Form 3160-5
(June 2015)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

NMOCD Artesia

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

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE - Other instructions on page 2

5. Lease Serial No.
NMNM19848

6. If Indian, Allottee or Tribe Name

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

1. Type of Well
☒ Oil Well ☐ Gas Well ☐ Other

8. Well Name and No.
LAGUNA GRANDE 29 FEDERAL 5H

2. Name of Operator
CIMAREX ENERGY COMPANY
Contact: TERRI STATHEM
E-Mail: tstathem@cimarex.com

9. API Well No.
30-015-42258

3a. Address
202 S. CHEYENNE AVE, STE 1000
TULSA, OK 74103

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

10. Field and Pool or Exploratory Area
WOLFCAMP

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
Sec 29 T23S R29E NWNW 140FNL 330FWL

11. County or Parish, State
EDDY COUNTY, NM

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

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

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

Cimarex Energy Co. respectfully requests approval to change the BHL and the completion formation to the Wolfcamp from the Bone Spring. The change of formation and BHL will also change the drilling plan for the well.

Proposed BHL: 660' FSL & 660' FWL, Sec. 29, 23S, 29E
Proposed pool: Pierce Crossing; Wolfcamp, North (Gas)

Please see attached C102 for BHL change.

Proposed Casing Design change:
13-3/8", 48#, H-40, STC set @ 425'
Cmt w/ lead: 75 sx Class C; tail w/ 195 sx Class C - TOC @ surf

SEE ATTACHED FOR CONDITIONS OF APPROVAL

NM OIL CONSERVATION
ARTESIA DISTRICT
MAR 13 2017
RECEIVED

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #362424 verified by the BLM Well Information System
For CIMAREX ENERGY COMPANY, sent to the Carlsbad
Committed to AFMSS for processing by DEBORAH MCKINNEY on 01/20/2017 ()

Name *(Printed/Typed)* TERRI STATHEM — Title MANAGER REGULATORY COMPLIANCE

Signature (Electronic Submission) — Date 12/31/2016

APPROVED
FEB 23 2017
BUREAU OF LAND MANAGEMENT
CARLSBAD FIELD OFFICE

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By _____ Title _____ Date _____

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

Office

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

(Instructions on page 2)

**** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ****

Additional data for EC transaction #362424 that would not fit on the form

32. Additional remarks, continued

9-5/8", 36#, J-55, LTC set @ 2760'
Cmt w/ lead: 531 sx PozC; tail w/ 162 Class C - TOC @ surf

7", 32", L80, LTC & BTC set @ 8115'
cmt w/ lead: 541 sx Class H; tail w/ 196 sx PozH - TOC @ 2560'

4-1/2", 11.6#, P110, BTC liner set @ 9300-14254'
cmt w/ 317 sx PozH. TOC @ 9893'

Please see attached drilling plan for additional casing and cement design information.

A 2M and 3M BOP was previously approved for the well. A 5M BOP will be added to the pressure control equipment. Please see attached diagrams and choke manifold for the additional 5M system.

Please see attached directional plan for Wolfcamp completion.

1. Geological Formations

TVD of target 9,924
MD at TD 14,255

Pilot Hole TD N/A
Deepest expected fresh water

Formation	Depth (TVD) from KB	Water/Mineral Bearing/Target Zone	Hazards
Groundwater	30	N/A	
Rustler	119	N/A	
Salado	564	N/A	
Bell Canyon	2790	Hydrocarbons	
Cherry Canyon	3822	Hydrocarbons	
Brushy Canyon	4921	Hydrocarbons	
Brushy Canyon Lower	6189	Hydrocarbons	
Bone Spring	6482	N/A	
Bone Spring "A" Shale	6603	Hydrocarbons	
Bone Spring "B" Limestone	6946	Hydrocarbons	
Bone Spring "C" Shale	7158	Hydrocarbons	
1st Bone Spring Ss	7536	N/A	
2nd Bone Spring Limestone	7807	N/A	
2nd Bone Spring Ss	8307	Hydrocarbons	
3rd BS Limestone	8650	N/A	
Wolfcamp A	9828	Hydrocarbons	
Wolfcamp Target	9944	Hydrocarbons	
Wolfcamp A2	10428	Hydrocarbons	

2. Casing Program

Hole Size	Casing Depth From	Casing Depth To	Casing Size	Weight (lb/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17 1/2	0	175' ~~425~~	13-3/8"	48.00	H-40	ST&C	4.03	9.43	15.78
12 1/4	0	2760	9-5/8"	36.00	J-55	LT&C	1.41	2.45	4.56
8 3/4	0	9343	7"	32.00	L-80	LT&C	1.92	2.02	2.12
8 3/4	9343' ~~8415~~	10093	7"	32.00	L-80	BT&C	1.82	1.79	42.10
6	9300	14254	4-1/2"	11.60	P-110	BT&C	1.36	1.92	50.70
				BLM Minimum Safety Factor			1.125	1	1.6 Dry 1.8 Wet

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.	Y
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?	Y
If yes, are there two strings cemented to surface?	Y
(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

3. Cementing Program

Casing	# Sks	Wt. lb/gal	Yld ft3/sack	H2O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surface	75	13.50	1.75	8.83	15.5	Lead: Class C + Bentonite + Calcium Chloride + LCM
	195	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Intermediate	531	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	541	10.80	2.35	9.60	17:43	Lead: Tuned Light I Class H
	96	14.50	1.30	5.79	20	Tail: 50:50 (Poz:H) + Salt + Bentonite + Fluid Loss + Dispersant + Expanding Agent + Retarder + Antifoam
	100	14.50	1.24	5.55	20	Tail: 50:50(Poz:H) + Bentonite + Salt + Fluid Loss + Dispersant + LCM + Retarder
Completion System	317	14.50	1.30	5.79	20	Tail: 50:50 (Poz:H) + Salt + Bentonite + Fluid Loss + Dispersant + Expanding Agent + Retarder + Antifoam
	-5% excess ~more cement will be needed					

Casing String	TOC	% Excess
Surface	0	32
Intermediate	0	45
Production	2560	23
Production	2560	23
Completion System	9893	10

4. Pressure Control Equipment

	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.

BOP installed and tested before drilling which hole?	Size	Min Required WP	Type		Tested To
12 1/4	13 5/8	2M	Annular	X	50% of working pressure
			Blind Ram	X	2M
			Pipe Ram		
			Double Ram	X	
			Other		
8 3/4		3M 5M Per Tem Stipulation	Annular	X	50% of working pressure
			Blind Ram	X	3M 5M 02/23/2017
			Pipe Ram		
			Double Ram	X	
			Other		
6	13 5/8	5M	Annular	X	50% of working pressure
			Blind Ram	X	5M
			Pipe Ram		
			Double Ram	X	
			Other		

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

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

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

5. Mud Program

Depth	Type	Weight (ppg)	Viscosity	Water Loss
0' to 425'	FW Spud Mud	7.80 - 8.30	28	N/C
425' to 2760'	Brine Water	9.50 - 10.00	30-32	N/C
2760' to 10093'	FW/Cut Brine	8.70 - 9.20	30-32	N/C
10454' to 14254'	Oil Based Mud	10.30 - 10.80	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	4734 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.	
	H2S is present
	H2S plan is attached

8. Other Facets of Operation

Drilling below 7" Casing

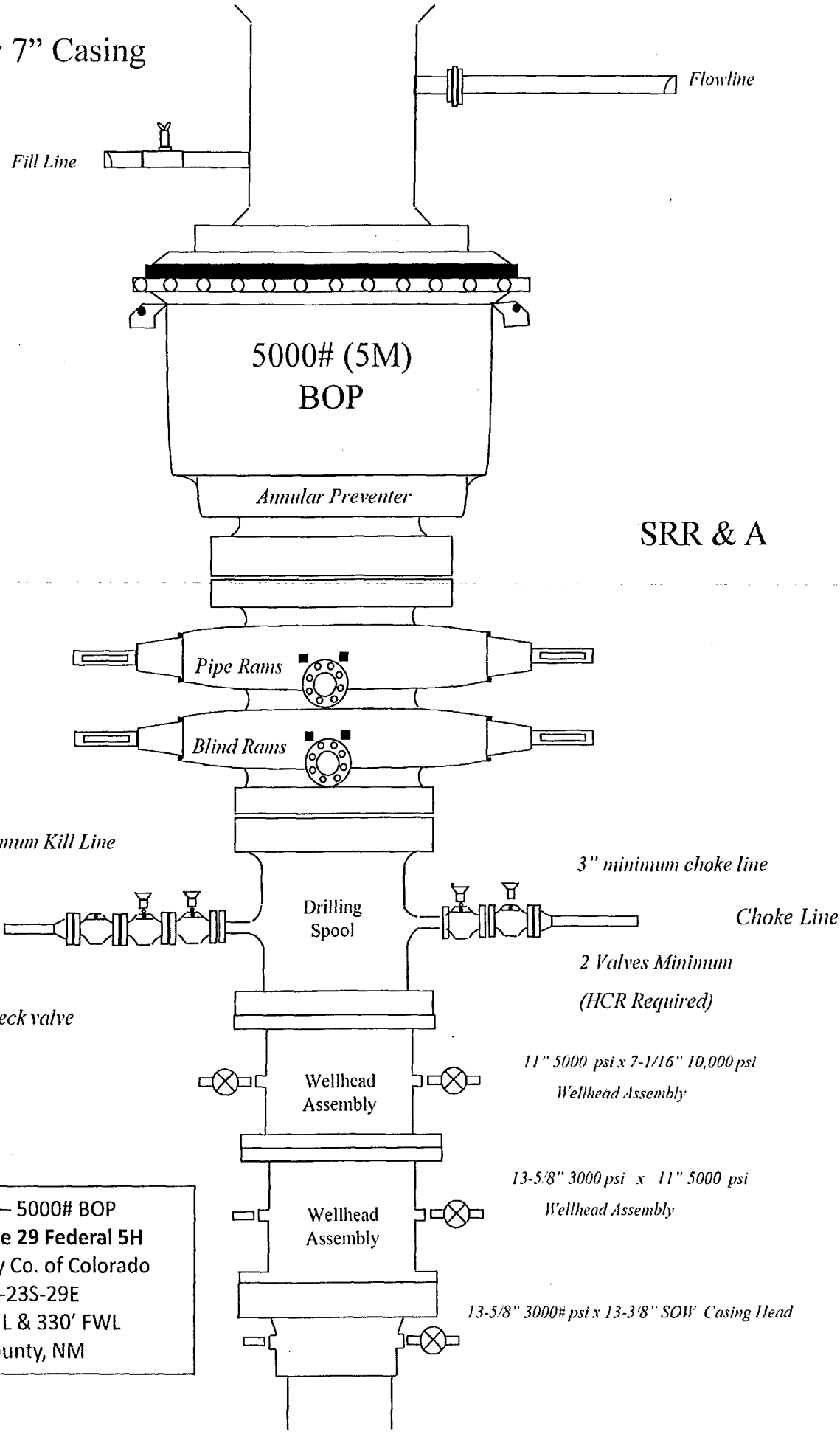
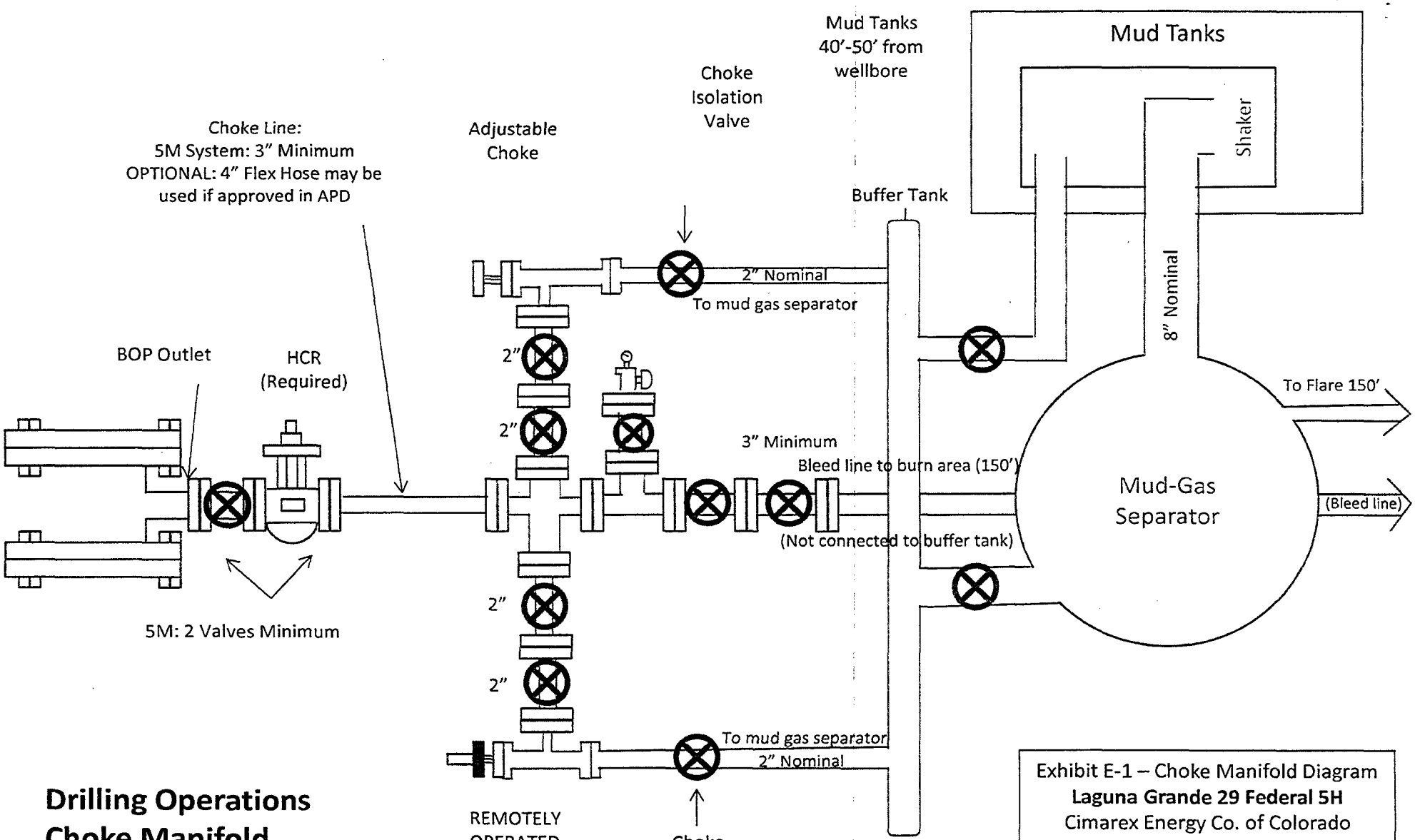


Exhibit E-1 – 5000# BOP
Laguna Grande 29 Federal 5H
Cimarex Energy Co. of Colorado
Sec. 29-23S-29E
SHL 140' FNL & 330' FWL
Eddy County, NM



Drilling Operations
Choke Manifold
5M Service

Exhibit E-1 – Choke Manifold Diagram
Laguna Grande 29 Federal 5H
Cimarex Energy Co. of Colorado
Sec. 29-23S-29E
SHL 140' FNL & 330' FWL
Eddy County, NM

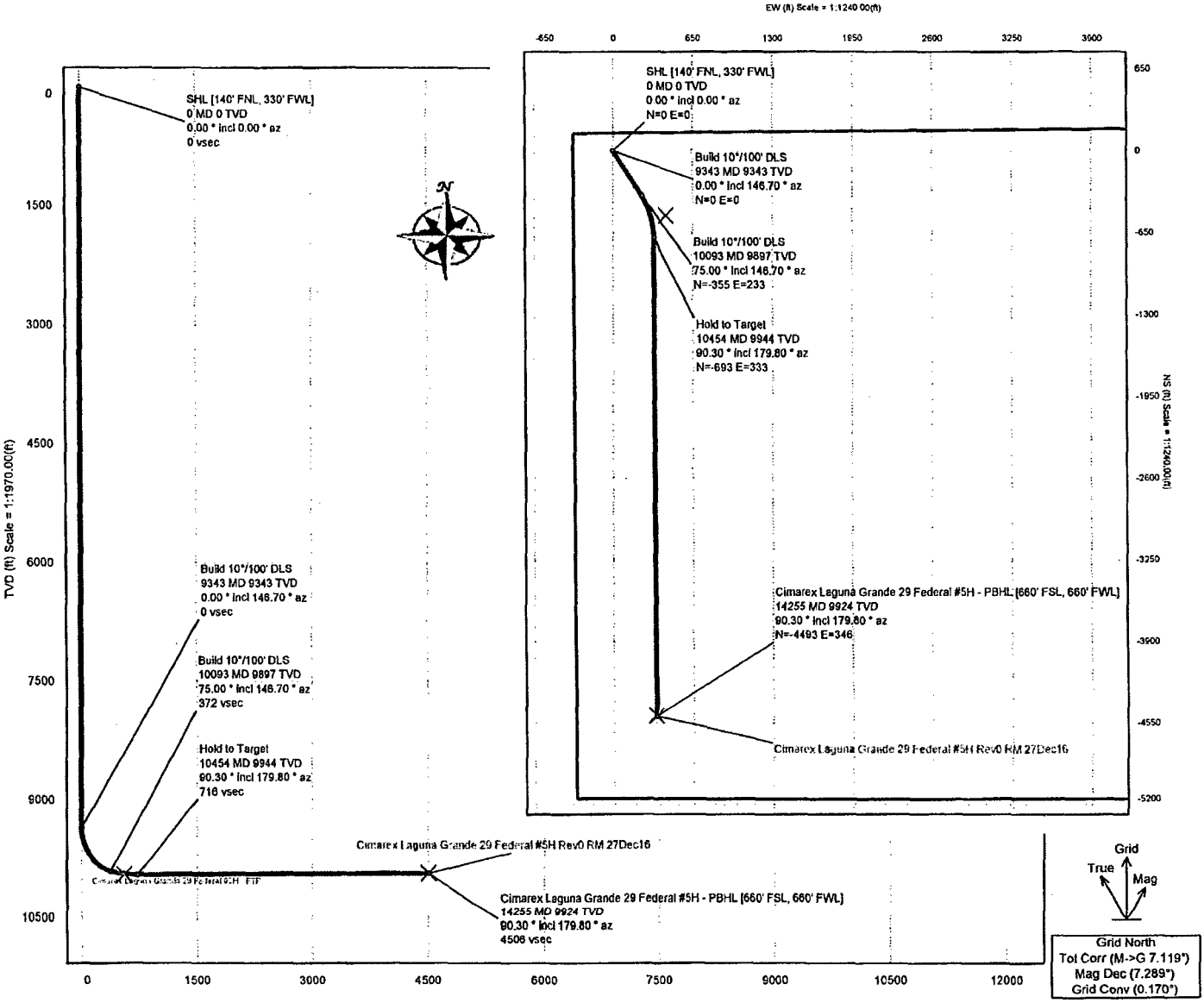
Schlumberger

Cimarex Rev 0

CIMAREX

Borehole:	Well:	Field:	Structure:
Original Borehole	Cimarex Laguna Grande 29 Federal #5H	NM Eddy County (NAD 83)	Cimarex Laguna Grande 29 Federal #5H

Gravity & Magnetic Parameters				Surface Location	NAD83 New Mexico State Plane, Eastern Zone, US Feet			Miscellaneous	
Model: HDGM 2016	Dip: 60.142°	Date: 27-Dec-2016		Lat: N 32 16 57.93	Northing: 466762.65ftUS	Grid Conv: 0.1703°		Slot: Cimarex Laguna Grande 29 Federal #5H	TVD Ref. RKB(2995ft above MSL)
MagDec: 7.289°	FS: 48188.068nT	Gravity FS: 999.474mgn (9.80665 Based)		Lon: W 104 0 52.08	Easting: 635879.91ftUS	Scale Fact: 0.99992021		Plan: Cimarex Laguna Grande 29 Federal #5H Rev0 RM 27Dec16	



Critical Points

Critical Point	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DLS
SHL [140' FNL, 330' FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Build 10°/100' DLS	9343.19	0.00	146.70	9343.19	0.00	0.00	0.00	0.00
Build 10°/100' DLS	10093.19	75.00	146.70	9896.62	371.78	-354.94	233.15	10.00
Hold to Target	10454.42	90.30	179.80	9944.00	716.12	-692.62	332.87	10.00
Cimarex Laguna Grande 29 Federal #5H - PBHL [660' FSL, 660' FWL]	14254.99	90.30	179.80	9924.00	4506.41	-4493.12	345.83	0.00

Schlumberger

Cimarex Laguna Grande 29 Federal #5H Rev0 RM 27Dec16 Proposal
Geodetic Report
(Non-Def Plan)

CIMAREX

Report Date:	December 27, 2016 - 02:12 PM	**Survey / DLS Computation:**	Minimum Curvature / Lubinski
Client:	Cimarex	**Vertical Section Azimuth:**	175.599 ° (Grid North)
Field:	NM Eddy County (NAD 83)	**Vertical Section Origin:**	0.000 ft, 0.000 ft
Structure / Slot:	Cimarex Laguna Grande 29 Federal #5H / Cimarex Laguna Grande 29 Federal #5H	**TVD Reference Datum:**	RKB
Well:	Cimarex Laguna Grande 29 Federal #5H	**TVD Reference Elevation:**	2995.000 ft above MSL
Borehole:	Original Borehole	**Seabed / Ground Elevation:**	2966.000 ft above MSL
UWI / API#:	Unknown / Unknown	**Magnetic Declination:**	7.289 °
Survey Name:	Cimarex Laguna Grande 29 Federal #5H Rev0 RM 27Dec16	**Total Gravity Field Strength:**	998.4739mgn (9.80665 Based)
Survey Date:	December 27, 2016	**Gravity Model:**	GARM
Tort / AHD / DDI / ERD Ratio:	111.123 ° / 4582.194 ft / 5.863 / 0.461	**Total Magnetic Field Strength:**	48188.068 nT
Coordinate Reference System:	NAD83 New Mexico State Plane, Eastern Zone, US Feet	**Magnetic Dip Angle:**	60.142 °
Location Lat / Long:	N 32° 16' 57.98848", W 104° 0' 52.05805"	**Declination Date:**	December 27, 2016
Location Grid N/E Y/X:	N 466752.650 ftUS, E 639879.900 ftUS	**Magnetic Declination Model:**	HDGM 2016
CRS Grid Convergence Angle:	0.1703 °	**North Reference:**	Grid North
Grid Scale Factor:	0.99992021	**Grid Convergence Used:**	0.1703 °
Version / Patch:	2.10.254.0	**Total Corr Mag North->Grid North:**	7.1185 °
		Local Coord Referenced To:	Structure Reference Point

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 [140' FNL, 330' FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	100.00	0.00	146.70	100.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	200.00	0.00	146.70	200.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	300.00	0.00	146.70	300.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	400.00	0.00	146.70	400.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	500.00	0.00	146.70	500.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	600.00	0.00	146.70	600.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	700.00	0.00	146.70	700.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	800.00	0.00	146.70	800.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	900.00	0.00	146.70	900.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	1000.00	0.00	146.70	1000.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	1100.00	0.00	146.70	1100.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	1200.00	0.00	146.70	1200.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	1300.00	0.00	146.70	1300.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	1400.00	0.00	146.70	1400.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	1500.00	0.00	146.70	1500.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	1600.00	0.00	146.70	1600.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	1700.00	0.00	146.70	1700.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	1800.00	0.00	146.70	1800.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	1900.00	0.00	146.70	1900.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	2000.00	0.00	146.70	2000.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	2100.00	0.00	146.70	2100.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	2200.00	0.00	146.70	2200.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	2300.00	0.00	146.70	2300.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	2400.00	0.00	146.70	2400.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	2500.00	0.00	146.70	2500.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06

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 ° ' ")
	2600.00	0.00	146.70	2600.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	2700.00	0.00	146.70	2700.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	2800.00	0.00	146.70	2800.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	2900.00	0.00	146.70	2900.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	3000.00	0.00	146.70	3000.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	3100.00	0.00	146.70	3100.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	3200.00	0.00	146.70	3200.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	3300.00	0.00	146.70	3300.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	3400.00	0.00	146.70	3400.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	3500.00	0.00	146.70	3500.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	3600.00	0.00	146.70	3600.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	3700.00	0.00	146.70	3700.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	3800.00	0.00	146.70	3800.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	3900.00	0.00	146.70	3900.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	4000.00	0.00	146.70	4000.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	4100.00	0.00	146.70	4100.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	4200.00	0.00	146.70	4200.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	4300.00	0.00	146.70	4300.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	4400.00	0.00	146.70	4400.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	4500.00	0.00	146.70	4500.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	4600.00	0.00	146.70	4600.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	4700.00	0.00	146.70	4700.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	4800.00	0.00	146.70	4800.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	4900.00	0.00	146.70	4900.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	5000.00	0.00	146.70	5000.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	5100.00	0.00	146.70	5100.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	5200.00	0.00	146.70	5200.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	5300.00	0.00	146.70	5300.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	5400.00	0.00	146.70	5400.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	5500.00	0.00	146.70	5500.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	5600.00	0.00	146.70	5600.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	5700.00	0.00	146.70	5700.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	5800.00	0.00	146.70	5800.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	5900.00	0.00	146.70	5900.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	6000.00	0.00	146.70	6000.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	6100.00	0.00	146.70	6100.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	6200.00	0.00	146.70	6200.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	6300.00	0.00	146.70	6300.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	6400.00	0.00	146.70	6400.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	6500.00	0.00	146.70	6500.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	6600.00	0.00	146.70	6600.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	6700.00	0.00	146.70	6700.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	6800.00	0.00	146.70	6800.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	6900.00	0.00	146.70	6900.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	7000.00	0.00	146.70	7000.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	7100.00	0.00	146.70	7100.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	7200.00	0.00	146.70	7200.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	7300.00	0.00	146.70	7300.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	7400.00	0.00	146.70	7400.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	7500.00	0.00	146.70	7500.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	7600.00	0.00	146.70	7600.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	7700.00	0.00	146.70	7700.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	7800.00	0.00	146.70	7800.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	7900.00	0.00	146.70	7900.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	8000.00	0.00	146.70	8000.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	8100.00	0.00	146.70	8100.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	8200.00	0.00	146.70	8200.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	8300.00	0.00	146.70	8300.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06

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 ° ' ")
	8400.00	0.00	146.70	8400.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	8500.00	0.00	146.70	8500.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	8600.00	0.00	146.70	8600.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	8700.00	0.00	146.70	8700.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	8800.00	0.00	146.70	8800.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	8900.00	0.00	146.70	8900.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	9000.00	0.00	146.70	9000.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	9100.00	0.00	146.70	9100.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	9200.00	0.00	146.70	9200.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	9300.00	0.00	146.70	9300.00	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
Build 10°/100' DLS	9343.19	0.00	146.70	9343.19	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
	9400.00	5.68	146.70	9399.91	2.46	-2.35	1.55	10.00	466750.30	639881.44	N 32 16 57.97	W 104 0 52.04
	9500.00	15.68	146.70	9498.05	18.67	-17.82	11.71	10.00	466734.83	639891.61	N 32 16 57.81	W 104 0 51.92
	9600.00	25.68	146.70	9591.49	49.55	-47.30	31.07	10.00	466705.35	639910.97	N 32 16 57.52	W 104 0 51.70
	9700.00	35.68	146.70	9677.38	94.16	-89.90	59.05	10.00	466662.76	639938.95	N 32 16 57.10	W 104 0 51.37
	9800.00	45.68	146.70	9753.12	151.16	-144.31	94.79	10.00	466608.35	639974.69	N 32 16 56.56	W 104 0 50.96
	9900.00	55.68	146.70	9816.40	218.80	-208.89	137.21	10.00	466543.78	640017.10	N 32 16 55.92	W 104 0 50.47
	10000.00	65.68	146.70	9865.31	295.04	-281.67	185.02	10.00	466471.00	640064.91	N 32 16 55.20	W 104 0 49.91
Build 10°/100' DLS	10093.19	75.00	146.70	9896.62	371.78	-354.94	233.15	10.00	466397.74	640113.03	N 32 16 54.47	W 104 0 49.35
	10100.00	75.26	147.35	9898.37	377.56	-360.46	236.73	10.00	466392.22	640116.61	N 32 16 54.41	W 104 0 49.31
	10200.00	79.23	156.77	9920.50	466.88	-446.53	282.31	10.00	466306.16	640162.19	N 32 16 53.56	W 104 0 48.79
	10300.00	83.47	165.93	9935.57	562.58	-540.09	313.84	10.00	466212.61	640193.72	N 32 16 52.64	W 104 0 48.42
	10400.00	87.88	174.93	9943.13	661.76	-638.29	330.38	10.00	466114.41	640210.25	N 32 16 51.66	W 104 0 48.23
Hold to Target	10454.42	90.30	179.80	9944.00	716.12	-692.62	332.87	10.00	466060.09	640212.75	N 32 16 51.13	W 104 0 48.20
	10500.00	90.30	179.80	9943.76	761.59	-738.20	333.03	0.00	466014.51	640212.90	N 32 16 50.67	W 104 0 48.20
	10600.00	90.30	179.80	9943.23	861.31	-838.20	333.37	0.00	465914.52	640213.24	N 32 16 49.68	W 104 0 48.20
	10700.00	90.30	179.80	9942.71	961.04	-938.20	333.71	0.00	465814.53	640213.58	N 32 16 48.70	W 104 0 48.20
	10800.00	90.30	179.80	9942.18	1060.77	-1038.20	334.05	0.00	465714.54	640213.92	N 32 16 47.71	W 104 0 48.20
	10900.00	90.30	179.80	9941.66	1160.50	-1138.20	334.39	0.00	465614.55	640214.27	N 32 16 46.72	W 104 0 48.20
	11000.00	90.30	179.80	9941.13	1260.23	-1238.20	334.73	0.00	465514.56	640214.61	N 32 16 45.73	W 104 0 48.20
	11100.00	90.30	179.80	9940.60	1359.96	-1338.19	335.07	0.00	465414.57	640214.95	N 32 16 44.74	W 104 0 48.20
	11200.00	90.30	179.80	9940.08	1459.69	-1438.19	335.42	0.00	465314.58	640215.29	N 32 16 43.75	W 104 0 48.20
	11300.00	90.30	179.80	9939.55	1559.42	-1538.19	335.76	0.00	465214.59	640215.63	N 32 16 42.76	W 104 0 48.20
	11400.00	90.30	179.80	9939.02	1659.15	-1638.19	336.10	0.00	465114.60	640215.97	N 32 16 41.77	W 104 0 48.20
	11500.00	90.30	179.80	9938.50	1758.88	-1738.19	336.44	0.00	465014.61	640216.31	N 32 16 40.78	W 104 0 48.20
	11600.00	90.30	179.80	9937.97	1858.61	-1838.18	336.78	0.00	464914.62	640216.65	N 32 16 39.79	W 104 0 48.20
	11700.00	90.30	179.80	9937.45	1958.34	-1938.18	337.12	0.00	464814.63	640216.99	N 32 16 38.80	W 104 0 48.20
	11800.00	90.30	179.80	9936.92	2058.07	-2038.18	337.46	0.00	464714.64	640217.33	N 32 16 37.81	W 104 0 48.20
	11900.00	90.30	179.80	9936.39	2157.80	-2138.18	337.80	0.00	464614.65	640217.67	N 32 16 36.82	W 104 0 48.20
	12000.00	90.30	179.80	9935.87	2257.52	-2238.18	338.14	0.00	464514.66	640218.01	N 32 16 35.83	W 104 0 48.20
	12100.00	90.30	179.80	9935.34	2357.25	-2338.17	338.48	0.00	464414.67	640218.36	N 32 16 34.84	W 104 0 48.20
	12200.00	90.30	179.80	9934.81	2456.98	-2438.17	338.82	0.00	464314.68	640218.70	N 32 16 33.85	W 104 0 48.20
	12300.00	90.30	179.80	9934.29	2556.71	-2538.17	339.16	0.00	464214.69	640219.04	N 32 16 32.86	W 104 0 48.20
	12400.00	90.30	179.80	9933.76	2656.44	-2638.17	339.51	0.00	464114.70	640219.38	N 32 16 31.87	W 104 0 48.20
	12500.00	90.30	179.80	9933.24	2756.17	-2738.17	339.85	0.00	464014.71	640219.72	N 32 16 30.88	W 104 0 48.19
	12600.00	90.30	179.80	9932.71	2855.90	-2838.16	340.19	0.00	463914.72	640220.06	N 32 16 29.89	W 104 0 48.19
	12700.00	90.30	179.80	9932.18	2955.63	-2938.16	340.53	0.00	463814.73	640220.40	N 32 16 28.91	W 104 0 48.19
	12800.00	90.30	179.80	9931.66	3055.36	-3038.16	340.87	0.00	463714.74	640220.74	N 32 16 27.92	W 104 0 48.19
	12900.00	90.30	179.80	9931.13	3155.09	-3138.16	341.21	0.00	463614.75	640221.08	N 32 16 26.93	W 104 0 48.19
	13000.00	90.30	179.80	9930.60	3254.82	-3238.16	341.55	0.00	463514.76	640221.42	N 32 16 25.94	W 104 0 48.19
	13100.00	90.30	179.80	9930.08	3354.55	-3338.15	341.89	0.00	463414.77	640221.76	N 32 16 24.95	W 104 0 48.19
	13200.00	90.30	179.80	9929.55	3454.28	-3438.15	342.23	0.00	463314.78	640222.10	N 32 16 23.96	W 104 0 48.19
	13300.00	90.30	179.80	9929.03	3554.01	-3538.15	342.57	0.00	463214.79	640222.45	N 32 16 22.97	W 104 0 48.19
	13400.00	90.30	179.80	9928.50	3653.73	-3638.15	342.91	0.00	463114.80	640222.79	N 32 16 21.98	W 104 0 48.19
	13500.00	90.30	179.80	9927.97	3753.46	-3738.15	343.25	0.00	463014.81	640223.13	N 32 16 20.99	W 104 0 48.19
	13600.00	90.30	179.80	9927.45	3853.19	-3838.14	343.60	0.00	462914.82	640223.47	N 32 16 20.00	W 104 0 48.19

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 ° ' ")
	13700.00	90.30	179.80	9926.92	3952.92	-3938.14	343.94	0.00	462814.83	640223.81	N 32 16 19.01	W 104 0 48.19
	13800.00	90.30	179.80	9926.39	4052.65	-4038.14	344.28	0.00	462714.84	640224.15	N 32 16 18.02	W 104 0 48.19
	13900.00	90.30	179.80	9925.87	4152.38	-4138.14	344.62	0.00	462614.85	640224.49	N 32 16 17.03	W 104 0 48.19
	14000.00	90.30	179.80	9925.34	4252.11	-4238.14	344.96	0.00	462514.86	640224.83	N 32 16 16.04	W 104 0 48.19
	14100.00	90.30	179.80	9924.82	4351.84	-4338.13	345.30	0.00	462414.87	640225.17	N 32 16 15.05	W 104 0 48.19
	14200.00	90.30	179.80	9924.29	4451.57	-4438.13	345.64	0.00	462314.88	640225.51	N 32 16 14.06	W 104 0 48.19
Cimarex Laguna Grande 29 Federal #5H - PBHL [660' FSL, 660' FWL]	14254.99	90.30	179.80	9924.00	4506.41	-4493.12	345.83	0.00	462259.90	640225.70	N 32 16 13.52	W 104 0 48.19

Survey Type: Non-Def Plan

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

Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Expected Max Inclination (deg)	Survey Tool Type	Borehole / Survey
	1	0.000	29.000	1/100.000	30.000	30.000		NAL_MWD_PLUS_0.5_DEG-Depth Only	Original Borehole / Cimarex Laguna Grande 29 Federal #5H Rev0 RM 27Dec16
	1	29.000	14254.986	1/100.000	30.000	30.000		NAL_MWD_PLUS_0.5_DEG	Original Borehole / Cimarex Laguna Grande 29 Federal #5H

Schlumberger

Cimarex Laguna Grande 29 Federal #5H Rev0 RM 27Dec16 Proposal
Geodetic Report
(Non-Def Plan)

Report Date:	December 27, 2016 - 02:12 PM	**Survey / DLS Computation:**	Minimum Curvature / Lubinski
Client:	Cimarex	**Vertical Section Azimuth:**	175.599 ° (Grid North)
Field:	NM Eddy County (NAD 83)	**Vertical Section Origin:**	0.000 ft, 0.000 ft
Structure / Slot:	Cimarex Laguna Grande 29 Federal #5H / Cimarex Laguna Grande 29 Federal #5H	**TVD Reference Datum:**	RKB
Well:	Cimarex Laguna Grande 29 Federal #5H	**TVD Reference Elevation:**	2995.000 ft above MSL
Borehole:	Original Borehole	**Seabed / Ground Elevation:**	2966.000 ft above MSL
UWI / API#:	Unknown / Unknown	**Magnetic Declination:**	7.289 °
Survey Name:	Cimarex Laguna Grande 29 Federal #5H Rev0 RM 27Dec16	**Total Gravity Field Strength:**	998.4739mgn (9.80665 Based)
Survey Date:	December 27, 2016	**Gravity Model:**	GARM
Tort / AHD / DDI / ERD Ratio:	111.123 ° / 4582.194 ft / 5.863 / 0.461	**Total Magnetic Field Strength:**	48188.068 nT
Coordinate Reference System:	NAD83 New Mexico State Plane, Eastern Zone, US Feet	**Magnetic Dip Angle:**	60.142 °
Location Lat / Long:	N 32° 16' 57.98848", W 104° 0' 52.05805"	**Declination Date:**	December 27, 2016
Location Grid N/E Y/X:	N 466752.650 ftUS, E 639879.900 ftUS	**Magnetic Declination Model:**	HDGM 2016
CRS Grid Convergence Angle:	0.1703 °	**North Reference:**	Grid North
Grid Scale Factor:	0.99992021	**Grid Convergence Used:**	0.1703 °
Version / Patch:	2.10.254.0	**Total Corr Mag North->Grid North:**	7.1185 °
		Local Coord Referenced To:	Structure Reference Point

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 [140' FNL, 330' FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
Build 10°/100' DLS	9343.19	0.00	146.70	9343.19	0.00	0.00	0.00	0.00	466752.65	639879.90	N 32 16 57.99	W 104 0 52.06
Build 10°/100' DLS	10093.19	75.00	146.70	9896.62	371.78	-354.94	233.15	10.00	466397.74	640113.03	N 32 16 54.47	W 104 0 49.35
Hold to Target Cimarex Laguna Grande 29 Federal #5H - PBHL [660' FSL, 660' FWL]	10454.42	90.30	179.80	9944.00	716.12	-692.62	332.87	10.00	466060.09	640212.75	N 32 16 51.13	W 104 0 48.20
	14254.99	90.30	179.80	9924.00	4506.41	-4493.12	345.83	0.00	462259.90	640225.70	N 32 16 13.52	W 104 0 48.19

Survey Type: Non-Def Plan

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

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Expected Max Inclination (deg)	Survey Tool Type	Borehole / Survey
	1	0.000	29.000	1/100.000	30.000	30.000		NAL_MWD_PLUS_0.5_DEG-Depth Only	Original Borehole / Cimarex Laguna Grande 29 Federal #5H Rev0 RM 27Dec16

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 ° ' ")
		1	29.000	14254.986	1/100.000	30.000	30.000		NAL_MWD_PLUS_0.5_DEG		Original Borehole / Cimarex Laguna Grande 29 Federal #5H	

PECOS DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**Cimarex Energy Co.**
LEASE NO.:	**NMNM-19848**
WELL NAME & NO.:	**Laguna Grande 29 Federal 5H**
SURFACE HOLE FOOTAGE:	**0140' FNL & 0330' FWL**
BOTTOM HOLE FOOTAGE	**0660' FSL & 0660' FWL**
LOCATION:	**Section 29, T. 23 S., R 29 E., NMPM**
COUNTY:	**Eddy County, New Mexico**
API:	**30-015-42258**

The original COAs still stand with the following drilling modifications:

I. DRILLING

A. DRILLING OPERATIONS 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

1. **Although Hydrogen Sulfide has not been reported in the area, it is always a potential hazard. If Hydrogen Sulfide is encountered, report measured amounts and formations to the BLM.**

2. 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. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a "Major" violation.**

3. 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 is located, this does not include the dog house or stairway area.

4. **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.**

B. CASING

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.

Centralizers required on surface casing per Onshore Order 2.III.B.1.f.

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.

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.

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

Medium Cave/Karst
Possibility of water flows in the Salado and Delaware.
Possibility of lost circulation in the Delaware.

1. The **13-3/8** inch surface casing shall be set at approximately **175** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface. **If salt is encountered, set casing at least 25 feet above the salt.**

    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 is to include the lead cement slurry.

    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.**

Formation below the 9-5/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe (not the mud weight required to prevent dissolving the salt formation) and the mud weight for the bottom of the hole. Report results to BLM office.

If 75% or greater lost circulation occurs while drilling the intermediate casing hole, the cement on the production casing must come to surface.

Centralizers approved as written.

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.

Formation below the 7" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe and the mud weight for the bottom of the hole. Report results to BLM office.

4. The minimum required fill of cement behind the **4-1/2** inch production Liner is:

   ☒ Cement as proposed by operator. Operator shall provide method of verification. **Excess calculates to negative 5% - Additional cement will be required.**

5. 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.

C. 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. Variance approved to use flex line from BOP to choke manifold. 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.** If the BLM inspector questions the straightness of the hose, a BLM engineer will be contacted and will review in the field or via picture supplied by inspector to determine if changes are required (operator shall expect delays if this occurs).

3. 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.

   a. **For surface casing only:** If the BOP/BOPE is to be tested against casing, the wait on cement (WOC) time for that casing is to be met (see WOC statement at start of casing section). Independent service company required.

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

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. 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 (18 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).

    c. 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.

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

    e. 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.**

    f. 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.

g. 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.

D. 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.

E. DRILL STEM TEST

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

F. 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.

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