

ENSIGN

Directional

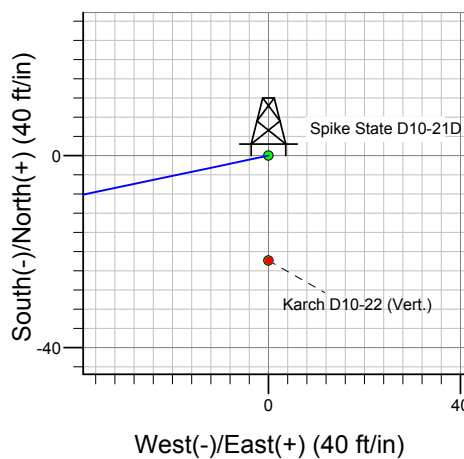
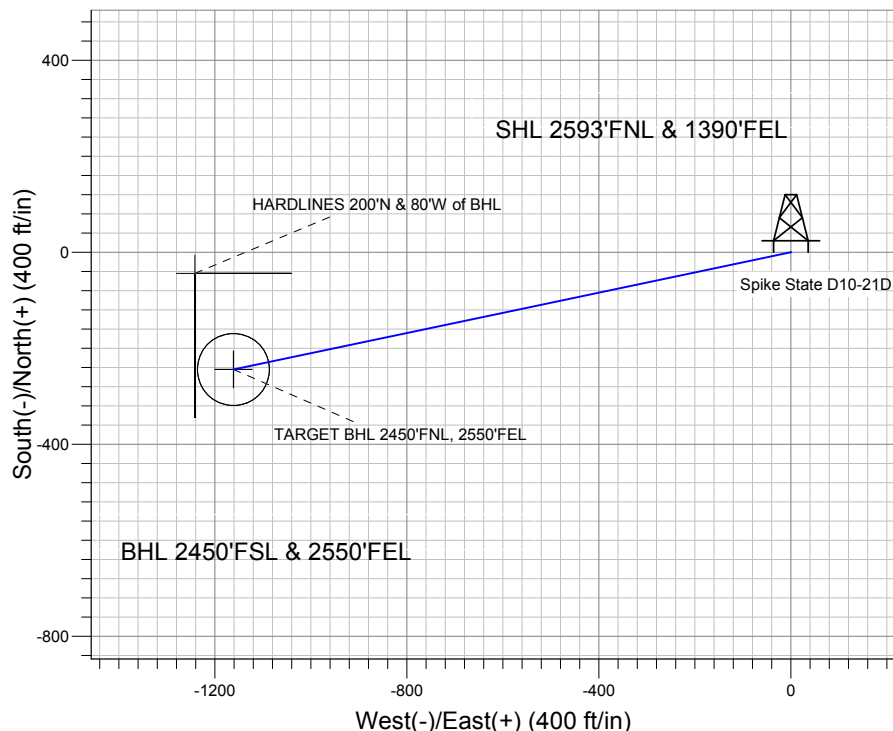
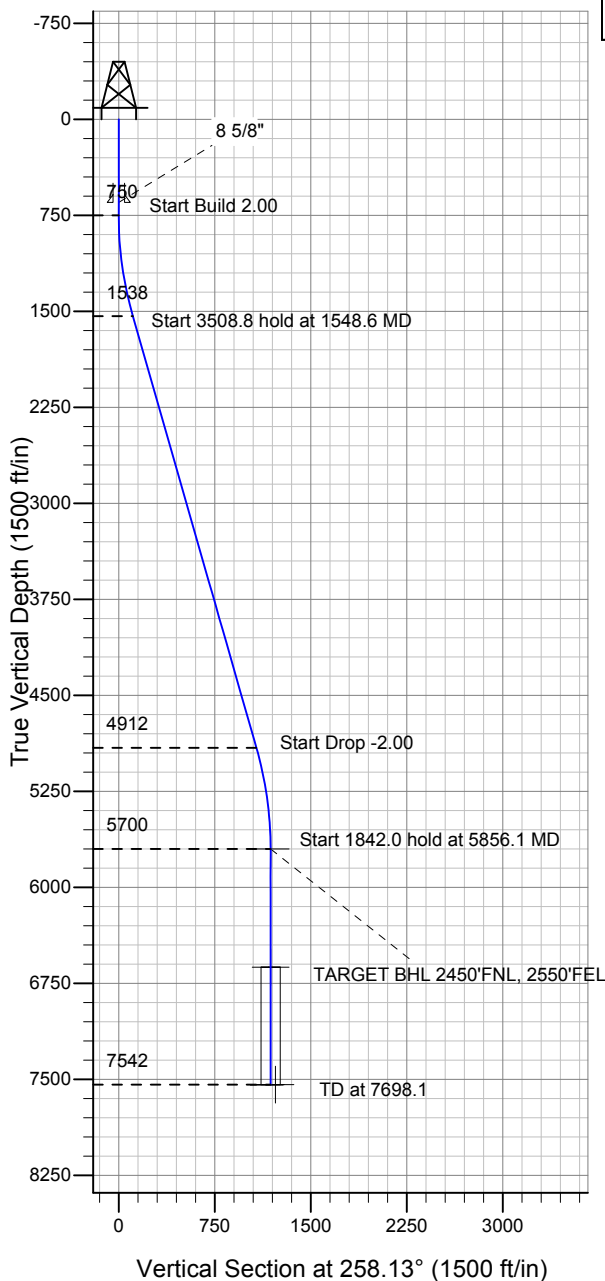
Well Name: Spike State D10-21D

Surface Location: Spike State D10-21D Pad Sec.10-T3N-R64W
 North American Datum 1983 US State Plane 1983 Colorado Northern Zone

Ground Elevation: 4762.0

+N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.0 0.0 1331771.85 3270005.33 40° 14' 24.252 N 104° 31' 58.080 W
 Original Well Elev WELL @ 4775.0ft (Original Well Elev)

NOBLE ENERGY INC WELD COUNTY CO



Spike State D10-21D Pad Sec.10-T3N-R64W
 Spike State D10-21D
 Noble Spike State D10-21D Plan #2 (4-28-11)
 7:41, April 29 2011



Azimuths to True North
 Magnetic North: 8.74°

Magnetic Field
 Strength: 53086.6snT
 Dip Angle: 66.96°
 Date: 4/29/2011
 Model: IGRF2010

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
TARGET BHL 2450'FNL, 2550'FEL	5700.0	-244.0	-1161.4	40° 14' 21.840 N	104° 32' 13.056 W	Point
TARGET CIRCLE 2450'FSL & 2550'FEL	6625.0	-244.0	-1161.4	40° 14' 21.840 N	104° 32' 13.056 W	Circle (Radius: 75.0)
HARDLINES 200'N & 80'W of BHL	7542.0	-44.1	-1241.4	40° 14' 23.816 N	104° 32' 14.088 W	Polygon

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	750.0	0.00	0.00	750.0	0.0	0.0	0.00	0.00	0.0	
3	1548.6	15.97	258.13	1538.3	-22.7	-108.2	2.00	258.13	110.6	
4	5057.4	15.97	258.13	4911.7	-221.3	-1053.2	0.00	0.00	1076.2	
5	5856.1	0.00	0.00	5700.0	-244.0	-1161.4	2.00	180.00	1186.8	TARGET BHL 2450'FNL, 2550'FEL
6	7698.1	0.00	0.00	7542.0	-244.0	-1161.4	0.00	0.00	1186.8	



Directional

NOBLE ENERGY INC WELD COUNTY CO

SEC.10-T3N-R64W

Spike State D10-21D Pad Sec.10-T3N-R64W

Spike State D10-21D

Wellbore #1

Plan: Noble Spike State D10-21D Plan #2 (4-28-11)

Standard Planning Report

29 April, 2011



Database:	Landmark	Local Co-ordinate Reference:	Well Spike State D10-21D
Company:	NOBLE ENERGY INC WELD COUNTY CO	TVD Reference:	WELL @ 4775.0ft (Original Well Elev)
Project:	SEC.10-T3N-R64W	MD Reference:	WELL @ 4775.0ft (Original Well Elev)
Site:	Spike State D10-21D Pad Sec.10-T3N-R64W	North Reference:	True
Well:	Spike State D10-21D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble Spike State D10-21D Plan #2 (4-28-11)		

Project	SEC.10-T3N-R64W		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site						Spike State D10-21D Pad Sec.10-T3N-R64W											
Site Position:						Northing:			1,331,771.86ft			Latitude:			40° 14' 24.252 N		
From:			Lat/Long			Easting:			3,270,005.33ft			Longitude:			104° 31' 58.080 W		
Position Uncertainty:			0.0 ft			Slot Radius:			"			Grid Convergence:			0.62 °		

Well	Spike State D10-21D					
Well Position	+N-S	0.0 ft	Northing:	1,331,771.85 ft	Latitude:	40° 14' 24.252 N
	+E-W	0.0 ft	Easting:	3,270,005.33 ft	Longitude:	104° 31' 58.080 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,762.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/29/2011	8.74	66.96	53,087

Design	Noble Spike State D10-21D Plan #2 (4-28-11)			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	258.13

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
750.0	0.00	0.00	750.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,548.6	15.97	258.13	1,538.3	-22.7	-108.2	2.00	2.00	0.00	258.13	
5,057.4	15.97	258.13	4,911.7	-221.3	-1,053.2	0.00	0.00	0.00	0.00	
5,856.1	0.00	0.00	5,700.0	-244.0	-1,161.4	2.00	-2.00	0.00	180.00	TARGET BHL 245C
7,698.1	0.00	0.00	7,542.0	-244.0	-1,161.4	0.00	0.00	0.00	0.00	

Database:	Landmark	Local Co-ordinate Reference:	Well Spike State D10-21D
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Project:	SEC.10-T3N-R64W	MD Reference:	WELL @ 4775.0ft (Original Well Elev)
Site:	Spike State D10-21D Pad Sec.10-T3N-R64W	North Reference:	True
Well:	Spike State D10-21D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble Spike State D10-21D Plan #2 (4-28-11)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
40.0	0.00	0.00	40.0	0.0	0.0	0.0	0.00	0.00	0.00
80.0	0.00	0.00	80.0	0.0	0.0	0.0	0.00	0.00	0.00
120.0	0.00	0.00	120.0	0.0	0.0	0.0	0.00	0.00	0.00
160.0	0.00	0.00	160.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
240.0	0.00	0.00	240.0	0.0	0.0	0.0	0.00	0.00	0.00
280.0	0.00	0.00	280.0	0.0	0.0	0.0	0.00	0.00	0.00
320.0	0.00	0.00	320.0	0.0	0.0	0.0	0.00	0.00	0.00
360.0	0.00	0.00	360.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
440.0	0.00	0.00	440.0	0.0	0.0	0.0	0.00	0.00	0.00
480.0	0.00	0.00	480.0	0.0	0.0	0.0	0.00	0.00	0.00
520.0	0.00	0.00	520.0	0.0	0.0	0.0	0.00	0.00	0.00
560.0	0.00	0.00	560.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
640.0	0.00	0.00	640.0	0.0	0.0	0.0	0.00	0.00	0.00
650.0	0.00	0.00	650.0	0.0	0.0	0.0	0.00	0.00	0.00
8 5/8"									
680.0	0.00	0.00	680.0	0.0	0.0	0.0	0.00	0.00	0.00
720.0	0.00	0.00	720.0	0.0	0.0	0.0	0.00	0.00	0.00
750.0	0.00	0.00	750.0	0.0	0.0	0.0	0.00	0.00	0.00
760.0	0.20	258.13	760.0	0.0	0.0	0.0	2.00	2.00	0.00
800.0	1.00	258.13	800.0	-0.1	-0.4	0.4	2.00	2.00	0.00
840.0	1.80	258.13	840.0	-0.3	-1.4	1.4	2.00	2.00	0.00
880.0	2.60	258.13	880.0	-0.6	-2.9	2.9	2.00	2.00	0.00
920.0	3.40	258.13	919.9	-1.0	-4.9	5.0	2.00	2.00	0.00
960.0	4.20	258.13	959.8	-1.6	-7.5	7.7	2.00	2.00	0.00
1,000.0	5.00	258.13	999.7	-2.2	-10.7	10.9	2.00	2.00	0.00
1,040.0	5.80	258.13	1,039.5	-3.0	-14.4	14.7	2.00	2.00	0.00
1,080.0	6.60	258.13	1,079.3	-3.9	-18.6	19.0	2.00	2.00	0.00
1,120.0	7.40	258.13	1,119.0	-4.9	-23.4	23.9	2.00	2.00	0.00
1,160.0	8.20	258.13	1,158.6	-6.0	-28.7	29.3	2.00	2.00	0.00
1,200.0	9.00	258.13	1,198.2	-7.3	-34.5	35.3	2.00	2.00	0.00
1,240.0	9.80	258.13	1,237.6	-8.6	-40.9	41.8	2.00	2.00	0.00
1,280.0	10.60	258.13	1,277.0	-10.1	-47.8	48.9	2.00	2.00	0.00
1,320.0	11.40	258.13	1,316.2	-11.6	-55.3	56.5	2.00	2.00	0.00
1,360.0	12.20	258.13	1,355.4	-13.3	-63.3	64.7	2.00	2.00	0.00
1,400.0	13.00	258.13	1,394.4	-15.1	-71.9	73.4	2.00	2.00	0.00
1,440.0	13.80	258.13	1,433.3	-17.0	-80.9	82.7	2.00	2.00	0.00
1,480.0	14.60	258.13	1,472.1	-19.0	-90.5	92.5	2.00	2.00	0.00
1,520.0	15.40	258.13	1,510.8	-21.2	-100.7	102.9	2.00	2.00	0.00
1,548.6	15.97	258.13	1,538.3	-22.7	-108.2	110.6	2.00	2.00	0.00
1,560.0	15.97	258.13	1,549.3	-23.4	-111.3	113.7	0.00	0.00	0.00
1,600.0	15.97	258.13	1,587.7	-25.7	-122.1	124.7	0.00	0.00	0.00
1,640.0	15.97	258.13	1,626.2	-27.9	-132.8	135.7	0.00	0.00	0.00
1,680.0	15.97	258.13	1,664.6	-30.2	-143.6	146.8	0.00	0.00	0.00
1,720.0	15.97	258.13	1,703.1	-32.4	-154.4	157.8	0.00	0.00	0.00
1,760.0	15.97	258.13	1,741.5	-34.7	-165.2	168.8	0.00	0.00	0.00
1,800.0	15.97	258.13	1,780.0	-37.0	-175.9	179.8	0.00	0.00	0.00
1,840.0	15.97	258.13	1,818.4	-39.2	-186.7	190.8	0.00	0.00	0.00
1,880.0	15.97	258.13	1,856.9	-41.5	-197.5	201.8	0.00	0.00	0.00
1,920.0	15.97	258.13	1,895.4	-43.8	-208.2	212.8	0.00	0.00	0.00
1,960.0	15.97	258.13	1,933.8	-46.0	-219.0	223.8	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Spike State D10-21D
Company:	NOBLE ENERGY INC WELD COUNTY CO	TVD Reference:	WELL @ 4775.0ft (Original Well Elev)
Project:	SEC.10-T3N-R64W	MD Reference:	WELL @ 4775.0ft (Original Well Elev)
Site:	Spike State D10-21D Pad Sec.10-T3N-R64W	North Reference:	True
Well:	Spike State D10-21D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble Spike State D10-21D Plan #2 (4-28-11)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
2,000.0	15.97	258.13	1,972.3	-48.3	-229.8	234.8	0.00	0.00	0.00
2,040.0	15.97	258.13	2,010.7	-50.5	-240.6	245.8	0.00	0.00	0.00
2,080.0	15.97	258.13	2,049.2	-52.8	-251.3	256.8	0.00	0.00	0.00
2,120.0	15.97	258.13	2,087.6	-55.1	-262.1	267.8	0.00	0.00	0.00
2,160.0	15.97	258.13	2,126.1	-57.3	-272.9	278.8	0.00	0.00	0.00
2,200.0	15.97	258.13	2,164.5	-59.6	-283.7	289.8	0.00	0.00	0.00
2,240.0	15.97	258.13	2,203.0	-61.9	-294.4	300.9	0.00	0.00	0.00
2,280.0	15.97	258.13	2,241.5	-64.1	-305.2	311.9	0.00	0.00	0.00
2,320.0	15.97	258.13	2,279.9	-66.4	-316.0	322.9	0.00	0.00	0.00
2,360.0	15.97	258.13	2,318.4	-68.7	-326.7	333.9	0.00	0.00	0.00
2,400.0	15.97	258.13	2,356.8	-70.9	-337.5	344.9	0.00	0.00	0.00
2,440.0	15.97	258.13	2,395.3	-73.2	-348.3	355.9	0.00	0.00	0.00
2,480.0	15.97	258.13	2,433.7	-75.4	-359.1	366.9	0.00	0.00	0.00
2,520.0	15.97	258.13	2,472.2	-77.7	-369.8	377.9	0.00	0.00	0.00
2,560.0	15.97	258.13	2,510.6	-80.0	-380.6	388.9	0.00	0.00	0.00
2,600.0	15.97	258.13	2,549.1	-82.2	-391.4	399.9	0.00	0.00	0.00
2,640.0	15.97	258.13	2,587.6	-84.5	-402.1	410.9	0.00	0.00	0.00
2,680.0	15.97	258.13	2,626.0	-86.8	-412.9	421.9	0.00	0.00	0.00
2,720.0	15.97	258.13	2,664.5	-89.0	-423.7	432.9	0.00	0.00	0.00
2,760.0	15.97	258.13	2,702.9	-91.3	-434.5	443.9	0.00	0.00	0.00
2,800.0	15.97	258.13	2,741.4	-93.6	-445.2	455.0	0.00	0.00	0.00
2,840.0	15.97	258.13	2,779.8	-95.8	-456.0	466.0	0.00	0.00	0.00
2,880.0	15.97	258.13	2,818.3	-98.1	-466.8	477.0	0.00	0.00	0.00
2,920.0	15.97	258.13	2,856.8	-100.3	-477.5	488.0	0.00	0.00	0.00
2,960.0	15.97	258.13	2,895.2	-102.6	-488.3	499.0	0.00	0.00	0.00
3,000.0	15.97	258.13	2,933.7	-104.9	-499.1	510.0	0.00	0.00	0.00
3,040.0	15.97	258.13	2,972.1	-107.1	-509.9	521.0	0.00	0.00	0.00
3,080.0	15.97	258.13	3,010.6	-109.4	-520.6	532.0	0.00	0.00	0.00
3,120.0	15.97	258.13	3,049.0	-111.7	-531.4	543.0	0.00	0.00	0.00
3,160.0	15.97	258.13	3,087.5	-113.9	-542.2	554.0	0.00	0.00	0.00
3,200.0	15.97	258.13	3,125.9	-116.2	-553.0	565.0	0.00	0.00	0.00
3,240.0	15.97	258.13	3,164.4	-118.5	-563.7	576.0	0.00	0.00	0.00
3,280.0	15.97	258.13	3,202.9	-120.7	-574.5	587.0	0.00	0.00	0.00
3,320.0	15.97	258.13	3,241.3	-123.0	-585.3	598.0	0.00	0.00	0.00
3,360.0	15.97	258.13	3,279.8	-125.2	-596.0	609.1	0.00	0.00	0.00
3,400.0	15.97	258.13	3,318.2	-127.5	-606.8	620.1	0.00	0.00	0.00
3,440.0	15.97	258.13	3,356.7	-129.8	-617.6	631.1	0.00	0.00	0.00
3,480.0	15.97	258.13	3,395.1	-132.0	-628.4	642.1	0.00	0.00	0.00
3,520.0	15.97	258.13	3,433.6	-134.3	-639.1	653.1	0.00	0.00	0.00
3,560.0	15.97	258.13	3,472.0	-136.6	-649.9	664.1	0.00	0.00	0.00
3,600.0	15.97	258.13	3,510.5	-138.8	-660.7	675.1	0.00	0.00	0.00
3,640.0	15.97	258.13	3,549.0	-141.1	-671.4	686.1	0.00	0.00	0.00
3,680.0	15.97	258.13	3,587.4	-143.4	-682.2	697.1	0.00	0.00	0.00
3,720.0	15.97	258.13	3,625.9	-145.6	-693.0	708.1	0.00	0.00	0.00
3,760.0	15.97	258.13	3,664.3	-147.9	-703.8	719.1	0.00	0.00	0.00
3,800.0	15.97	258.13	3,702.8	-150.1	-714.5	730.1	0.00	0.00	0.00
3,840.0	15.97	258.13	3,741.2	-152.4	-725.3	741.1	0.00	0.00	0.00
3,880.0	15.97	258.13	3,779.7	-154.7	-736.1	752.2	0.00	0.00	0.00
3,920.0	15.97	258.13	3,818.1	-156.9	-746.8	763.2	0.00	0.00	0.00
3,960.0	15.97	258.13	3,856.6	-159.2	-757.6	774.2	0.00	0.00	0.00
4,000.0	15.97	258.13	3,895.1	-161.5	-768.4	785.2	0.00	0.00	0.00
4,040.0	15.97	258.13	3,933.5	-163.7	-779.2	796.2	0.00	0.00	0.00
4,080.0	15.97	258.13	3,972.0	-166.0	-789.9	807.2	0.00	0.00	0.00
4,120.0	15.97	258.13	4,010.4	-168.3	-800.7	818.2	0.00	0.00	0.00

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Project:	SEC.10-T3N-R64W	MD Reference:	WELL @ 4775.0ft (Original Well Elev)
Site:	Spike State D10-21D Pad Sec.10-T3N-R64W	North Reference:	True
Well:	Spike State D10-21D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble Spike State D10-21D Plan #2 (4-28-11)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,160.0	15.97	258.13	4,048.9	-170.5	-811.5	829.2	0.00	0.00	0.00
4,200.0	15.97	258.13	4,087.3	-172.8	-822.3	840.2	0.00	0.00	0.00
4,240.0	15.97	258.13	4,125.8	-175.0	-833.0	851.2	0.00	0.00	0.00
4,280.0	15.97	258.13	4,164.2	-177.3	-843.8	862.2	0.00	0.00	0.00
4,320.0	15.97	258.13	4,202.7	-179.6	-854.6	873.2	0.00	0.00	0.00
4,360.0	15.97	258.13	4,241.2	-181.8	-865.3	884.2	0.00	0.00	0.00
4,400.0	15.97	258.13	4,279.6	-184.1	-876.1	895.2	0.00	0.00	0.00
4,440.0	15.97	258.13	4,318.1	-186.4	-886.9	906.3	0.00	0.00	0.00
4,480.0	15.97	258.13	4,356.5	-188.6	-897.7	917.3	0.00	0.00	0.00
4,520.0	15.97	258.13	4,395.0	-190.9	-908.4	928.3	0.00	0.00	0.00
4,560.0	15.97	258.13	4,433.4	-193.2	-919.2	939.3	0.00	0.00	0.00
4,600.0	15.97	258.13	4,471.9	-195.4	-930.0	950.3	0.00	0.00	0.00
4,640.0	15.97	258.13	4,510.3	-197.7	-940.7	961.3	0.00	0.00	0.00
4,680.0	15.97	258.13	4,548.8	-199.9	-951.5	972.3	0.00	0.00	0.00
4,720.0	15.97	258.13	4,587.3	-202.2	-962.3	983.3	0.00	0.00	0.00
4,760.0	15.97	258.13	4,625.7	-204.5	-973.1	994.3	0.00	0.00	0.00
4,800.0	15.97	258.13	4,664.2	-206.7	-983.8	1,005.3	0.00	0.00	0.00
4,840.0	15.97	258.13	4,702.6	-209.0	-994.6	1,016.3	0.00	0.00	0.00
4,880.0	15.97	258.13	4,741.1	-211.3	-1,005.4	1,027.3	0.00	0.00	0.00
4,920.0	15.97	258.13	4,779.5	-213.5	-1,016.1	1,038.3	0.00	0.00	0.00
4,960.0	15.97	258.13	4,818.0	-215.8	-1,026.9	1,049.3	0.00	0.00	0.00
5,000.0	15.97	258.13	4,856.4	-218.1	-1,037.7	1,060.4	0.00	0.00	0.00
5,040.0	15.97	258.13	4,894.9	-220.3	-1,048.5	1,071.4	0.00	0.00	0.00
5,057.4	15.97	258.13	4,911.7	-221.3	-1,053.2	1,076.2	0.00	0.00	0.00
5,080.0	15.52	258.13	4,933.4	-222.6	-1,059.2	1,082.3	2.00	-2.00	0.00
5,120.0	14.72	258.13	4,972.0	-224.7	-1,069.4	1,092.7	2.00	-2.00	0.00
5,160.0	13.92	258.13	5,010.8	-226.7	-1,079.0	1,102.6	2.00	-2.00	0.00
5,200.0	13.12	258.13	5,049.6	-228.7	-1,088.2	1,112.0	2.00	-2.00	0.00
5,240.0	12.32	258.13	5,088.7	-230.5	-1,096.8	1,120.8	2.00	-2.00	0.00
5,280.0	11.52	258.13	5,127.8	-232.2	-1,104.9	1,129.0	2.00	-2.00	0.00
5,320.0	10.72	258.13	5,167.0	-233.8	-1,112.5	1,136.8	2.00	-2.00	0.00
5,360.0	9.92	258.13	5,206.4	-235.2	-1,119.5	1,143.9	2.00	-2.00	0.00
5,400.0	9.12	258.13	5,245.8	-236.6	-1,125.9	1,150.5	2.00	-2.00	0.00
5,440.0	8.32	258.13	5,285.4	-237.8	-1,131.9	1,156.6	2.00	-2.00	0.00
5,480.0	7.52	258.13	5,325.0	-239.0	-1,137.3	1,162.1	2.00	-2.00	0.00
5,520.0	6.72	258.13	5,364.7	-240.0	-1,142.1	1,167.1	2.00	-2.00	0.00
5,560.0	5.92	258.13	5,404.5	-240.9	-1,146.4	1,171.5	2.00	-2.00	0.00
5,600.0	5.12	258.13	5,444.3	-241.7	-1,150.2	1,175.3	2.00	-2.00	0.00
5,640.0	4.32	258.13	5,484.1	-242.4	-1,153.4	1,178.6	2.00	-2.00	0.00
5,680.0	3.52	258.13	5,524.0	-242.9	-1,156.1	1,181.4	2.00	-2.00	0.00
5,720.0	2.72	258.13	5,564.0	-243.4	-1,158.2	1,183.5	2.00	-2.00	0.00
5,760.0	1.92	258.13	5,603.9	-243.7	-1,159.8	1,185.2	2.00	-2.00	0.00
5,800.0	1.12	258.13	5,643.9	-243.9	-1,160.9	1,186.2	2.00	-2.00	0.00
5,840.0	0.32	258.13	5,683.9	-244.0	-1,161.4	1,186.7	2.00	-2.00	0.00
5,856.1	0.00	0.00	5,700.0	-244.0	-1,161.4	1,186.8	2.00	-2.00	0.00
TARGET BHL 2450'FNL, 2550'FEL									
5,880.0	0.00	0.00	5,723.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
5,920.0	0.00	0.00	5,763.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
5,960.0	0.00	0.00	5,803.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
6,000.0	0.00	0.00	5,843.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
6,040.0	0.00	0.00	5,883.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
6,080.0	0.00	0.00	5,923.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
6,120.0	0.00	0.00	5,963.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
6,160.0	0.00	0.00	6,003.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Spike State D10-21D
Company:	NOBLE ENERGY INC WELD COUNTY CO	TVD Reference:	WELL @ 4775.0ft (Original Well Elev)
Project:	SEC.10-T3N-R64W	MD Reference:	WELL @ 4775.0ft (Original Well Elev)
Site:	Spike State D10-21D Pad Sec.10-T3N-R64W	North Reference:	True
Well:	Spike State D10-21D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble Spike State D10-21D Plan #2 (4-28-11)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,200.0	0.00	0.00	6,043.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
6,240.0	0.00	0.00	6,083.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
6,280.0	0.00	0.00	6,123.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
6,320.0	0.00	0.00	6,163.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
6,360.0	0.00	0.00	6,203.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
6,400.0	0.00	0.00	6,243.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
6,440.0	0.00	0.00	6,283.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
6,480.0	0.00	0.00	6,323.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
6,520.0	0.00	0.00	6,363.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
6,560.0	0.00	0.00	6,403.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
6,600.0	0.00	0.00	6,443.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
6,640.0	0.00	0.00	6,483.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
6,680.0	0.00	0.00	6,523.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
6,720.0	0.00	0.00	6,563.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
6,760.0	0.00	0.00	6,603.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
6,781.1	0.00	0.00	6,625.0	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
NIORARA - TARGET CIRCLE 2450'FSL & 2550'FEL									
6,800.0	0.00	0.00	6,643.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
6,840.0	0.00	0.00	6,683.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
6,880.0	0.00	0.00	6,723.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
6,920.0	0.00	0.00	6,763.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
6,960.0	0.00	0.00	6,803.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
7,000.0	0.00	0.00	6,843.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
7,040.0	0.00	0.00	6,883.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
7,076.1	0.00	0.00	6,920.0	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
CODELL									
7,080.0	0.00	0.00	6,923.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
7,120.0	0.00	0.00	6,963.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
7,160.0	0.00	0.00	7,003.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
7,200.0	0.00	0.00	7,043.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
7,240.0	0.00	0.00	7,083.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
7,280.0	0.00	0.00	7,123.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
7,320.0	0.00	0.00	7,163.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
7,360.0	0.00	0.00	7,203.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
7,400.0	0.00	0.00	7,243.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
7,440.0	0.00	0.00	7,283.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
7,480.0	0.00	0.00	7,323.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
7,484.1	0.00	0.00	7,328.0	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
D-SAND									
7,520.0	0.00	0.00	7,363.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
7,548.1	0.00	0.00	7,392.0	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
J-SAND									
7,560.0	0.00	0.00	7,403.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
7,600.0	0.00	0.00	7,443.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
7,640.0	0.00	0.00	7,483.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
7,680.0	0.00	0.00	7,523.9	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
7,698.1	0.00	0.00	7,542.0	-244.0	-1,161.4	1,186.8	0.00	0.00	0.00
HARDLINES 200'N & 80'W of BHL									

Database:	Landmark	Local Co-ordinate Reference:	Well Spike State D10-21D
Company:	NOBLE ENERGY INC WELD COUNTY CO	TVD Reference:	WELL @ 4775.0ft (Original Well Elev)
Project:	SEC.10-T3N-R64W	MD Reference:	WELL @ 4775.0ft (Original Well Elev)
Site:	Spike State D10-21D Pad Sec.10-T3N-R64W	North Reference:	True
Well:	Spike State D10-21D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble Spike State D10-21D Plan #2 (4-28-11)		

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
TARGET BHL 2450'F	0.00	0.00	5,700.0	-244.0	-1,161.4	1,331,515.16	3,268,846.72	40° 14' 21.840 N	104° 32' 13.056 W
- plan hits target center									
- Point									
HARDLINES 200'N &	0.00	0.00	7,542.0	-44.1	-1,241.4	1,331,714.24	3,268,764.53	40° 14' 23.816 N	104° 32' 14.088 W
- plan misses target center by 215.4ft at 7698.1ft MD (7542.0 TVD, -244.0 N, -1161.4 E)									
- Polygon									
Point 1			7,542.0	0.0	0.0	1,331,714.24	3,268,764.53		
Point 2			7,542.0	-300.0	0.0	1,331,414.27	3,268,767.81		
Point 3			7,542.0	0.0	0.0	1,331,714.24	3,268,764.53		
Point 4			7,542.0	0.0	200.0	1,331,716.42	3,268,964.51		
TARGET CIRCLE 245'	0.00	0.00	6,625.0	-244.0	-1,161.4	1,331,515.16	3,268,846.72	40° 14' 21.840 N	104° 32' 13.056 W
- plan hits target center									
- Circle (radius 75.0)									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
650.0	650.0	8 5/8"	8-5/8	12-1/4	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
6,781.1	6,625.0	NIOBRARA		0.00		
7,076.1	6,920.0	CODELL		0.00		
7,484.1	7,328.0	D-SAND		0.00		
7,548.1	7,392.0	J-SAND		0.00		