

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
APPLICATION FOR PERMIT TO DRILL OR REENTER

HOBBS OCD
FEB 28 2020
RECEIVED

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

1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NMNM112941
1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other		6. If Indian, Allottee or Tribe Name
1c. Type of Completion: <input type="checkbox"/> Hydraulic Fracturing <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		7. If Unit or CA Agreement, Name and No.
2. Name of Operator DEVON ENERGY PRODUCTION COMPANY LP (6137)		8. Lease Name and Well No. COBBER 21-28 FED 6H (327175)
3a. Address 333 West Sheridan Avenue Oklahoma City OK 73102	3b. Phone No. (include area code) (800)583-3866	9. API-Well No. 80-026-46922
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface NENE / 216 FNL / 1293 FEL / LAT 32.035596 / LONG -103.470464 At proposed prod. zone SENE / 2619 FNL / 1300 FEL / LAT 32.01449 / LONG -103.470474		10. Field and Pool, or Exploratory WC-025 G-09 S263619C / WOLFCAMP; (F8117)
11. Sec., T. R. M. or Blk. and Survey or Area SEC 21 / T26S / R34E / NMP		12. County or Parish LEA
13. State NM		14. Distance in miles and direction from nearest town or post office*
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 216 feet	16. No of acres in lease 1920	17. Spacing Unit dedicated to this well 480
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 466 feet	19. Proposed Depth 12630 feet / 20564 feet	20. BLM/BIA Bond No. in file FED: CO1104
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3307 feet	22. Approximate date work will start* 01/01/2020	23. Estimated duration 45 days
24. Attachments		

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

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

25. Signature (Electronic Submission)	Name (Printed/Typed) Rebecca Deal / Ph: (405)228-8429	Date 02/22/2019
Title Regulatory Compliance Professional		
Approved by (Signature) (Electronic Submission)	Name (Printed/Typed) Cody Layton / Ph: (575)234-5959	Date 02/26/2020
Title Assistant Field Manager Lands & Minerals CARLSBAD		

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

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

SCP Rec 02/25/2020

K2 02/29/2020

APPROVED WITH CONDITIONS
Approval Date: 02/26/2020

**PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL**

OPERATOR'S NAME:	Devon Energy Production Company LP
WELL NAME & NO.:	Cobber 21-28 Fed 8H
SURFACE HOLE FOOTAGE:	216'/N & 1418'/E
BOTTOM HOLE FOOTAGE:	20'/S & 1665'/E
LOCATION:	Section 21, T.26 S., R.34 E., NMPM
COUNTY:	Lea County, New Mexico

COA

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

A. HYDROGEN SULFIDE

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

B. CASING

1. The 13-3/8 inch surface casing shall be set at approximately 800 feet (a minimum of 25 feet (Lea County) into the Rustler Anhydrite and above the salt) and cemented to the surface.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8**

hours or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)

- c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
- d. If cement falls back, remedial cementing will be done prior to drilling out that string.

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

2. The minimum required fill of cement behind the 8-5/8 inch intermediate casing is:

- Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.**

Operator has proposed to pump down 13-3/8" X 8-5/8" annulus. Operator must run a CBL from TD of the 8-5/8" casing to surface. Submit results to BLM.

3. The minimum required fill of cement behind the 5-1/2 inch production casing is:

- Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).'
2. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M) psi. Variance is approved to use a 10,000 (10M) Annular which shall be tested to 5000 (5M) psi.**
 - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
 - c. Manufacturer representative shall install the test plug for the initial BOP test.
 - d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.

- e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

D. SPECIAL RESTRICTONS

1. Operator has been approved for their alternate casing design with a traditional cement job or Bradenhead squeeze. Any deviation from the approved casing plan should follow the sundry process.

GENERAL REQUIREMENTS

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

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

Eddy County

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

Lea County

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

- 1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
 - a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
 - b. When the operator proposes to set surface casing with Spudder Rig
 - Notify the BLM when moving in and removing the Spudder Rig.
 - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
 - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
- 2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on

which the draw works are located, this does not include the dog house or stairway area.

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

A. CASING

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

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

B. PRESSURE CONTROL

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

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

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

C. DRILLING MUD

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

D. WASTE MATERIAL AND FLUIDS

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

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



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

Operator Certification Data Report

02/26/2020

Operator Certification

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

NAME: Rebecca Deal

Signed on: 02/22/2019

Title: Regulatory Compliance Professional

Street Address: 333 West Sheridan Avenue

City: Oklahoma City

State: OK

Zip: 73102

Phone: (405)228-8429

Email address: Rebecca.Deal@dvn.com

Field Representative

Representative Name:

Street Address: 333 W SHERIDAN AVE

City: OKC


State: OK

Zip: 73102

Phone: (405)552-6556

Email address: blake.richardson@dvn.com



APD ID: 10400039435	Submission Date: 02/22/2019	 Show Final Text
Operator Name: DEVON ENERGY PRODUCTION COMPANY LP		
Well Name: COBBER 21-28 FED	Well Number: 6H	
Well Type: OIL WELL	Well Work Type: Drill	

Section 1 - General

APD ID: 10400039435	Tie to previous NOS?	Submission Date: 02/22/2019
BLM Office: CARLSBAD	User: Rebecca Deal	Title: Regulatory Compliance Professional
Federal/Indian APD: FED	Is the first lease penetrated for production Federal or Indian? FED	
Lease number: NMNM112941	Lease Acres: 1920	
Surface access agreement in place?	Allotted?	Reservation:
Agreement in place? NO	Federal or Indian agreement:	
Agreement number:		
Agreement name:		
Keep application confidential? YES		
Permitting Agent? NO	APD Operator: DEVON ENERGY PRODUCTION COMPANY LP	
Operator letter of designation:		

Operator Info

Operator Organization Name: DEVON ENERGY PRODUCTION COMPANY LP

Operator Address: 333 West Sheridan Avenue


Operator PO Box: Zip: 73102

Operator City: Oklahoma City **State:** OK

Operator Phone: (800)583-3866

Operator Internet Address:

Section 2 - Well Information

Well in Master Development Plan? NO	Master Development Plan name:
Well in Master SUPO? NO	Master SUPO name:
Well in Master Drilling Plan? NO	Master Drilling Plan name:
Well Name: COBBER 21-28 FED	Well Number: 6H Well API Number:
Field/Pool or Exploratory? Field and Pool	

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COBBER 21-28 FED

Well Number: 6H

Is the proposed well in an area containing other mineral resources? NATURAL GAS,OIL

Is the proposed well in a Helium production area? N

Use Existing Well Pad? NO

New surface disturbance?

Type of Well Pad: MULTIPLE WELL

Multiple Well Pad Name:

COBBER 21 WELLPAD

Number of Legs: 1

Well Class: HORIZONTAL

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: INFILL

Describe sub-type:

Distance to town:

Well plat: COBBER_21_28_FED_6H_C_102_REV_20190930123738.pdf

Well work start Date: 01/01/2020

Duration: 45 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83

Vertical Datum: NAVD88

Survey number:

Reference Datum:

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lo/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this lease?
SHL Leg #1				FEL	26S	34E	21	Aliquot NENE			LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 112941				
KOP Leg #1				FEL	26S	34E	21	Aliquot NENE			LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 112941				
PPP Leg #1-1				FEL	26S	34E	21	Aliquot NENE			LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 112941				

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COBBER 21-28 FED

Well Number: 6H

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this lease?
EXIT Leg #1				FEL	26S	34E	28	Aliquot SENE			LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 112941				
BHL Leg #1				FEL	26S	34E	28	Aliquot SENE			LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 112941				



APD ID: 10400039435

Submission Date: 02/22/2019

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COBBER 21-28 FED

Well Number: 6H

[Show Final Text](#)

Well Type: OIL WELL

Well Work Type: Drill

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
403425	—	3314	0	0	OTHER, SANDSTONE : SURFACE	NONE	N
403426	RUSTLER	2594	720	720	SANDSTONE	NONE	N
403438	SALADO	2214	1100	1100	SALT	NATURAL GAS, OIL	N
403428	BASE OF SALT	-1801	5115	5115	ANHYDRITE	NATURAL GAS, OIL	N
403429	BELL CANYON	-2046	5360	5360	SANDSTONE	NATURAL GAS, OIL	N
403435	CHERRY CANYON	-3122	6436	6436	SANDSTONE	NATURAL GAS, OIL	N
403436	BRUSHY CANYON	-4750	8064	8064	SANDSTONE	NATURAL GAS, OIL	N
403430	BONE SPRINGS	-6321	9635	9635	SHALE	NATURAL GAS, OIL	N
403437	BONE SPRING 1ST	-7273	10587	10587	SANDSTONE	NATURAL GAS, OIL	N
403431	BONE SPRING 2ND	-7834	11148	11148	SANDSTONE	NATURAL GAS, OIL	N
403432	BONE SPRING 3RD	-8296	11610	11610	SANDSTONE	NATURAL GAS, OIL	N
403433	WOLFCAMP	-9344	12658	12658	SHALE	NATURAL GAS, OIL	Y
403434	PENN	-11307	14621	14621	SHALE	NATURAL GAS, OIL	N

Section 2 - Blowout Prevention

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COBBER 21-28 FED

Well Number: 6H

Pressure Rating (PSI): 10M

Requesting Variance? YES

Variance request: A variance is requested for the use of a flexible choke line from the BOP stack to the choke manifold. See attached for specs for hydrostatic test chart. Devon requests a variance to run a 5M annular on a 10M BOP system. See separately attached variance request and support documents in AFMSS.

Testing Procedure: A multibowl wellhead may be used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested. 5M annular on 10M system will be tested to 100% of rated working pressure.

Choke Diagram Attachment:

10M_BOPE_CHK_DR_CLS_RKL_20190221115720.pdf

BOP Diagram Attachment:

10M_BOPE_CHK_DR_CLS_RKL_20190221115729.pdf

Pressure Rating (PSI): 5M

Requesting Variance? YES

Variance request: A variance is requested for the use of a flexible choke line from the BOP stack to the choke manifold. See attached for specs for hydrostatic test chart.

Testing Procedure: A multibowl wellhead may be used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested.

Choke Diagram Attachment:

5M_BOPE__CK_20190221115807.pdf

BOP Diagram Attachment:

5M_BOPE__CK_20190221115814.pdf

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COBBER 21-28 FED

Well Number: 6H

Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MID	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	SURFACE	17.5	13.375	NEW	API	N	0	725	0	725			725	H-40	48	ST&C	1.125	1	BUOY	1.6	BUOY	1.6
2	INTERMEDIATE	9.875	7.625	NEW	API	N	0	12250	0	12250			12250	P-110	29.7	OTHER - FLUSHMAX III	1.125	1	BUOY	1.6	BUOY	1.6
3	PRODUCTION	6.75	5.5	NEW	API	N	0	20564	0	12960			20564	P-110	20	OTHER - VAM SG	1.125	1	BUOY	1.6	BUOY	1.6

Casing Attachments

Casing ID: 1 String Type: SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Surf_Csg_Ass_20190222081542.pdf

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COBBER 21-28 FED

Well Number: 6H

Casing Attachments

Casing ID: 2 String Type: INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Int_Csg_Ass_20190221115912.pdf

Casing ID: 3 String Type: PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Prod_Csg_Ass_20190222081716.pdf

Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead					1.44					

INTERMEDIATE	Lead					3.27					
INTERMEDIATE	Tail										
PRODUCTION	Lead					3.27					

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COBBER 21-28 FED

Well Number: 6H

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

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

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

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

Describe what will be on location to control well or mitigate other conditions: Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

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

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
1225 0	2056 4	OIL-BASED MUD	10	10.5				12			
0	725	WATER-BASED MUD	8.5	9				2			
725	1225 0	SALT SATURATED	10	10.5				2			

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COBBER 21-28 FED

Well Number: 6H

Section 6 - Test, Logging, Coring

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

Will run GRMWD from TD to from KOP. Cement bond logs will be run in vertical to determine top of cement. Stated logs run will be in the Completion Report and submitted to the BLM.

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

CALIPER,CBL,DS,GR,MUDLOG

Coring operation description for the well:

N/A

Section 7 - Pressure

Anticipated abnormal pressures, temperatures, or potential geologic hazards? NO

Describe:

Contingency Plans geohazards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

Cobber_21_28_Fed_6H_Ver_2_20190930125059.pdf

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Devon_Cobber_21_28_Fed_6H__Permit_Plan_2_20190930125618.pdf

Devon_Cobber_21_28_Fed_6H_Plot_Permit_Plan_2_20190930125619.pdf

Other proposed operations facets description:

DRILLING PLAN
DIRECTIONAL SURVEY
MULTI-BOWL WELLHEAD
MULTI-BOWL VERBIAGE
GAS CAPTURE PLAN
CLOSED LOOP DESIGN
CO-FLEX VARIANCE
SPUDDER RIG DOCUMENT
SPEC SHEETS
ANNULAR VARIANCE REQUEST - DOC & SCHEMATIC

Other proposed operations facets attachment:

Clsd_Loop_20180823120203.pdf

8.625_32.00_P110HSCY_TLW_20190221065123.PDF

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COBBER 21-28 FED

Well Number: 6H

5.5_x_20_P110_EC_VAMSG_20190212135119.pdf

7.625_29.70_P110_Flushmax_20190212135120.pdf

Spudder_Rig_Info_20190212133910.pdf

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5.5_x_17_P_110_BTC_20190221092949.pdf

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MB_Wellhd_10M_13.375_8.625_5.5_20190819111617.PDF

Cobber_21_28_Fed_6H_Permit_Plan_2_20190930125655.pdf

Cobber_21_28_WP5_GCP_Form_20190930125715.pdf

MB_Verb_10M_20190930125737.pdf

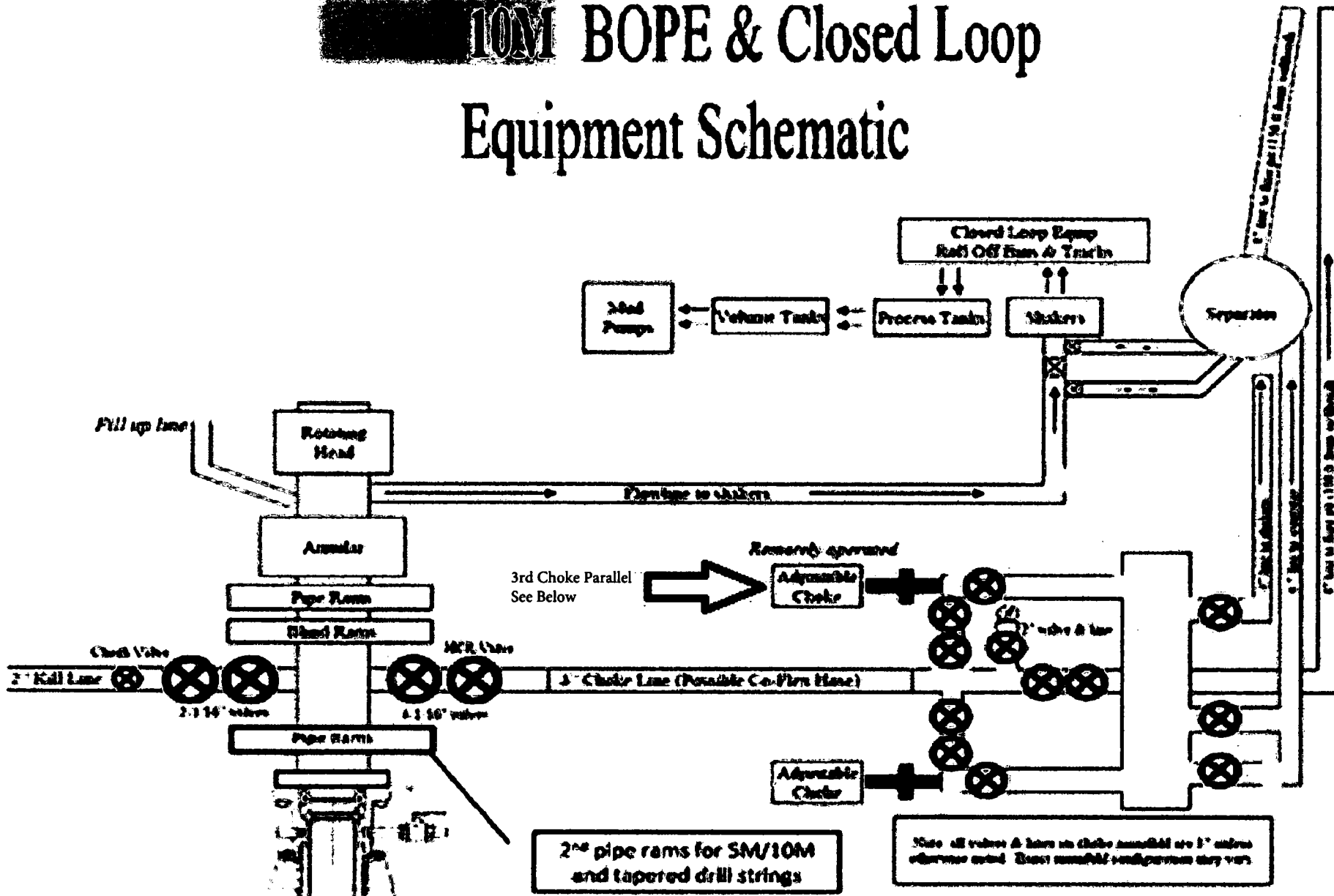
Other Variance attachment:

Co_flex_20180823120220.pdf

10M_BOPE_CHK_DR_CLS_RKL_20190212133813.pdf

Annular_Variance__Preventer_Summary_20190212133828.pdf

10M BOPE & Closed Loop Equipment Schematic





**Devon Energy Center
333 West Sheridan Avenue
Oklahoma City, Oklahoma 73102-5015**

Hydrogen Sulfide (H₂S) Contingency Plan

For

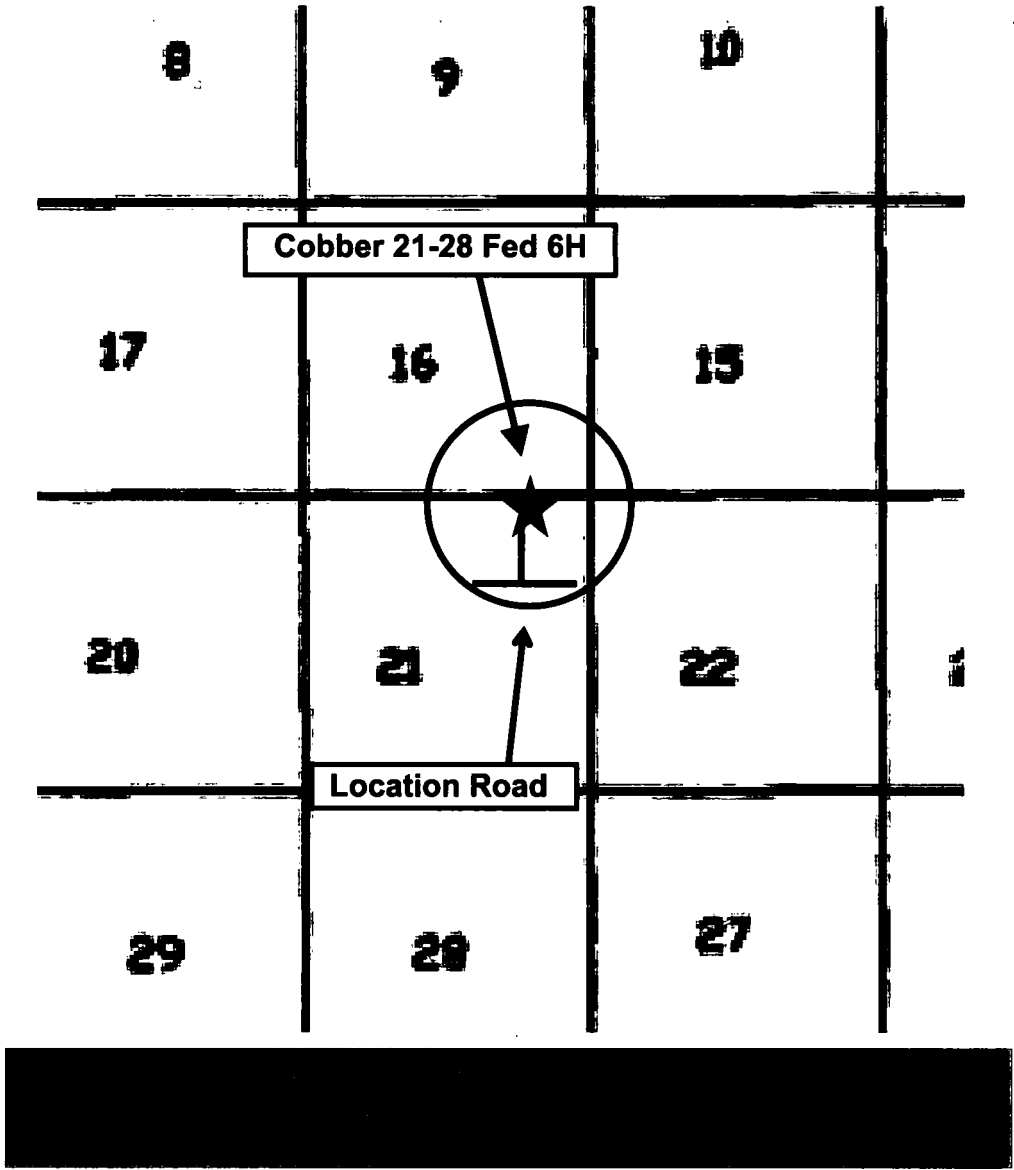
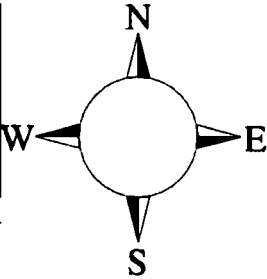
Cobber 21-28 Fed 6H

**Sec-21 T-26S R-34E
216' FNL & 1293' FEL
LAT. = 32.035596' N (NAD83)
LONG = 103.470464' W**

Lea County NM

Cobber 21-28 Fed 6H

This is an open drilling site. H₂S monitoring equipment and emergency response equipment will be used within 500' of zones known to contain H₂S, including warning signs, wind indicators and H₂S monitor.



Escape

Crews shall escape upwind of escaping gas in the event of an emergency release of gas. Escape can be facilitated from the location entrance road. Crews should then block the entrance to the location from the lease road so as not to allow anyone traversing into a hazardous area. The blockade should be at a safe distance outside of the ROE. There are no homes or buildings in or near the ROE.

Assumed 100 ppm ROE = 3000'

100 ppm H₂S concentration shall trigger activation of this plan.

Emergency Procedures

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

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

Ignition of Gas Source

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

Characteristics of H₂S and SO₂

Common Name	Chemical Formula	Specific Gravity	Threshold Limit	Hazardous Limit	Lethal Concentration
Hydrogen Sulfide	H₂S	1.189 Air = 1	10 ppm	100 ppm/hr	600 ppm
Sulfur Dioxide	SO₂	2.21 Air = 1	2 ppm	N/A	1000 ppm

Contacting Authorities

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

Hydrogen Sulfide Drilling Operation Plan

I. HYDROGEN SULFIDE (H₂S) TRAINING

All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will receive training from a qualified instructor in the following areas prior to commencing drilling operations on this well:

1. The hazards and characteristics of hydrogen sulfide (H₂S)
2. The proper use and maintenance of personal protective equipment and life support systems.
3. The proper use of H₂S detectors, alarms, warning systems, briefing areas, evacuation procedures, and prevailing winds.
4. The proper techniques for first aid and rescue procedures.

In addition, supervisory personnel will be trained in the following areas:

1. The effects of H₂S metal components. If high tensile tubulars are to be used, personnel will be trained in their special maintenance requirements.
2. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
3. The contents and requirements of the H₂S Drilling Operations Plan and Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H₂S zone (within 3 days or 500 feet) and weekly H₂S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H₂S Drilling Operations Plan and the Public Protection Plan.

II. HYDROGEN SULFIDE TRAINING

Note: All H₂S safety equipment and systems will be installed, tested, and operational when drilling reaches a depth of 500 feet above, or three days prior to penetrating the first zone containing or reasonably expected to contain H₂S.

1. Well Control Equipment

- A. Flare line
- B. Choke manifold – Remotely Operated
- C. Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit
- D. Auxiliary equipment may include if applicable: annular preventer and rotating head.
- E. Mud/Gas Separator

2. Protective equipment for essential personnel:

30-minute SCBA units located at briefing areas, as indicated on well site diagram, with escape units available in the top doghouse. As it may be difficult to communicate audibly while wearing these units, hand signals shall be utilized.

3. H₂S detection and monitoring equipment:

Portable H₂S monitors positioned on location for best coverage and response. These units have warning lights which activate when H₂S levels reach 10 ppm and audible sirens which activate at 15 ppm. Sensor locations:

- Bell nipple
- Possum Belly/Shale shaker
- Rig floor
- Choke manifold
- Cellar

Visual warning systems:

- A. Wind direction indicators as shown on well site diagram
- B. Caution/ Danger signs shall be posted on roads providing direct access to locations. Signs will be painted a high visibility yellow with black lettering of sufficient size to be reasonable distance from the immediate location. Bilingual signs will be used when appropriate.

4. Mud program:

The mud program has been designed to minimize the volume of H₂S circulated to surface. Proper mud weight, safe drilling practices and the use of H₂S scavengers will minimize hazards when penetrating H₂S bearing zones.

5. Metallurgy:

- A. All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold lines, and valves shall be H₂S trim.
- B. All elastomers used for packing and seals shall be H₂S trim.

6. Communication:

- A. Company personnel have/use cellular telephones in the field.
- B. Land line (telephone) communications at Office

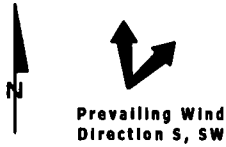
7. Well testing:

- A. Drill stem testing will be performed with a minimum number of personnel in the immediate vicinity, which are necessary to safety and adequately conduct the test. The drill stem testing will be conducted during daylight hours and formation fluids will not be flowed to the surface. All drill-stem-testing operations conducted in an H₂S environment will use the closed chamber method of testing.
- B. There will be no drill stem testing.

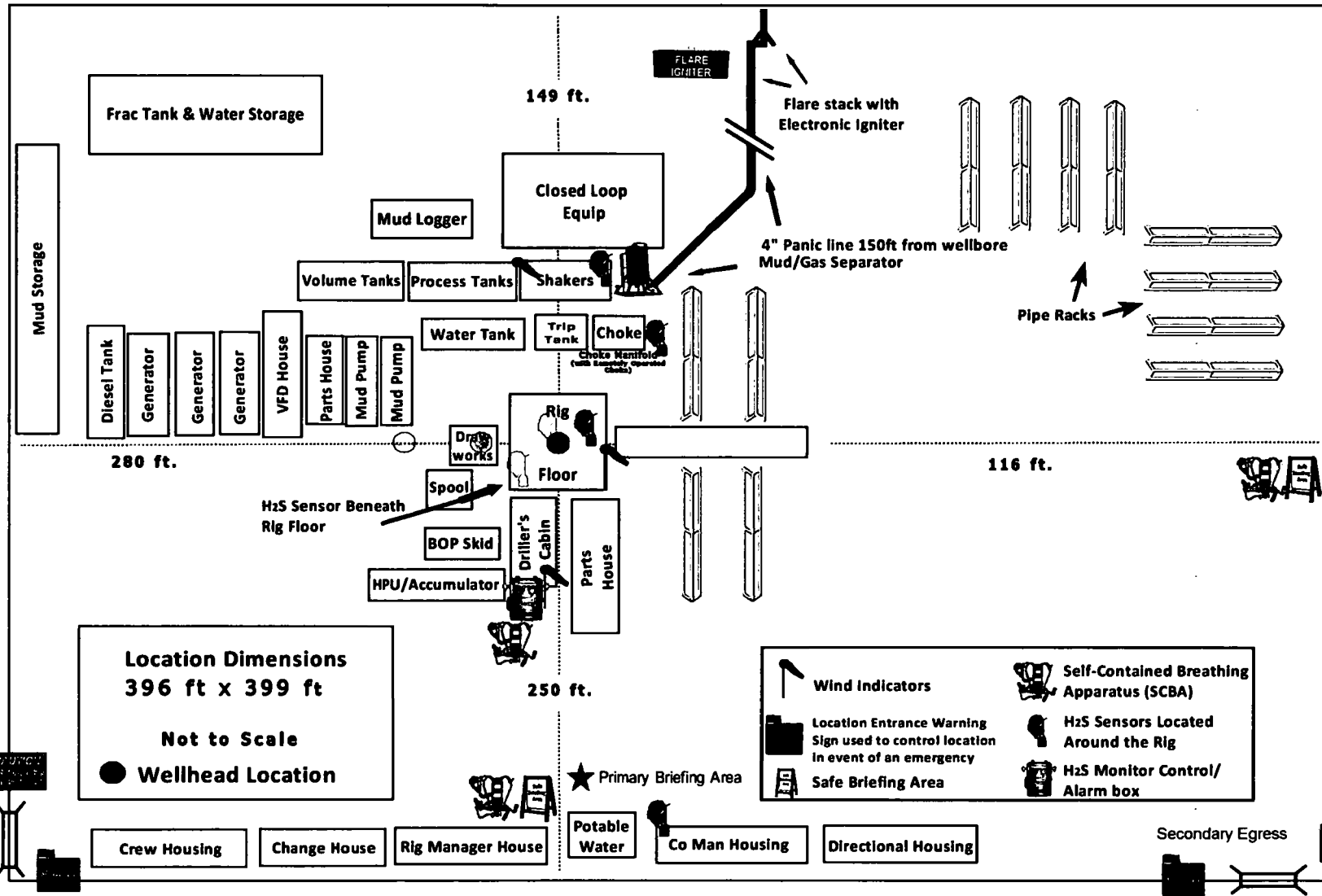
<u>Devon Energy Corp. Company Call List</u>		
Drilling Supervisor – Basin – Mark Kramer		405-823-4796
EHS Professional – Laura Wright		405-439-8129
<u>Agency Call List</u>		
<u>Lea County (575)</u>	Hobbs	
	Lea County Communication Authority	393-3981
	State Police	392-5588
	City Police	397-9265
	Sheriff's Office	393-2515
	Ambulance	911
	Fire Department	397-9308
	LEPC (Local Emergency Planning Committee)	393-2870
	NMOCD	393-6161
	US Bureau of Land Management	393-3612
<u>Eddy County (575)</u>	Carlsbad	
	State Police	885-3137
	City Police	885-2111
	Sheriff's Office	887-7551
	Ambulance	911
	Fire Department	885-3125
	LEPC (Local Emergency Planning Committee)	887-3798
	US Bureau of Land Management	887-6544
	NM Emergency Response Commission (Santa Fe)	(505) 476-9600
	24 HR	(505) 827-9126
	National Emergency Response Center	(800) 424-8802
	National Pollution Control Center: Direct	(703) 872-6000
	For Oil Spills	(800) 280-7118
	Emergency Services	
	Wild Well Control	(281) 784-4700
	Cudd Pressure Control	(915) 699-0139 (915) 563-3356
	Halliburton	(575) 746-2757
	B. J. Services	(575) 746-3569
<u>Give GPS position:</u>	Native Air – Emergency Helicopter – Hobbs (NM and TX)	(800)642-7828
	Flight For Life - Lubbock, TX	(806) 743-9911
	Aerocare - Lubbock, TX	(806) 747-8923
	Med Flight Air Amb - Albuquerque, NM	(575) 842-4433
	Lifeguard Air Med Svc. Albuquerque, NM	(800) 222-1222
	Poison Control (24/7)	(575) 272-3115
	Oil & Gas Pipeline 24 Hour Service	(800) 364-4366
	NOAA – Website - www.nhc.noaa.gov	

Prepared in conjunction with
Dave Small





Devon Energy - Well Pad Rig Location Layout Safety Equipment Location



WCDSC Permian NM

Lea County (NAD83 New Mexico East)

Sec 21-T26S-R34E

Cobber 21-28 Fed 6H

Wellbore #1

Plan: Permit Plan 2

Survey Report - Geographic

19 September, 2019

Survey Report - Geographic

Company:	WCDCS Permian NM	Local Co-ordinate Reference:	Well Cobber 21-28 Fed 6H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3332.40ft
Site:	Sec 21-T26S-R34E	MD Reference:	RKB @ 3332.40ft
Well:	Cobber 21-28 Fed 6H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Permit Plan 2	Database:	EDM r5000.141_Prod US

Project	Lea County (NAD83 New Mexico East)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Sec 21-T26S-R34E				
Site Position:		Northing:	372,767.99 usft	Latitude:	32.021870
From:	Map	Easting:	809,394.37 usft	Longitude:	-103.468410
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.46 °

Well	Cobber 21-28 Fed 6H					
Well Position	+N/-S	0.00 ft	Northing:	377,756.14 usft	Latitude:	32.035596
	+E/-W	0.00 ft	Easting:	808,717.84 usft	Longitude:	-103.470464
Position Uncertainty		0.50 ft	Wellhead Elevation:	ft	Ground Level:	3,307.40 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	9/18/2019	6.65	59.88	47,606.13207187

Design	Permit Plan 2				
Audit Notes:					
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00	
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	179.57	

Survey Tool Program	Date	9/19/2019			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.00	20,564.16	Permit Plan 2 (Wellbore #1)	MWD+HDGM	OWSG MWD + HDGM	

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
100.00	0.00	0.00	100.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
200.00	0.00	0.00	200.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
300.00	0.00	0.00	300.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
400.00	0.00	0.00	400.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
500.00	0.00	0.00	500.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
600.00	0.00	0.00	600.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
700.00	0.00	0.00	700.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
800.00	0.00	0.00	800.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
900.00	0.00	0.00	900.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
1,000.00	0.00	0.00	1,000.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
1,100.00	0.00	0.00	1,100.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464

Survey Report - Geographic

Company: WCDCS Permian NM	Local Co-ordinate Reference: Well Cobber 21-28 Fed 6H
Project: Lea County (NAD83 New Mexico East)	TVD Reference: RKB @ 3332.40ft
Site: Sec 21-T26S-R34E	MD Reference: RKB @ 3332.40ft
Well: Cobber 21-28 Fed 6H	North Reference: Grid
Wellbore: Wellbore #1	Survey Calculation Method: Minimum Curvature
Design: Permit Plan 2	Database: EDM r5000.141_Prod US

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,200.00	0.00	0.00	1,200.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
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1,800.00	0.00	0.00	1,800.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
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2,100.00	0.00	0.00	2,100.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
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2,400.00	0.00	0.00	2,400.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
2,500.00	0.00	0.00	2,500.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
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3,600.00	0.00	0.00	3,600.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
3,700.00	0.00	0.00	3,700.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
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4,200.00	0.00	0.00	4,200.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
4,300.00	0.00	0.00	4,300.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
4,400.00	0.00	0.00	4,400.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
4,500.00	0.00	0.00	4,500.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
4,600.00	0.00	0.00	4,600.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
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4,800.00	0.00	0.00	4,800.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
4,900.00	0.00	0.00	4,900.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
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5,100.00	0.00	0.00	5,100.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
5,200.00	0.00	0.00	5,200.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
5,300.00	0.00	0.00	5,300.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
5,400.00	0.00	0.00	5,400.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
5,500.00	0.00	0.00	5,500.00	0.00	0.00	377,756.14	808,717.84	32.035596	-103.470464
5,600.00	1.50	357.59	5,599.99	1.31	-0.06	377,757.45	808,717.78	32.035599	-103.470464
5,700.00	3.00	357.59	5,699.91	5.23	-0.22	377,761.37	808,717.62	32.035610	-103.470465
5,786.15	4.29	357.59	5,785.88	10.70	-0.45	377,766.84	808,717.39	32.035625	-103.470465
5,800.00	4.29	357.59	5,799.69	11.74	-0.50	377,767.88	808,717.34	32.035628	-103.470465
5,900.00	4.29	357.59	5,899.41	19.22	-0.81	377,775.36	808,717.03	32.035649	-103.470466
6,000.00	4.29	357.59	5,999.13	26.69	-1.13	377,782.83	808,716.71	32.035669	-103.470467
6,100.00	4.29	357.59	6,098.85	34.17	-1.44	377,790.31	808,716.40	32.035690	-103.470468
6,200.00	4.29	357.59	6,198.57	41.65	-1.76	377,797.79	808,716.08	32.035710	-103.470469
6,300.00	4.29	357.59	6,298.29	49.13	-2.07	377,805.27	808,715.77	32.035731	-103.470469
6,400.00	4.29	357.59	6,398.01	56.61	-2.39	377,812.74	808,715.45	32.035751	-103.470470
6,500.00	4.29	357.59	6,497.73	64.08	-2.70	377,820.22	808,715.14	32.035772	-103.470471

Survey Report - Geographic

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Cobber 21-28 Fed 6H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3332.40ft
Site:	Sec 21-T26S-R34E	MD Reference:	RKB @ 3332.40ft
Well:	Cobber 21-28 Fed 6H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Permit Plan 2	Database:	EDM r5000.141_Prod US

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,600.00	4.29	357.59	6,597.45	71.56	-3.02	377,827.70	808,714.82	32.035792	-103.470472
6,700.00	4.29	357.59	6,697.17	79.04	-3.33	377,835.18	808,714.51	32.035813	-103.470473
6,800.00	4.29	357.59	6,796.89	86.52	-3.65	377,842.65	808,714.19	32.035834	-103.470474
6,900.00	4.29	357.59	6,896.61	93.99	-3.96	377,850.13	808,713.87	32.035854	-103.470474
7,000.00	4.29	357.59	6,996.33	101.47	-4.28	377,857.61	808,713.56	32.035875	-103.470475
7,100.00	4.29	357.59	7,096.05	108.95	-4.59	377,865.09	808,713.24	32.035895	-103.470476
7,200.00	4.29	357.59	7,195.77	116.43	-4.91	377,872.56	808,712.93	32.035916	-103.470477
7,300.00	4.29	357.59	7,295.49	123.90	-5.22	377,880.04	808,712.61	32.035936	-103.470478
7,400.00	4.29	357.59	7,395.21	131.38	-5.54	377,887.52	808,712.30	32.035957	-103.470479
7,500.00	4.29	357.59	7,494.93	138.86	-5.86	377,895.00	808,711.98	32.035977	-103.470479
7,600.00	4.29	357.59	7,594.65	146.34	-6.17	377,902.48	808,711.67	32.035998	-103.470480
7,700.00	4.29	357.59	7,694.36	153.82	-6.49	377,909.95	808,711.35	32.036019	-103.470481
7,719.81	4.29	357.59	7,714.12	155.30	-6.55	377,911.43	808,711.29	32.036023	-103.470481
7,800.00	3.09	357.59	7,794.14	160.45	-6.77	377,916.59	808,711.07	32.036037	-103.470482
7,900.00	1.59	357.59	7,894.06	164.53	-6.94	377,920.67	808,710.90	32.036048	-103.470482
8,000.00	0.09	357.59	7,994.04	166.00	-7.00	377,922.13	808,710.84	32.036052	-103.470482
8,005.96	0.00	0.00	8,000.00	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
8,100.00	0.00	0.00	8,094.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
8,200.00	0.00	0.00	8,194.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
8,300.00	0.00	0.00	8,294.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
8,400.00	0.00	0.00	8,394.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
8,500.00	0.00	0.00	8,494.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
8,600.00	0.00	0.00	8,594.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
8,700.00	0.00	0.00	8,694.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
8,800.00	0.00	0.00	8,794.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
8,900.00	0.00	0.00	8,894.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
9,000.00	0.00	0.00	8,994.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
9,100.00	0.00	0.00	9,094.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
9,200.00	0.00	0.00	9,194.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
9,300.00	0.00	0.00	9,294.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
9,400.00	0.00	0.00	9,394.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
9,500.00	0.00	0.00	9,494.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
9,600.00	0.00	0.00	9,594.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
9,700.00	0.00	0.00	9,694.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
9,800.00	0.00	0.00	9,794.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
9,900.00	0.00	0.00	9,894.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
10,000.00	0.00	0.00	9,994.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
10,100.00	0.00	0.00	10,094.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
10,200.00	0.00	0.00	10,194.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
10,300.00	0.00	0.00	10,294.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
10,400.00	0.00	0.00	10,394.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
10,500.00	0.00	0.00	10,494.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
10,600.00	0.00	0.00	10,594.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
10,700.00	0.00	0.00	10,694.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
10,800.00	0.00	0.00	10,794.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
10,900.00	0.00	0.00	10,894.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
11,000.00	0.00	0.00	10,994.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
11,100.00	0.00	0.00	11,094.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
11,200.00	0.00	0.00	11,194.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
11,300.00	0.00	0.00	11,294.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
11,400.00	0.00	0.00	11,394.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
11,500.00	0.00	0.00	11,494.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
11,600.00	0.00	0.00	11,594.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
11,700.00	0.00	0.00	11,694.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
11,800.00	0.00	0.00	11,794.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482

Survey Report - Geographic

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Cobber 21-28 Fed 6H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3332.40ft
Site:	Sec 21-T26S-R34E	MD Reference:	RKB @ 3332.40ft
Well:	Cobber 21-28 Fed 6H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Permit Plan 2	Database:	EDM r5000.141_Prod US

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
11,900.00	0.00	0.00	11,894.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
12,000.00	0.00	0.00	11,994.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
12,100.00	0.00	0.00	12,094.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
12,200.00	0.00	0.00	12,194.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
12,300.00	0.00	0.00	12,294.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
12,393.00	0.00	0.00	12,387.04	166.00	-7.00	377,922.14	808,710.84	32.036052	-103.470482
KOP @ 12393' MD, 50' FNL, 1300' FEL									
12,400.00	0.70	179.52	12,394.04	165.96	-7.00	377,922.10	808,710.84	32.036052	-103.470482
12,500.00	10.70	179.52	12,493.42	156.04	-6.92	377,912.18	808,710.92	32.036250	-103.470482
12,600.00	20.70	179.52	12,589.57	129.01	-6.69	377,885.15	808,711.15	32.035950	-103.470482
12,634.15	24.12	179.52	12,621.13	116.00	-6.58	377,872.14	808,711.25	32.035915	-103.470482
FTP @ 12634' MD, 100' FNL, 1300' FEL									
12,700.00	30.70	179.52	12,679.56	85.70	-6.33	377,841.84	808,711.51	32.035831	-103.470482
12,800.00	40.70	179.52	12,760.67	27.43	-5.85	377,783.56	808,711.99	32.035671	-103.470482
12,900.00	50.70	179.52	12,830.42	-44.05	-5.26	377,712.09	808,712.58	32.035475	-103.470482
13,000.00	60.70	179.52	12,886.70	-126.55	-4.57	377,629.59	808,713.27	32.035248	-103.470482
13,100.00	70.70	179.52	12,927.80	-217.57	-3.81	377,538.56	808,714.02	32.034998	-103.470482
13,200.00	80.70	179.52	12,952.47	-314.35	-3.01	377,441.79	808,714.83	32.034732	-103.470482
13,293.00	90.00	179.52	12,960.00	-406.94	-2.24	377,349.20	808,715.60	32.034477	-103.470482
13,300.00	90.00	179.52	12,960.00	-413.94	-2.18	377,342.20	808,715.66	32.034458	-103.470482
13,400.00	90.00	179.52	12,960.00	-513.94	-1.35	377,242.20	808,716.49	32.034183	-103.470482
13,500.00	90.00	179.52	12,960.00	-613.93	-0.52	377,142.21	808,717.32	32.033908	-103.470482
13,600.00	90.00	179.52	12,960.00	-713.93	0.31	377,042.21	808,718.15	32.033633	-103.470481
13,700.00	90.00	179.52	12,960.00	-813.92	1.14	376,942.22	808,718.98	32.033358	-103.470481
13,800.00	90.00	179.52	12,960.00	-913.92	1.97	376,842.22	808,719.81	32.033084	-103.470481
13,900.00	90.00	179.52	12,960.00	-1,013.92	2.80	376,742.22	808,720.64	32.032809	-103.470481
14,000.00	90.00	179.52	12,960.00	-1,113.91	3.63	376,642.23	808,721.47	32.032534	-103.470481
14,100.00	90.00	179.52	12,960.00	-1,213.91	4.46	376,542.23	808,722.30	32.032259	-103.470481
14,200.00	90.00	179.52	12,960.00	-1,313.91	5.29	376,442.23	808,723.13	32.031984	-103.470481
14,300.00	90.00	179.52	12,960.00	-1,413.90	6.12	376,342.24	808,723.96	32.031709	-103.470481
14,400.00	90.00	179.52	12,960.00	-1,513.90	6.96	376,242.24	808,724.79	32.031434	-103.470481
14,500.00	90.00	179.52	12,960.00	-1,613.90	7.79	376,142.24	808,725.62	32.031159	-103.470480
14,600.00	90.00	179.52	12,960.00	-1,713.89	8.62	376,042.25	808,726.45	32.030885	-103.470480
14,700.00	90.00	179.52	12,960.00	-1,813.89	9.45	375,942.25	808,727.29	32.030610	-103.470480
14,800.00	90.00	179.52	12,960.00	-1,913.89	10.28	375,842.26	808,728.12	32.030335	-103.470480
14,900.00	90.00	179.52	12,960.00	-2,013.88	11.11	375,742.26	808,728.95	32.030060	-103.470480
15,000.00	90.00	179.52	12,960.00	-2,113.88	11.94	375,642.26	808,729.78	32.029785	-103.470480
15,100.00	90.00	179.52	12,960.00	-2,213.88	12.77	375,542.27	808,730.61	32.029510	-103.470480
15,200.00	90.00	179.52	12,960.00	-2,313.87	13.60	375,442.27	808,731.44	32.029235	-103.470480
15,300.00	90.00	179.52	12,960.00	-2,413.87	14.43	375,342.27	808,732.27	32.028960	-103.470480
15,400.00	90.00	179.52	12,960.00	-2,513.87	15.26	375,242.28	808,733.10	32.028686	-103.470480
15,500.00	90.00	179.52	12,960.00	-2,613.86	16.09	375,142.28	808,733.93	32.028411	-103.470479
15,600.00	90.00	179.52	12,960.00	-2,713.86	16.92	375,042.28	808,734.76	32.028136	-103.470479
15,700.00	90.00	179.52	12,960.00	-2,813.86	17.75	374,942.29	808,735.59	32.027861	-103.470479
15,800.00	90.00	179.52	12,960.00	-2,913.85	18.58	374,842.29	808,736.42	32.027586	-103.470479
15,900.00	90.00	179.52	12,960.00	-3,013.85	19.42	374,742.30	808,737.25	32.027311	-103.470479
16,000.00	90.00	179.52	12,960.00	-3,113.85	20.25	374,642.30	808,738.08	32.027036	-103.470479
16,100.00	90.00	179.52	12,960.00	-3,213.84	21.08	374,542.30	808,738.91	32.026761	-103.470479
16,200.00	90.00	179.52	12,960.00	-3,313.84	21.91	374,442.31	808,739.75	32.026487	-103.470479
16,300.00	90.00	179.52	12,960.00	-3,413.84	22.74	374,342.31	808,740.58	32.026212	-103.470479
16,400.00	90.00	179.52	12,960.00	-3,513.83	23.57	374,242.31	808,741.41	32.025937	-103.470479
16,500.00	90.00	179.52	12,960.00	-3,613.83	24.40	374,142.32	808,742.24	32.025662	-103.470478
16,600.00	90.00	179.52	12,960.00	-3,713.82	25.23	374,042.32	808,743.07	32.025387	-103.470478
16,700.00	90.00	179.52	12,960.00	-3,813.82	26.06	373,942.32	808,743.90	32.025112	-103.470478
16,800.00	90.00	179.52	12,960.00	-3,913.82	26.89	373,842.33	808,744.73	32.024837	-103.470478

Survey Report - Geographic

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Cobber 21-28 Fed 6H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3332.40ft
Site:	Sec 21-T26S-R34E	MD Reference:	RKB @ 3332.40ft
Well:	Cobber 21-28 Fed 6H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Permit Plan 2	Database:	EDM r5000.141_Prod US

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
16,900.00	90.00	179.52	12,960.00	-4,013.81	27.72	373,742.33	808,745.56	32.024562	-103.470478
17,000.00	90.00	179.52	12,960.00	-4,113.81	28.55	373,642.34	808,746.39	32.024288	-103.470478
17,100.00	90.00	179.52	12,960.00	-4,213.81	29.38	373,542.34	808,747.22	32.024013	-103.470478
17,200.00	90.00	179.52	12,960.00	-4,313.80	30.21	373,442.34	808,748.05	32.023738	-103.470478
17,300.00	90.00	179.52	12,960.00	-4,413.80	31.05	373,342.35	808,748.88	32.023463	-103.470478
17,400.00	90.00	179.52	12,960.00	-4,513.80	31.88	373,242.35	808,749.71	32.023188	-103.470477
17,500.00	90.00	179.52	12,960.00	-4,613.79	32.71	373,142.35	808,750.54	32.022913	-103.470477
17,600.00	90.00	179.52	12,960.00	-4,713.79	33.54	373,042.36	808,751.38	32.022638	-103.470477
17,700.00	90.00	179.52	12,960.00	-4,813.79	34.37	372,942.36	808,752.21	32.022363	-103.470477
17,800.00	90.00	179.52	12,960.00	-4,913.78	35.20	372,842.36	808,753.04	32.022089	-103.470477
17,900.00	90.00	179.52	12,960.00	-5,013.78	36.03	372,742.37	808,753.87	32.021814	-103.470477
17,948.00	90.00	179.52	12,960.00	-5,061.78	36.43	372,694.37	808,754.27	32.021682	-103.470477
Cross section @ 17948' MD, 0' FNL, 1300' FEL									
18,000.00	90.00	179.52	12,960.00	-5,113.78	36.86	372,642.37	808,754.70	32.021539	-103.470477
18,100.00	90.00	179.52	12,960.00	-5,213.77	37.69	372,542.38	808,755.53	32.021264	-103.470477
18,200.00	90.00	179.52	12,960.00	-5,313.77	38.52	372,442.38	808,756.36	32.020989	-103.470477
18,300.00	90.00	179.52	12,960.00	-5,413.77	39.35	372,342.38	808,757.19	32.020714	-103.470477
18,400.00	90.00	179.52	12,960.00	-5,513.76	40.18	372,242.39	808,758.02	32.020439	-103.470476
18,500.00	90.00	179.52	12,960.00	-5,613.76	41.01	372,142.39	808,758.85	32.020164	-103.470476
18,600.00	90.00	179.52	12,960.00	-5,713.76	41.84	372,042.39	808,759.68	32.019890	-103.470476
18,700.00	90.00	179.52	12,960.00	-5,813.75	42.67	371,942.40	808,760.51	32.019615	-103.470476
18,800.00	90.00	179.52	12,960.00	-5,913.75	43.51	371,842.40	808,761.34	32.019340	-103.470476
18,900.00	90.00	179.52	12,960.00	-6,013.75	44.34	371,742.40	808,762.17	32.019065	-103.470476
19,000.00	90.00	179.52	12,960.00	-6,113.74	45.17	371,642.41	808,763.00	32.018790	-103.470476
19,100.00	90.00	179.52	12,960.00	-6,213.74	46.00	371,542.41	808,763.84	32.018515	-103.470476
19,200.00	90.00	179.52	12,960.00	-6,313.74	46.83	371,442.42	808,764.67	32.018240	-103.470476
19,300.00	90.00	179.52	12,960.00	-6,413.73	47.66	371,342.42	808,765.50	32.017965	-103.470476
19,400.00	90.00	179.52	12,960.00	-6,513.73	48.49	371,242.42	808,766.33	32.017690	-103.470475
19,500.00	90.00	179.52	12,960.00	-6,613.72	49.32	371,142.43	808,767.16	32.017416	-103.470475
19,600.00	90.00	179.52	12,960.00	-6,713.72	50.15	371,042.43	808,767.99	32.017141	-103.470475
19,700.00	90.00	179.52	12,960.00	-6,813.72	50.98	370,942.43	808,768.82	32.016866	-103.470475
19,800.00	90.00	179.52	12,960.00	-6,913.71	51.81	370,842.44	808,769.65	32.016591	-103.470475
19,900.00	90.00	179.52	12,960.00	-7,013.71	52.64	370,742.44	808,770.48	32.016316	-103.470475
20,000.00	90.00	179.52	12,960.00	-7,113.71	53.47	370,642.45	808,771.31	32.016041	-103.470475
20,100.00	90.00	179.52	12,960.00	-7,213.70	54.30	370,542.45	808,772.14	32.015766	-103.470475
20,200.00	90.00	179.52	12,960.00	-7,313.70	55.14	370,442.45	808,772.97	32.015491	-103.470475
20,300.00	90.00	179.52	12,960.00	-7,413.70	55.97	370,342.46	808,773.80	32.015217	-103.470474
20,400.00	90.00	179.52	12,960.00	-7,513.69	56.80	370,242.46	808,774.63	32.014942	-103.470474
20,484.16	90.00	179.52	12,960.00	-7,597.85	57.50	370,158.30	808,775.33	32.014710	-103.470474
LTP @ 20484' MD, 2539' FNL, 1300' FEL									
20,500.00	90.00	179.52	12,960.00	-7,613.69	57.63	370,142.46	808,775.47	32.014667	-103.470474
20,564.15	90.00	179.52	12,960.00	-7,677.84	58.16	370,078.32	808,776.00	32.014491	-103.470474
PBHL; 2619' FNL, 1300' FEL									
20,564.16	90.00	179.52	12,960.00	-7,677.85	58.16	370,078.31	808,776.00	32.014491	-103.470474

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PBHL - Cobber 21-28 Fe	0.00	0.00	0.00	-7,677.85	58.16	370,078.31	808,776.00	32.014491	-103.470474
- hit/miss target									
- plan misses target center by 7678.07ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Point									

Survey Report - Geographic

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Cobber 21-28 Fed 6H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3332.40ft
Site:	Sec 21-T26S-R34E	MD Reference:	RKB @ 3332.40ft
Well:	Cobber 21-28 Fed 6H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Permit Plan 2	Database:	EDM r5000.141_Prod US

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
12,393	12,387	166	-7	KOP @ 12393' MD, 50' FNL, 1300' FEL
12,634	12,621	116	-7	FTP @ 12634' MD, 100' FNL, 1300' FEL
17,948	12,960	-5062	36	Cross section @ 17948' MD, 0' FNL, 1300' FEL
20,484	12,960	-7598	57	LTP @ 20484' MD, 2539' FNL, 1300' FEL
20,564	12,960	-7678	58	PBHL; 2619' FNL, 1300' FEL

Checked By: _____ Approved By: _____ Date: _____

WCDSC Permian NM

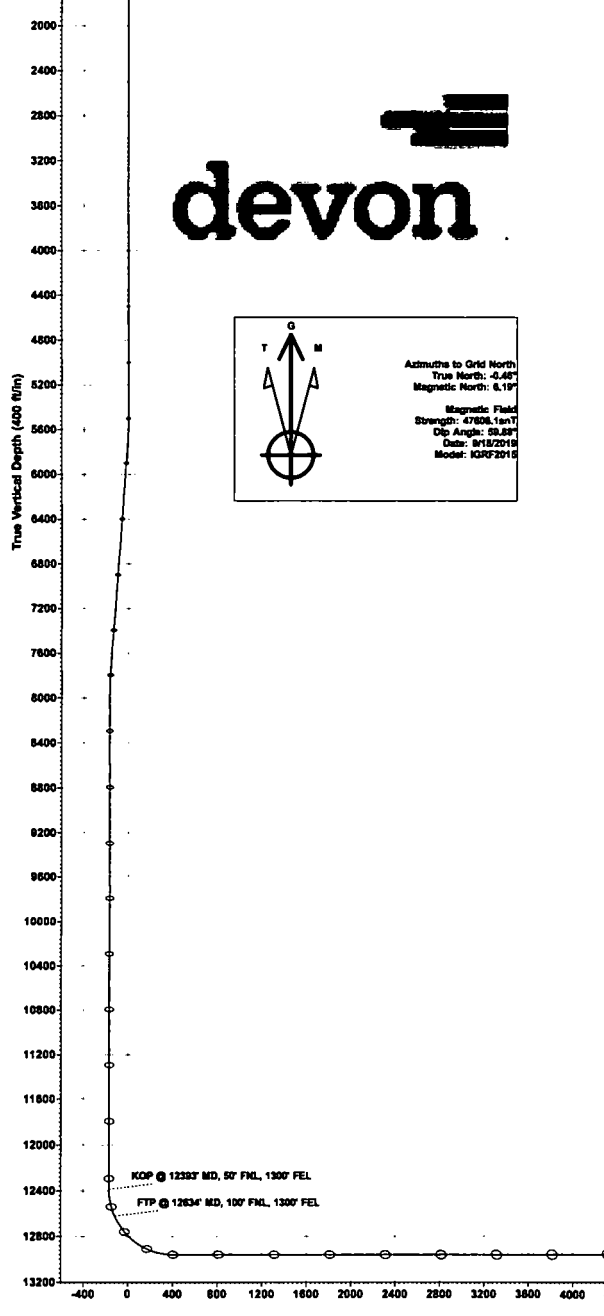
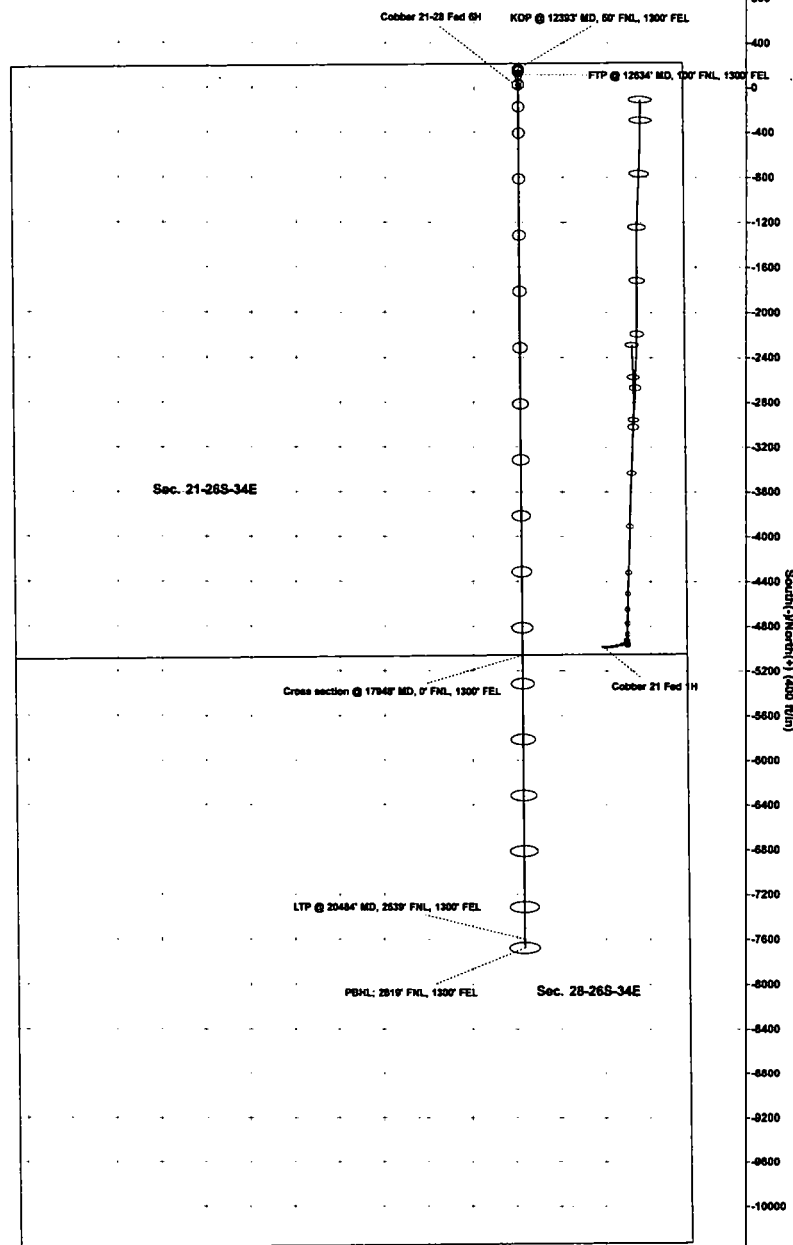
WELL DETAILS: Cobber 21-28 Fed 6H

RKB @ 3332 40R
3307.40
Northing 377756.14 Easting 808717.84 Latitude 32.035596 Longitude -103.470464

SECTION DETAILS Permit Plan 2

MD	Inc	Adj	TVD	+N-S	+E-W	Diag	VSec	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5500.00	0.00	0.00	5500.00	0.00	0.00	0.00	0.00	
5798.13	4.29	357.59	5785.88	10.70	-0.45	1.50	-10.71	
7712.81	4.29	357.59	7714.12	155.30	-6.55	0.50	-155.34	
8000.00	0.00	0.00	8000.00	166.00	-7.00	1.50	-166.00	
8	12383.00	0.00	12387.04	166.00	-7.00	0.00	-166.00	KOP @ 12383' MD, 50' FNL, 1300' FEL
7	13253.00	80.00	12969.00	-408.34	-2.24	10.00	408.91	
8	20584.10	80.00	12969.00	-7877.85	58.18	0.00	7878.07	PBHL: 2819' FNL, 1300' FEL

West(-)/East(+) (350 ft/in)



Azimuths to Grid North
 True North: -0.48°
 Magnetic North: 6.19°
 Magnetic Field
 Strength: 47808.1anT
 Dip Angle: 68.88°
 Date: 8/18/2018
 Model: IGRF2015

Vertical Section at 179.57° (400 ft/in)

1. Geologic Formations

TVD of target	12960	Pilot hole depth	N/A
MD at TD:	20564	Deepest expected fresh water	

Basin

Formation	Depth (TVD) from KB	Water/Mineral Bearing/Target Zone?	Hazards*
Rustler	700		
Salado	1100		
Base of Salt	5090		
Delaware	5350		
1BSLM	8500		
Bone Spring 1st	9650		
Bone Spring 2nd	10075		
Bone Spring 3rd	12250		
Wolfcamp	12650		

*H2S, water flows, loss of circulation, abnormal pressures, etc.

Cobber 21-28 Fed 6H

2. Casing Program (Primary Design)

Hole Size	Casing Interval		Csg. Size	Wt (PPF)	Grade	Conn	Min SF Collapse	Min SF Burst	Min SF Tension
	From	To							
17 1/2	0	725 TVD	13 3/8	48.0	H40	STC	1.125	1.25	1.6
9 7/8	0	12250 TVD	7 5/8	29.7	P110	Flushmax III	1.125	1.25	1.6
6 3/4	0	TD	5 1/2	20.0	P110	Vam SG	1.125	1.25	1.6
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 IILB.1.h Must have table for contingency casing.
- Rustler top will be validated via drilling parameters (i.e. reduction in ROP) and surface casing setting depth revised accordingly if needed.
- A variance is requested for collapse rating on intermediate casing. Operator will keep pipe full while running casing.
- Int casing shoe will be selected based on drilling data/gamma, setting depth with be revised accordingly if needed.
- A variance is requested to wave the centralizer requirement for the Intermediate casing and production casing.
- A variance is requested to set intermediate casing in the curve if hole conditions dictate that a higher shoe strength is required.

Casing Program (Alternative Design)

Hole Size	Casing Interval		Csg. Size	Wt (PPF)	Grade	Conn	Min SF Collapse	Min SF Burst	Min SF Tension
	From	To							
17 1/2	0	725 TVD	13 3/8	48.0	H40	STC	1.125	1.25	1.6
9 7/8	0	12250 TVD	8 5/8	32.0	P110	TLW	1.125	1.25	1.6
7 7/8	0	TD	5 1/2	17.0	P110	BTC	1.125	1.25	1.6
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 IILB.1.h Must have table for contingency casing.
- Rustler top will be validated via drilling parameters (i.e. reduction in ROP) and surface casing setting depth revised accordingly if needed.
- A variance is requested for collapse rating on intermediate casing. Operator will keep pipe full while running casing.
- Int casing shoe will be selected based on drilling data/gamma, setting depth with be revised accordingly if needed.
- A variance is requested to wave the centralizer requirement for the Intermediate casing and production casing.
- Variance requested to drill 10.625" hole instead of 9.875" for intermediate 1, the 8.625" connection will change from TLW to BTC.
- A variance is requested to set intermediate casing in the curve if hole conditions dictate that a higher shoe strength is required.

Cobber 21-28 Fed 6H

	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?	
Is well within the designated 4 string boundary.	
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3 rd string cement tied back 500' into previous casing?	
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	
Is 2 nd string set 100' to 600' below the base of salt?	
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

3. Cementing Program (Primary Design)

Casing	# Sks	TOC	Wt. (lb/gal)	Yld (ft ³ /sack)	Slurry Description
Surface	563	Surf	13.2	1.44	Lead: Class C Cement + additives
Int 1	768	Surf	9	3.27	Lead: Class C Cement + additives
	783	4000' above shoe	13.2	1.44	Tail: Class H / C + additives
Int 1 Two Stage w/ DV @ TVD of Delaware	965	Surf	9	3.27	1st stage Lead: Class C Cement + additives
	93	500' above shoe	13.2	1.44	1st stage Tail: Class H / C + additives
	464	Surf	9	3.27	2nd stage Lead: Class C Cement + additives
	93	500' above DV	13.2	1.44	2nd stage Tail: Class H / C + additives
Int 1 Intermediate Squeeze	As Needed	Surf	9	1.44	Squeeze Lead: Class C Cement + additives
	768	Surf	9	3.27	Lead: Class C Cement + additives
	783	4000' above shoe	13.2	1.44	Tail: Class H / C + additives
Production	62	10393	9.0	3.3	Lead: Class H / C + additives
	521	12393	13.2	1.4	Tail: Class H / C + additives

If a DV tool is ran the depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. Slurry weights will be adjusted based on estimated fracture gradient of the formation. DV tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe. If cement is not returned to surface during the primary cement job on the surface casing string, a planned top job will be conducted immediately after completion of the primary job.

Casing String	% Excess
Surface	50%
Intermediate 1	30%
Intermediate 1 (Two Stage)	25%
Prod	10%

3. Cementing Program (Alternative Design)

Casing	# Sk	TOC	Wt. ppg	Yld (ft ³ /sack)	Slurry Description
Surface	563	Surf	13.2	1.44	Lead: Class C Cement + additives
Int 1	483	Surf	9	3.27	Lead: Class C Cement + additives
	465	4000' above shoe	13.2	1.44	Tail: Class H / C + additives
Int 1 Two Stage w DV @ ~4500	567	Surf	9	3.27	1st stage Lead: Class C Cement + additives
	55	500' above shoe	13.2	1.44	1st stage Tail: Class H / C + additives
	304	Surf	9	3.27	2nd stage Lead: Class C Cement + additives
	55	500' above DV	13.2	1.44	2nd stage Tail: Class H / C + additives
Int 1 Intermediate Squeeze	As Needed	Surf	13.2	1.44	Squeeze Lead: Class C Cement + additives
	483	Surf	9	3.27	Lead: Class C Cement + additives
	465	4000' above shoe	13.2	1.44	Tail: Class H / C + additives
Int 1 (10.625" Hole Size)	734	Surf	9	3.27	Lead: Class C Cement + additives
	768	4000' above shoe	13.2	1.44	Tail: Class H / C + additives
Production	117	10393	9.0	3.3	Lead: Class H / C + additives
	1081	12393	13.2	1.4	Tail: Class H / C + additives

If a DV tool is ran the depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. Slurry weights will be adjusted based on estimated fracture gradient of the formation. DV tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe. If cement is not returned to surface during the primary cement job on the surface casing string, a planned top job will be conducted immediately after completion of the primary job.

Casing String	% Excess
Surface	50%
Intermediate 1	30%
Intermediate 1 (Two Stage)	25%
Prod	10%

4. Pressure Control Equipment (Three String Design)

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
Int 1	13-58"	5M	Annular	X	50% of rated working pressure
			Blind Ram	X	
			Pipe Ram		5M
			Double Ram	X	
			Other*		
Production	13-5/8"	10M	Annular (5M)	X	100% of rated working pressure
			Blind Ram	X	
			Pipe Ram		10M
			Double Ram	X	
			Other*		
			Annular (5M)		
			Blind Ram		
			Pipe Ram		
			Double Ram		
			Other*		
N	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.				
Y	A variance is requested to run a 5 M annular on a 10M system				

5. Mud Program (Three String Design)

Section	Type	Weight (ppg)
Surface	FW Gel	8.5-9
Intermediate	DBE / Cut Brine	10-10.5
Production	OBM	10-10.5

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 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? If yes, explain.
	Coring? If yes, explain.

Additional logs planned	Interval
Resistivity	Int. shoe to KOP
Density	Int. shoe to KOP
X CBL	Production casing
X Mud log	Intermediate shoe to TD
PEX	

7. Drilling Conditions

Condition	Specify what type and where?
BH pressure at deepest TVD	7076
Abnormal temperature	No

Mitigation measure for abnormal conditions. Describe. Lost circulation material/sweeps/mud scavengers.

Hydrogen Sulfide (H ₂ S) monitors will be installed prior to drilling out the surface shoe. If H ₂ S 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.	
N	H ₂ S is present
Y	H ₂ S plan attached.

8. Other facets of operation

Is this a walking operation? Potentially

- 1 If operator elects, drilling rig will batch drill the surface holes and run/cement surface casing; walking the rig to next wells on the pad.
- 2 The drilling rig will then batch drill the intermediate sections and run/cement intermediate casing; the wellbore will be isolated with a blind flange and pressure gauge installed for monitoring the well before walking to the next well.
- 3 The drilling rig will then batch drill the production hole sections on the wells with OBM, run/cement production casing, and install TA caps or tubing heads for completions.

NOTE: During batch operations the drilling rig will be moved from well to well however, it will not be removed from the pad until all wells have production casing run/cemented.

Will be pre-setting casing? Potentially

- 1 Spudder rig will move in and batch drill surface hole.
 - a. Rig will utilize fresh water based mud to drill surface hole to TD. Solids control will be handled entirely on a closed loop basis.,
- 2 After drilling the surface hole section, the spudder rig will run casing and cement following all of the applicable rules and regulations (OnShore Order 2, all COAs and NMOCD regulations).
- 3 The wellhead will be installed and tested once the surface casing is cut off and the WOC time has been reached.
- 4 A blind flange with the same pressure rating as the wellhead will be installed to seal the wellbore. Pressure will be monitored with a pressure gauge installed on the wellhead.
- 5 Spudder rig operations is expected to take 4-5 days per well on a multi-well pa.
- 6 The NMOCD will be contacted and notified 24 hours prior to commencing spudder rig operations.
- 7 Drilling operations will be performed with drilling rig. A that time an approved BOP stack will be nipped up and tested on the wellhead before drilling operations commences on each well.
 - a. The NMOCD will be contacted / notified 24 hours before the drilling rig moves back on to the pad with the pre-set surface casing.

Attachments

- X Directional Plan
 Other, describe

A multibowl wellhead may be used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested.

Devon proposes using a multi-bowl wellhead assembly. 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.

- Wellhead will be installed by wellhead representatives.
- If the welding is performed by a third party, the wellhead representative will monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
- Wellhead representative will install the test plug for the initial BOP test.
- Wellhead company will install a solid steel body pack-off to completely isolate the lower head after cementing intermediate casing. After installation of the pack-off, the pack-off and the lower flange will be tested to 5M, as shown on the attached schematic. Everything above the pack-off will not have been altered whatsoever from the initial nipple up. Therefore the BOP components will not be retested at that time.
- If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head will be cut and top out operations will be conducted.
- Devon will pressure test all seals above and below the mandrel (but still above the casing) to full working pressure rating.
- Devon will test the casing to 0.22 psi/ft or 1500 psi, whichever is greater, as per Onshore Order #2.

After running the surface casing, a 13-5/8" BOP/BOPE system with a minimum rating of 5M will be installed on the wellhead system and will undergo a 250 psi low pressure test followed by a 5,000 psi high pressure test. The 5,000 psi high and 250 psi low test will cover testing requirements a maximum of 30 days, as per Onshore Order #2. If the well is not complete within 30 days of this BOP test, another full BOP test will be conducted, as per Onshore Order #2.

After running the intermediate casing with a mandrel hanger, the 13-5/8" BOP/BOPE system with a minimum rating of 10M will be installed and tested, with 5M annular being tested to 100% of rated working pressure.

The pipe rams will be operated and checked each 24 hour period and each time the drill pipe is out of the hole. These tests will be logged in the daily driller's log. A 2" kill line and 3" choke line will be incorporated into the drilling spool below the ram BOP. In addition to the rams and annular preventer, additional BOP accessories include a kelly cock, floor safety valve, choke lines, and choke manifold rated at 10,000 psi WP.

Devon's proposed wellhead manufactures will be FMC Technologies, Cactus Wellhead, or Cameron.

Devon Energy Annular Preventer Summary

1. Component and Preventer Compatibility Table

The table below, which covers the drilling and casing of the 10M MASP portion of the well, outlines the tubulars and the compatible preventers in use. This table, combined with the mud program, documents that two barriers to flow can be maintained at all times, independent of the rating of the annular preventer.

6-3/4" Production hole section, 10M requirement

Component	OD	Preventer	RWP
Drillpipe	4.5"	Fixed lower 4.5" Upper 4.5-7" VBR	10M
HWDP	4.5"	Fixed lower 4.5" Upper 4.5-7" VBR	10M
Drill collars and MWD tools	4.75"	Upper 4.5-7" VBR	10M
Mud Motor	4.75"	Upper 4.5-7" VBR	10M
Production casing	5.5"	Upper 4.5-7" VBR	10M
ALL	0-13-5/8"	Annular	5M
Open-hole	-	Blind Rams	10M

VBR = Variable Bore Ram. Compatible range listed in chart.

2. Well Control Procedures

Well control procedures are specific to the rig equipment and the operation at the time the kick occurs. Below are the minimal high-level tasks prescribed to assure a proper shut-in while drilling, tripping, running casing, pipe out of the hole (open hole), and moving the BHA through the BOPs. The pressure at which control is swapped from the annular to another compatible ram is variable, but the operator will document in the submission their operating pressure limit. The operator may chose an operating pressure less than or equal to RWP, but in no case will it exceed the RWP of the annular preventer.

General Procedure While Drilling

1. Sound alarm (alert crew)
2. Space out drill string
3. Shut down pumps (stop pumps and rotary)
4. Shut-in Well (uppermost applicable BOP, typically annular preventer first. HCR and choke will already be in the closed position.)
5. Confirm shut-in
6. Notify toolpusher/company representative
7. Read and record the following:
 - a. SIDPP and SICP
 - b. Pit gain
 - c. Time
8. Regroup and identify forward plan
9. If pressure has built or is anticipated during the kill to reach the RWP of the annular preventer, confirm spacing and swap to the upper pipe ram.

Devon Energy Annular Preventer Summary

General Procedure While Tripping

1. Sound alarm (alert crew)
2. Stab full opening safety valve and close
3. Space out drill string
4. Shut-in (uppermost applicable BOP, typically annular preventer first. HCR and choke will already be in the closed position.)
5. Confirm shut-in
6. Notify toolpusher/company representative
7. Read and record the following:
 - a. SIDPP and SICP
 - b. Pit gain
 - c. Time
8. Regroup and identify forward plan
9. If pressure has built or is anticipated during the kill to reach the RWP of the annular preventer, confirm spacing and swap to the upper pipe ram.

General Procedure While Running Casing

1. Sound alarm (alert crew)
2. Stab crossover and full opening safety valve and close
3. Space out string
4. Shut-in (uppermost applicable BOP, typically annular preventer first. HCR and choke will already be in the closed position.)
5. Confirm shut-in
6. Notify toolpusher/company representative
7. Read and record the following:
 - a. SIDPP and SICP
 - b. Pit gain
 - c. Time
8. Regroup and identify forward plan
9. If pressure has built or is anticipated during the kill to reach the RWP of the annular preventer, confirm spacing and swap to compatible pipe ram.

General Procedure With No Pipe In Hole (Open Hole)

1. Sound alarm (alert crew)
2. Shut-in with blind rams or BSR. (HCR and choke will already be in the closed position.)
3. Confirm shut-in
4. Notify toolpusher/company representative
5. Read and record the following:
 - a. SICP
 - b. Pit gain
 - c. Time
6. Regroup and identify forward plan

Devon Energy Annular Preventer Summary

General Procedures While Pulling BHA thru Stack

1. PRIOR to pulling last joint of drillpipe thru the stack.
 - a. Perform flowcheck, if flowing:
 - b. Sound alarm (alert crew)
 - c. Stab full opening safety valve and close
 - d. Space out drill string with tool joint just beneath the upper pipe ram.
 - e. Shut-in using upper pipe ram. (HCR and choke will already be in the closed position.)
 - f. Confirm shut-in
 - g. Notify toolpusher/company representative
 - h. Read and record the following:
 - i. SIDPP and SICP
 - ii. Pit gain
 - iii. Time
 - i. Regroup and identify forward plan

2. With BHA in the stack and compatible ram preventer and pipe combo immediately available.
 - a. Sound alarm (alert crew)
 - b. Stab crossover and full opening safety valve and close
 - c. Space out drill string with upset just beneath the compatible pipe ram.
 - d. Shut-in using compatible pipe ram. (HCR and choke will already be in the closed position.)
 - e. Confirm shut-in
 - f. Notify toolpusher/company representative
 - g. Read and record the following:
 - i. SIDPP and SICP
 - ii. Pit gain
 - iii. Time
 - h. Regroup and identify forward plan

3. With BHA in the stack and NO compatible ram preventer and pipe combo immediately available.
 - a. Sound alarm (alert crew)
 - b. If possible to pick up high enough, pull string clear of the stack and follow "Open Hole" scenario.
 - c. If impossible to pick up high enough to pull the string clear of the stack:
 - d. Stab crossover, make up one joint/stand of drillpipe, and full opening safety valve and close
 - e. Space out drill string with tooljoint just beneath the upper pipe ram.
 - f. Shut-in using upper pipe ram. (HCR and choke will already be in the closed position.)
 - g. Confirm shut-in
 - h. Notify toolpusher/company representative
 - i. Read and record the following:
 - i. SIDPP and SICP
 - ii. Pit gain
 - iii. Time
 - j. Regroup and identify forward plan



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

PWD Data Report

02/26/2020

APD ID: 10400039435

Submission Date: 02/22/2019

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COBBER 21-28 FED

Well Number: 6H

Well Type: OIL WELL

Well Work Type: Drill

Section 1 - General

Would you like to address long-term produced water disposal? NO

Section 2 - Lined Pits

Would you like to utilize Lined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit specifications:

Pit liner description:

Pit liner manufacturers information:

Precipitated solids disposal:

Describe precipitated solids disposal:

Precipitated solids disposal permit:

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal-schedule attachment:

Lined pit reclamation description:

Lined pit reclamation attachment:

Leak detection system description:

Leak detection system attachment:

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COBBER 21-28 FED

Well Number: 6H

Lined pit Monitor description:

Lined pit Monitor attachment:

Lined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Lined pit bond number:

Lined pit bond amount:

Additional bond information attachment:

Section 3 - Unlined Pits

Would you like to utilize Unlined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD disturbance (acres):

PWD surface owner:

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit specifications:

Precipitated solids disposal:

Describe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

Unlined pit Monitor attachment:

Do you propose to put the produced water to beneficial use?

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

Does the produced water have an annual average Total Dissolved Solids (TDS) concentration equal to or less than that of the existing water to be protected?

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

Unlined Produced Water Pit Estimated percolation:

Unlined pit: do you have a reclamation bond for the pit?

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COBBER 21-28 FED

Well Number: 6H

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Additional bond information attachment:

Section 4 - Injection

Would you like to utilize Injection PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Injection PWD discharge volume (bbl/day):

Injection well mineral owner:

Injection well type:

Injection well number:

Injection well name:

Assigned injection well API number?

Injection well API number:

Injection well new surface disturbance (acres):

Minerals protection information:

Mineral protection attachment:

Underground Injection Control (UIC) Permit?

UIC Permit attachment:

Section 5 - Surface Discharge

Would you like to utilize Surface Discharge PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Surface discharge PWD discharge volume (bbl/day):

Surface Discharge NPDES Permit?

Surface Discharge NPDES Permit attachment:

Surface Discharge site facilities information:

Surface discharge site facilities map:

Section 6 - Other

Would you like to utilize Other PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Other PWD discharge volume (bbl/day):

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COBBER 21-28 FED

Well Number: 6H

Other PWD type description:

Other PWD type attachment:

Have other regulatory requirements been met?

Other regulatory requirements attachment:



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

Bond Info Data Report

02/26/2020

APD ID: 10400039435

Submission Date: 02/22/2019

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COBBER 21-28 FED

Well Number: 6H

Well Type: OIL WELL

Well Work Type: Drill

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Bond Information

Federal/Indian APD: FED

BLM Bond number: CO1104

BIA Bond number:

Do you have a reclamation bond? NO

Is the reclamation bond a rider under the BLM bond?

Is the reclamation bond BLM or Forest Service?

BLM reclamation bond number:

Forest Service reclamation bond number:

Forest Service reclamation bond attachment:

Reclamation bond number:

Reclamation bond amount:

Reclamation bond rider amount:

Additional reclamation bond information attachment: