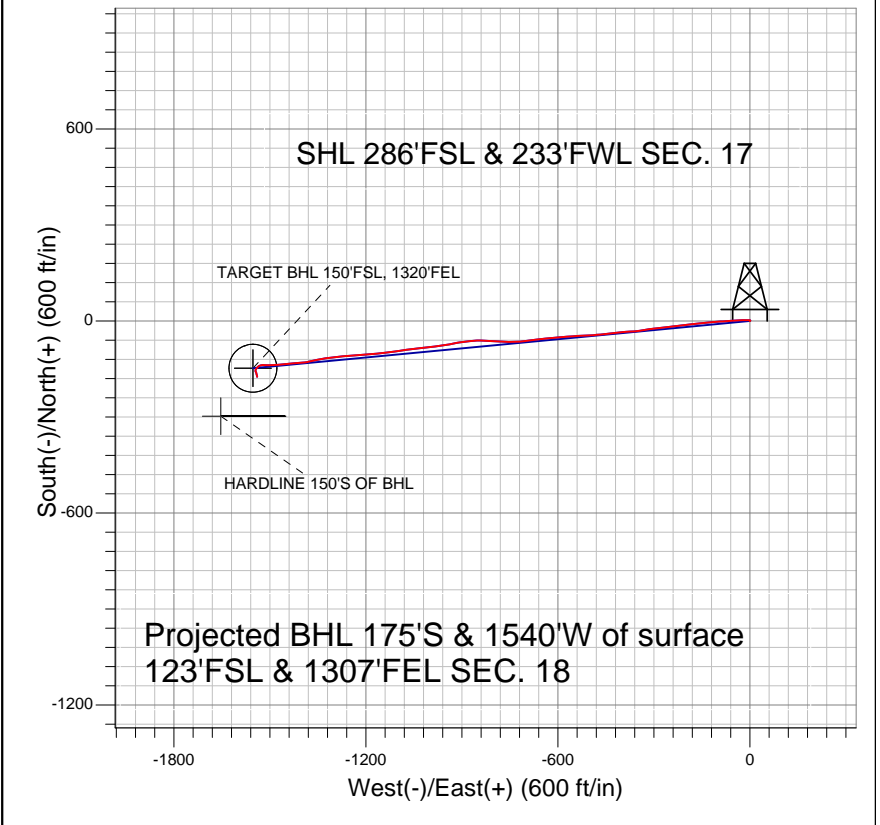


NOBLE ENERGY INC WELD COUNTY CO



LEGEND

- ✕ Butterball D19-27D, Wellbore #1, Noble Butterball D19-27D Plan #2 (9-21-10) V0
- Wellbore #1
- Survey #1

Final Survey Plot

Projected Final Survey -
7990'MD & 7745'TVD @ 1550' VS
1.1 deg Inc 167.5 deg AZ

Project: SEC.17-T3N-R64W
Site: LDS D20-29D Pad Sec.17-T3N-R64W
Well: Butterball D19-27D
Plan: Wellbore #1



Directional

NOBLE ENERGY INC WELD COUNTY CO

SEC.17-T3N-R64W

LDS D20-29D Pad Sec.17-T3N-R64W

Butterball D19-27D

Wellbore #1

Survey: Survey #1

Standard Survey Report

28 September, 2010



Company:	NOBLE ENERGY INC WELD COUNTY CO	Local Co-ordinate Reference:	Well Butterball D19-27D
Project:	SEC.17-T3N-R64W	TVD Reference:	WELL @ 4776.0ft (Original Well Elev)
Site:	LDS D20-29D Pad Sec.17-T3N-R64W	MD Reference:	WELL @ 4776.0ft (Original Well Elev)
Well:	Butterball D19-27D	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 D20-29D Pad Sec.17-T3N-R64W		
Site Position:		Northing:	1,323,837.46ft
From:	Lat/Long	Easting:	3,255,960.73ft
Position Uncertainty:	0.0 ft	Slot Radius:	"
		Latitude:	40° 13' 7.320 N
		Longitude:	104° 35' 0.240 W
		Grid Convergence:	0.59 °

Well	Butterball D19-27D		
Well Position	+N-S	0.0 ft	Northing: 1,323,891.51 ft
	+E-W	0.0 ft	Easting: 3,255,904.31 ft
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft
		Latitude:	40° 13' 7.860 N
		Longitude:	104° 35' 0.960 W
		Ground Level:	4,763.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/21/2010	8.85	66.96	53,134

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	263.53

Survey Program	Date	9/28/2010		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
728.0	7,990.0	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
728.0	0.20	45.80	728.0	0.9	0.9	-1.0	0.03	0.03	0.00
813.0	1.70	294.60	813.0	1.5	-0.1	0.0	2.10	1.76	-130.82
899.0	3.60	280.20	898.9	2.5	-3.9	3.6	2.32	2.21	-16.74
984.0	4.90	271.30	983.7	3.1	-10.2	9.8	1.71	1.53	-10.47
1,070.0	6.30	262.30	1,069.2	2.5	-18.6	18.1	1.92	1.63	-10.47
1,155.0	8.20	269.20	1,153.6	1.8	-29.2	28.8	2.45	2.24	8.12
1,240.0	10.30	268.20	1,237.5	1.5	-42.9	42.5	2.48	2.47	-1.18
1,326.0	12.10	263.70	1,321.8	0.3	-59.5	59.1	2.33	2.09	-5.23
1,411.0	13.40	266.30	1,404.7	-1.3	-78.2	77.9	1.67	1.53	3.06
1,497.0	15.40	267.90	1,488.0	-2.4	-99.6	99.2	2.37	2.33	1.86
1,582.0	16.10	264.30	1,569.8	-4.0	-122.6	122.3	1.41	0.82	-4.24
1,667.0	16.90	264.20	1,651.3	-6.4	-146.6	146.4	0.94	0.94	-0.12

Company:	NOBLE ENERGY INC WELD COUNTY CO	Local Co-ordinate Reference:	Well Butterball D19-27D
Project:	SEC.17-T3N-R64W	TVD Reference:	WELL @ 4776.0ft (Original Well Elev)
Site:	LDS D20-29D Pad Sec.17-T3N-R64W	MD Reference:	WELL @ 4776.0ft (Original Well Elev)
Well:	Butterball D19-27D	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)	
1,753.0	18.50	263.30	1,733.2	-9.3	-172.6	172.5	1.89	1.86	-1.05	
1,838.0	19.20	262.60	1,813.7	-12.6	-199.9	200.0	0.87	0.82	-0.82	
1,924.0	19.30	262.50	1,894.9	-16.3	-228.0	228.4	0.12	0.12	-0.12	
2,009.0	19.80	264.60	1,975.0	-19.5	-256.2	256.8	1.01	0.59	2.47	
2,094.0	19.70	265.20	2,055.0	-22.1	-284.8	285.5	0.27	-0.12	0.71	
2,180.0	20.80	259.60	2,135.7	-26.0	-314.3	315.2	2.59	1.28	-6.51	
2,265.0	21.30	262.90	2,215.0	-30.7	-344.5	345.7	1.51	0.59	3.88	
2,351.0	20.40	267.20	2,295.4	-33.3	-374.9	376.3	2.06	-1.05	5.00	
2,436.0	21.50	263.70	2,374.8	-35.8	-405.2	406.7	1.96	1.29	-4.12	
2,521.0	21.50	263.30	2,453.8	-39.3	-436.2	437.8	0.17	0.00	-0.47	
2,607.0	21.70	264.50	2,533.8	-42.6	-467.6	469.5	0.56	0.23	1.40	
2,692.0	24.20	267.20	2,612.1	-45.0	-500.7	502.6	3.19	2.94	3.18	
2,778.0	25.20	266.90	2,690.2	-46.9	-536.6	538.5	1.17	1.16	-0.35	
2,863.0	24.30	265.50	2,767.4	-49.2	-572.1	574.0	1.26	-1.06	-1.65	
2,948.0	23.40	264.80	2,845.1	-52.1	-606.3	608.3	1.11	-1.06	-0.82	
3,034.0	21.90	264.40	2,924.5	-55.2	-639.3	641.5	1.75	-1.74	-0.47	
3,119.0	21.50	262.00	3,003.5	-58.9	-670.5	672.9	1.15	-0.47	-2.82	
3,205.0	21.30	264.50	3,083.5	-62.6	-701.7	704.3	1.09	-0.23	2.91	
3,290.0	20.00	267.00	3,163.1	-64.9	-731.6	734.2	1.85	-1.53	2.94	
3,375.0	18.00	269.20	3,243.5	-65.8	-759.2	761.8	2.50	-2.35	2.59	
3,461.0	17.00	276.40	3,325.5	-64.6	-785.0	787.3	2.77	-1.16	8.37	
3,546.0	14.70	273.70	3,407.2	-62.5	-808.1	810.0	2.84	-2.71	-3.18	
3,632.0	15.40	271.90	3,490.3	-61.4	-830.4	832.0	0.98	0.81	-2.09	
3,717.0	15.50	267.00	3,572.2	-61.7	-853.0	854.5	1.54	0.12	-5.76	
3,802.0	16.00	264.30	3,654.0	-63.4	-876.0	877.6	1.04	0.59	-3.18	
3,888.0	17.00	263.00	3,736.5	-66.1	-900.3	902.0	1.24	1.16	-1.51	
3,973.0	19.30	259.70	3,817.3	-70.1	-926.5	928.5	2.96	2.71	-3.88	
4,059.0	18.70	259.20	3,898.6	-75.3	-954.0	956.4	0.72	-0.70	-0.58	
4,144.0	17.50	262.30	3,979.4	-79.5	-980.0	982.8	1.81	-1.41	3.65	
4,229.0	17.50	263.20	4,060.4	-82.8	-1,005.4	1,008.3	0.32	0.00	1.06	
4,315.0	18.50	265.30	4,142.2	-85.4	-1,031.8	1,034.9	1.39	1.16	2.44	
4,400.0	17.00	264.00	4,223.2	-87.8	-1,057.6	1,060.8	1.83	-1.76	-1.53	
4,486.0	17.90	260.30	4,305.2	-91.4	-1,083.2	1,086.6	1.66	1.05	-4.30	
4,573.0	19.10	262.20	4,387.7	-95.5	-1,110.4	1,114.1	1.54	1.38	2.18	
4,662.0	18.80	264.30	4,471.9	-98.9	-1,139.1	1,143.0	0.84	-0.34	2.36	
4,749.0	18.10	262.10	4,554.4	-102.2	-1,166.5	1,170.6	1.13	-0.80	-2.53	
4,835.0	17.10	266.70	4,636.4	-104.8	-1,192.3	1,196.5	1.99	-1.16	5.35	
4,921.0	18.20	267.50	4,718.4	-106.1	-1,218.4	1,222.6	1.31	1.28	0.93	
5,006.0	18.00	265.40	4,799.2	-107.7	-1,244.7	1,248.9	0.80	-0.24	-2.47	
5,091.0	17.60	263.20	4,880.1	-110.3	-1,270.6	1,274.9	0.92	-0.47	-2.59	
5,177.0	19.60	263.10	4,961.6	-113.5	-1,297.8	1,302.3	2.33	2.33	-0.12	
5,262.0	19.70	262.90	5,041.6	-117.0	-1,326.2	1,330.9	0.14	0.12	-0.24	
5,348.0	17.10	256.90	5,123.2	-121.7	-1,352.9	1,358.0	3.74	-3.02	-6.98	
5,433.0	15.90	257.60	5,204.7	-127.0	-1,376.4	1,382.0	1.43	-1.41	0.82	
5,519.0	14.70	265.80	5,287.7	-130.4	-1,398.8	1,404.6	2.87	-1.40	9.53	
5,604.0	13.80	264.30	5,370.1	-132.2	-1,419.7	1,425.5	1.14	-1.06	-1.76	
5,689.0	13.30	264.50	5,452.7	-134.1	-1,439.5	1,445.4	0.59	-0.59	0.24	
5,775.0	12.10	267.80	5,536.6	-135.4	-1,458.3	1,464.3	1.63	-1.40	3.84	
5,860.0	11.90	263.50	5,619.8	-136.7	-1,475.9	1,482.0	1.08	-0.24	-5.06	
5,946.0	9.70	265.70	5,704.2	-138.3	-1,492.0	1,498.1	2.60	-2.56	2.56	
6,031.0	8.60	271.40	5,788.2	-138.7	-1,505.5	1,511.5	1.68	-1.29	6.71	
6,117.0	6.90	276.40	5,873.4	-137.9	-1,517.0	1,522.9	2.12	-1.98	5.81	
6,202.0	5.60	258.80	5,957.9	-138.2	-1,526.2	1,532.0	2.71	-1.53	-20.71	
6,288.0	4.90	240.40	6,043.5	-140.8	-1,533.5	1,539.6	2.11	-0.81	-21.40	

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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)
6,345.8	3.73	233.71	6,101.1	-143.1	-1,537.2	1,543.5	2.21	-2.03	-11.57
TARGET BHL 150'FSL, 1320'FEL									
6,373.0	3.20	228.90	6,128.3	-144.1	-1,538.4	1,544.9	2.21	-1.93	-17.69
6,459.0	2.30	222.40	6,214.2	-147.0	-1,541.4	1,548.2	1.11	-1.05	-7.56
6,544.0	1.70	209.70	6,299.1	-149.3	-1,543.2	1,550.2	0.87	-0.71	-14.94
6,630.0	1.30	209.00	6,385.1	-151.3	-1,544.3	1,551.5	0.47	-0.47	-0.81
6,715.0	1.00	196.60	6,470.1	-152.9	-1,545.0	1,552.4	0.46	-0.35	-14.59
6,886.0	0.70	174.70	6,641.1	-155.3	-1,545.3	1,553.0	0.26	-0.18	-12.81
6,958.8	0.78	170.85	6,713.9	-156.3	-1,545.2	1,552.9	0.13	0.11	-5.30
TARGET CIRCLE 150'FSL, 1320'FEL									
7,057.0	0.90	166.80	6,812.1	-157.7	-1,544.9	1,552.8	0.13	0.12	-4.12
7,227.0	0.90	149.80	6,982.0	-160.1	-1,543.9	1,552.1	0.16	0.00	-10.00
7,398.0	1.10	151.90	7,153.0	-162.7	-1,542.5	1,551.0	0.12	0.12	1.23
7,569.0	1.10	185.50	7,324.0	-165.8	-1,541.9	1,550.7	0.37	0.00	19.65
7,740.0	1.40	164.30	7,494.9	-169.5	-1,541.4	1,550.7	0.32	0.18	-12.40
7,911.0	1.10	163.90	7,665.9	-173.1	-1,540.4	1,550.1	0.18	-0.18	-0.23
HARDLINE 150'S OF BHL									
7,990.0	1.10	167.46	7,744.9	-174.5	-1,540.1	1,549.9	0.09	0.00	4.51

Checked By: _____ Approved By: _____ Date: _____