

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

Well Name: **Rohn State LD09-66-1HN**

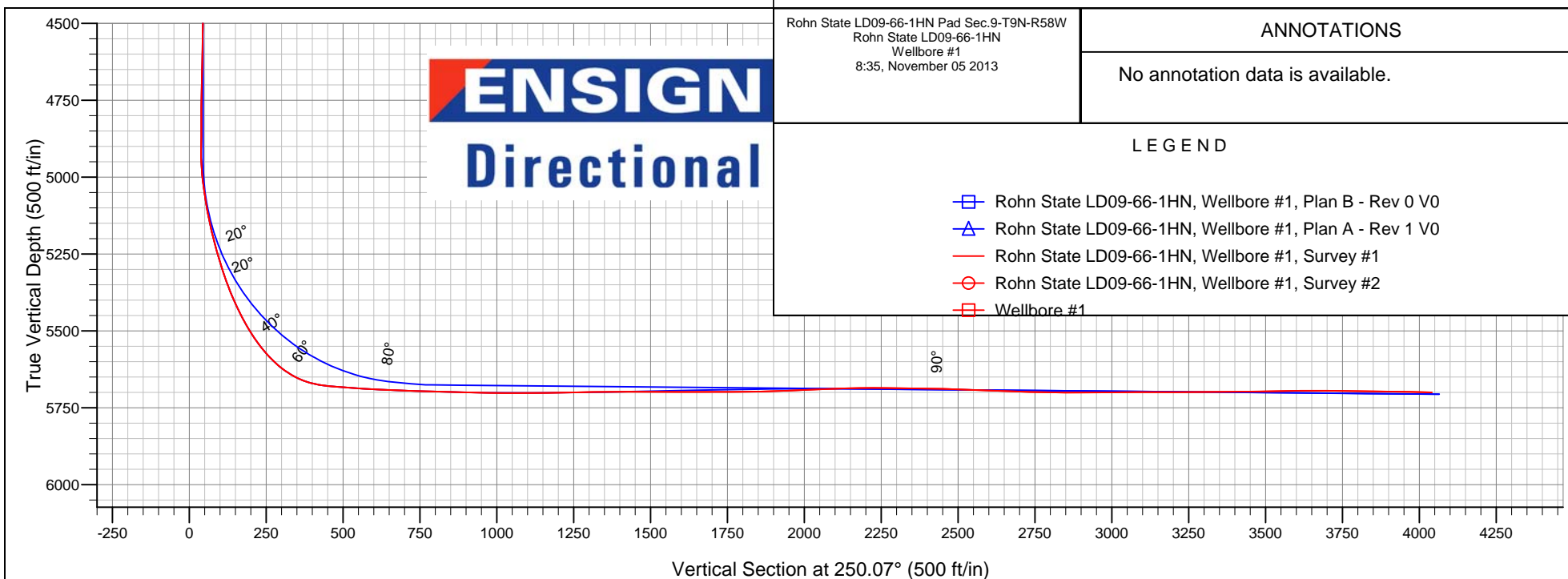
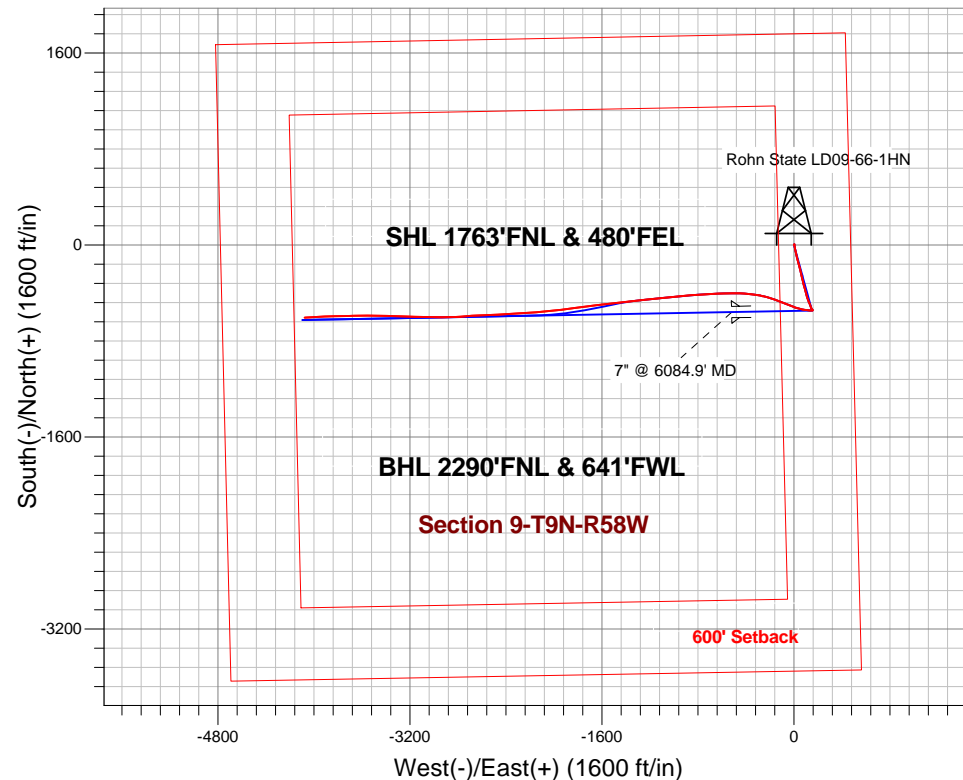
Surface Location: Rohn State LD09-66-1HN Pad Sec.9-T9N-R58W  
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone  
Ground Elevation: 4727.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1526936.64	3453784.14	40.768320	-103.861680	

H&P 273 RKB - 24' WELL @ 4751.0ft (H&P 273 RKB - 24')

## FINAL SURVEY

Projected Bottom Hole Location  
9729' MD 5700' TVD 606' S & 4078' W of SHL  
88.9 degree Incl @ 266.8 degree AZM





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

**SEC.9-T9N-R58W**

**Rohn State LD09-66-1HN Pad Sec.9-T9N-R58W**

**Rohn State LD09-66-1HN**

**Wellbore #1**

**Design: Wellbore #1**

## **Standard Survey Report**

**05 November, 2013**

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)
Survey A	0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
	350.0	0.40	28.00	350.0	1.1	0.6	-0.9	0.11	0.11	0.00
	820.0	0.40	25.30	820.0	4.0	2.0	-3.3	0.00	0.00	-0.57
	1,191.0	0.50	57.10	1,191.0	6.1	4.0	-5.8	0.07	0.03	8.57
	1,282.0	0.60	310.30	1,282.0	6.6	3.9	-5.9	0.97	0.11	-117.36
	1,375.0	1.40	183.30	1,375.0	5.8	3.5	-5.2	1.96	0.86	-136.56
	1,467.0	3.00	183.70	1,466.9	2.2	3.3	-3.8	1.74	1.74	0.43
	1,558.0	3.80	171.70	1,557.7	-3.1	3.6	-2.3	1.17	0.88	-13.19
	1,651.0	5.20	168.00	1,650.4	-10.3	4.9	-1.1	1.54	1.51	-3.98
	1,744.0	6.50	171.40	1,743.0	-19.6	6.5	0.5	1.45	1.40	3.66

<b>Company:</b>	Noble Energy Inc.- Weld County, CO (Grid North)	<b>Local Co-ordinate Reference:</b>	Well Rohn State LD09-66-1HN
<b>Project:</b>	SEC.9-T9N-R58W	<b>TVD Reference:</b>	WELL @ 4751.0ft (H&P 273 RKB - 24')
<b>Site:</b>	Rohn State LD09-66-1HN Pad Sec.9-T9N-R58W	<b>MD Reference:</b>	WELL @ 4751.0ft (H&P 273 RKB - 24')
<b>Well:</b>	Rohn State LD09-66-1HN	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	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)
1,839.0	8.00	172.80	1,837.2	-31.5	8.2	3.1	1.59	1.58	1.47
1,933.0	9.10	171.90	1,930.2	-45.3	10.0	6.0	1.18	1.17	-0.96
2,028.0	10.50	163.70	2,023.8	-61.1	13.5	8.1	2.08	1.47	-8.63
2,123.0	11.30	166.10	2,117.1	-78.4	18.2	9.6	0.97	0.84	2.53
2,218.0	10.30	162.10	2,210.4	-95.6	23.0	10.9	1.31	-1.05	-4.21
2,313.0	10.90	164.40	2,303.7	-112.3	28.1	11.9	0.77	0.63	2.42
2,408.0	12.20	168.70	2,396.8	-130.8	32.4	14.1	1.64	1.37	4.53
2,503.0	12.00	167.90	2,489.7	-150.3	36.5	16.9	0.27	-0.21	-0.84
2,597.0	11.80	166.80	2,581.7	-169.2	40.7	19.4	0.32	-0.21	-1.17
2,692.0	11.10	166.10	2,674.8	-187.5	45.1	21.5	0.75	-0.74	-0.74
2,787.0	11.50	165.10	2,768.0	-205.6	49.8	23.3	0.47	0.42	-1.05
2,882.0	11.70	163.80	2,861.0	-224.0	54.9	24.7	0.35	0.21	-1.37
2,977.0	11.20	165.10	2,954.1	-242.1	60.0	26.2	0.59	-0.53	1.37
3,072.0	10.60	167.90	3,047.4	-259.6	64.2	28.2	0.84	-0.63	2.95
3,167.0	12.10	167.30	3,140.6	-277.8	68.2	30.6	1.58	1.58	-0.63
3,262.0	12.30	166.60	3,233.4	-297.4	72.7	33.0	0.26	0.21	-0.74
3,356.0	12.70	165.90	3,325.2	-317.2	77.6	35.2	0.46	0.43	-0.74
3,451.0	12.70	166.60	3,417.9	-337.4	82.5	37.5	0.16	0.00	0.74
3,546.0	13.10	166.10	3,510.5	-358.1	87.5	39.8	0.44	0.42	-0.53
3,641.0	12.60	161.50	3,603.1	-378.3	93.4	41.2	1.20	-0.53	-4.84
3,735.0	12.10	162.80	3,694.9	-397.5	99.6	41.9	0.61	-0.53	1.38
3,830.0	10.30	167.00	3,788.1	-415.3	104.4	43.4	2.08	-1.89	4.42
3,925.0	9.90	167.30	3,881.6	-431.5	108.1	45.5	0.42	-0.42	0.32
4,020.0	10.00	161.20	3,975.2	-447.3	112.6	46.6	1.11	0.11	-6.42
4,115.0	10.80	158.00	4,068.6	-463.3	118.6	46.5	1.04	0.84	-3.37
4,210.0	9.00	157.10	4,162.2	-478.4	124.8	45.8	1.90	-1.89	-0.95
4,304.0	7.90	158.40	4,255.2	-491.2	130.0	45.2	1.19	-1.17	1.38
4,399.0	8.40	160.00	4,349.2	-503.8	134.8	45.0	0.58	0.53	1.68
4,494.0	6.40	158.20	4,443.4	-515.2	139.2	44.8	2.12	-2.11	-1.89
4,589.0	7.30	153.10	4,537.8	-525.5	143.8	43.9	1.14	0.95	-5.37
4,684.0	5.50	146.20	4,632.2	-534.7	149.1	42.1	2.06	-1.89	-7.26
4,778.0	4.00	144.70	4,725.8	-541.1	153.5	40.2	1.60	-1.60	-1.60
4,873.0	0.90	140.60	4,820.7	-544.4	155.9	39.0	3.27	-3.26	-4.32
4,966.0	0.80	136.80	4,913.7	-545.4	156.8	38.5	0.12	-0.11	-4.09
5,061.0	7.20	268.10	5,008.5	-546.1	151.3	43.9	8.16	6.74	138.21
5,156.0	10.60	273.00	5,102.3	-545.9	136.6	57.6	3.66	3.58	5.16
5,251.0	15.90	275.80	5,194.8	-544.1	114.9	77.4	5.62	5.58	2.95
5,346.0	19.00	277.90	5,285.4	-540.7	86.7	102.8	3.33	3.26	2.21
5,440.0	26.00	284.60	5,372.2	-533.3	51.5	133.4	7.92	7.45	7.13
5,535.0	33.70	289.20	5,454.6	-519.4	6.4	171.0	8.45	8.11	4.84
5,630.0	42.90	292.00	5,529.0	-498.6	-48.6	215.6	9.85	9.68	2.95
5,725.0	52.80	291.40	5,592.7	-472.6	-114.0	268.2	10.43	10.42	-0.63
5,822.0	64.60	287.60	5,643.0	-445.2	-192.0	332.2	12.61	12.16	-3.92
5,917.0	79.20	281.10	5,672.5	-423.1	-279.2	406.7	16.68	15.37	-6.84
5,970.0	85.40	278.60	5,679.6	-414.1	-330.9	452.3	12.60	11.70	-4.72
6,029.1	85.97	274.72	5,684.0	-407.2	-389.5	505.0	6.61	0.96	-6.56
<b>Rohn PC LD09-01</b>									
6,063.0	86.30	272.50	5,686.3	-405.1	-423.2	536.0	6.61	0.98	-6.55
6,154.0	87.70	270.40	5,691.1	-402.8	-514.1	620.6	2.77	1.54	-2.31
6,247.0	87.70	267.90	5,694.8	-404.2	-607.0	708.4	2.69	0.00	-2.69
6,282.6	88.20	267.21	5,696.1	-405.7	-642.5	742.4	2.39	1.40	-1.94
<b>Rohn State LD09-66-1HN Landing Pt.</b>									

<b>Company:</b>	Noble Energy Inc.- Weld County, CO (Grid North)	<b>Local Co-ordinate Reference:</b>	Well Rohn State LD09-66-1HN
<b>Project:</b>	SEC.9-T9N-R58W	<b>TVD Reference:</b>	WELL @ 4751.0ft (H&P 273 RKB - 24')
<b>Site:</b>	Rohn State LD09-66-1HN Pad Sec.9-T9N-R58W	<b>MD Reference:</b>	WELL @ 4751.0ft (H&P 273 RKB - 24')
<b>Well:</b>	Rohn State LD09-66-1HN	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	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)
6,340.0	89.00	266.10	5,697.5	-409.1	-699.8	797.3	2.39	1.40	-1.93
6,434.0	88.50	266.10	5,699.5	-415.5	-793.6	887.6	0.53	-0.53	0.00
6,529.0	88.90	265.40	5,701.7	-422.5	-888.3	979.1	0.85	0.42	-0.74
6,624.0	90.30	264.40	5,702.4	-430.9	-982.9	1,070.9	1.81	1.47	-1.05
6,719.0	90.70	264.40	5,701.5	-440.2	-1,077.4	1,163.0	0.42	0.42	0.00
6,814.0	90.70	264.40	5,700.4	-449.5	-1,172.0	1,255.0	0.00	0.00	0.00
6,909.0	91.10	263.80	5,698.9	-459.2	-1,266.4	1,347.1	0.76	0.42	-0.63
7,003.0	89.60	263.50	5,698.3	-469.6	-1,359.9	1,438.5	1.63	-1.60	-0.32
7,098.0	89.90	263.30	5,698.7	-480.6	-1,454.2	1,530.9	0.38	0.32	-0.21
7,193.0	90.20	263.50	5,698.6	-491.5	-1,548.6	1,623.4	0.38	0.32	0.21
7,288.0	89.80	262.80	5,698.6	-502.8	-1,642.9	1,715.9	0.85	-0.42	-0.74
7,383.0	90.90	263.10	5,698.1	-514.5	-1,737.2	1,808.5	1.20	1.16	0.32
7,478.0	91.40	263.00	5,696.2	-526.0	-1,831.5	1,901.1	0.54	0.53	-0.11
7,573.0	92.70	262.30	5,692.8	-538.1	-1,925.6	1,993.7	1.55	1.37	-0.74
7,668.0	92.10	263.80	5,688.8	-549.6	-2,019.9	2,086.2	1.70	-0.63	1.58
7,763.0	90.80	265.10	5,686.4	-558.8	-2,114.4	2,178.2	1.93	-1.37	1.37
7,858.0	89.50	265.60	5,686.1	-566.5	-2,209.1	2,269.9	1.47	-1.37	0.53
7,952.0	89.20	266.80	5,687.2	-572.7	-2,302.9	2,360.1	1.32	-0.32	1.28
8,047.0	88.70	267.90	5,688.9	-577.1	-2,397.7	2,450.8	1.27	-0.53	1.16
8,142.0	88.00	267.40	5,691.7	-581.0	-2,492.6	2,541.4	0.91	-0.74	-0.53
8,237.0	87.40	267.20	5,695.5	-585.5	-2,587.4	2,632.0	0.67	-0.63	-0.21
8,332.0	88.70	265.80	5,698.7	-591.3	-2,682.2	2,723.1	2.01	1.37	-1.47
8,426.0	89.50	266.10	5,700.2	-597.9	-2,775.9	2,813.5	0.91	0.85	0.32
8,521.0	90.00	267.90	5,700.6	-602.9	-2,870.8	2,904.4	1.97	0.53	1.89
8,616.0	90.60	271.90	5,700.1	-603.0	-2,965.8	2,993.7	4.26	0.63	4.21
8,711.0	90.20	271.90	5,699.4	-599.9	-3,060.7	3,081.9	0.42	-0.42	0.00
8,806.0	90.10	271.60	5,699.2	-597.0	-3,155.7	3,170.2	0.33	-0.11	-0.32
8,900.0	90.10	271.20	5,699.0	-594.7	-3,249.7	3,257.7	0.43	0.00	-0.43
8,995.0	90.20	270.90	5,698.8	-592.9	-3,344.6	3,346.4	0.33	0.11	-0.32
9,090.0	90.70	271.20	5,698.0	-591.2	-3,439.6	3,435.1	0.61	0.53	0.32
9,185.0	91.30	270.40	5,696.4	-589.9	-3,534.6	3,524.0	1.05	0.63	-0.84
9,280.0	90.60	269.30	5,694.8	-590.1	-3,629.6	3,613.3	1.37	-0.74	-1.16
9,374.0	89.40	268.80	5,694.8	-591.7	-3,723.6	3,702.2	1.38	-1.28	-0.53
9,469.0	89.10	268.20	5,696.0	-594.2	-3,818.5	3,792.4	0.71	-0.32	-0.63
9,564.0	89.30	267.70	5,697.4	-597.6	-3,913.5	3,882.8	0.57	0.21	-0.53
9,659.0	88.90	266.80	5,698.9	-602.1	-4,008.3	3,973.5	1.04	-0.42	-0.95
9,729.0	88.90	266.80	5,700.2	-606.0	-4,078.2	4,040.5	0.00	0.00	0.00
Rohn State LD09-66-1HN BHL 2310°FNL, 660°FWL									

Checked By: _____	Approved By: _____	Date: _____
-------------------	--------------------	-------------