

Vertical Section at 206.86° (250 ft/in)



## **Directional**

### **Noble Energy Inc.- Weld County, CO (Grid North)**

**Sec.4-T9N-R58W**

**Rohn State LD04-63HN Pad Sec.4-T9N-R58W**

**Rohn State LD04-63HN**

**Wellbore #1**

**Design: Wellbore #1**

### **Standard Survey Report**

**05 September, 2013**



Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Rohn State LD04-63HN
Project:	Sec.4-T9N-R58W	TVD Reference:	WELL @ 4733.0ft (H&P 273 RKB - 24')
Site:	Rohn State LD04-63HN Pad Sec.4-T9N-R58W	MD Reference:	WELL @ 4733.0ft (H&P 273 RKB - 24')
Well:	Rohn State LD04-63HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	Sec.4-T9N-R58W		
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	Rohn State LD04-63HN Pad Sec.4-T9N-R58W				
Site Position:		Northing:	1,530,647.50 ft	Latitude:	40.778510
From:	Lat/Long	Easting:	3,453,657.40 ft	Longitude:	-103.861890
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	1.06 °

Well	Rohn State LD04-63HN					
Well Position	+N/-S	0.0 ft	Northing:	1,530,647.47 ft	Latitude:	40.778510
	+E/-W	0.0 ft	Easting:	3,453,657.40 ft	Longitude:	-103.861890
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,709.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/22/2013	8.10	67.42	53,190

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	206.86	

Survey Program	Date 9/5/2013				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
350.0	720.0	Survey #1 (Wellbore #1)	Flexi-Shot	VES Flexi-Shot Tool	
1,160.0	9,758.0	Survey #2 (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	
350.0	1.20	15.76	350.0	3.5	1.0	-3.6	0.34	0.34	0.00	
720.0	1.00	71.76	719.9	8.3	5.1	-9.7	0.28	-0.05	15.14	
1,160.0	0.80	4.76	1,159.9	12.5	9.0	-15.3	0.23	-0.05	-15.23	
1,281.0	0.30	294.50	1,280.9	13.5	8.8	-16.0	0.62	-0.41	-58.07	
1,374.0	1.20	200.40	1,373.9	12.7	8.2	-15.0	1.35	0.97	-101.18	
1,467.0	2.50	201.80	1,466.8	9.9	7.1	-12.1	1.40	1.40	1.51	
1,562.0	4.40	186.90	1,561.6	4.4	5.9	-6.6	2.20	2.00	-15.68	
1,657.0	5.20	182.80	1,656.3	-3.6	5.3	0.8	0.92	0.84	-4.32	
1,752.0	6.10	171.90	1,750.8	-12.9	5.8	8.9	1.47	0.95	-11.47	
1,847.0	7.40	170.00	1,845.2	-23.9	7.6	17.9	1.39	1.37	-2.00	



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Site:	Rohn State LD04-63HN Pad Sec.4-T9N-R58W	MD Reference:	WELL @ 4733.0ft (H&P 273 RKB - 24')
Well:	Rohn State LD04-63HN	North Reference:	Grid
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)	
1,942.0	8.80	167.50	1,939.2	-37.0	10.2	28.4	1.52	1.47	-2.63	
2,036.0	11.00	169.10	2,031.8	-52.8	13.5	41.1	2.36	2.34	1.70	
2,131.0	12.80	165.40	2,124.8	-71.9	17.8	56.1	2.06	1.89	-3.89	
2,226.0	13.60	169.50	2,217.3	-93.1	22.5	72.9	1.30	0.84	4.32	
2,321.0	14.90	164.90	2,309.4	-115.9	27.7	90.8	1.81	1.37	-4.84	
2,416.0	16.10	167.00	2,400.9	-140.5	33.9	110.0	1.39	1.26	2.21	
2,510.0	16.60	166.10	2,491.1	-166.2	40.0	130.2	0.60	0.53	-0.96	
2,605.0	16.20	164.60	2,582.2	-192.2	46.8	150.3	0.61	-0.42	-1.58	
2,700.0	15.60	164.90	2,673.6	-217.3	53.7	169.6	0.64	-0.63	0.32	
2,794.0	14.30	162.10	2,764.4	-240.5	60.5	187.2	1.58	-1.38	-2.98	
2,889.0	13.90	163.30	2,856.5	-262.6	67.4	203.8	0.52	-0.42	1.26	
2,984.0	13.00	164.40	2,948.9	-283.8	73.6	220.0	0.98	-0.95	1.16	
3,079.0	13.60	169.80	3,041.4	-305.1	78.4	236.8	1.45	0.63	5.68	
3,174.0	15.80	169.30	3,133.3	-328.8	82.8	256.0	2.32	2.32	-0.53	
3,269.0	15.70	168.60	3,224.7	-354.1	87.7	276.3	0.23	-0.11	-0.74	
3,363.0	16.30	168.80	3,315.1	-379.6	92.8	296.7	0.64	0.64	0.21	
3,458.0	17.00	167.40	3,406.1	-406.2	98.4	317.9	0.85	0.74	-1.47	
3,553.0	17.50	166.80	3,496.8	-433.6	104.7	339.6	0.56	0.53	-0.63	
3,648.0	15.30	167.20	3,587.9	-459.8	110.8	360.1	2.32	-2.32	0.42	
3,743.0	13.40	171.90	3,680.0	-482.9	115.1	378.8	2.34	-2.00	4.95	
3,837.0	12.30	174.60	3,771.6	-503.7	117.6	396.2	1.33	-1.17	2.87	
3,932.0	11.60	174.90	3,864.6	-523.2	119.4	412.9	0.74	-0.74	0.32	
4,027.0	11.20	169.50	3,957.7	-541.8	121.9	428.3	1.20	-0.42	-5.68	
4,122.0	9.70	164.00	4,051.1	-558.6	125.8	441.5	1.89	-1.58	-5.79	
4,217.0	7.80	165.30	4,145.0	-572.5	129.6	452.2	2.01	-2.00	1.37	
4,312.0	7.90	158.10	4,239.1	-584.8	133.7	461.3	1.04	0.11	-7.58	
4,406.0	6.50	159.30	4,332.4	-595.8	138.0	469.2	1.50	-1.49	1.28	
4,501.0	5.10	153.50	4,426.9	-604.6	141.8	475.3	1.60	-1.47	-6.11	
4,596.0	3.60	153.10	4,521.6	-611.0	145.0	479.6	1.58	-1.58	-0.42	
4,691.0	2.30	151.00	4,616.5	-615.4	147.3	482.4	1.37	-1.37	-2.21	
4,786.0	2.10	126.10	4,711.4	-618.1	149.6	483.8	1.02	-0.21	-26.21	
4,881.0	1.80	126.80	4,806.4	-620.0	152.2	484.3	0.32	-0.32	0.74	
4,971.0	1.10	124.50	4,896.3	-621.3	154.0	484.7	0.78	-0.78	-2.56	
5,066.0	2.60	266.20	4,991.3	-622.0	152.6	485.9	3.72	1.58	149.16	
5,161.0	8.90	286.20	5,085.8	-620.1	143.4	488.4	6.86	6.63	21.05	
5,256.0	12.80	287.10	5,179.1	-614.9	126.3	491.5	4.11	4.11	0.95	
5,351.0	16.90	284.10	5,270.9	-608.5	102.8	496.4	4.39	4.32	-3.16	
5,445.0	21.70	282.90	5,359.6	-601.2	72.6	503.6	5.12	5.11	-1.28	
5,540.0	26.60	280.60	5,446.2	-593.4	34.6	513.8	5.25	5.16	-2.42	
5,635.0	31.70	276.00	5,529.2	-586.9	-11.2	528.6	5.86	5.37	-4.84	
5,729.0	42.50	272.30	5,604.1	-583.0	-67.6	550.7	11.73	11.49	-3.94	
5,824.0	58.20	270.00	5,664.5	-581.7	-140.5	582.5	16.63	16.53	-2.42	
5,918.0	75.20	268.30	5,701.5	-583.1	-226.5	622.5	18.16	18.09	-1.81	
5,934.0	77.60	267.90	5,705.3	-583.6	-242.1	630.0	15.20	15.00	-2.50	
5,995.0	87.20	268.10	5,713.4	-585.7	-302.4	659.1	15.74	15.74	0.33	
6,007.0	87.37	268.05	5,713.9	-586.1	-314.4	664.9	1.46	1.40	-0.43	
Rohn State LD04-63HN Landing Pt.										
6,088.0	88.50	267.70	5,716.8	-589.1	-395.3	704.1	1.46	1.40	-0.43	
6,182.0	90.90	268.80	5,717.3	-592.0	-489.3	749.1	2.81	2.55	1.17	
6,275.0	90.00	267.70	5,716.6	-594.8	-582.2	793.7	1.53	-0.97	-1.18	
6,368.0	89.70	268.60	5,716.9	-597.8	-675.2	838.4	1.02	-0.32	0.97	
6,463.0	91.00	269.00	5,716.3	-599.8	-770.1	883.0	1.43	1.37	0.42	
6,558.0	89.90	268.60	5,715.5	-601.8	-865.1	927.7	1.23	-1.16	-0.42	

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6,649.0	91.00	269.50	5,714.8	-603.3	-956.1	970.2	1.56	1.21	0.99
6,744.0	91.60	268.30	5,712.7	-605.1	-1,051.0	1,014.7	1.41	0.63	-1.26
6,839.0	91.40	267.00	5,710.2	-609.0	-1,145.9	1,061.0	1.38	-0.21	-1.37
6,934.0	87.70	267.50	5,710.9	-613.6	-1,240.8	1,108.0	3.93	-3.89	0.53
7,029.0	88.10	266.80	5,714.4	-618.3	-1,335.6	1,155.0	0.85	0.42	-0.74
7,124.0	89.10	266.30	5,716.7	-624.0	-1,430.4	1,202.9	1.18	1.05	-0.53
7,219.0	90.40	266.50	5,717.1	-630.0	-1,525.2	1,251.1	1.38	1.37	0.21
7,313.0	88.50	268.60	5,718.0	-634.0	-1,619.1	1,297.1	3.01	-2.02	2.23
7,408.0	89.70	268.30	5,719.5	-636.6	-1,714.1	1,342.3	1.30	1.26	-0.32
7,503.0	90.80	267.50	5,719.1	-640.0	-1,809.0	1,388.3	1.43	1.16	-0.84
7,598.0	89.10	268.40	5,719.2	-643.4	-1,903.9	1,434.2	2.02	-1.79	0.95
7,693.0	89.50	268.60	5,720.4	-645.9	-1,998.9	1,479.3	0.47	0.42	0.21
7,788.0	89.80	268.40	5,720.9	-648.4	-2,093.9	1,524.5	0.38	0.32	-0.21
7,883.0	92.20	267.50	5,719.3	-651.8	-2,188.8	1,570.4	2.70	2.53	-0.95
7,977.0	91.00	268.40	5,716.7	-655.2	-2,282.7	1,615.8	1.60	-1.28	0.96
8,072.0	88.80	268.10	5,716.8	-658.1	-2,377.6	1,661.3	2.34	-2.32	-0.32
8,167.0	90.60	267.70	5,717.3	-661.6	-2,472.6	1,707.3	1.94	1.89	-0.42
8,262.0	89.90	267.90	5,716.9	-665.2	-2,567.5	1,753.4	0.77	-0.74	0.21
8,356.0	88.20	269.10	5,718.5	-667.7	-2,661.4	1,798.1	2.21	-1.81	1.28
8,451.0	89.30	268.60	5,720.5	-669.6	-2,756.4	1,842.7	1.27	1.16	-0.53
8,546.0	89.40	268.10	5,721.6	-672.3	-2,851.4	1,888.0	0.54	0.11	-0.53
8,641.0	89.70	267.00	5,722.4	-676.4	-2,946.3	1,934.5	1.20	0.32	-1.16
8,736.0	90.40	266.70	5,722.3	-681.6	-3,041.1	1,982.0	0.80	0.74	-0.32
8,831.0	89.60	268.60	5,722.3	-685.5	-3,136.0	2,028.4	2.17	-0.84	2.00
8,925.0	90.30	267.90	5,722.4	-688.3	-3,230.0	2,073.4	1.05	0.74	-0.74
9,020.0	91.70	267.50	5,720.7	-692.2	-3,324.9	2,119.7	1.53	1.47	-0.42
9,115.0	89.40	267.50	5,719.8	-696.3	-3,419.8	2,166.2	2.42	-2.42	0.00
9,210.0	88.90	266.30	5,721.2	-701.4	-3,514.6	2,213.7	1.37	-0.53	-1.26
9,305.0	90.20	266.10	5,721.9	-707.7	-3,609.4	2,262.1	1.38	1.37	-0.21
9,399.0	87.20	267.00	5,724.1	-713.4	-3,703.2	2,309.5	3.33	-3.19	0.96
9,494.0	88.10	266.80	5,728.0	-718.5	-3,798.0	2,356.9	0.97	0.95	-0.21
9,589.0	88.10	265.60	5,731.1	-724.8	-3,892.7	2,405.3	1.26	0.00	-1.26
9,684.0	88.50	265.80	5,733.9	-731.9	-3,987.4	2,454.5	0.47	0.42	0.21
9,703.0	88.50	265.80	5,734.4	-733.3	-4,006.4	2,464.3	0.00	0.00	0.00
9,758.0	88.50	265.80	5,735.9	-737.4	-4,061.2	2,492.6	0.00	0.00	0.00

Rohn State LD04-63HN BHL 1320'FSL, 660'FWL

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