

Form 3160-3
(June 2015)UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

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

1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NMNM19848
1b. Type of Well: <input type="checkbox"/> Oil Well <input checked="" type="checkbox"/> Gas Well <input type="checkbox"/> Other		6. If Indian, Allottee or Tribe Name
1c. Type of Completion: <input type="checkbox"/> Hydraulic Fracturing <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		7. If Unit or CA Agreement, Name and No.
2. Name of Operator CIMAREX ENERGY COMPANY OF COLORADO		8. Lease Name and Well No. LAGUNA GRANDE 29 FEDERAL 18H
3a. Address 600 N MARIENFELD STREET SUITE 600, MIDLAND, TX	3b. Phone No. (include area code) (432) 571-7800	9. API Well No. 30-015-49522
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface SESW / 390 FSL / 1350 FWL / LAT 32.26967 / LONG -104.011155 At proposed prod. zone NENW / 330 FNL / 1650 FWL / LAT 32.282274 / LONG -104.01019		10. Field and Pool, or Exploratory purple sage (wolfcamp) gas/purple sage (
14. Distance in miles and direction from nearest town or post office* 5 miles		11. Sec., T. R. M. or Blk. and Survey or Area SEC 29/T23S/R29E/NMP
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 390 feet	16. No of acres in lease	12. County or Parish EDDY
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 20 feet	17. Spacing Unit dedicated to this well 320.0	13. State NM
19. Proposed Depth 9911 feet / 14299 feet	20. BLM/BIA Bond No. in file FED: NMB001188	
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 2969 feet	22. Approximate date work will start* 07/31/2020	23. Estimated duration 30 days
24. Attachments		

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

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

25. Signature (Electronic Submission)	Name (Printed/Typed) AMITHY CRAWFORD / Ph: (432) 620-1936	Date 04/20/2020
Title Regulatory Analyst		
Approved by (Signature) (Electronic Submission)	Name (Printed/Typed) Cody Layton / Ph: (575) 234-5959	Date 09/30/2021
Title Assistant Field Manager Lands & Minerals		
Office Carlsbad Field Office		

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Conditions of approval, if any, are attached.

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

APPROVED WITH CONDITIONS

Approval Date: 09/30/2021

(Continued on page 2)

*(Instructions on page 2)

Additional Operator Remarks

Location of Well

0. SHL: SESW / 390 FSL / 1350 FWL / TWSP: 23S / RANGE: 29E / SECTION: 29 / LAT: 32.26967 / LONG: -104.011155 (TVD: 0 feet, MD: 0 feet)

PPP: SESW / 620 FSL / 1650 FWL / TWSP: 23S / RANGE: 29E / SECTION: 29 / LAT: 32.269666 / LONG: -104.010185 (TVD: 9830 feet, MD: 9928 feet)

BHL: NENW / 330 FNL / 1650 FWL / TWSP: 23S / RANGE: 29E / SECTION: 29 / LAT: 32.282274 / LONG: -104.01019 (TVD: 9911 feet, MD: 14299 feet)

BLM Point of Contact

Name: JORDAN NAVARRETTE

Title: LIE

Phone: (575) 234-5972

Email: jnavarrette@blm.gov

CONFIDENTIAL

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

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

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-015- 49522	² Pool Code 98220	³ Pool Name Purple Sage; Wolfcamp (Gas)
⁴ Property Code 40483	⁵ Property Name LAGUNA GRANDE 29 FEDERAL	⁶ Well Number 18H
⁷ OGRID No. 162683	⁸ Operator Name CIMAREX ENERGY CO. of Colorado	⁹ Elevation 2969.7'

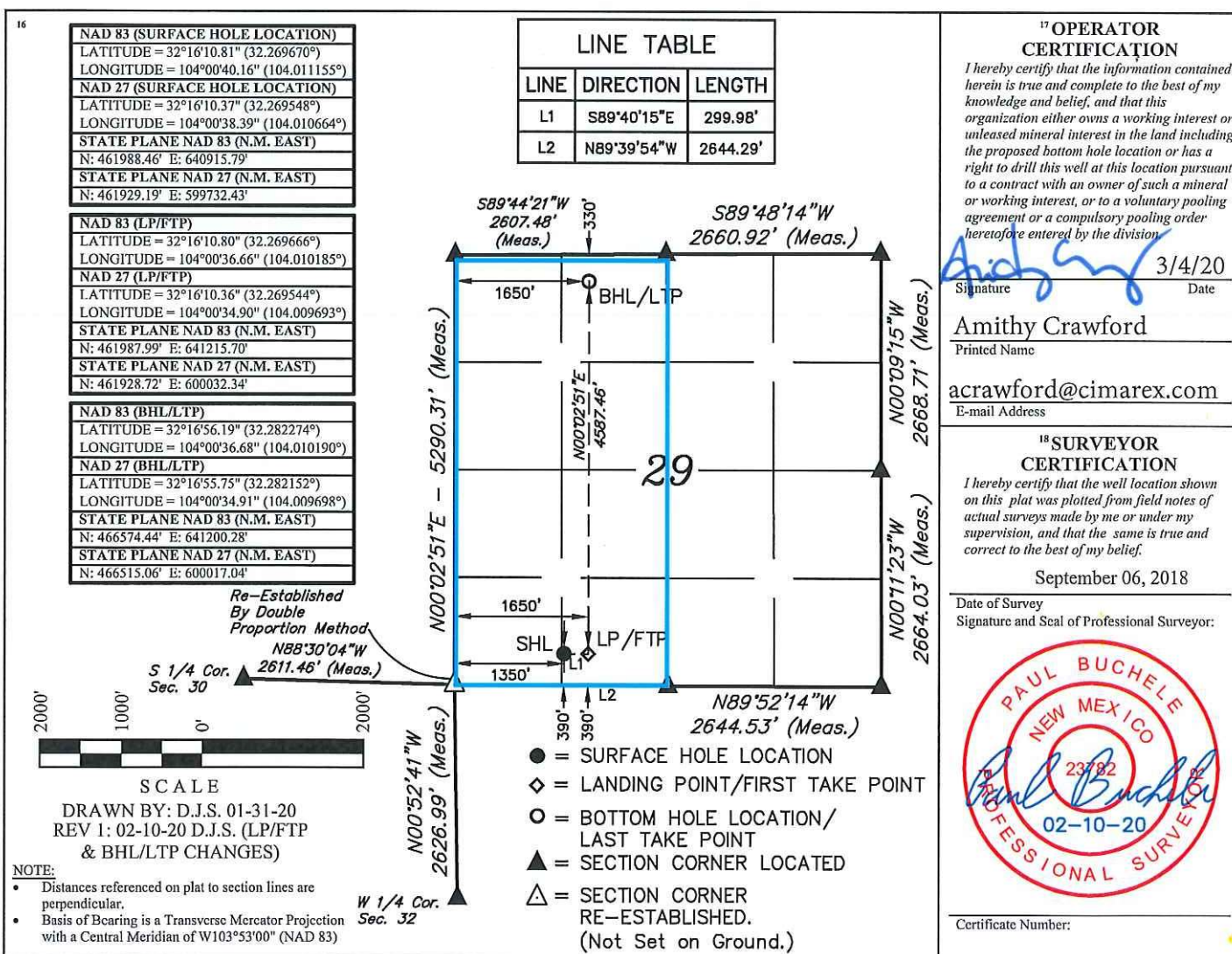
¹⁰ Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
N	29	23S	29E		390	SOUTH	1350	WEST	EDDY

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
C	29	23S	29E		330	NORTH	1650	WEST	EDDY
¹² Dedicated Acres 320	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.						

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



State of New Mexico
Energy, Minerals and Natural Resources Department

Submit Electronically
Via E-permitting

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

NATURAL GAS MANAGEMENT PLAN

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

Section 1 – Plan Description

Effective May 25, 2021

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

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

If Other, please describe: _____

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

Well Name	API	ULSTR	Footages	Anticipated Oil BBL/D	Anticipated Gas MCF/D	Anticipated Produced Water BBL/D
Laguna Grande 29 Fed 18H		N, Sec 29, T23S, R29E	390 FSL/1350 FVWL	1000	2500	4000

IV. Central Delivery Point Name: Laguna Grande 29 CDP Sales [See 19.15.27.9(D)(1) NMAC]

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

Well Name	API	Spud Date	TD Reached Date	Completion Commencement Date	Initial Flow Back Date	First Production Date
Laguna Grande 29 Fed 18H		12/15/2025	12/30/2025	3/1/2026	4/1/2026	4/1/2026

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

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

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

Section 2 – Enhanced Plan**EFFECTIVE APRIL 1, 2022**

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

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

IX. Anticipated Natural Gas Production:

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

X. Natural Gas Gathering System (NGGS):

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

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

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

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

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

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

Section 3 - Certifications

Effective May 25, 2021

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

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

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

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

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

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

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

Section 4 - Notices

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

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

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

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

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

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

From State of New Mexico, Natural Gas Management Plan

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

XEC Standard Response

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

Cimarex

VII. Operational Practices

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

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

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

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

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

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

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

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



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

Drilling Plan Data Report

12/07/2021

APD ID: 10400053872

Submission Date: 04/20/2020

Highlighted data
reflects the most
recent changes

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO

Well Name: LAGUNA GRANDE 29 FEDERAL

Well Number: 18H

[Show Final Text](#)

Well Type: CONVENTIONAL GAS WELL

Well Work Type: Drill

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
680261	RUSTLER	0	115	115	ANHYDRITE	USEABLE WATER	N
680262	SALADO	-559	559	559	ANHYDRITE, SALT	NONE	N
680263	CASTILE	-2573	2573	2573	ANHYDRITE, SALT	NONE	N
680264	BELL CANYON	-2788	2788	2788	SANDSTONE	NONE	N
680265	CHERRY CANYON	-3660	3660	3664	SANDSTONE	NATURAL GAS, OIL	N
680266	BRUSHY CANYON	-4940	4940	4952	SANDSTONE	NATURAL GAS, OIL	N
680267	BONE SPRING	-6570	6570	6585	LIMESTONE	NATURAL GAS, OIL	N
680268	BONE SPRING 1ST	-7550	7550	7566	SANDSTONE	NATURAL GAS, OIL	N
680269	BONE SPRING 2ND	-8330	8330	8346	SANDSTONE	NATURAL GAS, OIL	N
680270	BONE SPRING 3RD	-9490	9490	9506	SANDSTONE	NATURAL GAS, OIL	N
680271	WOLFCAMP	-9830	9830	9928	SANDSTONE, SHALE	NATURAL GAS, OIL	Y

Section 2 - Blowout Prevention

Pressure Rating (PSI): 2M

Rating Depth: 2738

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

Requesting Variance? YES

Variance request: Co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached. The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used. Variance to include Hammer Union connections on lines downstream of the buffer tank only.

Relief Pressure: 5/9/2022 10:36:08 AM
BOP/BOPE system with a minimum working pressure of 2000 psi will be installed on the wellhead system and will be

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO**Well Name:** LAGUNA GRANDE 29 FEDERAL**Well Number:** 18H

pressure tested to 250 psi low followed by a 2000 psi test. Annular will be tested to 100% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2. The multi-bowl wellhead will be installed by vendors representative. A copy of the installation instructions has been sent to the BLM field office. The wellhead will be installed by a third-party welder, monitored by the wellhead vendor representative. All BOP equipment will be tested utilizing a conventional test plug. Not a cup or J-packer type. A solid steel body pack-off will be utilized after running and cementing the intermediate casing. After installation the pack-off and lower flange will be pressure tested to 2000 psi. The surface casing string will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater. The casing strings utilizing steel body pack-off will be tested to 70% of casing burst. If well conditions dictate conventional slips will be set and BOPE will be tested to appropriate pressures based on permitted pressure requirements.

Choke Diagram Attachment:

Laguna_Grande_29_Federal_18H_2M_Choke_20200305145533.pdf

BOP Diagram Attachment:

Laguna_Grande_29_Federal_18H_2M_BOP_20200305145537.pdf

Pressure Rating (PSI): 5M**Rating Depth:** 14299

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

Requesting Variance? YES

Variance request: Co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached. The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used. Variance to include Hammer Union connections on lines downstream of the buffer tank only.

Testing Procedure: A multi-bowl wellhead system will be utilized. After running the 13-3/8" surface casing, a 13 5/8 BOP/BOPE system with a minimum working pressure of 5000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 5000 psi test. Annular will be tested to 100% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2. The multi-bowl wellhead will be installed by vendors representative. A copy of the installation instructions has been sent to the BLM field office. The wellhead will be installed by a third-party welder, monitored by the wellhead vendor representative. All BOP equipment will be tested utilizing a conventional test plug. Not a cup or J-packer type. A solid steel body pack-off will be utilized after running and cementing the intermediate casing. After installation the pack-off and lower flange will be pressure tested to 5000 psi. Slips will be utilized after running and cementing the production casing. After installation of the slips and wellhead on the production casing, a 13 5/8 BOP/BOPE system with a minimum working pressure of 5000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 5000 psi test. Annular will be tested to 50% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2. The surface casing string will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater. The casing string utilizing steel body pack-off will be tested to 70% of casing burst. If well conditions dictate conventional slips will be set and BOPE will be tested to appropriate pressures based on permitted pressure requirements.

Choke Diagram Attachment:

Laguna_Grande_29_Federal_18H_5M_Choke_20200305145707.pdf

BOP Diagram Attachment:

Laguna_Grande_29_Federal_18H_5M_BOP_6.125_20200305145712.pdf

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO**Well Name:** LAGUNA GRANDE 29 FEDERAL**Well Number:** 18H**Pressure Rating (PSI):** 5M**Rating Depth:** 10444

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

Requesting Variance? YES

Variance request: Co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached. The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used. Variance to include Hammer Union connections on lines downstream of the buffer tank only

Testing Procedure: A multi-bowl wellhead system will be utilized. After running the 13-3/8" surface casing, a 13 5/8 BOP/BOPE system with a minimum working pressure of 5000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 5000 psi test. Annular will be tested to 100% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2. The multi-bowl wellhead will be installed by vendors representative. A copy of the installation instructions has been sent to the BLM field office. The wellhead will be installed by a third-party welder, monitored by the wellhead vendor representative. All BOP equipment will be tested utilizing a conventional test plug. Not a cup or J-packer type. A solid steel body pack-off will be utilized after running and cementing the intermediate casing. After installation the pack-off and lower flange will be pressure tested to 5000 psi. Slips will be utilized after running and cementing the production casing. After installation of the slips and wellhead on the production casing, a 13 5/8 BOP/BOPE system with a minimum working pressure of 5000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 5000 psi test. Annular will be tested to 50% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2. The surface casing string will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater. The casing string utilizing steel body pack-off will be tested to 70% of casing burst. If well conditions dictate conventional slips will be set and BOPE will be tested to appropriate pressures based on permitted pressure requirements.

Choke Diagram Attachment:

Laguna_Grande_29_Federal_18H_5M_Choke_20200305145625.pdf

BOP Diagram Attachment:

Laguna_Grande_29_Federal_18H_5M_BOP_8.75_20200305145630.pdf

Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	SURFACE	17.5	13.375	NEW	API	N	0	500	0	500	0	-500	500	J-55	48	ST&C	3.42	10.9	BUOY	18.0	BUOY	18.0
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	2738	0	2738	0	-2738	2738	J-55	36	ST&C	1.38	2.4	BUOY	4	BUOY	4
3	PRODUCTION	8.75	7.0	NEW	API	N	0	8536	0	8536	0	-8536	8536	L-80	26	LT&C	1.37	1.84	BUOY	1.95	BUOY	1.95
4	PRODUCTION	8.75	7.0	NEW	API	N	0	10444	8536	10061	-8536	-10061	1908	L-80	26	BUTT	1.16	1.56	BUOY	15.2	BUOY	15.2

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO**Well Name:** LAGUNA GRANDE 29 FEDERAL**Well Number:** 18H

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
5	COMPLETION SYSTEM	6.125	4.5	NEW	API	N	8437	14299	8437	9911	-8437	-9911	5862	P-110	11.6	BUTT	1.4	1.98	BUOY	21.46	BUOY	21.46

Casing Attachments**Casing ID:** 1 **String Type:** SURFACE**Inspection Document:****Spec Document:****Tapered String Spec:****Casing Design Assumptions and Worksheet(s):**

Laguna_Grande_29_Fed_18H_Casing_Assumptions_20200305150103.pdf

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

Laguna_Grande_29_Fed_18H_Casing_Assumptions_20200305150248.pdf

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO**Well Name:** LAGUNA GRANDE 29 FEDERAL**Well Number:** 18H**Casing Attachments**

Casing ID: 3 **String Type:** PRODUCTION**Inspection Document:****Spec Document:****Tapered String Spec:****Casing Design Assumptions and Worksheet(s):**Laguna_Grande_29_Fed_18H_Casing_Assumptions_20200305150357.pdf

Casing ID: 4 **String Type:** PRODUCTION**Inspection Document:****Spec Document:****Tapered String Spec:****Casing Design Assumptions and Worksheet(s):**Laguna_Grande_29_Fed_18H_Casing_Assumptions_20200305150519.pdf

Casing ID: 5 **String Type:** COMPLETION SYSTEM**Inspection Document:****Spec Document:****Tapered String Spec:****Casing Design Assumptions and Worksheet(s):**Laguna_Grande_29_Fed_18H_Casing_Assumptions_20200305150659.pdf

Section 4 - Cement

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO**Well Name:** LAGUNA GRANDE 29 FEDERAL**Well Number:** 18H

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

SURFACE	Lead		0	500	325	1.34	14.8	435	25	Class C	LCM
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INTERMEDIATE	Lead		0	2738	523	1.88	12.9	983	44	35:65 (Poz C)	Salt, Bentonite
INTERMEDIATE	Tail		0	2738	159	1.36	14.8	216	44	Class C	Retarder
PRODUCTION	Lead		0	1044 4	430	3.64	10.3	1306	51	Tuned Light	LCm
PRODUCTION	Tail		0	1044 4	176	1.3	14.2	167	51	50:50 (Poz H)	Salt, Bentonite, Fluid Loss, Dispersant, SMS
COMPLETION SYSTEM	Lead		8437	1429 9	324	1.3	14.2	421	10	50:50 (Poz H)	Salt, Bentonite, Fluid Loss, Dispersant, SMS

Section 5 - Circulating Medium

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

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

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

Circulating Medium Table

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO**Well Name:** LAGUNA GRANDE 29 FEDERAL**Well Number:** 18H

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
0	500	OTHER : Fresh Water	7.83	8.33							
500	2738	SALT SATURATED	9.8	10.3							
2738	10444	OTHER : Cut Brine or OBM	8.4	8.9							
10444	14299	OIL-BASED MUD	10	10.5							

Section 6 - Test, Logging, Coring

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

No DST Planned

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

GAMMA RAY LOG,COMPENSATED NEUTRON LOG,DIRECTIONAL SURVEY,

Coring operation description for the well:

N/A

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 5411

Anticipated Surface Pressure: 3230

Anticipated Bottom Hole Temperature(F): 169

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

Describe:

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

Contingency Plans geohazards description:

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

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO

Well Name: LAGUNA GRANDE 29 FEDERAL

Well Number: 18H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Laguna_Grande_29_Federal_18H_Directional_Survey_20200305152352.pdf

Laguna_Grande_29_Federal_18H_AC_Report_20200305152411.pdf

Other proposed operations facets description:

Other proposed operations facets attachment:

Laguna_Grande_29_Fed_18H_Gas_Capture_Plan_20200305152936.pdf

Laguna_Grande_29_Federal_18H_Drilling_Plan_20210203072647.pdf

Other Variance attachment:

Laguna_Grande_29_Federal_18H_Multibowl_20200305153050.pdf

1. Geological Formations

TVD of target 9,911

Pilot Hole TD N/A

MD at TD 14,299

Deepest expected fresh water

Formation	Depth (TVD) from KB	Water/Mineral Bearing/Target Zone	Hazards
Rustler	115	Useable Water	
Saldao	559	N/A	
Castille	2573	N/A	
Bell Canyon	2788	N/A	
Cherry Canyon	3660	Hydrocarbons	
Brushy Canyon	4940	Hydrocarbons	
Bone Spring	6570	Hydrocarbons	
1st Bone Spring	7550	Hydrocarbons	
2nd Bone Spring	8330	Hydrocarbons	
3rd Bone Spring	9490	Hydrocarbons	
Wolfcamp	9830	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	500	500	13-3/8"	48.00	J-55	ST&C	3.42	10.97	18.04
12 1/4	0	2738	2738	9-5/8"	36.00	J-55	ST&C	1.38	2.40	4.00
8 3/4	0	8536	8536	7"	26.00	L-80	LT&C	1.37	1.84	1.95
8 3/4	8536	10444	10061	7"	26.00	L-80	BT&C	1.16	1.56	15.23
6 1/8	8437	14299	9911	4-1/2"	11.60	P-110	BT&C	1.40	1.98	21.46
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., Laguna Grande 29 Federal 18H

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

3. Cementing Program

Casing	# Sk	Wt. lb/gal	Yld ft ³ /sack	H ₂ O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surface	325	14.80	1.34	9.15	9.5	Tail: Class C + LCM
Intermediate	523	12.90	1.88	9.65	12	Lead: 35:65 (Poz:C) + Salt + Bentonite
	159	14.80	1.36	6.57	9.5	Tail: Class C + Retarder
Production	430	10.30	3.64	22.18		Lead: Tuned Light + LCM
	176	14.20	1.30	5.86	14:30	Tail: 50:50 (Poz:H) + Salt + Bentonite + Fluid Loss + Dispersant + SMS
Completion System	324	14.20	1.30	5.86	14:30	Tail: 50:50 (Poz:H) + Salt + Bentonite + Fluid Loss + Dispersant + SMS

DV tool depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. DV tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe. Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.

Casing String	TOC	% Excess
Surface	0	25
Intermediate	0	44
Production	2500	51
Completion System	10244	10

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

4. Pressure Control Equipment

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

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

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

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

5. Mud Program

Depth	Type	Weight (ppg)	Viscosity	Water Loss
0' to 500'	Fresh Water	7.83 - 8.33	28	N/C
500' to 2738'	Brine Water	9.80 - 10.30	30-32	N/C
				N/C
2738'-10444'	Cut Brine or OBM	8.40 - 8.90	27-70	N/C
10444' to 14299'	OBM	10.00 - 10.50	50-70	N/C

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

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.
	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	5411 psi
Abnormal Temperature	No

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

	H ₂ S is present
	H ₂ S plan is attached

8. Other Facets of Operation**9. Wellhead**

A multi-bowl wellhead system will be utilized.

After running the 13-3/8" surface casing, a 13 5/8" BOP/BOPE system with a minimum working pressure of 5000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 5000 psi test. Annular will be tested to 100% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2.

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

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

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

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

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

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

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



Cimarex Laguna Grande 29 Federal #18H Rev0 RM 12Feb20 Proposal **Geodetic Report** **(Non-Def Plan)**



Report Date: February 12, 2020 - 04:29 PM
Client: Cimarex Energy
Field: NM Eddy County (NAD 83)
Structure / Slot: Cimarex Laguna Grande 29 Federal #18H / New Slot
Well: Laguna Grande 29 Federal #18H
Borehole: Laguna Grande 29 Federal #18H
UWI / AP#: Unknown / Unknown
Survey Name: Cimarex Laguna Grande 29 Federal #18H Rev0 RM 12Feb20
Survey Date: February 12, 2020
Tort / AHD / DDI / ERD Ratio: 102.981 ° / 4886.841 ft / 5.860 / 0.492
Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
Location Lat / Long: N 32° 16' 10.81225", W 104° 0' 40.15756"
Location Grid N/E Y/X: N 461988,460 ftUS, E 640915,790 ftUS
CRS Grid Convergence Angle: 0.1720 °
Grid Scale Factor: 0.99992045
Version / Patch: 2.10.787.0

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 359,807 ° (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: RKB
TVD Reference Elevation: 2995,700 ft above MSL
Seabed / Ground Elevation: 2969,700 ft above MSL
Magnetic Declination: 6,969 °
Total Gravity Field Strength: 998,4720mgn (9,80665 Based)
Gravity Model: GARM
Total Magnetic Field Strength: 47837.070 nT
Magnetic Dip Angle: 59,983 °
Declination Date: February 12, 2020
Magnetic Declination Model: HDGM 2019
North Reference: Grid North
Grid Convergence Used: 0,1720 °
Total Corr Mag North->Grid North: 6,7972 °
Local Coord Referenced To: Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL [390' FSL, 1350' FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
Rustler	100.00	0.00	90.10	100.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
	115.00	0.00	90.10	115.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
	200.00	0.00	90.10	200.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
	300.00	0.00	90.10	300.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
	400.00	0.00	90.10	400.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
	500.00	0.00	90.10	500.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
Salado (Top Salt)	559.00	0.00	90.10	559.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
	600.00	0.00	90.10	600.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
	700.00	0.00	90.10	700.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
	800.00	0.00	90.10	800.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
	900.00	0.00	90.10	900.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
	1000.00	0.00	90.10	1000.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
	1100.00	0.00	90.10	1100.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
	1200.00	0.00	90.10	1200.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
	1300.00	0.00	90.10	1300.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
	1400.00	0.00	90.10	1400.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
	1500.00	0.00	90.10	1500.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
	1600.00	0.00	90.10	1600.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
	1700.00	0.00	90.10	1700.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
	1800.00	0.00	90.10	1800.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
	1900.00	0.00	90.10	1900.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
	2000.00	0.00	90.10	2000.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
	2100.00	0.00	90.10	2100.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
2200.00	0.00	90.10	2200.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16	
2300.00	0.00	90.10	2300.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16	
2400.00	0.00	90.10	2400.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16	
2500.00	0.00	90.10	2500.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16	
Castille (Base Salt)	2573.00	0.00	90.10	2573.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
	2600.00	0.00	90.10	2600.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
	2700.00	0.00	90.10	2700.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
Bell Canyon (Top Delaware)	2788.00	0.00	90.10	2788.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
Nudge 2°/100' DLS	2800.00	0.00	90.10	2800.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81	W 104 0 40.16
	2900.00	2.00	90.10	2899.98	-0.01	0.00	1.75	2.00	461988.46	640917.54	N 32 16 10.81	W 104 0 40.14
	3000.00	4.00	90.10	2999.84	-0.04	-0.01	6.98	2.00	461988.45	640922.77	N 32 16 10.81	W 104 0 40.08
	3100.00	6.00	90.10	3099.45	-0.08	-0.03	15.69	2.00	461988.43	640931.48	N 32 16 10.81	W 104 0 39.97
	3117.09	6.34	90.10	3116.44	-0.09	-0.03	17.53	2.00	461988.43	640933.32	N 32 16 10.81	W 104 0 39.95
	3200.00	6.34	90.10	3198.85	-0.13	-0.04	26.69	0.00	461988.42	640942.48	N 32 16 10.81	W 104 0 39.85
	3300.00	6.34	90.10	3298.23	-0.19	-0.06	37.73	0.00	461988.40	640953.52	N 32 16 10.81	W 104 0 39.72
	3400.00	6.34	90.10	3397.62	-0.25	-0.08	48.78	0.00	461988.38	640964.57	N 32 16 10.81	W 104 0 39.59
	3500.00	6.34	90.10	3497.01	-0.30	-0.10	59.83	0.00	461988.36	640975.61	N 32 16 10.81	W 104 0 39.46
	3600.00	6.34	90.10	3596.40	-0.36	-0.12	70.87	0.00	461988.34	640986.66	N 32 16 10.81	W 104 0 39.33
	3663.99	6.34	90.10	3660.00	-0.39	-0.13	77.94	0.00	461988.33	640993.72	N 32 16 10.81	W 104 0 39.25
3700.00	6.34	90.10	3695.79	-0.41	-0.14	81.92	0.00	461988.32	640997.70	N 32 16 10.81	W 104 0 39.20	
3800.00	6.34	90.10	3795.17	-0.47	-0.15	92.96	0.00	461988.31	641008.75	N 32 16 10.81	W 104 0 39.07	
3900.00	6.34	90.10	3894.56	-0.52	-0.17	104.01	0.00	461988.29	641019.79	N 32 16 10.81	W 104 0 38.95	
4000.00	6.34	90.10	3993.95	-0.58	-0.19	115.05	0.00	461988.27	641030.84	N 32 16 10.81	W 104 0 38.82	
4100.00	6.34	90.10	4093.34	-0.63	-0.21	126.10	0.00	461988.25	641041.88	N 32 16 10.81	W 104 0 38.69	
4200.00	6.34	90.10	4192.73	-0.69	-0.23	137.15	0.00	461988.23	641052.93	N 32 16 10.81	W 104 0 38.56	
4300.00	6.34	90.10	4292.11	-0.74	-0.25	148.19	0.00	461988.21	641063.97	N 32 16 10.81	W 104 0 38.43	
4400.00	6.34	90.10	4391.50	-0.80	-0.26	159.24	0.00	461988.20	641075.01	N 32 16 10.80	W 104 0 38.30	
4500.00	6.34	90.10	4490.89	-0.86	-0.28	170.28	0.00	461988.18	641086.06	N 32 16 10.80	W 104 0 38.17	
4600.00	6.34	90.10	4590.28	-0.91	-0.30	181.33	0.00	461988.16	641097.10	N 32 16 10.80	W 104 0 38.05	
4700.00	6.34	90.10	4689.67	-0.97	-0.32	192.38	0.00	461988.14	641108.15	N 32 16 10.80	W 104 0 37.92	
4800.00	6.34	90.10	4789.05	-1.02	-0.34	203.42	0.00	461988.12	641119.19	N 32 16 10.80	W 104 0 37.79	
4900.00	6.34	90.10	4888.44	-1.08	-0.36	214.47	0.00	461988.10	641130.24	N 32 16 10.80	W 104 0 37.66	
4951.87	6.34	90.10	4940.00	-1.11	-0.37	220.20	0.00	461988.09	641135.97	N 32 16 10.80	W 104 0 37.59	
5000.00	6.34	90.10	4987.83	-1.13	-0.37	225.51	0.00	461988.09	641141.28	N 32 16 10.80	W 104 0 37.53	
5100.00	6.34	90.10	5087.22	-1.19	-0.39	236.56	0.00	461988.07	641152.33	N 32 16 10.80	W 104 0 37.40	
5200.00	6.34	90.10	5186.61	-1.24	-0.41	247.60	0.00	461988.05	641163.37	N 32 16 10.80	W 104 0 37.27	
5300.00	6.34	90.10	5286.00	-1.30	-0.43	258.65	0.00	461988.03	641174.42	N 32 16 10.80	W 104 0 37.15	
5400.00	6.34	90.10	5385.38	-1.36	-0.45	269.70	0.00	461988.01	641185.46	N 32 16 10.80	W 104 0 37.02	
5500.00	6.34	90.10	5484.77	-1.41	-0.47	280.74	0.00	461987.99	641196.51	N 32 16 10.80	W 104 0 36.89	
Drop to Vertical 2°/100' DLS	5515.32	6.34	90.10	5500.00	-1.42	-0.47	282.43	0.00	461987.99	641198.20	N 32 16 10.80	W 104 0 36.87
	5600.00	4.65	90.10	5584.29	-1.46	-0.48	290.54	2.00	461987.98	641206.31	N 32 16 10.80	W 104 0 36.77
	5700.00	2.65	90.10	5684.08	-1.49	-0.49	296.90	2.00	461987.97	641212.67	N 32 16 10.80	W 104 0 36.70
	5800.00	0.65	90.10	5784.03	-1.51	-0.50	299.78	2.00	461987.96	641215.55	N 32 16 10.80	W 104 0 36.67
	5832.41	0.00	90.10	5816.44	-1.51	-0.50	299.96	2.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	5900.00	0.00	90.10	5884.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	6000.00	0.00	90.10	5984.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	6100.00	0.00	90.10	6084.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	6200.00	0.00	90.10	6184.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	6300.00	0.00	90.10	6284.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	6400.00	0.00	90.10	6384.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	6500.00	0.00	90.10	6484.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
Top Bone Spring	6585.97	0.00	90.10	6570.00	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	6600.00	0.00	90.10	6584.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	6700.00	0.00	90.10	6684.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	6800.00	0.00	90.10	6784.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	6900.00	0.00	90.10	6884.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	7000.00	0.00	90.10	6984.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	7100.00	0.00	90.10	7084.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	7200.00	0.00	90.10	7184.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	7300.00	0.00	90.10	7284.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	7400.00	0.00	90.10	7384.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	7500.00	0.00	90.10	7484.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
Top 1st BSPG SS	7565.97	0.00	90.10	7550.00	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	7600.00	0.00	90.10	7584.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	7700.00	0.00	90.10	7684.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	7800.00	0.00	90.10	7784.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	7900.00	0.00	90.10	7884.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	8000.00	0.00	90.10	7984.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	8100.00	0.00	90.10	8084.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	8200.00	0.00	90.10	8184.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	8300.00	0.00	90.10	8284.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
Top 2nd BSPG SS	8345.97	0.00	90.10	8330.00	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	8400.00	0.00	90.10	8384.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	8500.00	0.00	90.10	8484.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	8600.00	0.00	90.10	8584.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	8700.00	0.00	90.10	8684.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	8800.00	0.00	90.10	8784.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	8900.00	0.00	90.10	8884.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	9000.00	0.00	90.10	8984.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
Top Harkey SS	9015.97	0.00	90.10	9000.00	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	9100.00	0.00	90.10	9084.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	9200.00	0.00	90.10	9184.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	9300.00	0.00	90.10	9284.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	9400.00	0.00	90.10	9384.03	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
KOP - Build 12"/100" DLS	9436.99	0.00	90.10	9421.02	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80	W 104 0 36.66
	9500.00	7.56	359.81	9483.95	2.64	3.65	299.95	12.00	461992.11	641215.72	N 32 16 10.84	W 104 0 36.66
Top 3rd BSPG SS	9506.21	8.31	359.81	9490.00	3.50	4.51	299.95	12.00	461992.97	641215.71	N 32 16 10.85	W 104 0 36.66
	9600.00	19.56	359.81	9580.88	26.05	27.06	299.87	12.00	462015.52	641215.64	N 32 16 11.07	W 104 0 36.66
	9700.00	31.56	359.81	9670.93	69.12	70.13	299.73	12.00	462058.58	641215.49	N 32 16 11.50	W 104 0 36.66
	9800.00	43.56	359.81	9750.05	129.97	130.98	299.52	12.00	462119.43	641215.29	N 32 16 12.10	W 104 0 36.66
	9900.00	55.56	359.81	9814.80	205.94	206.95	299.26	12.00	462195.39	641215.03	N 32 16 12.85	W 104 0 36.66
Top Wolfcamp	9928.10	58.93	359.81	9830.00	229.57	230.58	299.19	12.00	462219.02	641214.95	N 32 16 13.08	W 104 0 36.67
	10000.00	67.56	359.81	9862.33	293.71	294.72	298.97	12.00	462283.16	641214.73	N 32 16 13.72	W 104 0 36.67
Build 4"/100" DLS	10061.99	75.00	359.81	9882.21	352.38	353.39	298.77	12.00	462341.82	641214.54	N 32 16 14.30	W 104 0 36.67
	10100.00	76.52	359.81	9891.56	389.23	390.23	298.65	4.00	462378.66	641214.41	N 32 16 14.66	W 104 0 36.67
	10200.00	80.52	359.81	9911.46	487.21	488.21	298.32	4.00	462476.63	641214.08	N 32 16 15.63	W 104 0 36.67
Wolfcamp 'Y' SS	10209.54	80.90	359.81	9913.00	496.62	497.63	298.29	4.00	462486.05	641214.05	N 32 16 15.73	W 104 0 36.67
	10300.00	84.52	359.81	9924.47	586.33	587.34	297.98	4.00	462575.75	641213.75	N 32 16 16.62	W 104 0 36.67
	10400.00	88.52	359.81	9930.54	686.13	687.14	297.65	4.00	462675.54	641213.41	N 32 16 17.60	W 104 0 36.67
Wolfcamp 'Y' SS Tgt	10429.56	89.70	359.81	9931.00	715.68	716.69	297.55	4.00	462705.09	641213.31	N 32 16 17.90	W 104 0 36.67
Wolfcamp 'Y' SS Tgt	10444.42	90.30	359.81	9931.00	730.54	731.55	297.50	4.00	462719.95	641213.26	N 32 16 18.04	W 104 0 36.67
Landing Point												
	10500.00	90.30	359.81	9930.71	786.12	787.13	297.31	0.00	462775.53	641213.08	N 32 16 18.59	W 104 0 36.67
	10600.00	90.30	359.81	9930.19	886.12	887.13	296.97	0.00	462875.52	641212.74	N 32 16 19.58	W 104 0 36.67
	10700.00	90.30	359.81	9929.67	986.12	987.13	296.64	0.00	462975.51	641212.40	N 32 16 20.57	W 104 0 36.67
	10800.00	90.30	359.81	9929.16	1086.12	1087.13	296.30	0.00	463075.50	641212.07	N 32 16 21.56	W 104 0 36.67
	10900.00	90.30	359.81	9928.64	1186.12	1187.12	295.96	0.00	463175.49	641211.73	N 32 16 22.55	W 104 0 36.67
	11000.00	90.30	359.81	9928.12	1286.12	1287.12	295.63	0.00	463275.48	641211.39	N 32 16 23.54	W 104 0 36.67
	11100.00	90.30	359.81	9927.60	1386.12	1387.12	295.29	0.00	463375.47	641211.06	N 32 16 24.53	W 104 0 36.67
	11200.00	90.30	359.81	9927.08	1486.12	1487.12	294.95	0.00	463475.46	641210.72	N 32 16 25.52	W 104 0 36.67
	11300.00	90.30	359.81	9926.56	1586.11	1587.12	294.62	0.00	463575.45	641210.38	N 32 16 26.51	W 104 0 36.67
	11400.00	90.30	359.81	9926.04	1686.11	1687.11	294.28	0.00	463675.44	641210.05	N 32 16 27.50	W 104 0 36.67
	11500.00	90.30	359.81	9925.52	1786.11	1787.11	293.94	0.00	463775.43	641209.71	N 32 16 28.49	W 104 0 36.67
	11600.00	90.30	359.81	9925.00	1886.11	1887.11	293.61	0.00	463875.42	641209.37	N 32 16 29.48	W 104 0 36.67
	11700.00	90.30	359.81	9924.49	1986.11	1987.11	293.27	0.00	463975.41	641209.03	N 32 16 30.47	W 104 0 36.67
	11800.00	90.30	359.81	9923.97	2086.11	2087.11	292.93	0.00	464075.40	641208.70	N 32 16 31.46	W 104 0 36.67
	11900.00	90.30	359.81	9923.45	2186.11	2187.10	292.59	0.00	464175.39	641208.36	N 32 16 32.44	W 104 0 36.67
	12000.00	90.30	359.81	9922.93	2286.10	2287.10	292.26	0.00	464275.38	641208.02	N 32 16 33.43	W 104 0 36.67
	12100.00	90.30	359.81	9922.41	2386.10	2387.10	291.92	0.00	464375.37	641207.69	N 32 16 34.42	W 104 0 36.67
	12200.00	90.30	359.81	9921.89	2486.10	2487.10	291.58	0.00	464475.36	641207.35	N 32 16 35.41	W 104 0 36.67
	12300.00	90.30	359.81	9921.37	2586.10	2587.10	291.25	0.00	464575.35	641207.01	N 32 16 36.40	W 104 0 36.67
	12400.00	90.30	359.81	9920.85	2686.10	2687.09	290.91	0.00	464675.34	641206.68	N 32 16 37.39	W 104 0 36.68
	12500.00	90.30	359.81	9920.34	2786.10	2787.09	290.57	0.00	464775.33	641206.34	N 32 16 38.38	W 104 0 36.68
	12600.00	90.30	359.81	9919.82	2886.10	2887.09	290.24	0.00	464875.32	641206.00	N 32 16 39.37	W 104 0 36.68
	12700.00	90.30	359.81	9919.30	2986.10	2987.09	289.90	0.00	464975.31	641205.67	N	

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
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Survey Type: Non-Def Plan

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

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Expected Max Inclination (deg)	Survey Tool Type	Borehole / Survey
	1	0,000	26,000	1/100,000	17,500	13,375		NAL_MWD_IFR1+MS-Depth Only	Laguna Grande 29 Federal #18H / Cimarex Laguna Grande 29 Federal #18H Rev0 RM 12Feb20
	1	26,000	14299,296	1/100,000	17,500	13,375		NAL_MWD_IFR1+MS	Laguna Grande 29 Federal #18H / Cimarex Laguna Grande 29

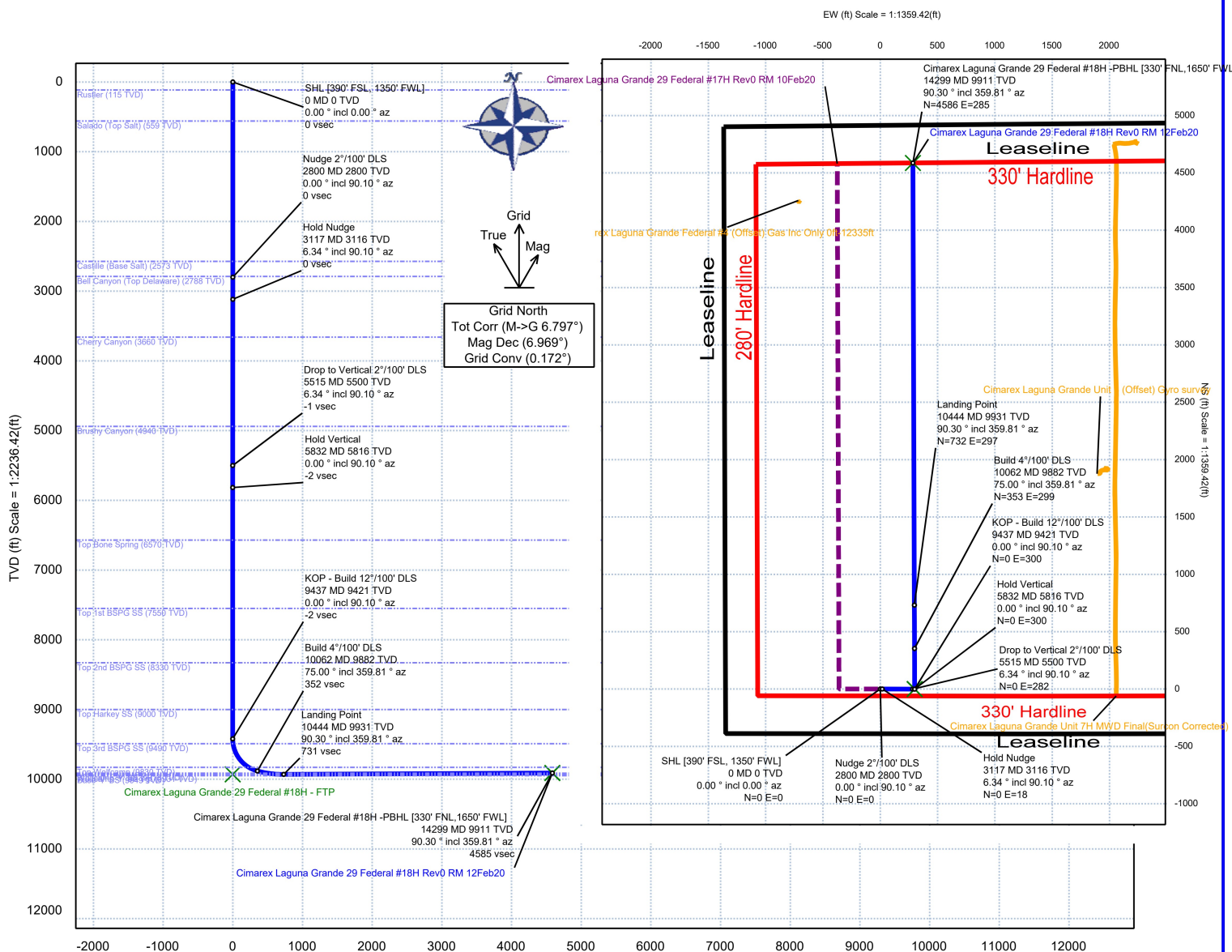


Cimarex Energy

Rev 0



Borehole: Laguna Grande 29 Federal #18H				Well: Laguna Grande 29 Federal #18H				Field: NM Eddy County (NAD 83)				Structure: Cimarex Laguna Grande 29 Federal #18H							
Gravity & Magnetic Parameters								Surface Location NAD83 New Mexico State Plane, Eastern Zone, US Feet								Miscellaneous			
Model: HDGM 2019		Dip: 59.983°		Date: 12-Feb-2020				Lat: N 32 16 10.81		Northing: 461988.46ftUS		Grid Conv: 0.172°		Slot: New Slot		TVD Ref: RKB(2995.7ft above MSL)			
MagDec: 6.969°		FS: 47837.07nT		Gravity FS: 998.472mgn (9.80665 Based)				Lon: W 104 0 40.16		Easting: 640915.79ftUS		Scale Fact: 0.99992045		Plan: Cimarex Laguna Grande 29 Federal #18H Rev0 RM 12Feb20					



Vertical Section (ft) Azim = 359.81° Scale = 1:2236.42(ft) Origin = 0N/-S, 0E/-W

Critical Points

Critical Point	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DLS
SHL [390° FSL, 1350° FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rustler	115.00	0.00	90.10	115.00	0.00	0.00	0.00	0.00
Salado (Top Salt)	559.00	0.00	90.10	559.00	0.00	0.00	0.00	0.00
Castile (Base Salt)	2573.00	0.00	90.10	2573.00	0.00	0.00	0.00	0.00
Bell Canyon (Top Delaware)	2788.00	0.00	90.10	2788.00	0.00	0.00	0.00	0.00
Nudge 2°/100' DLS	2800.00	0.00	90.10	2800.00	0.00	0.00	0.00	0.00
Hold Nudge	3117.09	6.34	90.10	3116.44	-0.09	-0.03	17.53	2.00
Cherry Canyon	3663.99	6.34	90.10	3660.00	-0.39	-0.13	77.94	0.00
Brushy Canyon	4951.87	6.34	90.10	4940.00	-1.11	-0.37	220.20	0.00
Drop to Vertical 2°/100' DLS	5515.32	6.34	90.10	5500.00	-1.42	-0.47	282.43	0.00
Hold Vertical	5832.41	0.00	90.10	5816.44	-1.51	-0.50	299.96	2.00
Top Bone Spring	6585.97	0.00	90.10	6570.00	-1.51	-0.50	299.96	0.00
Top 1st BSPG SS	7565.97	0.00	90.10	7550.00	-1.51	-0.50	299.96	0.00
Top 2nd BSPG SS	8345.97	0.00	90.10	8330.00	-1.51	-0.50	299.96	0.00
Top Harkey SS	9015.97	0.00	90.10	9000.00	-1.51	-0.50	299.96	0.00
KOP - Build 12°/100' DLS	9436.99	0.00	90.10	9421.02	-1.51	-0.50	299.96	0.00
Top 3rd BSPG SS	9506.21	8.31	359.81	9490.00	3.50	4.51	299.95	12.00
Top Wolfcamp	9928.10	58.93	359.81	9830.00	229.57	230.58	299.19	12.00
Build 4°/100' DLS	10061.99	75.00	359.81	9882.21	352.38	353.39	298.77	12.00
Wolfcamp "Y" SS	10209.54	80.90	359.81	9913.00	496.62	497.63	298.29	4.00
Wolfcamp "Y" SS Tgt	10429.56	89.70	359.81	9931.00	715.68	716.69	297.55	4.00
Wolfcamp "Y" SS Tgt	10444.41	90.30	359.81	9931.00	730.54	731.55	297.50	4.00
Landing Point	10444.42	90.30	359.81	9931.00	730.54	731.55	297.50	4.00
Wolfcamp "Y" SS	13913.81	90.30	359.81	9913.00	4199.89	4200.87	285.81	0.00
Cimarex Laguna Grande 29 Federal #18H - PBHL	14299.30	90.30	359.81	9911.00	4585.37	4586.35	284.51	0.00
[330° FNL, 1650° FWL]								
Base "Y" SS	NaN			9949.00				



Cimarex Laguna Grande 29 Federal #18H Rev0 RM 12Feb20 Proposal **Geodetic Report** **(Non-Def Plan)**



Report Date: February 12, 2020 - 04:29 PM
Client: Cimarex Energy
Field: NM Eddy County (NAD 83)
Structure / Slot: Cimarex Laguna Grande 29 Federal #18H / New Slot
Well: Laguna Grande 29 Federal #18H
Borehole: Laguna Grande 29 Federal #18H
UWI / AP#: Unknown / Unknown
Survey Name: Cimarex Laguna Grande 29 Federal #18H Rev0 RM 12Feb20
Survey Date: February 12, 2020
Tort / AHD / DDI / ERD Ratio: 102.981 ° / 4886.841 ft / 5.860 / 0.492
Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
Location Lat / Long: N 32° 16' 10.81225", W 104° 0' 40.15756"
Location Grid N/E Y/X: N 461988.460 ftUS, E 640915.790 ftUS
CRS Grid Convergence Angle: 0.1720 °
Grid Scale Factor: 0.99992045
Version / Patch: 2.10.787.0

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 359.807 ° (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: RKB
TVD Reference Elevation: 2995.700 ft above MSL
Seabed / Ground Elevation: 2969.700 ft above MSL
Magnetic Declination: 6.969 °
Total Gravity Field Strength: 998.4720mgn (9.80665 Based)
Gravity Model: GARM
Total Magnetic Field Strength: 47837.070 nT
Magnetic Dip Angle: 59.983 °
Declination Date: February 12, 2020
Magnetic Declination Model: HDGM 2019
North Reference: Grid North
Grid Convergence Used: 0.1720 °
Total Corr Mag North->Grid North: 6.7972 °
Local Coord Referenced To: Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL [390' FSL, 1350' FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	461988.46	640915.79	N 32 16 10.81 W 104	0 40.16
Nudge 2"/100' DLS	2800.00	0.00	90.10	2800.00	0.00	0.00	0.00	0.00	461988.46	640915.79	N 32 16 10.81 W 104	0 40.16
Hold Nudge	3117.09	6.34	90.10	3116.44	-0.09	-0.03	17.53	2.00	461988.43	640933.32	N 32 16 10.81 W 104	0 39.95
Drop to Vertical 2"/100' DLS	5515.32	6.34	90.10	5500.00	-1.42	-0.47	282.43	0.00	461987.99	641198.20	N 32 16 10.80 W 104	0 36.87
Hold Vertical	5832.41	0.00	90.10	5816.44	-1.51	-0.50	299.96	2.00	461987.96	641215.73	N 32 16 10.80 W 104	0 36.66
KOP - Build 12"/100' DLS	9436.99	0.00	90.10	9421.02	-1.51	-0.50	299.96	0.00	461987.96	641215.73	N 32 16 10.80 W 104	0 36.66
Build 4"/100' DLS	10061.99	75.00	359.81	9882.21	352.38	353.39	298.77	12.00	462341.82	641214.54	N 32 16 14.30 W 104	0 36.67
Landing Point	10444.42	90.30	359.81	9931.00	730.54	731.55	297.50	4.00	462719.95	641213.26	N 32 16 18.04 W 104	0 36.67
Cimarex Laguna Grande 29 Federal #18H - PBHL [330' FNL,1650' FWL]	14299.30	90.30	359.81	9911.00	4585.37	4586.35	284.51	0.00	466574.44	641200.28	N 32 16 56.19 W 104	0 36.68

Survey Type: Non-Def Plan

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

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Expected Max Inclination (deg)	Survey Tool Type	Borehole / Survey
	1	0.000	26.000	1/100.000	17.500	13.375		NAL_MWD_IFR1+MS-Depth Only	Laguna Grande 29 Federal #18H / Cimarex Laguna Grande 29
	1	26.000	14299.296	1/100.000	17.500	13.375		NAL_MWD_IFR1+MS	Federal #18H Rev0 RM 12Feb20 Laguna Grande 29 Federal #18H / Cimarex Laguna Grande 29



Cimarex Laguna Grande 29 Federal #18H Rev0 RM 12Feb20 Anti-Collision Summary Report

Analysis Date-24hr Time: February 12, 2020 - 16:29

Client: Cimarex Energy

Field: NM Eddy County (NAD 83)

Structure: Cimarex Laguna Grande 29 Federal #18H

Slot: New Slot

Well: Laguna Grande 29 Federal #18H

Borehole: Laguna Grande 29 Federal #18H

Scan MD Range: 0.00ft ~ 14299.30ft

Analysis Method: 3D Least Distance

Reference Trajectory: Cimarex Laguna Grande 29 Federal #18H Rev0 RM 12Feb20 (Non-Def Plan)

Depth Interval: Every 10.00 Measured Depth (ft)

Rule Set: NAL Procedure: D&M AntiCollision Standard S002

Min Pts: All local minima indicated.

Version / Patch: 2.10.787.0

Database \ Project: us1153APP452.DIR.SLB.COM\DRILLING-NM Eddy County 2.10

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

Offset Trajectories Summary

Offset Selection Criteria

Wellhead distance scan: Not performed!

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

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

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

Results highlighted: Sep-Factor separation <= 1.50 ft

Cimarex Laguna Grande 29 Federal #17H Rev0 RM 10Feb20 (Non-Def Plan)													Fail Minor
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20.00	16.26	18.72	3.74	N/A	MAS = 4.96 (m)	0.00	0.00	CtCt<=15m<15.00				Enter Alert
20.00	16.26	18.71	3.74	84233.28	MAS = 4.96 (m)	26.00	26.00					WRP
20.00	20.02	6.23	-0.02	1.50	OSF1.50	2050.00	2050.00		OSF<1.50			Enter Minor
20.00	26.99	1.58	-6.99	1.09	OSF1.50	2790.00	2790.00					MinPt-CtCt
20.00	27.09	1.51	-7.09	1.09	OSF1.50	2800.00	2800.00					MinPts
20.04	27.13	1.52	-7.10	1.09	OSF1.50	2810.00	2810.00					MinPt-O-ADP
26.82	27.55	8.02	-0.74	1.46	OSF1.50	2940.00	2939.94			OSF>1.50		Exit Minor
88.62	27.76	69.68	60.86	4.95	OSF1.50	3270.00	3268.42		OSF>5.00			Exit Alert
658.92	75.38	609.24	584.54	13.33	OSF1.50	10444.42	9931.00					MinPt-CtCt
659.93	174.21	543.36	485.72	5.71	OSF1.50	14299.30	9911.00					MinPts

Cimarex Laguna Grande Federal #4 (Offset) Gas Inc Only 0ft-12335ft (Def Survey)													Warning Alert
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4307.29	32.81	4306.16	4274.48	N/A	MAS = 10.00 (m)	0.00	0.00					Surface
4307.24	32.81	4306.10	4274.43	600139.97	MAS = 10.00 (m)	10.00	10.00					MinPt-O-SF
4307.20	32.81	4306.07	4274.39	N/A	MAS = 10.00 (m)	26.00	26.00					WRP
4305.26	32.81	4292.84	4272.45	381.23	MAS = 10.00 (m)	410.00	410.00					MinPts
4305.31	60.37	4264.69	4244.94	108.99	OSF1.50	1230.00	1230.00					MinPt-CtCt
4307.13	76.44	4255.79	4230.69	85.76	OSF1.50	1570.00	1570.00					MINPT-O-EQU
4305.42	100.26	4238.20	4205.16	65.13	OSF1.50	1980.00	1980.00					MinPt-CtCt
4306.17	102.86	4237.22	4203.31	63.48	OSF1.50	2090.00	2090.00					MINPT-O-EQU
4307.06	103.94	4237.39	4203.12	62.82	OSF1.50	2140.00	2140.00					MinPt-O-ADP
4308.73	115.25	4231.52	4193.48	56.62	OSF1.50	2280.00	2280.00					MinPt-CtCt
4308.79	115.38	4231.49	4193.41	56.56	OSF1.50	2300.00	2300.00					MINPT-O-EQU
4308.85	115.44	4231.51	4193.41	56.53	OSF1.50	2310.00	2310.00					MinPt-O-ADP
4309.22	121.80	4227.64	4187.42	53.55	OSF1.50	2400.00	2400.00					MinPt-CtCt
4309.25	121.93	4227.59	4187.32	53.50	OSF1.50	2420.00	2420.00					MINPT-O-EQU
4309.30	121.99	4227.59	4187.31	53.47	OSF1.50	2430.00	2430.00					MinPt-O-ADP
4309.20	128.57	4223.11	4180.63	50.71	OSF1.50	2530.00	2530.00					MinPt-CtCt
4309.24	128.72	4223.05	4180.52	50.65	OSF1.50	2550.00	2550.00					MINPT-O-EQU
4309.45	128.97	4223.09	4180.48	50.55	OSF1.50	2580.00	2580.00					MinPt-O-ADP
4309.56	135.12	4219.10	4174.44	48.23	OSF1.50	2660.00	2660.00					MinPt-CtCt
4309.74	135.54	4219.00	4174.20	48.08	OSF1.50	2700.00	2700.00					MINPT-O-EQU
4310.07	135.94	4219.07	4174.13	47.95	OSF1.50	2730.00	2730.00					MinPt-O-ADP
4308.88	159.62	4202.09	4149.26	40.77	OSF1.50	3070.00	3069.60					MinPt-CtCt
4317.22	184.01	4194.17	4133.21	35.40	OSF1.50	3640.00	3636.15					MINPT-O-EQU
4326.55	208.03	4187.48	4118.52	31.36	OSF1.50	4100.00	4093.34					MINPT-O-EQU
4335.84	219.19	4189.34	4116.66	29.82	OSF1.50	4370.00	4361.69					MinPt-O-ADP
4364.80	352.58	4129.36	4012.21	18.62	OSF1.50	6870.00	6854.03					MinPt-CtCt
4366.47	362.84	4124.33	4003.83	18.11	OSF1.50	7130.00	7114.03					MINPT-O-EQU
4367.98	364.45	4124.63	4003.53	18.03	OSF1.50	7200.00	7164.03					MinPt-O-ADP
4372.66	378.23	4120.14	3994.44	17.39	OSF1.50	7350.00	7334.03					MinPt-CtCt
4372.68	378.27	4120.12	3994.41	17.39	OSF1.50	7360.00	7344.03					MINPT-O-EQU
4372.71	378.31	4120.13	3994.40	17.39	OSF1.50	7370.00	7354.03					MinPt-O-ADP
4373.03	384.82	4116.11	3988.21	17.09	OSF1.50	7480.00	7464.03					MinPt-CtCt
4373.05	384.86	4116.10	3988.19	17.09	OSF1.50	7490.00	7474.03					MINPT-O-EQU
4373.10	384.91	4116.11	3988.19	17.09	OSF1.50	7500.00	7484.03					MinPt-O-ADP
4373.07	391.45	4111.72	3981.61	16.80	OSF1.50	7600.00	7584.03					MinPt-CtCt
4373.09	391.55	4111.68	3981.54	16.80	OSF1.50	7620.00	7604.03					MINPT-O-EQU
4373.14	391.60	4111.70	3981.54	16.80	OSF1.50	7630.00	7614.03					MinPt-O-ADP
4373.68	392.08	4111.92	3981.60	16.78	OSF1.50	7680.00	7664.03					MINPT-O-EQU
4374.61	393.19	4112.10	3981.42	16.73	OSF1.50	7730.00	7714.03					MinPt-O-ADP
4381.57	430.91	4093.82	3950.66	15.29	OSF1.50	8350.00	8334.03					MinPt-CtCt
4381.64	431.16	4093.82	3950.48	15.28	OSF1.50	8380.00	8364.03					MINPT-O-EQU
4381.70	431.24	4093.83	3950.46	15.28	OSF1.50	8390.00	8374.03					MinPt-O-ADP
4381.24	437.49	4089.20	3943.75	15.06	OSF1.50	8480.00	8464.03					MinPt-CtCt
4381.27	437.62	4089.15	3943.65	15.05	OSF1.50	8500.00	8484.03					MINPT-O-EQU
4381.32	437.69	4089.15	3943.63	15.05	OSF1.50	8510.00	8494.03					MinPt-O-ADP
4380.00	445.45	4082.66	3934.55	14.78	OSF1.50	8640.00	8624.03					MinPt-CtCt
4380.05	445.58	4082.62	3934.47	14.78	OSF1.50	8660.00	8644.03					MINPT-O-EQU
4380.11	445.64	4082.63	3934.46	14.78	OSF1.50	8670.00	8654.03					MinPt-O-ADP
4380.67	446.19	4082.63	3934.48	14.76	OSF1.50	8720.00	8704.03					MinPt-CtCt
4381.13	453.86	4078.18	3927.27	14.51	OSF1.50	8800.00	8784.03					MINPT-O-EQU
4381.19	453.99	4078.15	3927.20	14.51	OSF1.50	8820.00	8804.03					MinPt-O-ADP
4381.25	454.05	4078.17	3927.19	14.51	OSF1.50	8830.00	8814.03					MinPt-CtCt
4381.53	460.44	4074.19	3921.09	14.31	OSF1.50	8920.00	8904.03					MINPT-O-EQU
4381.60	467.02	4069.88	3914.58	14.10	OSF1.50	9050.00	9034.03					MinPt-CtCt
4382.12	468.43	4069.46	3913.69	14.06	OSF1.50	9130.00	9114.03					MINPT-O-EQU
1708.77	517.56	1362.30	1191.21	4.98	OSF1.50	12590.00	9919.87		OSF<5.00			Enter Alert
1001.79	522.39	653.15	479.40	2.88	OSF1.50	13970.00	9912.71					MinPt-CtCt

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level			Alert	Status
	Cl-Ct (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major		
1001.79		522.42	653.14	479.38	2.88	OSF1.50	13980.00	9912.66				MinPts	
1053.16		522.27	704.60	530.89	3.03	OSF1.50	14299.30	9911.00				TD	
Cimarex Laguna Grande Unit 3 (Offset) Gyro survey (Def Survey)													
												Pass	
2738.06	32.81	2736.04	2705.25	69660.44	MAS = 10.00 (m)		0.00	0.00				MinPts	
2738.10	32.81	2736.03	2705.29	32139.35	MAS = 10.00 (m)		20.00	20.00				MINPT-O-EQU	
2738.11	32.81	2736.04	2705.31	27582.57	MAS = 10.00 (m)		26.00	26.00				WRP	
2741.99	32.81	2733.21	2709.18	403.39	MAS = 10.00 (m)		1400.00	1400.00				MinPts	
2738.24	32.81	2726.32	2705.43	275.40	MAS = 10.00 (m)		2270.00	2270.00				MinPts	
2738.33	32.81	2726.21	2705.53	269.68	MAS = 10.00 (m)		2320.00	2320.00				MINPT-O-EQU	
2562.97	32.81	2541.05	2530.16	129.93	MAS = 10.00 (m)		5600.00	5584.29				MinPt-O-SF	
1623.41	72.93	1573.98	1550.48	34.49	OSF1.50		11590.00	9925.06				MinPt-CtCt	
1623.56	73.30	1573.90	1550.27	34.30	OSF1.50		11610.00	9924.95				MINPT-O-EQU	
1623.73	73.48	1573.95	1550.25	34.20	OSF1.50		11620.00	9924.90				MinPt-O-SF	
1698.33	81.28	1644.49	1618.06	32.11	OSF1.50		12090.00	9922.46				MinPt-O-SF	
3160.20	86.32	3101.99	3073.88	56.17	OSF1.50		14299.30	9911.00				TD	
Cimarex Laguna Grande Unit 7H MWD Final(Surcon Corrected) (Def Survey)													
												Pass	
5259.08	32.81	5257.07	5226.27	203968.01	MAS = 10.00 (m)		0.00	0.00				MinPts	
5259.08	32.81	5257.02	5226.27	63306.55	MAS = 10.00 (m)		26.00	26.00				WRP	
5257.40	32.81	5249.24	5224.59	850.73	MAS = 10.00 (m)		1270.00	1270.00				MinPts	
5257.54	32.81	5249.12	5224.73	815.90	MAS = 10.00 (m)		1350.00	1350.00				MINPT-O-EQU	
5270.39	32.81	5257.34	5237.58	475.71	MAS = 10.00 (m)		2450.00	2450.00				MinPt-O-SF	
5267.35	32.81	5253.04	5234.54	427.02	MAS = 10.00 (m)		2760.00	2760.00				MinPts	
5267.44	32.81	5252.95	5234.64	420.85	MAS = 10.00 (m)		2800.00	2800.00				MINPT-O-EQU	
1794.18	158.39	1687.85	1635.79	17.21	OSF1.50		9630.00	9608.82				MinPt-O-SF	
1753.14	147.84	1653.71	1605.31	18.08	OSF1.50		10140.00	9900.34				MinPt-O-ADP	
1752.86	147.49	1653.67	1605.37	18.12	OSF1.50		10160.00	9904.32				MINPT-O-EQU	
1752.51	146.49	1654.01	1606.02	18.23	OSF1.50		10220.00	9914.62				MinPt-CtCt	
1757.00	125.24	1672.62	1631.76	21.47	OSF1.50		11110.00	9927.55				MinPt-O-ADP	
1755.92	123.95	1672.41	1631.97	21.68	OSF1.50		11190.00	9927.13				MINPT-O-EQU	
1752.08	119.99	1671.23	1632.09	22.35	OSF1.50		11420.00	9925.94				MinPt-O-ADP	
1752.04	119.94	1671.22	1632.10	22.36	OSF1.50		11430.00	9925.89				MINPT-O-EQU	
1752.02	119.89	1671.24	1632.13	22.36	OSF1.50		11440.00	9925.83				MinPt-CtCt	
1766.47	109.31	1692.69	1657.16	24.82	OSF1.50		12390.00	9920.91				MinPt-O-SF	
1761.73	109.52	1687.83	1652.20	24.69	OSF1.50		12600.00	9919.82				MinPt-O-SF	
1758.48	110.16	1684.19	1648.32	24.47	OSF1.50		12850.00	9918.52				MinPt-CtCt	
1758.53	110.34	1684.13	1648.18	24.43	OSF1.50		12880.00	9918.36				MINPT-O-EQU	
1758.68	110.53	1684.16	1648.15	24.38	OSF1.50		12910.00	9918.21				MinPt-O-ADP	
1761.56	111.49	1686.47	1650.07	24.17	OSF1.50		13060.00	9917.43				MinPt-O-SF	
1766.68	112.73	1690.77	1653.96	23.96	OSF1.50		13260.00	9916.39				MinPt-O-SF	
1769.85	113.41	1693.43	1656.44	23.89	OSF1.50		13400.00	9915.67				MinPt-O-SF	
1765.19	115.91	1687.08	1649.28	23.32	OSF1.50		13660.00	9914.32				MinPt-CtCt	
1765.43	116.63	1686.86	1648.80	23.16	OSF1.50		13710.00	9914.06				MINPT-O-EQU	
1765.92	117.22	1686.97	1648.70	23.04	OSF1.50		13750.00	9913.85				MinPt-O-ADP	
1775.47	125.41	1691.05	1650.06	21.83	OSF1.50		14260.00	9911.20				MINPT-O-EQU	
1775.77	125.81	1691.10	1649.96	21.55	OSF1.50		14280.00	9911.10				MinPt-O-ADP	
1776.22	126.19	1691.31	1650.02	21.49	OSF1.50		14299.30	9911.00				MinPt-O-SF	

PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Cimarex Energy
LEASE NO.:	NMNM019848
LOCATION:	Section 29, T.23 S., R.29 E., NMPM
COUNTY:	Eddy County, New Mexico

WELL NAME & NO.:	Laguna Grande 29 Fed 18H
SURFACE HOLE FOOTAGE:	390'/S & 1350'/W
BOTTOM HOLE FOOTAGE:	330'/N & 1650'/W

COA

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

A. HYDROGEN SULFIDE

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

B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately **500** feet (a minimum of **70 feet (Eddy County)** into the Rustler Anhydrite and above the salt) and cemented to the surface.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8**

- hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
- c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
 - d. If cement falls back, remedial cementing will be done prior to drilling out that string.
2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:
- Cement to surface. If cement does not circulate see B.1.a, c-d above.
- Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.**
- ❖ In Medium Cave/Karst Areas if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.
3. The minimum required fill of cement behind the **7** inch production casing is:
- Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.
4. The minimum required fill of cement behind the **4-1/2** inch production liner is:
- Cement should tie-back **100 feet** into the previous casing. Operator shall provide method of verification. **Excess calculates to 12%. Additional cement maybe required.**

C. PRESSURE CONTROL

1. **Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).**
 2. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M)** psi.
 - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
 - c. Manufacturer representative shall install the test plug for the initial BOP test.
 - d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
 - e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

GENERAL REQUIREMENTS

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

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

☒ Eddy County

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

☒ Lea County

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

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
 - a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
 - b. When the operator proposes to set surface casing with Spudder Rig
 - Notify the BLM when moving in and removing the Spudder Rig.
 - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
 - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.
3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.
2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.
5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.
7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.
3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.
4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
 - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
 - c. Manufacturer representative shall install the test plug for the initial BOP test.
 - d. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
 - e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
 - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including

lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

- b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).
- c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).
- d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
- e. The results of the test shall be reported to the appropriate BLM office.
- f. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.
- g. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.
- h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

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

D. WASTE MATERIAL AND FLUIDS

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

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

ZS 040721

Hydrogen Sulfide Drilling Operations Plan

Laguna Grande 29 Federal 18H

Cimarex Energy Co.

UL: M, Sec. 29, 23S, 29E

Eddy Co., NM

- 1 All Company and Contract personnel admitted on location must be trained by a qualified H₂S safety instructor to the following:
 - A. Characteristics of H₂S
 - B. Physical effects and hazards
 - C. Principal and operation of H₂S detectors, warning system and briefing areas.
 - D. Evacuation procedure, routes and first aid.
 - E. Proper use of safety equipment & life support systems
 - F. Essential personnel meeting Medical Evaluation criteria will receive additional training on the proper use of 30 minute pressure demand air packs.

H₂S Detection and Alarm Systems:

 - A. H₂S sensors/detectors to be located on the drilling rig floor, in the base of the sub structure/cellar area, on the mud pits in the shale shaker area. Additional H₂S detectors may be placed as deemed necessary.
 - B. An audio alarm system will be installed on the derrick floor and in the top doghouse.
- 3 Windsock and/or wind streamers:
 - A. Windsock at mudpit area should be high enough to be visible.
 - B. Windsock on the rig floor and / or top doghouse should be high enough to be visible.
- 4 Condition Flags and Signs
 - A. Warning sign on access road to location.
 - B. Flags to be displayed on sign at entrance to location. Green flag indicates normal safe condition. Yellow flag indicates potential pressure and danger. Red flag indicates danger (H₂S present in dangerous concentration). Only H₂S trained and certified personnel admitted to location.
- 5 Well control equipment:
 - A. See exhibit "E-1"
- 6 Communication:
 - A. While working under masks chalkboards will be used for communication.
 - B. Hand signals will be used where chalk board is inappropriate.
 - C. Two way radio will be used to communicate off location in case of emergency help is required. In most cases cellular telephones will be available at most drilling foreman's trailer or living quarters.
- 7 Drillstem Testing:

No DSTs or cores are planned at this time.
- 8 Drilling contractor supervisor will be required to be familiar with the effects H₂S has on tubular goods and other mechanical equipment.
- 9 If H₂S is encountered, mud system will be altered if necessary to maintain control of formation. A mud gas separator will be brought into service along with H₂S scavengers if necessary.

H₂S Contingency Plan
Laguna Grande 29 Federal 18H
Cimarex Energy Co.
UL: M, Sec. 29, 23S, 29E
Eddy Co., NM

Emergency Procedures

In the event of a release of gas containing H₂S, the first responder(s) must:

- « Isolate the area and prevent entry by other persons into the 100 ppm ROE.
- « Evacuate any public places encompassed by the 100 ppm ROE.
- « Be equipped with H₂S monitors and air packs in order to control the release.
- « Use the "buddy system" to ensure no injuries occur during the 432-620-1975
- « Take precautions to avoid personal injury during this operation.
- « Contact operator and/or local officials to aid in operation. See list of phone numbers attached.
- « Have received training in the:
 - Detection of H₂S, and
 - Measures for protection against the gas,
 - Equipment used for protection and emergency response.

Ignition of Gas Source

Should control of the well be considered lost and ignition considered, take care to protect against exposure to Sulfur Dioxide (SO₂). Intentional ignition must be coordinated with the NMOCD and local officials. Additionally, the NM State Police may become involved. NM State Police shall be the Incident Command on scene of any major release. Take care to protect downwind whenever there is an ignition of the gas.

Characteristics of H₂S and SO₂

Please see attached International Chemical Safety Cards.

Contacting Authorities

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

H₂S Contingency Plan Emergency Contact
s Laguna Grande 29 Federal 18H Cimarex
 Energy Co.
 UL: M, Sec. 29, 23S, 29E
 Eddy Co., NM

Company Office

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

Key Personnel

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

Artesia

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

Carlsbad

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

Santa Fe

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

National

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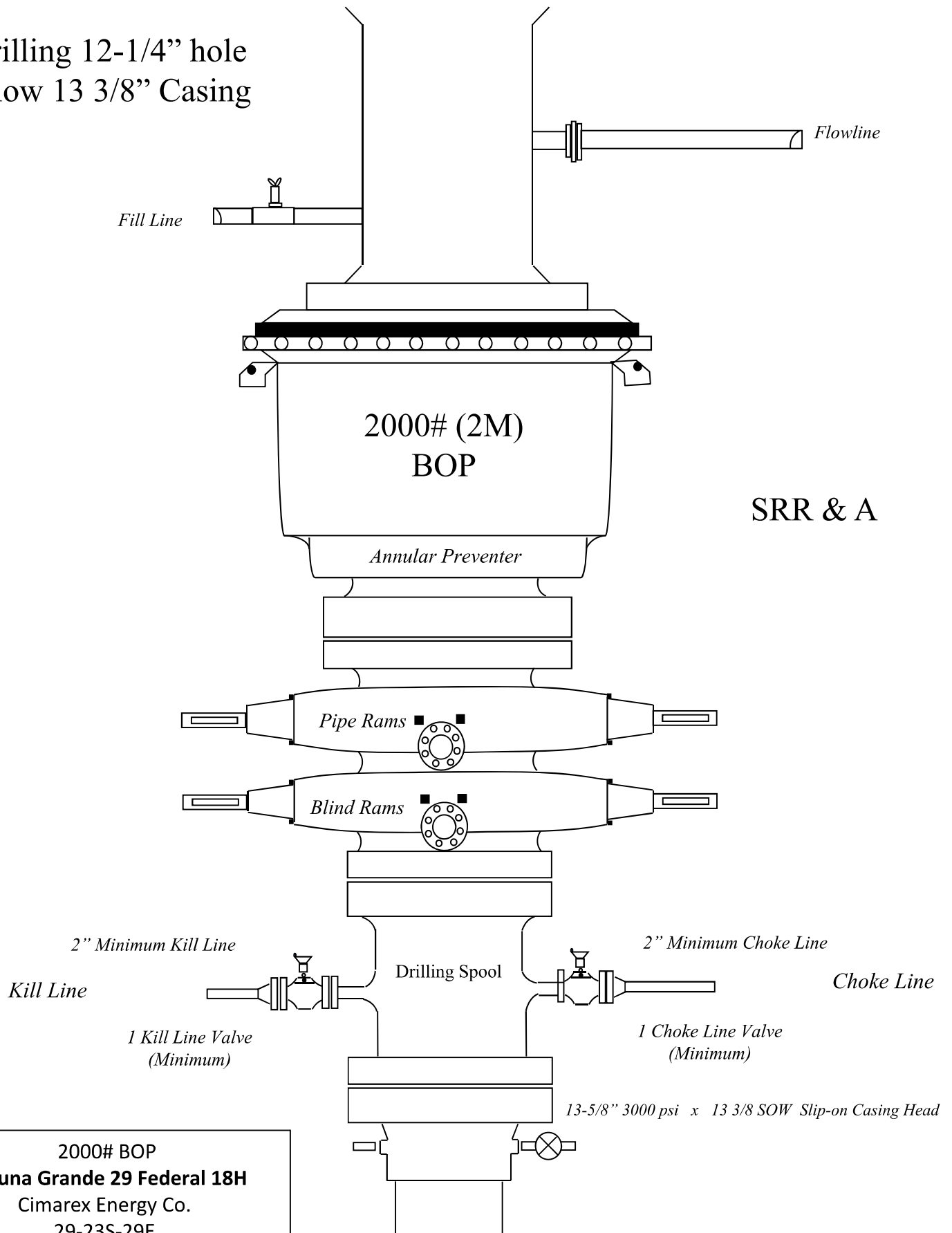
Medical

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

Other

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

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



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

Fill Line

Flowline

5000# (5M)
BOP

Annular Preventer

SRR & A

Pipe Rams

Blind Rams

2" Minimum Kill Line

Kill Line

Drilling
Spool

3" minimum choke line

Choke Line

2 Valves Minimum

(HCR Required)

2 Valves and a check valve

Wellhead
Assembly

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

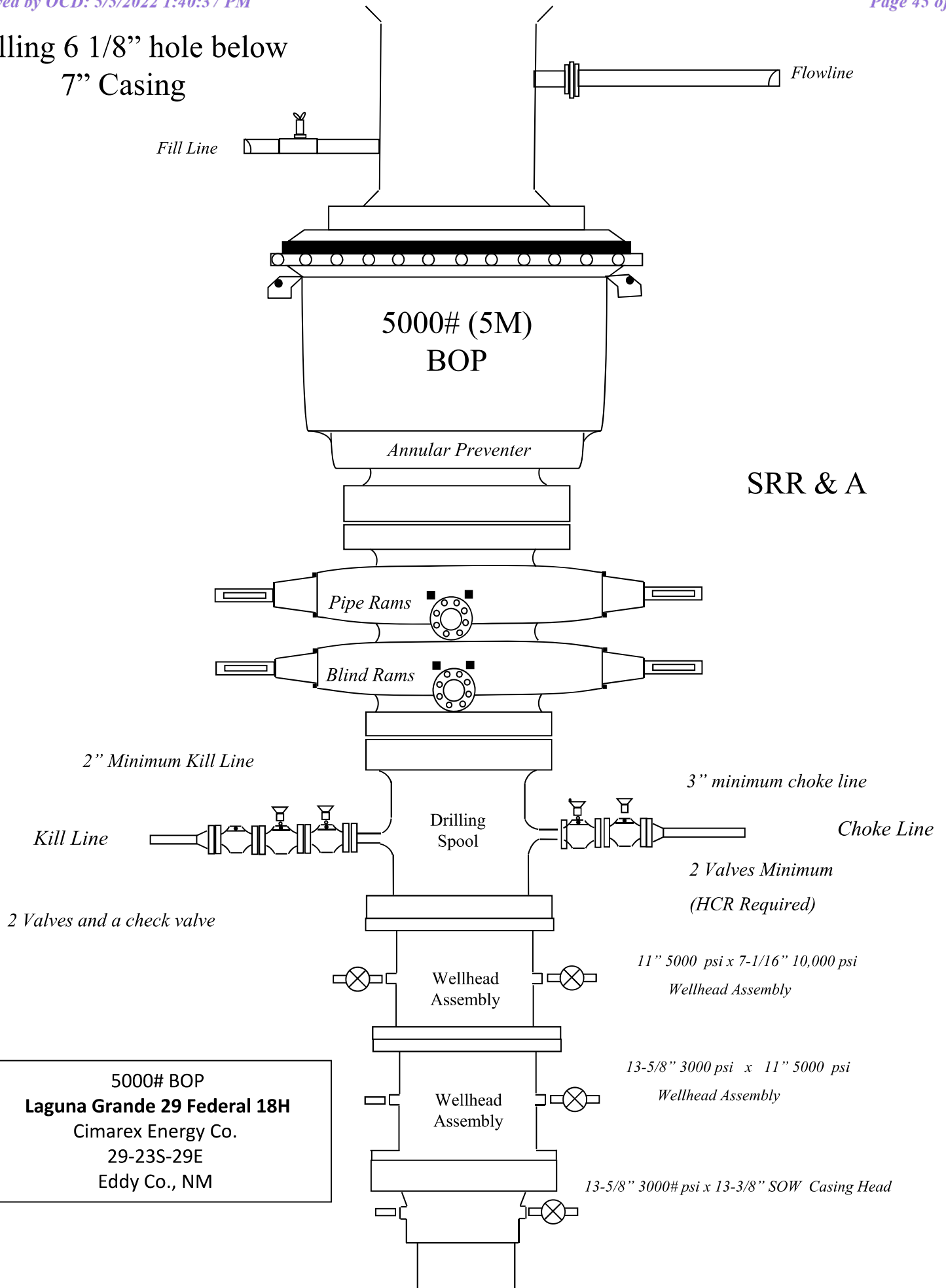
Wellhead
Assembly

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

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

5000# BOP
Laguna Grande 29 Federal 18H
Cimarex Energy Co.
29-23S-29E
Eddy Co., NM

Drilling 6 1/8" hole below
7" Casing



SRR & A

5000# BOP
Laguna Grande 29 Federal 18H
Cimarex Energy Co.
29-23S-29E
Eddy Co., NM

District I

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

District II

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

District III

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

District IV

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

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

CONDITIONS

Action 104615

CONDITIONS

Operator: CIMAREX ENERGY CO. 600 N. Marienfeld Street Midland, TX 79701	OGRID: 215099
	Action Number: 104615
	Action Type: [C-101] BLM - Federal/Indian Land Lease (Form 3160-3)

CONDITIONS

Created By	Condition	Condition Date
kpickford	Notify OCD 24 hours prior to casing & cement	5/9/2022
kpickford	Will require a File As Drilled C-102 and a Directional Survey with the C-104	5/9/2022
kpickford	Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string	5/9/2022
kpickford	Cement is required to circulate on both surface and intermediate1 strings of casing	5/9/2022
kpickford	Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system	5/9/2022