

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

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.*

**HOBBS OCD**

5. Lease Serial No.  
NMNM26394

6. If Indian, Allottee or Tribe Name

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

8. Well Name and No.  
VACA DRAW 20-17 FEDERAL 1H

9. API Well No.  
30-025-44135-00-S1

10. Field and Pool or Exploratory Area  
WILDCAT;WOLFCAMP

11. County or Parish, State  
LEA COUNTY, NM

**SUBMIT IN TRIPLICATE - Other instructions on page 2** **JAN 03 2018**

**RECEIVED**

1. Type of Well  
 Oil Well  Gas Well  Other

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

3a. Address  
600 N. MARIENFELD SUITE 600  
MIDLAND, TX 79701

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

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)  
Sec 20 T25S R33E SWSW 390FSL 590FWL  
32.109901 N Lat, 103.600945 W Lon

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

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other Change to Original APD
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> 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 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 recompleat 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 request approval to change the pilot hole cmt as follows:

612 sks Type H cement, dispersant 0.080 gals/sk, retarder 0.045 gals/sk @ 17.50 ppg, 0.94 cuft/sk, & 0% excess from pilot hole TD to KOP TO 600 sx Class H 15.6 ppg, 1.18 yield cement from the pilot hole TD to KOP using a completed wellstock.

**SEE ATTACHED FOR  
CONDITIONS OF APPROVAL**

The attached rig layout including V-door and flare line may change depending on rig availability. The pad dimensions and orientation will remain the same. There will be no additional disturbance if a rig layout change is necessary to accommodate the drilling rig.

**OCD Hobbs**

*Engineering Good. 25 Surface good IR 12-27-2017*

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

**Electronic Submission #398861 verified by the BLM Well Information System For CIMAREX ENERGY COMPANY, sent to the Hobbs Committed to AFMSS for processing by ZOTA STEVENS on 12/27/2017 (18ZS0034SE)**

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

Signature (Electronic Submission) Date 12/21/2017

**THIS SPACE FOR FEDERAL OR STATE OFFICE USE**

Approved By ZOTA STEVENS Title PETROLEUM ENGINEER Date 12/17/2017

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.

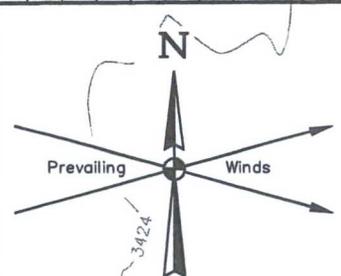
Office Hobbs

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.

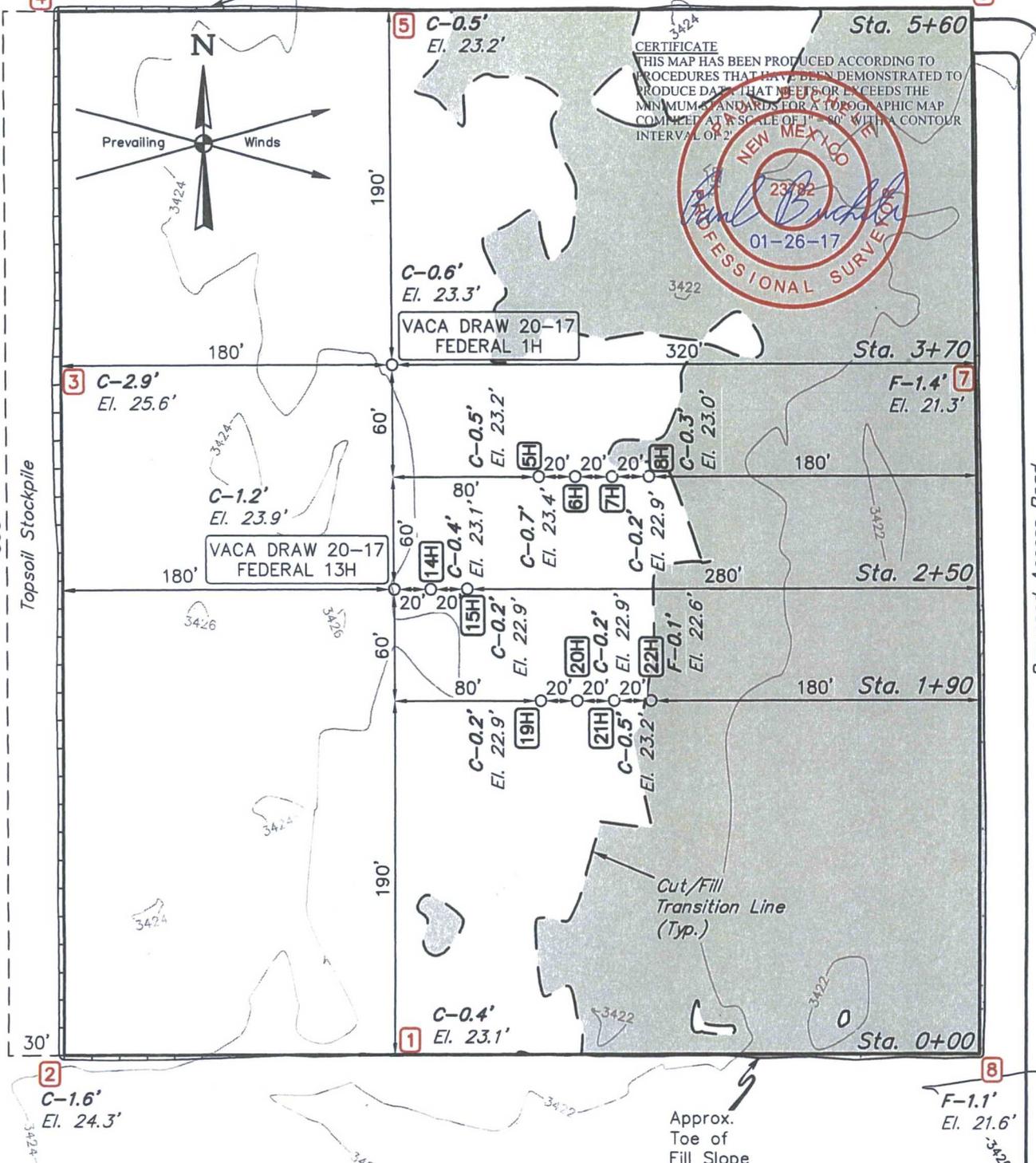
C-1.6'  
El. 24.3'

Approx.  
Top of  
Cut Slope

F-0.5'  
El. 22.2'



CERTIFICATE  
THIS MAP HAS BEEN PRODUCED ACCORDING TO  
PROCEDURES THAT HAVE BEEN DEMONSTRATED TO  
PRODUCE DATA THAT MEETS OR EXCEEDS THE  
MINIMUM STANDARDS FOR A TOPOGRAPHIC MAP  
COMPILED AT A SCALE OF 1" = 80' WITH A CONTOUR  
INTERVAL OF 2'  
**NEW MEXICO**  
23782  
*Paul Buckle*  
01-26-17  
**PROFESSIONAL SURVEYOR**



Existing Buried Petroleum Pipeline (ETP)

NOTE: Earthwork calculations require a fill @ the 22H location stake for balance. All fill is to be compacted to a minimum of 95% of the maximum dry density obtained by AASHTO method t-99.

FINISHED GRADE ELEVATION = 3422.7'

**NOTES:**

- Contours shown at 2' intervals.
- Cut/Fill slopes 1 1/2:1 (Typ. except where noted)
- Underground utilities shown on this sheet are for visualization purposes only, actual locations to be determined prior to construction.



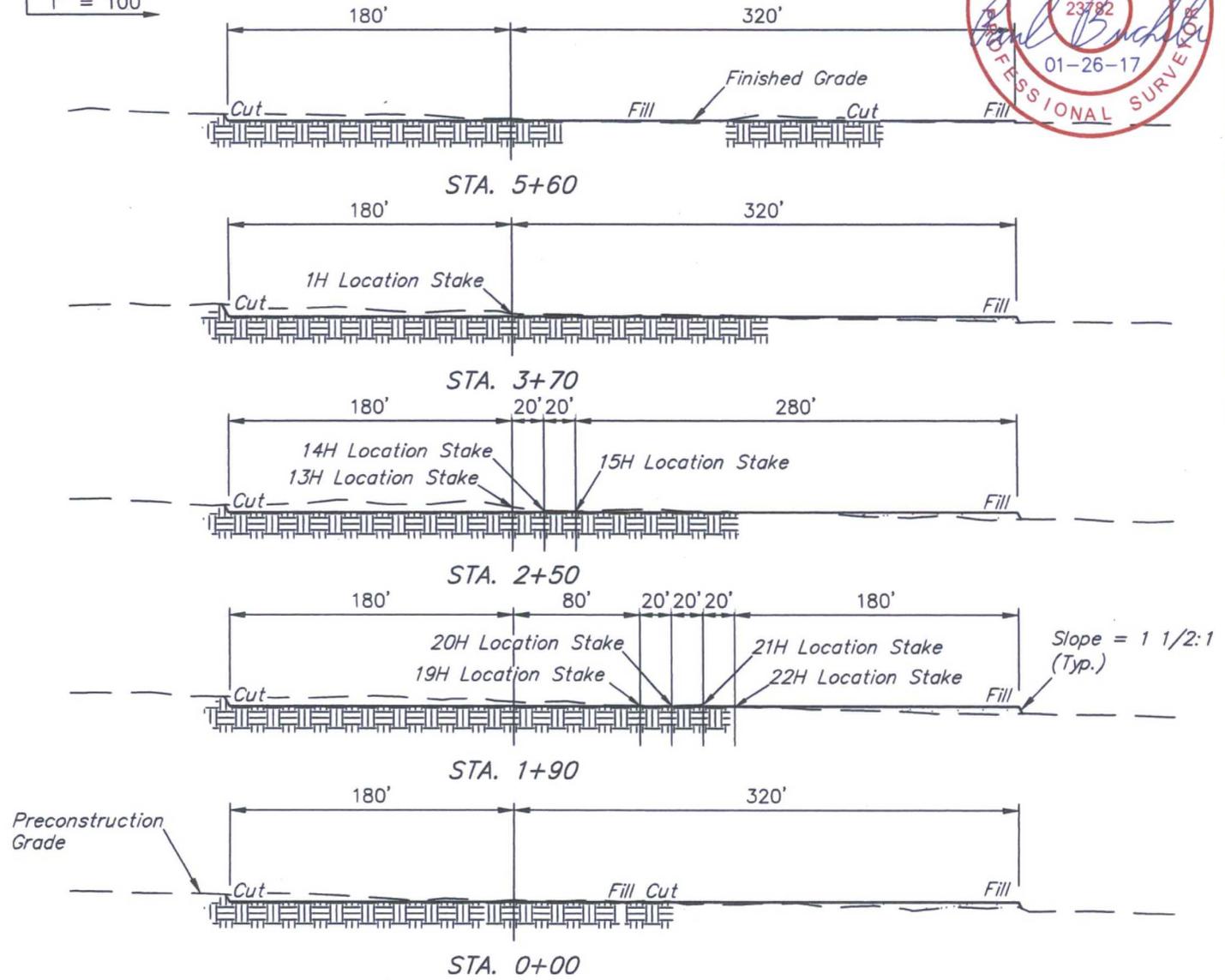
**UELS, LLC**  
Corporate Office \* 85 South 200 East  
Vernal, UT 84078 \* (435) 789-1017

**CIMAREX ENERGY CO.**

VACA DRAW 20-17 FEDERAL 1H, 5H, 6H, 7H,  
8H, 13H, 14H, 15H, 19H, 20H, 21H & 22H  
SW 1/4 SW 1/4, SECTION 20, T25S, R33E, N.M.P.M.  
LEA COUNTY, NEW MEXICO

SURVEYED BY	C.J., D.J.	01-19-17	SCALE
DRAWN BY	S.F.	01-20-17	1" = 80'
<b>LOCATION LAYOUT</b>		<b>EXHIBIT D</b>	

1" = 40'  
X-Section Scale  
1" = 100'



APPROXIMATE EARTHWORK QUANTITIES	
(4") TOPSOIL STRIPPING	3,510 Cu. Yds.
REMAINING LOCATION	5,090 Cu. Yds.
<b>TOTAL CUT</b>	<b>8,600 Cu. Yds.</b>
<b>FILL</b>	<b>5,090 Cu. Yds.</b>
EXCESS MATERIAL	3,510 Cu. Yds.
TOPSOIL	3,510 Cu. Yds.
<b>EXCESS UNBALANCE</b> (After Interim Rehabilitation)	<b>0 Cu. Yds.</b>

APPROXIMATE SURFACE DISTURBANCE AREAS		
	DISTANCE	ACRES
WELL SITE DISTURBANCE	NA	±6.870
30' WIDE ACCESS ROAD R-O-W DISTURBANCE	±1,102.83'	±0.760
30' WIDE GAS LIFT PIPELINE R-O-W DISTURBANCE	±627.59'	±0.432
30' WIDE FLOW LINE R-O-W DISTURBANCE	±612.38'	±0.422
<b>TOTAL SURFACE USE AREA</b>		<b>±8.484</b>

**NOTES:**

- Fill quantity includes 5% for compaction.
- Cut/Fill slopes 1 1/2:1 (Typ. except where noted)

**CIMAREX ENERGY CO.**

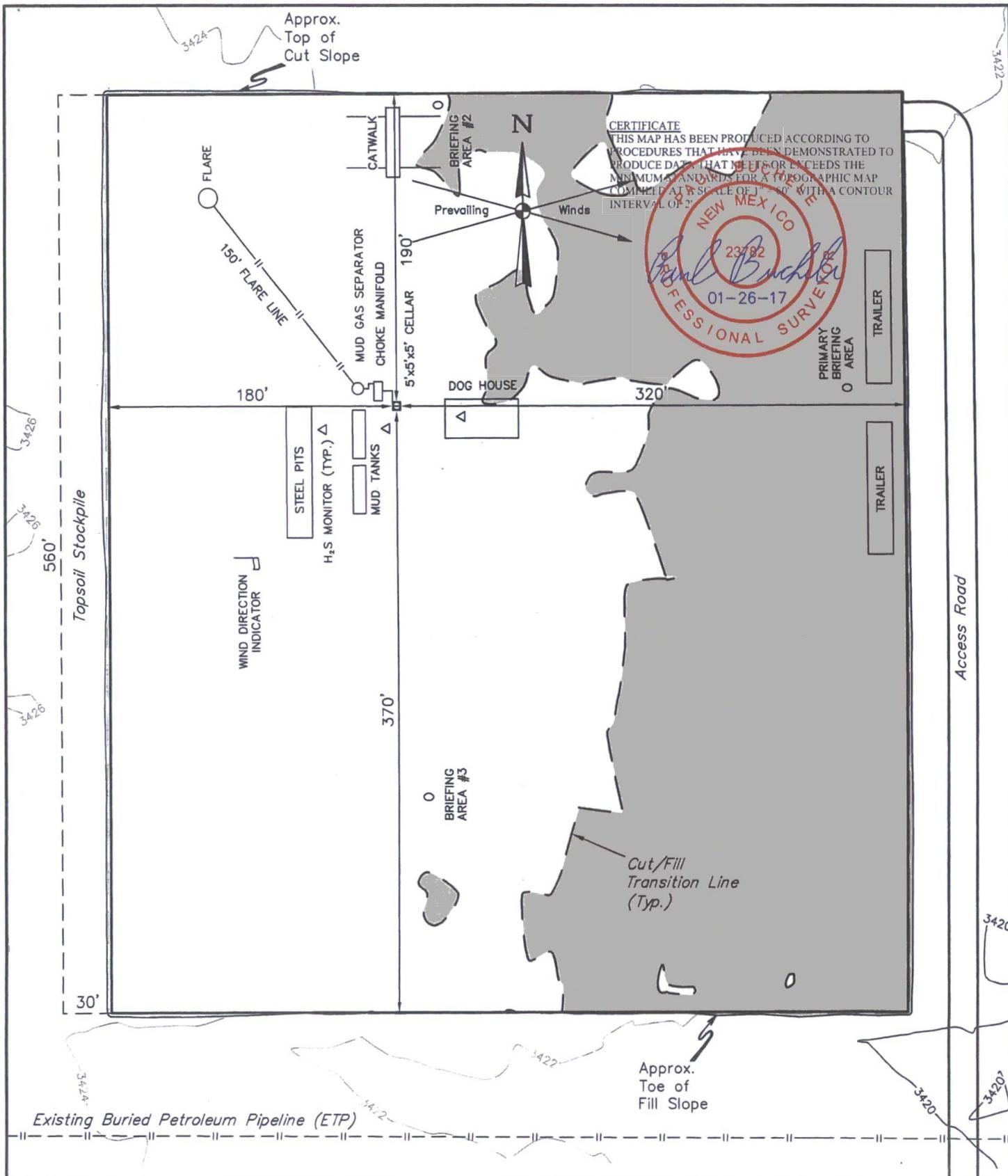
VACA DRAW 20-17 FEDERAL 1H, 5H, 6H, 7H, 8H, 13H, 14H, 15H, 19H, 20H, 21H & 22H  
SW 1/4 SW 1/4, SECTION 20, T25S, R33E, N.M.P.M.  
LEA COUNTY, NEW MEXICO



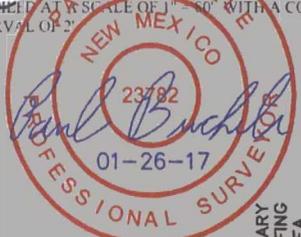
**UELS, LLC**  
Corporate Office \* 85 South 200 East  
Vernal, UT 84078 \* (435) 789-1017

SURVEYED BY	C.J., D.J.	01-19-17	SCALE
DRAWN BY	S.F.	01-20-17	AS SHOWN

**TYPICAL CROSS SECTIONS EXHIBIT D**



CERTIFICATE  
 THIS MAP HAS BEEN PRODUCED ACCORDING TO PROCEDURES THAT HAVE BEEN DEMONSTRATED TO PRODUCE DATA THAT MEETS OR EXCEEDS THE MINIMUM STANDARDS FOR A TOPOGRAPHIC MAP COMPILED AT A SCALE OF 1" = 60' WITH A CONTOUR INTERVAL OF 2'



**NOTES:**  
 • Contours shown at 2' intervals.

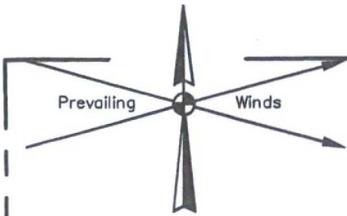
**CIMAREX ENERGY CO.**  
**VACA DRAW 20-17 FEDERAL 1H**  
**390' FSL 590' FWL**  
**SW 1/4 SW 1/4, SECTION 20, T25S, R33E, N.M.P.M.**  
**LEA COUNTY, NEW MEXICO**

SURVEYED BY	C.J., D.J.	01-19-17	SCALE
DRAWN BY	S.F.	01-20-17	1" = 80'
<b>TYPICAL RIG LAYOUT</b>			<b>EXHIBIT D</b>

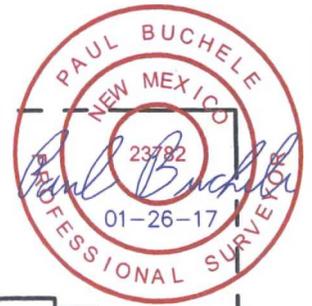


**UELS, LLC**  
 Corporate Office \* 85 South 200 East  
 Vernal, UT 84078 \* (435) 789-1017

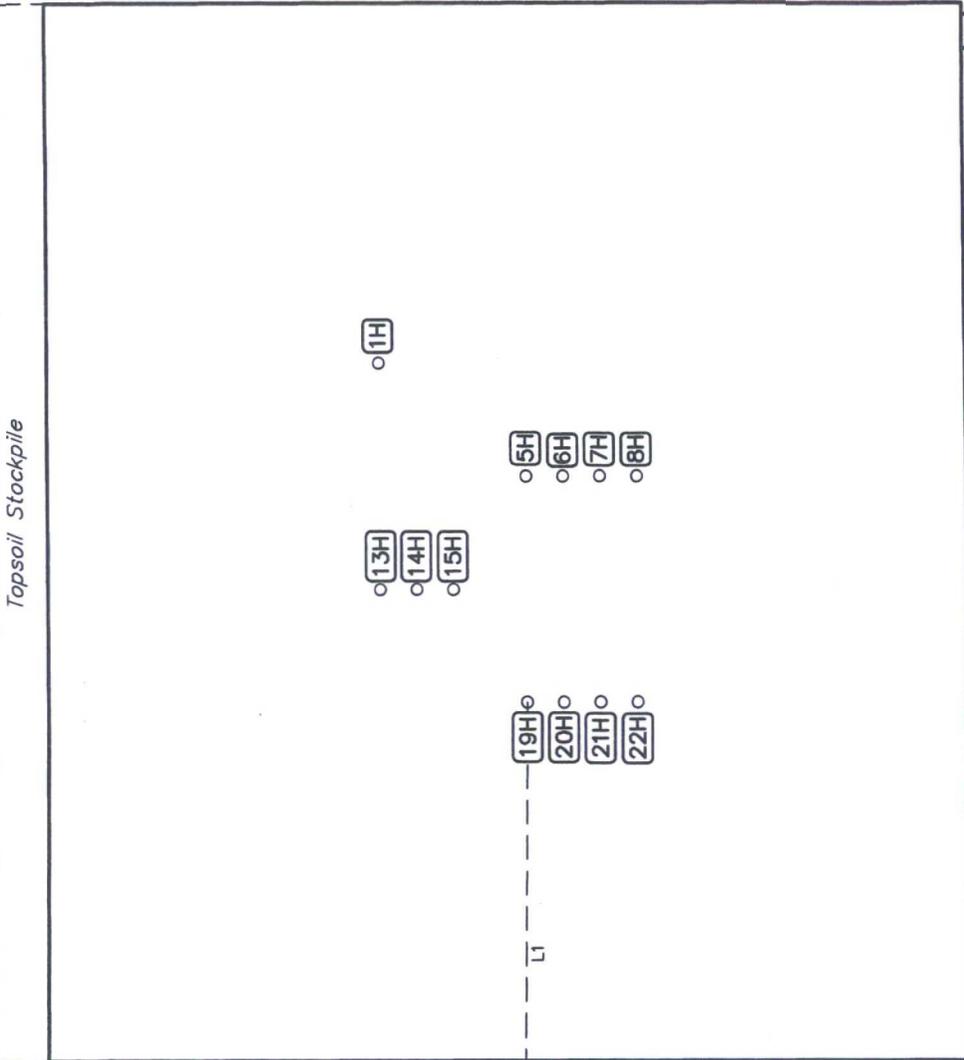
N



760' X 700' Archaeological Survey Boundary



LINE TABLE		
LINE	DIRECTION	LENGTH
L1	SOUTH	266'



Topsoil Stockpile

Proposed Access Road

Existing Buried Petroleum Pipeline (ETP)

NOTES:

CIMAREX ENERGY CO.

VACA DRAW 20-17 FEDERAL 1H, 5H, 6H, 7H,  
 8H, 13H, 14H, 15H, 19H, 20H, 21H & 22H  
 SW 1/4 SW 1/4, SECTION 20, T25S, R33E, N.M.P.M.  
 LEA COUNTY, NEW MEXICO

SURVEYED BY	C.J., D.J.	01-19-17	SCALE
DRAWN BY	S.F.	01-20-17	1" = 100'
ARCHAEOLOGICAL SURVEY BOUNDARY			<b>EXHIBIT D</b>



UELS, LLC  
 Corporate Office \* 85 South 200 East  
 Vernal, UT 84078 \* (435) 789-1017

## PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

<b>OPERATOR'S NAME:</b>	CIMAREX ENERGY COMPANY
<b>LEASE NO.:</b>	NMNM26394
<b>WELL NAME &amp; NO.:</b>	1H -VACA DRAW 20 17 FEDERAL
<b>SURFACE HOLE FOOTAGE:</b>	390'/S & 590'/W
<b>BOTTOM HOLE FOOTAGE:</b>	330'/N & 380'/W
<b>LOCATION:</b>	Section 20 T.25 S., R.33 E., NMP
<b>COUNTY:</b>	LEA County, New Mexico

COA

**All previous COAs still apply expect the following:**

H2S	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
Potash	<input checked="" type="radio"/> None	<input type="radio"/> Secretary	<input type="radio"/> R-111-P
Cave/Karst Potential	<input checked="" type="radio"/> Low	<input type="radio"/> Medium	<input type="radio"/> High
Variance	<input type="radio"/> None	<input checked="" type="radio"/> Flex Hose	<input type="radio"/> Other
Wellhead	<input checked="" type="radio"/> Conventional	<input type="radio"/> Multibowl	<input type="radio"/> Both
Other	<input type="checkbox"/> 4 String Area	<input type="checkbox"/> Capitan Reef	<input type="checkbox"/> WIPP

### A. Hydrogen Sulfide

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

### B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately **1034** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.
  - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
  - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
  - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours

after bringing cement to surface or 500 pounds compressive strength, whichever is greater.

- d. If cement falls back, remedial cementing will be done prior to drilling out that string.

**Keep the casing 1/3 full while running intermediate casing to maintain collapse safety factor.**

2. The minimum required fill of cement behind the 7-5/8 inch intermediate casing is: Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.
  - a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.

Second stage above DV tool: Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Additional cement maybe required. Excess cement calculates to 23%.**

**Pilot hole is required to have a plug at the bottom of the hole. If two plugs are set, the BLM is to be contacted (575-361-2822) prior to tag of bottom plug, which must be a minimum of 200' in length. Operator can set one plug from bottom of pilot hole to kick-off point and save the WOC time for tagging the first plug. Note plug tops on subsequent drilling report.**

**Operator is approved to plug the pilot hole with a cemented whipstock.**

3. The minimum required fill of cement behind the 5-1/2 x 5 inch production casing is: Cement should tie-back 200' into the previous casing. Operator shall provide method of verification. **Additional cement maybe required. Excess cement calculates only -52%. Variance for the casing annular clearance is approved.**

**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 **5000 (5M) psi.**
3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the 7-5/8 intermediate casing shoe shall be **10,000 (10M) psi.**

**Variance approved to use a 5M annular. The annular must be tested to full working pressure (5000 psi.)**

## GENERAL REQUIREMENTS

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

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

Lea County

Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575)  
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 2<sup>nd</sup> Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
    - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.
3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

## A. CASING

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

8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

#### B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53.
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. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
  - e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
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. The results of the test shall be reported to the appropriate BLM office.
- 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. 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. 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.

### C. DRILLING MUD

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

#### D. WASTE MATERIAL AND FLUIDS

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

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

**ZS 122717**

## Pilot Hole plug calculations

4th plug		INPUT CELLS			Calculations	
Top of plug	ft			Length of pilot hole	0 ft	
Bottom of plug	ft			Length of plug	#DIV/0! ft	
No. of sacks	sks			Percent excess	#DIV/0!	
Yield						
Hole Size	in	vol hole (cft/ft)	0.0000	Distance between plugs	0 ft	
3rd plug						Calculations
Top of plug	ft			Length of pilot hole	0 ft	
Bottom of plug	ft			Length of plug	#DIV/0! ft	
No. of sacks	sks			Percent excess	#DIV/0!	
Yield						
Hole Size	in	vol hole (cft/ft)	0.0000	Distance between plugs	11867 ft	
2nd plug						
Top of plug	11867 ft			Length of pilot hole	1133 ft	
Bottom of plug	13000 ft			Length of plug	2849 ft	
No. of sacks	600 sks			Percent excess	151%	
Yield	1.18					
Hole Size	6.75 in	vol hole (cft/ft)	0.2485	Distance between plugs	-1133 ft	
1st plug						
Top of plug	11867 ft			Length of pilot hole	1133 ft	
Bottom of plug	13000 ft			Length of plug	2315 ft	
No. of sacks	612 sks			Percent excess	104%	
Yield	0.94					
Hole Size	6.75 in	vol hole (cft/ft)	0.2485			

KFC

10 3/4 Segment	surface csg in a #/ft	14 3/4 Grade	inch hole. Coupling	Body	Design Factors		SURFACE		
"A"	40.50	J 55	BUTT	15.02	Collapse 3.34	Burst 0.54	Length 1,034	Weight 41,877	
"B"							0	0	
w/8.4#/g mud, 30min Sfc Csg Test psig: 1,500				Tail Cmt does not	circ to sfc.	Totals:	1,034	41,877	
<b>Comparison of Proposed to Minimum Required Cement Volumes</b>									
Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
14 3/4	0.5563	509	835	601	39	8.80	3052	5M	1.50

Burst Frac Gradient(s) for Segment(s) A, B = , b All > 0.70, OK.

7 5/8 Segment	casing inside the #/ft	10 3/4 Grade	Coupling	Body	Design Factors		INTERMEDIATE			
"A"	29.70	L 80	BUTT	1.84	Collapse 0.86	Burst 0.82	Length 11,867	Weight 352,450		
"B"	29.70	L 80	BUTT	71.58	0.83	0.82	625	18,563		
w/8.4#/g mud, 30min Sfc Csg Test psig:							Totals:	12,492	371,012	
B would be:				36.81	0.83	if it were a vertical wellbore.				
No Pilot Hole Planned				MTD 12492	Max VTD 12328	Csg VD 12328	Curve KOP 11867	Dogleg° 75	Severity° -1	MEOC 0
The cement volume(s) are intended to achieve a top of				0	ft from surface or a		1034	overlap.		
Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg	
9 7/8	0.2148	look ↘	0	2714		9.00	5582	10M	0.69	
D V Tool(s):				4888			sum of sx	Σ CuFt	Σ% excess	
t by stage % :				49	23		1507	3769	39	
Class 'C' tail cmt yld > 1.35							MASP is within 10% of 5000psig, need			

Burst Frac Gradient(s) for Segment(s) A, B, C, D = 0.58, 0.56, c, d < 0.70 a Problem!!

**ALT. COLLAPSE SF IS GOOD. SF= .83 \*1.5= 1.25. KEEP CASING 2/3RD FILL WITH FLUID WHILE RUNNING INTERMEDIATE CASING. CURVE SF IS GOOD BUT CONSERVATIVE.**

5 1/2 Segment	casing inside the #/ft	7 5/8 Grade	A Buoyant Coupling	Joint	Design Factors		PRODUCTION			
"A"	20.00	L 80	LT&C	2.45	Collapse 1.15	Burst 1.09	Length 11,867	Weight 237,340		
"B"	18.00	P 110	BUTT	7.91	1.56	1.61	10,158	182,844		
w/8.4#/g mud, 30min Sfc Csg Test psig: 1,255							Totals:	22,025	420,184	
B would be:				63.96	1.68	if it were a vertical wellbore.				
Proposed cmt sx could fill 2315 ft of a x1133 ft Pilot Hole				MTD 22025	Max VTD 13000	Csg VD 12371	Curve KOP 11867	Dogleg° 90	Severity° 10	MEOC 12740
The cement volume(s) are intended to achieve a top of				0	ft from surface or a		12492	overlap.		
Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg	
6 3/4	0.0835	719	935	1960	-52	12.50			0.35	
Class 'H' tail cmt yld > 1.20										