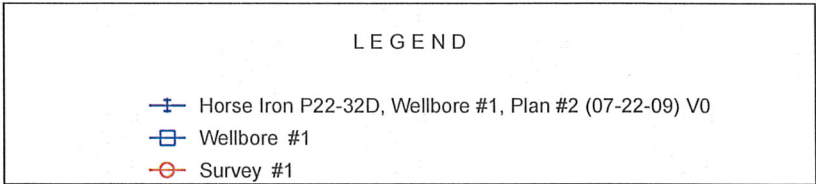
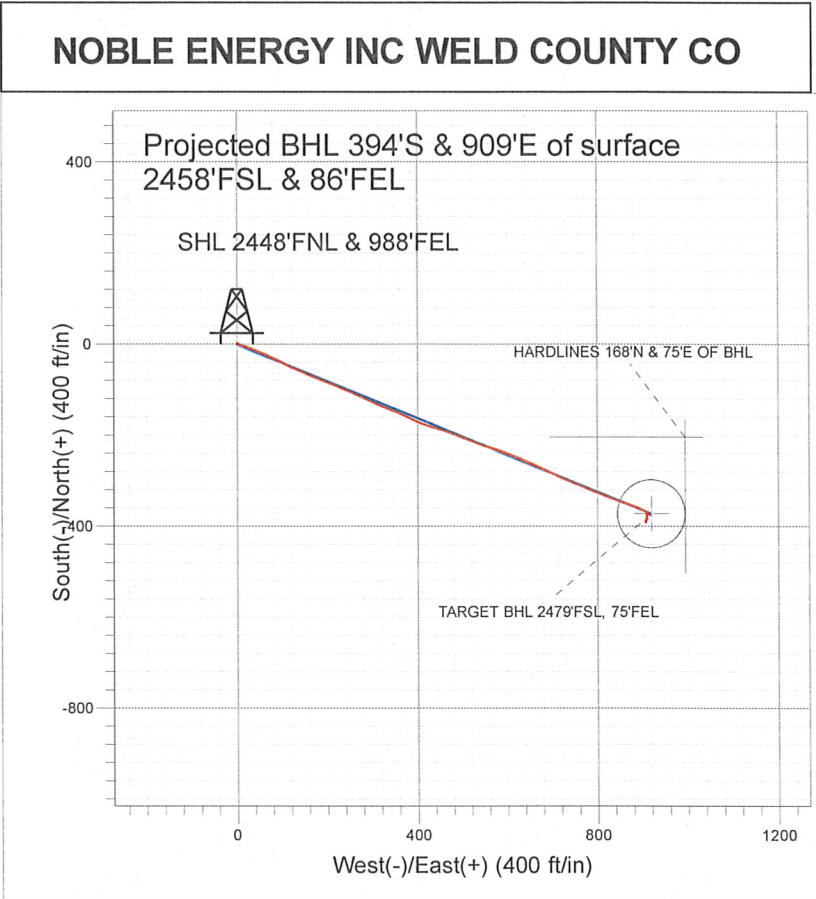
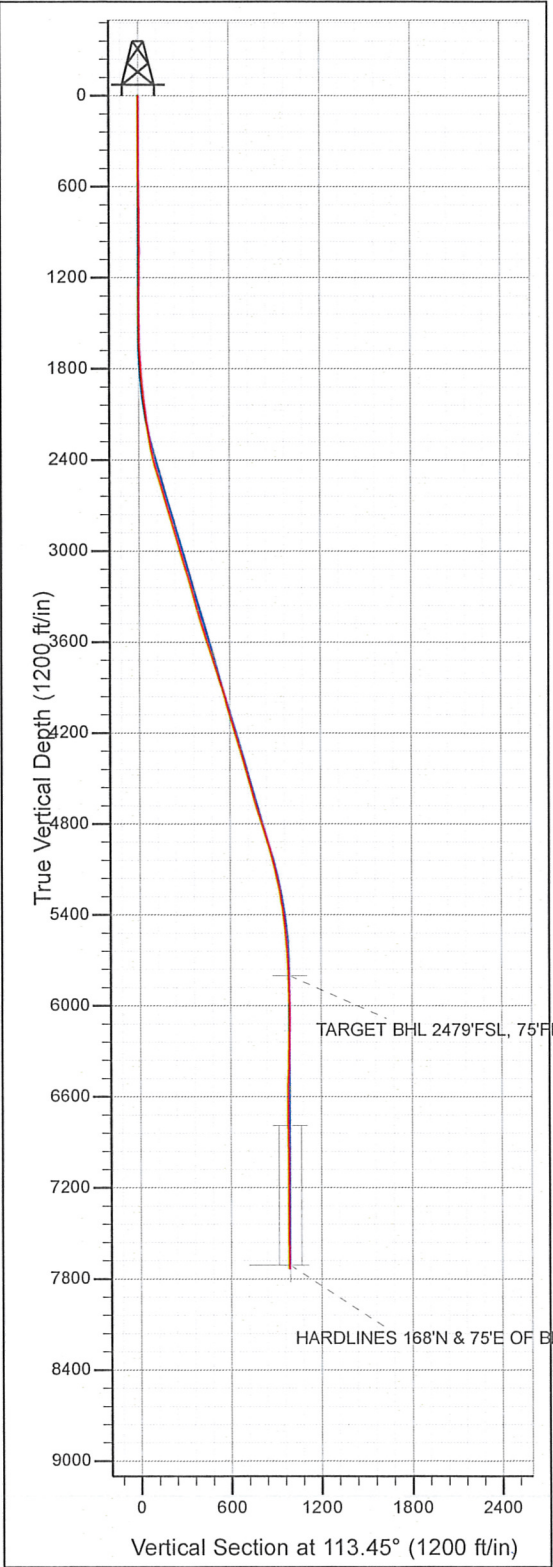




Well Name: <b>Horse Iron P22-32D</b>					
Surface Location: Horse Iron Pad Sec.21-T3N-R67W					
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone					
Ground Elevation: 4789.0					
+N/-S+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1320584.19	3170487.30	40° 12' 42.444 N	104° 53' 22.380 W
Original Well Elev WELL @ 4802.0ft (Original Well Elev)					



## Final Survey Plot

Projected Final Survey -  
7870'MD & 7739'TVD @ 990' VS  
0.8 deg Inc 180.6 deg AZ

Project:	SEC.21-T3N-R67W
Site:	Horse Iron Pad Sec.21-T3N-R67W
Well:	Horse Iron P22-32D
Plan:	Wellbore #1

Company: NOBLE ENERGY INC WELD COUNTY CO  
Project: SEC.21-T3N-R67W  
Site: Horse Iron Pad Sec.21-T3N-R67W  
Well: Horse Iron P22-32D  
Wellbore: Wellbore #1  
Design: Wellbore #1

Local Co-ordinate Reference: Well Horse Iron P22-32D  
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: EDM den0-adp01 Server Data

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 P22-32D					
Well Position	+N/-S	0.0 ft	Northing:	1,320,584.19 ft	Latitude:	40° 12' 42.444 N
	+E/-W	0.0 ft	Easting:	3,170,487.30 ft	Longitude:	104° 53' 22.380 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	5/28/2010	9.06	66.91	53,130

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	113.45	

Survey Program	Date 6/6/2010				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
562.0	7,870.0	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	
562.0	0.40	103.20	562.0	-0.4	1.9	1.9	0.07	0.07	0.00	
648.0	0.50	106.00	648.0	-0.6	2.6	2.6	0.12	0.12	3.26	
733.0	0.40	109.20	733.0	-0.8	3.2	3.3	0.12	-0.12	3.76	
819.0	0.30	99.10	819.0	-1.0	3.7	3.8	0.14	-0.12	-11.74	
904.0	0.10	150.00	904.0	-1.1	4.0	4.1	0.29	-0.24	59.88	
990.0	0.30	65.20	990.0	-1.0	4.2	4.3	0.36	0.23	-98.60	
1,076.0	0.40	261.60	1,076.0	-1.0	4.1	4.2	0.81	0.12	-190.23	
1,161.0	0.30	318.90	1,161.0	-0.8	3.7	3.7	0.41	-0.12	67.41	
1,247.0	0.40	331.50	1,247.0	-0.4	3.4	3.3	0.15	0.12	14.65	
1,333.0	0.60	297.60	1,333.0	0.1	2.8	2.6	0.41	0.23	-39.42	
1,419.0	0.70	326.40	1,419.0	0.7	2.1	1.7	0.39	0.12	33.49	
1,504.0	0.40	131.00	1,504.0	0.9	2.1	1.5	1.28	-0.35	193.65	



Company: NOBLE ENERGY INC WELD COUNTY CO  
Project: SEC.21-T3N-R67W  
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Wellbore: Wellbore #1  
Design: Wellbore #1

Local Co-ordinate Reference: Well Horse Iron P22-32D  
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: EDM den0-adp01 Server Data

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)
1,590.0	2.00	119.60	1,590.0	0.0	3.6	3.3	1.87	1.86	-13.26
1,676.0	3.20	104.00	1,675.9	-1.3	7.3	7.2	1.61	1.40	-18.14
1,761.0	4.20	107.10	1,760.7	-2.8	12.5	12.6	1.20	1.18	3.65
1,847.0	4.80	111.50	1,846.4	-5.1	18.9	19.3	0.80	0.70	5.12
1,933.0	5.50	113.20	1,932.1	-8.0	26.0	27.1	0.83	0.81	1.98
2,018.0	7.30	113.30	2,016.5	-11.7	34.7	36.5	2.12	2.12	0.12
2,104.0	8.10	109.10	2,101.8	-15.9	45.5	48.0	1.14	0.93	-4.88
2,190.0	8.70	114.60	2,186.8	-20.6	57.1	60.6	1.17	0.70	6.40
2,275.0	10.10	113.10	2,270.7	-26.2	69.8	74.5	1.67	1.65	-1.76
2,361.0	12.30	114.00	2,355.1	-32.9	85.1	91.2	2.57	2.56	1.05
2,446.0	14.40	117.50	2,437.8	-41.4	102.8	110.8	2.65	2.47	4.12
2,532.0	16.60	115.00	2,520.6	-51.6	123.4	133.7	2.67	2.56	-2.91
2,618.0	17.60	114.20	2,602.8	-62.1	146.4	159.0	1.19	1.16	-0.93
2,703.0	17.10	112.60	2,684.0	-72.1	169.6	184.3	0.81	-0.59	-1.88
2,789.0	16.30	110.10	2,766.3	-81.2	192.6	209.0	1.25	-0.93	-2.91
2,875.0	17.10	111.00	2,848.7	-89.8	215.8	233.7	0.98	0.93	1.05
2,962.0	16.50	113.70	2,932.0	-99.4	239.0	258.8	1.13	-0.69	3.10
3,046.0	15.90	115.50	3,012.7	-109.1	260.3	282.3	0.93	-0.71	2.14
3,132.0	16.30	114.60	3,095.3	-119.2	282.0	306.1	0.55	0.47	-1.05
3,218.0	16.10	113.40	3,177.9	-129.0	303.9	330.1	0.45	-0.23	-1.40
3,303.0	15.90	113.10	3,259.6	-138.2	325.4	353.5	0.25	-0.24	-0.35
3,389.0	15.90	110.10	3,342.3	-146.9	347.3	377.1	0.96	0.00	-3.49
3,474.0	16.40	115.30	3,423.9	-156.0	369.1	400.7	1.80	0.59	6.12
3,560.0	16.70	117.20	3,506.4	-166.9	391.0	425.2	0.72	0.35	2.21
3,646.0	16.90	108.60	3,588.7	-176.5	413.9	449.9	2.90	0.23	-10.00
3,731.0	19.20	107.10	3,669.5	-184.6	439.0	476.1	2.76	2.71	-1.76
3,817.0	19.00	107.10	3,750.8	-192.8	465.9	504.1	0.23	-0.23	0.00
3,903.0	18.80	110.90	3,832.2	-201.9	492.2	531.9	1.45	-0.23	4.42
3,988.0	16.40	110.70	3,913.2	-211.0	516.2	557.5	2.82	-2.82	-0.24
4,074.0	13.80	113.00	3,996.2	-219.3	537.0	579.9	3.10	-3.02	2.67
4,159.0	15.90	105.90	4,078.4	-226.5	557.5	601.6	3.26	2.47	-8.35
4,245.0	16.70	108.20	4,160.9	-233.6	580.6	625.6	1.20	0.93	2.67
4,331.0	17.10	111.90	4,243.2	-242.1	604.1	650.5	1.33	0.47	4.30
4,416.0	17.40	111.80	4,324.4	-251.5	627.5	675.7	0.35	0.35	-0.12
4,502.0	16.30	113.50	4,406.7	-261.1	650.5	700.7	1.40	-1.28	1.98
4,587.0	15.20	116.10	4,488.5	-270.8	671.4	723.7	1.54	-1.29	3.06
4,673.0	15.40	112.90	4,571.4	-280.2	692.1	746.4	1.01	0.23	-3.72
4,759.0	16.20	116.60	4,654.2	-290.0	713.3	769.8	1.50	0.93	4.30
4,844.0	17.60	111.30	4,735.5	-300.0	735.9	794.5	2.45	1.65	-6.24
4,930.0	18.40	112.30	4,817.3	-309.8	760.6	821.1	1.00	0.93	1.16
5,016.0	16.40	113.00	4,899.4	-319.7	784.3	846.8	2.34	-2.33	0.81
5,101.0	15.40	112.20	4,981.1	-328.7	805.8	870.0	1.20	-1.18	-0.94
5,187.0	14.90	110.10	5,064.1	-336.8	826.8	892.5	0.86	-0.58	-2.44
5,273.0	12.80	110.10	5,147.6	-343.9	846.1	913.1	2.44	-2.44	0.00
5,358.0	10.40	109.80	5,230.9	-349.7	862.2	930.1	2.82	-2.82	-0.35
5,444.0	9.20	109.70	5,315.6	-354.7	875.9	944.7	1.40	-1.40	-0.12
5,530.0	7.50	110.30	5,400.7	-358.9	887.7	957.2	1.98	-1.98	0.70
5,615.0	6.10	115.90	5,485.1	-362.8	896.9	967.2	1.82	-1.65	6.59
5,701.0	5.00	121.00	5,570.7	-366.7	904.3	975.5	1.40	-1.28	5.93
5,786.0	4.00	115.30	5,655.4	-369.9	910.1	982.2	1.29	-1.18	-6.71
5,872.0	3.00	119.80	5,741.3	-372.3	914.8	987.4	1.20	-1.16	5.23
5,930.8	2.24	117.21	5,800.1	-373.6	917.1	990.1	1.31	-1.30	-4.39
TARGET BHL 2479'FSL, 75'FEL									
5,957.0	1.90	115.40	5,826.2	-374.0	918.0	991.0	1.31	-1.29	-6.94

**Company:** NOBLE ENERGY INC WELD COUNTY CO  
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**Wellbore:** Wellbore #1  
**Design:** Wellbore #1

**Local Co-ordinate Reference:** Well Horse Iron P22-32D  
**TVD Reference:** WELL @ 4802.0ft (Original Well Elev)  
**MD Reference:** WELL @ 4802.0ft (Original Well Elev)  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature  
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**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)
6,043.0	1.30	134.60	5,912.2	-375.3	920.0	993.3	0.93	-0.70	22.33
6,171.0	0.30	210.60	6,040.2	-376.6	920.8	994.7	0.99	-0.78	59.38
6,300.0	0.50	293.90	6,169.2	-376.7	920.1	994.0	0.43	0.16	64.57
6,429.0	1.10	299.00	6,298.1	-375.9	918.5	992.3	0.47	0.47	3.95
6,557.0	1.50	294.70	6,426.1	-374.6	915.9	989.4	0.32	0.31	-3.36
6,686.0	2.00	290.00	6,555.1	-373.1	912.3	985.4	0.40	0.39	-3.64
6,814.0	1.80	177.60	6,683.0	-374.3	910.3	984.1	2.47	-0.16	-87.81
6,920.9	1.80	179.02	6,789.8	-377.7	910.4	985.5	0.04	0.00	1.33
<b>TARGET CIRCLE 2479'FSL, 75'FEL</b>									
6,942.0	1.80	179.30	6,810.9	-378.4	910.4	985.8	0.04	0.00	1.33
7,070.0	1.90	160.40	6,938.9	-382.4	911.1	988.0	0.48	0.08	-14.77
7,199.0	0.70	211.60	7,067.9	-385.1	911.4	989.4	1.21	-0.93	39.69
7,327.0	0.90	217.00	7,195.8	-386.5	910.4	989.0	0.17	0.16	4.22
7,456.0	1.00	209.80	7,324.8	-388.3	909.2	988.7	0.12	0.08	-5.58
7,584.0	0.80	183.60	7,452.8	-390.2	908.6	988.9	0.35	-0.16	-20.47
7,712.0	0.80	179.20	7,580.8	-392.0	908.6	989.5	0.05	0.00	-3.44
7,825.0	0.80	180.60	7,693.8	-393.5	908.6	990.2	0.02	0.00	1.24
<b>HARDLINES 168'N &amp; 75'E OF BHL</b>									
7,870.0	0.80	180.60	7,738.8	-394.2	908.6	990.4	0.00	0.00	0.00

**Wellbore Targets**

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
TARGET BHL 2479'F: - survey misses target center by 2.6ft at 5930.8ft MD (5800.1 TVD, -373.6 N, 917.1 E) - Point	0.00	0.00	5,800.0	-372.6	919.5	1,320,217.96	3,171,409.34	40° 12' 38.762 N	104° 53' 10.528 W
TARGET CIRCLE 247 - survey misses target center by 10.4ft at 6920.9ft MD (6789.8 TVD, -377.7 N, 910.4 E) - Circle (radius 75.0)	0.00	0.00	6,790.0	-372.6	919.5	1,320,217.94	3,171,409.30	40° 12' 38.762 N	104° 53' 10.528 W
HARDLINES 168'N & - survey misses target center by 208.1ft at 7825.0ft MD (7693.8 TVD, -393.5 N, 908.6 E) - Polygon	0.00	0.00	7,709.0	-204.6	994.5	1,320,386.45	3,171,483.14	40° 12' 40.422 N	104° 53' 9.561 W
Point 1			7,709.0	0.0	0.0	1,320,386.45	3,171,483.14		
Point 2			7,709.0	0.0	-300.0	1,320,384.38	3,171,183.16		
Point 3			7,709.0	0.0	0.0	1,320,386.45	3,171,483.14		
Point 4			7,709.0	-300.0	0.0	1,320,086.47	3,171,485.20		

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_