	6,369.33	-100.00	-100.00	116.00	398,988.06	768,031.79	32.09478510	-103.60128793	0.00	0.00	0.00
	9,900.00	0.00	130.76	9,893.63	6,469.33	-100.00	-100.00	116.00	398,988.06	768,031.79	32.09478510	-103.60128793	0.00	0.00	0.00
	10,000.00	0.00	130.76	9,993.63	6,569.33	-100.00	-100.00	116.00	398,988.06	768,031.79	32.09478510	-103.60128793	0.00	0.00	0.00
1st BS Sand	10,015.97	0.00	130.76	10,009.50	6,585.30	-100.00	-100.00	116.00	398,988.06	768,031.79	32.09478510	-103.60128793	0.00	0.00	0.00
	10,100.00	0.00	130.76	10,093.63	6,689.33	-100.00	-100.00	116.00	398,988.06	768,031.79	32.09478510	-103.60128793	0.00	0.00	0.00
KOP, Build 10"/100ft	10,141.99	0.00	130.76	10,135.62	6,711.32	-100.00	-100.00	116.00	398,988.06	768,031.79	32.09478510	-103.60128793	0.00	0.00	0.00
	10,200.00	5.80	348.63	10,193.53	6,769.23	-97.12	-97.12	115.42	398,991.94	768,031.21	32.09479302	-103.60128974	10.00	10.00	0.00
2nd BS Shale	10,238.42	9.64	348.63	10,231.60	6,807.30	-92.06	-92.06	114.40	398,997.00	768,030.19	32.09480695	-103.60129291	10.00	10.00	0.00
	10,300.00	15.80	348.63	10,291.64	6,867.34	-78.77	-78.77	111.73	399,010.29	768,027.52	32.09484352	-103.60130125	10.00	10.00	0.00
	10,400.00	25.80	348.63	10,385.00	6,960.70	-44.00	-44.00	104.74	399,045.06	768,020.53	32.09483923	-103.60132306	10.00	10.00	0.00
	10,500.00	34.80	348.63	10,470.78	7,046.48	-31.50	-31.50	94.66	399,095.13	768,010.46	32.09501722	-103.60135452	10.00	10.00	0.00
2nd BS Sand	10,600.00	45.80	348.63	10,546.39	7,122.09	70.11	70.11	81.79	399,159.17	767,997.58	32.09525332	-103.60139466	10.00	10.00	0.00
	10,657.92	51.59	348.63	10,584.60	7,160.30	112.75	112.75	73.22	399,201.81	767,989.00	32.09537068	-103.60142141	10.00	10.00	0.00
	10,700.00	55.80	348.63	10,609.51	7,185.21	145.99	145.99	66.53	399,235.05	767,982.32	32.09546217	-103.60144226	10.00	10.00	0.00
Build 5"/100ft	10,800.00	65.80	348.63	10,658.23	7,233.93	231.46	231.46	49.35	399,320.52	767,965.13	32.09569742	-103.60149589	10.00	10.00	0.00
	10,891.99	75.00	348.63	10,689.05	7,264.75	316.33	316.33	32.28	399,405.38	767,948.07	32.09593101	-103.60154913	10.00	10.00	0.00
	10,900.00	75.38	348.76	10,691.10	7,268.80	323.93	323.93	30.76	399,412.97	767,946.55	32.09595191	-103.60155387	5.00	4.75	1.60
	11,000.00	80.14	350.33	10,712.30	7,286.00	420.00	420.00	13.04	399,504.53	767,826.83	32.09621632	-103.60160898	5.00	4.76	1.57
	11,100.00	84.91	351.85	10,725.31	7,301.01	517.92	517.92	-2.30	399,585.97	767,913.49	32.09648572	-103.60165341	5.00	4.77	1.52
	11,200.00	89.68	353.36	10,730.03	7,305.73	616.95	616.95	-15.15	399,705.99	767,900.64	32.09675819	-103.60169570	5.00	4.77	1.50
Landing Point	11,218.33	90.55	353.63	10,730.00	7,305.70	635.16	635.16	-17.23	399,724.20	767,898.56	32.09680829	-103.60170201	5.00	4.77	1.50
	11,300.00	90.55	353.63	10,729.21	7,304.91	716.32	716.32	-26.29	399,805.36	767,889.50	32.09703154	-103.60172949	0.00	0.00	0.00
Turn 2"/100ft	11,323.33	90.55	353.63	10,728.99	7,304.69	739.51	739.51	-28.88	399,828.54	767,886.91	32.09709532	-103.60173734	0.00	0.00	0.00
	11,400.00	90.55	355.16	10,728.25	7,303.95	815.81	815.81	-36.36	399,904.84	767,879.43	32.09730517	-103.60175984	2.00	0.00	2.00
	11,500.00	90.55	357.19	10,727.29	7,302.99	891.57	891.57	-46.25	400,004.56	767,872.74	32.09759758	-103.60178141	2.00	0.00	2.00
	11,600.00	90.55	359.16	10,726.33	7,302.03	1,015.51	1,015.51	-46.25	400,104.54	767,869.63	32.09785427	-103.60178741	2.00	0.00	2.00
Hold	11,623.15	90.55	359.63	10,726.11	7,301.81	1,038.66	1,038.66	-46.50	400,127.69	767,869.29	32.09791791	-103.60178769	2.00	0.00	2.00
	11,700.00	90.55	359.63	10,725.38	7,301.08	1,115.50	1,115.50	-47.00	400,204.53	767,868.79	32.09812913	-103.60178763	0.00	0.00	0.00
	11,800.00	90.55	359.63	10,724.42	7,300.12	1,215.50	1,215.50	-47.66	400,304.52	767,868.14	32.09840399	-103.60178754	0.00	0.00	0.00
	11,900.00	90.55	359.63	10,723.46	7,299.16	1,315.49	1,315.49	-48.31	400,404.51	767,867.48	32.09867884	-103.60178745	0.00	0.00	0.00
	12,000.00	90.55	359.63	10,722.50	7,298.20	1,415.48	1,415.48	-48.96	400,504.50	767,866.83	32.09895370	-103.60178737	0.00	0.00	0.00
	12,100.00	90.55	359.63	10,721.54	7,297.24	1,515.48	1,515.48	-49.61	400,604.49	767,866.18	32.09922856	-103.60178728	0.00	0.00	0.00
	12,156.73	90.58	359.63	10,721.49	7,296.70	1,572.20	1,572.20	-49.98	400,661.21	767,865.81	32.09938448	-103.60178723	0.00	0.00	0.00
	12,158.10	90.58	359.63	10,720.99	7,296.69	1,573.57	1,573.57	-49.99	400,662.58	767,865.80	32.09938825	-103.60178723	2.00	1.94	0.50
	12,200.00	90.58	359.63	10,720.57	7,296.27	1,615.47	1,615.47	-50.26	400,704.47	767,865.53	32.09950342	-103.60178718	0.00	0.00	0.00
	12,300.00	90.58	359.63	10,719.56	7,295.26	1,715.46	1,715.46	-50.90	400,804.46	767,864.90	32.09977827	-103.60178705	0.00	0.00	0.00
	12,400.00	90.58	359.63	10,718.56	7,294.26	1,815.46	1,815.46	-51.54	400,904.45	767,864.26	32.10005313	-103.60178693	0.00	0.00	0.00
	12,500.00	90.58	359.63	10,717.55	7,293.25	1,915.45	1,915.45	-52.18	401,004.44	767,863.62	32.10032799	-103.60178680	0.00	0.00	0.00
	12,600.00	90.58	359.63	10,716.55	7,292.25	2,015.44	2,015.44	-52.81	401,104.43	767,862.98	32.10060289	-103.60178667	0.00	0.00	0.00
	12,700.00	90.58	359.63	10,715.54	7,291.24	2,115.43	2,115.43	-53.45	401,204.42	767,862.34	32.10087777	-103.60178655	0.00	0.00	0.00
	12,800.00	90.58	359.63	10,714.54	7,290.24	2,215.43	2,215.43	-54.09	401,304.41	767,861.70	32.10115256	-103.60178642	0.00	0.00	0.00
	12,900.00	90.58	359.63	10,713.54	7,289.24	2,315.42	2,315.42	-54.73	401,404.40	767,861.06	32.10142741	-103.60178630	0.00	0.00	0.00
	13,000.00	90.58	359.63	10,712.53	7,288.23	2,415.41	2,415.41	-55.37	401,504.39	767,860.42	32.10170227	-103.60178617	0.00	0.00	0.00
	13,100.00	90.58	359.63	10,711.53	7,287.23	2,515.41	2,515.41	-56.01	401,604.38	767,859.78	32.10197713	-103.60178604	0.00	0.00	0.00
	13,200.00	90.58	359.63	10,710.52	7,286.22	2,615.40	2,615.40	-56.65	401,704.37	767,859.14	32.10225198	-103.60178592	0.00	0.00	0.00
	13,300.00	90.58	359.63	10,709.52	7,285.22	2,715.39	2,715.39	-57.29	401,804.36	767,858.50	32.10252684	-103.60178579	0.00	0.00	0.00
	13,400.00	90.58	359.63	10,708.51	7,284.21	2,815.38	2,815.38	-57.93	401,904.35	767,857.85	32.10280170	-103.60178567	0.00	0.00	0.00
	13,500.00	90.58	359.63	10,707.51	7,283.21	2,915.38	2,915.38	-58.57	402,004.34	767,857.22	32.10307655	-103.60178554	0.00	0.00	0.00
	13,600.00	90.58	359.63	10,706.50	7,282.20	3,015.37	3,015.37	-59.21	402,104.33	767,856.58	32.10335141	-103.60178541	0.00	0.00	0.00
	13,700.00	90.58	359.63	10,705.50	7,281.20	3,115.36	3,115.36	-59.85	402,204.32	767,855.94	32.10362627	-103.60178529	0.00	0.00	0.00
	13,800.00	90.58	359.63	10,704.50	7,280.20	3,215.36	3,215.36	-60.49	402,304.31	767,855.30	32.10390112	-103.60178516	0.00	0.00	0.00
	13,900.00	90.58	359.63	10,703.49	7,279.19	3,315.35	3,315.35	-61.13	402,404.30	767,854.66	32.10417598	-103.60178504	0.00	0.00	0.00
	14,000.00	90.58	359.63</												

Comments	MD (ft)	Incl (°)	Azim (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	Northing (ftUS)	Easting (ftUS)	Latitude (°)	Longitude (°)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)
	19,800.00	89.44	179.63	10,734.14	7,309.84	1,369.50	1,369.50	1,261.05	400,458.52	769,176.80	32.09880282	-103.59755832	0.00	0.00	0.00
	19,900.00	89.44	179.63	10,735.11	7,310.81	1,269.51	1,269.51	1,261.69	400,358.53	769,177.44	32.09852796	-103.59755845	0.00	0.00	0.00
	20,000.00	89.44	179.63	10,736.08	7,311.78	1,169.52	1,169.52	1,262.34	400,258.54	769,178.08	32.09825311	-103.59755858	0.00	0.00	0.00
	20,100.00	89.44	179.63	10,737.05	7,312.75	1,069.53	1,069.53	1,262.98	400,158.55	769,178.73	32.09797825	-103.59755870	0.00	0.00	0.00
	20,200.00	89.44	179.63	10,738.02	7,313.72	969.53	969.53	1,263.62	400,058.56	769,179.37	32.09770339	-103.59755883	0.00	0.00	0.00
	20,300.00	89.44	179.63	10,738.99	7,314.69	869.54	869.54	1,264.27	399,958.57	769,180.01	32.09742853	-103.59755895	0.00	0.00	0.00
	20,400.00	89.44	179.63	10,739.96	7,315.66	769.55	769.55	1,264.91	399,858.58	769,180.66	32.09715368	-103.59755908	0.00	0.00	0.00
	20,500.00	89.44	179.63	10,740.93	7,316.63	669.55	669.55	1,265.55	399,758.59	769,181.30	32.09687882	-103.59755921	0.00	0.00	0.00
	20,600.00	89.44	179.63	10,741.90	7,317.60	569.56	569.56	1,266.20	399,658.60	769,181.94	32.09660396	-103.59755933	0.00	0.00	0.00
	20,700.00	89.44	179.63	10,742.87	7,318.57	469.57	469.57	1,266.84	399,558.61	769,182.59	32.09632910	-103.59755946	0.00	0.00	0.00
	20,800.00	89.44	179.63	10,743.84	7,319.54	369.57	369.57	1,267.48	399,458.62	769,183.23	32.09605425	-103.59755959	0.00	0.00	0.00
	20,900.00	89.44	179.63	10,744.81	7,320.51	269.58	269.58	1,268.13	399,358.63	769,183.87	32.09577939	-103.59755971	0.00	0.00	0.00
	21,000.00	89.44	179.63	10,745.78	7,321.48	169.59	169.59	1,268.77	399,258.64	769,184.52	32.09550453	-103.59755984	0.00	0.00	0.00
	21,100.00	89.44	179.63	10,746.75	7,322.45	69.59	69.59	1,269.41	399,158.65	769,185.16	32.09522967	-103.59755997	0.00	0.00	0.00
	21,200.00	89.44	179.63	10,747.72	7,323.42	-30.40	-30.40	1,270.06	399,058.66	769,185.80	32.09495482	-103.59756009	0.00	0.00	0.00
	21,300.00	89.44	179.63	10,748.69	7,324.39	-130.39	-130.39	1,270.70	398,958.67	769,186.45	32.09467996	-103.59756022	0.00	0.00	0.00
Cascade 29 Federal 211U - BHL	21,331.76	89.44	179.63	10,749.00	7,324.70	-162.16	-162.16	1,270.90	398,926.91	769,186.65	32.09459265	-103.59756026	0.00	0.00	0.00

Survey Type: Def Plan

Survey Error Model: ISOWSA Rev 4 *** 3-D 95 % 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 Code	Vendor / Tool	Borehole / Survey
	1	0.000	10,100.000	1/100.000 1.25 – 8.75 – 6.75 10.75 – 7.625 – 5				A001Mb_MWD		Cascade 29 Federal 211U / Coterra Cascade 29 Fe
	1	10,100.000	21,331.764	1/100.000	6.75	5		A008Mb_MWD+IFR1+MS		Cascade 29 Federal 211U / Coterra Cascade 29 Fe

EOU Geometry:

End MD (ft)	Hole Size (in)	Casing Size (in)	Name
1,000.100	17.500	13.375	
6,000.100	12.250	10.750	
10,000.100	8.750	7.625	
21,331.764	6.750	5.000	



Coterra Cascade 29 Federal 211U Rev2 kFc 29Oct25 Anti-Collision Summary Report

Analysis Date-24hr Time: October 29, 2025 - 02:48 PM (UTC 0)
Client: COTERRA
Field: NM Lea County (NAD 83)
Structure: Coterra - Cascade 29 Federal Pad Lot M
Slot: Cascade 29 Federal 211U
Well: Cascade 29 Federal 211U
Borehole: Cascade 29 Federal 211U
Scan MD Range: 0.00ft ~ 21301.36ft

Analysis Method: 3D Least Distance
Reference Trajectory: Coterra Cascade 29 Federal 211U Rev2 kFc 29Oct25 (Def
Depth Interval: Every 10.00 Measured Depth (ft)
Rule Set: NAL Procedure: D&M AntiCollision Standard S002
Min Pts: Absolute minima indicated.
Engine Version: 2025.1.0.1
Database \ Project: Cascade 29 Federal 211U-COTERRA

Trajectory Error Model: ISCWSA Rev 4 *** 3-D 95 % Confidence 2.7955 sigma

Offset Trajectories Summary

Offset Selection Criteria

Bounding box scan: minimum Ct-Ct separation <= 2000ft
 Definitive Surveys - Definitive Plans - Definitive surveys exclude definitive plans
 Selection filters: - 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

15 out of 69 are selected

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Breaking Rule	Reference Trajectory		Risk Level			Alert
	Ct-Ct (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major	

Results highlighted in red: Sep-Factor <= 1.5

Result highlighted in boxed, red and bold: all local minima indicated.

Coterra Cascade 29-20-17 Federal Com 301H Rev2 kFc 29Oct25 (DefinitivePlan) - **Fail Major**

19.99	16.39	16.70	3.60	9.35	CtCt 15.00m	0.00	0.00	CtCt<=15.00m				Enter Alert
19.99	16.39	16.70	3.60	9.35	CtCt 15.00m	23.00	23.00					WRP
19.99	16.39	9.19	3.60	1.97	CtCt 15.00m	990.00	990.00					MinPts
19.99	20.14	6.24	-0.15	1.49	OSF 1.50	1320.00	1320.00	OSF<=1.50				Enter Minor
19.99	29.53	-0.02	-9.54	1.00	OSF 1.00	1950.00	1950.00		OSF<=1.00			Enter Major
19.99	30.28	-0.52	-10.29	0.97	OSF 1.00	2000.00	2000.00					MinPt-CtCt
20.12	30.72	-0.68	-10.60	0.97	OSF 1.00	2030.00	2030.00					MinPts
20.35	31.01	-0.65	-10.65	0.97	OSF 1.00	2050.00	2050.00					MinPt-ADP
21.46	31.73	-0.03	-10.27	1.00	OSF 1.00	2100.00	2100.00			OSF>1.00		Exit Major
34.68	34.83	11.13	-0.16	1.49	OSF 1.50	2320.00	2320.00	OSF>1.50				Exit Minor
87.90	70.57	40.53	17.33	1.87	OSF 5.00	4770.00	4763.89					MinPt-CtCt
88.06	71.02	40.39	17.04	1.87	OSF 5.00	4800.00	4793.80					MinPt-EQU
88.32	71.32	40.45	17.01	1.86	OSF 5.00	4820.00	4813.76					MinPt-ADP
88.50	71.46	40.53	17.03	1.86	OSF 5.00	4830.00	4823.74					MinPt-SF
173.99	149.66	73.89	24.33	1.75	OSF 5.00	10120.00	10113.63					MinPt-EQU
174.05	149.74	73.90	24.31	1.75	OSF 5.00	10130.00	10123.63					MinPts
504.82	154.31	401.62	350.52	4.93	OSF 5.00	10830.00	10654.62	OSF>5.00				Exit Alert
715.01	154.72	611.54	560.29	6.97		14230.00	10705.00					MinPt-CtCt
717.89	170.36	603.99	547.53	6.35		14820.00	10705.00					MinPt-EQU
715.00	183.84	592.12	531.17	5.86		15310.00	10705.00					MinPt-CtCt
715.37	185.02	591.70	530.36	5.82		15350.00	10705.00					MinPt-EQU
715.85	185.62	591.77	530.22	5.81		15370.00	10705.00					MinPt-ADP
727.02	190.32	599.81	536.70	5.75		15510.00	10705.00					MinPt-SF
1457.42	201.52	1322.74	1255.90	10.89		20230.00	10705.00					MinPts
994.93	189.39	868.35	805.55	7.91		21301.36	10705.00					MinPts

30-025-46306 - Coterra Cascade 29 Federal 17H - Corrected MWD to 17485ft (DefinitiveSurvey) - **Fail Minor**

152.29	32.81	149.70	119.48	106.84		0.00	0.00					Surface
152.28	32.81	149.69	119.47	106.83		23.00	23.00					WRP
149.36	32.81	144.03	116.55	35.64		478.61	478.61					MinPts
150.61	32.81	140.84	117.80	17.40		940.00	940.00					MinPt-EQU
150.76	32.81	140.63	117.95	16.49		990.00	990.00					MinPt-EQU
152.18	32.81	138.57	119.38	11.97		1350.00	1350.00					MinPt-EQU
169.15	32.81	151.43	136.35	10.05		1780.00	1780.00					MinPt-SF
515.89	62.88	473.65	453.02	12.48		4280.00	4275.76					MinPt-SF
579.71	71.75	531.55	507.96	12.27		4860.00	4853.69					MinPt-SF
1005.23	117.74	926.41	887.49	12.90		7830.00	7823.63					MinPt-EQU
1007.62	121.12	926.55	886.50	12.57		8060.00	8053.63					MinPt-EQU
1009.73	124.21	926.59	885.52	12.28		8270.00	8263.63					MinPt-EQU
1011.87	127.45	926.58	884.42	11.99		8490.00	8483.63					MinPt-EQU
1004.43	150.94	903.48	853.49	10.04		10150.00	10143.61					MinPt-CtCt
1004.45	151.01	903.45	853.44	10.03		10160.00	10153.59					MinPt-EQU
1004.50	151.07	903.46	853.43	10.03		10170.00	10163.56					MinPt-ADP
1006.56	151.62	905.15	854.94	10.01		10250.00	10242.49					MinPt-SF
2220.13	138.24	2127.64	2081.89	24.25		12630.00	10705.00					MinPt-CtCt
2219.24	141.95	2124.28	2077.29	23.60		12870.00	10705.00					MinPt-CtCt
2218.99	146.59	2120.93	2072.39	22.85		13140.00	10705.00					MinPt-CtCt
2219.21	149.88	2118.96	2069.33	22.35		13320.00	10705.00					MinPt-CtCt
2219.70	151.30	2118.50	2068.40	22.14		13410.00	10705.00					MinPt-EQU
2218.02	161.99	2109.70	2056.03	20.65		13920.00	10705.00					MinPt-CtCt
2218.31	162.96	2109.35	2055.35	20.53		13980.00	10705.00					MinPt-EQU
2219.08	164.15	2109.31	2054.92	20.39		14040.00	10705.00					MinPt-EQU
2219.93	167.91	2107.67	2052.02	19.94		14190.00	10705.00					MinPt-CtCt
2220.54	169.71	2107.07	2050.83	19.73		14290.00	10705.00					MinPt-EQU
2221.32	170.62	2107.24	2050.70	19.63		14340.00	10705.00					MinPt-ADP
2225.66	179.68	2105.54	2045.98	18.67		14700.00	10705.00					MinPt-CtCt
1902.68	206.90	1764.42	1695.78	13.85		16460.00	10705.00					MinPt-CtCt
1902.73	207.12	1764.32	1695.61	13.84		16480.00	10705.00					MinPt-EQU
1902.78	207.18	1764.33	1695.60	13.83		16490.00	10705.00					MinPts
1902.77	207.49	1764.12	1695.28	13.81		16590.00	10705.00					MinPt-CtCt
1903.04	208.27	1763.86	1694.77	13.76		16660.00	10705.00					MinPt-EQU
1903.19	208.48	1763.88	1694.71	13.75		16680.00	10705.00					MinPt-ADP
1892.67	213.93	1749.72	1678.74	13.33		17540.00	10705.00					MinPt-CtCt
1892.68	214.03	1749.67	1678.65	13.32		17550.00	10705.00					MinPts

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Breaking Rule	Reference Trajectory		Risk Level			Alert
	Ct-Ct (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major	
	1889.80	215.54	1745.78	1674.26	13.20		17740.00	10705.00				MinPt-CtCt
	1890.05	216.31	1745.52	1673.74	13.16		17800.00	10705.00				MinPt-EOU
	1890.27	216.57	1745.56	1673.70	13.15		17820.00	10705.00				MinPt-ADP
	1890.89	217.08	1745.84	1673.81	13.12		17860.00	10705.00				MinPt-SF
	1881.91	233.00	1726.25	1648.91	12.16		19210.00	10705.00				MinPt-CtCt
	1882.26	234.31	1725.72	1647.94	12.09		19290.00	10705.00				MinPt-EOU
	1882.54	234.65	1725.78	1647.89	12.08		19310.00	10705.00				MinPt-ADP
	1884.94	236.15	1727.18	1648.79	12.02		19400.00	10705.00				MinPt-SF
	1884.99	236.13	1727.24	1648.86	12.02		19420.00	10705.00				MinPts
	543.22	163.77	433.71	379.45	5.00	OSF 5.00	20780.00	10705.00	OSF<=5.00			Enter Alert
	179.13	184.63	55.71	-5.50	1.46	OSF 1.50	21210.00	10705.00		OSF<=1.50		Enter Minor
	154.38	189.93	27.44	-35.55	1.22	OSF 1.50	21300.00	10705.00				MinPts
	154.38	189.89	27.46	-35.51	1.22	OSF 1.50	21301.36	10705.00				MinPt-CtCt

Coterra Cascade 29 Federal 201U Rev1 kFc 07Oct25 (DefinitivePlan) - Warning Alert

39.99	32.39	36.71	7.60	19.35	CtCt 15.00m	0.00	0.00	CtCt<=15.00m				Enter Alert
39.99	32.39	36.71	7.60	19.35	CtCt 15.00m	23.00	23.00					WRP
39.99	32.39	29.19	7.60	4.07	CtCt 15.00m	990.00	990.00					MinPt-EOU
39.99	32.39	23.56	7.60	2.52	OSF 5.00	1590.00	1590.00					MinPts
40.15	32.39	23.32	7.75	2.47	OSF 5.00	1630.00	1630.00					MinPt-EOU
40.82	32.39	23.61	8.43	2.46	OSF 5.00	1670.00	1670.00					MinPt-SF
141.72	43.31	112.52	98.42	4.99	OSF 5.00	2900.00	2900.00					Exit Alert
165.19	50.28	131.35	114.92	5.00	OSF 5.00	3380.00	3379.19	OSF<=5.00				Enter Alert
199.04	71.82	150.83	127.22	4.19	OSF 5.00	4820.00	4813.76					MinPt-SF
299.62	145.15	202.53	154.47	3.11	OSF 5.00	9810.00	9803.63					MinPt-EOU
299.69	145.23	202.54	154.46	3.11	OSF 5.00	9820.00	9813.63					MinPt-ADP
300.17	145.56	202.80	154.61	3.10	OSF 5.00	9860.00	9853.63					MinPt-SF
435.61	132.42	347.01	303.19	4.96	OSF 5.00	10550.00	10504.08	OSF>5.00				Exit Alert
575.43	173.32	459.55	402.11	5.00	OSF 5.00	14010.00	10705.00	OSF<=5.00				Enter Alert
572.21	187.59	446.83	384.63	4.59	OSF 5.00	14660.00	10705.00					MinPt-CtCt
572.40	188.01	446.73	384.39	4.58	OSF 5.00	14680.00	10705.00					MinPt-EOU
572.58	188.22	446.77	384.36	4.58	OSF 5.00	14690.00	10705.00					MinPt-ADP
575.62	189.68	448.84	385.94	4.57	OSF 5.00	14760.00	10705.00					MinPt-SF
343.11	195.26	212.61	147.85	2.64	OSF 5.00	16150.00	10705.00					MinPts
343.14	195.30	212.61	147.84	2.64	OSF 5.00	16160.00	10705.00					MinPts
574.83	174.64	458.08	400.19	4.96	OSF 5.00	16680.00	10705.00	OSF>5.00				Exit Alert
867.76	210.75	726.93	657.01	6.20		17050.00	10705.00					MinPts
867.61	242.85	705.38	624.76	5.37		21301.36	10705.00					MinPts

Coterra Cascade 29 Federal 221U Rev1 kFc 07Oct25 (DefinitivePlan) - Warning Alert

59.99	32.81	56.71	27.18	29.35		0.00	0.00					Surface
59.99	32.81	56.71	27.18	29.35		23.00	23.00					WRP
59.99	32.81	49.19	27.18	6.17		990.00	990.00					MinPt-EOU
59.99	32.81	47.13	27.18	4.97	OSF 5.00	1230.00	1230.00	OSF<=5.00				Enter Alert
59.99	32.81	45.54	27.18	4.38	OSF 5.00	1390.00	1390.00					MinPts
60.15	32.81	45.31	27.34	4.27	OSF 5.00	1430.00	1430.00					MinPt-EOU
62.45	32.81	46.75	29.64	4.18	OSF 5.00	1520.00	1520.00					MinPt-SF
86.87	32.81	68.57	54.07	4.96	OSF 5.00	1800.00	1800.00	OSF>5.00				Exit Alert
347.00	71.72	298.86	275.28	7.34		4810.00	4803.78					MinPt-SF
596.65	150.56	495.95	446.09	5.97		10130.00	10123.63					MinPts
597.27	150.85	496.38	446.43	5.97		10170.00	10163.56					MinPt-SF
691.48	145.56	594.11	545.92	7.16		11080.00	10701.55					MinPt-SF
671.52	202.61	536.12	468.91	4.99	OSF 5.00	15150.00	10705.00	OSF<=5.00				Enter Alert
259.93	197.64	127.84	62.29	1.98	OSF 5.00	16190.30	10705.00					MinPt-CtCt
260.24	198.72	127.43	61.51	1.97	OSF 5.00	16210.00	10705.00					MinPts
260.84	199.22	127.69	61.62	1.97	OSF 5.00	16220.00	10705.00					MinPt-SF
597.26	181.97	475.62	415.29	4.94	OSF 5.00	16760.00	10705.00	OSF>5.00				Exit Alert
699.80	210.00	559.47	489.80	5.02		16880.00	10705.00					MinPts
647.46	195.13	517.04	452.33	4.99	OSF 5.00	20770.00	10705.00	OSF<=5.00				Enter Alert
570.26	187.63	444.84	382.63	4.57	OSF 5.00	21220.00	10705.00					MinPts
570.38	187.68	444.93	382.70	4.57	OSF 5.00	21230.00	10705.00					MinPt-SF
575.22	187.95	449.60	387.27	4.61	OSF 5.00	21301.36	10705.00					TD

30-025-46355 - Coterra Cascade 29 Federal 15H - Corrected MWD to 17358ft (DefinitiveSurvey) - Warning Alert

116.60	32.81	114.01	83.80	81.61		0.00	0.00					MinPts
116.62	32.81	114.02	83.81	81.61		23.00	23.00					WRP
121.81	32.81	111.99	89.01	13.95		940.00	940.00					MinPt-EOU
122.25	32.81	112.06	89.44	13.26		990.00	990.00					MinPt-EOU
114.50	35.04	90.81	79.45	5.00	OSF 5.00	2360.00	2360.00	OSF<=5.00				Enter Alert
110.14	43.42	80.87	66.72	3.86	OSF 5.00	2920.00	2920.00					MinPt-CtCt
64.12	59.60	24.06	4.52	1.62	OSF 5.00	4027.08	4023.80					MinPt-CtCt
64.58	60.84	23.65	3.74	1.59	OSF 5.00	4110.00	4106.41					MinPt-EOU
65.33	61.74	23.84	3.59	1.59	OSF 5.00	4170.00	4166.18					MinPt-ADP
65.49	61.89	23.90	3.60	1.59	OSF 5.00	4180.00	4176.14					MinPt-SF
156.60	122.63	74.51	33.97	1.92	OSF 5.00	8260.00	8253.63					MinPt-EOU
159.14	126.67	74.36	32.46	1.89	OSF 5.00	8530.00	8523.63					MinPt-EOU
166.72	142.45	71.43	24.27	1.76	OSF 5.00	9590.00	9583.63					MinPt-EOU
167.35	143.19	71.56	24.16	1.75	OSF 5.00	9640.00	9633.63					MinPt-ADP
168.48	144.23	72.00	24.25	1.75	OSF 5.00	9710.00	9703.63					MinPt-SF
171.39	148.24	72.23	23.14	1.74	OSF 5.00	9980.00	9973.63					MinPt-EOU
172.76	150.00	72.43	22.76	1.73	OSF 5.00	10100.00	10093.63					MinPts
173.01	150.21	72.54	22.79	1.73	OSF 5.00	10118.89	10112.52					MinPt-SF
504.20	154.65	400.78	349.56	4.91	OSF 5.00	10880.00	10668.78	OSF>5.00				Exit Alert
1876.82	119.42	1795.89	1757.41	23.76		12330.00	10705.00					MinPt-EOU
1877.67	120.44	1797.05	1757.24	23.57		12400.00	10705.00					MinPt-ADP
1878.64	121.40	1797.38	1757.24	23.39		12460.00	10705.00					MinPt-ADP
1881.71	128.27	1795.86	1753.43	22.16		12830.00	10705.00					MinPt-EOU
1882.24	128.91	1795.97	1753.33	22.06		12870.00	10705.00					MinPt-ADP
1890.63	135.14	1800.21	1755.49	21.13		13180.00	10705.00					MinPt-EOU
1892.47	137.24	1800.65	1755.23	20.82		13280.00	10705.00					MinPt-ADP
1887.96	153.87	1785.18	1734.29	18.54		13970.00	10705.00					MinPt-CtCt



Coterra Cascade 29 Federal 211U Rev2 kFc 29Oct25 Proposal Geodetic Report

Def Plan

Report Date:	October 29, 2025 - 02:51 PM (UTC 0)	Survey / DLS Computation:	Minimum Curvature / Lubinski
Client:	COTERRA	Vertical Section Azimuth:	0.000 °(GRID North)
Field:	NM Lea County (NAD 83)	Vertical Section Origin:	0.000 ft, 0.000 ft
Structure / Slot:	Coterra - Cascade 29 Federal Pad Lot M / Cascade 29 Federal 211U	TVD Reference Datum:	RKB
Well:	Cascade 29 Federal 211U	TVD Reference Elevation:	3424.300 ft above MSL
Borehole:	Cascade 29 Federal 211U	Sealed / Ground Elevation:	3401.300 ft above MSL
UBHI / API#:	Unknown / Unknown	Magnetic Declination:	6.05g°
Survey Name:	Coterra Cascade 29 Federal 211U Rev2 kFc 29Oct25	Total Gravity Field Strength:	998.4291mgn (9.80665 Based)
Survey Date:	October 29, 2025	Gravity Model:	GARM
Tort / AHD / DOI / ERD Ratio:	290.010' / 11006.875 ft / 6.803 / 1.028	Total Magnetic Field Strength:	47048.407 nT
Coordinate Reference System:	NAD83 New Mexico State Plane, Eastern Zone, US Feet	Magnetic Dip Angle:	59.544°
Location Lat / Long:	32°54'22.367"N , 103°36'5.97706"W	Declination Date:	October 29, 2025
Location Grid NIE YX:	N 399089.060 BUS , E 767915.790 BUS	Magnetic Declination Model:	HDGM 2025
CRS Grid Convergence Angle:	0.389°	North Reference:	Grid North
Grid Scale Factor:	0.99996789(Applied)	Grid Convergence Used:	0.389°
Version / Patch:	2025.1.0.1	Total Corr Mag North->Grid North:	5.671°
		Local Coord Referenced To:	Well Head

Comments	MD (ft)	Incl (°)	Azim (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	Northing (RUS)	Easting (RUS)	Latitude (°)	Longitude (°)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)
SHL [270°FSL, 370°FWL]	0.00	0.00	0.00	0.00	-3,424.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029			
Nudge, Build 2"/100ft	3,000.00	0.00	130.76	3,000.00	-424.30	0.00	0.00	0.00	399,089.06	767,915.79	32.09506213	-103.60166029	0.00	0.00	0.00
Hold	3,250.20	5.00	130.76	3,249.88	-174.42	-7.13	-7.13	8.27	399,081.93	767,924.06	32.09504238	-103.60163375	2.00	2.00	0.00
Drop 2"/100ft	4,755.70	5.00	130.76	4,749.64	1,325.34	-92.87	-92.87	107.73	398,996.19	768,023.52	32.09480485	-103.60131448	0.00	0.00	0.00
Hold	5,005.89	0.00	130.76	4,999.52	1,575.22	-100.00	-100.00	116.00	398,989.06	768,031.79	32.09478510	-103.60128793	2.00	-2.00	0.00
KOP, Build 10"/100ft	10,118.89	0.00	130.76	10,112.52	6,688.22	-100.00	-100.00	116.00	398,989.06	768,031.79	32.09478510	-103.60128793	0.00	0.00	0.00
Build 5"/100ft	10,868.89	75.00	349.63	10,865.95	7,241.65	317.73	317.73	39.56	399,406.78	767,955.35	32.09593472	-103.60152560	10.00	10.00	0.00
Landing Point	11,168.89	90.00	349.63	10,705.00	7,280.70	609.47	609.47	-13.83	399,698.51	767,901.96	32.09673760	-103.60169159	5.00	5.00	0.00
Turn 2"/100ft	11,201.89	90.00	349.63	10,705.00	7,280.70	641.93	641.93	-19.77	399,730.97	767,896.02	32.09682694	-103.60171006	0.00	0.00	0.00
Hold	11,719.83	90.00	359.99	10,705.00	7,280.70	1,157.04	1,157.04	-66.56	400,246.06	767,849.23	32.09624366	-103.60184987	2.00	0.00	2.00
TP1, Turn 8.77"/100ft	14,823.09	90.00	359.99	10,705.00	7,280.70	4,280.30	4,280.30	-67.17	403,349.21	767,846.62	32.10677342	-103.60178384	0.00	0.00	0.00
Hold	15,848.23	90.00	89.63	10,705.00	7,280.70	4,913.73	4,913.73	581.92	404,002.62	768,497.69	32.10855734	-103.59967335	8.77	0.00	8.77
TP2, Turn 8.77"/100ft	15,848.23	90.00	89.63	10,705.00	7,280.70	4,913.75	4,913.75	584.92	404,002.64	768,500.69	32.10855734	-103.59966366	0.00	0.00	0.00
Hold	16,874.45	90.00	179.63	10,705.00	7,280.70	4,264.67	4,264.67	1,242.45	403,353.58	768,158.19	32.10676092	-103.59755460	8.77	0.00	8.77
Hold	16,874.53	90.00	179.63	10,705.00	7,280.70	4,264.58	4,264.58	1,242.45	403,353.50	768,158.19	32.10676099	-103.59755460	2.00	0.00	2.00
Cascade 29 Federal 211U - BHL [100°FSL, 1640°FWL]	21,301.36	90.00	179.63	10,705.00	7,280.70	-162.16	-162.16	1,270.90	398,926.91	768,186.65	32.09459265	-103.59756026	0.00	0.00	0.00

Survey Type:	Def Plan										
Survey Error Model:	ISCWSA Rev 4 *** 3-D 95 % 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 Code	Vendor / Tool	Borehole / Survey	
	1	0.000	10,100.000	1/100.000 :25 – 8.75 – 6.75 10.75 – 7.625 – 5				A001Mb_MWD		Cascade 29 Federal 211U / Coterra Cascade 29 Fe	
	1	10,100.000	21,301.365	1/100.000	6.75	5		A008Mb_MWD+JFR1+MS		Cascade 29 Federal 211U / Coterra Cascade 29 Fe	

EOU Geometry:			
End MD (ft)	Hole Size (in)	Casing Size (in)	Name
1,000.100	17.500	13.375	
6,000.100	12.250	10.750	
10,000.100	8.750	7.625	
21,301.365	6.750	5.000	

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Breaking Rule	Reference Trajectory		Risk Level			Alert
	Ct-Ct (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major	
1888.13	158.83	1781.91	1729.30	17.93			14180.00	10705.00				MinPt-CiCt
1891.58	176.84	1773.36	1714.74	16.13			14880.00	10705.00				MinPt-CiCt
1892.90	180.22	1772.43	1712.68	15.83			15030.00	10705.00				MinPt-EOU
1894.31	181.90	1772.72	1712.41	15.70			15100.00	10705.00				MinPt-ADP
1947.58	196.11	1816.52	1751.47	14.96			15650.00	10705.00				MinPt-SF
2288.40	210.26	2147.90	2078.14	16.39			16890.00	10705.00				MinPt-SF
2285.99	209.45	2146.03	2076.54	16.44			17230.00	10705.00				MinPt-SF
2280.67	210.58	2139.95	2070.08	16.31			17780.00	10705.00				MinPt-CiCt
2280.75	210.87	2139.85	2069.88	16.29			17820.00	10705.00				MinPt-EOU
2280.88	211.01	2139.87	2069.86	16.28			17840.00	10705.00				MinPt-ADP
2283.99	212.00	2142.33	2071.99	16.23			18020.00	10705.00				MinPt-SF
2288.05	213.40	2145.46	2074.65	16.15			18300.00	10705.00				MinPt-SF
2284.44	214.20	2141.32	2070.25	16.06			18530.00	10705.00				MinPt-SF
2278.30	217.10	2133.24	2061.21	15.81			18880.00	10705.00				MinPt-CiCt
2278.48	217.70	2133.02	2060.78	15.76			18940.00	10705.00				MinPt-EOU
2277.24	221.74	2129.08	2055.50	15.47			19370.00	10705.00				MinPt-CiCt
2277.38	222.41	2128.78	2054.97	15.42			19430.00	10705.00				MinPts
1314.15	189.47	1187.51	1124.68	10.45			21300.00	10705.00				MinPt-CiCt
1314.15	189.47	1187.51	1124.68	10.45			21301.36	10705.00				MinPts

Coterra Cascade 29-20-17 Federal Com 302H Rev0 kFc 29Oct25 (DefinitivePlan) - Warning Alert

79.98	32.81	76.70	47.18	39.34			0.00	0.00				Surface
79.98	32.81	76.70	47.18	39.34			23.00	23.00				WRP
79.98	32.81	69.18	47.18	8.27			990.00	990.00				MinPt-EOU
79.98	32.81	67.51	47.18	6.88			1190.00	1190.00				MinPts
80.14	32.81	67.28	47.33	6.67			1230.00	1230.00				MinPt-EOU
85.46	32.81	71.19	52.65	6.36			1380.00	1380.00				MinPt-SF
1363.37	152.72	1261.22	1210.64	13.47			10130.00	10123.63				MinPt-EOU
1363.43	152.80	1261.24	1210.64	13.46			10140.00	10133.62				MinPt-ADP
1367.32	153.62	1264.58	1213.70	13.43			10260.00	10252.20				MinPt-SF
1473.04	142.72	1377.56	1330.32	15.58			11030.00	10696.59				MinPt-CiCt
1473.07	142.82	1377.53	1330.25	15.57			11040.00	10697.76				MinPt-EOU
1473.15	142.92	1377.54	1330.22	15.56			11050.00	10698.84				MinPt-ADP
1475.60	143.48	1379.62	1332.12	15.52			11130.00	10704.34				MinPt-SF
1493.76	192.06	1365.39	1301.70	11.72			14460.00	10705.00				MinPt-CiCt
1493.98	192.85	1365.09	1301.13	11.67			14510.00	10705.00				MinPt-EOU
1494.37	193.33	1365.15	1301.04	11.65			14540.00	10705.00				MinPt-ADP
714.70	204.90	577.78	509.80	5.25			17220.00	10705.00				MinPt-CiCt
714.70	215.14	570.95	499.57	5.00	OSF 5.00		18280.00	10705.00	OSF<=5.00			Enter Alert
714.70	245.73	550.56	468.97	4.37	OSF 5.00		20210.00	10705.00				MinPt-CiCt
711.60	252.96	542.63	458.63	4.23	OSF 5.00		20620.00	10705.00	OSF>5.00			Exit Alert
570.39	173.78	454.21	396.61	4.94	OSF 5.00		20770.00	10705.00	OSF<=5.00			Enter Alert
207.08	191.63	79.00	15.45	1.62	OSF 5.00		21301.36	10705.00				MinPts

30-025-46305 - Coterra Cascade 29 Federal 16H - Corrected MWD to 17201ft (DefinitiveSurvey) - Warning Alert

134.15	32.81	131.56	101.34	94.01			0.00	0.00				Surface
134.14	32.81	131.55	101.33	94.00			23.00	23.00				WRP
132.07	32.81	127.25	99.27	35.87			422.67	422.67				MinPts
132.39	32.81	126.94	99.58	30.74			490.00	490.00				MinPt-EOU
175.87	33.91	152.93	141.96	7.97			2300.00	2300.00				MinPt-SF
289.69	62.09	247.97	227.60	7.09			4210.00	4206.02				MinPt-EOU
290.84	63.40	248.24	227.43	6.97			4300.00	4295.68				MinPt-ADP
292.90	66.57	248.20	226.34	6.68			4510.00	4504.88				MinPt-EOU
293.38	67.15	248.29	226.24	6.63			4550.00	4544.73				MinPt-ADP
305.92	73.66	256.49	232.26	6.29			4980.00	4973.63				MinPt-SF
409.95	94.62	346.54	315.33	6.55			6380.00	6373.63				MinPt-SF
441.43	133.18	352.31	308.25	5.00	OSF 5.00		9000.00	8993.63	OSF<=5.00			Enter Alert
427.36	149.49	327.38	277.88	4.31	OSF 5.00		10140.00	10133.62				MinPts
427.41	149.56	327.38	277.85	4.31	OSF 5.00		10150.00	10143.61				MinPt-ADP
427.72	149.70	327.60	278.02	4.30	OSF 5.00		10170.00	10163.56				MinPt-SF
502.58	152.19	400.80	350.40	4.98	OSF 5.00		10540.00	10496.72	OSF>5.00			Exit Alert
1731.57	120.97	1650.60	1610.60	21.63			12080.00	10705.00				MinPt-EOU
1726.07	129.85	1639.18	1596.22	20.08			12650.00	10705.00				MinPt-CiCt
1726.13	130.04	1639.11	1596.09	20.05			12670.00	10705.00				MinPt-EOU
1726.21	130.14	1639.12	1596.07	20.04			12680.00	10705.00				MinPt-ADP
1732.98	139.70	1639.52	1593.28	18.73			13170.00	10705.00				MinPt-CiCt
1734.27	143.54	1638.25	1590.73	18.24			13370.00	10705.00				MinPt-EOU
1735.00	144.40	1638.40	1590.60	18.14			13420.00	10705.00				MinPt-ADP
1730.30	162.54	1621.61	1567.76	16.06			14200.00	10705.00				MinPt-CiCt
1731.39	173.59	1615.33	1557.80	15.04			14650.00	10705.00				MinPt-EOU
1731.63	173.90	1615.37	1557.73	15.01			14670.00	10705.00				MinPt-ADP
1633.51	197.73	1501.36	1435.78	12.45			15790.00	10705.00				MinPt-CiCt
1633.61	198.09	1501.22	1435.52	12.42			15810.00	10705.00				MinPt-EOU
1633.75	198.28	1501.24	1435.47	12.41			15820.00	10705.00				MinPt-ADP
1654.72	203.03	1519.04	1451.69	12.28			16060.00	10705.00				MinPt-SF
1780.62	210.76	1639.78	1569.86	12.73			17050.00	10705.00				MinPt-CiCt
1780.75	211.18	1639.63	1569.56	12.70			17080.00	10705.00				MinPt-EOU
1780.86	211.32	1639.66	1569.54	12.69			17090.00	10705.00				MinPt-ADP
1781.02	211.40	1639.75	1569.61	12.69			17100.00	10705.00				MinPt-SF
1788.33	212.93	1646.05	1575.40	12.65			17490.00	10705.00				MinPt-SF
1780.32	215.33	1636.44	1564.99	12.45			18050.00	10705.00				MinPt-CiCt
1780.45	215.70	1636.32	1564.75	12.43			18080.00	10705.00				MinPt-EOU
1780.66	215.94	1636.37	1564.72	12.42			18100.00	10705.00				MinPt-ADP
1782.54	216.72	1637.73	1565.82	12.39			18210.00	10705.00				MinPt-SF
1781.72	217.78	1636.21	1563.94	12.32			18370.00	10705.00				MinPt-CiCt
1781.46	220.12	1634.38	1561.33	12.19			18630.00	10705.00				MinPt-CiCt
1781.77	221.32	1633.90	1560.45	12.12			18740.00	10705.00				MinPt-EOU
1782.06	221.66	1633.96	1560.40	12.11			18770.00	10705.00				MinPt-ADP
1783.46	222.69	1634.67	1560.77	12.06			18860.00	10705.00				MinPt-SF
1772.51	226.07	1621.47	1546.44	11.81			19180.00	10705.00				MinPt-CiCt
1772.65	226.54	1621.30	1546.11	11.78			19210.00	10705.00				MinPt-EOU

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Breaking Rule	Reference Trajectory		Risk Level			Alert
	Ct-Ct (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major	
1772.90	226.84	1621.34	1546.06	11.77			19230.00	10705.00				MinPt-ADP
1773.77	227.43	1621.83	1546.35	11.74			19270.00	10705.00				MinPt-SF
1772.63	228.47	1619.98	1544.15	11.68			19370.00	10705.00				MinPt-CtCt
1772.78	228.94	1619.83	1543.84	11.66			19400.00	10705.00				MinPt-EOU
1773.05	229.24	1619.89	1543.80	11.65			19420.00	10705.00				MinPt-ADP
1776.31	232.28	1621.13	1544.04	11.51			19660.00	10705.00				MinPt-CtCt
1776.47	233.01	1620.80	1543.46	11.48			19710.00	10705.00				MinPts
738.51	189.14	612.09	549.37	5.88			21301.36	10705.00				MinPts
30-025-50787 - Coterra Cascade 29 Federal 18H - Corrected MWD to 17355ft (DefinitiveSurvey) - Warning Alert												
170.86	32.81	168.26	138.05	119.96			0.00	0.00				Surface
170.85	32.81	168.26	138.04	119.95			23.00	23.00				WRP
169.60	32.81	164.97	136.79	48.76			401.79	401.79				MinPts
169.94	32.81	164.61	137.14	40.55			480.00	480.00				MinPt-EOU
175.62	32.81	165.51	142.81	19.26			990.00	990.00				MinPt-EOU
178.33	32.81	164.03	145.52	13.32			1420.00	1420.00				MinPt-EOU
198.37	32.81	180.95	165.56	12.01			1750.00	1750.00				MinPt-SF
543.55	46.38	512.31	497.18	17.93			3200.00	3199.84				MinPt-SF
624.61	53.58	588.57	571.04	17.79			3670.00	3668.08				MinPt-SF
675.38	57.98	636.41	617.41	17.75			3960.00	3956.98				MinPt-SF
722.88	62.42	680.94	660.46	17.62			4240.00	4235.91				MinPt-SF
1530.07	113.15	1454.30	1416.91	20.45			7520.00	7513.63				MinPt-SF
1599.07	127.12	1513.99	1471.95	19.00			8300.00	8293.63				MinPt-CtCt
1602.99	148.04	1503.97	1454.95	16.34			9770.00	9763.63				MinPt-CtCt
1603.69	150.04	1503.34	1453.65	16.13			9910.00	9903.63				MinPt-EOU
1605.56	153.00	1503.23	1452.55	15.83			10120.00	10113.63				MinPt-EOU
1605.62	153.08	1503.24	1452.54	15.83			10130.00	10123.63				MinPt-ADP
1611.99	154.19	1508.87	1457.80	15.77			10290.00	10281.09				MinPt-SF
2398.87	142.90	2303.28	2255.98	25.35			12100.00	10705.00				MinPt-CtCt
2397.95	145.90	2300.35	2252.04	24.81			12380.00	10705.00				MinPt-CtCt
2394.54	159.61	2287.81	2234.93	22.63			13330.00	10705.00				MinPt-CtCt
2395.00	165.48	2284.35	2229.52	21.83			13660.00	10705.00				MinPt-CtCt
2395.56	167.11	2283.82	2228.44	21.62			13760.00	10705.00				MinPt-EOU
2395.81	167.42	2283.87	2228.39	21.58			13780.00	10705.00				MinPt-ADP
2400.67	173.45	2284.71	2227.22	20.87			14060.00	10705.00				MinPt-CtCt
1699.54	207.15	1561.11	1492.39	12.36			17090.00	10705.00				MinPt-CtCt
1692.59	210.76	1551.75	1481.83	12.10			17670.00	10705.00				MinPt-CtCt
1692.69	211.08	1551.65	1481.62	12.08			17700.00	10705.00				MinPt-EOU
1691.43	212.92	1549.16	1478.51	11.96			17920.00	10705.00				MinPt-CtCt
1691.60	213.54	1548.91	1478.06	11.93			17970.00	10705.00				MinPt-EOU
1691.68	213.66	1548.91	1478.02	11.92			17980.00	10705.00				MinPt-ADP
1689.48	220.88	1541.90	1468.60	11.52			18660.00	10705.00				MinPt-CtCt
1687.74	230.62	1533.66	1457.12	11.02			19370.00	10705.00				MinPt-CtCt
1686.33	235.93	1528.71	1450.40	10.76			19710.00	10705.00				MinPts
581.15	176.75	462.99	404.41	4.95		OSF 5.00	20970.00	10705.00	OSF<=5.00			Enter Alert
449.55	191.12	321.81	258.43	3.54		OSF 5.00	21301.36	10705.00				MinPts
30-025-40346 - CASCADE 29 FEDERAL 1H ST01 - Gyro+MWD to 14296ft - A (DefinitiveSurvey) - Warning Alert												
4680.16	32.81	4676.77	4647.35	3307.40			0.00	0.00				MinPts
4680.19	32.81	4676.80	4647.38	3305.25			23.00	23.00				WRP
4743.98	40.24	4716.57	4703.74	184.87			2710.00	2710.00				MinPts
4858.07	66.18	4813.36	4791.88	113.07			4380.00	4375.38				MinPt-ADP
4875.50	73.44	4825.95	4802.06	101.99			4860.00	4853.69				MinPt-ADP
454.94	138.24	362.24	316.70	4.98		OSF 5.00	9430.00	9423.63	OSF<=5.00			Enter Alert
198.18	174.01	81.64	24.18	1.71		OSF 5.00	9839.50	9833.13				MinPt-CtCt
472.50	143.62	376.24	328.88	4.97		OSF 5.00	9840.00	9833.63				MinPts
873.98	125.77	789.62	748.21	10.53		OSF 5.00	10280.00	10271.51	OSF>5.00			Exit Alert
873.68	125.41	789.56	748.27	10.56			11420.00	10705.00				MinPt-ADP
873.47	124.77	789.79	748.71	10.61			11460.00	10705.00				MinPt-EOU
877.47	120.13	796.87	757.34	11.08			11530.00	10705.00				MinPt-CtCt
880.13	116.44	802.00	763.69	11.47			11940.00	10705.00				MinPt-CtCt
880.13	116.41	802.01	763.71	11.47			12410.00	10705.00				MinPts
887.69	115.35	810.28	772.34	11.68			12420.00	10705.00				MinPt-CtCt
872.74	116.47	794.58	756.26	11.37			12890.00	10705.00				MinPt-SF
872.79	116.65	794.52	756.14	11.35			13460.00	10705.00				MinPt-CtCt
872.87	116.74	794.54	756.13	11.34			13480.00	10705.00				MinPt-EOU
876.17	117.75	797.16	758.42	11.29			13490.00	10705.00				MinPt-ADP
880.00	119.21	800.01	760.79	11.20			13610.00	10705.00				MinPt-SF
877.45	121.84	795.71	755.61	10.92			13840.00	10705.00				MinPt-SF
876.93	124.01	793.75	752.93	10.72			14130.00	10705.00				MinPt-CtCt
877.04	126.49	792.21	750.55	10.51			14310.00	10705.00				MinPt-CtCt
877.23	126.99	792.06	750.24	10.47			14490.00	10705.00				MinPt-CtCt
877.52	127.33	792.12	750.18	10.44			14520.00	10705.00				MinPt-EOU
902.65	134.35	812.58	768.30	10.18			14540.00	10705.00				MinPt-ADP
1487.32	178.17	1368.04	1309.16	12.62			14890.00	10705.00				MinPt-SF
1527.84	185.15	1403.90	1342.69	12.47			16950.00	10705.00				MinPt-SF
1527.84	193.19	1398.54	1334.65	11.95			17520.00	10705.00				MinPt-ADP
1527.11	198.39	1394.34	1328.72	11.62			17970.00	10705.00				MinPt-CtCt
1528.74	202.73	1393.08	1326.01	11.39			18220.00	10705.00				MinPt-CtCt
1529.40	203.55	1393.19	1325.85	11.34			18420.00	10705.00				MinPt-EOU
1530.71	205.62	1393.12	1325.09	11.24			18600.00	10705.00				MinPt-ADP
1531.83	206.95	1393.35	1324.87	11.17			18460.00	10705.00				MinPt-ADP
1533.16	226.95	1381.35	1306.21	10.19			18540.00	10705.00				MinPt-EOU
1513.49	259.97	1339.66	1253.52	8.78			19300.00	10705.00				MinPt-CtCt
1507.71	277.37	1322.29	1230.35	8.19			20300.00	10705.00				MinPt-CtCt
1508.06	287.57	1315.84	1220.49	7.90			20780.00	10705.00				MinPt-CtCt
1508.17	287.71	1315.86	1220.46	7.90			21060.00	10705.00				MinPt-EOU
1509.70	288.23	1317.04	1221.48	7.89			21070.00	10705.00				MinPt-ADP
1529.03	288.24	1336.37	1240.80	7.99			21120.00	10705.00				MinPt-SF
							21301.36	10705.00				TD

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Breaking Rule	Reference Trajectory		Risk Level			Alert
	Ct-Ct (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major	
30-025-41243 - CASCADE 29 FEDERAL 5H - MWD to 14373ft - A (DefinitiveSurvey) - Warning Alert												
	4684.70	32.81	4681.31	4651.89			0.00	0.00				MinPts
	4684.72	32.81	4681.33	4651.92	3308.46		23.00	23.00				WRP
	4686.90	32.81	4680.17	4654.09	986.81		510.00	510.00				MinPt-EOU
	4689.82	32.81	4678.31	4657.01	491.80		990.00	990.00				MinPt-EOU
	4690.02	32.81	4678.49	4657.22	479.91		1020.00	1020.00				MinPt-EOU
	4693.47	32.81	4678.79	4660.66	363.32		1340.00	1340.00				MinPt-EOU
	4697.46	32.81	4678.99	4664.65	281.13		1720.00	1720.00				MinPt-EOU
	4699.07	32.81	4678.23	4666.26	246.17		1940.00	1940.00				MinPts
	4699.31	32.81	4677.95	4666.50	239.65		2010.00	2010.00				MinPt-EOU
	4713.51	46.26	4682.09	4667.25	158.84		3000.00	3000.00				MinPt-CtCt
	4713.68	46.80	4681.90	4666.88	156.92		3040.00	3040.00				MinPt-EOU
	4713.92	47.08	4681.95	4666.84	155.98		3060.00	3060.00				MinPt-ADP
	812.25	245.85	647.82	566.41	4.98	OSF 5.00	9490.00	9483.63	OSF<=5.00			Enter Alert
	720.65	272.26	538.60	448.38	3.99	OSF 5.00	9864.73	9858.36				MinPt-CtCt
	720.66	272.32	538.58	448.35	3.98	OSF 5.00	9870.00	9863.63				MinPts
	720.81	272.39	538.68	448.42	3.98	OSF 5.00	9880.00	9873.63				MinPt-SF
	825.34	250.51	657.82	574.83	4.96	OSF 5.00	10270.00	10261.88	OSF>5.00			Exit Alert
	1214.51	168.55	1101.64	1045.96	10.89		12690.00	10705.00				MinPt-ADP
	1214.29	168.26	1101.61	1046.03	10.91		12710.00	10705.00				MinPt-EOU
	1214.14	167.69	1101.83	1046.44	10.95		12750.00	10705.00				MinPt-CtCt
	1218.88	157.54	1113.35	1061.34	11.70		14470.00	10705.00				MinPt-CtCt
	1218.91	157.63	1113.31	1061.28	11.70		14490.00	10705.00				MinPt-EOU
	1218.99	157.73	1113.33	1061.26	11.69		14510.00	10705.00				MinPt-ADP
	1220.40	158.30	1114.36	1062.11	11.66		14630.00	10705.00				MinPt-SF
	1220.83	157.67	1115.21	1063.16	11.71		14740.00	10705.00				MinPt-CtCt
	939.89	189.49	813.05	750.39	7.49		17700.00	10705.00				MinPt-CtCt
	941.25	193.79	811.55	747.46	7.33		17900.00	10705.00				MinPt-EOU
	949.25	202.78	813.55	746.47	7.06		18290.00	10705.00				MinPt-ADP
	952.52	206.19	814.55	746.33	6.97		18430.00	10705.00				MinPt-ADP
	958.22	212.83	815.82	745.38	6.79		18690.00	10705.00				MinPt-EOU
	947.86	242.37	785.77	705.50	5.89		19740.00	10705.00				MinPt-CtCt
	959.59	283.33	770.20	676.27	5.10		21080.00	10705.00				MinPts
	959.72	283.40	770.28	676.32	5.10		21090.00	10705.00				MinPt-SF
	986.44	280.28	799.08	706.16	5.30		21301.36	10705.00				TD
30-025-41240 - CASCADE 29 FEDERAL 2H - MWD to 14248ft - A (DefinitiveSurvey) - Pass												
	4926.65	32.81	4923.25	4893.84	3481.66		0.00	0.00				Surface
	4926.64	32.81	4923.24	4893.83	3477.65		23.00	23.00				WRP
	4924.69	32.81	4913.45	4891.89	531.10		990.00	990.00				MinPt-EOU
	4923.06	32.81	4904.63	4890.25	295.22		1750.00	1750.00				MinPts
	4926.16	37.77	4900.39	4888.39	205.10		2520.00	2520.00				MinPt-EOU
	4927.38	39.27	4900.61	4888.11	196.95		2630.00	2630.00				MinPt-ADP
	4970.94	59.10	4930.95	4911.84	130.00		3980.00	3976.90				MinPt-ADP
	1624.28	266.90	1445.81	1357.38	9.18		9870.00	9863.63				MinPt-CtCt
	1624.30	266.95	1445.79	1357.35	9.17		9880.00	9873.63				MinPts
	1624.52	267.03	1445.97	1357.50	9.17		9900.00	9893.63				MinPt-SF
	1994.05	170.03	1880.18	1824.02	17.74		13650.00	10705.00				MinPt-ADP
	1992.61	168.87	1879.51	1823.73	17.85		13800.00	10705.00				MinPt-ADP
	1992.54	168.79	1879.50	1823.75	17.86		13820.00	10705.00				MinPt-EOU
	1992.52	168.72	1879.53	1823.81	17.86		13840.00	10705.00				MinPt-CtCt
	2001.85	167.98	1889.35	1833.87	18.03		14560.00	10705.00				MinPt-SF
	2001.75	168.15	1889.14	1833.60	18.01		14650.00	10705.00				MinPt-CtCt
	2001.81	168.37	1889.05	1833.44	17.98		14680.00	10705.00				MinPts
	2001.67	168.59	1888.77	1833.08	17.96		14730.00	10705.00				MinPt-CtCt
	2001.73	168.76	1888.71	1832.97	17.94		14750.00	10705.00				MinPt-EOU
	2001.79	168.85	1888.71	1832.94	17.93		14760.00	10705.00				MinPt-ADP
	2002.98	169.53	1889.45	1833.46	17.87		14850.00	10705.00				MinPts
	982.14	174.46	865.32	807.68	8.51		17050.00	10705.00				MinPt-CtCt
	977.57	191.87	849.14	785.69	7.69		17920.00	10705.00				MinPt-CtCt
	979.41	197.84	847.01	781.57	7.47		18180.00	10705.00				MinPt-EOU
	981.18	199.96	847.36	781.22	7.41		18270.00	10705.00				MinPt-ADP
	957.79	281.68	769.50	676.11	5.12		21060.86	10705.00				MinPt-CtCt
	957.99	282.20	769.34	675.78	5.11		21080.00	10705.00				MinPts
	959.62	283.05	770.41	676.57	5.10		21120.00	10705.00				MinPt-SF
	987.53	282.62	798.60	704.90	5.26		21301.36	10705.00				TD
30-025-50784 - Coterra Cascade 29 Federal 71H - Corrected MWD to 17573ft (DefinitiveSurvey) - Pass												
	3779.27	32.81	3776.68	3746.47	2671.06		0.00	0.00				Surface
	3779.26	32.81	3776.67	3746.45	2670.91		23.00	23.00				WRP
	3773.62	32.81	3766.54	3740.81	639.63		660.00	660.00				MinPts
	3774.36	32.81	3764.44	3741.55	431.64		970.00	970.00				MinPt-EOU
	2150.62	118.04	2071.59	2032.57	27.55		7670.00	7663.63				MinPt-CtCt
	2150.69	118.32	2071.48	2032.37	27.48		7700.00	7693.63				MinPt-EOU
	2150.84	118.50	2071.51	2032.34	27.44		7720.00	7713.63				MinPt-ADP
	2151.61	121.77	2070.10	2029.84	26.71		7940.00	7933.63				MinPt-CtCt
	2151.94	127.25	2066.78	2024.69	25.55		8330.00	8323.63				MinPt-CtCt
	2150.73	136.49	2059.41	2014.24	23.80		8980.00	8973.63				MinPt-CtCt
	2151.20	140.29	2057.35	2010.91	23.15		9250.00	9243.63				MinPt-CtCt
	2148.25	148.92	2048.64	1999.33	21.77		9850.00	9843.63				MinPt-CtCt
	2148.47	149.59	2048.41	1998.88	21.68		9910.00	9903.63				MinPt-EOU
	2148.65	149.80	2048.46	1998.85	21.65		9930.00	9923.63				MinPt-ADP
	2151.88	152.41	2049.95	1999.47	21.31		10120.00	10113.63				MinPt-ADP
	2163.03	154.30	2059.83	2008.72	21.15		10350.00	10337.41				MinPt-SF
	2998.94	178.96	2879.30	2819.98	25.27		12890.00	10705.00				MinPt-CtCt
	2996.86	187.61	2871.45	2809.24	24.08		13380.00	10705.00				MinPt-CtCt
	2994.47	209.94	2854.18	2784.53	21.49		14470.00	10705.00				MinPt-CtCt
	2154.39	224.98	2004.07	1929.40	14.42		16810.00	10705.00				MinPt-SF
	2152.37	224.81	2002.17	1927.56	14.42		16980.00	10705.00				MinPt-CtCt
	2152.37	224.82	2002.17	1927.55	14.42		16990.00	10705.00				MinPts
	2150.73	224.67	2000.62	1926.05	14.42		17370.00	10705.00				MinPt-SF

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Breaking Rule	Reference Trajectory		Risk Level			Alert
	Ct-Ct (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major	
	2149.29	225.30	1998.76	1923.99	14.37		17680.00	10705.00				MinPt-CtCt
	2149.35	225.50	1998.70	1923.86	14.35		17720.00	10705.00				MinPt-EOU
	2149.44	225.59	1998.71	1923.84	14.35		17740.00	10705.00				MinPt-ADP
	2149.55	225.69	1998.76	1923.86	14.34		17760.00	10705.00				MinPt-SF
	2144.05	228.14	1991.63	1915.91	14.15		18400.00	10705.00				MinPt-CtCt
	2140.97	231.70	1986.17	1909.26	13.91		18930.00	10705.00				MinPt-CtCt
	2141.12	232.27	1985.95	1908.85	13.88		18990.00	10705.00				MinPt-EOU
	2141.17	233.09	1985.45	1908.08	13.83		19100.00	10705.00				MinPt-CtCt
	2141.41	233.81	1985.22	1907.61	13.79		19170.00	10705.00				MinPt-EOU
	2143.13	236.21	1985.33	1906.92	13.66		19430.00	10705.00				MinPts
	997.17	191.03	869.49	806.14	7.86		21301.36	10705.00				MinPts
Coterra Cascade 29 Federal 222U plan0 (DefinitivePlan) - Pass												
	3719.16	32.81	3715.87	3686.35	1858.61		0.00	0.00				Surface
	3719.16	32.81	3715.87	3686.35	1858.61		23.00	23.00				WRP
	3719.16	32.81	3709.24	3686.35	430.62		900.00	900.00				MinPt-EOU
	3719.16	32.81	3708.46	3686.35	390.81		990.00	990.00				MinPt-EOU
	3719.16	32.81	3700.64	3686.35	212.07		1800.00	1800.00				MinPts
	3719.43	32.81	3700.37	3686.62	205.73		1870.00	1870.00				MinPt-EOU
	2604.03	192.67	2475.26	2411.36	20.37		10230.00	10222.93				MinPt-SF
	2562.75	187.71	2437.28	2375.04	20.58		10550.00	10504.08				MinPt-ADP
	2562.63	187.59	2437.25	2375.05	20.59		10560.00	10511.32				MinPt-EOU
	2562.58	187.47	2437.27	2375.11	20.60		10570.00	10518.44				MinPt-CtCt
	1364.86	213.73	1222.04	1151.13	9.62		16870.00	10705.00				MinPt-SF
	1364.83	213.72	1222.02	1151.10	9.62		16874.45	10705.00				MinPt-ADP
	1364.83	213.72	1222.02	1151.10	9.62		16874.53	10705.00				MinPt-EOU
	1364.62	223.66	1215.16	1140.95	9.19		21301.36	10705.00				MinPts
Coterra Cascade 29 Federal 202U plan0 (DefinitivePlan) - Pass												
	3699.16	32.81	3695.87	3666.35	1848.61		0.00	0.00				Surface
	3699.15	32.81	3695.87	3666.35	1848.61		23.00	23.00				WRP
	3699.15	32.81	3689.23	3666.35	428.31		900.00	900.00				MinPt-EOU
	3699.15	32.81	3688.46	3666.35	388.71		990.00	990.00				MinPt-EOU
	2502.27	182.48	2380.28	2319.79	20.67		10170.00	10163.56				MinPt-SF
	2499.37	182.16	2377.61	2317.22	20.69		10260.00	10252.20				MinPts
	1382.36	211.40	1241.09	1170.95	9.85		16860.00	10705.00				MinPt-SF
	1382.11	211.34	1240.89	1170.77	9.85		16874.45	10705.00				MinPts
	1382.11	211.32	1240.90	1170.79	9.85		16879.70	10705.00				MinPt-CtCt
	1382.44	226.02	1231.43	1156.42	9.21		21301.36	10705.00				MinPts
30-025-50291 - Coterra Cascade 29 Federal 72H Corrected MWD to 17208ft (DefinitiveSurvey) - Pass												
	3799.26	32.81	3796.67	3766.45	2685.19		0.00	0.00				Surface
	3799.26	32.81	3796.67	3766.45	2685.19		10.00	10.00				MinPts
	3799.26	32.81	3796.67	3766.46	2685.19		23.00	23.00				WRP
	2717.10	137.16	2625.34	2579.94	29.92		9140.00	9133.63				MinPt-CtCt
	2717.63	139.68	2624.18	2577.95	29.38		9330.00	9323.63				MinPt-EOU
	2713.70	151.54	2612.34	2562.15	27.03		10140.00	10133.62				MinPt-CtCt
	2713.71	151.61	2612.30	2562.10	27.01		10150.00	10143.61				MinPt-EOU
	2713.76	151.68	2612.31	2562.08	27.00		10160.00	10153.59				MinPt-ADP
	2728.25	153.28	2625.73	2574.97	26.86		10410.00	10391.26				MinPt-SF
	3348.07	167.12	3236.33	3180.95	30.22		12080.00	10705.00				MinPts
	3340.74	174.54	3224.06	3166.21	28.87		12620.00	10705.00				MinPt-CtCt
	3340.99	175.29	3223.81	3165.71	28.74		12690.00	10705.00				MinPt-EOU
	3341.27	175.61	3223.87	3165.66	28.69		12720.00	10705.00				MinPt-ADP
	3342.37	177.47	3223.73	3164.90	28.40		12820.00	10705.00				MinPt-CtCt
	3342.85	178.85	3223.29	3164.00	28.18		12930.00	10705.00				MinPt-EOU
	3343.39	179.50	3223.40	3163.89	28.09		12980.00	10705.00				MinPt-ADP
	3346.65	182.68	3224.54	3163.97	27.62		13180.00	10705.00				MinPt-ADP
	3326.60	207.40	3188.01	3119.21	24.17		14450.00	10705.00				MinPt-CtCt
	3326.83	208.08	3187.78	3118.75	24.09		14500.00	10705.00				MinPt-EOU
	3327.15	208.49	3187.83	3118.67	24.04		14530.00	10705.00				MinPt-ADP
	2290.16	221.78	2141.97	2068.37	15.55		16850.00	10705.00				MinPt-SF
	2279.12	220.69	2131.66	2058.43	15.55		17280.00	10705.00				MinPt-SF
	2279.11	220.68	2131.66	2058.43	15.55		17290.00	10705.00				MinPts
	2279.10	220.66	2131.67	2058.44	15.56		17300.00	10705.00				MinPt-CtCt
	2281.41	219.98	2134.43	2061.43	15.62		17660.00	10705.00				MinPt-SF
	2293.27	218.99	2146.94	2074.27	15.77		18220.00	10705.00				MinPt-CtCt
	2293.27	219.02	2146.93	2074.25	15.77		18230.00	10705.00				MinPt-EOU
	2293.30	219.05	2146.93	2074.24	15.77		18240.00	10705.00				MinPts
	2293.36	219.03	2147.01	2074.33	15.77		18320.00	10705.00				MinPts
	2280.37	221.28	2132.52	2059.08	15.52		19120.00	10705.00				MinPt-CtCt
	2280.53	221.73	2132.36	2058.80	15.49		19200.00	10705.00				MinPt-EOU
	2280.64	221.86	2132.41	2058.78	15.48		19220.00	10705.00				MinPt-ADP
	2283.68	224.10	2133.96	2059.59	15.35		19640.00	10705.00				MinPts
	1556.62	190.14	1429.53	1366.48	12.34		21301.36	10705.00				MinPts

29-25-33-M Sundry ID 2881236 Cascade 29 Federal 211H .xslm

Cascade 29 Federal 211H

13 3/8		surface csg in a		17 1/2		inch hole.		Design Factors				Surface		
Segment	#/ft	Grade		Coupling	Joint	Collapse	Burst	Length	B@s	a-B	a-C	Weight		
"A"	48.00		h 40	stc	6.21	1.65	0.66	1,080	4	1.12	3.38	51,840		
"B"				stc				0				0		
w/8.4#/g mud, 30min Sfc Csg Test psig: 740														
				Tail Cmt	does not	circ to sfc.	Totals:	1,080						
Comparison of Proposed to Minimum Required Cement Volumes														
Hole	Annular	1 Stage	1 Stage	Min	1 Stage	Drilling	Calc	Req'd	Min Dist					
Size	Volume	Cmt Sx	CuFt Cmt	Cu Ft	% Excess	Mud Wt	MASP	BOPE	Hole-Cplg					
17 1/2	0.6946	645	1058	750	41	8.30	1549	2M	1.56					
Burst Frac Gradient(s) for Segment(s) A, B = , b All > 0.70, OK.														
Site plot (pipe racks 3 or 4) as per O.D. 138.D.3.1, not found														

9 5/8		casing inside the		13 3/8		Design Factors				Int 1		
Segment	#/ft	Grade		Coupling	Body	Collapse	Burst	Length	B@s	a-B	a-C	Weight
"A"	40.00		j 55	btc	3.20	0.98	0.79	4,915	2	1.49	1.66	196,600
"B"								0				0
w/8.4#/g mud, 30min Sfc Csg Test psig: 620								Totals:	4,915			196,600
The cement volume(s) are intended to achieve a top of								0	ft from surface or a		1080	overlap.
Hole	Annular	1 Stage	1 Stage	Min	1 Stage	Drilling	Calc	Req'd				Min Dist
Size	Volume	Cmt Sx	CuFt Cmt	Cu Ft	% Excess	Mud Wt	MASP	BOPE				Hole-Cplg
12 1/4	0.3132	1218	2135	1608	33	10.30	2650	3M				0.81
r D V Tool(s):								sum of sx	Σ CuFt			Σ%excess
t by stage % :									1218	2135		33
Class 'H' tail cmt yld > 1.20												
Burst Frac Gradient(s) for Segment(s): A, B, C, D = 0.8, b, c, d All > 0.70, OK.												

Tail cmt		casing inside the		9 5/8		Design Factors				Prod 1		
5 1/2												
Segment	#/ft	Grade		Coupling	Body	Collapse	Burst	Length	B@s	a-B	a-C	Weight
"A"	20.00		p 110	btc	2.99	2.34	2.53	10,118	3	4.77	4.42	202,360
"B"	20.00		p 110	btc	3.19	2.02	2.53	4,705	3	4.77	4.18	94,100
"C"	20.00		p 110	btc	3.77	2.01	2.53	1,025	3	4.77	4.18	20,500
"D"	20.00		p 110	btc	10.55	2.01	2.53	5,453	3	4.77	4.18	109,060
w/8.4#/g mud, 30min Sfc Csg Test psig: 2,226								Totals:	21,301	426,020		
The cement volume(s) are intended to achieve a top of								4715	ft from surface or a		200	overlap.
Hole	Annular	1 Stage	1 Stage	Min	1 Stage	Drilling	Calc	Req'd	Min Dist			
Size	Volume	Cmt Sx	CuFt Cmt	Cu Ft	% Excess	Mud Wt	MASP	BOPE	Hole-Cplg			
8 3/4	0.2526	2809	6263	4191	49	9.00			1.35			
Class 'C' tail cmt yld > 1.35												

#N/A											
0	5 1/2			Design Factors				<Choose Casing>			
Segment	#/ft	Grade	Coupling	#N/A	Collapse	Burst	Length	B@s	a-B	a-C	Weight
"A"			0.00				0				0
"B"			0.00				0				0
w/8.4#/g mud, 30min Sfc Csg Test psig:							Totals:	0			0
Cmt vol calc below includes this csg, TOC intended					#N/A	ft from surface or a		#N/A			overlap.
Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE			Min Dist Hole-Cplg
0		#N/A	#N/A	0	#N/A						
#N/A Capitan Reef est top XXXX.											

Cascade 29 FEDERAL 211H

APD - Geology COAs (Not in Potash or WIPP)

- For at least one well per pad (deepest well within initial development preferred) the record of the drilling rate (ROP) along with the Gamma Ray (GR) and Neutron (CNL) well logs run from TVD to surface in the vertical section of the hole shall be submitted to the BLM office as well as all other logs run on the full borehole 30 days from completion. Any other logs run on the wellbore, excluding cement remediation, should also be sent. Only digital copies of the logs in .TIF or .LAS formats are necessary; paper logs are no longer required. Logs shall be emailed to blm-cfo-geology@doimspp.onmicrosoft.com. Well completion report should have .pdf copies of any CBLs or Temp Logs run on the wellbore.
- Exceptions: In areas where there is extensive log coverage (in particular the salt zone adjacent to a pad), Operators are encouraged to contact BLM Geologists to discuss if additional GR and N logs are necessary on a pad. Operator may request a waiver of the GR and N log requirement due to good well control or other reasons to be approved by BLM Geologist prior to well completion. A waiver approved by BLM must be attached to completion well report to satisfy COAs.
- The top of the Rustler, top and bottom of the Salt, and the top of the Capitan Reef (if present) are to be recorded on the Completion Report.

Be aware that:

- H2S has been reported within one mile of the proposed project. Measurements up to 9000 ppm were recorded.

Questions? Contact Thomas Evans, BLM Geologist at 575-234-5965 or tvevans@blm.gov

**PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL**

OPERATOR’S NAME:	CIMAREX ENERGY COMPANY
LEASE NO.:	NMNM43562
COUNTY:	Lea County, New Mexico

Wells:

- CASCADE 29 FEDERAL 201H
- CASCADE 29 FEDERAL 211H
- CASCADE 29 FEDERAL 221H
- CASCADE 29 FEDERAL 301H

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1. GENERAL PROVISIONS

The failure of the operator to comply with these requirements may result in the assessment of liquidated damages or penalties pursuant to 43 CFR 3163.1 or 3163.2. A copy of these conditions of approval shall be present on the location during construction, drilling and reclamation activity. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

1.1. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

Any cultural resource (historic or prehistoric site or object) discovered by the operator, or any person working on the operator's behalf, on the public or federal land shall be immediately reported to the Authorized Officer. The operator shall suspend all operations in the immediate area (within 100ft) of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer, in conjunction with a BLM Cultural Resource Specialist, to determine appropriate actions to prevent the loss of significant scientific values. The operator shall be responsible for the cost of evaluation and any decision as to the proper mitigation measures will be made by the Authorized Officer after consulting with the operator.

Traditional Cultural Properties (TCPs) are protected by NHPA as codified in 36 CFR 800 for possessing traditional, religious, and cultural significance tied to a certain group of individuals. Though there are currently no designated TCPs within the project area or within a mile of the project area, but it is possible for a TCP to be designated after the approval of this project. **If a TCP is designated in the project area after the project's approval, the BLM Authorized Officer will notify the operator of the following conditions and the duration for which these conditions are required.**

1. Temporary halting of all construction, drilling, and production activities to lower noise.
2. Temporary shut-off of all artificial lights at night.

The operator is hereby obligated to comply with procedures established in the Native American Graves Protection and Repatriation Act (NAGPRA), specifically NAGPRA Subpart B regarding discoveries, to protect human remains, associated funerary objects, sacred objects, and objects of cultural patrimony discovered during project work. If any human skeletal remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered at any time during construction, all construction activities shall halt and a BLM-CFO Authorized Officer will be notified immediately. The BLM will then be required to be notified, in writing, within 24 hours of the discovery. The written notification should include the geographic location by county and state, the contents of the discovery, and the steps taken to protect said discovery. You must also include any potential threats to the discovery and a conformation that all activity within 100ft of the discovery has ceased and work will not resume until written certification is issued. All work on the entire project must halt for a minimum of 3 days and work cannot resume until an Authorized Officer grants permission to do so.

Any paleontological resource discovered by the operator, or any person working on the operator's behalf, on public or Federal land shall be immediately reported to the Authorized Officer. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. The operator will be responsible for the cost of evaluation and any decision as to the proper mitigation measures will be made by the Authorized Officer after consulting with the operator.

1.2. RANGELAND RESOURCES

1.2.1. Cattleguards

Where a permanent cattleguard is approved, an appropriately sized cattleguard(s) sufficient to carry out the project shall be installed and maintained at fence crossing(s). Any existing cattleguard(s) on the access road shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattleguard(s) that are in place and are utilized during lease operations. A gate shall be constructed on one side of the cattleguard and fastened securely to H-braces.

1.2.2. Fence Requirement

Where entry granted across a fence line, the fence must be braced and tied off on both sides of the passageway prior to cutting. Once the work is completed, the fence will be restored to its prior condition, or better. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fence(s).

1.2.3. Livestock Watering Requirement

Any damage to structures that provide water to livestock throughout the life of the well, caused by operations from the well site, must be immediately corrected by the operator. The operator must notify the BLM office (575-234-5972) and the private surface landowner or the grazing allotment holder if any damage occurs to structures that provide water to livestock.

1.3. NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA, New Mexico Department of Agriculture, and BLM requirements and policies.

1.3.1 African Rue (*Peganum harmala*)

Spraying: The spraying of African Rue must be completed by a licensed or certified applicator. In order to attempt to kill or remove African Rue the proper mix of chemical is needed. The mix consists of 2% Arsenal (Imazapyr) and 2% Roundup (Glyphosate) along with a nonionic surfactant. Any other chemicals or combinations shall be approved by the BLM Noxious Weeds Coordinator prior to treatment. African Rue shall be sprayed in connection to any dirt working activities or disturbances to the site being sprayed. Spraying of African Rue shall be done on immature plants at initial growth through flowering and mature plants between budding and flowering stages. Spraying shall not be conducted after flowering when plant is fruiting. This will ensure optimal intake of chemical and decrease chances of developing herbicide resistance. After spraying, the operator or necessary parties must contact the Carlsbad Field Office to inspect the effectiveness of the application treatment to the plant species. No ground disturbing activities can take place until the inspection by the authorized officer is complete. The operator may contact the Environmental Protection Department or the BLM Noxious Weed Coordinator at (575) 234-5972 or BLM_NM_CFO_NoxiousWeeds@blm.gov.

Management Practices: In addition to spraying for African Rue, good management practices should be followed. All equipment should be washed off using a power washer in a designated containment area. The containment area shall be bermed to allow for containment of the seed to prevent it from entering any open areas of the nearby landscape. The containment area shall be excavated near or adjacent to the well pad at a depth of three feet and just large enough to get equipment inside it to be washed off. This will allow all seeds to be in a centrally located area that can be treated at a later date if the need arises.

1.4. LIGHT POLLUTION

1.4.1. Downfacing

All permanent lighting will be pointed straight down at the ground in order to prevent light spill beyond the edge of approved surface disturbance.

1.4.2. Shielding

All permanent lighting will use full cutoff luminaires, which are fully shielded (i.e., not emitting direct or indirect light above an imaginary horizontal plane passing through the lowest part of the light source).

1.4.3. Lighting Color

Lighting shall be 3,500 Kelvin or less (Warm White) except during drilling, completion, and workover operations. No bluish-white lighting shall be used in permanent outdoor lighting.

2. SPECIAL REQUIREMENTS

2.3 WILDLIFE

2.3.1 Lesser Prairie Chicken

2.3.1.1 Timing Limitation Stipulation/Condition of Approval for Lesser Prairie-Chicken:

Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, geophysical exploration other than 3-D operations, and pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 ft. from the source of the noise.

2.3.1.2 Timing Limitation Exceptions:

The Carlsbad Field Office will publish an annual map of where the LPC timing and noise stipulations and conditions of approval (Limitations) will apply for the identified year (between March 1 and June 15) based on the latest survey information. The LPC Timing Area map will identify areas which are Habitat Areas (HA), Isolated Population Area (IPA), and Primary Population Area (PPA). The LPC Timing Area map will also have an area in red crosshatch. The red crosshatch area is the only area where an operator is required to submit a request for exception to the LPC Limitations. If an operator is operating outside the red crosshatch area, the LPC Limitations do not apply for that year and an exception to LPC Limitations is not required.

2.3.1.3 Ground-level Abandoned Well Marker to avoid raptor perching:

Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well. For more installation details, contact the Carlsbad Field Office at BLM_NM_CFO_Construction_Reclamation@blm.gov.

2.4 VISUAL RESOURCE MANAGEMENT

2.5.1 VRM IV

Above-ground structures including meter housing that are not subject to safety requirements are painted a flat non-reflective paint color, Shale Green from the BLM Standard Environmental Color Chart (CC-001: June 2008).

3. CONSTRUCTION REQUIREMENTS

3.1 CONSTRUCTION NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at BLM_NM_CFO_Construction_Reclamation@blm.gov at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and COAs on the well site and they shall be made available upon request by the Authorized Officer.

3.2 TOPSOIL

The operator shall strip the topsoil (the A horizon) from the entire well pad area and stockpile the topsoil along the edge of the well pad as depicted in the APD. No more than the top 6 inches of topsoil shall be removed. All the stockpiled topsoil will be redistributed over the interim reclamation areas. Topsoil shall not be used for berming the pad or facilities. For final reclamation, the topsoil shall be spread over the entire pad area for seeding preparation.

Other subsoil (the B horizon and below) stockpiles must be completely segregated from the topsoil stockpile. Large rocks or subsoil clods (not evident in the surrounding terrain) must be buried within the approved area for interim and final reclamation.

3.3 CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No reserve pits will be used for drill cuttings. The operator shall properly dispose of drilling contents at an authorized disposal site.

3.4 FEDERAL MINERAL PIT

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the Carlsbad Field Office at (575) 234-5972.

3.5 WELL PAD & SURFACING

Any surfacing material used to surface the well pad will be removed at the time of interim and final reclamation.

3.6 EXCLOSURE FENCING (CELLARS & PITS)

The operator will install and maintain enclosure fencing for all open well cellars to prevent access to public, livestock, and large forms of wildlife before and after drilling operations until the well cellar is free of fluids and the operator initiates backfilling. (For examples of enclosure fencing design, refer to BLM's Oil and Gas Gold Book, Exclosure Fence Illustrations, Figure 1, Page 18.)

The operator will also install and maintain mesh netting for all open well cellars to prevent access to smaller wildlife before and after drilling operations until the well cellar is free of fluids and the operator. Use a maximum netting mesh size of 1 ½ inches. The netting must not have holes or gaps.

3.7 ON LEASE ACCESS ROAD

3.7.1 Road Width

The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed twenty-five (25) feet.

3.7.2 Surfacing

Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements will be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

3.7.3 Crowning

Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

3.7.4 Ditching

Ditching shall be required on both sides of the road.

3.7.5 Turnouts

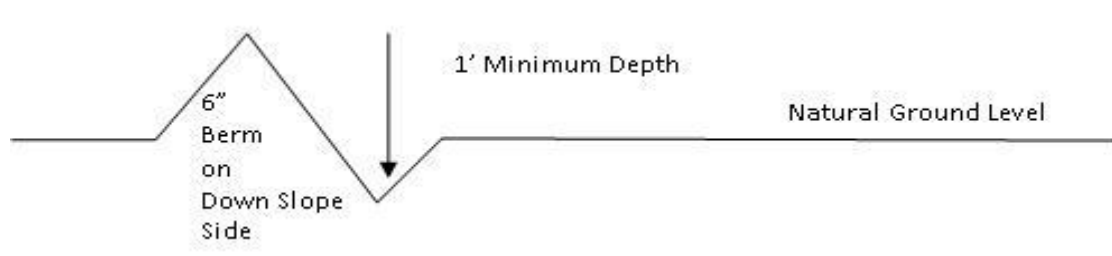
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

3.7.6 Drainage

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outslowing and insloping, leadoff ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.

Cross Section of a Typical Lead-off Ditch



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

Formula for Spacing Interval of Lead-off Ditches

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

$$400 \text{ foot road with } 4\% \text{ road slope: } \frac{400'}{4} + 100' = 200' \text{ lead-off ditch interval}$$

3.7.7 **Public Access**

Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

Construction Steps

1. Salvage topsoil
2. Construct road

3. Redistribute topsoil
4. Revegetate slopes

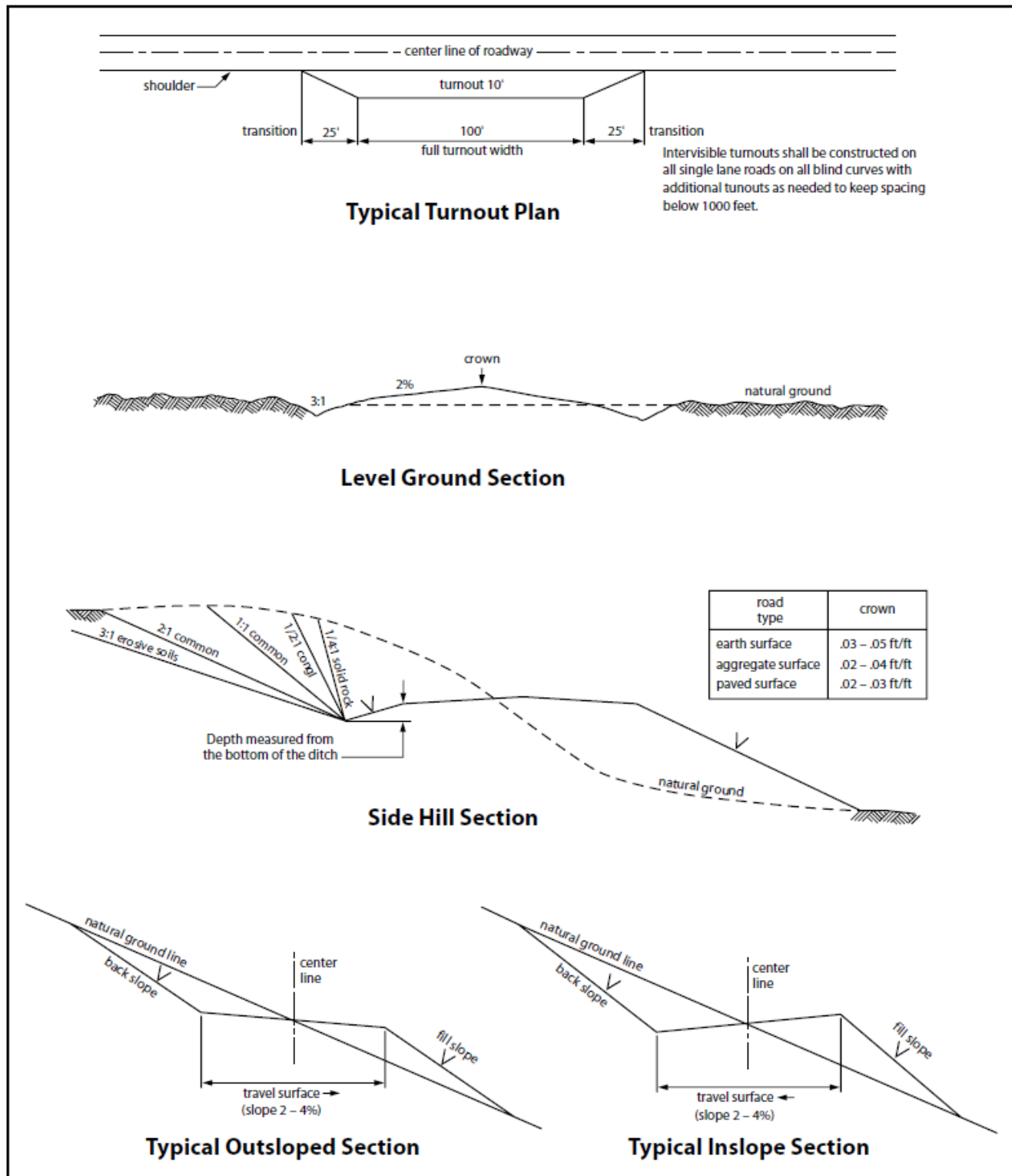


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

5. PRODUCTION (POST DRILLING)

5.1 WELL STRUCTURES & FACILITIES

5.1.1 Placement of Production Facilities

Production facilities must be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

5.1.2 Enclosure Netting (Open-top Tanks)

Immediately following active drilling or completion operations, the operator will take actions necessary to prevent wildlife and livestock access, including avian wildlife, to all open-topped tanks that contain or have the potential to contain salinity sufficient to cause harm to wildlife or livestock, hydrocarbons, or Resource Conservation and Recovery Act of 1976-exempt hazardous substances. At a minimum, the operator will net, screen, or cover open-topped tanks to exclude wildlife and livestock and prevent mortality. If the operator uses netting, the operator will cover and secure the open portion of the tank to prevent wildlife entry. The operator will net, screen, or cover the tanks until the operator removes the tanks from the location or the tanks no longer contain substances that could be harmful to wildlife or livestock. Use a maximum netting mesh size of 1 ½ inches. The netting must not be in contact with fluids and must not have holes or gaps.

5.1.3. Chemical and Fuel Secondary Containment and Enclosure Screening

The operator will prevent all hazardous, poisonous, flammable, and toxic substances from coming into contact with soil and water. At a minimum, the operator will install and maintain an impervious secondary containment system for any tank or barrel containing hazardous, poisonous, flammable, or toxic substances sufficient to contain the contents of the tank or barrel and any drips, leaks, and anticipated precipitation. The operator will dispose of fluids within the containment system that do not meet applicable state or U. S. Environmental Protection Agency livestock water standards in accordance with state law; the operator must not drain the fluids to the soil or ground. The operator will design, construct, and maintain all secondary containment systems to prevent wildlife and livestock exposure to harmful substances. At a minimum, the operator will install effective wildlife and livestock enclosure systems such as fencing, netting, expanded metal mesh, lids, and grate covers. Use a maximum netting mesh size of 1 ½ inches.

5.1.4. Open-Vent Exhaust Stack Enclosures

The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. (*Recommended enclosure structures on open-vent exhaust stacks are in the shape of a cone.*) Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers.

5.1.5. Containment Structures

Proposed production facilities such as storage tanks and other vessels will have a secondary containment structure that is constructed to hold the capacity of 1.5 times the largest tank, plus freeboard to account for precipitation, unless more stringent protective requirements are deemed necessary.

6. RECLAMATION

Stipulations required by the Authorized Officer on specific actions may differ from the following general guidelines

6.1 ROAD AND SITE RECLAMATION

Any roads constructed during the life of the well will have the caliche removed or linear burial. If contaminants are indicated then testing will be required for chlorides and applicable contaminate anomalies for final disposal determination (disposed of in a manner approved by the Authorized Officer within Federal, State and Local statutes, regulations, and ordinances) and seeded to the specifications in sections 6.5 and 6.6.

6.2 EROSION CONTROL

Install erosion control berms, windrows, and hummocks. Windrows must be level and constructed perpendicular to down-slope drainage; steeper slopes will require greater windrow density. Topsoil between windrows must be ripped to a depth of at least 12", unless bedrock is encountered. Any large boulders pulled up during ripping must be deep-buried on location. Ripping must be perpendicular to down-slope. The surface must be left rough in order to catch and contain rainfall on-site. Any trenches resulting from erosion caused by run-off shall be addressed immediately.

6.3 INTERIM RECLAMATION

During the life of the development, all disturbed areas not needed for active support of production operations must undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

Within six (6) months of well completion, operators must work with BLM surface protection specialists (BLM_NM_CFO_Construction_Reclamation@blm.gov) to devise the best strategies to reduce the size of the location. Interim reclamation must allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche and any other surface material is required. Removed caliche that is free of contaminants may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

All disturbed areas after they have been satisfactorily prepared need to be reseeded with the seed mixture provided in section 6.6.

Upon completion of interim reclamation, the operator shall submit a Sundry Notice, Subsequent Report of Reclamation (Form 3160-5).

6.4 FINAL ABANDONMENT & RECLAMATION

Prior to surface abandonment, the operator shall submit a Notice of Intent Sundry Notice and reclamation plan.

At final abandonment, well locations, production facilities, and access roads must undergo "final" reclamation so that the character and productivity of the land are restored.

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

After all disturbed areas have been satisfactorily prepared, these areas need to be revegetated with the seed mixture provided below. Seeding will be accomplished by drilling on the contour whenever practical or by other approved methods. Seeding may need to be repeated until revegetation is successful, as determined by the BLM. After earthwork and seeding is completed, the operator is required to submit a Sundry Notice, Subsequent Report of Reclamation.

Operators shall contact a BLM surface protection specialist prior to surface abandonment operations for site specific objectives (BLM_NM_CFO_Construction_Reclamation@blm.gov).

6.5 SEEDING TECHNIQUES

Seeds shall be hydro-seeded, mechanically drilled, or broadcast, with the broadcast-seeded area raked, ripped or dragged to aid in covering the seed. The seed mixture shall be evenly and uniformly planted over the disturbed area.

6.6 SOIL SPECIFIC SEED MIXTURE

The lessee/permittee shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed will be done in accordance with State law(s) and within nine (9) months prior to purchase. Commercial seed will be either certified or registered seed. The seed container will be tagged in accordance with State law(s) and available for inspection by the Authorized Officer.

Seed land application will be accomplished by mechanical planting using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area. Smaller/heavier seeds tend to drop the bottom of the drill and are planted first; the operator shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory BLM or Soil Conservation

District stand is established as determined by the Authorized Officer. Evaluation of growth will not be made before completion of at least one full growing season after seeding or until several months of precipitation have occurred, enabling a full four months of growth, with one or more seed generations being established.

Seed Mixture 2, for Sandy Site

Species to be planted in pounds of pure live seed* per acre:

Species**lb/acre**Sand dropseed (*Sporobolus cryptandrus*)

1.0

Sand love grass (*Eragrostis trichodes*)

1.0

Plains bristlegass (*Setaria macrostachya*)

2.0

*Pounds of pure live seed:

Pounds of seed x percent purity x percent germination = pounds pure live seed

**PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL**

OPERATOR'S NAME:	Cimarex Energy Company
LOCATION:	Section 29, T.25 S., R.33 E., NMPM
COUNTY:	Lea County, New Mexico

WELL NAME & NO.:	Cascade 29 Federal 211H
ATS/API ID:	ATS-25-2308
APD ID:	10400106642
Sundry ID:	N/a

WELL NAME & NO.:	Cascade 29 Federal 221H
ATS/API ID:	ATS-25-2318
APD ID:	10400106643
Sundry ID:	N/a

WELL NAME & NO.:	Cascade 29 Federal 301H
ATS/API ID:	ATS-25-2317
APD ID:	10400106644
Sundry ID:	N/a

COA

H2S	Yes		
Potash	None	None	
Cave/Karst Potential	Low		
Cave/Karst Potential	☐ Critical		
Variance	☒ None	☒ Flex Hose	☒ Other
Wellhead	Conventional and Multibowl		
Other	☐ 4 String ☐ 5 String	Capitan Reef None	☐ WIPP
Other	Pilot Hole None	☐ Open Annulus	
Cementing	Contingency Squeeze None	Echo-Meter None	Primary Cement Squeeze None
Special Requirements	☐ Water Disposal/Injection	☐ COM	☐ Unit
Special Requirements	☐ Batch Sundry	Waste Prevention Waste MP	
Special Requirements Variance	☐ BOPE Break Testing ☐ Offline BOPE Testing	☐ Offline Cementing	☐ Casing Clearance

A. HYDROGEN SULFIDE

A Hydrogen Sulfide (H₂S) Drilling Plan shall be activated 500 feet prior to drilling into the **Delaware** formation. As a result, the Hydrogen Sulfide area must meet **43 CFR part 3170 Subpart 3176** requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, please provide measured values and formations to the BLM.

B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately **1080 feet** (a minimum of 70 feet into the Rustler Anhydrite and above the salt when present, and below usable fresh water) and cemented to the surface. The surface hole shall be **17 1/2** inch in diameter.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
 - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
 - d. If cement falls back, remedial cementing will be done prior to drilling out that string.

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

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:
 - Cement to surface. If cement does not circulate see B.1.a, c-d above.
3. The minimum required fill of cement behind the **5-1/2** inch production casing is:
 - Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

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.

Option 1:

- a. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **3000 (3M)** psi.
- b. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8** inch intermediate casing shoe shall be **5000 (5M)** psi.

Option 2:

Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the **13-3/8** inch surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M)** psi.

- a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
- b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
- c. Manufacturer representative shall install the test plug for the initial BOP test.
- d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
- e. Whenever any seal subject to test pressure is broken, all the tests in 43 CFR 3172.6(b)(9) must be followed.

GENERAL REQUIREMENTS

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

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

☒ Lea County

Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240,
(575) 689-5981

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 **43 CFR part 3170 Subpart 3172** 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.

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 of both lead and tail cement, 2) until cement has been in place at least 8 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 **43 CFR part 3170 Subpart 3172 and API STD 53 Sec. 5.3**.
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 43 CFR 3172.6(b)(9) 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 cement), 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 cement plug. The BOPE test can be

initiated after bumping the cement plug with the casing valve open. (only applies to single stage cement jobs, prior to the cement setting up.)

- c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer and can be initiated immediately with the casing valve open. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to **43 CFR part 3170 Subpart 3172** 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 8 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 **43 CFR part 3170 Subpart 3172**.

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.

Long Vo (LVO) 10/30/2025

Sante Fe Main Office
Phone: (505) 476-3441

General Information
Phone: (505) 629-6116

Online Phone Directory
<https://www.emnrd.nm.gov/ocd/contact-us>

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

COMMENTS

Action 535235

COMMENTS

Operator: Coterra Energy Operating Co. 6001 Deauville Blvd Midland, TX 79706	OGRID: 215099
	Action Number: 535235
	Action Type: [C-103] NOI Change of Plans (C-103A)

COMMENTS

Created By	Comment	Comment Date
matthew.gomez	Invalid defining well reported on C-102.	12/18/2025

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CONDITIONS

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Operator: Coterra Energy Operating Co. 6001 Deauville Blvd Midland, TX 79706	OGRID: 215099
	Action Number: 535235
	Action Type: [C-103] NOI Change of Plans (C-103A)

CONDITIONS

Created By	Condition	Condition Date
matthew.gomez	If cement does not circulate to surface on any string, a Cement Bond Log (CBL) is required for that string of casing, if a CBL is unable to indicate sufficient cement coverage due to a lighter cement, a USI log may also be required. If strata isolation is not achieved, remediation will be required before further operations may commence.	12/18/2025
matthew.gomez	All conducted logs must be submitted to the OCD.	12/18/2025
matthew.gomez	Cement must be in place for at least eight hours and achieve a minimum compressive strength of 500 PSI before performing any further operations on the well.	12/18/2025
matthew.gomez	Any previous COA's not addressed within the updated COA's still apply.	12/18/2025