

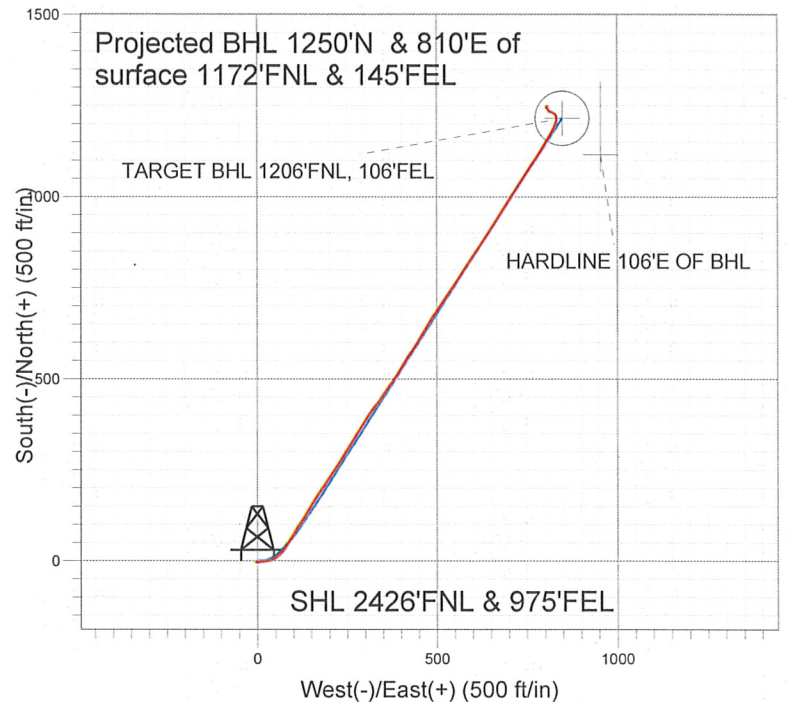
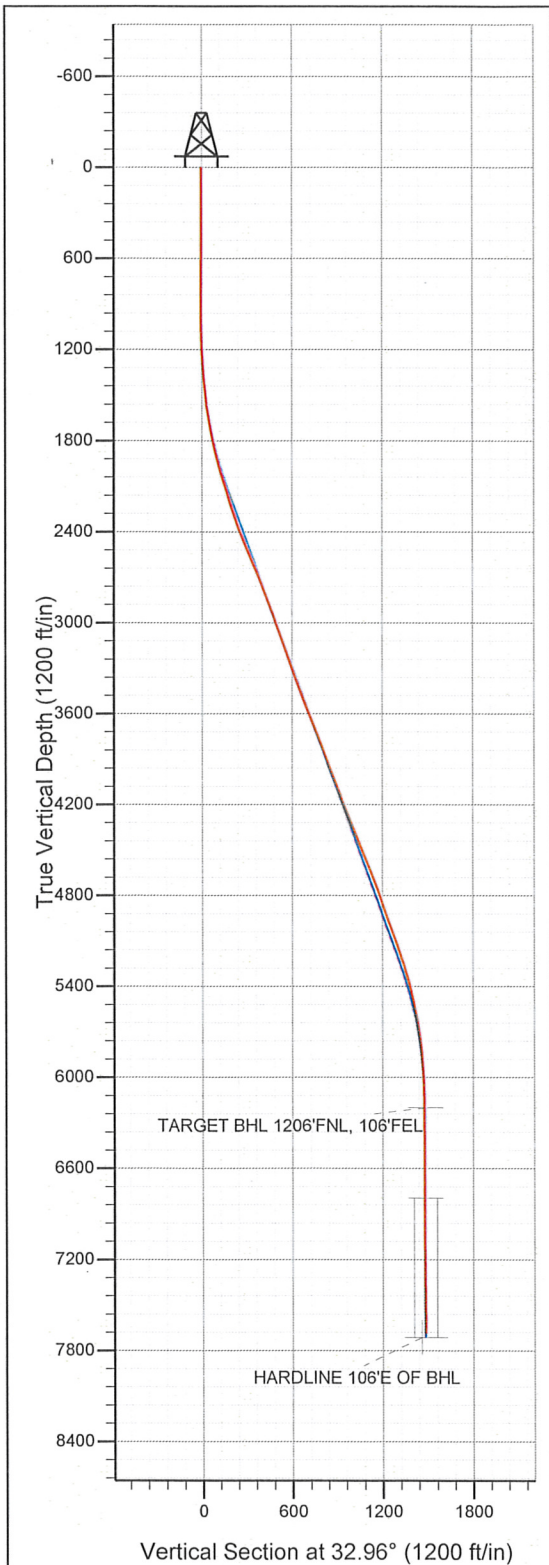


Well Name: **Horse Iron P22-31D**

Surface Location: Horse Iron Pad Sec.21-T3N-R67W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4789.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1320606.14	3170501.11	40° 12' 42.660 N	104° 53' 22.200 W	
Original Well Elev				WELL @ 4802.0ft (Original Well Elev)		

NOBLE ENERGY INC WELD COUNTY CO



LEGEND

- Horse Iron P22-31D, Wellbore #1, Plan #2 (07-22-09) V0
- Survey #1

Final Survey Plot

Projected Final Survey -
7935'MD & 7685'TVD @ 1488' VS
0.9 deg Inc 105.8 deg AZ

Project: SEC.21-T3N-R67W
Site: Horse Iron Pad Sec.21-T3N-R67W
Well: Horse Iron P22-31D
Plan: Wellbore #1



Directional

**NOBLE ENERGY INC WELD
COUNTY CO**

SEC.21-T3N-R67W

Horse Iron Pad Sec.21-T3N-R67W

Horse Iron P22-31D

Wellbore #1

Survey: Survey #1

Standard Survey Report

29 June, 2010

Company:	NOBLE ENERGY INC WELD COUNTY CO	Local Co-ordinate Reference:	Well Horse Iron P22-31D
Project:	SEC.21-T3N-R67W	TVD Reference:	WELL @ 4802.0ft (Original Well Elev)
Site:	Horse Iron Pad Sec.21-T3N-R67W	MD Reference:	WELL @ 4802.0ft (Original Well Elev)
Well:	Horse Iron P22-31D	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.21-T3N-R67W, Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	Horse Iron Pad Sec.21-T3N-R67W				
Site Position:		Northing:	1,320,540.31 ft	Latitude:	40° 12' 42.012 N
From:	Lat/Long	Easting:	3,170,462.46 ft	Longitude:	104° 53' 22.704 W
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.39 °

Well	Horse Iron P22-31D					
Well Position	+N/-S	0.0 ft	Northing:	1,320,606.14 ft	Latitude:	40° 12' 42.660 N
	+E/-W	0.0 ft	Easting:	3,170,501.11 ft	Longitude:	104° 53' 22.200 W
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,789.0 ft	

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/17/2010	9.06	66.91	53,133

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	0.00	

	Date				
From ()	To ()	Survey (Wellbore) ()	Tool Name	Description	

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	
608.0	0.40	202.30	608.0	-2.0	-0.8	-2.0	0.07	0.07	0.00	
693.0	0.60	222.50	693.0	-2.6	-1.2	-2.6	0.31	0.24	23.76	
776.0	0.40	127.90	776.0	-3.1	-1.3	-3.1	0.90	-0.24	-113.98	
861.0	0.40	134.60	861.0	-3.5	-0.8	-3.5	0.05	0.00	7.88	
947.0	0.50	82.70	947.0	-3.6	-0.3	-3.6	0.47	0.12	-60.35	
1,033.0	1.60	71.50	1,033.0	-3.2	1.3	-3.2	1.30	1.28	-13.02	
1,119.0	3.40	90.50	1,118.9	-2.8	4.9	-2.8	2.28	2.09	22.09	
1,204.0	5.20	80.20	1,203.6	-2.2	11.3	-2.2	2.30	2.12	-12.12	
1,290.0	5.70	88.40	1,289.3	-1.4	19.4	-1.4	1.07	0.58	9.53	
1,376.0	7.20	84.30	1,374.7	-0.8	29.0	-0.8	1.82	1.74	-4.77	
1,461.0	7.60	70.00	1,459.0	1.7	39.6	1.7	2.21	0.47	-16.82	
1,547.0	8.60	61.40	1,544.2	6.7	50.6	6.7	1.82	1.16	-10.00	

Company: NOBLE ENERGY INC WELD COUNTY CO
Project: SEC.21-T3N-R67W
Site: Horse Iron Pad Sec.21-T3N-R67W
Well: Horse Iron P22-31D
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Horse Iron P22-31D
TVD Reference: WELL @ 4802.0ft (Original Well Elev)
MD Reference: WELL @ 4802.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
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)
1,633.0	9.80	48.60	1,629.1	14.6	61.7	14.6	2.75	1.40	-14.88
1,718.0	10.90	38.80	1,712.7	25.7	72.2	25.7	2.44	1.29	-11.53
1,804.0	11.30	29.60	1,797.1	39.3	81.4	39.3	2.11	0.47	-10.70
1,890.0	14.00	32.20	1,881.0	55.5	91.1	55.5	3.21	3.14	3.02
1,975.0	15.40	31.20	1,963.2	73.8	102.5	73.8	1.67	1.65	-1.18
2,061.0	16.00	32.70	2,046.0	93.6	114.8	93.6	0.84	0.70	1.74
2,147.0	17.50	34.70	2,128.3	114.2	128.6	114.2	1.87	1.74	2.33
2,233.0	17.80	30.70	2,210.3	136.1	142.6	136.1	1.45	0.35	-4.65
2,318.0	18.50	30.90	2,291.1	158.9	156.2	158.9	0.83	0.82	0.24
2,404.0	20.50	31.80	2,372.1	183.4	171.1	183.4	2.35	2.33	1.05
2,489.0	21.90	36.70	2,451.4	208.7	188.4	208.7	2.66	1.65	5.76
2,575.0	22.50	32.60	2,531.0	235.5	206.9	235.5	1.93	0.70	-4.77
2,661.0	23.40	33.90	2,610.2	263.5	225.3	263.5	1.20	1.05	1.51
2,746.0	22.90	32.10	2,688.4	291.5	243.5	291.5	1.02	-0.59	-2.12
2,832.0	20.90	32.00	2,768.1	318.7	260.5	318.7	2.33	-2.33	-0.12
2,918.0	21.20	31.50	2,848.4	345.0	276.8	345.0	0.41	0.35	-0.58
3,004.0	20.80	32.90	2,928.7	371.0	293.2	371.0	0.75	-0.47	1.63
3,089.0	19.40	34.00	3,008.5	395.4	309.3	395.4	1.71	-1.65	1.29
3,175.0	18.90	36.20	3,089.8	418.5	325.5	418.5	1.02	-0.58	2.56
3,261.0	20.20	36.30	3,170.8	441.7	342.5	441.7	1.51	1.51	0.12
3,346.0	19.20	34.70	3,250.8	465.0	359.2	465.0	1.34	-1.18	-1.88
3,432.0	20.00	35.60	3,331.8	488.6	375.8	488.6	0.99	0.93	1.05
3,517.0	20.10	31.90	3,411.7	512.8	391.9	512.8	1.50	0.12	-4.35
3,603.0	20.30	31.80	3,492.4	538.1	407.6	538.1	0.24	0.23	-0.12
3,689.0	20.90	34.70	3,572.9	563.3	424.2	563.3	1.38	0.70	3.37
3,774.0	21.80	31.80	3,652.1	589.2	441.2	589.2	1.63	1.06	-3.41
3,860.0	22.30	30.70	3,731.8	616.8	457.9	616.8	0.75	0.58	-1.28
3,945.0	21.80	31.40	3,810.6	644.2	474.4	644.2	0.66	-0.59	0.82
4,031.0	21.70	34.20	3,890.4	670.9	491.6	670.9	1.21	-0.12	3.26
4,117.0	20.80	36.00	3,970.6	696.5	509.5	696.5	1.29	-1.05	2.09
4,202.0	20.10	33.60	4,050.2	720.8	526.5	720.8	1.28	-0.82	-2.82
4,288.0	20.20	32.10	4,131.0	745.7	542.6	745.7	0.61	0.12	-1.74
4,373.0	21.40	33.40	4,210.4	771.1	558.9	771.1	1.51	1.41	1.53
4,459.0	22.60	35.60	4,290.2	797.6	577.1	797.6	1.69	1.40	2.56
4,545.0	22.00	31.80	4,369.7	824.8	595.3	824.8	1.82	-0.70	-4.42
4,630.0	22.70	34.20	4,448.4	851.9	612.9	851.9	1.35	0.82	2.82
4,716.0	21.40	34.20	4,528.1	878.6	631.0	878.6	1.51	-1.51	0.00
4,801.0	21.30	33.90	4,607.2	904.2	648.3	904.2	0.17	-0.12	-0.35
4,887.0	22.50	30.70	4,687.0	931.3	665.5	931.3	1.97	1.40	-3.72
4,973.0	21.30	31.40	4,766.8	958.8	682.0	958.8	1.43	-1.40	0.81
5,058.0	19.20	31.60	4,846.6	983.9	697.4	983.9	2.47	-2.47	0.24
5,144.0	18.20	35.50	4,928.0	1,006.9	712.6	1,006.9	1.86	-1.16	4.53
5,230.0	19.40	33.40	5,009.4	1,029.7	728.2	1,029.7	1.60	1.40	-2.44
5,316.0	20.60	31.80	5,090.3	1,054.5	744.1	1,054.5	1.53	1.40	-1.86
5,401.0	19.10	32.60	5,170.2	1,078.9	759.4	1,078.9	1.79	-1.76	0.94
5,487.0	17.60	34.40	5,251.8	1,101.5	774.4	1,101.5	1.86	-1.74	2.09
5,572.0	16.20	32.30	5,333.2	1,122.1	788.0	1,122.1	1.80	-1.65	-2.47
5,658.0	13.60	29.70	5,416.3	1,141.1	799.4	1,141.1	3.12	-3.02	-3.02
5,744.0	12.20	31.30	5,500.1	1,157.6	809.1	1,157.6	1.68	-1.63	1.86
5,829.0	11.20	30.10	5,583.3	1,172.4	817.9	1,172.4	1.21	-1.18	-1.41
5,915.0	9.60	27.00	5,667.9	1,186.0	825.4	1,186.0	1.97	-1.86	-3.60
6,001.0	7.30	22.60	5,753.0	1,197.5	830.7	1,197.5	2.78	-2.67	-5.12
6,086.0	5.50	15.00	5,837.4	1,206.4	833.9	1,206.4	2.34	-2.12	-8.94
6,171.0	4.40	4.31	5,922.1	1,213.6	835.2	1,213.6	1.68	-1.29	-12.58

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6,257.0	2.80	350.70	6,007.9	1,219.0	835.1	1,219.0	2.10	-1.86	-15.83
6,343.0	2.30	334.00	6,093.9	1,222.6	834.0	1,222.6	1.04	-0.58	-19.42
6,429.0	1.60	332.60	6,179.8	1,225.2	832.7	1,225.2	0.82	-0.81	-1.63
6,448.6	1.72	327.20	6,199.4	1,225.7	832.4	1,225.7	1.00	0.61	-27.55
TARGET BHL 1206'FNL, 106'FEL									
6,514.0	2.20	314.00	6,264.8	1,227.4	830.9	1,227.4	1.00	0.73	-20.18
6,600.0	2.10	305.00	6,350.7	1,229.4	828.5	1,229.4	0.41	-0.12	-10.47
6,686.0	1.90	304.50	6,436.6	1,231.1	826.0	1,231.1	0.23	-0.23	-0.58
6,771.0	2.70	296.50	6,521.6	1,232.8	823.0	1,232.8	1.01	0.94	-9.41
6,857.0	2.70	279.10	6,607.5	1,234.1	819.2	1,234.1	0.95	0.00	-20.23
6,942.0	2.50	299.40	6,692.4	1,235.3	815.6	1,235.3	1.10	-0.24	23.88
7,027.0	3.60	325.90	6,777.3	1,238.4	812.5	1,238.4	2.07	1.29	31.18
7,042.5	3.46	325.81	6,792.8	1,239.2	812.0	1,239.2	0.93	-0.93	-0.57
TARGET CIRCLE 1206'FNL, 106'FEL									
7,113.0	2.80	325.30	6,863.1	1,242.4	809.8	1,242.4	0.93	-0.93	-0.73
7,199.0	1.80	304.10	6,949.1	1,244.9	807.5	1,244.9	1.51	-1.16	-24.65
7,284.0	0.60	286.60	7,034.1	1,245.7	806.0	1,245.7	1.46	-1.41	-20.59
7,370.0	0.40	10.70	7,120.1	1,246.1	805.6	1,246.1	0.80	-0.23	97.79
7,456.0	0.40	53.78	7,206.1	1,246.6	805.9	1,246.6	0.34	0.00	50.09
7,541.0	0.40	29.70	7,291.1	1,247.1	806.3	1,247.1	0.20	0.00	-28.33
7,627.0	0.90	40.40	7,377.0	1,247.8	806.9	1,247.8	0.60	0.58	12.44
7,712.0	0.70	36.30	7,462.0	1,248.8	807.6	1,248.8	0.24	-0.24	-4.82
7,798.0	0.80	45.00	7,548.0	1,249.6	808.3	1,249.6	0.18	0.12	10.12
7,890.0	0.90	105.80	7,640.0	1,249.9	809.5	1,249.9	0.94	0.11	66.09
7,935.0	0.90	105.80	7,685.0	1,249.7	810.2	1,249.7	0.00	0.00	0.00
HARDLINE 106'E OF BHL									

Checked By: _____ Approved By: _____ Date: _____