

Devon Energy, North Thistle 2 State 2H

30-025-42821

1. Geologic Formations

TVD of target	11,062'	Pilot hole depth	N/A
MD at TD:	15,241'	Deepest expected fresh water:	

Basin

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Rustler	936		
Top of Salt	1331		
Base of Salt	4,847		
Delaware	4,966		
Cherry Canyon	5,845		
Lower Brushey	8,701		
Bone Spring	8,873		
1st BSPG Sand	9,991		
2nd BSPG Sand	10,573		

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

NOV 03 2015

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2. Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
	From	To							
17.5"	0	1,000'	13.375"	54.5	J-55	BTC	1.32	2.98	7.77
12.25"	0	4,300'	9.625"	40	J-55	BTC	1.12	1.73	4.46
12.25"	4,300'	5,000'	9.625"	40	HCK-55	BTC	1.48	1.38	23.15
8.75"	0	15,241'	5.5"	17	P-110	BTC	1.75	2.17	2.74
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

Must have table for contingency casing

	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?	

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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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BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
12-1/4"	13-5/8"	3M	Annular	x	50% of working pressure
			Blind Ram		3M
			Pipe Ram		
			Double Ram	x	
			Other*		
8-3/4"	13-5/8"	3M	Annular	x	50% of working pressure
			Blind Ram		3M
			Pipe Ram		
			Double Ram	x	
			Other*		
			Annular		
			Blind Ram		
			Pipe Ram		
			Double Ram		
			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.
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3. Cementing Program

Casing	# Sks	Wt. lb/ gal	H ₂ O gal/sk	Yld ft ³ / sack	500# Comp. Strength (hours)	Slurry Description
13-3/8" Surf	1070	14.8	6.32	1.33	6	Tail: Class C Cement + 0.125 lbs/sack Poly-E-Flake
9-5/8" Inter.	1070	12.9	9.81	1.85	14	Lead: (65:35) Class C Cement: Poz (Fly Ash): 6% BWOC Bentonite + 5% BWOW Sodium Chloride + 0.125 lbs/sack Poly-E-Flake
	430	14.8	6.32	1.33	6	Tail: Class C Cement + 0.125 lbs/sack Poly-E-Flake
5-1/2" Prod Single Stage	780	11.9	12.89	2.31	n/a	Lead: (50:50) Class H Cement: Poz (Fly Ash) + 10% BWOC Bentonite + 1 lb/sk of Kol-Seal + 0.3% BWOC HR-601 + 0.5lb/sk D-Air 5000
	1260	14.5	5.31	1.2	25	Tail: (50:50) Class H Cement: Poz (Fly Ash) + 0.5% bwoc HALAD-344 + 0.4% bwoc CFR-3 + 0.2% BWOC HR-601 + 2% bwoc Bentonite
5-1/2" Prod Two Stage	750	11.9	12.89	2.31	n/a	1 st Stage Lead: (50:50) Class H Cement: Poz (Fly Ash) + 10% BWOC Bentonite + 1 lb/sk of Kol-Seal + 0.3% BWOC HR-601 + 0.5lb/sk D-Air 5000
	1260	14.5	5.31	1.2	25	1 st Stage Tail: (50:50) Class H Cement: Poz (Fly Ash) + 0.5% bwoc HALAD-344 + 0.4% bwoc CFR-3 + 0.2% BWOC HR-601 + 2% bwoc Bentonite
	DV Tool = 5050ft					
	20	11	14.81	2.55	22	2 nd Stage Lead: Tuned Light® Cement + 0.125 lb/sk Pol-E-Flake
	30	14.8	6.32	1.33	6	2 nd Stage Tail: Class C Cement + 0.125 lbs/sack Poly-E-Flake

DV tool depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. DV tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe. Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.

Casing String	TOC	% Excess
13-3/8" Surface	0'	100%
9-5/8" Intermediate	0'	75%
5-1/2" Production Casing Single Stage Option	4800'	25%
5-1/2" Production Casing Two Stage Option	1 st Stage = 5050' / 2 nd Stage = 4800'	25%

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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.
Y	Are anchors required by manufacturer?
Y	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 the option of 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. - Wellhead will be installed by wellhead vendor 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 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 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. 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. 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.

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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
	See attached schematic.

5. Mud Program

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From	To				
0	1,000'	FW Gel	8.6-8.8	28-34	N/C
1,000'	5,000'	Saturated Brine	10.0-10.2	28-34	N/C
5,000'	15,241'	Cut Brine	8.5-9.3	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
	Coring? If yes, explain

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

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7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	5,350 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	H ₂ S is present
Y	H ₂ S Plan attached

8. Other facets of operation

Is this a walking operation? Yes.

Will be pre-setting casing? No.

Attachments

☒ Directional Plan

☐ Other, describe

**5D Plan Report**

Devon Energy

Field Name: *Lea Co, NM Nad 83 NMEZ*
Site Name: *North Thistle 2 State 2H, 1H*
Well Name: *North Thistle 2 State 2H*
Plan: *P1:V3*

30 September 2015



devon

North Thistle 2 State 2H
Lea Co, NM

Plan Data for North Thistle 2 State 2H

Plan Point Information:									
Dogleg Severity Unit: °/100.00ft									
MD	Inc	Az	TVD	+N/-S	+E/-W	North	Easting	VSec	DLS
(USft)	(°)	(°)	(USft)	(USft)	(USft)	(USft)	(USft)	(USft)	(DLS)
0.00	0.00	0.00	0.00	-0.00	0.00	488169.46	786040.51	0.00	0.00
10491.93	0.00	0.00	10491.93	-0.00	0.00	488169.46	786040.51	0.00	0.00
10691.93	20.00	183.64	10687.89	-34.48	-2.19	488134.98	786038.32	34.55	10.00
11268.05	89.13	183.64	11062.00	-475.05	-30.23	487694.41	786010.28	476.01	12.00
15240.50	89.13	183.64	11062.00	-4439.03	-282.46	483730.43	785758.05	4448.01	0.00

Plan Data for North Thistle 2 State 2H

Slot: North Thistle 2 State 2H
Position:
Offset is from Site centre
+N/-S: 0.00USft Northing: 488169.46USft Latitude: 32°20'22.4"
+E/-W: 0.00USft Easting: 786040.51USft Longitude: -103°32'27.7"
Elevation Above VRD: 3515.00USft

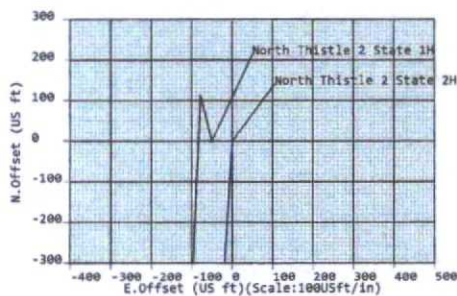
Plan Data for North Thistle 2 State 2H

Target Set Information:
Name: North Thistle 2 State 2H Tgts
Position offsets from Slot centre
Name TVD +N/-S +E/-W Northing Easting Shape Comment
(USft) (USft) (USft) (USft) (USft)
PBHL 2H 11062.00 -4439.03 -282.46 483730.43 785758.05 Cuboid

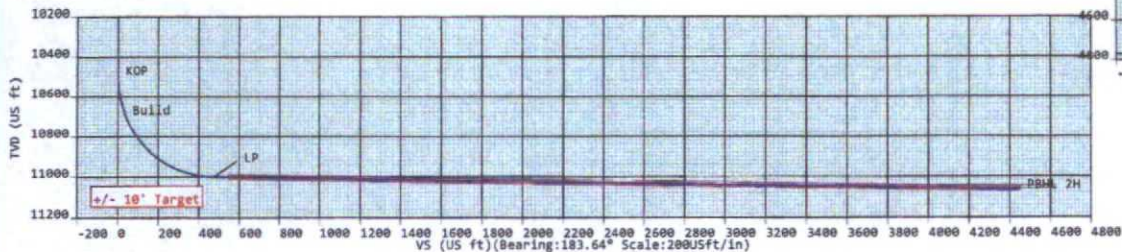
Plan Data for North Thistle 2 State 2H

Well: North Thistle 2 State 2H
Type: Main-Well
File Number:
Plan Folder: P1 Plan: P1.V3
Vertical Section: Position offset of origin from Slot centre:
+N/-S: 0.00USft Azimuth: 183.64°
+E/-W: 0.00USft
Magnetic Parameters:
Model: Field Strength: Declination: Dip: Date:
bgs2015 48280(NT) 7.21° 60.25° 2015-10-30

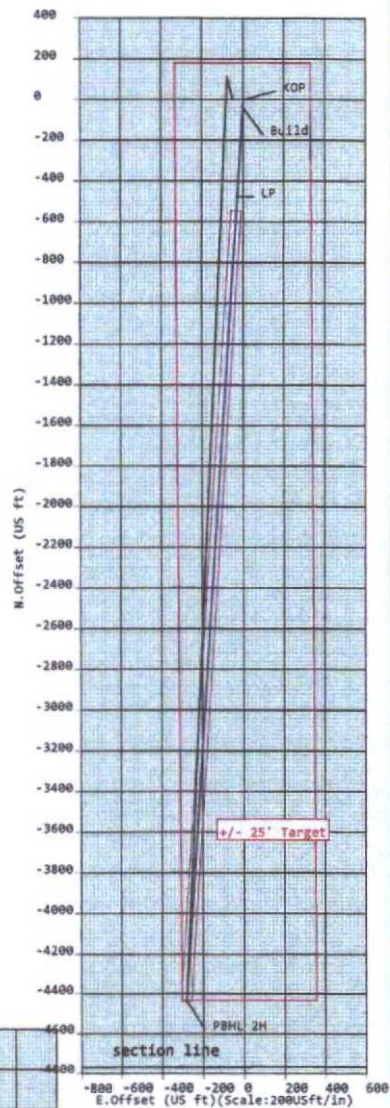
North Thistle 2 State 2H
North Thistle 2 State 1H



KB-3540
GL-3615



Weatherford





North Thistle 2 State 2H

Field Name: Lea Co, NM Nad 83 NMEZ	Map Units: US ft		Company Name: Devon Energy	
	Vertical Reference Datum (VRD): Mean Sea Level			
	Projected Coordinate System: NAD83 / New Mexico East (ftUS)			
	Comment:			
Site: North Thistle 2 State 2H, 1H	Units: US ft	North Reference: Grid	Convergence Angle: 0.42	
	Position:	Northing: 488169.46US ft	Latitude: 32° 20' 22.42"	
		Easting: 786040.51US ft	Longitude: -103° 32' 27.66"	
	Elevation above MSL:3515.00 US ft			
Comment:				
Slot: North Thistle 2 State 2H	Position (Relative to Site Centre)			
	+N/-S: 0.00US ft	Northing: 488169.46US ft	Latitude: 32°20'22.42"	
	+E/-W: 0.00US ft	Easting: 786040.51US ft	Longitude: -103°32'27.66"	
	Slot TVD Reference: Ground Elevation			
Elevation above MSL: 3515.00US ft				
Comment:				
Well: North Thistle 2 State 2H	Type:Main well	UWI:	Plan:P1:V3	
	File Number:	Comment:		
	Closure Distance:4448.01US ft	Closure Azimuth:183.64°		
	Vertical Section: Position of Origin (Relative to Slot centre)			
	+N/-S: -0.00US ft	+E/-W: 0.00US ft	Az: 183.64°	
	Magnetic Parameters:			
	Model: bggm2015	Field Strength: 48280.7nT	Declination: 7.21°	Dip: 60.25°

Drill floor: Plan: P1:V3

Rig Height (Kelly Bushing): Elevation above MSL: 3540.00us ft
25.00us ft

Inclination: 0.00°

Azimuth: 0.00°

Target set: North Thistle 2 State 2H Tgts **Comment:**

Target Name:	Shape:	TVD (US ft)	N Offset (US ft)	E Offset (US ft)	Northing (US ft)	Easting (US ft)	Comment
PBHL 2H	Cuboid	11062.00	-4439.03	-282.46	483730.43	785758.05	

Wellpath created using minimum curvature.

Tie Point:

MD: 0.00USFt **Inclination:** 0.00° **Azimuth:** 0.00° **TVD:** 0.00USFt **North Offset:** -0.00USFt **East Offset:** 0.00USFt

5D Plan Report

Interpolated Points: (Relative to Slot centre)(TVD relative to Kelly Bushing)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	O/S (%/100US ft)	Nothing (US ft)	Easting (US ft)	Comment
5000.00	0.00	0.00	5000.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
5100.00	0.00	0.00	5100.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
5200.00	0.00	0.00	5200.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
5300.00	0.00	0.00	5300.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
5400.00	0.00	0.00	5400.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
5500.00	0.00	0.00	5500.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
5600.00	0.00	0.00	5600.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
5700.00	0.00	0.00	5700.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
5800.00	0.00	0.00	5800.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
5900.00	0.00	0.00	5900.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
6000.00	0.00	0.00	6000.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
6100.00	0.00	0.00	6100.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
6200.00	0.00	0.00	6200.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
6300.00	0.00	0.00	6300.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
6400.00	0.00	0.00	6400.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
6500.00	0.00	0.00	6500.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
6600.00	0.00	0.00	6600.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
6700.00	0.00	0.00	6700.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
6800.00	0.00	0.00	6800.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
6900.00	0.00	0.00	6900.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
7000.00	0.00	0.00	7000.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
7100.00	0.00	0.00	7100.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
7200.00	0.00	0.00	7200.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
7300.00	0.00	0.00	7300.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
7400.00	0.00	0.00	7400.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
7500.00	0.00	0.00	7500.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
7600.00	0.00	0.00	7600.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
7700.00	0.00	0.00	7700.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
7800.00	0.00	0.00	7800.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
7900.00	0.00	0.00	7900.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
8000.00	0.00	0.00	8000.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
8100.00	0.00	0.00	8100.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
8200.00	0.00	0.00	8200.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
8300.00	0.00	0.00	8300.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
8400.00	0.00	0.00	8400.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
8500.00	0.00	0.00	8500.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
8600.00	0.00	0.00	8600.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
8700.00	0.00	0.00	8700.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
8800.00	0.00	0.00	8800.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
8900.00	0.00	0.00	8900.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
9000.00	0.00	0.00	9000.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
9100.00	0.00	0.00	9100.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
9200.00	0.00	0.00	9200.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
9300.00	0.00	0.00	9300.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
9400.00	0.00	0.00	9400.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
9500.00	0.00	0.00	9500.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
9600.00	0.00	0.00	9600.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
9700.00	0.00	0.00	9700.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
9800.00	0.00	0.00	9800.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
9900.00	0.00	0.00	9900.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
10000.00	0.00	0.00	10000.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
10100.00	0.00	0.00	10100.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
10200.00	0.00	0.00	10200.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
10300.00	0.00	0.00	10300.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
10400.00	0.00	0.00	10400.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51	
10491.93	0.00	0.00	10491.93	-0.00	0.00	-0.00	0.00	488169.46	786040.51	KOP
10500.00	0.81	183.64	10500.00	-0.06	-0.00	0.06	10.00	488169.40	786040.51	
10600.00	10.81	183.64	10599.36	-10.14	-0.65	10.16	10.00	488159.32	786039.86	
10691.93	20.00	183.64	10687.89	-34.48	-2.19	34.55	10.00	488134.98	786038.32	Build

SD Plan Report

Salient Points: (Relative to Slot centre)(TVD relative to Kelly Bushing)											
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N. Offset (US ft)	E. Offset (US ft)	VS (US ft)	DLS (°/100US ft)	B. Rate (°/100US ft)	T. Rate (°/100US ft)	I. Face (°)	Comment
0.00	0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	0.00	0.00	
10491.93	0.00	0.00	10491.93	-0.00	0.00	-0.00	0.00	0.00	0.00	0.00	KOP
10691.93	20.00	183.64	10687.89	-34.48	-2.19	34.55	10.00	10.00	0.00	183.64	Build
11268.05	89.13	183.64	11002.00	-475.05	-30.23	476.01	12.00	12.00	0.00	0.00	LP
15240.50	89.13	183.64	11062.00	-4439.03	-282.46	4448.01	0.00	0.00	0.00	0.00	PBHL 2H

Interpolated Points: (Relative to Slot centre)(TVD relative to Kelly Bushing)											
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N. Offset (US ft)	E. Offset (US ft)	VS (US ft)	DLS (°/100US ft)	Northing (US ft)	Eastng (US ft)		Comment
0.00	0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
100.00	0.00	0.00	100.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
200.00	0.00	0.00	200.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
300.00	0.00	0.00	300.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
400.00	0.00	0.00	400.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
500.00	0.00	0.00	500.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
600.00	0.00	0.00	600.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
700.00	0.00	0.00	700.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
800.00	0.00	0.00	800.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
900.00	0.00	0.00	900.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
1000.00	0.00	0.00	1000.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
1100.00	0.00	0.00	1100.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
1200.00	0.00	0.00	1200.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
1300.00	0.00	0.00	1300.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
1400.00	0.00	0.00	1400.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
1500.00	0.00	0.00	1500.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
1600.00	0.00	0.00	1600.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
1700.00	0.00	0.00	1700.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
1800.00	0.00	0.00	1800.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
1900.00	0.00	0.00	1900.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
2000.00	0.00	0.00	2000.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
2100.00	0.00	0.00	2100.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
2200.00	0.00	0.00	2200.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
2300.00	0.00	0.00	2300.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
2400.00	0.00	0.00	2400.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
2500.00	0.00	0.00	2500.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
2600.00	0.00	0.00	2600.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
2700.00	0.00	0.00	2700.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
2800.00	0.00	0.00	2800.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
2900.00	0.00	0.00	2900.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
3000.00	0.00	0.00	3000.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
3100.00	0.00	0.00	3100.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
3200.00	0.00	0.00	3200.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
3300.00	0.00	0.00	3300.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
3400.00	0.00	0.00	3400.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
3500.00	0.00	0.00	3500.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
3600.00	0.00	0.00	3600.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
3700.00	0.00	0.00	3700.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
3800.00	0.00	0.00	3800.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
3900.00	0.00	0.00	3900.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
4000.00	0.00	0.00	4000.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
4100.00	0.00	0.00	4100.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
4200.00	0.00	0.00	4200.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
4300.00	0.00	0.00	4300.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
4400.00	0.00	0.00	4400.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
4500.00	0.00	0.00	4500.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
4600.00	0.00	0.00	4600.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
4700.00	0.00	0.00	4700.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
4800.00	0.00	0.00	4800.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		
4900.00	0.00	0.00	4900.00	-0.00	0.00	-0.00	0.00	488169.46	786040.51		

SD Plan Report

Interpolated Points: (Relative to Slot centre)(TVD relative to Kelly Bushing)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N. Offset (US ft)	E. Offset (US ft)	VS (US ft)	D/S (+/1000S ft)	Northing (US ft)	Easting (US ft)	Comment
10700.00	20.97	183.64	10695.45	-37.30	-2.37	37.38	12.00	488132.16	786038.14	
10800.00	32.97	183.64	10784.42	-82.48	-5.25	82.64	12.00	488086.98	786035.26	
10900.00	44.97	183.64	10862.02	-145.13	-9.23	145.42	12.00	488024.33	786031.28	
11000.00	56.97	183.64	10924.88	-222.51	-14.16	222.96	12.00	487946.95	786026.35	
11100.00	68.97	183.64	10970.25	-311.24	-19.80	311.87	12.00	487858.22	786020.71	
11200.00	80.97	183.64	10996.14	-407.45	-25.92	408.27	12.00	487762.01	786014.59	
11268.05	89.13	183.64	11002.00	-475.05	-30.23	476.01	12.00	487694.41	786010.28	LP
11300.00	89.13	183.64	11002.48	-506.93	-32.25	507.96	0.00	487662.53	786008.26	
11400.00	89.13	183.64	11003.99	-606.72	-38.60	607.95	0.00	487562.74	786001.91	
11500.00	89.13	183.64	11005.50	-706.51	-44.95	707.93	0.00	487462.95	785995.56	
11600.00	89.13	183.64	11007.01	-806.29	-51.30	807.92	0.00	487363.17	785989.21	
11700.00	89.13	183.64	11008.52	-906.08	-57.65	907.91	0.00	487263.38	785982.86	
11800.00	89.13	183.64	11010.04	-1005.87	-64.00	1007.90	0.00	487163.59	785976.51	
11900.00	89.13	183.64	11011.55	-1105.65	-70.35	1107.89	0.00	487063.81	785970.16	
12000.00	89.13	183.64	11013.06	-1205.44	-76.70	1207.88	0.00	486964.02	785963.81	
12100.00	89.13	183.64	11014.57	-1305.23	-83.05	1307.87	0.00	486864.23	785957.46	
12200.00	89.13	183.64	11016.08	-1405.01	-89.40	1407.85	0.00	486764.45	785951.11	
12300.00	89.13	183.64	11017.59	-1504.80	-95.75	1507.84	0.00	486664.66	785944.76	
12400.00	89.13	183.64	11019.10	-1604.59	-102.10	1607.83	0.00	486564.87	785938.41	
12500.00	89.13	183.64	11020.61	-1704.37	-108.45	1707.82	0.00	486465.09	785932.06	
12600.00	89.13	183.64	11022.12	-1804.16	-114.80	1807.81	0.00	486365.30	785925.71	
12700.00	89.13	183.64	11023.63	-1903.95	-121.15	1907.80	0.00	486265.51	785919.36	
12800.00	89.13	183.64	11025.14	-2003.73	-127.50	2007.79	0.00	486165.73	785913.01	
12900.00	89.13	183.64	11026.65	-2103.52	-133.85	2107.77	0.00	486065.94	785906.66	
13000.00	89.13	183.64	11028.16	-2203.31	-140.20	2207.76	0.00	485966.15	785900.31	
13100.00	89.13	183.64	11029.67	-2303.09	-146.55	2307.75	0.00	485866.37	785893.96	
13200.00	89.13	183.64	11031.18	-2402.88	-152.90	2407.74	0.00	485766.58	785887.61	
13300.00	89.13	183.64	11032.69	-2502.67	-159.25	2507.73	0.00	485666.79	785881.26	
13400.00	89.13	183.64	11034.20	-2602.45	-165.60	2607.72	0.00	485566.01	785874.91	
13500.00	89.13	183.64	11035.71	-2702.24	-171.95	2707.71	0.00	485467.22	785868.56	
13600.00	89.13	183.64	11037.22	-2802.03	-178.30	2807.69	0.00	485367.43	785862.21	
13700.00	89.13	183.64	11038.73	-2901.81	-184.64	2907.68	0.00	485267.65	785855.87	
13800.00	89.13	183.64	11040.24	-3001.60	-190.99	3007.67	0.00	485167.86	785849.52	
13900.00	89.13	183.64	11041.75	-3101.39	-197.34	3107.66	0.00	485068.07	785843.17	
14000.00	89.13	183.64	11043.26	-3201.18	-203.69	3207.65	0.00	484968.28	785836.82	
14100.00	89.13	183.64	11044.77	-3300.96	-210.04	3307.64	0.00	484868.50	785830.47	
14200.00	89.13	183.64	11046.28	-3400.75	-216.39	3407.63	0.00	484768.71	785824.12	
14300.00	89.13	183.64	11047.79	-3500.54	-222.74	3507.61	0.00	484668.92	785817.77	
14400.00	89.13	183.64	11049.31	-3600.32	-229.09	3607.60	0.00	484569.14	785811.42	
14500.00	89.13	183.64	11050.82	-3700.11	-235.44	3707.59	0.00	484469.35	785805.07	
14600.00	89.13	183.64	11052.33	-3799.90	-241.79	3807.58	0.00	484369.56	785798.72	
14700.00	89.13	183.64	11053.84	-3899.68	-248.14	3907.57	0.00	484269.78	785792.37	
14800.00	89.13	183.64	11055.35	-3999.47	-254.49	4007.56	0.00	484169.99	785786.02	
14900.00	89.13	183.64	11056.86	-4099.26	-260.84	4107.55	0.00	484070.20	785779.67	
15000.00	89.13	183.64	11058.37	-4199.04	-267.19	4207.54	0.00	483970.42	785773.32	
15100.00	89.13	183.64	11059.88	-4298.83	-273.54	4307.52	0.00	483870.63	785766.97	
15200.00	89.13	183.64	11061.39	-4398.62	-279.89	4407.51	0.00	483770.84	785760.62	
15240.50	89.13	183.64	11062.00	-4439.03	-282.46	4448.01	0.00	483730.43	785758.05	PBHL 2H

**5D Anti-Collision Report****Devon Energy****Field Name:** *Lea Co, NM Nad 83 NMEZ***Site Name:** *North Thistle 2 State 2H, 1H***Well Name:** *North Thistle 2 State 2H*

30 September 2015





North Thistle 2 State 2H

Field Name:	Map Units: US ft		Company Name: Devon Energy	
	Vertical Reference Datum (VRD): Mean Sea Level			
	Projected Coordinate System: NAD83 / New Mexico East (ftUS)			
	Comment:			
Lea Co, NM Nad 83 NMEZ				
Site:	Units: US ft	North Reference: Grid	Convergence Angle: 0.42	
	Position:	Northing: 488169.46US ft	Latitude: 32° 20' 22.42"	
		Easting: 786040.51US ft	Longitude: -103° 32' 27.66"	
	North Thistle 2 State 2H, 1H	Elevation above MSL:3515.00 US ft		Comment:
Slot:	Position (Relative to Site Centre)			
	+N/-S: 0.00US ft	Northing: 488169.46US ft	Latitude: 32°20'22.42"	
	+E/-W: 0.00US ft	Easting: 786040.51US ft	Longitude: -103°32'27.66"	
	Slot TVD Reference: Ground Elevation			
North Thistle 2 State 2H	Elevation above MSL: 3515.00US ft		Comment:	
Well:	Type:Main well	UWI:	Plan:Working Plan	
	File Number:	Comment:		
	Closure Distance:4448.01US ft	Closure Azimuth:183.64°		
	Vertical Section: Position of Origin (Relative to Slot centre)			
North Thistle 2 State 2H	+N/-S: -0.00US ft		+E/-W: 0.00US ft	Az: 183.64°
	Magnetic Parameters:			
	Model: bggm2015	Field Strength:	Declination: 7.21°	Dip: 60.25°
		48280.7nT		Date: 30/Oct/2015

Drill floor: Plan: Working Plan

Rig Height (Kelly Bushing): Elevation above MSL: 3540.00us ft
Inclination: 0.00° **Azimuth:** 0.00°

Collision / Uncertainty Analysis

Primary Well	Start MD (USFt)	End MD (USFt)	Collision Risk Interval	No. of Std. Deviations in Error Computation
North Thistle 2 State 2H (p)	0.00	30000.00	100.00	2

Secondary Well Names:

North Thistle 2 State 1H (p)

Anti-Collision Report Terminology

S.Minor, S.Major: Radii of the ellipse of uncertainty at the current location as seen in the along hole direction.

PHI: Angle between high-side vector and semi-minor axis

TVD Spread: Total TVD range of the ellipsoid of uncertainty at the current location.

ES: Distance between the extremities of the primary and secondary uncertainty ellipsoids in the direction Cr-Cr.

T.Face to Sec: Angle between the HI-Side vector of the primary well at the current location and line of closest approach between the two wells.

SD Anti-Collision Report

AC Filter Info: the following filter has been applied: Depth Range.

Separation factors calculated using Pedal Curve (Independent Uncertainty). Surface Uncertainty (S.U.) Not Applied. Wellpath created using minimum curvature.

Anti-Collision Summary (TVD relative to Kelly Bushing)

Secondary Well Name	Pri MD (US ft)	TVD (US ft)	Sec MD (US ft)	ES (US ft)	CC (US ft)	SF	Risk
North Thistle 2 State 1H (p)	9305.66	9305.66	9333.42	41.72	83.31	2.00	

Primary Well: North Thistle 2 State 2H (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
MD (US ft)	TVD (US ft)	Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	Nearest Well	ES (US ft)	CC (US ft)	SF	Risk
0.00	0.00	269.60	0.00	0.00	0.00	North Thistle 2 State 1H (p)	49.49	50.06	88.35	
100.00	100.00	269.60	0.11	0.11	4.60	North Thistle 2 State 1H (p)	49.27	50.06	63.59	
200.00	200.00	269.60	0.34	0.34	4.62	North Thistle 2 State 1H (p)	48.82	50.06	40.48	
300.00	300.00	269.60	0.56	0.56	4.65	North Thistle 2 State 1H (p)	48.37	50.06	29.69	
400.00	400.00	269.60	0.79	0.79	4.70	North Thistle 2 State 1H (p)	47.93	50.06	23.44	
500.00	500.00	269.60	1.01	1.01	4.75	North Thistle 2 State 1H (p)	47.48	50.06	19.36	
600.00	600.00	269.60	1.24	1.24	4.82	North Thistle 2 State 1H (p)	47.03	50.06	16.49	
700.00	700.00	269.60	1.46	1.46	4.89	North Thistle 2 State 1H (p)	46.58	50.06	14.37	
800.00	800.00	269.60	1.69	1.69	4.98	North Thistle 2 State 1H (p)	46.13	50.06	12.72	
900.00	900.00	269.60	1.91	1.91	5.07	North Thistle 2 State 1H (p)	45.68	50.06	11.42	
1000.00	1000.00	269.60	2.14	2.14	5.17	North Thistle 2 State 1H (p)	45.23	50.06	10.36	
1100.00	1100.00	269.60	2.36	2.36	5.28	North Thistle 2 State 1H (p)	44.78	50.06	9.48	
1200.00	1200.00	269.60	2.59	2.59	5.39	North Thistle 2 State 1H (p)	44.33	50.06	8.73	
1300.00	1300.00	269.60	2.81	2.81	5.51	North Thistle 2 State 1H (p)	43.88	50.06	8.10	
1400.00	1400.00	269.60	3.03	3.03	5.64	North Thistle 2 State 1H (p)	43.43	50.06	7.55	
1500.00	1500.00	269.60	3.26	3.26	5.77	North Thistle 2 State 1H (p)	42.98	50.06	7.07	
1600.00	1600.00	269.60	3.48	3.48	5.90	North Thistle 2 State 1H (p)	42.53	50.06	6.65	
1700.00	1700.00	269.60	3.71	3.71	6.04	North Thistle 2 State 1H (p)	42.08	50.06	6.27	
1800.00	1800.00	269.60	3.93	3.93	6.19	North Thistle 2 State 1H (p)	41.63	50.06	5.94	
1900.00	1900.00	269.60	4.16	4.16	6.33	North Thistle 2 State 1H (p)	41.18	50.06	5.64	
2000.00	2000.00	269.60	4.38	4.38	6.48	North Thistle 2 State 1H (p)	40.73	50.06	5.37	

5D Anti-Collision Report

Primary Well: North Thistle 2 State 2H (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
MD (US ft)	TVD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	Nearest Well	ES (US ft)	CC (US ft)	SF	Risk
2100.00	2100.00	269.60	4.61	4.61	6.64	North Thistle 2 State 1H (p)	40.28	50.06	5.12	
2200.00	2200.00	269.60	4.83	4.83	6.80	North Thistle 2 State 1H (p)	39.83	50.06	4.89	
2300.00	2300.00	269.60	5.06	5.06	6.96	North Thistle 2 State 1H (p)	39.38	50.06	4.69	
2400.00	2400.00	269.60	5.28	5.28	7.12	North Thistle 2 State 1H (p)	38.93	50.06	4.50	
2500.00	2500.00	269.60	5.51	5.51	7.29	North Thistle 2 State 1H (p)	38.48	50.06	4.32	
2600.00	2600.00	269.60	5.73	5.73	7.45	North Thistle 2 State 1H (p)	38.03	50.06	4.16	
2700.00	2700.00	269.60	5.96	5.96	7.63	North Thistle 2 State 1H (p)	37.59	50.06	4.01	
2800.00	2800.00	269.60	6.18	6.18	7.80	North Thistle 2 State 1H (p)	37.14	50.06	3.87	
2900.00	2900.00	269.60	6.41	6.41	7.98	North Thistle 2 State 1H (p)	36.69	50.06	3.74	
3000.00	3000.00	269.60	6.63	6.63	8.15	North Thistle 2 State 1H (p)	36.24	50.06	3.62	
3100.00	3100.00	269.60	6.86	6.86	8.34	North Thistle 2 State 1H (p)	35.79	50.06	3.51	
3200.00	3200.00	269.60	7.08	7.08	8.52	North Thistle 2 State 1H (p)	35.34	50.06	3.40	
3300.00	3300.00	269.60	7.31	7.31	8.71	North Thistle 2 State 1H (p)	34.89	50.06	3.30	
3400.00	3400.00	269.60	7.53	7.53	8.90	North Thistle 2 State 1H (p)	34.44	50.06	3.20	
3500.00	3500.00	269.60	7.76	7.76	9.09	North Thistle 2 State 1H (p)	33.99	50.06	3.11	
3600.00	3600.00	269.60	7.98	7.98	9.28	North Thistle 2 State 1H (p)	33.54	50.06	3.03	
3700.00	3700.00	269.60	8.20	8.20	9.48	North Thistle 2 State 1H (p)	33.09	50.06	2.95	
3800.00	3800.00	269.60	8.43	8.43	9.68	North Thistle 2 State 1H (p)	32.64	50.06	2.87	
3900.00	3900.00	269.60	8.65	8.65	9.88	North Thistle 2 State 1H (p)	32.19	50.06	2.80	
4000.00	4000.00	269.60	8.88	8.88	10.08	North Thistle 2 State 1H (p)	31.74	50.06	2.73	
4100.00	4100.00	269.60	9.10	9.10	10.29	North Thistle 2 State 1H (p)	31.29	50.06	2.67	
4200.00	4200.00	269.60	9.33	9.33	10.50	North Thistle 2 State 1H (p)	30.84	50.06	2.60	
4300.00	4300.00	269.60	9.55	9.55	10.72	North Thistle 2 State 1H (p)	30.39	50.06	2.55	
4400.00	4400.00	270.56	9.78	9.78	10.93	North Thistle 2 State 1H (p)	30.17	50.28	2.50	
4500.00	4500.00	273.39	10.00	10.00	11.16	North Thistle 2 State 1H (p)	30.46	51.01	2.48	
4600.00	4600.00	277.90	10.23	10.23	11.38	North Thistle 2 State 1H (p)	31.50	52.49	2.50	

SD Anti-Collision Report

Primary Well: North Thistle 2 State 2H (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
MD (US ft)	TVD (US ft)	I.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	Nearest Well	ES (US ft)	CC (US ft)	SF	Risk
4700.00	4700.00	283.74	10.45	10.45	11.61	North Thistle 2 State 1H (p)	33.69	55.08	2.58	
4800.00	4800.00	290.39	10.68	10.68	11.84	North Thistle 2 State 1H (p)	37.32	59.15	2.71	
4900.00	4900.00	297.26	10.90	10.90	12.07	North Thistle 2 State 1H (p)	42.78	65.06	2.92	
5000.00	5000.00	303.44	11.13	11.13	12.31	North Thistle 2 State 1H (p)	49.74	72.43	3.19	
5100.00	5100.00	308.45	11.35	11.35	12.55	North Thistle 2 State 1H (p)	57.33	80.49	3.48	
5200.00	5200.00	312.52	11.58	11.58	12.79	North Thistle 2 State 1H (p)	65.48	89.04	3.78	
5300.00	5300.00	315.87	11.80	11.80	13.04	North Thistle 2 State 1H (p)	73.99	97.97	4.09	
5400.00	5400.00	318.65	12.03	12.03	13.30	North Thistle 2 State 1H (p)	82.71	107.17	4.38	
5500.00	5500.00	320.86	12.25	12.25	13.55	North Thistle 2 State 1H (p)	90.96	115.88	4.65	
5600.00	5600.00	322.44	12.48	12.48	13.81	North Thistle 2 State 1H (p)	97.76	123.11	4.86	
5700.00	5700.00	323.55	12.70	12.70	14.08	North Thistle 2 State 1H (p)	103.01	128.78	5.00	
5800.00	5800.00	324.28	12.93	12.93	14.35	North Thistle 2 State 1H (p)	106.66	132.84	5.08	
5900.00	5900.00	324.69	13.15	13.15	14.62	North Thistle 2 State 1H (p)	108.67	135.25	5.09	
6000.00	6000.00	324.81	13.37	13.37	14.90	North Thistle 2 State 1H (p)	109.02	136.00	5.04	
6100.00	6100.00	324.81	13.60	13.60	15.18	North Thistle 2 State 1H (p)	108.60	136.00	4.96	
6200.00	6200.00	324.81	13.82	13.82	15.47	North Thistle 2 State 1H (p)	108.15	136.00	4.88	
6300.00	6300.00	324.81	14.05	14.05	15.76	North Thistle 2 State 1H (p)	107.71	136.00	4.81	
6400.00	6400.00	324.81	14.27	14.27	16.05	North Thistle 2 State 1H (p)	107.26	136.00	4.73	
6500.00	6500.00	324.81	14.50	14.50	16.35	North Thistle 2 State 1H (p)	106.82	136.00	4.66	
6600.00	6600.00	324.81	14.72	14.72	16.66	North Thistle 2 State 1H (p)	106.37	136.00	4.59	
6700.00	6700.00	324.81	14.95	14.95	16.97	North Thistle 2 State 1H (p)	105.92	136.00	4.52	
6800.00	6800.00	324.81	15.17	15.17	17.28	North Thistle 2 State 1H (p)	105.48	136.00	4.46	
6900.00	6900.00	324.81	15.40	15.40	17.60	North Thistle 2 State 1H (p)	105.03	136.00	4.39	
7000.00	7000.00	324.81	15.62	15.62	17.93	North Thistle 2 State 1H (p)	104.58	136.00	4.33	
7100.00	7100.00	324.81	15.85	15.85	18.26	North Thistle 2 State 1H (p)	104.14	136.00	4.27	
7200.00	7200.00	324.81	16.07	16.07	18.59	North Thistle 2 State 1H (p)	103.69	136.00	4.21	

5D Anti-Collision Report

Primary Well: North Thistle 2 State 2H (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
MD (US ft)	TVD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	Nearest Well	ES (US ft)	CC (US ft)	SF	Risk
9900.00	9900.00	206.19	22.14	22.14	29.68	North Thistle 2 State 1H (p)	466.03	497.85	15.65	
10000.00	10000.00	204.52	22.37	22.37	30.18	North Thistle 2 State 1H (p)	557.98	589.62	18.64	
10100.00	10100.00	203.27	22.59	22.59	30.67	North Thistle 2 State 1H (p)	651.36	682.87	21.67	
10200.00	10200.00	202.30	22.82	22.82	31.17	North Thistle 2 State 1H (p)	745.83	777.23	24.75	
10300.00	10300.00	201.53	23.04	23.04	31.68	North Thistle 2 State 1H (p)	841.01	872.46	27.74	
10400.00	10400.00	200.90	23.27	23.27	32.20	North Thistle 2 State 1H (p)	936.78	968.36	30.67	
10500.00	10500.00	15.91	23.49	23.49	32.72	North Thistle 2 State 1H (p)	1033.08	1064.78	33.59	
10600.00	10599.36	9.52	23.65	23.44	33.23	North Thistle 2 State 1H (p)	1126.97	1158.75	36.46	
10700.00	10695.45	6.68	23.80	23.02	33.70	North Thistle 2 State 1H (p)	1214.97	1246.74	39.25	
10800.00	10784.42	4.98	23.97	22.10	34.13	North Thistle 2 State 1H (p)	1294.12	1325.92	41.69	
10900.00	10862.02	4.03	24.16	20.88	34.48	North Thistle 2 State 1H (p)	1361.70	1393.57	43.73	
11000.00	10924.88	3.46	24.42	19.58	34.75	North Thistle 2 State 1H (p)	1416.23	1448.10	45.44	
11100.00	10970.25	3.12	24.77	18.45	34.98	North Thistle 2 State 1H (p)	1456.39	1488.28	46.68	
11200.00	10996.14	2.89	25.23	17.77	35.20	North Thistle 2 State 1H (p)	1480.50	1512.59	47.14	
11300.00	11002.48	2.77	25.78	17.71	35.43	North Thistle 2 State 1H (p)	1485.47	1517.86	46.87	
11400.00	11003.99	2.70	26.44	17.85	35.70	North Thistle 2 State 1H (p)	1485.55	1518.30	46.37	
11500.00	11005.50	2.63	27.20	18.02	36.04	North Thistle 2 State 1H (p)	1485.57	1518.74	45.79	
11600.00	11007.01	2.56	28.06	18.21	36.43	North Thistle 2 State 1H (p)	1485.53	1519.18	45.15	
11700.00	11008.52	2.49	29.01	18.43	36.88	North Thistle 2 State 1H (p)	1485.44	1519.63	44.45	
11800.00	11010.04	2.42	30.04	18.68	37.37	North Thistle 2 State 1H (p)	1485.30	1520.08	43.70	
11900.00	11011.55	2.35	31.14	18.95	37.92	North Thistle 2 State 1H (p)	1485.10	1520.53	42.92	
12000.00	11013.06	2.28	32.30	19.25	38.52	North Thistle 2 State 1H (p)	1484.86	1520.98	42.11	
12100.00	11014.57	2.20	33.52	19.57	39.16	North Thistle 2 State 1H (p)	1484.56	1521.44	41.26	
12200.00	11016.08	2.13	34.80	19.91	39.85	North Thistle 2 State 1H (p)	1484.22	1521.89	40.39	
12300.00	11017.59	2.06	36.12	20.28	40.57	North Thistle 2 State 1H (p)	1483.84	1522.35	39.52	
12400.00	11019.10	1.99	37.48	20.66	41.34	North Thistle 2 State 1H (p)	1483.43	1522.82	38.66	

SD Anti-Collision Report

Primary Well: North Thistle 2 State 2H (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										Risk
MU (US ft)	TVD (US ft)	I,Face to Sec (°)	S, Major (US ft)	S, Minor (US ft)	TVD Spread (US ft)	Nearest Well	ES (US ft)	CC (US ft)	SI	
7300.00	7300.00	324.81	16.30	16.30	18.93	North Thistle 2 State 1H (p)	103.25	136.00	4.15	
7400.00	7400.00	324.81	16.52	16.52	19.28	North Thistle 2 State 1H (p)	102.80	136.00	4.10	
7500.00	7500.00	324.81	16.75	16.75	19.63	North Thistle 2 State 1H (p)	102.36	136.00	4.04	
7600.00	7600.00	324.81	16.97	16.97	19.98	North Thistle 2 State 1H (p)	101.91	136.00	3.99	
7700.00	7700.00	324.81	17.20	17.20	20.34	North Thistle 2 State 1H (p)	101.46	136.00	3.94	
7800.00	7800.00	324.81	17.42	17.42	20.71	North Thistle 2 State 1H (p)	101.02	136.00	3.89	
7900.00	7900.00	324.81	17.65	17.65	21.08	North Thistle 2 State 1H (p)	100.57	136.00	3.84	
8000.00	8000.00	324.81	17.87	17.87	21.46	North Thistle 2 State 1H (p)	100.13	136.00	3.79	
8100.00	8100.00	324.81	18.10	18.10	21.84	North Thistle 2 State 1H (p)	99.68	136.00	3.74	
8200.00	8200.00	324.81	18.32	18.32	22.23	North Thistle 2 State 1H (p)	99.24	136.00	3.70	
8300.00	8300.00	324.81	18.54	18.54	22.62	North Thistle 2 State 1H (p)	98.79	136.00	3.65	
8400.00	8400.00	324.81	18.77	18.77	23.02	North Thistle 2 State 1H (p)	98.35	136.00	3.61	
8500.00	8500.00	324.81	18.99	18.99	23.43	North Thistle 2 State 1H (p)	97.90	136.00	3.57	
8600.00	8600.00	324.81	19.22	19.22	23.84	North Thistle 2 State 1H (p)	97.46	136.00	3.53	
8700.00	8700.00	324.81	19.44	19.44	24.25	North Thistle 2 State 1H (p)	97.01	136.00	3.49	
8800.00	8800.00	324.81	19.67	19.67	24.67	North Thistle 2 State 1H (p)	96.57	136.00	3.45	
8900.00	8900.00	324.81	19.89	19.89	25.10	North Thistle 2 State 1H (p)	96.12	136.00	3.41	
9000.00	9000.00	324.59	20.12	20.12	25.53	North Thistle 2 State 1H (p)	95.16	135.47	3.36	
9100.00	9100.00	319.11	20.34	20.34	25.97	North Thistle 2 State 1H (p)	82.98	123.36	3.06	
9200.00	9200.00	303.17	20.57	20.57	26.41	North Thistle 2 State 1H (p)	59.55	100.00	2.47	
9300.00	9300.00	273.31	20.79	20.79	26.86	North Thistle 2 State 1H (p)	41.78	83.29	2.01	
9400.00	9400.00	243.91	21.02	21.02	27.32	North Thistle 2 State 1H (p)	66.78	106.15	2.70	
9500.00	9500.00	226.62	21.24	21.24	27.78	North Thistle 2 State 1H (p)	128.43	164.56	4.55	
9600.00	9600.00	217.33	21.47	21.47	28.25	North Thistle 2 State 1H (p)	204.86	239.04	6.99	
9700.00	9700.00	211.94	21.69	21.69	28.72	North Thistle 2 State 1H (p)	288.31	321.31	9.74	
9800.00	9800.00	208.52	21.92	21.92	29.20	North Thistle 2 State 1H (p)	375.79	408.11	12.63	

5D Anti-Collision Report

Primary Well: North Thistle 2 State 2H (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
MD (US ft)	TVD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	Nearest Well	ES (US ft)	CC (US ft)	SF	Risk
15100.00	11059.88	0.09	81.23	35.44	70.92	North Thistle 2 State 1H (p)	1465.70	1536.18	21.80	
15200.00	11061.39	0.02	82.96	36.08	72.20	North Thistle 2 State 1H (p)	1464.90	1536.71	21.40	
15240.50	11062.00	0.00	83.66	36.34	72.72	North Thistle 2 State 1H (p)	1464.71	1537.00	21.26	

Secondary Well: North Thistle 2 State 1H (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
PH MD (US ft)	TVD (US ft)	Sec MD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	SF	Risk
0.00	0.00	0.00	269.60	0.00	0.00	0.00	49.49	50.06	88.35	
100.00	100.00	100.00	269.60	0.11	0.11	4.60	49.27	50.06	63.59	
200.00	200.00	200.00	269.60	0.34	0.34	4.62	48.82	50.06	40.48	
300.00	300.00	300.00	269.60	0.56	0.56	4.65	48.37	50.06	29.69	
400.00	400.00	400.00	269.60	0.79	0.79	4.70	47.93	50.06	23.44	
500.00	500.00	500.00	269.60	1.01	1.01	4.75	47.48	50.06	19.36	
600.00	600.00	600.00	269.60	1.24	1.24	4.82	47.03	50.06	16.49	
700.00	700.00	700.00	269.60	1.46	1.46	4.89	46.58	50.06	14.37	
800.00	800.00	800.00	269.60	1.69	1.69	4.98	46.13	50.06	12.72	
900.00	900.00	900.00	269.60	1.91	1.91	5.07	45.68	50.06	11.42	
1000.00	1000.00	1000.00	269.60	2.14	2.14	5.17	45.23	50.06	10.36	
1100.00	1100.00	1100.00	269.60	2.36	2.36	5.28	44.78	50.06	9.48	
1200.00	1200.00	1200.00	269.60	2.59	2.59	5.39	44.33	50.06	8.73	
1300.00	1300.00	1300.00	269.60	2.81	2.81	5.51	43.88	50.06	8.10	
1400.00	1400.00	1400.00	269.60	3.03	3.03	5.64	43.43	50.06	7.55	
1500.00	1500.00	1500.00	269.60	3.26	3.26	5.77	42.98	50.06	7.07	
1600.00	1600.00	1600.00	269.60	3.48	3.48	5.90	42.53	50.06	6.65	
1700.00	1700.00	1700.00	269.60	3.71	3.71	6.04	42.08	50.06	6.27	
1800.00	1800.00	1800.00	269.60	3.93	3.93	6.19	41.63	50.06	5.94	
1900.00	1900.00	1900.00	269.60	4.16	4.16	6.33	41.18	50.06	5.64	
2000.00	2000.00	2000.00	269.60	4.38	4.38	6.48	40.73	50.06	5.37	
2100.00	2100.00	2100.00	269.60	4.61	4.61	6.64	40.28	50.06	5.12	
2200.00	2200.00	2200.00	269.60	4.83	4.83	6.80	39.83	50.06	4.89	
2300.00	2300.00	2300.00	269.60	5.06	5.06	6.96	39.38	50.06	4.69	
2400.00	2400.00	2400.00	269.60	5.28	5.28	7.12	38.93	50.06	4.50	
2500.00	2500.00	2500.00	269.60	5.51	5.51	7.29	38.48	50.06	4.32	
2600.00	2600.00	2600.00	269.60	5.73	5.73	7.45	38.03	50.06	4.16	
2700.00	2700.00	2700.00	269.60	5.96	5.96	7.63	37.59	50.06	4.01	
2800.00	2800.00	2800.00	269.60	6.18	6.18	7.80	37.14	50.06	3.87	
2900.00	2900.00	2900.00	269.60	6.41	6.41	7.98	36.69	50.06	3.74	
3000.00	3000.00	3000.00	269.60	6.63	6.63	8.15	36.24	50.06	3.62	
3100.00	3100.00	3100.00	269.60	6.86	6.86	8.34	35.79	50.06	3.51	
3200.00	3200.00	3200.00	269.60	7.08	7.08	8.52	35.34	50.06	3.40	
3300.00	3300.00	3300.00	269.60	7.31	7.31	8.71	34.89	50.06	3.30	
3400.00	3400.00	3400.00	269.60	7.53	7.53	8.90	34.44	50.06	3.20	
3500.00	3500.00	3500.00	269.60	7.76	7.76	9.09	33.99	50.06	3.11	
3600.00	3600.00	3600.00	269.60	7.98	7.98	9.28	33.54	50.06	3.03	
3700.00	3700.00	3700.00	269.60	8.20	8.20	9.48	33.09	50.06	2.95	
3800.00	3800.00	3800.00	269.60	8.43	8.43	9.68	32.64	50.06	2.87	
3900.00	3900.00	3900.00	269.60	8.65	8.65	9.88	32.19	50.06	2.80	
4000.00	4000.00	4000.00	269.60	8.88	8.88	10.08	31.74	50.06	2.73	
4100.00	4100.00	4100.00	269.60	9.10	9.10	10.29	31.29	50.06	2.67	
4200.00	4200.00	4200.00	269.60	9.33	9.33	10.50	30.84	50.06	2.60	
4300.00	4300.00	4300.00	269.60	9.55	9.55	10.72	30.39	50.06	2.55	
4400.00	4399.78	4399.78	270.56	9.78	9.78	10.93	30.17	50.28	2.50	
4500.00	4499.46	4499.50	273.39	10.00	10.00	11.15	30.46	51.01	2.48	
4600.00	4598.97	4599.10	277.90	10.22	10.21	11.37	31.50	52.49	2.50	
4700.00	4698.20	4698.52	283.74	10.44	10.43	11.60	33.69	55.08	2.58	

5D Anti-Collision Report

Primary Well: North Thistle 2 State 2H (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
MD (US ft)	TVD (US ft)	T Face to Sec (°)	S Major (US ft)	S Minor (US ft)	TVD Spread (US ft)	Nearest Well	ES (US ft)	CC (US ft)	SF	Risk
12500.00	11020.61	1.92	38.88	21.06	42.14	North Thistle 2 State 1H (p)	1483.01	1523.28	37.82	
12600.00	11022.12	1.85	40.31	21.48	42.98	North Thistle 2 State 1H (p)	1482.56	1523.75	36.99	
12700.00	11023.63	1.78	41.77	21.91	43.85	North Thistle 2 State 1H (p)	1482.03	1524.22	36.13	
12800.00	11025.14	1.71	43.26	22.36	44.76	North Thistle 2 State 1H (p)	1481.55	1524.69	35.34	
12900.00	11026.65	1.64	44.77	22.83	45.69	North Thistle 2 State 1H (p)	1481.09	1525.17	34.60	
13000.00	11028.16	1.56	46.31	23.31	46.65	North Thistle 2 State 1H (p)	1480.51	1525.64	33.80	
13100.00	11029.67	1.49	47.86	23.80	47.63	North Thistle 2 State 1H (p)	1479.98	1526.12	33.08	
13200.00	11031.18	1.42	49.43	24.30	48.64	North Thistle 2 State 1H (p)	1479.37	1526.60	32.32	
13300.00	11032.69	1.35	51.02	24.82	49.67	North Thistle 2 State 1H (p)	1478.76	1527.09	31.60	
13400.00	11034.20	1.28	52.62	25.35	50.73	North Thistle 2 State 1H (p)	1478.06	1527.57	30.85	
13500.00	11035.71	1.21	54.23	25.88	51.80	North Thistle 2 State 1H (p)	1477.44	1528.06	30.19	
13600.00	11037.22	1.14	55.86	26.43	52.89	North Thistle 2 State 1H (p)	1476.75	1528.55	29.51	
13700.00	11038.73	1.07	57.50	26.98	54.01	North Thistle 2 State 1H (p)	1476.17	1529.04	28.92	
13800.00	11040.24	1.00	59.15	27.55	55.13	North Thistle 2 State 1H (p)	1475.42	1529.54	28.27	
13900.00	11041.75	0.93	60.81	28.12	56.27	North Thistle 2 State 1H (p)	1474.72	1530.04	27.66	
14000.00	11043.26	0.86	62.47	28.70	57.43	North Thistle 2 State 1H (p)	1474.03	1530.54	27.09	
14100.00	11044.77	0.79	64.15	29.28	58.60	North Thistle 2 State 1H (p)	1473.33	1531.04	26.53	
14200.00	11046.28	0.72	65.83	29.87	59.79	North Thistle 2 State 1H (p)	1472.60	1531.54	25.98	
14300.00	11047.79	0.65	67.52	30.47	60.98	North Thistle 2 State 1H (p)	1471.87	1532.05	25.46	
14400.00	11049.31	0.58	69.22	31.08	62.19	North Thistle 2 State 1H (p)	1471.14	1532.56	24.95	
14500.00	11050.82	0.51	70.92	31.68	63.41	North Thistle 2 State 1H (p)	1470.40	1533.07	24.46	
14600.00	11052.33	0.44	72.62	32.30	64.64	North Thistle 2 State 1H (p)	1469.65	1533.58	23.99	
14700.00	11053.84	0.37	74.34	32.92	65.88	North Thistle 2 State 1H (p)	1468.87	1534.10	23.52	
14800.00	11055.35	0.30	76.05	33.54	67.13	North Thistle 2 State 1H (p)	1468.08	1534.62	23.06	
14900.00	11056.86	0.23	77.77	34.17	68.38	North Thistle 2 State 1H (p)	1467.29	1535.14	22.63	
15000.00	11058.37	0.16	79.50	34.80	69.65	North Thistle 2 State 1H (p)	1466.50	1535.66	22.20	

SD Anti-Collision Report

Secondary Well: North Thistle 2 State 1H (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pr MD (US ft)	TVD (US ft)	Sec MD (US ft)	T,Face to Sec (°)	S, Major (US ft)	S, Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	SF	Risk
4800.00	4797.08	4797.70	290.39	10.67	10.64	11.82	37.32	59.15	2.71	
4900.00	4895.50	4896.58	297.26	10.89	10.85	12.05	42.78	65.06	2.92	
5000.00	4994.39	4996.01	303.44	11.12	11.07	12.29	49.74	72.43	3.19	
5100.00	5093.29	5095.46	308.45	11.35	11.30	12.53	57.33	80.49	3.48	
5200.00	5192.20	5194.91	312.52	11.58	11.52	12.77	65.48	89.04	3.78	
5300.00	5291.11	5294.37	315.87	11.82	11.74	13.02	73.99	97.97	4.09	
5400.00	5390.02	5393.82	318.65	12.06	11.97	13.27	82.71	107.17	4.38	
5500.00	5490.74	5495.02	320.86	12.27	12.18	13.53	90.96	115.88	4.65	
5600.00	5592.04	5596.64	322.44	12.46	12.37	13.79	97.76	123.11	4.86	
5700.00	5693.73	5698.52	323.55	12.65	12.55	14.07	103.01	128.78	5.00	
5800.00	5795.70	5800.59	324.28	12.84	12.73	14.34	106.66	132.84	5.08	
5900.00	5897.86	5902.79	324.69	13.02	12.91	14.62	108.67	135.25	5.09	
6000.00	6000.00	6004.93	324.81	13.20	13.09	14.91	109.02	136.00	5.04	
6100.00	6100.00	6104.93	324.81	13.40	13.29	15.19	108.60	136.00	4.96	
6200.00	6200.00	6204.93	324.81	13.62	13.51	15.47	108.15	136.00	4.88	
6300.00	6300.00	6304.93	324.81	13.85	13.74	15.76	107.71	136.00	4.81	
6400.00	6400.00	6404.93	324.81	14.07	13.96	16.06	107.26	136.00	4.73	
6500.00	6500.00	6504.93	324.81	14.29	14.19	16.36	106.82	136.00	4.66	
6600.00	6600.00	6604.93	324.81	14.51	14.41	16.67	106.37	136.00	4.59	
6700.00	6700.00	6704.93	324.81	14.73	14.63	16.98	105.92	136.00	4.52	
6800.00	6800.00	6804.93	324.81	14.96	14.86	17.29	105.48	136.00	4.46	
6900.00	6900.00	6904.93	324.81	15.18	15.08	17.61	105.03	136.00	4.39	
7000.00	7000.00	7004.93	324.81	15.40	15.31	17.93	104.58	136.00	4.33	
7100.00	7100.00	7104.93	324.81	15.62	15.53	18.26	104.14	136.00	4.27	
7200.00	7200.00	7204.93	324.81	15.85	15.75	18.60	103.69	136.00	4.21	
7300.00	7300.00	7304.93	324.81	16.07	15.98	18.94	103.25	136.00	4.15	
7400.00	7400.00	7404.93	324.81	16.29	16.20	19.28	102.80	136.00	4.10	
7500.00	7500.00	7504.93	324.81	16.51	16.43	19.63	102.36	136.00	4.04	
7600.00	7600.00	7604.93	324.81	16.74	16.65	19.99	101.91	136.00	3.99	
7700.00	7700.00	7704.93	324.81	16.96	16.87	20.35	101.46	136.00	3.94	
7800.00	7800.00	7804.93	324.81	17.18	17.10	20.72	101.02	136.00	3.89	
7900.00	7900.00	7904.93	324.81	17.40	17.32	21.09	100.57	136.00	3.84	
8000.00	8000.00	8004.93	324.81	17.63	17.55	21.46	100.13	136.00	3.79	
8100.00	8100.00	8104.93	324.81	17.85	17.77	21.85	99.68	136.00	3.74	
8200.00	8200.00	8204.93	324.81	18.07	17.99	22.23	99.24	136.00	3.70	
8300.00	8300.00	8304.93	324.81	18.30	18.22	22.63	98.79	136.00	3.65	
8400.00	8400.00	8404.93	324.81	18.52	18.44	23.03	98.35	136.00	3.61	
8500.00	8500.00	8504.93	324.81	18.74	18.67	23.43	97.90	136.00	3.57	
8600.00	8600.00	8604.93	324.81	18.97	18.89	23.84	97.46	136.00	3.53	
8700.00	8700.00	8704.93	324.81	19.19	19.12	24.26	97.01	136.00	3.49	
8800.00	8800.00	8804.93	324.81	19.41	19.34	24.68	96.57	136.00	3.45	
8900.00	8900.00	8904.93	324.81	19.64	19.56	25.10	96.12	136.00	3.41	
9000.00	9005.75	9010.70	324.59	19.86	19.77	25.56	95.16	135.47	3.36	
9100.00	9123.62	9130.28	319.11	20.02	19.57	26.05	82.98	123.36	3.06	
9200.00	9225.23	9239.18	303.17	20.15	18.85	26.44	59.55	100.00	2.47	
9300.00	9300.84	9328.97	273.31	20.26	17.88	26.73	41.78	83.29	2.01	
9400.00	9352.46	9398.57	243.91	20.35	16.99	26.91	66.78	106.15	2.70	
9500.00	9387.16	9451.99	226.62	20.46	16.28	27.03	128.43	164.56	4.55	
9600.00	9410.78	9493.32	217.33	20.54	15.74	27.13	204.86	239.04	6.99	
9700.00	9427.23	9525.81	211.94	20.64	15.33	27.20	288.31	321.31	9.74	
9800.00	9438.99	9551.78	208.52	20.72	15.03	27.26	375.79	408.11	12.63	
9900.00	9447.62	9572.91	206.19	20.78	14.80	27.31	466.03	497.85	15.65	
10000.00	9454.10	9590.38	204.52	20.83	14.62	27.34	557.98	589.62	18.64	
10100.00	9459.07	9605.01	203.27	20.88	14.49	27.38	651.36	682.87	21.67	
10200.00	9462.96	9617.43	202.30	20.94	14.38	27.41	745.83	777.23	24.75	
10300.00	9466.05	9628.09	201.53	20.98	14.30	27.43	841.01	872.46	27.74	
10400.00	9468.54	9637.33	200.90	21.02	14.23	27.46	936.78	968.36	30.67	
10500.00	9470.58	9645.43	15.91	21.05	14.18	27.48	1033.08	1064.78	33.59	

SD Anti-Collision Report

Secondary Well: North Thistle 2 State 1H (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pr MD (US ft)	TVD (US ft)	Sec MD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	ES (US ft)	LC (US ft)	SF	Risk
10600.00	9472.91	9655.39	9.52	21.10	14.12	27.50	1126.97	1158.75	36.46	
10700.00	9475.71	9668.71	6.68	21.15	14.04	27.54	1214.97	1246.74	39.25	
10800.00	9478.66	9685.12	4.98	21.22	13.97	27.58	1294.12	1325.92	41.69	
10900.00	9481.39	9704.17	4.03	21.31	13.91	27.62	1361.70	1393.57	43.73	
11000.00	9483.52	9725.20	3.46	21.42	13.87	27.68	1416.23	1448.10	45.44	
11100.00	9484.77	9747.63	3.12	21.53	13.87	27.74	1456.39	1488.28	46.68	
11200.00	9485.51	9810.49	2.89	21.90	13.97	27.94	1480.50	1512.59	47.14	
11300.00	9486.49	9910.22	2.77	22.59	14.15	28.31	1485.47	1517.86	46.87	
11400.00	9487.47	10010.20	2.70	23.39	14.37	28.76	1485.55	1518.30	46.37	
11500.00	9488.45	10110.18	2.63	24.31	14.63	29.27	1485.57	1518.74	45.79	
11600.00	9489.43	10210.16	2.56	25.32	14.91	29.84	1485.53	1519.18	45.15	
11700.00	9490.42	10310.14	2.49	26.42	15.23	30.47	1485.44	1519.63	44.45	
11800.00	9491.40	10410.12	2.42	27.60	15.57	31.16	1485.30	1520.08	43.70	
11900.00	9492.38	10510.10	2.35	28.84	15.94	31.90	1485.10	1520.53	42.92	
12000.00	9493.36	10610.08	2.28	30.14	16.34	32.69	1484.86	1520.98	42.11	
12100.00	9494.34	10710.07	2.20	31.50	16.76	33.53	1484.56	1521.44	41.26	
12200.00	9495.32	10810.05	2.13	32.89	17.19	34.40	1484.22	1521.89	40.39	
12300.00	9496.30	10910.03	2.06	34.33	17.65	35.32	1483.84	1522.35	39.52	
12400.00	9497.28	11010.01	1.99	35.80	18.13	36.28	1483.43	1522.82	38.66	
12500.00	9498.26	11109.99	1.92	37.30	18.62	37.26	1483.01	1523.28	37.82	
12600.00	9499.24	11209.97	1.85	38.83	19.13	38.28	1482.56	1523.75	36.99	
12700.00	9500.23	11309.95	1.78	40.38	19.65	39.33	1482.03	1524.22	36.13	
12800.00	9501.21	11409.93	1.71	41.95	20.19	40.40	1481.55	1524.69	35.34	
12900.00	9502.19	11509.91	1.64	43.55	20.74	41.49	1481.09	1525.17	34.60	
13000.00	9503.17	11609.90	1.56	45.16	21.29	42.61	1480.51	1525.64	33.80	
13100.00	9504.15	11709.88	1.49	46.78	21.86	43.75	1479.98	1526.12	33.08	
13200.00	9505.13	11809.86	1.42	48.42	22.44	44.91	1479.37	1526.60	32.32	
13300.00	9506.11	11909.84	1.35	50.07	23.03	46.08	1478.76	1527.09	31.60	
13400.00	9507.09	12009.82	1.28	51.73	23.63	47.28	1478.06	1527.57	30.85	
13500.00	9508.07	12109.80	1.21	53.40	24.23	48.48	1477.44	1528.06	30.19	
13600.00	9509.05	12209.78	1.14	55.08	24.84	49.70	1476.75	1528.55	29.51	
13700.00	9510.04	12309.76	1.07	56.77	25.46	50.94	1476.17	1529.04	28.92	
13800.00	9511.02	12409.74	1.00	58.47	26.08	52.18	1475.42	1529.54	28.27	
13900.00	9512.00	12509.73	0.93	60.17	26.71	53.44	1474.72	1530.04	27.66	
14000.00	9512.98	12609.71	0.86	61.89	27.34	54.71	1474.03	1530.54	27.09	
14100.00	9513.96	12709.69	0.79	63.60	27.98	55.98	1473.33	1531.04	26.53	
14200.00	9514.94	12809.67	0.72	65.32	28.62	57.27	1472.60	1531.54	25.98	
14300.00	9515.92	12909.65	0.65	67.05	29.27	58.57	1471.87	1532.05	25.46	
14400.00	9516.90	13009.63	0.58	68.78	29.92	59.87	1471.14	1532.56	24.95	
14500.00	9517.88	13109.61	0.51	70.52	30.58	61.18	1470.40	1533.07	24.46	
14600.00	9518.86	13209.59	0.44	72.26	31.23	62.49	1469.65	1533.58	23.99	
14700.00	9519.85	13309.57	0.37	74.00	31.90	63.82	1468.87	1534.10	23.52	
14800.00	9520.83	13409.55	0.30	75.75	32.56	65.15	1468.08	1534.62	23.06	
14900.00	9521.81	13509.54	0.23	77.50	33.23	66.48	1467.29	1535.14	22.63	
15000.00	9522.79	13609.52	0.16	79.25	33.90	67.82	1466.50	1535.66	22.20	
15100.00	9523.77	13709.50	0.09	81.01	34.57	69.17	1465.70	1536.18	21.80	
15200.00	9524.75	13809.48	0.02	82.76	35.25	70.52	1464.90	1536.71	21.40	
15240.50	9525.00	13834.89	0.00	83.21	35.42	70.86	1464.71	1537.00	21.26	

**Weatherford****Weatherford Drilling Services**

GeoDec4 v2.1.0.0

Report Date: September 24, 2015
Job Number: _____
Customer: Devon Energy
Well Name: North Thistle 2 State 2H
API Number: _____
Rig Name: _____
Location: Lea Co, NM Nad83 NME
Block: _____
Engineer: _____

NAD83 / New Mexico East (ftUS)	NAD83 (1986)
Projected Coordinate System	Geodetic Coordinate System
Datum: North American Datum 1983 (1986)	Datum: North American Datum 1983 (1986)
Ellipsoid: GRS 1980	Ellipsoid: GRS 1980
EPSG: 2257	EPSG: 4269
North: 488169.46 US Survey Foot	Latitude: 32.339561 Degree
East: 786040.51 US Survey Foot	Longitude: -103.541015 Degree
Convergence: 0.42°	
Declination: 7.21°	
Total Correction: 6.79°	
Datum Transformation: none	

Geodetic Location WGS84
MSL Elevation = 0 m
Latitude = 32° 20' 22.42" N
Longitude = 103° 32' 27.66" W

Magnetic Declination = 7.21 deg	[True North Offset]
Local Gravity = .9988 g	Checksum = 6652
Local Field Strength = 48281 nT	Magnetic Vector X = 23767 nT
Magnetic Dip = 60.25 deg	Magnetic Vector Y = 3006 nT
Magnetic Model = bggm2015.dat	Magnetic Vector Z = 41918 nT
Run Date = October 30, 2015	Magnetic Vector H = 23956 nT

Signed: _____ Date: _____

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