

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTNMOCD
HobbsFORM 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.*5. Lease Serial No.
NMNM0392082A

6. If Indian, Allottee or Tribe Name

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

8. Well Name and No.
HALLERTAU 5 FEDERAL 10H9. API Well No.
30-025-4330410. Field and Pool or Exploratory Area
WILDCAT WOLFCAMP11. County or Parish, State
LEA COUNTY, NM**SUBMIT IN TRIPLICATE - Other instructions on page 2**1. Type of Well
☐ Oil Well ☒ Gas Well ☐ Other2. Name of Operator
CIMAREX ENERGY COMPANY
Contact: ARICKA EASTERLING
E-Mail: aeasterling@cimarex.com3a. Address
202 S. CHEYENNE AVE, SUITE 1000
TULSA, OK 741033b. Phone No. (include area code)
Ph: 918-560-70604. Location of Well (Footage, Sec., T., R., M., or Survey Description)
Sec 5 T26S R32E SESW 318FSL 1782FWL

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

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

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 recompleat 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 respectfully request approval to change the original drilling plan for the above referenced well. Cimarex proposes to change the BHL there by changing the directional plan. No additional disturbance is required for the well pad.

Approved:
BHL: 330 FNL & 1635 FWL
Proposed
BHL: 330 FNL & 1700 FWL

Original COAs still stand.

Please see attached plat, directional prelim & drilling plan for changes.

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

Electronic Submission #370758 verified by the BLM Well Information System
For CIMAREX ENERGY COMPANY, sent to the Hobbs
Committed to AFMSS for processing by DEBORAH MCKINNEY on 04/11/2017 ()

Name (Printed/Typed) ARICKA EASTERLING

Title REGULATORY ANALYST

Signature (Electronic Submission)

Date 03/23/2017

THIS SPACE FOR FEDERAL OR STATE OFFICE USE JUN 26 2017

Approved By

Title

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 **

1. Geological Formations

TVD of target 11,920

Pilot Hole TD N/A

MD at TD 16,366

Deepest expected fresh water

Formation	Depth (TVD) from KB	Water/Mineral Bearing/Target Zone	Hazards
Rustler	1019	N/A	
Salt	1345	N/A	
Castille	2800	N/A	
Base Last Salt	4159	N/A	
Lamar	4435	N/A	
Bell Canyon	4455	Hydrocarbons	
Cherry Canyon	5411	Hydrocarbons	
Brushy Canyon	6730	Hydrocarbons	
Top Bone Spring	8466	Hydrocarbons	
Top Wolfcamp	11710	Hydrocarbons	
Wolfcamp A-1 Shale	11890	Hydrocarbons	
Wolfcamp Target	12050	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	1210' 875	13-3/8"	48.00	H-40/J-55 Hybrid	ST&C	1.66	3.88	6.88
12 1/4	0	4355	9-5/8"	40.00	J-55	BT&C	1.22	1.71	3.62
8 3/4	0	11403	7"	32.00	L-80	LT&C	1.58	1.66	1.76
8 3/4	11403	12455	7"	32.00	L-80	BT&C	1.51	1.48	45.03
6	11403	16366	4-1/2"	13.50	P-110	BT&C	1.44	1.67	60.46
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.	N
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	N
Is well within the designated 4 string boundary.	N
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3rd string cement tied back 500' into previous casing?	N
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	N
Is 2nd string set 100' to 600' below the base of salt?	N
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	N
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	N
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	N

3. Cementing Program

Casing	# Sk	Wt. lb/gal	Yld ft ³ /sack	H ₂ O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surface	409	13.50	1.72	9.15	15.5	Lead: Class C + Bentonite
	195	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Intermediate	823	12.90	1.88	9.65	12	Lead: 35:65 (Poz:C) + Salt + Bentonite
	254	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Production	220	9.20	6.18	28.80		Lead: Class C + Extender + Salt + Strength Enhancement + LCM + Fluid Loss + Retarder
	134	14.20	1.30	5.86	14:30	Tail: 50:50 (Poz:H) + Salt + Bentonite + Fluid Loss + Dispersant + SMS
Completion System	284	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	42
Intermediate	0	44
Production	4155	23
Completion System	12455	10

4. Pressure Control Equipment

	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.
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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	13 5/8	10M	Annular	X	50% of working pressure
			Blind Ram		10M
			Pipe Ram		
			Double Ram	X	
			Other		
6	13 5/8	10M	Annular	X	50% of working pressure
			Blind Ram		10M
			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.

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

5. Mud Program

Depth	Type	Weight (ppg)	Viscosity	Water Loss
0' to 975'	FW Spud Mud	8.30 - 8.80	28	N/C
975' to 4355'	Brine Water	9.70 - 10.20	30-32	N/C
4355' to 12455'	FW/Cut Brine	8.70 - 9.20	30-32	N/C
12455' to 16366'	Oil Based Mud	11.50 - 12.00	50-70	N/C

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

What will be used to monitor the loss or gain of fluid?	PVT/Pason/Visual Monitoring
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6. Logging and Testing Procedures

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

Additional Logs Planned	Interval
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7. Drilling Conditions

Condition	
BH Pressure at deepest TVD	5702 psi
Abnormal Temperature	No

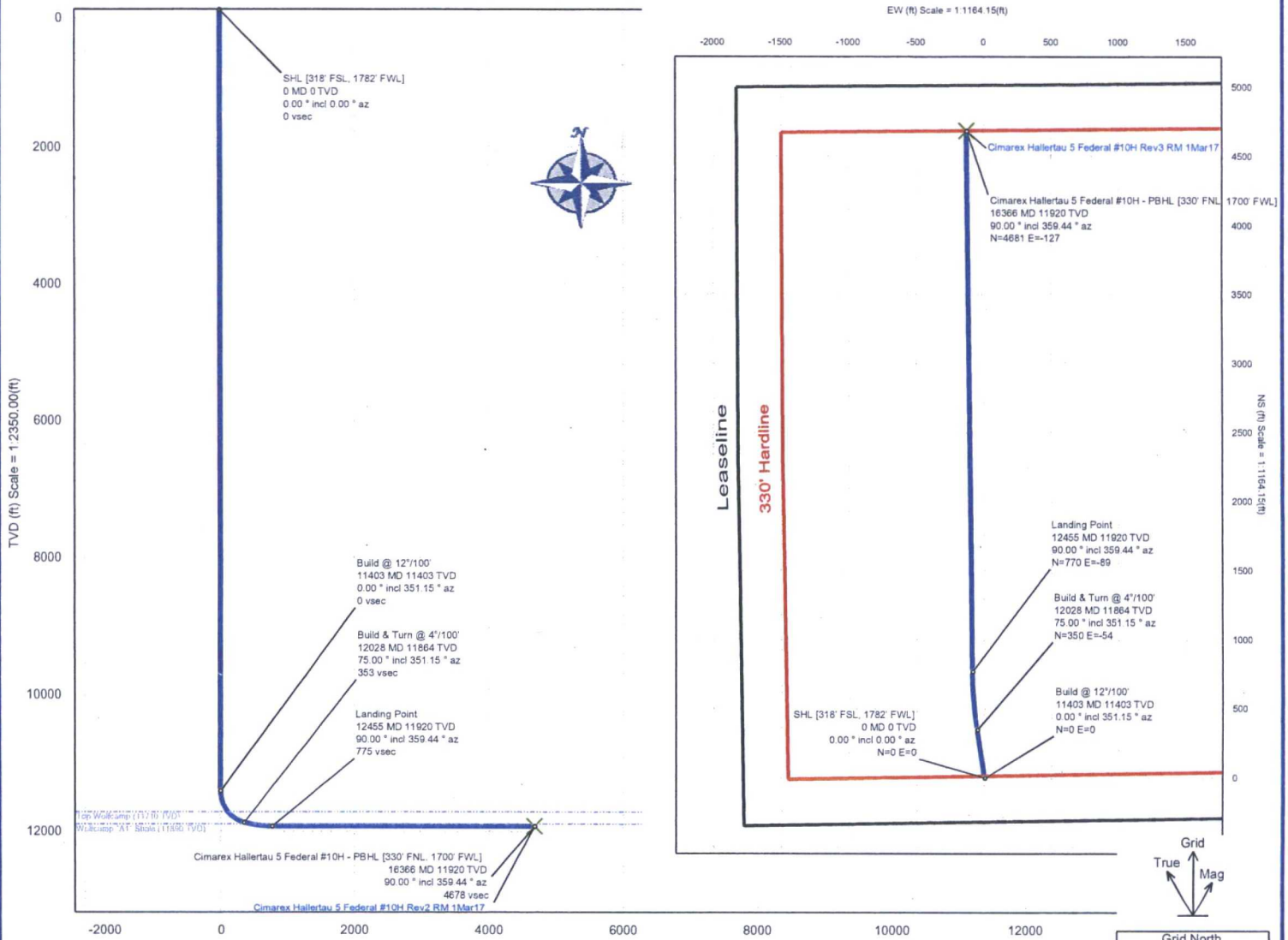
Hydrogen Sulfide (H₂S) monitors will be installed prior to drilling out the surface shoe. If H₂S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be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

X	H ₂ S is present
X	H ₂ S plan is attached

8. Other Facets of Operation

Borehole:	Well:	Field:	Structure:
Original Borehole	Cimarex Hallertau 5 Federal #10H	NM Lea County (NAD 83)	Cimarex Hallertau 5 Federal #10H

Gravity & Magnetic Parameters	Surface Location	Miscellaneous
Model: HDGM 2016 Dip: 59.781° Date: 01-Mar-2017	NAD83 New Mexico State Plane, Eastern Zone, US Feet	Cimarex
MagDec: 6.881° FS: 47993.585nT Gravity FS: 998.426mgm (9.80665 Based)	Lat: N 32 3 56.94 Northing: 388256.69HUS Grid Conv: 0.3362°	Hallertau 5
	Lon: W 103 42 0.26 Easting: 737501.88HUS Scale Fact: 0.99995316	Federal #10H
		Plan: Cimarex Hallertau 5 Federal #10H Rev3 RM 1Mar17



Critical Points

Critical Point	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DLS
SHL [318' FSL, 1782' FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Build @ 12°/100'	11403.09	0.00	351.15	11403.09	0.00	0.00	0.00	0.00
Top Wolfcamp	11736.43	40.00	351.15	11710.00	110.80	110.38	-17.19	12.00
Build & Turn @ 4°/100'	12028.09	75.00	351.15	11864.29	351.02	349.67	-54.44	12.00
Wolfcamp "A1" Shale	12142.39	78.99	353.43	11890.00	461.71	460.01	-69.36	4.00
Landing Point	12455.40	90.00	359.44	11920.00	772.48	770.37	-88.53	4.00
Cimarex Hallertau 5 Federal #10H - PBHL [330' FNL, 1700' FWL]	16366.26	90.00	359.44	11920.00	4682.75	4681.04	-126.71	0.00

Cimarex Hallertau 5 Federal #10H Rev2 RM 1Mar17 Proposal Geodetic



Report

(Non-Def Plan)

Report Date:	March 01, 2017 - 04:26 PM	Survey / DLS Computation:	Minimum Curvature / Lubinski
Client:	Cimarex	Vertical Section Azimuth:	358.449 ° (Grid North)
Field:	NM Lea County (NAD 83)	Vertical Section Origin:	0.000 ft, 0.000 ft
Structure / Slot:	Cimarex Hallertau 5 Federal #10H / Cimarex Hallertau 5 Federal #10H	TVD Reference Datum:	RKB
Well:	Cimarex Hallertau 5 Federal #10H	TVD Reference Elevation:	3292.500 ft above MSL
Borehole:	Original Borehole	Seabed / Ground Elevation:	3272.500 ft above MSL
UWI / API#:	Unknown / Unknown	Magnetic Declination:	6.881 °
Survey Name:	Cimarex Hallertau 5 Federal #10H Rev3 RM 1Mar17	Total Gravity Field Strength:	998.4259mgn (9.80665 Based)
Survey Date:	January 12, 2017	Gravity Model:	GARM
Tort / AHD / DDI / ERD Ratio:	92.093 ° / 4687.183 ft / 5.773 / 0.393	Total Magnetic Field Strength:	47993.585 nT
Coordinate Reference System:	NAD83 New Mexico State Plane, Eastern Zone, US Feet	Magnetic Dip Angle:	59.781 °
Location Lat / Long:	N 32° 3' 56.93508", W 103° 42' 0.26477"	Declination Date:	March 01, 2017
Location Grid N/E Y/X:	N 388256.690 ftUS, E 737501.880 ftUS	Magnetic Declination Model:	HDGM 2016
CRS Grid Convergence Angle:	0.3362 °	North Reference:	Grid North
Grid Scale Factor:	0.99995316	Grid Convergence Used:	0.3362 °
Version / Patch:	2.10.254.0	Total Corr Mag North->Grid North:	6.5446 °
		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 [318' FSL, 1782' FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	
	100.00	0.00	351.15	100.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	
	200.00	0.00	351.15	200.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	
	300.00	0.00	351.15	300.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	
	400.00	0.00	351.15	400.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	
	500.00	0.00	351.15	500.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	
	600.00	0.00	351.15	600.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	
	700.00	0.00	351.15	700.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	
	800.00	0.00	351.15	800.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	
	900.00	0.00	351.15	900.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	
	1000.00	0.00	351.15	1000.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	
	1100.00	0.00	351.15	1100.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	
	1200.00	0.00	351.15	1200.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	
	1300.00	0.00	351.15	1300.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	
	1400.00	0.00	351.15	1400.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	
	1500.00	0.00	351.15	1500.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	
	1600.00	0.00	351.15	1600.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	
	1700.00	0.00	351.15	1700.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	
	1800.00	0.00	351.15	1800.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	
	1900.00	0.00	351.15	1900.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	
	2000.00	0.00	351.15	2000.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	
	2100.00	0.00	351.15	2100.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	
	2200.00	0.00	351.15	2200.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	
	2300.00	0.00	351.15	2300.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	
	2400.00	0.00	351.15	2400.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	
	2500.00	0.00	351.15	2500.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42 0.26	

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 ° ' ")
	8500.00	0.00	351.15	8500.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	8600.00	0.00	351.15	8600.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	8700.00	0.00	351.15	8700.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	8800.00	0.00	351.15	8800.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	8900.00	0.00	351.15	8900.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	9000.00	0.00	351.15	9000.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	9100.00	0.00	351.15	9100.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	9200.00	0.00	351.15	9200.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	9300.00	0.00	351.15	9300.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	9400.00	0.00	351.15	9400.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	9500.00	0.00	351.15	9500.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	9600.00	0.00	351.15	9600.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	9700.00	0.00	351.15	9700.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	9800.00	0.00	351.15	9800.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	9900.00	0.00	351.15	9900.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	10000.00	0.00	351.15	10000.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	10100.00	0.00	351.15	10100.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	10200.00	0.00	351.15	10200.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	10300.00	0.00	351.15	10300.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	10400.00	0.00	351.15	10400.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	10500.00	0.00	351.15	10500.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	10600.00	0.00	351.15	10600.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	10700.00	0.00	351.15	10700.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	10800.00	0.00	351.15	10800.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	10900.00	0.00	351.15	10900.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	11000.00	0.00	351.15	11000.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	11100.00	0.00	351.15	11100.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	11200.00	0.00	351.15	11200.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	11300.00	0.00	351.15	11300.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	11400.00	0.00	351.15	11400.00	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
Build @ 12°/100'	11403.09	0.00	351.15	11403.09	0.00	0.00	0.00	0.00	388256.69	737501.88	N 32 3 56.94 W 103 42	0.26
	11500.00	11.63	351.15	11499.34	9.72	9.68	-1.51	12.00	388266.37	737500.37	N 32 3 57.03 W 103 42	0.28
	11600.00	23.63	351.15	11594.47	39.71	39.55	-6.16	12.00	388296.24	737495.72	N 32 3 57.33 W 103 42	0.33
Top Wolfcamp	11700.00	35.63	351.15	11681.23	88.66	88.32	-13.75	12.00	388345.00	737488.13	N 32 3 57.81 W 103 42	0.42
	11736.43	40.00	351.15	11710.00	110.80	110.38	-17.19	12.00	388367.06	737484.69	N 32 3 58.03 W 103 42	0.46
	11800.00	47.63	351.15	11755.84	154.43	153.84	-23.95	12.00	388410.52	737477.93	N 32 3 58.46 W 103 42	0.53
	11900.00	59.63	351.15	11815.03	234.15	233.25	-36.32	12.00	388489.93	737465.56	N 32 3 59.25 W 103 42	0.67
	12000.00	71.63	351.15	11856.22	324.33	323.09	-50.31	12.00	388579.77	737451.58	N 32 4 0.14 W 103 42	0.83
Build & Turn @ 4°/100'	12028.09	75.00	351.15	11864.29	351.02	349.67	-54.44	12.00	388606.35	737447.44	N 32 4 0.40 W 103 42	0.87
	12100.00	77.51	352.59	11881.37	420.40	418.82	-64.31	4.00	388675.49	737437.57	N 32 4 1.08 W 103 42	0.98
Wolfcamp "A1" Shale	12142.39	78.99	353.43	11890.00	461.71	460.01	-69.36	4.00	388716.67	737432.52	N 32 4 1.49 W 103 42	1.04
	12200.00	81.01	354.56	11900.00	518.28	516.43	-75.29	4.00	388773.09	737426.59	N 32 4 2.05 W 103 42	1.10
	12300.00	84.53	356.49	11912.58	617.33	615.31	-83.03	4.00	388871.97	737418.85	N 32 4 3.03 W 103 42	1.19
	12400.00	88.05	358.39	11919.05	717.09	714.98	-87.49	4.00	388971.64	737414.40	N 32 4 4.02 W 103 42	1.23
Landing Point	12455.40	90.00	359.44	11920.00	772.48	770.37	-88.53	4.00	389027.02	737413.35	N 32 4 4.56 W 103 42	1.24
	12500.00	90.00	359.44	11920.00	817.07	814.96	-88.97	0.00	389071.61	737412.91	N 32 4 5.00 W 103 42	1.24
	12600.00	90.00	359.44	11920.00	917.05	914.95	-89.95	0.00	389171.60	737411.94	N 32 4 5.99 W 103 42	1.25
	12700.00	90.00	359.44	11920.00	1017.04	1014.95	-90.92	0.00	389271.59	737410.96	N 32 4 6.98 W 103 42	1.25
	12800.00	90.00	359.44	11920.00	1117.02	1114.95	-91.90	0.00	389371.58	737409.99	N 32 4 7.97 W 103 42	1.26
	12900.00	90.00	359.44	11920.00	1217.01	1214.94	-92.87	0.00	389471.57	737409.01	N 32 4 8.96 W 103 42	1.26
	13000.00	90.00	359.44	11920.00	1316.99	1314.94	-93.85	0.00	389571.56	737408.03	N 32 4 9.95 W 103 42	1.27
	13100.00	90.00	359.44	11920.00	1416.98	1414.93	-94.83	0.00	389671.55	737407.06	N 32 4 10.94 W 103 42	1.27
	13200.00	90.00	359.44	11920.00	1516.96	1514.93	-95.80	0.00	389771.54	737406.08	N 32 4 11.93 W 103 42	1.27
	13300.00	90.00	359.44	11920.00	1616.95	1614.92	-96.78	0.00	389871.53	737405.11	N 32 4 12.92 W 103 42	1.28
	13400.00	90.00	359.44	11920.00	1716.93	1714.92	-97.75	0.00	389971.52	737404.13	N 32 4 13.91 W 103 42	1.28
	13500.00	90.00	359.44	11920.00	1816.92	1814.91	-98.73	0.00	390071.51	737403.15	N 32 4 14.90 W 103 42	1.29

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 ° ' ")
	13600.00	90.00	359.44	11920.00	1916.90	1914.91	-99.71	0.00	390171.50	737402.18	N 32 4 15.89 W 103 42	1.29
	13700.00	90.00	359.44	11920.00	2016.89	2014.90	-100.68	0.00	390271.49	737401.20	N 32 4 16.88 W 103 42	1.30
	13800.00	90.00	359.44	11920.00	2116.87	2114.90	-101.66	0.00	390371.48	737400.23	N 32 4 17.87 W 103 42	1.30
	13900.00	90.00	359.44	11920.00	2216.86	2214.89	-102.63	0.00	390471.47	737399.25	N 32 4 18.86 W 103 42	1.31
	14000.00	90.00	359.44	11920.00	2316.84	2314.89	-103.61	0.00	390571.47	737398.27	N 32 4 19.85 W 103 42	1.31
	14100.00	90.00	359.44	11920.00	2416.83	2414.88	-104.59	0.00	390671.46	737397.30	N 32 4 20.84 W 103 42	1.32
	14200.00	90.00	359.44	11920.00	2516.81	2514.88	-105.56	0.00	390771.45	737396.32	N 32 4 21.83 W 103 42	1.32
	14300.00	90.00	359.44	11920.00	2616.80	2614.87	-106.54	0.00	390871.44	737395.35	N 32 4 22.82 W 103 42	1.32
	14400.00	90.00	359.44	11920.00	2716.78	2714.87	-107.51	0.00	390971.43	737394.37	N 32 4 23.81 W 103 42	1.33
	14500.00	90.00	359.44	11920.00	2816.77	2814.86	-108.49	0.00	391071.42	737393.39	N 32 4 24.80 W 103 42	1.33
	14600.00	90.00	359.44	11920.00	2916.75	2914.86	-109.47	0.00	391171.41	737392.42	N 32 4 25.78 W 103 42	1.34
	14700.00	90.00	359.44	11920.00	3016.74	3014.85	-110.44	0.00	391271.40	737391.44	N 32 4 26.77 W 103 42	1.34
	14800.00	90.00	359.44	11920.00	3116.72	3114.85	-111.42	0.00	391371.39	737390.47	N 32 4 27.76 W 103 42	1.35
	14900.00	90.00	359.44	11920.00	3216.71	3214.85	-112.39	0.00	391471.38	737389.49	N 32 4 28.75 W 103 42	1.35
	15000.00	90.00	359.44	11920.00	3316.69	3314.84	-113.37	0.00	391571.37	737388.51	N 32 4 29.74 W 103 42	1.36
	15100.00	90.00	359.44	11920.00	3416.68	3414.84	-114.35	0.00	391671.36	737387.54	N 32 4 30.73 W 103 42	1.36
	15200.00	90.00	359.44	11920.00	3516.66	3514.83	-115.32	0.00	391771.35	737386.56	N 32 4 31.72 W 103 42	1.37
	15300.00	90.00	359.44	11920.00	3616.65	3614.83	-116.30	0.00	391871.34	737385.59	N 32 4 32.71 W 103 42	1.37
	15400.00	90.00	359.44	11920.00	3716.63	3714.82	-117.27	0.00	391971.33	737384.61	N 32 4 33.70 W 103 42	1.37
	15500.00	90.00	359.44	11920.00	3816.62	3814.82	-118.25	0.00	392071.32	737383.63	N 32 4 34.69 W 103 42	1.38
	15600.00	90.00	359.44	11920.00	3916.60	3914.81	-119.23	0.00	392171.31	737382.66	N 32 4 35.68 W 103 42	1.38
	15700.00	90.00	359.44	11920.00	4016.59	4014.81	-120.20	0.00	392271.30	737381.68	N 32 4 36.67 W 103 42	1.39
	15800.00	90.00	359.44	11920.00	4116.57	4114.80	-121.18	0.00	392371.29	737380.71	N 32 4 37.66 W 103 42	1.39
	15900.00	90.00	359.44	11920.00	4216.56	4214.80	-122.16	0.00	392471.28	737379.73	N 32 4 38.65 W 103 42	1.40
	16000.00	90.00	359.44	11920.00	4316.54	4314.79	-123.13	0.00	392571.27	737378.75	N 32 4 39.64 W 103 42	1.40
	16100.00	90.00	359.44	11920.00	4416.53	4414.79	-124.11	0.00	392671.26	737377.78	N 32 4 40.63 W 103 42	1.41
	16200.00	90.00	359.44	11920.00	4516.51	4514.78	-125.08	0.00	392771.25	737376.80	N 32 4 41.62 W 103 42	1.41
	16300.00	90.00	359.44	11920.00	4616.50	4614.78	-126.06	0.00	392871.24	737375.83	N 32 4 42.61 W 103 42	1.42
Cimarex Hallertau 5 Federal #10H - PBHL [330' FNL, 1700' FWL]	16366.26	90.00	359.44	11920.00	4682.75	4681.04	-126.71	0.00	392937.50	737375.18	N 32 4 43.26 W 103 42	1.42

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	20.000	1/100.000	30.000	30.000		NAL_MWD_PLUS_0.5_DEG- Depth Only	Original Borehole / Cimarex Hallertau 5 Federal #10H Rev3 RM 1Mar17
	1	20.000	16366.263	1/100.000	30.000	30.000		NAL_MWD_PLUS_0.5_DEG	Original Borehole / Cimarex Hallertau 5 Federal #10H Rev3