

Well Name: **LDS D17-31D**

Surface Location: LDS D17-31D PAD Sec.17-T3N-R64W
 North American Datum 1983 US State Plane 1983 Colorado Northern Zone

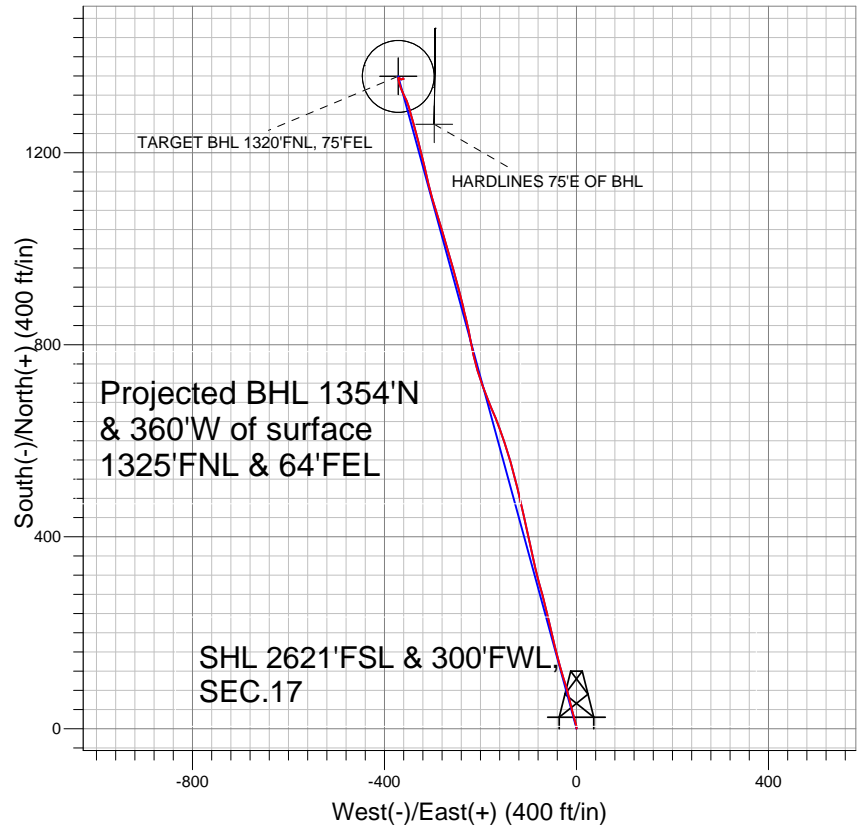
Ground Elevation: 4756.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1326227.23	3255955.57	40.225260	-104.583330

Original Well Elev WELL @ 4769.0ft (Original Well Elev)

Slot

NOBLE ENERGY INC WELD COUNTY CO



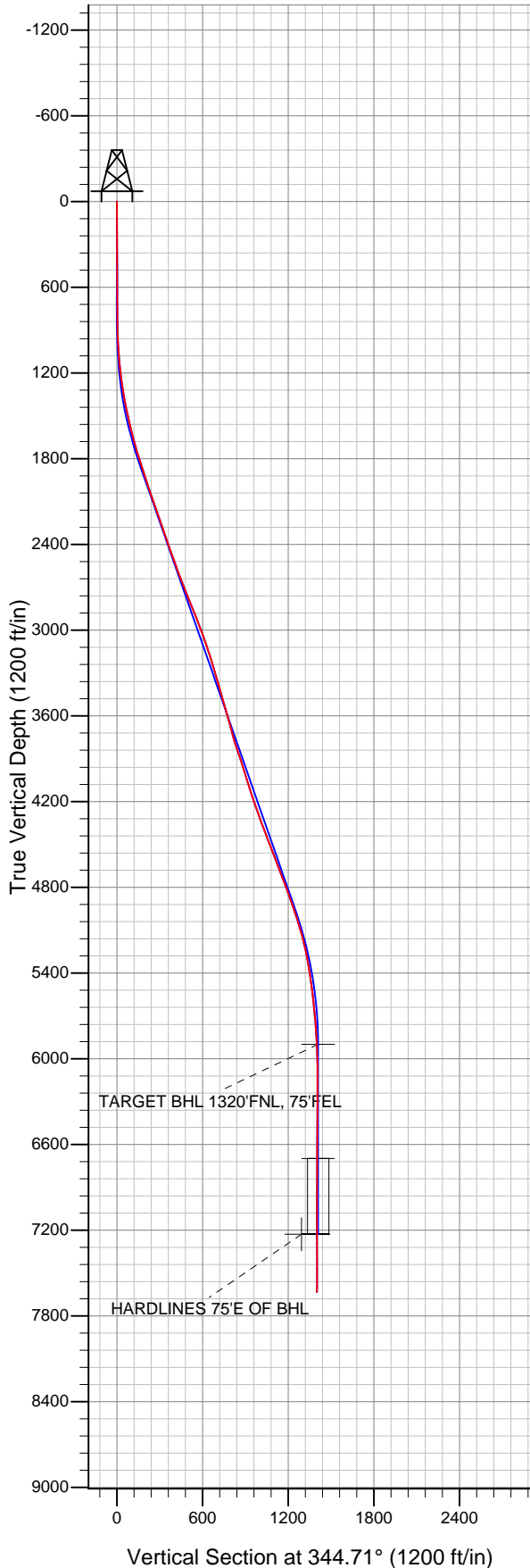
LEGEND

- ✕ LDS D17-31D, Wellbore #1, Noble LDS D17-31D Plan #2 (5-04-11) V0
- Wellbore #1
- Survey #1

Final Survey Plot

Projected Final Survey -
 7850'MD & 7634'TVD @ 1401'VS
 0.5 deg Inc 100.0 deg AZ

Project: SEC.17-T3N-R64W
 Site: LDS D17-31D PAD Sec.17-T3N-R64W
 Well: LDS D17-31D
 Plan: Wellbore #1





Directional

NOBLE ENERGY INC WELD COUNTY CO

SEC.17-T3N-R64W

LDS D17-31D PAD Sec.17-T3N-R64W

LDS D17-31D

Wellbore #1

Survey: Survey #1

Standard Survey Report

27 July, 2011



Company:	NOBLE ENERGY INC WELD COUNTY CO	Local Co-ordinate Reference:	Well LDS D17-31D
Project:	SEC.17-T3N-R64W	TVD Reference:	WELL @ 4769.0ft (Original Well Elev)
Site:	LDS D17-31D PAD Sec.17-T3N-R64W	MD Reference:	WELL @ 4769.0ft (Original Well Elev)
Well:	LDS D17-31D	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.17-T3N-R64W, Weld County, Colorado		
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	LDS D17-31D PAD Sec.17-T3N-R64W		
Site Position:		Northing:	1,326,227.25 ft
From:	Lat/Long	Easting:	3,255,955.57 ft
Position Uncertainty:	0.0 ft	Slot Radius:	"
		Latitude:	40.225260
		Longitude:	-104.583330
		Grid Convergence:	0.59 °

Well	LDS D17-31D		
Well Position	+N/-S	0.0 ft	Northing: 1,326,227.23 ft
	+E/-W	0.0 ft	Easting: 3,255,955.57 ft
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft
		Latitude:	40.225260
		Longitude:	-104.583330
		Ground Level:	4,756.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/22/2011	8.74	66.94	53,049

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	344.71	

Survey Program	Date	7/27/2011			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
774.0	7,850.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

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	
774.0	0.30	4.20	774.0	2.0	0.1	1.9	0.04	0.04	0.00	
860.0	1.10	350.50	860.0	3.1	0.0	2.9	0.94	0.93	-15.93	
945.0	2.30	348.60	945.0	5.5	-0.4	5.5	1.41	1.41	-2.24	
1,031.0	3.60	342.80	1,030.8	9.8	-1.6	9.9	1.55	1.51	-6.74	
1,116.0	4.90	342.80	1,115.6	15.8	-3.4	16.2	1.53	1.53	0.00	
1,202.0	6.50	346.20	1,201.2	24.1	-5.7	24.7	1.90	1.86	3.95	
1,287.0	8.50	346.70	1,285.4	34.8	-8.3	35.8	2.35	2.35	0.59	
1,373.0	10.10	345.40	1,370.3	48.3	-11.6	49.7	1.88	1.86	-1.51	
1,458.0	11.80	346.50	1,453.8	64.0	-15.6	65.8	2.01	2.00	1.29	
1,544.0	12.90	344.60	1,537.8	81.8	-20.2	84.2	1.36	1.28	-2.21	
1,629.0	14.30	342.70	1,620.4	101.0	-25.8	104.2	1.73	1.65	-2.24	
1,715.0	16.30	344.30	1,703.3	122.7	-32.2	126.9	2.38	2.33	1.86	

Company:	NOBLE ENERGY INC WELD COUNTY CO	Local Co-ordinate Reference:	Well LDS D17-31D
Project:	SEC.17-T3N-R64W	TVD Reference:	WELL @ 4769.0ft (Original Well Elev)
Site:	LDS D17-31D PAD Sec.17-T3N-R64W	MD Reference:	WELL @ 4769.0ft (Original Well Elev)
Well:	LDS D17-31D	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

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)
1,800.0	17.00	344.30	1,784.8	146.2	-38.8	151.2	0.82	0.82	0.00
1,886.0	17.70	345.60	1,866.9	170.9	-45.5	176.9	0.93	0.81	1.51
1,971.0	18.00	347.90	1,947.8	196.3	-51.4	202.9	0.90	0.35	2.71
2,057.0	18.40	347.30	2,029.5	222.5	-57.2	229.7	0.51	0.47	-0.70
2,142.0	19.40	346.40	2,109.9	249.3	-63.5	257.3	1.23	1.18	-1.06
2,228.0	19.90	344.80	2,190.9	277.4	-70.7	286.2	0.85	0.58	-1.86
2,313.0	19.20	344.00	2,271.0	304.7	-78.3	314.6	0.88	-0.82	-0.94
2,399.0	19.20	346.60	2,352.2	332.1	-85.5	342.9	0.99	0.00	3.02
2,484.0	19.40	348.70	2,432.4	359.5	-91.5	370.9	0.85	0.24	2.47
2,570.0	19.00	347.40	2,513.6	387.2	-97.3	399.2	0.68	-0.47	-1.51
2,656.0	20.40	346.80	2,594.6	415.5	-103.8	428.1	1.64	1.63	-0.70
2,741.0	22.50	347.10	2,673.7	445.7	-110.8	459.2	2.47	2.47	0.35
2,827.0	21.80	347.30	2,753.3	477.4	-118.0	491.6	0.82	-0.81	0.23
2,912.0	21.80	347.40	2,832.3	508.2	-124.9	523.1	0.04	0.00	0.12
2,998.0	21.70	344.30	2,912.2	539.1	-132.7	555.0	1.34	-0.12	-3.60
3,083.0	19.90	342.00	2,991.6	567.9	-141.4	585.1	2.33	-2.12	-2.71
3,169.0	19.70	341.50	3,072.5	595.6	-150.6	614.2	0.30	-0.23	-0.58
3,254.0	18.70	341.20	3,152.8	622.1	-159.5	642.1	1.18	-1.18	-0.35
3,340.0	16.50	338.30	3,234.8	646.5	-168.5	668.0	2.75	-2.56	-3.37
3,425.0	15.80	336.60	3,316.4	668.3	-177.5	691.5	0.99	-0.82	-2.00
3,511.0	16.50	338.80	3,399.0	690.5	-186.6	715.2	1.08	0.81	2.56
3,596.0	17.30	339.50	3,480.3	713.6	-195.4	739.8	0.97	0.94	0.82
3,682.0	15.10	342.30	3,562.9	736.2	-203.3	763.8	2.71	-2.56	3.26
3,767.0	14.50	345.60	3,645.1	757.1	-209.3	785.5	1.22	-0.71	3.88
3,853.0	15.00	346.80	3,728.3	778.3	-214.5	807.3	0.68	0.58	1.40
3,938.0	18.90	349.50	3,809.6	802.6	-219.5	832.1	4.68	4.59	3.18
4,024.0	18.70	347.60	3,891.0	829.7	-225.0	859.7	0.75	-0.23	-2.21
4,109.0	18.20	346.30	3,971.6	855.9	-231.1	886.6	0.76	-0.59	-1.53
4,195.0	16.60	347.60	4,053.7	881.0	-236.9	912.3	1.91	-1.86	1.51
4,280.0	18.70	346.00	4,134.7	906.1	-242.8	938.0	2.54	2.47	-1.88
4,366.0	18.50	344.70	4,216.2	932.6	-249.7	965.5	0.54	-0.23	-1.51
4,451.0	19.30	342.50	4,296.6	959.0	-257.5	993.0	1.26	0.94	-2.59
4,537.0	20.30	344.40	4,377.5	986.9	-265.8	1,022.1	1.38	1.16	2.21
4,622.0	21.70	344.80	4,456.9	1,016.3	-273.9	1,052.6	1.66	1.65	0.47
4,708.0	21.30	343.60	4,536.9	1,046.6	-282.5	1,084.1	0.69	-0.47	-1.40
4,794.0	21.10	341.00	4,617.1	1,076.3	-291.9	1,115.1	1.12	-0.23	-3.02
4,879.0	20.50	345.10	4,696.5	1,105.1	-300.7	1,145.3	1.85	-0.71	4.82
4,965.0	20.70	345.90	4,777.0	1,134.4	-308.3	1,175.6	0.40	0.23	0.93
5,050.0	19.00	347.40	4,857.0	1,162.5	-315.0	1,204.4	2.09	-2.00	1.76
5,136.0	19.40	346.30	4,938.2	1,190.0	-321.4	1,232.7	0.63	0.47	-1.28
5,221.0	18.60	345.70	5,018.6	1,216.9	-328.1	1,260.3	0.97	-0.94	-0.71
5,307.0	15.80	345.50	5,100.7	1,241.5	-334.4	1,285.8	3.26	-3.26	-0.23
5,392.0	13.70	342.90	5,182.9	1,262.3	-340.3	1,307.4	2.59	-2.47	-3.06
5,478.0	11.50	346.00	5,266.8	1,280.4	-345.4	1,326.1	2.68	-2.56	3.60
5,563.0	9.60	343.00	5,350.4	1,295.4	-349.5	1,341.7	2.33	-2.24	-3.53
5,649.0	8.30	339.10	5,435.3	1,308.0	-353.8	1,355.0	1.67	-1.51	-4.53
5,734.0	7.50	329.40	5,519.5	1,318.5	-358.8	1,366.5	1.83	-0.94	-11.41
5,820.0	6.30	335.80	5,604.9	1,327.7	-363.6	1,376.6	1.66	-1.40	7.44
5,905.0	5.30	346.10	5,689.5	1,335.7	-366.5	1,385.1	1.69	-1.18	12.12
5,991.0	4.20	343.70	5,775.2	1,342.6	-368.3	1,392.2	1.30	-1.28	-2.79
6,076.0	3.10	342.20	5,860.0	1,347.8	-369.9	1,397.6	1.30	-1.29	-1.76
6,116.4	2.53	343.72	5,900.4	1,349.7	-370.5	1,399.6	1.41	-1.40	3.75
TARGET BHL 1320°FNL, 75°FEL									
6,162.0	1.90	346.50	5,945.9	1,351.4	-370.9	1,401.4	1.41	-1.39	6.11

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

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)
6,247.0	1.20	352.70	6,030.9	1,353.7	-371.4	1,403.7	0.85	-0.82	7.29
6,333.0	0.70	14.00	6,116.9	1,355.1	-371.4	1,405.0	0.70	-0.58	24.77
6,418.0	0.40	64.00	6,201.9	1,355.7	-371.0	1,405.5	0.63	-0.35	58.82
6,504.0	0.50	102.50	6,287.9	1,355.7	-370.3	1,405.4	0.36	0.12	44.77
6,589.0	0.70	119.40	6,372.9	1,355.4	-369.5	1,404.9	0.31	0.24	19.88
6,675.0	0.60	129.40	6,458.9	1,354.9	-368.7	1,404.1	0.18	-0.12	11.63
6,760.0	0.70	142.70	6,543.9	1,354.2	-368.0	1,403.3	0.21	0.12	15.65
6,846.0	0.80	133.00	6,629.9	1,353.3	-367.3	1,402.3	0.19	0.12	-11.28
6,915.1	0.63	115.68	6,698.9	1,352.8	-366.6	1,401.6	0.40	-0.25	-25.07
TARGET CIRCLE 1320'FNL, 75'FEL									
6,932.0	0.60	110.10	6,715.8	1,352.8	-366.4	1,401.5	0.40	-0.18	-32.97
7,017.0	0.50	111.60	6,800.8	1,352.5	-365.7	1,401.0	0.12	-0.12	1.76
7,103.0	0.40	93.20	6,886.8	1,352.3	-365.0	1,400.7	0.20	-0.12	-21.40
7,188.0	0.40	71.40	6,971.8	1,352.4	-364.4	1,400.6	0.18	0.00	-25.65
7,274.0	0.40	64.70	7,057.8	1,352.6	-363.9	1,400.7	0.05	0.00	-7.79
7,359.0	0.60	50.70	7,142.8	1,353.0	-363.3	1,400.9	0.27	0.24	-16.47
7,444.9	0.70	39.51	7,228.8	1,353.7	-362.6	1,401.4	0.19	0.12	-13.02
HARDLINES 75'E OF BHL									
7,445.0	0.70	39.50	7,228.8	1,353.7	-362.6	1,401.4	0.19	0.13	-11.09
7,530.0	0.40	37.60	7,313.8	1,354.4	-362.1	1,401.9	0.35	-0.35	-2.24
7,616.0	0.40	115.00	7,399.8	1,354.5	-361.6	1,401.9	0.58	0.00	90.00
7,701.0	0.50	121.40	7,484.8	1,354.2	-361.0	1,401.4	0.13	0.12	7.53
7,787.0	0.40	125.70	7,570.8	1,353.8	-360.5	1,400.9	0.12	-0.12	5.00
7,806.0	0.50	111.00	7,589.8	1,353.7	-360.3	1,400.8	0.80	0.53	-77.37
7,850.0	0.50	100.00	7,633.8	1,353.6	-360.0	1,400.6	0.22	0.00	-25.00

Checked By: _____	Approved By: _____	Date: _____
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