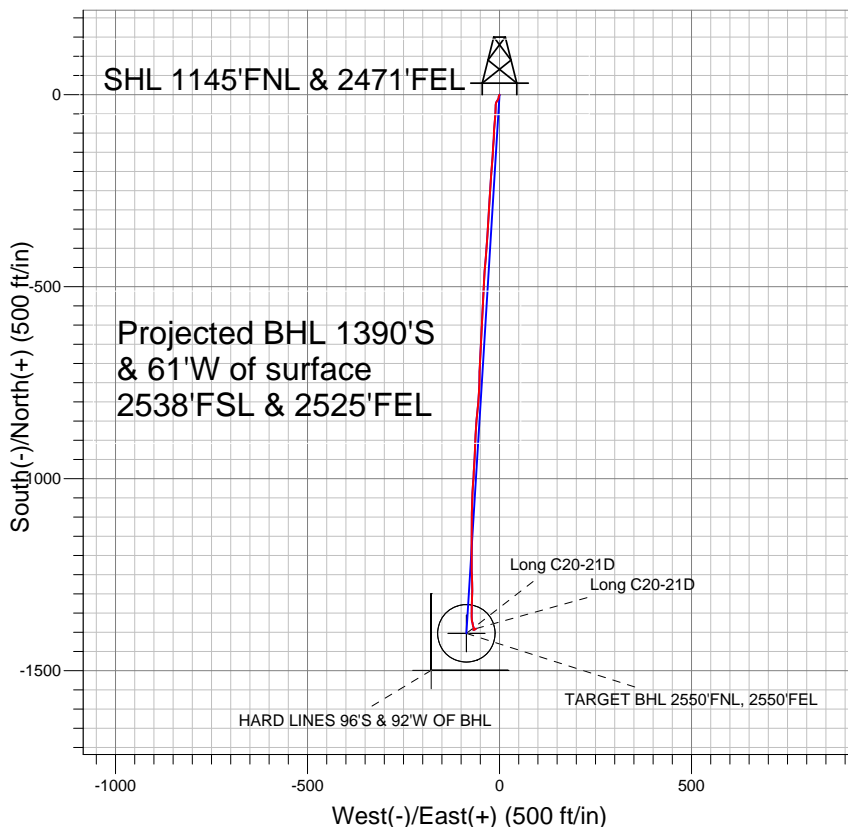
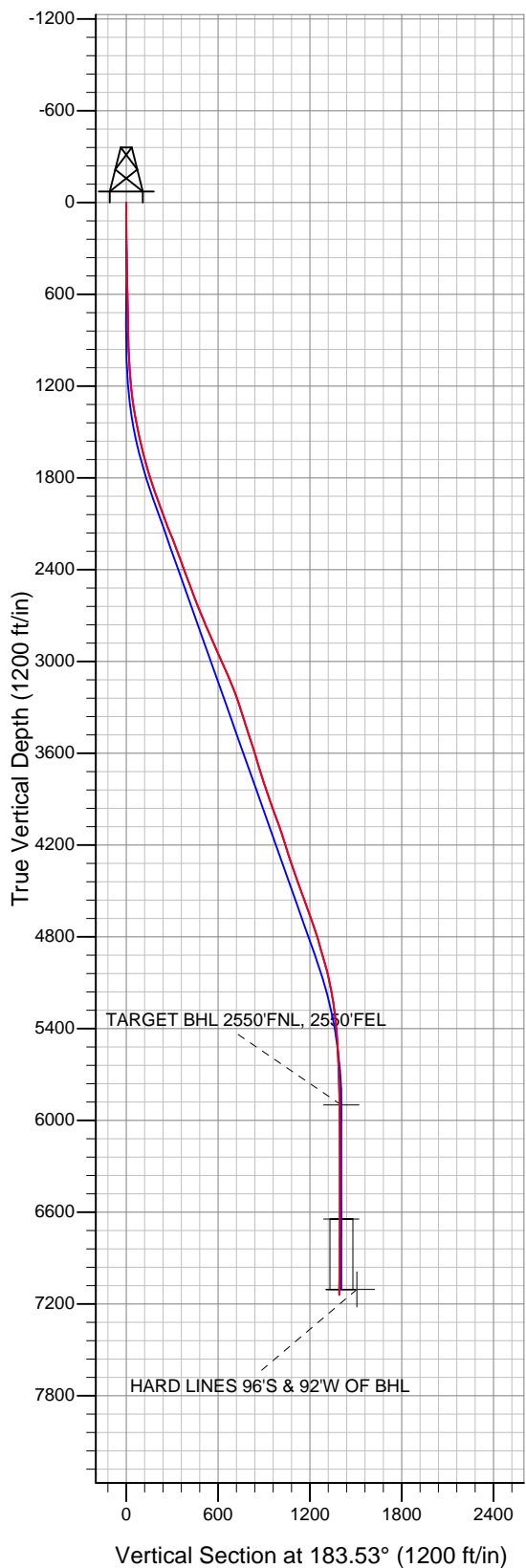


NOBLE ENERGY INC WELD COUNTY CO



LEGEND

- Wellbore #1
- Survey #1
- Long C20-21D, Wellbore #1, Noble Long C20-21D Plan #1 (12-12-11) R V0

Final Survey Plot

Projected Final Survey -
 7365'MD & 7141'TVD @ 1392'VS
 0.8 deg Inc 42.3 deg AZ

Project: SEC.20-T4N-R64W
 Site: Long C20-18 Pad Sec.20-T4N-R64W
 Well: Long C20-21D
 Plan: Wellbore #1



Directional

NOBLE ENERGY INC WELD COUNTY CO

SEC.20-T4N-R64W

Long C20-18 Pad Sec.20-T4N-R64W

Long C20-21D

Wellbore #1

Survey: Survey #1

Standard Survey Report

20 December, 2011



Company:	NOBLE ENERGY INC WELD COUNTY CO	Local Co-ordinate Reference:	Well Long C20-21D
Project:	SEC.20-T4N-R64W	TVD Reference:	WELL @ 4746.0ft (Original Well Elev)
Site:	Long C20-18 Pad Sec.20-T4N-R64W	MD Reference:	WELL @ 4746.0ft (Original Well Elev)
Well:	Long C20-21D	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.20-T4N-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	Long C20-18 Pad Sec.20-T4N-R64W		
Site Position:		Northing:	1,354,233.47 ft
From:	Lat/Long	Easting:	3,258,248.92 ft
Position Uncertainty:	0.0 ft	Slot Radius:	"
		Latitude:	40.302070
		Longitude:	-104.574070
		Grid Convergence:	0.60 °

Well	Long C20-21D		
Well Position	+N/-S	0.0 ft	Northing:
	+E/-W	0.0 ft	Easting:
Position Uncertainty	0.0 ft		Wellhead Elevation:
			Latitude:
			Longitude:
			Ground Level:

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/12/2011	8.69	66.99	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	183.53	

Survey Program	Date	12/20/2011			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
142.0	7,365.0	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	
142.0	0.00	304.00	142.0	0.0	0.0	0.0	0.00	0.00	0.00	
237.0	1.00	209.60	237.0	-0.7	-0.4	0.7	1.05	1.05	0.00	
332.0	1.00	198.20	332.0	-2.2	-1.1	2.3	0.21	0.00	-12.00	
427.0	0.90	202.10	427.0	-3.7	-1.6	3.8	0.13	-0.11	4.11	
522.0	1.00	195.40	522.0	-5.2	-2.1	5.3	0.16	0.11	-7.05	
617.0	1.20	187.30	616.9	-7.0	-2.5	7.1	0.27	0.21	-8.53	
768.0	1.30	197.00	767.9	-10.2	-3.2	10.4	0.15	0.07	6.42	
850.0	1.50	198.70	849.9	-12.1	-3.8	12.3	0.25	0.24	2.07	
931.0	2.10	227.00	930.8	-14.1	-5.2	14.4	1.30	0.74	34.94	
1,013.0	2.80	210.80	1,012.8	-16.9	-7.3	17.3	1.19	0.85	-19.76	
1,095.0	3.70	194.60	1,094.6	-21.1	-9.0	21.7	1.56	1.10	-19.76	
1,176.0	5.00	186.30	1,175.4	-27.2	-10.1	27.7	1.78	1.60	-10.25	

Company:	NOBLE ENERGY INC WELD COUNTY CO	Local Co-ordinate Reference:	Well Long C20-21D
Project:	SEC.20-T4N-R64W	TVD Reference:	WELL @ 4746.0ft (Original Well Elev)
Site:	Long C20-18 Pad Sec.20-T4N-R64W	MD Reference:	WELL @ 4746.0ft (Original Well Elev)
Well:	Long C20-21D	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)
1,258.0	7.20	180.70	1,256.9	-35.9	-10.5	36.4	2.78	2.68	-6.83
1,340.0	9.00	181.50	1,338.1	-47.4	-10.8	48.0	2.20	2.20	0.98
1,422.0	10.30	185.40	1,418.9	-61.1	-11.6	61.7	1.77	1.59	4.76
1,504.0	11.90	185.60	1,499.4	-76.8	-13.1	77.5	1.95	1.95	0.24
1,585.0	13.20	182.00	1,578.5	-94.4	-14.3	95.1	1.87	1.60	-4.44
1,667.0	14.80	183.60	1,658.0	-114.2	-15.3	114.9	2.01	1.95	1.95
1,749.0	16.40	183.70	1,737.0	-136.2	-16.7	137.0	1.95	1.95	0.12
1,831.0	17.80	183.80	1,815.4	-160.3	-18.2	161.1	1.71	1.71	0.12
1,913.0	19.10	184.30	1,893.2	-186.2	-20.1	187.0	1.60	1.59	0.61
1,994.0	20.00	183.90	1,969.5	-213.2	-22.0	214.1	1.12	1.11	-0.49
2,076.0	20.20	183.70	2,046.5	-241.3	-23.9	242.3	0.26	0.24	-0.24
2,158.0	21.50	183.70	2,123.1	-270.4	-25.8	271.5	1.59	1.59	0.00
2,240.0	21.60	184.00	2,199.4	-300.5	-27.8	301.6	0.18	0.12	0.37
2,321.0	20.70	183.50	2,274.9	-329.7	-29.7	330.9	1.13	-1.11	-0.62
2,403.0	20.40	182.20	2,351.7	-358.4	-31.1	359.6	0.67	-0.37	-1.59
2,485.0	19.90	184.70	2,428.7	-386.6	-32.8	387.9	1.21	-0.61	3.05
2,566.0	20.50	184.40	2,504.7	-414.5	-35.0	415.8	0.75	0.74	-0.37
2,648.0	20.80	185.00	2,581.5	-443.3	-37.4	444.8	0.45	0.37	0.73
2,730.0	22.60	183.00	2,657.6	-473.5	-39.5	475.1	2.37	2.20	-2.44
2,812.0	22.40	182.90	2,733.4	-504.9	-41.1	506.4	0.25	-0.24	-0.12
2,894.0	23.50	183.50	2,808.9	-536.8	-42.9	538.4	1.37	1.34	0.73
2,975.0	24.70	183.30	2,882.9	-569.8	-44.9	571.5	1.48	1.48	-0.25
3,057.0	22.90	182.30	2,957.9	-602.9	-46.5	604.6	2.25	-2.20	-1.22
3,139.0	24.00	182.10	3,033.1	-635.5	-47.7	637.2	1.34	1.34	-0.24
3,221.0	23.90	183.98	3,108.0	-668.7	-49.5	670.5	0.94	-0.12	2.29
3,303.0	21.50	182.50	3,183.7	-700.3	-51.3	702.1	3.01	-2.93	-1.80
3,384.0	18.40	181.40	3,259.8	-727.9	-52.3	729.7	3.85	-3.83	-1.36
3,466.0	17.50	181.50	3,337.8	-753.2	-52.9	755.0	1.10	-1.10	0.12
3,548.0	17.80	182.50	3,416.0	-778.0	-53.8	779.8	0.52	0.37	1.22
3,630.0	17.90	185.70	3,494.0	-803.1	-55.6	805.0	1.20	0.12	3.90
3,712.0	18.50	187.30	3,571.9	-828.5	-58.5	830.5	0.95	0.73	1.95
3,793.0	16.50	182.50	3,649.2	-852.8	-60.6	854.9	3.04	-2.47	-5.93
3,875.0	15.90	182.30	3,727.9	-875.6	-61.6	877.7	0.73	-0.73	-0.24
3,957.0	18.50	182.80	3,806.2	-899.8	-62.7	902.0	3.18	3.17	0.61
4,039.0	19.60	183.40	3,883.7	-926.6	-64.1	928.8	1.36	1.34	0.73
4,120.0	20.60	183.60	3,959.8	-954.3	-65.8	956.6	1.24	1.23	0.25
4,202.0	19.30	182.30	4,036.9	-982.3	-67.3	984.6	1.68	-1.59	-1.59
4,284.0	18.30	183.80	4,114.5	-1,008.7	-68.7	1,011.0	1.35	-1.22	1.83
4,366.0	18.20	182.90	4,192.4	-1,034.3	-70.2	1,036.7	0.36	-0.12	-1.10
4,447.0	18.10	183.10	4,269.4	-1,059.5	-71.5	1,061.9	0.15	-0.12	0.25
4,529.0	18.30	180.70	4,347.3	-1,085.1	-72.3	1,087.5	0.95	0.24	-2.93
4,611.0	19.10	181.00	4,424.9	-1,111.4	-72.7	1,113.8	0.98	0.98	0.37
4,693.0	20.80	178.90	4,502.0	-1,139.4	-72.7	1,141.7	2.25	2.07	-2.56
4,775.0	19.70	180.80	4,578.9	-1,167.7	-72.6	1,170.0	1.56	-1.34	2.32
4,856.0	19.90	180.30	4,655.1	-1,195.2	-72.9	1,197.4	0.32	0.25	-0.62
4,938.0	19.40	180.00	4,732.4	-1,222.7	-72.9	1,224.9	0.62	-0.61	-0.37
5,020.0	16.70	176.60	4,810.3	-1,248.1	-72.2	1,250.2	3.53	-3.29	-4.15
5,102.0	16.40	179.30	4,888.9	-1,271.5	-71.4	1,273.4	1.01	-0.37	3.29
5,184.0	15.60	180.20	4,967.8	-1,294.1	-71.3	1,296.0	1.02	-0.98	1.10
5,265.0	13.50	182.00	5,046.2	-1,314.4	-71.7	1,316.3	2.65	-2.59	2.22
5,347.0	11.50	182.90	5,126.2	-1,332.1	-72.4	1,334.1	2.45	-2.44	1.10
5,429.0	9.20	180.70	5,206.9	-1,346.9	-72.9	1,348.8	2.85	-2.80	-2.68
5,511.0	7.20	176.20	5,288.0	-1,358.5	-72.6	1,360.4	2.56	-2.44	-5.49
5,592.0	5.80	176.00	5,368.5	-1,367.7	-72.0	1,369.5	1.73	-1.73	-0.25

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Survey										
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5,674.0	4.30	165.80	5,450.2	-1,374.8	-71.0	1,376.6	2.13	-1.83	-12.44	
5,756.0	3.60	165.90	5,532.0	-1,380.3	-69.6	1,381.9	0.85	-0.85	0.12	
5,837.0	2.30	171.10	5,612.9	-1,384.4	-68.7	1,386.0	1.64	-1.60	6.42	
5,919.0	1.70	157.10	5,694.8	-1,387.1	-68.0	1,388.7	0.94	-0.73	-17.07	
6,001.0	1.10	148.60	5,776.8	-1,388.9	-67.1	1,390.4	0.77	-0.73	-10.37	
6,083.0	1.80	187.70	5,858.8	-1,390.8	-66.9	1,392.3	1.43	0.85	47.68	
6,124.6	1.23	204.40	5,900.4	-1,391.9	-67.1	1,393.4	1.72	-1.37	40.13	
TARGET BHL 2550'FNL, 2550'FEL										
6,165.0	0.90	238.30	5,940.8	-1,392.5	-67.6	1,394.0	1.72	-0.81	83.94	
6,246.0	0.40	238.10	6,021.8	-1,392.9	-68.4	1,394.5	0.62	-0.62	-0.25	
6,328.0	0.30	219.80	6,103.8	-1,393.3	-68.8	1,394.8	0.18	-0.12	-22.32	
6,410.0	0.00	267.60	6,185.8	-1,393.4	-68.9	1,395.0	0.37	-0.37	0.00	
6,491.0	0.10	132.90	6,266.8	-1,393.5	-68.8	1,395.1	0.12	0.12	0.00	
6,655.0	0.40	82.30	6,430.8	-1,393.5	-68.2	1,395.0	0.21	0.18	-30.85	
6,818.0	0.40	100.80	6,593.7	-1,393.5	-67.0	1,395.0	0.08	0.00	11.35	
6,870.1	0.48	86.62	6,645.8	-1,393.5	-66.6	1,395.0	0.25	0.15	-27.24	
TARGET CIRCLE 2550'FNL & 2550'FEL										
6,982.0	0.70	69.10	6,757.7	-1,393.3	-65.5	1,394.7	0.25	0.20	-15.65	
7,145.0	0.80	60.60	6,920.7	-1,392.4	-63.6	1,393.6	0.09	0.06	-5.21	
7,319.0	0.80	42.30	7,094.7	-1,390.9	-61.7	1,392.0	0.15	0.00	-10.52	
HARD LINES 96'S & 92'W OF BHL										
7,365.0	0.80	42.30	7,140.7	-1,390.4	-61.3	1,391.5	0.00	0.00	0.00	

Checked By: _____	Approved By: _____	Date: _____
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