

Devon Energy, Tator Tot State 2 VDW 1

NM OIL CONSERVATION

ARTESIA DISTRICT

OCT 12 2017

1. Geologic Formations

RECEIVED

TVD of target	12,350'	Pilot hole depth	
MD at TD:	12,350'	Deepest expected fresh water:	

Basin

Formation	Depth (ft)	Notes	Remarks
RUSTLER	575		
Base of Salt	3106		
Lamar	3106		
Bell Canyon	3157		
Brushy Canyon	5230		
Bone Spring Lime	6812		
1st BSPG Sand	7872		
2nd BSPG Sand	8716		
3rd BSPG Sand	9791		
Wolfcamp	10133		
Wolfcamp XY	10164		
Wolfcamp 100	10268		
Wolfcamp 200	10561		
Wolfcamp 300	10989		
Wolfcamp 400	11287		
Wolfcamp 600	11777		
Cisco	12043		
Strawn	12132		

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

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### 2. Casing Program

Casing Size	Number of Strings	Depth (ft)	Casing Size	Number of Strings	Casing Type	Casing Weight (lb/ft)	API Spec	API Spec	API Spec
26"	0	600'	20"	94	J-55	BTC	1.35	2.17	4.43
17-1/2"	0	3,150'	13-3/8"	68	J-55	BTC	1.37	4.06	2.42
12-1/4"	0	9,800'	9-5/8"	40	P-110 EC	BTC	2.03	1.31	2.35
8-3/4"	0	12,350'	5.5"	17	P-110	BTC	3.26	1.32	3.79
BLM Minimum Safety Factor							1.125	1.00	1.6 Dry 1.8 Wet

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

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 <sup>rd</sup> 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 <sup>nd</sup> 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?	

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**3. Cementing Program**

Casing Size	Weight	Yield	Yield	Yield	Yield	Slurry Description
20"	940	14.8	6.37	1.33	7	Tail: Class C Cement
13-3/8" Int 1	1200	12.8	10.68 1	1.99	21.5	Lead: (65:35) Class C Cement: Poz (Fly Ash): 8% BWOB Bentonite + 8% BWOW Salt + 0.2 gal/sk Anti-Foam + 0.2% BWOB Dispersant + 0.4% BWOB Retarder
	705	14.8	6.352	1.33	5	Tail: Class C Cement: 0.2% BWOB Retarder
9-5/8" Inter II	550	9.07	12.29 2	2.99	17.5	Lead: LiteFILL Blend Cement: 0.5% Retarder + 0.05 gal/sk Anit-Foam
	779	13.5	7.459	1.55	5	Tail: (50:50) Class H Cement: Poz (Fly Ash): 0.4% BWOB Retarder + 0.02 gal/sk Anti-Foam + 0.2% BWOB FLAC + 10% BWOB Extender + 2% BWOB Expanding Agent
5-1/2" Prod	N/A	N/A	N/A	N/A	N/A	N/A
	310	13.5	7.459	1.55	5	Tail: (50:50) Class H Cement: Poz (Fly Ash): 0.4% BWOB Retarder + 0.02 gal/sk Anti-Foam + 0.4% BWOB FLAC + 10% BWOB Extender + 2% BWOB Expanding Agent

Casing Size	Depth	Percentage
20" Surface	0'	25%
13-3/8" Intermediate 1	0'	25%
9-5/8" Intermediate 2	2,950	25%
5-1/2" Production Casing	9,600'	15%

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**4. Pressure Control Equipment**

N	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.
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Wellbore Diameter	Surface Casing Diameter	Maximum Depth	Pressure Control Equipment	Pressure Control Equipment	Pressure Control Equipment
17-1/2"	21-1/4"	2M	Annular	x	50% of working pressure  2M
			Blind Ram		
			Pipe Ram		
			Double Ram		
			Other*		
12-1/4"	13-5/8"	3M	Annular	x	50% of working pressure  3M
			Blind Ram		
			Pipe Ram		
			Double Ram	x	
			Other*		
8-3/4"	13-5/8" or 11"	5M	Annular	x	50% of working pressure  5M
			Blind Ram		
			Pipe Ram		
			Double Ram	x	
			Other*		

\*Specify if additional ram is utilized.

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

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

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

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	<p align="center">Y      Are anchors required by manufacturer?</p>
<p>N</p>	<p>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.</p> <p>Devon proposes using 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 3000 (3M) psi.</p> <ul style="list-style-type: none"> <li>• Wellhead will be installed by wellhead representatives.</li> <li>• 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.</li> <li>• Wellhead representative will install the test plug for the initial BOP test.</li> <li>• 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 3M, 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.</li> <li>• 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.</li> <li>• Devon will pressure test all seals above and below the mandrel (but still above the casing) to full working pressure rating.</li> <li>• Devon will test the casing to 0.22 psi/ft or 1500 psi, whichever is greater, as per Onshore Order #2.</li> </ul> <p>After running the 13-3/8" surface casing, a 13-5/8" BOP/BOPE system with a minimum rating of 3M will be installed on the wellhead system and will undergo a 250 psi low pressure test followed by a 3,000 psi high pressure test. The 3,000 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.</p> <p>After running the 9-5/8" intermediate casing with a mandrel hanger, the 13-5/8" BOP/BOPE system with a minimum rating of 3M will already be installed on the wellhead.</p> <p>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 3,000 psi WP.</p> <p>Devon's proposed wellhead manufactures will be FMC Technologies, Cactus Wellhead, or Cameron.</p>

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	Devon requests a variance to use a flexible line with flanged ends between the BOP and the choke manifold (choke line). The line will be kept as straight as possible with minimal turns.
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**5. Mud Program**

Depth (ft)	Depth (ft)	Mud Type	Viscosity (cp)	Yield Point (lb/ft <sup>2</sup> )	Water Loss (cc/hr)
0	600'	FW Gel	8.6-8.8	28-34	N/C
600'	3,150'	Saturated Brine	10.0-10.2	28-34	N/C
3150'	9800'	Cut Brine	8.5-9.5	28-34	N/C
9800'	12350'	Cut Brine	9.5-12.0	28-34	N/C

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

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

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

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

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7. Drilling Conditions

Condition	Specify when you mitigate?
BH Pressure at deepest TVD	7000 psi
Abnormal Temperature	No

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

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

8. Other facets of operation

Is this a walking operation? No.  
Will be pre-setting casing? No.

Attachments  
 Directional Plan  
 Other, describe