Form 3160-3
(June 2015)

RECEIVED
FEB 04 2020
EMNRD-OCD ARTESIA

RECEIVED
FEB 04 2020
EMNRD-OCD ARTESIA

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

5. Lease Serial No.
NMNM019848

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☑ DRILL ☐ REENTER

1b. Type of Well: ☐ Oil Well ☑ Gas Well ☐ Other

1c. Type of Completion: ☐ Hydraulic Fracturing ☑ Single Zone ☐ Multiple Zone

7. If Unit or CA Agreement, Name and No.

8. Lease Name and Well No.
LAGUNA GRANDE-29 FEDERAL COM
15H 327124

2. Name of Operator
CIMAREX ENERGY COMPANY OF COLORADO

9. API Well No.
30-015-46690

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

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

10. Field and Pool, or Exploratory
UPPER WOLFCAMP / PURPLE SAGE W

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface SWSW / 390 FSL / 1290 FWL / LAT 32.269671 / LONG -104.011349
At proposed prod. zone NWNW / 330 FNL / 380 FWL / LAT 32.282254 / LONG -104.014298

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 29 / T23S / R29E / NMP

14. Distance in miles and direction from nearest town or post office*
5.4 miles

12. County or Parish
EDDY

13. State
NM

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
960

17. Spacing Unit dedicated to this well
320

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.
20 feet

19. Proposed Depth
9911 feet / 14339 feet

20. BLM/BIA Bond No. in file
FED: NMB001187

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
2971 feet

22. Approximate date work will start*
07/01/2019

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

25. Signature	Name *(Printed/Typed)*	Date
(Electronic Submission)	Aricka Easterling / Ph: (918)560-7060	11/19/2018

Title
Regulatory Analyst

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
(Electronic Submission)	Cody Layton / Ph: (575)234-5959	01/29/2020

Title	Office
Assistant Field Manager Lands & Minerals	CARLSBAD

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

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

APPROVED WITH CONDITIONS
Approval Date: 01/29/2020

KS 2-10-20

(Continued on page 2)

*(Instructions on page 2)

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**CIMAREX ENERGY COMPANY OF COLORADO**
LEASE NO.:	**NMNM019848**
WELL NAME & NO.:	**Laguna Grande 29 Federal Com 15H**
SURFACE HOLE FOOTAGE:	**390'/S & 1290'/W**
BOTTOM HOLE FOOTAGE	**330'/N & 380'/W**
LOCATION:	**Section 29, T.23 S., R.29 E., NMPM**
COUNTY:	**Eddy County, New Mexico**

COA

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

A. HYDROGEN SULFIDE

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

B. CASING

1. The **20** inch surface casing shall be set at approximately **200** feet (a minimum of **70 feet (Eddy County)** into the Rustler Anhydrite and above the salt) and cemented to the surface. **Excess cement calculates to negative 18%, additional cement will be required.**

    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.

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

3. The minimum required fill of cement behind the **7** inch production casing is:

- Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification. **Excess cement calculates to 22%, additional cement may be required.**

Production liner must be kept fluid filled to meet BLM minimum collapse requirement.

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 cement calculates to 6%, additional cement may be required.**

C. PRESSURE CONTROL

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

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

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

4. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the production casing shoe shall be **5000 (5M)** psi.

D. SPECIAL REQUIREMENT (S)

Communitization Agreement

- The operator will submit a Communitization Agreement to the Carlsbad Field Office, 620 E Greene St. Carlsbad, New Mexico 88220, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

GENERAL REQUIREMENTS

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

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

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

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

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.

   a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
   b. When the operator proposes to set surface casing with Spudder Rig
      - Notify the BLM when moving in and removing the Spudder Rig.
      - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
      - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.

2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.

3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.

2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.

5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.

7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.

2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.

3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.

4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:

    a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
    b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
    c. Manufacturer representative shall install the test plug for the initial BOP test.
    d. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
    e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.

5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

    a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not

hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).

c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).

d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.

e. The results of the test shall be reported to the appropriate BLM office.

f. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.

g. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

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

D. WASTE MATERIAL AND FLUIDS

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

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

JJP01262020

PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Cimarex
LEASE NO.:	NMNM00019848
COUNTY:	Eddy

Wells:

Laguna Grande 29 Federal Com 15H
Surface Hole Location: 390' FSL & 1290' FWL, Section 29, T. 23 S., R. 29 E.
Bottom Hole Location: 330' FNL & 380' FWL. Section 29, T. 23 S., R. 29 E.

Laguna Grande 29 Federal Com 16H
Surface Hole Location: 390' FSL & 1310' FWL, Section 29, T. 23 S., R. 29 E.
Bottom Hole Location: 100' FNL & 660' FWL. Section 29, T. 23 S., R. 29 E.

TABLE OF CONTENTS

Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

Approval Date: 01/29/2020

I. GENERAL PROVISIONS

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

II. PERMIT EXPIRATION

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

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

OR

If the entire project is covered under the Permian Basin Programmatic Agreement (cultural resources only):

The proponent has contributed funds commensurate to the undertaking into an account for offsite mitigation. Participation in the PA serves as mitigation for the effects of this project on cultural resources. If any human skeletal remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered at any time during construction, all construction activities shall halt and the BLM will be notified as soon as possible within 24 hours. Work shall not resume until a Notice to Proceed is issued by the BLM. See information below discussing NAGPRA.

If the proposed project is split between a Class III inventory and a Permian Basin Programmatic Agreement contribution, the portion of the project covered under Class III inventory should default to the first paragraph stipulations.

The holder is hereby obligated to comply with procedures established in the Native American Graves Protection and Repatriation Act (NAGPRA) to protect such cultural items as human remains, associated funerary objects, sacred objects, and objects of cultural patrimony discovered inadvertently during the course of project implementation. In the event that any of the cultural items listed above are discovered during the course of project work, the proponent shall immediately halt the disturbance and contact the BLM within 24 hours for instructions. The proponent or initiator of any project shall be held responsible for protecting, evaluating, reporting, excavating, treating, and disposing of these cultural items according to the procedures established by the BLM in consultation with Indian Tribes."

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

IV. NOXIOUS WEEDS

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

V. SPECIAL REQUIREMENT(S)

Watershed:
The entire well pad(s) will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad. The compacted berm shall be constructed at a minimum of 12 inches with impermeable mineral material (e.g. caliche). Topsoil shall not be used to construct the berm. No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad. The integrity of the berm shall be maintained around the surfaced pad throughout the life of the well and around the downsized pad after interim reclamation has been completed. Any water erosion that may occur due to the construction of the well pad during the life of the well will be quickly corrected and proper measures will be taken to prevent future erosion. Stockpiling of topsoil is required. The top soil shall be stockpiled in an appropriate location to prevent loss of soil due to water or wind erosion and not used for berming or erosion control. If fluid collects within the bermed area, the fluid must be vacuumed into a safe container and disposed of properly at a state approved facility.

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

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well. For more installation details, contact the Carlsbad Field Office at 575-234-5972.

This authorization is subject to your Certificate of Participation and/or Certificate of Inclusion under the New Mexico Candidate Conservation Agreement. Because it involves surface disturbing activities covered under your Certificate, your Habitat Conservation Fund Account with the Center of Excellence for Hazardous Materials Management (CEHMM) will be debited according to Exhibit B Part 2 of the Certificate of Participation.

Texas Hornshell Mussel

Oil and Gas and Associated Infrastructure Mitigation Measures for Zone D – CCA Boundary Requirements:

- Provide CEHMM with the permit, lease grant, or other authorization form BLM, if applicable.
- Provide CEHMM with plats or other electronic media describing the new surface disturbance for the project.

VRM IV:

- Above-ground structures including meter housing that are not subject to safety requirements are painted a flat non-reflective paint color, Shale Green from the BLM Standard Environmental Color Chart (CC-001: June 2013).

VI. CONSTRUCTION

A. NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (575) 234-5909 at least 3 working days prior to commencing construction of the access road and/or well pad.

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

B. TOPSOIL

The operator shall strip the top portion of the soil (root zone) from the entire well pad area and stockpile the topsoil along the edge of the well pad as depicted in the APD. The root zone is typically six (6) inches in depth. All the stockpiled topsoil will be redistributed over the interim reclamation areas. Topsoil shall not be used for berming the pad or facilities. For final reclamation, the topsoil shall be spread over the entire pad area for seeding preparation.

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

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

The operator shall properly dispose of drilling contents at an authorized disposal site.

D. FEDERAL MINERAL MATERIALS PIT

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

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation. The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

F. EXCLOSURE FENCING (CELLARS & PITS)

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

G. ON LEASE ACCESS ROADS

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

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

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

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

Crowning

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

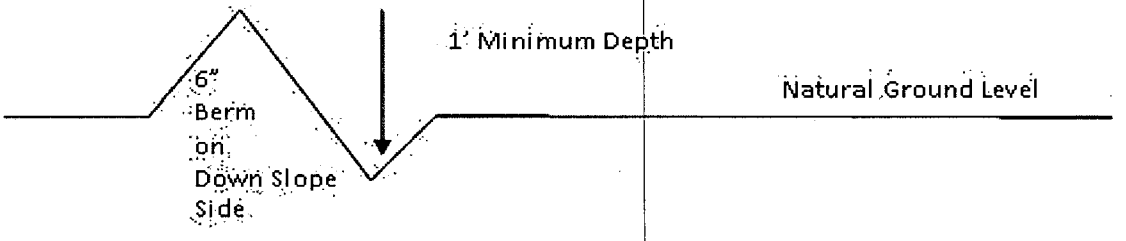
Ditching
Ditching shall be required on both sides of the road.

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

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

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

Cross Section of a Typical Lead-off Ditch



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

Formula for Spacing Interval of Lead-off Ditches

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

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

Cattle guards

An appropriately sized cattle guard sufficient to carry out the project shall be installed and maintained at fence/road crossings. Any existing cattle guards on the access road route shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattle guards that are in place and are utilized during lease operations.

Fence Requirement

Where entry is granted across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences.

Public Access

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

Construction Steps

1. Salvage topsoil
2. Construct road
3. Redistribute topsoil
4. Revegetate slopes

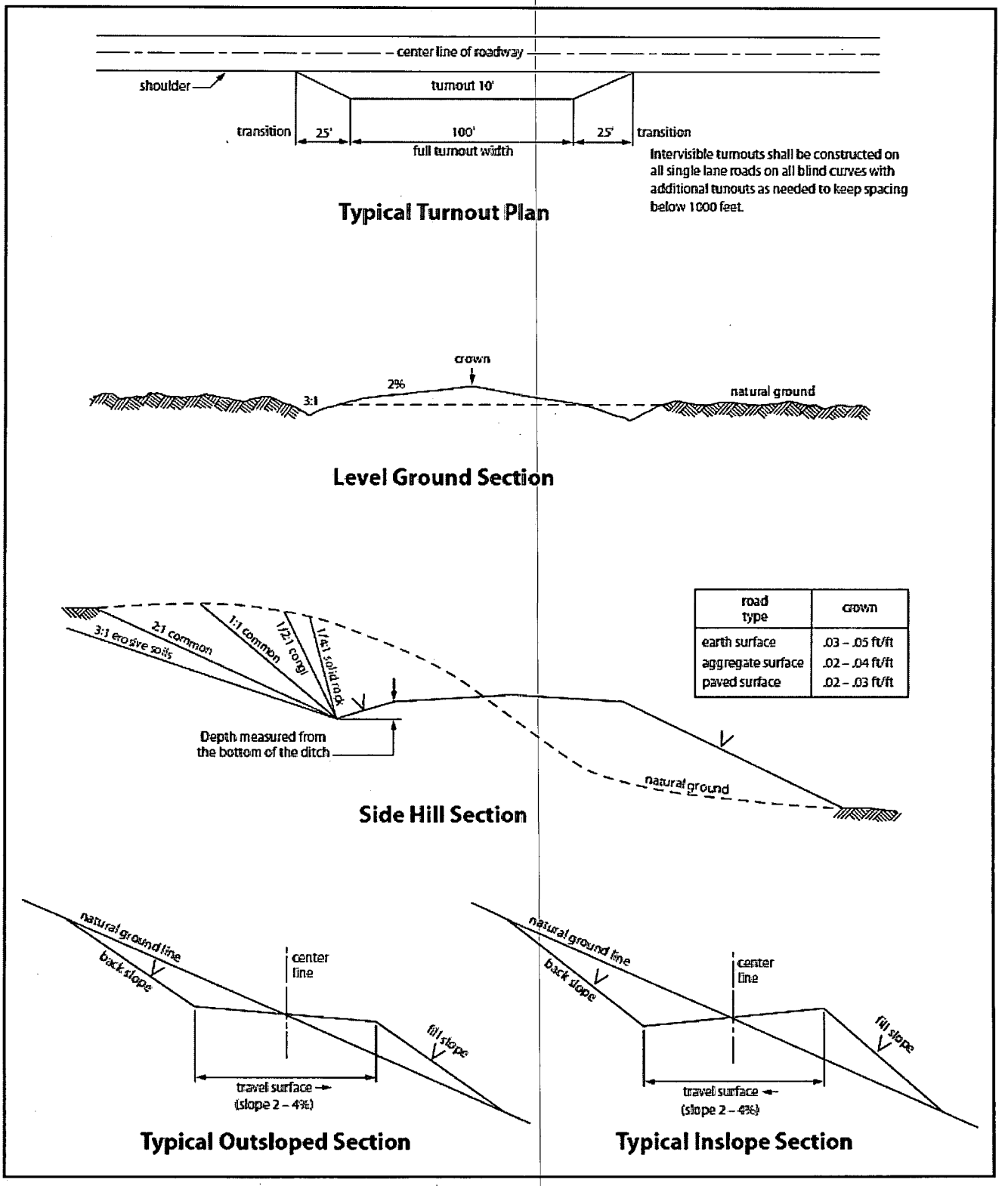


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

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

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

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

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

Containment Structures

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

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

B. PIPELINES

- The BLM, Carlsbad Field Office, will be informed immediately if any subsurface drainage channels, passages, or voids are intersected by trenching, and no pipe will be laid in the trench at that point until clearance has been issued by the Authorized Officer.
- If a void is encountered alignments may be rerouted to avoid the karst feature and lessen; the potential of subsidence or collapse of karst features, buildup of toxic or combustible gas, or other possible impacts to cave and karst resources from the buried pipeline.
- Special restoration stipulations or realignment may be required at such intersections, if any.
- A leak detection plan **will be submitted to the BLM Carlsbad Field Office for approval** prior to pipeline installation. The method could incorporate gauges to detect pressure drops, situating values and lines so they can be visually inspected periodically or installing electronic sensors to alarm when a leak is present. The leak detection plan will incorporate an automatic shut off system that will be installed for proposed pipelines to minimize the effects of an undesirable event.
- Regular monitoring is required to quickly identify leaks for their immediate and proper treatment.
- All spills or leaks will be reported to the BLM immediately for their immediate and proper treatment.

BURIED PIPELINE STIPULATIONS

A copy of the application (Grant, APD, or Sundry Notice) and attachments, including conditions of approval, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. The Holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.

2. The Holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C.6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil or other pollutant should be discharged from the pipeline system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil or other pollutant, wherever found, shall be the responsibility of holder, regardless of fault. Upon failure of holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages resulting therefrom, on the Federal lands, the Authorized Officer may take such measures as he deems necessary to control and clean up the discharge and restore the area, including where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the Authorized Officer shall not relieve holder of any responsibility as provided herein.

5. All construction and maintenance activity will be confined to the authorized right-of-way.

6. The pipeline will be buried with a minimum cover of **36** inches between the top of the pipe and ground level.

7. The maximum allowable disturbance for construction in this right-of-way will be **30** feet:

- Blading of vegetation within the right-of-way will be allowed: maximum width of blading operations will not exceed **20** feet. The trench is included in this area. (*Blading is defined as the complete removal of brush and ground vegetation.*)

- Clearing of brush species within the right-of-way will be allowed: maximum width of clearing operations will not exceed **30** feet. The trench and bladed area are included in this area. (*Clearing is defined as the removal of brush while leaving ground vegetation (grasses, weeds, etc.) intact. Clearing is best accomplished by holding the blade 4 to 6 inches above the ground surface.*)

- The remaining area of the right-of-way (if any) shall only be disturbed by compressing the vegetation. (*Compressing can be caused by vehicle tires, placement of equipment, etc.*)

8. The holder shall stockpile an adequate amount of topsoil where blading is allowed. The topsoil to be stripped is approximately 6 inches in depth. The topsoil will be segregated from other spoil piles from trench construction. The topsoil will be evenly distributed over the bladed area for the preparation of seeding.

9. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

10. Vegetation, soil, and rocks left as a result of construction or maintenance activity will be randomly scattered on this right-of-way and will not be left in rows, piles, or berms, unless otherwise approved by the Authorized Officer. The entire right-of-way shall be recontoured to match the surrounding landscape. The backfilled soil shall be compacted and a 6 inch berm will be left over the ditch line to allow for settling back to grade.

11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

12. The holder will reseed all disturbed areas. Seeding will be done according to the attached seeding requirements, using the following seed mix.

( ) seed mixture 1	( ) seed mixture 3
(X) seed mixture 2	( ) seed mixture 4
( ) seed mixture 2/LPC	( ) Aplomado Falcon Mixture

13. All above-ground structures not subject to safety requirements shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2.

14. The pipeline will be identified by signs at the point of origin and completion of the right-of-way and at all road crossings. At a minimum, signs will state the holder's name, BLM serial number, and the product being transported. All signs and information thereon will be posted in a permanent, conspicuous manner, and will be maintained in a legible condition for the life of the pipeline.

15. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder before maintenance begins. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway. As determined necessary during the life of the pipeline, the Authorized Officer may ask the holder to construct temporary deterrence structures.

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

OR

If the entire project is covered under the Permian Basin Programmatic Agreement (cultural resources only):

The proponent has contributed funds commensurate to the undertaking into an account for offsite mitigation. Participation in the PA serves as mitigation for the effects of this project on cultural resources. If any human skeletal remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered at any time during construction, all construction activities shall halt and

the BLM will be notified as soon as possible within 24 hours. Work shall not resume until a Notice to Proceed is issued by the BLM. See Stipulation 17 for more information.

If the proposed project is split between a Class III inventory and a Permian Basin Programmatic Agreement contribution, the portion of the project covered under Class III inventory should default to the first paragraph stipulations.

17. The holder is hereby obligated to comply with procedures established in the Native American Graves Protection and Repatriation Act (NAGPRA) to protect such cultural items as human remains, associated funerary objects, sacred objects, and objects of cultural patrimony discovered inadvertently during the course of project implementation. In the event that any of the cultural items listed above are discovered during the course of project work, the proponent shall immediately halt the disturbance and contact the BLM within 24 hours for instructions. The proponent or initiator of any project shall be held responsible for protecting, evaluating, reporting, excavating, treating, and disposing of these cultural items according to the procedures established by the BLM in consultation with Indian Tribes."

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

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

20. Escape Ramps - The operator will construct and maintain pipeline/utility trenches [that are not otherwise fenced, screened, or netted] to prevent livestock, wildlife, and humans from becoming entrapped. At a minimum, the operator will construct and maintain escape ramps, ladders, or other methods of avian and terrestrial wildlife escape in the trenches according to the following criteria:

a. Any trench left open for eight (8) hours or less is not required to have escape ramps; however, before the trench is backfilled, the contractor/operator shall inspect the trench for wildlife, remove all trapped wildlife, and release them at least 100 yards from the trench.
b. For trenches left open for eight (8) hours or more, earthen escape ramps (built at no more than a 30 degree slope and spaced no more than 500 feet apart) shall be placed in the trench.

21. Special Stipulations:

Lesser Prairie-Chicken

Oil and gas activities will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, geophysical exploration other than 3-D operations, and pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 ft. from the source of the noise.

Karst:

- The BLM, Carlsbad Field Office, will be informed immediately if any subsurface drainage channels, passages, or voids are intersected by trenching, and no pipe will be laid in the trench at that point until clearance has been issued by the Authorized Officer.
- If a void is encountered alignments may be rerouted to avoid the karst feature and lessen; the potential of subsidence or collapse of karst features, buildup of toxic or combustible gas, or other possible impacts to cave and karst resources from the buried pipeline.
- Special restoration stipulations or realignment may be required at such intersections, if any.
- A leak detection plan **will be submitted to the BLM Carlsbad Field Office for approval** prior to pipeline installation. The method could incorporate gauges to detect pressure drops, situating values and lines so they can be visually inspected periodically or installing electronic sensors to alarm when a leak is present. The leak detection plan will incorporate an automatic shut off system that will be installed for proposed pipelines to minimize the effects of an undesirable event.
- Regular monitoring is required to quickly identify leaks for their immediate and proper treatment.
- All spills or leaks will be reported to the BLM immediately for their immediate and proper treatment.

STANDARD STIPULATIONS FOR SURFACE INSTALLED PIPELINES

A copy of the Grant and attachments, including stipulations, survey plat(s) and/or map(s), shall be on location during construction. BLM personnel may request to review a copy of your permit during construction to ensure compliance with all stipulations.

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. Holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.

2. Holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, Holder shall comply with the Toxic

Substances Control Act of 1976 as amended, 15 USC § 2601 *et seq.* (1982) with regard to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant (*see* 40 CFR, Part 702-799 and in particular, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193). Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the Authorized Officer concurrent with the filing of the reports to the involved Federal agency or State government.

3. Holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. § 9601, *et seq.* or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, *et seq.*) on the Right-of-Way (unless the release or threatened release is wholly unrelated to activity of the Right-of-Way Holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way Holder on the Right-of-Way. This provision applies without regard to whether a release is caused by Holder, its agent, or unrelated third parties.

4. Holder shall be liable for damage or injury to the United States to the extent provided by 43 CFR Sec. 2883.1-4. Holder shall be held to a standard of strict liability for damage or injury to the United States resulting from pipe rupture, fire, or spills caused or substantially aggravated by any of the following within the right-of-way or permit area:

a. Activities of Holder including, but not limited to: construction, operation, maintenance, and termination of the facility;

b. Activities of other parties including, but not limited to:
    (1) Land clearing
    (2) Earth-disturbing and earth-moving work
    (3) Blasting
    (4) Vandalism and sabotage;

c. Acts of God.

The maximum limitation for such strict liability damages shall not exceed one million dollars ($1,000,000) for any one event, and any liability in excess of such amount shall be determined by the ordinary rules of negligence of the jurisdiction in which the damage or injury occurred.

This section shall not impose strict liability for damage or injury resulting primarily from an act of war or from the negligent acts or omissions of the United States.

5. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil, salt water, or other pollutant should be discharged from the pipeline

system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil, salt water, or other pollutant, wherever found, shall be the responsibility of Holder, regardless of fault. Upon failure of Holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages resulting therefrom, on the Federal lands, the Authorized Officer may take such measures as he/she deems necessary to control and clean up the discharge and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of Holder. Such action by the Authorized Officer shall not relieve Holder of any responsibility as provided herein.

6. All construction and maintenance activity shall be confined to the authorized right-of-way width of **30** feet. If the pipeline route follows an existing road or buried pipeline right-of-way, the surface pipeline shall be installed no farther than 10 feet from the edge of the road or buried pipeline right-of-way. If existing surface pipelines prevent this distance, the proposed surface pipeline shall be installed immediately adjacent to the outer surface pipeline. All construction and maintenance activity shall be confined to existing roads or right-of-ways.

7. No blading or clearing of any vegetation shall be allowed unless approved in writing by the Authorized Officer.

8. Holder shall install the pipeline on the surface in such a manner that will minimize suspension of the pipeline across low areas in the terrain. In hummocky of duney areas, the pipeline shall be "snaked" around hummocks and dunes rather than suspended across these features.

9. The pipeline shall be buried with a minimum of 6 inches under all roads, "two-tracks," and trails. Burial of the pipe will continue for 20 feet on each side of each crossing. The condition of the road, upon completion of construction, shall be returned to at least its former state with no bumps or dips remaining in the road surface.

10. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

12. Excluding the pipe, all above-ground structures not subject to safety requirement shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be a color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell

Soil Color No. 5Y 4/2; designated by the Rocky Mountain Five State Interagency Committee.

13. The pipeline will be identified by signs at the point of origin and completion of the right-of-way and at all road crossings. At a minimum, signs will state the holder's name, BLM serial number, and the product being transported. Signs will be maintained in a legible condition for the life of the pipeline.

14. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway.

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

OR

If the entire project is covered under the Permian Basin Programmatic Agreement (cultural resources only):

The proponent has contributed funds commensurate to the undertaking into an account for offsite mitigation. Participation in the PA serves as mitigation for the effects of this project on cultural resources. If any human skeletal remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered at any time during construction, all construction activities shall halt and the BLM will be notified as soon as possible within 24 hours. Work shall not resume until a Notice to Proceed is issued by the BLM. See Stipulation 16 for more information.

If the proposed project is split between a Class III inventory and a Permian Basin Programmatic Agreement contribution, the portion of the project covered under Class III inventory should default to the first paragraph stipulations.

16. The holder is hereby obligated to comply with procedures established in the Native American Graves Protection and Repatriation Act (NAGPRA) to protect such cultural items as human remains, associated funerary objects, sacred objects, and objects of cultural patrimony discovered inadvertently during the course of project implementation. In the event that any of the cultural items listed above are discovered during the course of project work, the proponent shall immediately halt the disturbance and contact the BLM within 24

hours for instructions. The proponent or initiator of any project shall be held responsible for protecting, evaluating, reporting, excavating, treating, and disposing of these cultural items according to the procedures established by the BLM in consultation with Indian Tribes."

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

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

19. Surface pipelines shall be less than or equal to 4 inches and a working pressure below 125 psi.

VIII. INTERIM RECLAMATION

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

Within six (6) months of well completion, operators should work with BLM surface management specialists (Jim Amos: 575-234-5909) to devise the best strategies to reduce the size of the location. Interim reclamation should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

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

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

Upon completion of interim reclamation, the operator shall submit a Sundry Notices and Reports on Wells, Subsequent Report of Reclamation (Form 3160-5).

IX. FINAL ABANDONMENT & RECLAMATION

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

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

After all disturbed areas have been satisfactorily prepared, these areas need to be revegetated with the seed mixture provided below. Seeding should be accomplished by drilling on the contour whenever practical or by other approved methods. Seeding may need to be repeated until revegetation is successful, as determined by the BLM.

Operators shall contact a BLM surface protection specialist prior to surface abandonment operations for site specific objectives (Jim Amos: 575-234-5909).

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well.

Seed Mixture 2, for Sandy Sites

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

Seed will be planted using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (smaller/heavier seeds have a tendency to drop the bottom of the drill and are planted first). The holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will not be made before completion of at least one full growing season after seeding.

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

Species	lb/acre
Sand dropseed (Sporobolus cryptandrus)	1.0
Sand love grass (Eragrostis trichodes)	1.0
Plains bristlegrass (Setaria macrostachya)	2.0

*Pounds of pure live seed:

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

AFMSS

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

Operator Certification Data Report

01/30/2020

Operator Certification

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

NAME: Hope Knauls

Signed on: 11/19/2018

Title: Regulatory Technician

Street Address: 202 S. Cheyenne Ave, Ste 1000

City: Tulsa **State:** OK **Zip:** 74103

Phone: (918)295-1799

Email address: hknauls@cimarex.com

Field Representative

Representative Name:

Street Address:

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

Phone:

Email address:

AFMSS

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

Application Data Report

01/30/2020

APD ID: 10400036135 **Submission Date:** 11/19/2018

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO

Well Name: LAGUNA GRANDE 29 FEDERAL COM **Well Number:** 15H

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

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - General

APD ID: 10400036135 **Tie to previous NOS?** Y **Submission Date:** 11/19/2018

BLM Office: CARLSBAD **User:** Hope Knauls **Title:** Regulatory Technician

Federal/Indian APD: FED **Is the first lease penetrated for production Federal or Indian?** FED

Lease number: NMNM019848 **Lease Acres:** 960

Surface access agreement in place? **Allotted?** **Reservation:**

Agreement in place? NO **Federal or Indian agreement:**

Agreement number:

Agreement name:

Keep application confidential? YES

Permitting Agent? NO **APD Operator:** CIMAREX ENERGY COMPANY OF COLORADO

Operator letter of designation:

Operator Info

Operator Organization Name: CIMAREX ENERGY COMPANY OF COLORADO

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

Operator PO Box:

Operator City: Midland **State:** TX

Operator Phone: (432)620-1936

Operator Internet Address: tstathem@cimarex.com

Section 2 - Well Information

Well in Master Development Plan? NO **Master Development Plan name:**

Well in Master SUPO? NO **Master SUPO name:**

Well in Master Drilling Plan? NO **Master Drilling Plan name:**

Well Name: LAGUNA GRANDE 29 FEDERAL COM **Well Number:** 15H **Well API Number:**

Field/Pool or Exploratory? Field and Pool **Field Name:** UPPER WOLFCAMP **Pool Name:** PURPLE SAGE WOLFCAMP GAS

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

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO

Well Name: LAGUNA GRANDE 29 FEDERAL COM **Well Number:** 15H

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

Is the proposed well in a Helium production area? N **Use Existing Well Pad?** NO **New surface disturbance?**

Type of Well Pad: MULTIPLE WELL **Multiple Well Pad Name:** LAGUNA GRANDE 29 FEDERAL COM **Number:** E2W2 PAD

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

Well Work Type: Drill

Well Type: CONVENTIONAL GAS WELL

Describe Well Type:

Well sub-Type: EXPLORATORY (WILDCAT)

Describe sub-type:

Distance to town: 5.4 Miles **Distance to nearest well:** 20 FT **Distance to lease line:** 390 FT

Reservoir well spacing assigned acres Measurement: 320 Acres

Well plat: Laguna_Grande_29_Fed_15H_C102_Plat_20181115105635.pdf

Well work start Date: 07/01/2019 **Duration:** 30 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NAVD88

Survey number: 23782 **Reference Datum:**

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this lease?
SHL Leg #1	390	FSL	1290	FWL	23S	29E	29	Aliquot SWSW	32.269671	-104.011349	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 019848	2971	0	0	
KOP Leg #1	390	FSL	380	FWL	23S	29E	29	Aliquot SWSW	32.269677	-104.0142917	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 019848	-6450	9488	9421	

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO

Well Name: LAGUNA GRANDE 29 FEDERAL COM **Well Number:** 15H

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this lease?
PPP Leg #1-1	390	FSL	380	FWL	23S	29E	29	Aliquot SWSW	32.2703139	-104.0142917	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 019848	-6859	9979	9830	
EXIT Leg #1	330	FNL	380	FWL	23S	29E	29	Aliquot NWNW	32.282254	-104.014298	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 019848	-6940	14339	9911	
BHL Leg #1	330	FNL	380	FWL	23S	29E	29	Aliquot NWNW	32.282254	-104.014298	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 019848	-6940	14339	9911	

AFMSS

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

Drilling Plan Data Report

01/30/2020

APD ID: 10400036135 **Submission Date:** 11/19/2018

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO

Well Name: LAGUNA GRANDE 29 FEDERAL COM **Well Number:** 15H

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

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
340302	RUSTLER	2971	95	95		USEABLE WATER	N
340298	SALADO	2432	539	539		NONE	N
340301	CASTILE	418	2553	2553		NONE	N
340294	BELL CANYON	203	2768	2768		NONE	N
340295	CHERRY CANYON	-669	3640	3640		NONE	N
340296	BRUSHY CANYON	-1949	4920	4920		NATURAL GAS, OIL	N
340303	BONE SPRING	-3579	6550	6550		NATURAL GAS, OIL	N
340299	BONE SPRING 1ST	-4559	7530	7530		NATURAL GAS, OIL	N
340293	BONE SPRING 2ND	-5339	8310	8310		NATURAL GAS, OIL	N
340297	BONE SPRING 3RD	-6499	9470	9470		NATURAL GAS, OIL	N
340300	WOLFCAMP	-6839	9810	9810		NATURAL GAS, OIL	Y

Section 2 - Blowout Prevention

Pressure Rating (PSI): 2M **Rating Depth:** 9488

Equipment: The system consists of a 21-1/4" flange welded to the 20" casing, 21-1/4" 2M mudcross with 2" kill/fill up line and 8" diverter line, 21-1/4" 2M annular preventer, 20" riser and rotating head bowl. 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: Cimarex requests a 20" Annular diverter variance to be used after setting 20" surface casing due to the shallow shoe of the 20" casing (145' from GL). Our reasoning for omitting the BOP system is below: There is no hydrocarbon bearing zones below the 20" surface shoe and intermediate casing depth of 2,900'. Normally pressured gradient of 0.433

psi over balance when drilling intermediate section. The system consists of a 21-1/4" flange welded to the 20" casing, 21-1/4" 2M mudcross with 2" kill/fill up line and 8" diverter line, 21-1/4" 2M annular preventer, 20" riser and rotating head bowl.
Testing Procedure: Due to the shallow 20" shoe the Diverter system will not be tested. Diverter System will be rigged up to simultaneously close the annular and open the HCR valve to divert flow from rig. This prevents any pressure from being applied to the 20" casing shoe.
Choke Diagram Attachment:

Laguna_Grande_29_Fed_15H_Annular_Diverter_System_20181119075536.pdf

BOP Diagram Attachment:

Laguna_Grande_29_Fed_15H_Annular_Diverter_System_20181119075551.pdf

---

Pressure Rating (PSI): 3M **Rating Depth:** 10495

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

Variance request: Co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached. The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used. Variance to include Hammer Union connections on lines downstream of the buffer tank only.
Testing Procedure: BOP's will be tested by an independent service company. The ram preventers, choke manifold, and safety valves will be tested as follows: Prior to drilling out the surface casing, BOPE pressure tests will be 250 psi low and 3000 psi high. Prior to drilling out the intermediate casing, BOPE pressure tests will be 250 psi low and 5000 psi high. Prior to drilling out the production casing, BOPE pressure tests will be 250 psi low and 5,000 psi high. The Annular Preventer will be tested to 250 psi low and 1500 psi high prior to drilling out the surface casing, 250 psi low and 2500 psi high prior to drilling out the intermediate casing, 250 psi low and 2500 psi high prior to drilling out the production casing. The System may be upgraded to a higher pressure but still tested to the working pressures listed. If the system is upgraded all the components installed will be functional and tested.
Choke Diagram Attachment:

Laguna_Grande_29_Fed_15H_Choke_3M_20181119075600.pdf

BOP Diagram Attachment:

Laguna_Grande_29_Fed_15H_BOP_3M_20181119075622.pdf

Pressure Rating (PSI): 5M **Rating Depth:** 14339

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

Variance request: Co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached. The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used. Variance to include Hammer Union connections on lines downstream of the buffer tank only.
Testing Procedure: BOP's will be tested by an independent service company. The ram preventers, choke manifold, and safety valves will be tested as follows: Prior to drilling out the surface casing, BOPE pressure tests will be 250 psi low and 3000 psi high. Prior to drilling out the intermediate casing, BOPE pressure tests will be 250 psi low and 5000 psi high. Prior to

out the intermediate casing, 250 psi low and 2500 psi high prior to drilling out the production casing. The System may be upgraded to a higher pressure but still tested to the working pressures listed. If the system is upgraded all the components installed will be functional and tested.

Choke Diagram Attachment:

Laguna_Grande_29_Fed_15H_Choke_5M_20181119075647.pdf

BOP Diagram Attachment:

Laguna_Grande_29_Fed_15H_BOP_5M_20181119075952.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	30	20.0	NEW	API	N	0	145	0	145	0	145	145	J-55	94	BUTT	7.22	29.28	BUOY	90.39	BUOY	90.39
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	2768	0	2768	0	2768	2768	J-55	36	ST&C	1.38	2.4	BUOY	5.66	BUOY	5.66
3	PRODUCTION	8.75	7.0	NEW	API	N	0	9488	0	9488	0	9488	9488	L-80	26	LT&C	1.22	1.63	BUOY	1.98	BUOY	1.98
4	PRODUCTION	8.75	7.0	NEW	API	N	9488	10495	9488	9911	9488	10495	1007	L-80	26	BUTT	1.17	1.56	BUOY	54.92	BUOY	54.92
5	COMPLETION SYSTEM	6	4.5	NEW	API	N	9488	14339	9488	9911	9488	14339	4851	P-110	11.6	BUTT	1.18	1.66	BUOY	74.79	BUOY	74.79

Casing Attachments

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO

Well Name: LAGUNA GRANDE 29 FEDERAL COM **Well Number:** 15H

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_15H_Casing_Assumptions_20181119080159.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Laguna_Grande_29_Fed_15H_Casing_Assumptions_20181119080211.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Laguna_Grande_29_Fed_15H_Casing_Assumptions_20181119080219.pdf

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO

Well Name: LAGUNA GRANDE 29 FEDERAL COM **Well Number:** 15H

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Laguna_Grande_29_Fed_15H_Casing_Assumptions_20181119080230.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_15H_Casing_Assumptions_20181119080239.pdf

Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	145	369	1.34	14.8	494	50	Class C	LCM
INTERMEDIATE	Lead		0	2768	644	1.88	12.9	2140	50	35:65 Poz:C	Salt and Bentonite
INTERMEDIATE	Tail		0	2768	162	1.34	14.8	217	25	Class C	LCM
PRODUCTION	Lead		0	9488	357	3.64	10.3	1299	25	Tuned light	LCM

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO

Well Name: LAGUNA GRANDE 29 FEDERAL COM **Well Number:** 15H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
PRODUCTION	Tail		0	9488	129	1.3	14.2	168	10	50:50 Poz:H	salt, bentonite, fluid loss, dispersant, sms
PRODUCTION	Lead		9488	10495	357	3.64	10.3	1299	25	Tuned Light	LCM
PRODUCTION	Tail		9488	10495	129	1.3	14.2	168	10	50:50 Poz:H	Salt, Bentionite, Fluid Loss, Dispersant, SMS
COMPLETION SYSTEM	Lead		9488	14339	280	1.3	14.2	364	10	50:50 Poz:H	Salt, Bentonite, fluid loss, dispersant, sms

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

Description of the equipment for the circulating system in accordance with Onshore Order #2:

Diagram of the equipment for the circulating system in accordance with Onshore Order #2:

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

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
0	165	SPUD MUD	7.9	8.4							
2768	10495	OTHER : FW/ Cut Brine	8.5	9							
10495	14339	OIL-BASED MUD	12	12.5							
165	2768	SALT	9.7	10.2							

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO

Well Name: LAGUNA GRANDE 29 FEDERAL COM **Well Number:** 15H

Section 6 - Test, Logging, Coring

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

No DST Planned

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

CNL,DS,GR

Coring operation description for the well:

N/A

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 6442 **Anticipated Surface Pressure:** 4261.58

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.
(Also if we are in the Capitan Reef area we should mention that it can have lost circulation)

Contingency Plans geoharzards description:

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

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

Laguna_Grande_29_Fed_15H_H2S_Plan_20181119074302.pdf

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Laguna_Grande_29_Fed_15H_AC_Report_20181119074316.pdf
Laguna_Grande_29_Fed_15H_Directional_Plan_20181119074318.pdf

Other proposed operations facets description:

Other proposed operations facets attachment:

Laguna_Grande_29_Fed_15H_Flex_Hose_20181119074353.pdf
Laguna_Grande_29_Fed_15H_Gas_Capture_Plan_20181119074354.pdf
Laguna_Grande_29_Fed_15H_Drilling_Plan_20181119080608.pdf

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO

Well Name: LAGUNA GRANDE 29 FEDERAL COM **Well Number:** 15H

Other Variance attachment:

Laguna_Grande_29_Fed_15H_Annular_Diverter_System_20181119074420.pdf

Hydrogen Sulfide Drilling Operations Plan
Laguna Grande 29 Federal 15H
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 H_2S
B. Physical effects and hazards
C. Principal and operation of H2S detectors, warning system and briefing areas.
D. Evacuation procedure, routes and first aid.
E. Proper use of safety equipment & life support systems
F. Essential personnel meeting Medical Evaluation criteria will receive additional training on the proper use of 30 minute pressure demand air packs.

H_2S Detection and Alarm Systems:

A. H2S sensors/detectors to be located on the drilling rig floor, in the base of the sub structure/cellar area, on the mud pits in the shale shaker area. Additional H2S detectors may play placed as deemed necessary.

B. An audio alarm system will be installed on the derrick floor and in the top doghouse.

3 Windsock and/or wind streamers:

A. Windsock at mudpit area should be high enough to be visible.

B. Windsock on the rig floor and / or top doghouse should be high enough to be visible.

4 Condition Flags and Signs

A. Warning sign on access road to location.
B. Flags to be displayed on sign at entrance to location. Green flag indicates normal safe condition. Yellow flag indicates potential pressure and danger. Red flag indicates danger (H_2S present in dangerous concentration). Only H2S trained and certified personnel admitted to location.

5 Well control equipment:

A. See exhibit "E-1"

6 Communication:

A. While working under masks chalkboards will be used for communication.
B. Hand signals will be used where chalk board is inappropriate.
C. Two way radio will be used to communicate off location in case of emergency help is required. In most cases cellular telephones will be available at most drilling foreman's trailer or living quarters.

7 Drillstem Testing:
No DSTs r cores are planned at this time.

8 Drilling contractor supervisor will be required to be familiar with the effects H_2S has on tubular goods and other mechanical equipment.

9 If H2S is encountered, mud system will be altered if necessary to maintain control of formation. A mud gas separator will be brought into service along with H2S scavengers if necessary.

H_2S Contingency Plan
Laguna Grande 29 Federal 15H
Cimarex Energy Co.
UL: M, Sec. 29, 23S, 29E
Eddy Co., NM

Emergency Procedures

In the event of a release of gas containing H_2S, the first responder(s) must:

« Isolate the area and prevent entry by other persons into the 100 ppm ROE.
« Evacuate any public places encompassed by the 100 ppm ROE.
« Be equipped with H_2S monitors and air packs in order to control the release.
« Use the "buddy system" to ensure no injuries occur during the 432-620-1975
« Take precautions to avoid personal injury during this operation.
« Contact operator and/or local officials to aid in operation. See list of phone numbers attached.
« Have received training in the:
  - Detection of H_2S, and
  - Measures for protection against the gas,
  - Equipment used for protection and emergency response.

Ignition of Gas Source

Should control of the well be considered lost and ignition considered, take care to protect against exposure to Sulfur Dioxide (SO_2). Intentional ignition must be coordinated with the NMOCD and local officials. Additionally, the NM State Police may become involved. NM State Police shall be the Incident Command on scene of any major release. Take care to protect downwind whenever there is an ignition of the gas.

Characteristics of H_2S and SO_2

Please see attached International Chemical Safety Cards.

Contacting Authorities

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

H_2S Contingency Plan Emergency Contacts

Laguna Grande 29 Federal 15H

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

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

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

Schlumberger

CIMAREX

Cimarex Laguna Grande 29 Federal #15H Rev1 RM 14Nov18 Anti-Collision Summary Report

Analysis Date-24hr Time:	November 14, 2018 - 12:10	**Analysis Method:**	3D Least Distance
Client:	Cimarex Energy	**Reference Trajectory:**	Cimarex Laguna Grande 29 Federal #15H Rev1 RM 14Nov18 (Def Plan)
Field:	NM Eddy County (NAD 83)	**Depth Interval:**	Every 10.00 Measured Depth (ft)
Structure:	Cimarex Laguna Grande 29 Federal #15H	**Rule Set:**	NAL Procedure: D&M AntiCollision Standard S002
Slot:	New Slot	**Min Pts:**	All local minima indicated.
Well:	Laguna Grande 29 Federal #15H	**Version / Patch:**	2.10.740.0
Borehole:	Laguna Grande 29 Federal #15H	**Database \ Project:**	US1153APP452.dir.slb.com\drilling-NM Eddy County 2.10
Scan MD Range:	0.00ft ~ 14338.64ft		

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: Restricted within 55349.14 ft

Selection filters: Definitive Surveys - Definitive Plans - Definitive surveys exclude definitive plans
- All Non-Def Surveys when no Def-Survey is set in a borehole - All Non-Def Plans when no Def-Plan is set in a borehole

Offset Trajectory	Separation			Allow	Sep.	Controlling	Reference Trajectory		Risk Level			Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)	Dev. (ft)	Fact.	Rule	MD (ft)	TVD (ft)	Alert	Minor	Major		
Results highlighted: Sep-Factor separation <= 1.50 ft													
Cimarex Laguna Grande 29 Federal #16H Rev1 RM 14Nov18 (Def Plan)													Warning Alert
	20.00	16.50	17.50	3.50	N/A	MAS = 5.03 (m)	0.00	0.00	CtCt<=15m<15.00			Enter Alert	
	20.00	16.50	17.50	3.50	39385.72	MAS = 5.03 (m)	26.00	26.00				WRP	
	20.00	16.50	8.47	3.50	1.94	MAS = 5.03 (m)	1500.00	1500.00				MinPts	
	20.02	16.50	8.44	3.52	1.93	MAS = 5.03 (m)	1510.00	1510.00				MINPT-O-EOU	
	20.16	16.50	8.49	3.66	1.92	MAS = 5.03 (m)	1530.00	1530.00				MinPt-O-SF	
	56.71	18.84	43.32	37.87	4.98	OSF1.50	1960.00	1958.05	OSF>5.00			Exit Alert	
	198.84	57.74	159.52	141.11	5.33	OSF1.50	7030.00	6970.69				MinPt-O-ADP	
	199.38	57.99	159.89	141.39	5.32	OSF1.50	7070.00	7010.24				MinPt-O-SF	
	279.96	59.64	239.37	220.33	7.28	OSF1.50	8220.00	8153.01				MinPt-CtCt	
	279.98	59.73	239.33	220.25	7.27	OSF1.50	8250.00	8183.01				MINPT-O-EOU	
	280.00	59.76	239.33	220.24	7.27	OSF1.50	8260.00	8193.01				MinPt-O-ADP	
	280.13	59.81	239.42	220.31	7.27	OSF1.50	8290.00	8223.01				MinPt-O-SF	
	1340.76	140.39	1246.33	1200.36	14.56	OSF1.50	14338.64	9911.00				MinPts	

Schlumberger

Cimarex Laguna Grande 29 Federal #15H Rev1 RM 14Nov18 Proposal
Geodetic Report
(Def Plan)

CIMAREX

Report Date:	November 14, 2018 - 12:09 PM	**Survey / DLS Computation:**	Minimum Curvature / Lubinski
Client:	Cimarex Energy	**Vertical Section Azimuth:**	359.807 ° (Grid North)
Field:	NM Eddy County (NAD 83)	**Vertical Section Origin:**	0.000 ft, 0.000 ft
Structure / Slot:	Cimarex Laguna Grande 29 Federal #15H / New Slot	**TVD Reference Datum:**	RKB
Well:	Laguna Grande 29 Federal #15H	**TVD Reference Elevation:**	2996.700 ft above MSL
Borehole:	Laguna Grande 29 Federal #15H	**Seabed / Ground Elevation:**	2970.700 ft above MSL
UWI / API#:	Unknown / Unknown	**Magnetic Declination:**	7.109 °
Survey Name:	Cimarex Laguna Grande 29 Federal #15H Rev1 RM 14Nov18	**Total Gravity Field Strength:**	998.4719mgn (9.80665 Based)
Survey Date:	November 08, 2018	**Gravity Model:**	GARM
Tort / AHD / DDI / ERD Ratio:	107.551 ° / 5485.082 ft / 5.930 / 0.552	**Total Magnetic Field Strength:**	47967.198 nT
Coordinate Reference System:	NAD83 New Mexico State Plane, Eastern Zone, US Feet	**Magnetic Dip Angle:**	60.041 °
Location Lat / Long:	N 32° 16' 10.81483", W 104° 0' 40.85628"	**Declination Date:**	November 08, 2018
Location Grid N/E Y/X:	N 461988.540 ftUS, E 640855.800 ftUS	**Magnetic Declination Model:**	HDGM 2018
CRS Grid Convergence Angle:	0.1719 °	**North Reference:**	Grid North
Grid Scale Factor:	0.99992043	**Grid Convergence Used:**	0.1719 °
Version / Patch:	2.10.740.0	**Total Corr Mag North->Grid North:**	6.9374 °
		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, 1290' FWL]	0.00	0.00	359.92	0.00	0.00	0.00	0.00	N/A	461988.54	640855.80	N 32 16 10.81	W 104 0 40.86
	100.00	0.00	270.00	100.00	0.00	0.00	0.00	0.00	461988.54	640855.80	N 32 16 10.81	W 104 0 40.86
Rustler	*115.00*	*0.00*	*270.00*	*115.00*	*0.00*	*0.00*	*0.00*	*0.00*	*461988.54*	*640855.80*	*N 32 16 10.81*	*W 104 0 40.86*
	200.00	0.00	270.00	200.00	0.00	0.00	0.00	0.00	461988.54	640855.80	N 32 16 10.81	W 104 0 40.86
	300.00	0.00	270.00	300.00	0.00	0.00	0.00	0.00	461988.54	640855.80	N 32 16 10.81	W 104 0 40.86
	400.00	0.00	270.00	400.00	0.00	0.00	0.00	0.00	461988.54	640855.80	N 32 16 10.81	W 104 0 40.86
	500.00	0.00	270.00	500.00	0.00	0.00	0.00	0.00	461988.54	640855.80	N 32 16 10.81	W 104 0 40.86
Salado (Top Salt)	*559.00*	*0.00*	*270.00*	*559.00*	*0.00*	*0.00*	*0.00*	*0.00*	*461988.54*	*640855.80*	*N 32 16 10.81*	*W 104 0 40.86*
	600.00	0.00	270.00	600.00	0.00	0.00	0.00	0.00	461988.54	640855.80	N 32 16 10.81	W 104 0 40.86
	700.00	0.00	270.00	700.00	0.00	0.00	0.00	0.00	461988.54	640855.80	N 32 16 10.81	W 104 0 40.86
	800.00	0.00	270.00	800.00	0.00	0.00	0.00	0.00	461988.54	640855.80	N 32 16 10.81	W 104 0 40.86
	900.00	0.00	270.00	900.00	0.00	0.00	0.00	0.00	461988.54	640855.80	N 32 16 10.81	W 104 0 40.86
	1000.00	0.00	270.00	1000.00	0.00	0.00	0.00	0.00	461988.54	640855.80	N 32 16 10.81	W 104 0 40.86
	1100.00	0.00	270.00	1100.00	0.00	0.00	0.00	0.00	461988.54	640855.80	N 32 16 10.81	W 104 0 40.86
	1200.00	0.00	270.00	1200.00	0.00	0.00	0.00	0.00	461988.54	640855.80	N 32 16 10.81	W 104 0 40.86
	1300.00	0.00	270.00	1300.00	0.00	0.00	0.00	0.00	461988.54	640855.80	N 32 16 10.81	W 104 0 40.86
	1400.00	0.00	270.00	1400.00	0.00	0.00	0.00	0.00	461988.54	640855.80	N 32 16 10.81	W 104 0 40.86
Nudge 2°/100' DLS	1500.00	0.00	270.00	1500.00	0.00	0.00	0.00	0.00	461988.54	640855.80	N 32 16 10.81	W 104 0 40.86
	1600.00	2.00	270.00	1599.98	0.01	0.00	-1.75	2.00	461988.54	640854.05	N 32 16 10.81	W 104 0 40.88
	1700.00	4.00	270.00	1699.84	0.02	0.00	-6.98	2.00	461988.54	640848.82	N 32 16 10.82	W 104 0 40.94
	1800.00	6.00	270.00	1799.45	0.05	0.00	-15.69	2.00	461988.54	640840.11	N 32 16 10.82	W 104 0 41.04
	1900.00	8.00	270.00	1898.70	0.09	0.00	-27.88	2.00	461988.54	640827.92	N 32 16 10.82	W 104 0 41.18
Hold Nudge	1931.33	8.63	270.00	1929.70	0.11	0.00	-32.41	2.00	461988.54	640823.39	N 32 16 10.82	W 104 0 41.23
	2000.00	8.63	270.00	1997.60	0.14	0.00	-42.71	0.00	461988.54	640813.09	N 32 16 10.82	W 104 0 41.35
	2100.00	8.63	270.00	2096.46	0.19	0.00	-57.71	0.00	461988.54	640798.10	N 32 16 10.82	W 104 0 41.53
	2200.00	8.63	270.00	2195.33	0.24	0.00	-72.71	0.00	461988.54	640783.10	N 32 16 10.82	W 104 0 41.70

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	2300.00	8.63	270.00	2294.20	0.30	0.00	-87.71	0.00	461988.54	640768.10	N 32 16 10.82	W 104 0 41.88
	2400.00	8.63	270.00	2393.07	0.35	0.00	-102.71	0.00	461988.54	640753.10	N 32 16 10.82	W 104 0 42.05
	2500.00	8.63	270.00	2491.94	0.40	0.00	-117.71	0.00	461988.54	640738.10	N 32 16 10.82	W 104 0 42.23
Castille (Base Salt)	*2581.99*	*8.63*	*270.00*	*2573.00*	*0.44*	*0.00*	*-130.00*	*0.00*	*461988.54*	*640725.81*	*N 32 16 10.82*	*W 104 0 42.37*
	2600.00	8.63	270.00	2590.81	0.45	0.00	-132.71	0.00	461988.54	640723.11	N 32 16 10.82	W 104 0 42.40
	2700.00	8.63	270.00	2689.68	0.50	0.00	-147.70	0.00	461988.54	640708.11	N 32 16 10.82	W 104 0 42.58
Bell Canyon (Top Delaware)	*2799.45*	*8.63*	*270.00*	*2788.00*	*0.55*	*0.00*	*-162.62*	*0.00*	*461988.54*	*640693.19*	*N 32 16 10.82*	*W 104 0 42.75*
	2800.00	8.63	270.00	2788.55	0.55	0.00	-162.70	0.00	461988.54	640693.11	N 32 16 10.82	W 104 0 42.75
	2900.00	8.63	270.00	2887.41	0.60	0.00	-177.70	0.00	461988.54	640678.11	N 32 16 10.82	W 104 0 42.93
	3000.00	8.63	270.00	2986.28	0.65	0.00	-192.70	0.00	461988.54	640663.11	N 32 16 10.82	W 104 0 43.10
	3100.00	8.63	270.00	3085.15	0.70	0.00	-207.70	0.00	461988.54	640648.12	N 32 16 10.82	W 104 0 43.28
	3200.00	8.63	270.00	3184.02	0.75	0.00	-222.70	0.00	461988.54	640633.12	N 32 16 10.82	W 104 0 43.45
	3300.00	8.63	270.00	3282.89	0.80	0.00	-237.70	0.00	461988.54	640618.12	N 32 16 10.82	W 104 0 43.62
	3400.00	8.63	270.00	3381.76	0.85	0.00	-252.70	0.00	461988.54	640603.12	N 32 16 10.82	W 104 0 43.80
	3500.00	8.63	270.00	3480.63	0.90	0.00	-267.70	0.00	461988.54	640588.12	N 32 16 10.82	W 104 0 43.97
	3600.00	8.63	270.00	3579.49	0.95	0.00	-282.70	0.00	461988.54	640573.13	N 32 16 10.82	W 104 0 44.15
Cherry Canyon	*3681.43*	*8.63*	*270.00*	*3660.00*	*0.99*	*0.00*	*-294.91*	*0.00*	*461988.54*	*640560.91*	*N 32 16 10.82*	*W 104 0 44.29*
	3700.00	8.63	270.00	3678.36	1.00	0.00	-297.70	0.00	461988.54	640558.13	N 32 16 10.82	W 104 0 44.32
	3800.00	8.63	270.00	3777.23	1.05	0.00	-312.70	0.00	461988.54	640543.13	N 32 16 10.82	W 104 0 44.50
	3900.00	8.63	270.00	3876.10	1.10	0.00	-327.70	0.00	461988.54	640528.13	N 32 16 10.82	W 104 0 44.67
	4000.00	8.63	270.00	3974.97	1.15	0.00	-342.70	0.00	461988.54	640513.13	N 32 16 10.82	W 104 0 44.85
	4100.00	8.63	270.00	4073.84	1.20	0.00	-357.69	0.00	461988.54	640498.13	N 32 16 10.83	W 104 0 45.02
	4200.00	8.63	270.00	4172.71	1.26	0.00	-372.69	0.00	461988.54	640483.14	N 32 16 10.83	W 104 0 45.20
	4300.00	8.63	270.00	4271.58	1.31	0.00	-387.69	0.00	461988.54	640468.14	N 32 16 10.83	W 104 0 45.37
	4400.00	8.63	270.00	4370.44	1.36	0.00	-402.69	0.00	461988.54	640453.14	N 32 16 10.83	W 104 0 45.55
	4500.00	8.63	270.00	4469.31	1.41	0.00	-417.69	0.00	461988.54	640438.14	N 32 16 10.83	W 104 0 45.72
	4600.00	8.63	270.00	4568.18	1.46	0.00	-432.69	0.00	461988.54	640423.14	N 32 16 10.83	W 104 0 45.90
	4700.00	8.63	270.00	4667.05	1.51	0.00	-447.69	0.00	461988.54	640408.15	N 32 16 10.83	W 104 0 46.07
	4800.00	8.63	270.00	4765.92	1.56	0.00	-462.69	0.00	461988.54	640393.15	N 32 16 10.83	W 104 0 46.24
	4900.00	8.63	270.00	4864.79	1.61	0.00	-477.69	0.00	461988.54	640378.15	N 32 16 10.83	W 104 0 46.42
Brushy Canyon	*4976.07*	*8.63*	*270.00*	*4940.00*	*1.65*	*0.00*	*-489.10*	*0.00*	*461988.54*	*640366.74*	*N 32 16 10.83*	*W 104 0 46.55*
	5000.00	8.63	270.00	4963.66	1.66	0.00	-492.69	0.00	461988.54	640363.15	N 32 16 10.83	W 104 0 46.59
	5100.00	8.63	270.00	5062.53	1.71	0.00	-507.69	0.00	461988.54	640348.15	N 32 16 10.83	W 104 0 46.77
	5200.00	8.63	270.00	5161.39	1.76	0.00	-522.69	0.00	461988.54	640333.16	N 32 16 10.83	W 104 0 46.94
	5300.00	8.63	270.00	5260.26	1.81	0.00	-537.69	0.00	461988.54	640318.16	N 32 16 10.83	W 104 0 47.12
	5400.00	8.63	270.00	5359.13	1.86	0.00	-552.68	0.00	461988.54	640303.16	N 32 16 10.83	W 104 0 47.29
	5500.00	8.63	270.00	5458.00	1.91	0.00	-567.68	0.00	461988.54	640288.16	N 32 16 10.83	W 104 0 47.47
	5600.00	8.63	270.00	5556.87	1.96	0.00	-582.68	0.00	461988.54	640273.16	N 32 16 10.83	W 104 0 47.64
	5700.00	8.63	270.00	5655.74	2.01	0.00	-597.68	0.00	461988.54	640258.17	N 32 16 10.83	W 104 0 47.82
	5800.00	8.63	270.00	5754.61	2.06	0.00	-612.68	0.00	461988.54	640243.17	N 32 16 10.83	W 104 0 47.99
	5900.00	8.63	270.00	5853.48	2.11	0.00	-627.68	0.00	461988.54	640228.17	N 32 16 10.83	W 104 0 48.17
	6000.00	8.63	270.00	5952.34	2.16	0.00	-642.68	0.00	461988.54	640213.17	N 32 16 10.83	W 104 0 48.34
	6100.00	8.63	270.00	6051.21	2.22	0.00	-657.68	0.00	461988.54	640198.17	N 32 16 10.83	W 104 0 48.52
	6200.00	8.63	270.00	6150.08	2.27	0.00	-672.68	0.00	461988.54	640183.18	N 32 16 10.83	W 104 0 48.69
	6300.00	8.63	270.00	6248.95	2.32	0.00	-687.68	0.00	461988.54	640168.18	N 32 16 10.84	W 104 0 48.87
	6400.00	8.63	270.00	6347.82	2.37	0.00	-702.68	0.00	461988.54	640153.18	N 32 16 10.84	W 104 0 49.04
	6500.00	8.63	270.00	6446.69	2.42	0.00	-717.68	0.00	461988.54	640138.18	N 32 16 10.84	W 104 0 49.21
	6600.00	8.63	270.00	6545.56	2.47	0.00	-732.68	0.00	461988.54	640123.18	N 32 16 10.84	W 104 0 49.39
Top Bone Spring	*6624.72*	*8.63*	*270.00*	*6570.00*	*2.48*	*0.00*	*-736.38*	*0.00*	*461988.54*	*640119.48*	*N 32 16 10.84*	*W 104 0 49.43*
	6700.00	8.63	270.00	6644.42	2.52	0.00	-747.68	0.00	461988.54	640108.19	N 32 16 10.84	W 104 0 49.56
	6800.00	8.63	270.00	6743.29	2.57	0.00	-762.67	0.00	461988.54	640093.19	N 32 16 10.84	W 104 0 49.74
	6900.00	8.63	270.00	6842.16	2.62	0.00	-777.67	0.00	461988.54	640078.19	N 32 16 10.84	W 104 0 49.91
	7000.00	8.63	270.00	6941.03	2.67	0.00	-792.67	0.00	461988.54	640063.19	N 32 16 10.84	W 104 0 50.09
	7100.00	8.63	270.00	7039.90	2.72	0.00	-807.67	0.00	461988.54	640048.19	N 32 16 10.84	W 104 0 50.26
	7200.00	8.63	270.00	7138.77	2.77	0.00	-822.67	0.00	461988.54	640033.20	N 32 16 10.84	W 104 0 50.44
	7300.00	8.63	270.00	7237.64	2.82	0.00	-837.67	0.00	461988.54	640018.20	N 32 16 10.84	W 104 0 50.61

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 ° ' ")
	7400.00	8.63	270.00	7336.51	2.87	0.00	-852.67	0.00	461988.54	640003.20	N 32 16 10.84	W 104 0 50.79
	7500.00	8.63	270.00	7435.37	2.92	0.00	-867.67	0.00	461988.54	639988.20	N 32 16 10.84	W 104 0 50.96
Drop to Vertical 2°/100' DLS	7565.36	8.63	270.00	7500.00	2.96	0.00	-877.47	0.00	461988.54	639978.40	N 32 16 10.84	W 104 0 51.08
	7600.00	7.93	270.00	7534.27	2.97	0.00	-882.46	2.00	461988.54	639973.41	N 32 16 10.84	W 104 0 51.13
Top 1st BSPS SS	*7615.87*	*7.62*	*270.00*	*7550.00*	*2.98*	*0.00*	*-884.61*	*2.00*	*461988.54*	*639971.26*	*N 32 16 10.84*	*W 104 0 51.16*
	7700.00	5.93	270.00	7633.54	3.01	0.00	-894.53	2.00	461988.54	639961.34	N 32 16 10.84	W 104 0 51.27
	7800.00	3.93	270.00	7733.16	3.04	0.00	-903.13	2.00	461988.54	639952.74	N 32 16 10.84	W 104 0 51.37
	7900.00	1.93	270.00	7833.03	3.06	0.00	-908.25	2.00	461988.54	639947.62	N 32 16 10.84	W 104 0 51.43
Hold Vertical	7996.69	0.00	270.00	7929.70	3.06	0.00	-909.88	2.00	461988.54	639945.99	N 32 16 10.84	W 104 0 51.45
	8000.00	0.00	270.00	7933.01	3.06	0.00	-909.88	0.00	461988.54	639945.99	N 32 16 10.84	W 104 0 51.45
	8100.00	0.00	270.00	8033.01	3.06	0.00	-909.88	0.00	461988.54	639945.99	N 32 16 10.84	W 104 0 51.45
	8200.00	0.00	270.00	8133.01	3.06	0.00	-909.88	0.00	461988.54	639945.99	N 32 16 10.84	W 104 0 51.45
	8300.00	0.00	270.00	8233.01	3.06	0.00	-909.88	0.00	461988.54	639945.99	N 32 16 10.84	W 104 0 51.45
Top 2nd BSPG SS	*8396.99*	*0.00*	*270.00*	*8330.00*	*3.06*	*0.00*	*-909.88*	*0.00*	*461988.54*	*639945.99*	*N 32 16 10.84*	*W 104 0 51.45*
	8400.00	0.00	270.00	8333.01	3.06	0.00	-909.88	0.00	461988.54	639945.99	N 32 16 10.84	W 104 0 51.45
	8500.00	0.00	270.00	8433.01	3.06	0.00	-909.88	0.00	461988.54	639945.99	N 32 16 10.84	W 104 0 51.45
	8600.00	0.00	270.00	8533.01	3.06	0.00	-909.88	0.00	461988.54	639945.99	N 32 16 10.84	W 104 0 51.45
	8700.00	0.00	270.00	8633.01	3.06	0.00	-909.88	0.00	461988.54	639945.99	N 32 16 10.84	W 104 0 51.45
	8800.00	0.00	270.00	8733.01	3.06	0.00	-909.88	0.00	461988.54	639945.99	N 32 16 10.84	W 104 0 51.45
	8900.00	0.00	270.00	8833.01	3.06	0.00	-909.88	0.00	461988.54	639945.99	N 32 16 10.84	W 104 0 51.45
	9000.00	0.00	270.00	8933.01	3.06	0.00	-909.88	0.00	461988.54	639945.99	N 32 16 10.84	W 104 0 51.45
Top Harkey SS	*9066.99*	*0.00*	*270.00*	*9000.00*	*3.06*	*0.00*	*-909.88*	*0.00*	*461988.54*	*639945.99*	*N 32 16 10.84*	*W 104 0 51.45*
	9100.00	0.00	270.00	9033.01	3.06	0.00	-909.88	0.00	461988.54	639945.99	N 32 16 10.84	W 104 0 51.45
	9200.00	0.00	270.00	9133.01	3.06	0.00	-909.88	0.00	461988.54	639945.99	N 32 16 10.84	W 104 0 51.45
	9300.00	0.00	270.00	9233.01	3.06	0.00	-909.88	0.00	461988.54	639945.99	N 32 16 10.84	W 104 0 51.45
	9400.00	0.00	270.00	9333.01	3.06	0.00	-909.88	0.00	461988.54	639945.99	N 32 16 10.84	W 104 0 51.45
KOP - Build 12°/100' DLS	9488.01	0.00	270.00	9421.02	3.06	0.00	-909.88	0.00	461988.54	639945.99	N 32 16 10.84	W 104 0 51.45
	9500.00	1.44	359.81	9433.01	3.22	0.15	-909.88	12.00	461988.69	639945.99	N 32 16 10.84	W 104 0 51.45
Top 3rd BSPG SS	*9557.24*	*8.31*	*359.81*	*9490.00*	*8.07*	*5.01*	*-909.90*	*12.00*	*461993.55*	*639945.97*	*N 32 16 10.89*	*W 104 0 51.45*
	9600.00	13.44	359.81	9531.98	16.14	13.07	-909.93	12.00	462001.61	639945.95	N 32 16 10.97	W 104 0 51.45
	9700.00	25.44	359.81	9626.11	49.36	46.29	-910.04	12.00	462034.83	639945.84	N 32 16 11.30	W 104 0 51.45
	9800.00	37.44	359.81	9711.27	101.42	98.36	-910.21	12.00	462086.89	639945.66	N 32 16 11.81	W 104 0 51.45
	9900.00	49.44	359.81	9783.75	170.05	166.99	-910.45	12.00	462155.51	639945.43	N 32 16 12.49	W 104 0 51.45
Top Wolfcamp	*9979.13*	*58.93*	*359.81*	*9830.00*	*234.15*	*231.08*	*-910.66*	*12.00*	*462219.60*	*639945.21*	*N 32 16 13.13*	*W 104 0 51.45*
	10000.00	61.44	359.81	9840.38	252.26	249.19	-910.72	12.00	462237.71	639945.15	N 32 16 13.31	W 104 0 51.45
	10100.00	73.44	359.81	9878.67	344.43	341.37	-911.03	12.00	462329.88	639944.84	N 32 16 14.22	W 104 0 51.45
Build 4°/100' DLS	10113.01	75.00	359.81	9882.21	356.95	353.89	-911.07	12.00	462342.40	639944.80	N 32 16 14.34	W 104 0 51.45
	10200.00	78.48	359.81	9902.16	441.61	438.54	-911.36	4.00	462427.05	639944.51	N 32 16 15.18	W 104 0 51.46
Wolfcamp 'Y' SS	*10260.57*	*80.90*	*359.81*	*9913.00*	*501.20*	*498.13*	*-911.56*	*4.00*	*462486.63*	*639944.31*	*N 32 16 15.77*	*W 104 0 51.46*
	10300.00	82.48	359.81	9918.70	540.21	537.15	-911.69	4.00	462525.64	639944.18	N 32 16 16.16	W 104 0 51.46
	10400.00	86.48	359.81	9928.32	639.73	636.66	-912.03	4.00	462625.15	639943.85	N 32 16 17.14	W 104 0 51.46
Wolfcamp 'Y' SS Tgt	*10480.56*	*89.70*	*359.81*	*9931.00*	*720.23*	*717.17*	*-912.30*	*4.00*	*462705.65*	*639943.58*	*N 32 16 17.94*	*W 104 0 51.46*
Wolfcamp 'Y' SS Tgt Landing Point	10495.46	90.30	359.81	9931.00	735.14	732.07	-912.35	4.00	462720.55	639943.53	N 32 16 18.09	W 104 0 51.46
	10500.00	90.30	359.81	9930.98	739.67	736.61	-912.36	0.00	462725.09	639943.51	N 32 16 18.13	W 104 0 51.46
	10600.00	90.30	359.81	9930.46	839.67	836.60	-912.70	0.00	462825.08	639943.17	N 32 16 19.12	W 104 0 51.46
	10700.00	90.30	359.81	9929.94	939.67	936.60	-913.04	0.00	462925.07	639942.84	N 32 16 20.11	W 104 0 51.46
	10800.00	90.30	359.81	9929.42	1039.67	1036.60	-913.37	0.00	463025.06	639942.50	N 32 16 21.10	W 104 0 51.46
	10900.00	90.30	359.81	9928.89	1139.67	1136.60	-913.71	0.00	463125.05	639942.16	N 32 16 22.09	W 104 0 51.46
	11000.00	90.30	359.81	9928.37	1239.67	1236.60	-914.05	0.00	463225.04	639941.83	N 32 16 23.08	W 104 0 51.46

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 ° ' ")
	11100.00	90.30	359.81	9927.85	1339.67	1336.59	-914.39	0.00	463325.03	639941.49	N 32 16 24.07	W 104 0 51.46
	11200.00	90.30	359.81	9927.33	1439.67	1436.59	-914.72	0.00	463425.02	639941.15	N 32 16 25.06	W 104 0 51.46
	11300.00	90.30	359.81	9926.81	1539.66	1536.59	-915.06	0.00	463525.00	639940.82	N 32 16 26.05	W 104 0 51.46
	11400.00	90.30	359.81	9926.29	1639.66	1636.59	-915.40	0.00	463624.99	639940.48	N 32 16 27.04	W 104 0 51.46
	11500.00	90.30	359.81	9925.77	1739.66	1736.59	-915.73	0.00	463724.98	639940.14	N 32 16 28.03	W 104 0 51.46
	11600.00	90.30	359.81	9925.25	1839.66	1836.58	-916.07	0.00	463824.97	639939.81	N 32 16 29.01	W 104 0 51.46
	11700.00	90.30	359.81	9924.73	1939.66	1936.58	-916.41	0.00	463924.96	639939.47	N 32 16 30.00	W 104 0 51.46
	11800.00	90.30	359.81	9924.21	2039.66	2036.58	-916.74	0.00	464024.95	639939.13	N 32 16 30.99	W 104 0 51.46
	11900.00	90.30	359.81	9923.69	2139.66	2136.58	-917.08	0.00	464124.94	639938.79	N 32 16 31.98	W 104 0 51.46
	12000.00	90.30	359.81	9923.17	2239.65	2236.58	-917.42	0.00	464224.93	639938.46	N 32 16 32.97	W 104 0 51.46
	12100.00	90.30	359.81	9922.65	2339.65	2336.57	-917.75	0.00	464324.92	639938.12	N 32 16 33.96	W 104 0 51.46
	12200.00	90.30	359.81	9922.13	2439.65	2436.57	-918.09	0.00	464424.91	639937.78	N 32 16 34.95	W 104 0 51.46
	12300.00	90.30	359.81	9921.61	2539.65	2536.57	-918.43	0.00	464524.90	639937.45	N 32 16 35.94	W 104 0 51.46
	12400.00	90.30	359.81	9921.09	2639.65	2636.57	-918.76	0.00	464624.89	639937.11	N 32 16 36.93	W 104 0 51.47
	12500.00	90.30	359.81	9920.57	2739.65	2736.57	-919.10	0.00	464724.88	639936.77	N 32 16 37.92	W 104 0 51.47
	12600.00	90.30	359.81	9920.05	2839.65	2836.57	-919.44	0.00	464824.87	639936.44	N 32 16 38.91	W 104 0 51.47
	12700.00	90.30	359.81	9919.53	2939.65	2936.56	-919.78	0.00	464924.86	639936.10	N 32 16 39.90	W 104 0 51.47
	12800.00	90.30	359.81	9919.01	3039.64	3036.56	-920.11	0.00	465024.85	639935.76	N 32 16 40.89	W 104 0 51.47
	12900.00	90.30	359.81	9918.49	3139.64	3136.56	-920.45	0.00	465124.84	639935.43	N 32 16 41.88	W 104 0 51.47
	13000.00	90.30	359.81	9917.97	3239.64	3236.56	-920.79	0.00	465224.83	639935.09	N 32 16 42.87	W 104 0 51.47
	13100.00	90.30	359.81	9917.45	3339.64	3336.56	-921.12	0.00	465324.82	639934.75	N 32 16 43.86	W 104 0 51.47
	13200.00	90.30	359.81	9916.93	3439.64	3436.55	-921.46	0.00	465424.81	639934.42	N 32 16 44.85	W 104 0 51.47
	13300.00	90.30	359.81	9916.41	3539.64	3536.55	-921.80	0.00	465524.80	639934.08	N 32 16 45.84	W 104 0 51.47
	13400.00	90.30	359.81	9915.88	3639.64	3636.55	-922.13	0.00	465624.79	639933.74	N 32 16 46.83	W 104 0 51.47
	13500.00	90.30	359.81	9915.36	3739.63	3736.55	-922.47	0.00	465724.78	639933.40	N 32 16 47.82	W 104 0 51.47
	13600.00	90.30	359.81	9914.84	3839.63	3836.55	-922.81	0.00	465824.77	639933.07	N 32 16 48.80	W 104 0 51.47
	13700.00	90.30	359.81	9914.32	3939.63	3936.54	-923.14	0.00	465924.76	639932.73	N 32 16 49.79	W 104 0 51.47
	13800.00	90.30	359.81	9913.80	4039.63	4036.54	-923.48	0.00	466024.75	639932.39	N 32 16 50.78	W 104 0 51.47
	13900.00	90.30	359.81	9913.28	4139.63	4136.54	-923.82	0.00	466124.74	639932.06	N 32 16 51.77	W 104 0 51.47
Wolfcamp 'Y' SS	*13954.32*	*90.30*	*359.81*	*9913.00*	*4193.95*	*4190.86*	*-924.00*	*0.00*	*466179.06*	*639931.87*	*N 32 16 52.31*	*W 104 0 51.47*
	14000.00	90.30	359.81	9912.76	4239.63	4236.54	-924.15	0.00	466224.73	639931.72	N 32 16 52.76	W 104 0 51.47
	14100.00	90.30	359.81	9912.24	4339.63	4336.54	-924.49	0.00	466324.72	639931.38	N 32 16 53.75	W 104 0 51.47
	14200.00	90.30	359.81	9911.72	4439.62	4436.53	-924.83	0.00	466424.71	639931.05	N 32 16 54.74	W 104 0 51.47
	14300.00	90.30	359.81	9911.20	4539.62	4536.53	-925.17	0.00	466524.70	639930.71	N 32 16 55.73	W 104 0 51.47
Cimarex Laguna Grande 29 Federal #15H - PBHL [330' FNL, 380' FWL]	14338.64	90.30	359.81	9911.00	4578.26	4575.17	-925.30	0.00	466563.34	639930.58	N 32 16 56.11	W 104 0 51.47

Survey Type: Def Plan

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

Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Expected Max Inclination (deg)	Survey Tool Type	Borehole / Survey
	1	0.000	26.000	1/100.000	30.000	30.000		NAL_MWD_IFR2+MS-Depth Only	Laguna Grande 29 Federal #15H / Cimarex Laguna Grande 29 Federal #15H Rev1 RM 14Nov18
	1	26.000	14338.641	1/100.000	30.000	30.000		NAL_MWD_IFR2+MS	Laguna Grande 29 Federal #15H / Cimarex Laguna Grande 29

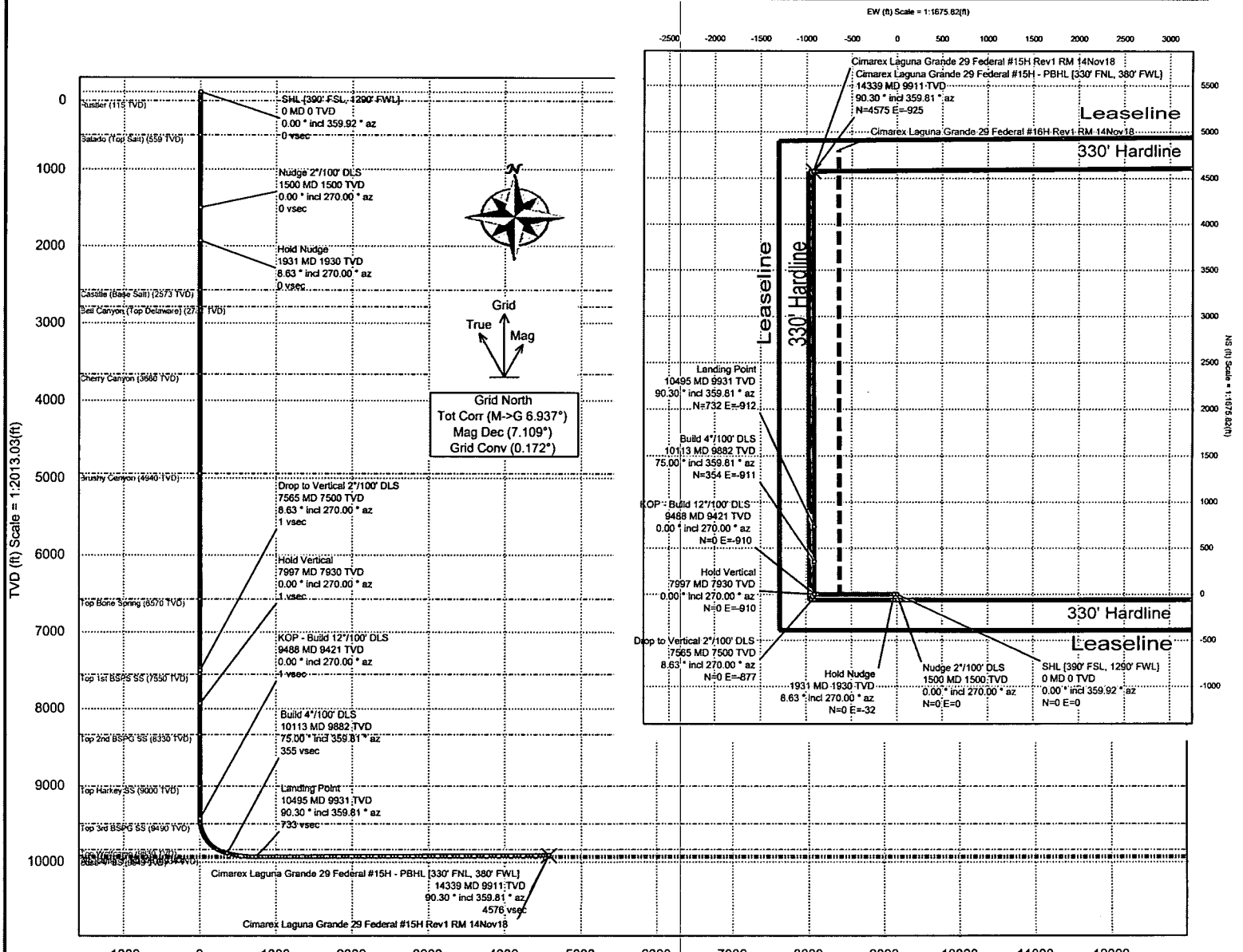
Schlumberger

Cimarex Energy Rev 1

CIMAREX

Borehole:	Well:	Field:	Structure:
Laguna Grande 29 Federal #15H	Laguna Grande 29 Federal #15H	NM Eddy County (NAD 83)	Cimarex Laguna Grande 29 Federal # 15H

Gravity & Magnetic Parameters				Surface Location	NAD83 New Mexico State Plane, Eastern Zone, US Feet			Miscellaneous			
Model:	HDGM 2018	Dip: 60.041°	Date: 08-Nov-2018	Lat:	N 32 16 10.81	Northing: 461988.54ftUS	Grid Conv: 0.1719°	Slot:	New Slot	TVD Ref:	RKB(2996.7ft above MSL)
MagDec:	7.109°	FS: 47957.198nT	Gravity FS: 998.472mgn (9.80665 Based)	Lon:	W 104 0 40.86	Easting: 640855.8ftUS	Scale Fact: 0.99992043	Plan:	Cimarex Laguna Grande 29 Federal #15H Rev1 RM 14Nov18		



Vertical Section (ft) Azim = 359.92° Scale = 1:2013.03(ft) Origin = 0N/-S, 0E/-W

Critical Points

Critical Point	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DLS
SHL [390' FSL, 1290' FWL]	0.00	0.00	359.92	0.00	0.00	0.00	0.00	
Rustler	115.00	0.00	270.00	115.00	0.00	0.00	0.00	0.00
Salado (Top Salt)	559.00	0.00	270.00	559.00	0.00	0.00	0.00	0.00
Nudge 2°/100' DLS	1500.00	0.00	270.00	1500.00	0.00	0.00	0.00	0.00
Hold Nudge	1931.33	8.63	270.00	1929.70	0.11	0.00	-32.41	2.00
Castille (Base Salt)	2581.99	8.63	270.00	2573.00	0.44	0.00	-130.00	0.00
Bell Canyon (Top Delaware)	2799.45	8.63	270.00	2788.00	0.55	0.00	-162.62	0.00
Cherry Canyon	3681.43	8.63	270.00	3660.00	0.99	0.00	-294.91	0.00
Brushy Canyon	4976.07	8.63	270.00	4940.00	1.65	0.00	-489.10	0.00
Top Bone Spring	6624.72	8.63	270.00	6570.00	2.48	0.00	-736.38	0.00
Drop to Vertical 2°/100' DLS	7565.36	8.63	270.00	7500.00	2.96	0.00	-877.47	0.00
Top 1st BSPS SS	7615.87	7.62	270.00	7550.00	2.98	0.00	-884.61	2.00
Hold Vertical	7996.69	0.00	270.00	7929.70	3.06	0.00	-909.88	2.00
Top 2nd BSPG SS	8396.99	0.00	270.00	8330.00	3.06	0.00	-909.88	0.00
Top Harkey SS	9066.99	0.00	270.00	9000.00	3.06	0.00	-909.88	0.00
KOP - Build 12°/100' DLS	9488.01	0.00	270.00	9421.02	3.06	0.00	-909.88	0.00
Top 3rd BSPG SS	9557.24	8.31	359.81	9490.00	8.07	5.01	-909.90	12.00
Top Wolfcamp	9979.13	58.93	359.81	9830.00	234.15	231.08	-910.66	12.00
Build 4°/100' DLS	10113.01	75.00	359.81	9882.21	356.95	353.89	-911.07	12.00
Wolfcamp 'Y' SS	10260.57	80.90	359.81	9913.00	501.20	498.13	-911.56	4.00
Wolfcamp 'Y' SS Tgt	10480.56	89.70	359.81	9931.00	720.23	717.17	-912.30	4.00
Wolfcamp 'Y' SS Tgt	10495.46	90.30	359.81	9931.00	735.13	732.06	-912.35	4.00
Landing Point	10495.46	90.30	359.81	9931.00	735.14	732.07	-912.35	4.00
Wolfcamp 'Y' SS	13954.32	90.30	359.81	9913.00	4193.95	4190.86	-924.00	0.00
Cimarex Laguna Grande 29 Federal #15H - PBHL [330' FNL, 380' FWL]	14338.64	90.30	359.81	9911.00	4578.26	4575.17	-925.30	0.00
Base 'Y' SS	NaN			9949.00				

1. Geological Formations

TVD of target 9,911 Pilot Hole TD N/A
MD at TD 14,339 Deepest expected fresh water

Formation	Depth (TVD) from KB	Water/Mineral Bearing/Target Zone	Hazards
Rustler	115	N/A	
Salado	559	N/A	
Castille	2573	N/A	
Bell Canyon	2788	N/A	
Cherry Canyon	3660	N/A	
Brushy Canyon	4940	N/A	
Bone Spring	6570	Hydrocarbons	
1st Bone Spring Sand	7550	Hydrocarbons	
2nd Bone Spring Sand	8330	Hydrocarbons	
3rd Bone Spring Sand	9490	Hydrocarbons	
Wolfcamp	9830	Hydrocarbons	
Wolfcamp Target	9931	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
30	0	145	145	20"	94.00	J-55	BT&C	7.22	29.28	90.39
12 1/4	0	2768	2768	9-5/8"	36.00	J-55	ST&C	1.38	2.40	5.66
8 3/4	0	9488	9488	7"	26.00	L-80	LT&C	1.22	1.63	1.98
8 3/4	9488	10495	9911	7"	26.00	L-80	BT&C	1.17	1.56	54.92
6	9488	14339	9911	4-1/2"	11.60	P-110	BT&C	1.18	1.66	74.79
							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

	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?	N
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	# Sks	Wt. lb/gal	Yld ft3/sack	H2O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surface	369	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Intermediate	644	12.90	1.88	9.65	12	Lead: 35:65 (Poz:C) + Salt + Bentonite
	162	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Production	357	10.30	3.64	22.18		Lead: Tuned Light + LCM
	129	14.20	1.30	5.86	14:30	Tail: 50:50 (Poz:H) + Salt + Bentonite + Fluid Loss + Dispersant + SMS
Completion System	280	14.20	1.30	5.86	14:30	Tail: 50:50 (Poz:H) + Salt + Bentonite + Fluid Loss + Dispersant + SMS

Casing String	TOC	% Excess
Surface	0	25
Intermediate	0	69
Production	2568	23
Completion System	10495	10

4. Pressure Control Equipment

X	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	21-1/4		Annular Diverter	X	50% of working pressure
			Blind Ram		2M
			Pipe Ram		
			Double Ram		
			Other		
8 3/4	13 5/8	3M	Annular	X	50% of working pressure
			Blind Ram		3M
			Pipe Ram		
			Double Ram	X	
			Other		
6	13 5/8	5M	Annular	X	50% of working pressure
			Blind Ram		5M
			Pipe Ram	X	
			Double Ram	X	
			Other		

BOP's will be tested by an independent service company. The ram preventers, choke manifold, and safety valves will be tested as follows: Prior to drilling out the surface casing, Annular Diverter System will be rigged up to divert flow from rig if encountered. Prior to drilling out the intermediate casing, BOPE pressure tests will be 250 psi low and 3,000 psi high and prior to drilling out of the production casing BOPE pressure tests will be 250 psi low, and 5,000 psi high. The Annular Preventer will be tested to 250 psi low and 1500 psi high prior to drilling out the intermediate casing, 250 psi low and 2500 psi high prior to drilling out the production casing. The System may be upgraded to a higher pressure but still tested to the working pressures listed. If the system is upgraded all the components installed will be functional and tested

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.

Annular Diverter Variance:

Cimarex requests a 20" Annular diverter variance to be used after setting 20" surface casing due to the shallow shoe of the 20" casing (145' from GL). Our reasoning for omitting the BOP system is below:

- There is no hydrocarbon bearing zones below the 20" surface shoe and intermediate casing depth of 2,900'.
- Normally pressured gradient of 0.433 psi/ft = 1,199 psi and this section will be drilled with 10# brine water which equates to 1,384 psi of hydrostatic. We will be 185 psi over balance when drilling intermediate section.
- The system consists of a 21-1/4" flange welded to the 20" casing, 21-1/4" 2M mudcross with 2" kill/fill up line and 8" diverter line, 21-1/4" 2M annular preventer, 20" riser and rotating head bowl. See diagram below:

Surface Casing to Intermediate casing order of Operations:

- Drill 30" hole with rathole rig to 120-145' from ground level (A conductor will not be set)
- Run and Set 20" 133# J-55 BTC casing. (
- Cement with 14.8 ppg, 1.36 ft3/sack, 6.57 gal/sk, 500 psi = 9.5 hours, and Class C Cement. 100% excess. (This will be cemented conventionally with a plug system)
- WOC – 8 hours
- Release Rathole rig and Wait to MIRU with Drilling Rig
- MIRU Rig (Within 90 days)
- Weld on 21-1/4" 2M flange with mud cross, 21-1/4" 2M 20" annular and rotating head with 8" diverter line.
- Diverter System will be rigged up to simultaneously close the annular and open the HCR valve to divert flow from rig. This prevents any pressure from being applied to the 20" casing shoe.
- Function test system
- No casing/BOP test will be performed.
- Drill 12-1/4" surface and set and cement 9-5/8" casing.
- WOC per COA.
- Cut off 20" casing and Nipple down 20" diverter system
- Weld on 11" 5M wellhead onto 9-5/8" casing.
- Proceed as current COA

X	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.	
	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 165'	FW Spud Mud	7.90 - 8.40	30-32	N/C
165' to 2768'	Brine Water	9.70 - 10.20	30-32	N/C
2768' to 10495'	FW/Cut Brine	8.50 - 9.00	30-32	N/C
10495' to 14339'	Oil Based Mud	12.00 - 12.50	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

6. Logging and Testing Procedures

Logging, Coring and Testing	
X	Will run GR/CNL fromTD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
	No logs are planned based on well control or offset log information.
	Drill stem test?
	Coring?

Additional Logs Planned	Interval

7. Drilling Conditions

Condition	
BH Pressure at deepest TVD	6442 psi
Abnormal Temperature	No

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

X	H2S is present
X	H2S plan is attached