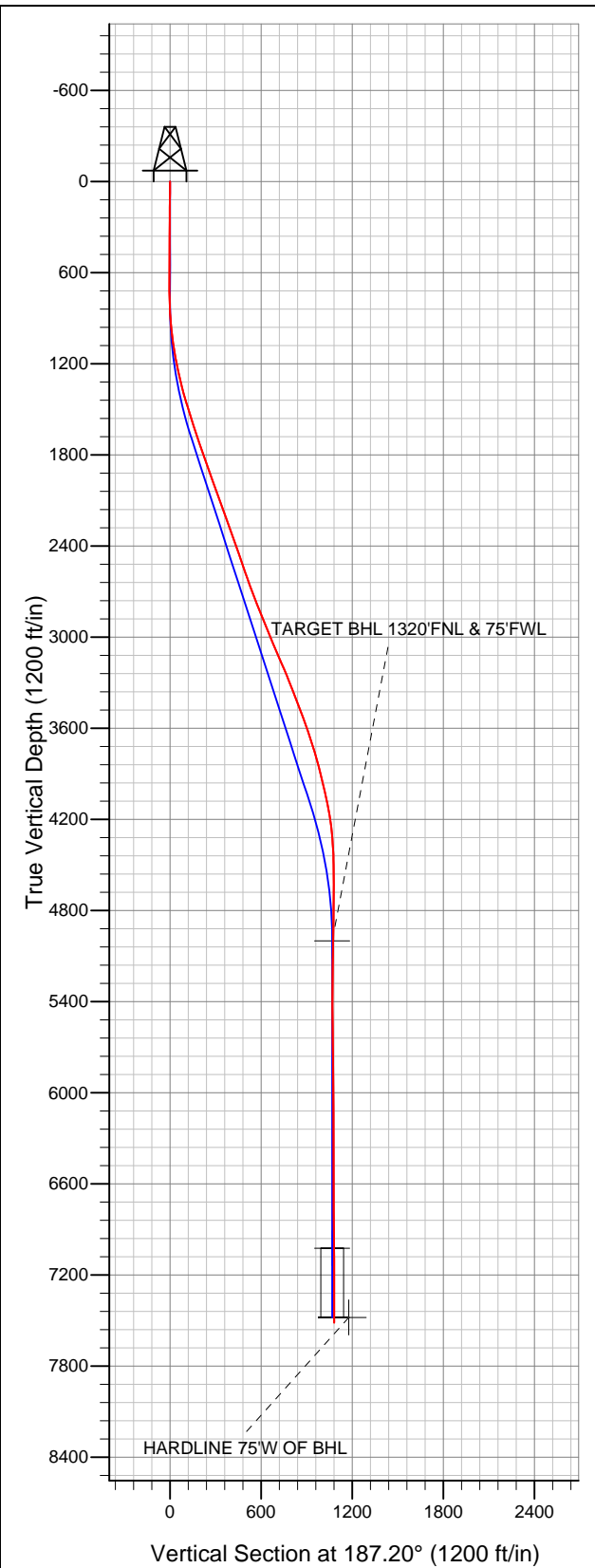


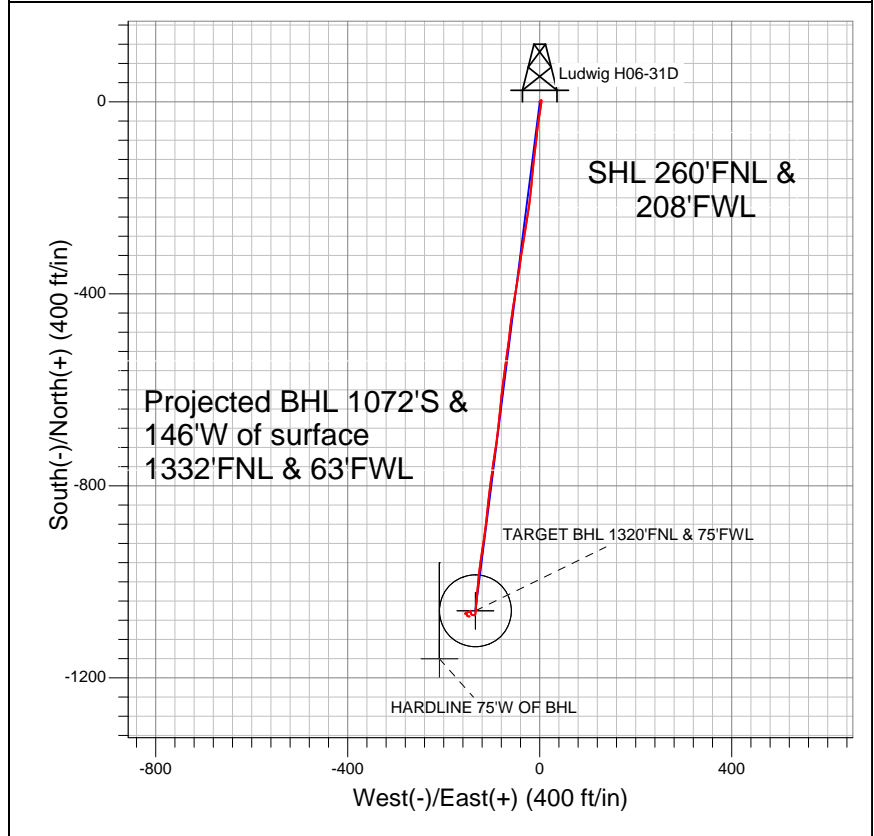
Well Name: Ludwig H06-31D

Surface Location: Ludwig H06-31D Pad Sec.6-T3N-R65W
North American Datum 1983 US State Plane 1983Colorado Northern Zone
Ground Elevation: 4901.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1338868.25	3219101.37	40.260930	-104.714910	
Original Well Elev			WELL @ 4914.0ft (Original Well Elev)			



NOBLE ENERGY INC WELD COUNTY CO



- LEGEND
- Wellbore #1
 - Ludwig H06-31D, Wellbore #1, Noble Ludwig H06-31D Plan #1 (9-14-11) V0
 - Survey #1

Final Survey Plot

Projected Final Survey -
7690'MD & 7514'TVD @ 1082'VS
0.50 deg Inc 84.00 deg AZ

Project: SEC.6-T3N-R65W
Site: Ludwig H06-31D Pad Sec.6-T3N-R65W
Well: Ludwig H06-31D
Plan: Wellbore #1



NOBLE ENERGY INC WELD COUNTY CO

SEC.6-T3N-R65W

Ludwig H06-31D Pad Sec.6-T3N-R65W

Ludwig H06-31D

Wellbore #1

Survey: Survey #1

Standard Survey Report

18 May, 2012



Company:	NOBLE ENERGY INC WELD COUNTY CO	Local Co-ordinate Reference:	Well Ludwig H06-31D
Project:	SEC.6-T3N-R65W	TVD Reference:	WELL @ 4914.0ft (Original Well Elev)
Site:	Ludwig H06-31D Pad Sec.6-T3N-R65W	MD Reference:	WELL @ 4914.0ft (Original Well Elev)
Well:	Ludwig H06-31D	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.6-T3N-R65W, 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	Ludwig H06-31D Pad Sec.6-T3N-R65W		
Site Position:		Northing:	1,338,868.27 ft
From:	Lat/Long	Easting:	3,219,101.37 ft
Position Uncertainty:	0.0 ft	Slot Radius:	"
		Latitude:	40.260930
		Longitude:	-104.714910
		Grid Convergence:	0.51 °

Well	Ludwig H06-31D		
Well Position	+N/-S	0.0 ft	Northing: 1,338,868.25 ft
	+E/-W	0.0 ft	Easting: 3,219,101.37 ft
Position Uncertainty	0.0 ft		Wellhead Elevation: ft
			Latitude: 40.260930
			Longitude: -104.714910
			Ground Level: 4,901.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/14/2011	8.79	66.94	53,037

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 (°)	
	5,000.0	0.0	0.0	187.20	

Survey Program	Date	5/18/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
76.0	7,690.0	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	
76.0	0.30	35.90	76.0	0.2	0.1	-0.2	0.39	0.39	0.00	
167.0	0.40	18.40	167.0	0.7	0.4	-0.7	0.16	0.11	-19.23	
255.0	0.40	26.10	255.0	1.2	0.6	-1.3	0.06	0.00	8.75	
358.0	0.70	37.90	358.0	2.0	1.1	-2.2	0.31	0.29	11.46	
486.0	0.40	62.30	486.0	2.9	2.0	-3.1	0.29	-0.23	19.06	
613.0	0.30	73.70	613.0	3.2	2.7	-3.5	0.10	-0.08	8.98	
725.0	0.40	105.40	725.0	3.1	3.4	-3.5	0.19	0.09	28.30	
854.0	3.30	186.40	853.9	-0.7	3.4	0.2	2.53	2.25	62.79	
982.0	6.20	188.90	981.5	-11.2	1.9	10.8	2.27	2.27	1.95	
1,111.0	9.20	190.50	1,109.3	-28.2	-1.0	28.1	2.33	2.33	1.24	
1,239.0	12.00	185.20	1,235.1	-51.5	-4.1	51.6	2.31	2.19	-4.14	
1,367.0	14.50	187.30	1,359.7	-80.7	-7.4	80.9	1.99	1.95	1.64	

Company:	NOBLE ENERGY INC WELD COUNTY CO	Local Co-ordinate Reference:	Well Ludwig H06-31D
Project:	SEC.6-T3N-R65W	TVD Reference:	WELL @ 4914.0ft (Original Well Elev)
Site:	Ludwig H06-31D Pad Sec.6-T3N-R65W	MD Reference:	WELL @ 4914.0ft (Original Well Elev)
Well:	Ludwig H06-31D	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)
1,496.0	17.60	186.90	1,483.6	-116.0	-11.7	116.6	2.40	2.40	-0.31
1,624.0	17.90	184.50	1,605.5	-154.9	-15.6	155.6	0.62	0.23	-1.88
1,753.0	18.60	186.90	1,728.0	-195.1	-19.6	196.0	0.80	0.54	1.86
1,881.0	19.70	188.20	1,849.0	-236.7	-25.2	238.0	0.92	0.86	1.02
2,009.0	19.60	189.80	1,969.5	-279.2	-31.9	281.0	0.43	-0.08	1.25
2,138.0	19.80	188.50	2,091.0	-322.1	-38.8	324.4	0.37	0.16	-1.01
2,266.0	20.20	188.70	2,211.2	-365.4	-45.4	368.2	0.32	0.31	0.16
2,395.0	19.80	190.30	2,332.5	-408.9	-52.6	412.3	0.53	-0.31	1.24
2,523.0	19.00	186.40	2,453.2	-450.9	-58.8	454.8	1.19	-0.63	-3.05
2,651.0	18.70	187.60	2,574.3	-492.0	-63.9	496.1	0.38	-0.23	0.94
2,780.0	20.80	188.00	2,695.7	-535.2	-69.8	539.7	1.63	1.63	0.31
2,908.0	21.30	187.10	2,815.2	-580.8	-75.8	585.7	0.47	0.39	-0.70
3,037.0	23.30	185.90	2,934.5	-629.4	-81.4	634.6	1.59	1.55	-0.93
3,165.0	22.00	186.10	3,052.7	-678.4	-86.5	683.9	1.02	-1.02	0.16
3,293.0	24.00	188.90	3,170.5	-728.0	-93.1	733.9	1.78	1.56	2.19
3,422.0	21.80	187.30	3,289.3	-777.7	-100.2	784.1	1.77	-1.71	-1.24
3,550.0	20.80	187.50	3,408.6	-823.8	-106.2	830.6	0.78	-0.78	0.16
3,679.0	20.50	185.00	3,529.3	-869.0	-111.1	876.1	0.72	-0.23	-1.94
3,807.0	18.60	189.40	3,649.9	-911.5	-116.4	918.9	1.88	-1.48	3.44
3,935.0	16.30	187.30	3,772.0	-949.4	-122.0	957.2	1.86	-1.80	-1.64
4,064.0	13.70	187.30	3,896.6	-982.5	-126.3	990.6	2.02	-2.02	0.00
4,192.0	13.10	186.20	4,021.1	-1,012.0	-129.8	1,020.3	0.51	-0.47	-0.86
4,321.0	10.70	181.80	4,147.3	-1,038.5	-131.7	1,046.8	1.99	-1.86	-3.41
4,449.0	5.70	189.80	4,274.0	-1,056.6	-133.2	1,065.0	4.00	-3.91	6.25
4,577.0	3.00	180.10	4,401.6	-1,066.3	-134.3	1,074.7	2.18	-2.11	-7.58
4,706.0	0.90	276.90	4,530.6	-1,069.5	-135.3	1,078.0	2.51	-1.63	75.04
4,834.0	1.10	276.10	4,658.5	-1,069.3	-137.5	1,078.1	0.16	0.16	-0.63
4,963.0	1.00	280.30	4,787.5	-1,068.9	-139.8	1,078.0	0.10	-0.08	3.26
5,091.0	1.20	310.00	4,915.5	-1,067.9	-142.0	1,077.2	0.47	0.16	23.20
5,175.6	1.58	341.69	5,000.0	-1,066.2	-143.0	1,075.7	1.00	0.45	37.47
TARGET BHL 1320'FNL & 75'FWL									
5,219.0	1.90	351.50	5,043.4	-1,064.9	-143.3	1,074.5	1.00	0.73	22.59
5,348.0	1.30	344.80	5,172.4	-1,061.4	-144.0	1,071.1	0.49	-0.47	-5.19
5,476.0	0.40	228.40	5,300.4	-1,060.3	-144.7	1,070.1	1.19	-0.70	-90.94
5,605.0	0.70	231.10	5,429.4	-1,061.1	-145.7	1,071.0	0.23	0.23	2.09
5,733.0	1.10	244.20	5,557.4	-1,062.1	-147.4	1,072.2	0.35	0.31	10.23
5,861.0	1.10	248.80	5,685.3	-1,063.1	-149.6	1,073.4	0.07	0.00	3.59
5,990.0	1.20	250.20	5,814.3	-1,064.0	-152.1	1,074.6	0.08	0.08	1.09
6,118.0	0.80	237.60	5,942.3	-1,064.9	-154.1	1,075.8	0.35	-0.31	-9.84
6,247.0	0.40	245.30	6,071.3	-1,065.6	-155.2	1,076.6	0.32	-0.31	5.97
6,375.0	0.30	136.70	6,199.3	-1,066.0	-155.4	1,077.1	0.45	-0.08	-84.84
6,503.0	0.50	123.30	6,327.3	-1,066.6	-154.7	1,077.5	0.17	0.16	-10.47
6,632.0	0.60	112.90	6,456.3	-1,067.1	-153.6	1,078.0	0.11	0.08	-8.06
6,760.0	0.50	108.90	6,584.3	-1,067.6	-152.5	1,078.3	0.08	-0.08	-3.13
6,889.0	0.30	143.50	6,713.3	-1,068.0	-151.8	1,078.6	0.24	-0.16	26.82
7,017.0	0.40	225.30	6,841.3	-1,068.6	-151.9	1,079.2	0.36	0.08	63.91
7,145.0	0.60	146.30	6,969.3	-1,069.5	-151.8	1,080.1	0.51	0.16	-61.72
7,199.8	0.67	135.78	7,024.1	-1,070.0	-151.4	1,080.5	0.25	0.13	-19.19
TARGET CIRCLE 1320'FNL & 75'FWL									
7,274.0	0.80	125.10	7,098.2	-1,070.6	-150.7	1,081.0	0.25	0.17	-14.40
7,402.0	0.70	114.00	7,226.2	-1,071.4	-149.3	1,081.7	0.14	-0.08	-8.67
7,531.0	0.60	101.70	7,355.2	-1,071.9	-147.9	1,081.9	0.13	-0.08	-9.53
7,643.0	0.50	84.80	7,467.2	-1,071.9	-146.8	1,081.9	0.17	-0.09	-15.09
HARDLINE 75'W OF BHL									

Company:	NOBLE ENERGY INC WELD COUNTY CO	Local Co-ordinate Reference:	Well Ludwig H06-31D
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Site:	Ludwig H06-31D Pad Sec.6-T3N-R65W	MD Reference:	WELL @ 4914.0ft (Original Well Elev)
Well:	Ludwig H06-31D	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)	
7,690.0	0.50	84.00	7,514.2	-1,071.9	-146.4	1,081.8	0.01	0.00	-1.70	

Checked By: _____	Approved By: _____	Date: _____
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