

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

Well Name: **Rohn State LD04-62HN**

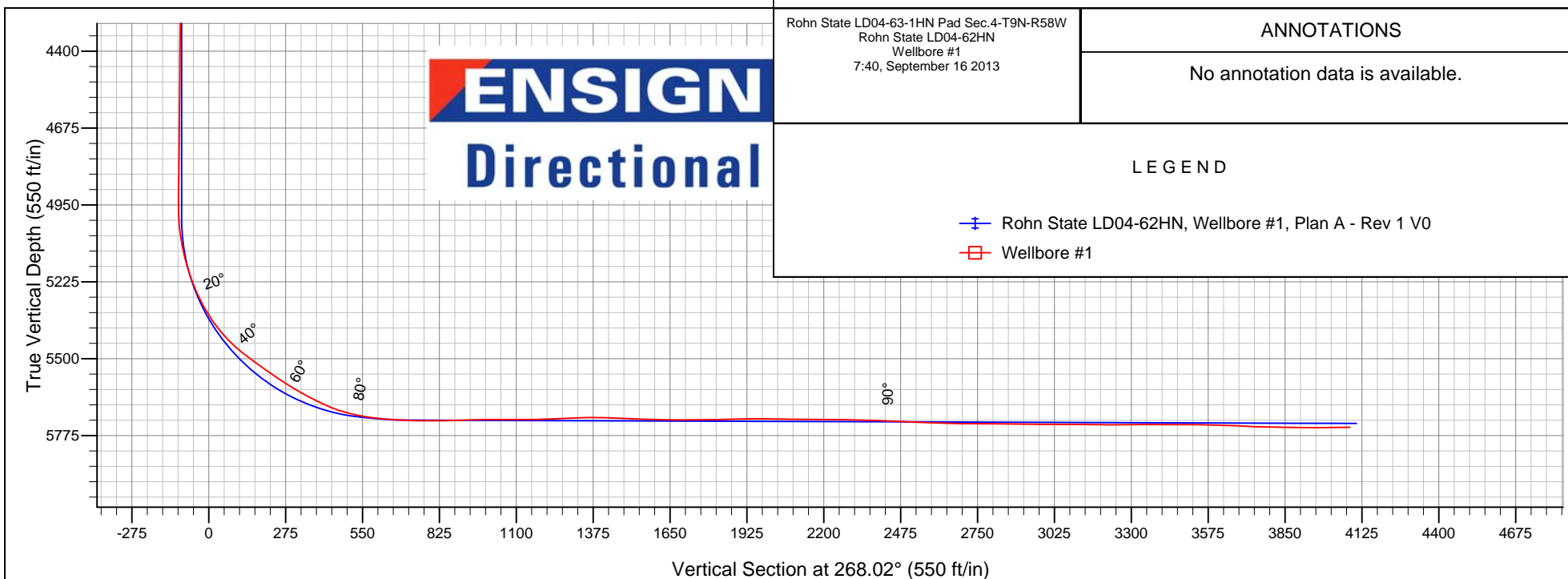
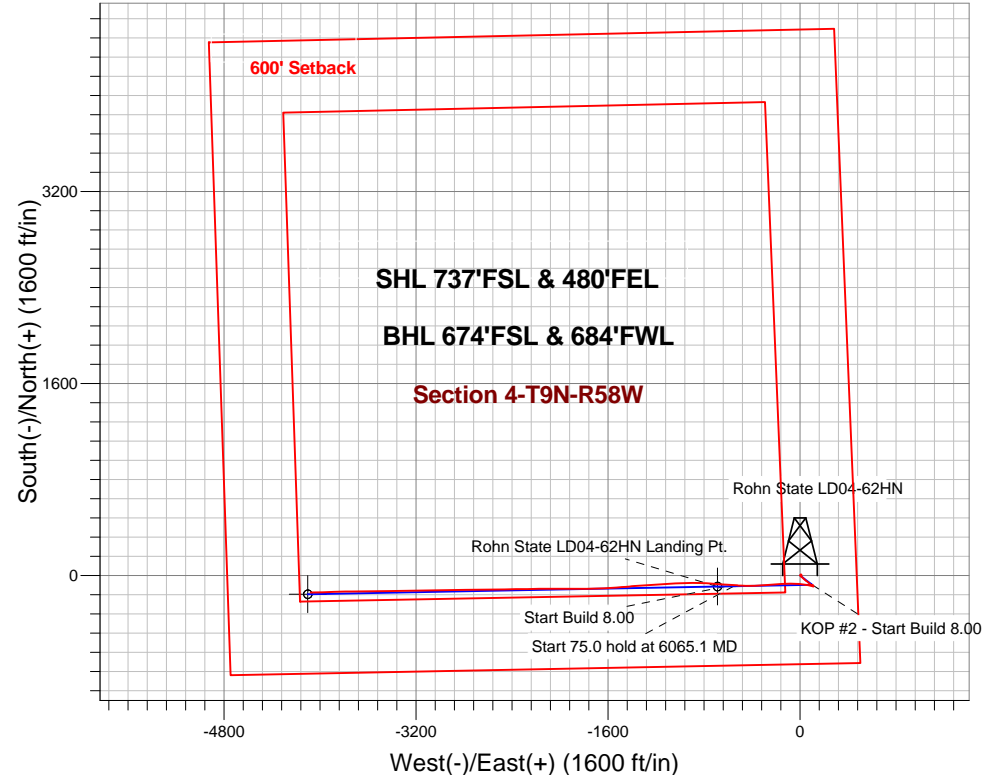
Surface Location: Rohn State LD04-63-1HN Pad Sec.4-T9N-R58W  
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone  
Ground Elevation: 4711.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1529435.03	3453710.27	40.775180	-103.861780	

H&P 273 RKB - 24' WELL @ 4735.0ft (H&P 273 RKB - 24')

## FINAL SURVEY

Projected Bottom Hole Location  
9580' MD 5745' TVD 141' S & 4079' W of SHL  
90.4 degree Incl @ 268.6 degree AZM



Rohn State LD04-63-1HN Pad Sec.4-T9N-R58W  
Rohn State LD04-62HN  
Wellbore #1  
7:40, September 16 2013

### ANNOTATIONS

No annotation data is available.

### LEGEND

- Rohn State LD04-62HN, Wellbore #1, Plan A - Rev 1 V0
- Wellbore #1



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

**Sec.4-T9N-R58W**

**Rohn State LD04-63-1HN Pad Sec.4-T9N-R58W**

**Rohn State LD04-62HN**

**Wellbore #1**

**Design: Wellbore #1**

## **Standard Survey Report**

**19 September, 2013**

<b>Company:</b>	Noble Energy Inc.- Weld County, CO (Grid North)	<b>Local Co-ordinate Reference:</b>	Well Rohn State LD04-62HN
<b>Project:</b>	Sec.4-T9N-R58W	<b>TVD Reference:</b>	WELL @ 4735.0ft (H&P 273 RKB - 24')
<b>Site:</b>	Rohn State LD04-63-1HN Pad Sec.4-T9N-R58W	<b>MD Reference:</b>	WELL @ 4735.0ft (H&P 273 RKB - 24')
<b>Well:</b>	Rohn State LD04-62HN	<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

<b>Project</b>	Sec.4-T9N-R58W		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		Using Well Reference Point
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

Site	Rohn State LD04-63-1HN Pad Sec.4-T9N-R58W				
Site Position:		Northing:	1,529,471.41 ft	Latitude:	40.775280
From:	Lat/Long	Easting:	3,453,706.83ft	Longitude:	-103.861790
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	1.06 °

Well	Rohn State LD04-62HN					
Well Position	+N-S	0.0 ft	Northing:	1,529,435.03 ft	Latitude:	40.775180
	+E-W	0.0 ft	Easting:	3,453,710.27 ft	Longitude:	-103.861780
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,711.0 ft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	8/22/2013	8.10	67.42	53,189

<b>Design</b>	Wellbore #1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	268.02	

<b>Survey Program</b>	<b>Date</b> 9/19/2013				
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
350.0	1,222.0	Survey #1 (Wellbore #1)	Flexi-Shot	VES Flexi-Shot Tool	
1,298.0	9,580.0	Survey #2 (Wellbore #1)	MWD	MWD - Standard	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
350.0	1.20	84.80	350.0	0.3	3.6	-3.7	0.34	0.34	0.00	
800.0	0.60	76.80	799.9	1.3	10.6	-10.7	0.14	-0.13	-1.78	
1,222.0	0.10	296.00	1,221.9	2.0	12.5	-12.5	0.16	-0.12	-33.36	
1,298.0	0.50	340.00	1,297.9	2.3	12.3	-12.4	0.57	0.53	57.89	
1,580.0	0.40	325.70	1,579.9	4.3	11.3	-11.4	0.05	-0.04	-5.07	
1,865.0	1.10	328.70	1,864.9	7.4	9.3	-9.6	0.25	0.25	1.05	
2,149.0	0.80	241.00	2,148.8	8.8	6.2	-6.5	0.47	-0.11	-30.88	
2,434.0	0.70	244.30	2,433.8	7.1	2.9	-3.1	0.04	-0.04	1.16	
2,529.0	2.60	180.70	2,528.8	4.7	2.3	-2.5	2.50	2.00	-66.95	

<b>Company:</b>	Noble Energy Inc.- Weld County, CO (Grid North)	<b>Local Co-ordinate Reference:</b>	Well Rohn State LD04-62HN
<b>Project:</b>	Sec.4-T9N-R58W	<b>TVD Reference:</b>	WELL @ 4735.0ft (H&P 273 RKB - 24')
<b>Site:</b>	Rohn State LD04-63-1HN Pad Sec.4-T9N-R58W	<b>MD Reference:</b>	WELL @ 4735.0ft (H&P 273 RKB - 24')
<b>Well:</b>	Rohn State LD04-62HN	<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)
2,624.0	3.30	169.10	2,623.7	-0.2	2.8	-2.8	0.96	0.74	-12.21
2,719.0	4.60	144.00	2,718.4	-5.9	5.6	-5.4	2.25	1.37	-26.42
2,813.0	4.80	120.40	2,812.1	-11.0	11.2	-10.8	2.05	0.21	-25.11
2,908.0	5.20	127.80	2,906.8	-15.6	18.0	-17.5	0.80	0.42	7.79
3,003.0	6.20	139.10	3,001.3	-22.1	24.8	-24.0	1.58	1.05	11.89
3,098.0	5.90	127.50	3,095.8	-29.0	32.0	-31.0	1.32	-0.32	-12.21
3,193.0	6.80	134.80	3,190.2	-35.9	39.9	-38.6	1.27	0.95	7.68
3,288.0	7.90	127.30	3,284.4	-43.8	49.0	-47.5	1.53	1.16	-7.89
3,382.0	8.00	125.20	3,377.5	-51.5	59.5	-57.7	0.33	0.11	-2.23
3,477.0	7.00	128.20	3,471.7	-58.9	69.5	-67.4	1.13	-1.05	3.16
3,572.0	6.40	140.30	3,566.1	-66.6	77.4	-75.1	1.61	-0.63	12.74
3,638.0	5.70	129.40	3,631.7	-71.5	82.3	-79.8	2.03	-1.06	-16.52
3,733.0	3.40	132.40	3,726.4	-76.4	88.0	-85.3	2.43	-2.42	3.16
3,827.0	3.30	98.60	3,820.2	-78.7	92.8	-90.0	2.07	-0.11	-35.96
3,922.0	1.30	92.50	3,915.1	-79.1	96.5	-93.7	2.12	-2.11	-6.42
4,017.0	1.10	105.10	4,010.1	-79.4	98.5	-95.7	0.35	-0.21	13.26
4,112.0	1.80	130.60	4,105.1	-80.6	100.5	-97.7	0.99	0.74	26.84
4,207.0	1.50	54.90	4,200.1	-80.9	102.7	-99.8	2.15	-0.32	-79.68
4,301.0	1.30	99.10	4,294.0	-80.3	104.7	-101.9	1.14	-0.21	47.02
4,396.0	0.60	124.80	4,389.0	-80.8	106.2	-103.3	0.84	-0.74	27.05
4,491.0	1.10	167.70	4,484.0	-82.0	106.8	-103.9	0.82	0.53	45.16
4,586.0	1.40	151.50	4,579.0	-83.9	107.5	-104.6	0.48	0.32	-17.05
4,681.0	1.00	144.70	4,674.0	-85.6	108.6	-105.5	0.45	-0.42	-7.16
4,776.0	1.10	137.80	4,769.0	-86.9	109.7	-106.6	0.17	0.11	-7.26
4,871.0	1.20	156.10	4,863.9	-88.5	110.7	-107.5	0.40	0.11	19.26
4,985.0	1.20	201.60	4,977.9	-90.7	110.7	-107.5	0.81	0.00	39.91
5,079.0	9.80	286.00	5,071.4	-89.4	102.7	-99.5	10.38	9.15	89.79
5,174.0	16.60	286.70	5,163.9	-83.3	81.9	-78.9	7.16	7.16	0.74
5,269.0	23.60	280.00	5,253.1	-76.1	50.1	-47.4	7.75	7.37	-7.05
5,364.0	31.70	274.40	5,337.1	-70.8	6.4	-3.9	8.95	8.53	-5.89
5,458.0	41.00	271.10	5,412.8	-68.3	-49.2	51.5	10.11	9.89	-3.51
5,553.0	51.90	268.10	5,478.1	-69.0	-117.9	120.2	11.70	11.47	-3.16
5,648.0	54.60	266.80	5,535.0	-72.4	-194.0	196.3	3.05	2.84	-1.37
5,743.0	57.90	265.10	5,587.8	-78.0	-272.7	275.3	3.78	3.47	-1.79
5,838.0	61.00	266.80	5,636.0	-83.7	-354.3	357.0	3.61	3.26	1.79
5,933.0	68.90	270.90	5,676.2	-85.4	-440.3	443.0	9.19	8.32	4.32
6,028.0	79.30	273.50	5,702.2	-81.8	-531.4	534.0	11.26	10.95	2.74
6,164.0	87.10	274.60	5,718.3	-72.3	-666.0	668.1	5.79	5.74	0.81
6,184.9	87.55	274.28	5,719.3	-70.7	-686.9	688.9	2.62	2.15	-1.51
Rohn State LD04-62HN Landing Pt.									
6,257.0	89.10	273.20	5,721.4	-66.0	-758.8	760.6	2.62	2.15	-1.50
6,352.0	91.80	270.70	5,720.7	-62.7	-853.7	855.4	3.87	2.84	-2.63
6,446.0	91.20	269.30	5,718.2	-62.7	-947.7	949.3	1.62	-0.64	-1.49
6,541.0	89.40	266.30	5,717.7	-66.4	-1,042.6	1,044.2	3.68	-1.89	-3.16
6,636.0	90.60	266.50	5,717.7	-72.3	-1,137.4	1,139.2	1.28	1.26	0.21
6,731.0	92.60	266.70	5,715.1	-78.0	-1,232.2	1,234.1	2.12	2.11	0.21
6,825.0	92.20	266.80	5,711.1	-83.3	-1,325.9	1,328.0	0.44	-0.43	0.11
6,920.0	87.90	263.90	5,711.0	-91.0	-1,420.6	1,422.9	5.46	-4.53	-3.05
7,015.0	87.40	266.10	5,714.9	-99.3	-1,515.1	1,517.7	2.37	-0.53	2.32
7,110.0	89.30	266.80	5,717.7	-105.1	-1,609.9	1,612.6	2.13	2.00	0.74
7,204.0	89.50	268.80	5,718.7	-108.8	-1,703.8	1,706.6	2.14	0.21	2.13
7,299.0	91.70	269.10	5,717.7	-110.5	-1,798.8	1,801.6	2.34	2.32	0.32

<b>Company:</b>	Noble Energy Inc.- Weld County, CO (Grid North)	<b>Local Co-ordinate Reference:</b>	Well Rohn State LD04-62HN
<b>Project:</b>	Sec.4-T9N-R58W	<b>TVD Reference:</b>	WELL @ 4735.0ft (H&P 273 RKB - 24')
<b>Site:</b>	Rohn State LD04-63-1HN Pad Sec.4-T9N-R58W	<b>MD Reference:</b>	WELL @ 4735.0ft (H&P 273 RKB - 24')
<b>Well:</b>	Rohn State LD04-62HN	<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)	
7,394.0	91.00	270.50	5,715.4	-110.8	-1,893.8	1,896.5	1.65	-0.74	1.47	
7,489.0	89.80	270.70	5,714.8	-109.8	-1,988.8	1,991.4	1.28	-1.26	0.21	
7,584.0	88.70	269.10	5,716.0	-110.0	-2,083.8	2,086.3	2.04	-1.16	-1.68	
7,679.0	89.90	268.60	5,717.2	-111.9	-2,178.7	2,181.3	1.37	1.26	-0.53	
7,774.0	89.10	269.50	5,718.0	-113.5	-2,273.7	2,276.3	1.27	-0.84	0.95	
7,868.0	88.10	269.30	5,720.3	-114.5	-2,367.7	2,370.2	1.08	-1.06	-0.21	
7,963.0	87.30	269.50	5,724.1	-115.5	-2,462.6	2,465.1	0.87	-0.84	0.21	
8,058.0	87.90	269.30	5,728.1	-116.4	-2,557.5	2,560.0	0.67	0.63	-0.21	
8,153.0	88.40	269.30	5,731.1	-117.6	-2,652.5	2,654.9	0.53	0.53	0.00	
8,247.0	89.70	269.10	5,732.7	-118.9	-2,746.4	2,748.9	1.40	1.38	-0.21	
8,342.0	90.10	269.50	5,732.9	-120.1	-2,841.4	2,843.9	0.60	0.42	0.42	
8,437.0	88.60	269.00	5,733.9	-121.3	-2,936.4	2,938.8	1.66	-1.58	-0.53	
8,532.0	90.50	268.80	5,734.7	-123.1	-3,031.4	3,033.8	2.01	2.00	-0.21	
8,627.0	89.40	269.00	5,734.8	-125.0	-3,126.4	3,128.8	1.18	-1.16	0.21	
8,722.0	89.00	268.60	5,736.1	-127.0	-3,221.3	3,223.8	0.60	-0.42	-0.42	
8,817.0	91.00	269.30	5,736.1	-128.7	-3,316.3	3,318.8	2.23	2.11	0.74	
8,911.0	90.70	269.50	5,734.7	-129.7	-3,410.3	3,412.7	0.38	-0.32	0.21	
9,006.0	89.30	269.70	5,734.7	-130.3	-3,505.3	3,507.7	1.49	-1.47	0.21	
9,101.0	87.50	269.70	5,737.4	-130.8	-3,600.2	3,602.6	1.89	-1.89	0.00	
9,195.0	87.60	269.50	5,741.4	-131.5	-3,694.2	3,696.5	0.24	0.11	-0.21	
9,290.0	88.90	268.10	5,744.3	-133.5	-3,789.1	3,791.4	2.01	1.37	-1.47	
9,385.0	89.30	268.40	5,745.8	-136.4	-3,884.0	3,886.4	0.53	0.42	0.32	
9,480.0	90.40	268.60	5,746.0	-138.9	-3,979.0	3,981.4	1.18	1.16	0.21	
9,580.0	90.40	268.60	5,745.3	-141.3	-4,079.0	4,081.4	0.00	0.00	0.00	
Rohn State LD04-62HN BHL 660'FSL & 660'FWL										

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