

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

Well Name: **Oscar Y10-77-1HC**

Surface Location: Oscar Y10-77HN Pad Sec.10-T2N-R64W

North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

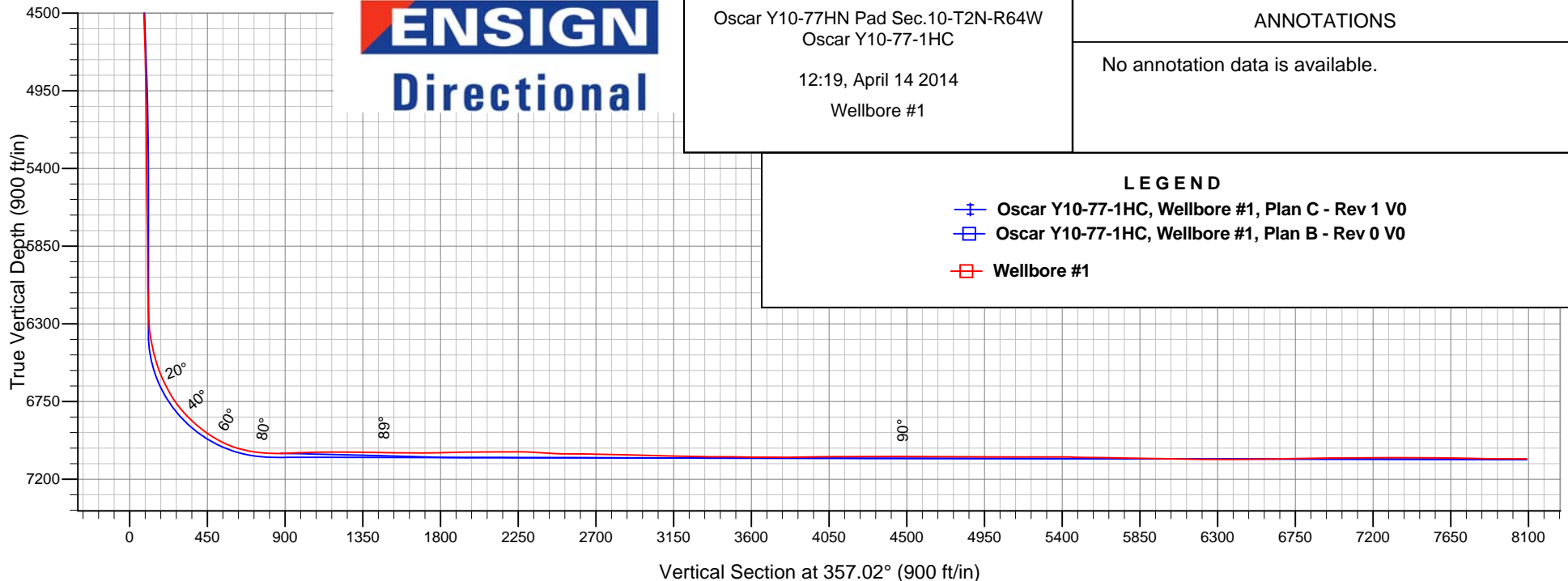
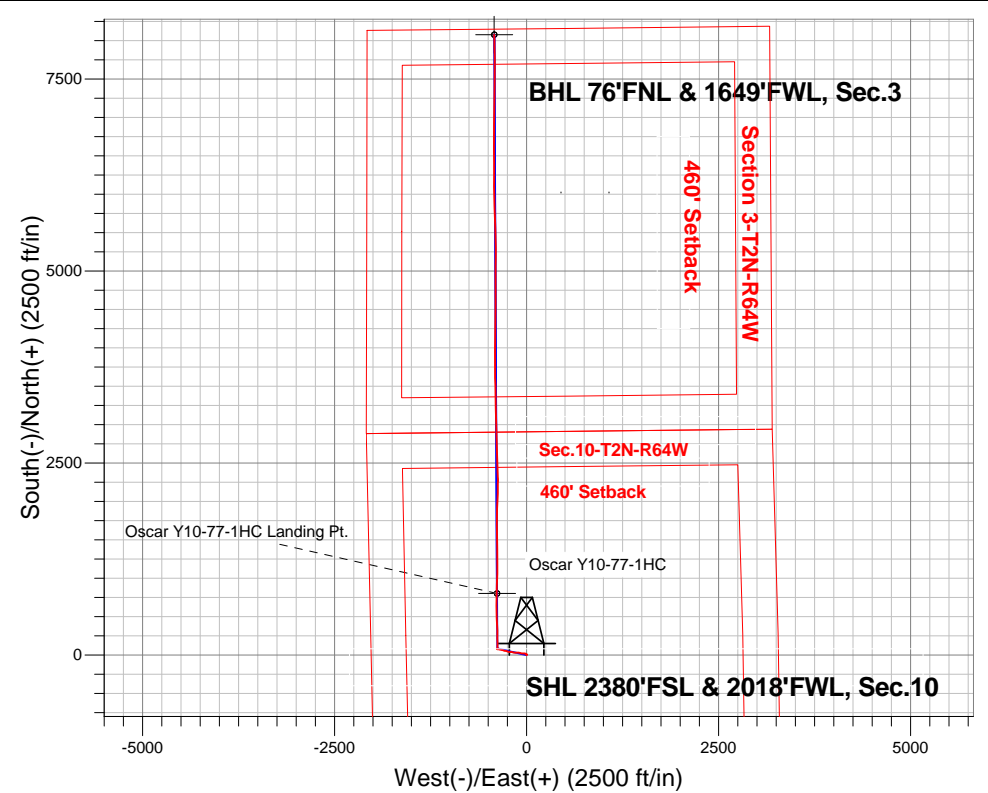
Ground Elevation: 4929.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1299757.34	3268380.95	40.152240	-104.539860	

Precision 828 RKB - 16' WELL @ 4945.0ft (Precision 828 RKB - 16')

## FINAL SURVEY

Projected Bottom Hole Location  
14740'MD 7082'TVD 8078'N & 421'W of SHL  
89.9 degree Incl @ 358.4 degree AZM



Oscar Y10-77HN Pad Sec.10-T2N-R64W  
Oscar Y10-77-1HC

12:19, April 14 2014

Wellbore #1

### ANNOTATIONS

No annotation data is available.

### LEGEND

- + Oscar Y10-77-1HC, Wellbore #1, Plan C - Rev 1 V0
- + Oscar Y10-77-1HC, Wellbore #1, Plan B - Rev 0 V0
- + Wellbore #1



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

**Sec.10-T2N-R64W**

**Oscar Y10-77HN Pad Sec.10-T2N-R64W**

**Oscar Y10-77-1HC**

**Wellbore #1**

**Design: Wellbore #1**

## **Standard Survey Report**

**14 April, 2014**



<b>Company:</b>	Noble Energy Inc.- Weld County, CO (Grid North)	<b>Local Co-ordinate Reference:</b>	Well Oscar Y10-77-1HC
<b>Project:</b>	Sec.10-T2N-R64W	<b>TVD Reference:</b>	WELL @ 4945.0ft (Precision 828 RKB - 16')
<b>Site:</b>	Oscar Y10-77HN Pad Sec.10-T2N-R64W	<b>MD Reference:</b>	WELL @ 4945.0ft (Precision 828 RKB - 16')
<b>Well:</b>	Oscar Y10-77-1HC	<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)
1,740.0	7.20	295.00	1,738.8	20.2	-16.5	21.0	1.82	1.37	-10.63
1,835.0	8.70	275.40	1,832.9	23.4	-29.0	24.8	3.24	1.58	-20.63
1,930.0	7.60	265.20	1,926.9	23.5	-42.4	25.7	1.91	-1.16	-10.74
2,025.0	5.40	269.90	2,021.3	23.0	-53.2	25.7	2.38	-2.32	4.95
2,104.0	5.30	271.30	2,100.0	23.0	-60.5	26.2	0.21	-0.13	1.77
2,194.0	4.90	278.60	2,189.6	23.7	-68.5	27.2	0.85	-0.44	8.11
2,284.0	4.90	282.80	2,279.3	25.1	-76.0	29.1	0.40	0.00	4.67
2,374.0	5.80	290.20	2,368.9	27.6	-84.0	31.9	1.26	1.00	8.22
2,464.0	6.60	285.60	2,458.4	30.5	-93.3	35.3	1.05	0.89	-5.11
2,554.0	6.10	279.60	2,547.8	32.7	-103.0	38.0	0.92	-0.56	-6.67
2,644.0	6.10	272.50	2,637.3	33.7	-112.5	39.5	0.84	0.00	-7.89
2,733.0	6.50	267.80	2,725.8	33.7	-122.2	40.0	0.73	0.45	-5.28
2,823.0	6.30	263.10	2,815.2	32.9	-132.2	39.8	0.62	-0.22	-5.22
2,913.0	6.00	271.20	2,904.7	32.5	-141.8	39.8	1.02	-0.33	9.00
3,003.0	6.70	278.30	2,994.1	33.3	-151.7	41.1	1.17	0.78	7.89
3,093.0	6.70	278.10	3,083.5	34.8	-162.1	43.2	0.03	0.00	-0.22
3,182.0	7.10	280.30	3,171.9	36.5	-172.7	45.4	0.54	0.45	2.47
3,272.0	6.80	286.40	3,261.2	39.0	-183.3	48.5	0.88	-0.33	6.78
3,362.0	6.30	281.90	3,350.6	41.5	-193.2	51.5	0.80	-0.56	-5.00
3,452.0	6.50	268.00	3,440.1	42.4	-203.1	52.9	1.73	0.22	-15.44
3,542.0	6.80	270.60	3,529.5	42.3	-213.5	53.3	0.47	0.33	2.89
3,632.0	5.10	273.20	3,619.0	42.5	-222.9	54.1	1.91	-1.89	2.89
3,721.0	5.00	275.50	3,707.6	43.1	-230.7	55.1	0.25	-0.11	2.58
3,811.0	5.00	289.80	3,797.3	44.8	-238.3	57.1	1.38	0.00	15.89
3,901.0	5.80	289.00	3,886.9	47.6	-246.3	60.4	0.89	0.89	-0.89
3,991.0	6.20	284.90	3,976.4	50.4	-255.3	63.6	0.65	0.44	-4.56
4,081.0	6.50	284.80	4,065.9	52.9	-264.9	66.6	0.33	0.33	-0.11
4,171.0	6.10	280.50	4,155.3	55.1	-274.5	69.3	0.69	-0.44	-4.78
4,261.0	6.00	280.40	4,244.8	56.8	-283.8	71.5	0.11	-0.11	-0.11
4,351.0	7.00	289.30	4,334.2	59.5	-293.6	74.6	1.57	1.11	9.89
4,441.0	6.80	289.00	4,423.6	63.0	-303.9	78.7	0.23	-0.22	-0.33
4,531.0	6.70	287.00	4,513.0	66.3	-313.9	82.5	0.28	-0.11	-2.22
4,620.0	6.70	285.90	4,601.4	69.2	-323.9	86.0	0.14	0.00	-1.24
4,710.0	6.60	283.30	4,690.8	71.9	-334.0	89.1	0.35	-0.11	-2.89
4,800.0	5.50	275.90	4,780.2	73.5	-343.3	91.2	1.50	-1.22	-8.22
4,890.0	5.10	284.60	4,869.9	75.0	-351.4	93.1	1.00	-0.44	9.67
4,980.0	4.40	278.90	4,959.6	76.5	-358.7	95.0	0.94	-0.78	-6.33
5,070.0	4.70	269.20	5,049.3	77.0	-365.8	95.9	0.92	0.33	-10.78
5,159.0	4.70	275.10	5,138.0	77.3	-373.1	96.5	0.54	0.00	6.63
5,249.0	2.90	274.90	5,227.8	77.8	-379.0	97.3	2.00	-2.00	-0.22
5,339.0	1.30	256.80	5,317.7	77.7	-382.3	97.5	1.90	-1.78	-20.11
5,428.0	1.00	44.80	5,406.7	78.1	-382.7	97.8	2.49	-0.34	166.29
5,518.0	1.10	54.30	5,496.7	79.1	-381.5	98.8	0.22	0.11	10.56
5,608.0	1.70	45.60	5,586.7	80.6	-379.8	100.2	0.71	0.67	-9.67
5,698.0	0.80	3.10	5,676.6	82.1	-378.8	101.7	1.37	-1.00	-47.22
5,788.0	0.90	32.40	5,766.6	83.3	-378.4	102.9	0.49	0.11	32.56
5,878.0	0.80	62.30	5,856.6	84.2	-377.5	103.7	0.50	-0.11	33.22
5,968.0	0.80	322.60	5,946.6	85.0	-377.3	104.5	1.36	0.00	-110.78
6,058.0	0.90	327.50	6,036.6	86.1	-378.1	105.6	0.14	0.11	5.44
6,148.0	1.20	358.60	6,126.6	87.7	-378.5	107.2	0.70	0.33	34.56
6,238.0	1.20	356.40	6,216.6	89.5	-378.6	109.1	0.05	0.00	-2.44
6,282.0	1.80	359.90	6,260.6	90.7	-378.6	110.2	1.38	1.36	7.95
6,327.0	4.30	4.60	6,305.5	93.1	-378.5	112.6	5.58	5.56	10.44
6,371.0	7.30	3.90	6,349.3	97.5	-378.1	117.0	6.82	6.82	-1.59

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<b>Site:</b>	Oscar Y10-77HN Pad Sec.10-T2N-R64W	<b>MD Reference:</b>	WELL @ 4945.0ft (Precision 828 RKB - 16')
<b>Well:</b>	Oscar Y10-77-1HC	<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)
6,416.0	10.30	0.30	6,393.7	104.4	-377.9	123.9	6.77	6.67	-8.00
6,461.0	12.30	0.40	6,437.9	113.2	-377.9	132.7	4.44	4.44	0.22
6,506.0	14.50	0.20	6,481.6	123.6	-377.8	143.1	4.89	4.89	-0.44
6,551.0	17.10	0.50	6,524.9	135.9	-377.7	155.3	5.78	5.78	0.67
6,596.0	20.40	359.00	6,567.5	150.3	-377.8	169.8	7.41	7.33	-3.33
6,641.0	23.60	358.30	6,609.2	167.2	-378.2	186.6	7.13	7.11	-1.56
6,686.0	26.50	356.70	6,650.0	186.2	-379.1	205.7	6.62	6.44	-3.56
6,731.0	29.00	356.70	6,689.8	207.1	-380.3	226.6	5.56	5.56	0.00
6,776.0	31.90	358.60	6,728.6	229.9	-381.2	249.4	6.79	6.44	4.22
6,821.0	36.10	0.20	6,765.9	255.1	-381.4	274.5	9.54	9.33	3.56
6,866.0	40.40	1.00	6,801.2	282.9	-381.1	302.3	9.62	9.56	1.78
6,911.0	44.00	0.20	6,834.6	313.2	-380.8	332.5	8.09	8.00	-1.78
6,955.0	47.30	358.70	6,865.3	344.6	-381.1	363.9	7.89	7.50	-3.41
7,000.0	51.00	356.70	6,894.8	378.6	-382.5	398.0	8.88	8.22	-4.44
7,045.0	54.10	356.00	6,922.1	414.3	-384.8	433.7	7.00	6.89	-1.56
7,090.0	56.80	356.80	6,947.6	451.2	-387.1	470.7	6.18	6.00	1.78
7,135.0	59.90	357.70	6,971.3	489.5	-389.0	509.0	7.10	6.89	2.00
7,180.0	64.20	359.00	6,992.3	529.2	-390.1	548.8	9.89	9.56	2.89
7,225.0	69.90	359.00	7,009.9	570.6	-390.8	590.2	12.67	12.67	0.00
7,270.0	74.80	359.80	7,023.5	613.5	-391.3	633.0	11.02	10.89	1.78
7,315.0	78.10	359.60	7,034.1	657.2	-391.5	676.7	7.35	7.33	-0.44
7,360.0	81.30	0.80	7,042.1	701.5	-391.3	720.9	7.58	7.11	2.67
7,405.0	84.90	1.30	7,047.5	746.2	-390.5	765.4	8.08	8.00	1.11
7,450.0	88.50	1.80	7,050.1	791.1	-389.3	810.2	8.08	8.00	1.11
7,462.9	88.90	1.82	7,050.4	803.9	-388.9	823.0	3.14	3.14	0.13
<b>Oscar Y10-77-1HC Landing Pt.</b>									
7,568.0	92.20	1.95	7,049.4	909.0	-385.4	927.8	3.14	3.14	0.13
7,658.0	92.30	1.16	7,045.8	998.9	-383.0	1,017.4	0.88	0.11	-0.88
7,748.0	90.30	359.92	7,043.8	1,088.9	-382.1	1,107.2	2.61	-2.22	-1.38
7,838.0	90.00	0.16	7,043.6	1,178.9	-382.1	1,197.1	0.43	-0.33	0.27
7,928.0	89.80	0.32	7,043.7	1,268.9	-381.7	1,287.0	0.28	-0.22	0.18
8,018.0	89.00	359.52	7,044.7	1,358.8	-381.8	1,376.8	1.26	-0.89	-0.89
8,108.0	88.60	359.25	7,046.6	1,448.8	-382.8	1,466.7	0.54	-0.44	-0.30
8,197.0	89.30	359.80	7,048.2	1,537.8	-383.5	1,555.6	1.00	0.79	0.62
8,287.0	90.10	359.67	7,048.7	1,627.8	-384.0	1,645.5	0.90	0.89	-0.14
8,394.0	90.90	358.61	7,047.7	1,734.8	-385.6	1,752.5	1.24	0.75	-0.99
8,488.0	91.10	1.14	7,046.1	1,828.8	-385.8	1,846.3	2.70	0.21	2.69
8,581.0	91.10	3.32	7,044.3	1,921.7	-382.1	1,938.9	2.34	0.00	2.34
8,673.0	90.70	2.18	7,042.9	2,013.5	-377.7	2,030.4	1.31	-0.43	-1.24
8,767.0	90.30	1.37	7,042.0	2,107.5	-374.8	2,124.1	0.96	-0.43	-0.86
8,861.0	90.00	0.82	7,041.8	2,201.5	-373.0	2,217.9	0.67	-0.32	-0.59
8,955.0	88.20	359.84	7,043.3	2,295.5	-372.5	2,311.7	2.18	-1.91	-1.04
9,049.0	85.10	357.65	7,048.8	2,389.3	-374.5	2,405.5	4.04	-3.30	-2.33
9,143.0	89.10	357.71	7,053.5	2,483.0	-378.3	2,499.3	4.26	4.26	0.06
9,238.0	89.70	357.26	7,054.5	2,577.9	-382.5	2,594.3	0.79	0.63	-0.47
9,331.0	89.20	358.11	7,055.4	2,670.9	-386.3	2,687.3	1.06	-0.54	0.91
9,425.0	89.00	358.25	7,056.9	2,764.8	-389.2	2,781.3	0.26	-0.21	0.15
9,520.0	88.30	358.99	7,059.1	2,859.7	-391.5	2,876.2	1.07	-0.74	0.78
9,614.0	88.90	358.32	7,061.4	2,953.7	-393.7	2,970.2	0.96	0.64	-0.71
9,708.0	88.60	359.31	7,063.5	3,047.6	-395.7	3,064.1	1.10	-0.32	1.05
9,802.0	87.90	358.18	7,066.3	3,141.6	-397.7	3,158.0	1.41	-0.74	-1.20
9,896.0	88.60	358.39	7,069.2	3,235.5	-400.6	3,251.9	0.78	0.74	0.22
9,989.0	89.50	359.30	7,070.7	3,328.5	-402.4	3,344.9	1.38	0.97	0.98

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<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Landmark

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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)
10,083.0	90.20	358.76	7,071.0	3,422.4	-404.0	3,438.8	0.94	0.74	-0.57
10,177.0	89.10	358.86	7,071.6	3,516.4	-406.0	3,532.8	1.18	-1.17	0.11
10,270.0	89.70	358.52	7,072.5	3,609.4	-408.1	3,625.7	0.74	0.65	-0.37
10,364.0	89.70	359.80	7,073.0	3,703.4	-409.5	3,719.6	1.36	0.00	1.36
10,457.0	90.10	359.17	7,073.2	3,796.4	-410.3	3,812.6	0.80	0.43	-0.68
10,549.0	91.50	1.08	7,071.9	3,888.4	-410.1	3,904.4	2.57	1.52	2.08
10,641.0	90.40	0.74	7,070.4	3,980.3	-408.6	3,996.2	1.25	-1.20	-0.37
10,734.0	90.70	0.49	7,069.5	4,073.3	-407.7	4,089.0	0.42	0.32	-0.27
10,827.0	89.70	0.83	7,069.2	4,166.3	-406.6	4,181.8	1.14	-1.08	0.37
10,917.0	90.60	0.71	7,068.9	4,256.3	-405.4	4,271.6	1.01	1.00	-0.13
11,007.0	89.30	0.06	7,069.0	4,346.3	-404.8	4,361.5	1.61	-1.44	-0.72
11,097.0	89.90	0.03	7,069.6	4,436.3	-404.7	4,451.3	0.67	0.67	-0.03
11,187.0	90.60	359.52	7,069.2	4,526.3	-405.0	4,541.2	0.96	0.78	-0.57
11,277.0	90.20	359.93	7,068.6	4,616.3	-405.5	4,631.1	0.64	-0.44	0.46
11,367.0	89.40	0.31	7,068.9	4,706.3	-405.3	4,721.0	0.98	-0.89	0.42
11,456.0	89.50	0.28	7,069.8	4,795.3	-404.8	4,809.8	0.12	0.11	-0.03
11,546.0	89.50	359.73	7,070.6	4,885.3	-404.8	4,899.7	0.61	0.00	-0.61
11,636.0	89.90	0.67	7,071.0	4,975.3	-404.5	4,989.6	1.14	0.44	1.04
11,726.0	89.30	0.61	7,071.7	5,065.3	-403.5	5,079.4	0.67	-0.67	-0.07
11,816.0	90.00	0.71	7,072.2	5,155.3	-402.5	5,169.2	0.79	0.78	0.11
11,905.0	90.30	0.55	7,072.0	5,244.3	-401.5	5,258.0	0.38	0.34	-0.18
11,995.0	90.90	359.89	7,071.0	5,334.3	-401.1	5,347.9	0.99	0.67	-0.73
12,085.0	88.00	357.99	7,071.9	5,424.2	-402.8	5,437.8	3.85	-3.22	-2.11
12,175.0	89.10	357.62	7,074.2	5,514.1	-406.3	5,527.8	1.29	1.22	-0.41
12,265.0	89.30	358.48	7,075.4	5,604.1	-409.3	5,617.8	0.98	0.22	0.96
12,355.0	89.40	359.12	7,076.5	5,694.0	-411.2	5,707.7	0.72	0.11	0.71
12,445.0	89.00	358.17	7,077.7	5,784.0	-413.3	5,797.7	1.15	-0.44	-1.06
12,534.0	87.90	357.29	7,080.1	5,872.9	-416.9	5,886.6	1.58	-1.24	-0.99
12,624.0	88.70	358.28	7,082.8	5,962.8	-420.3	5,976.6	1.41	0.89	1.10
12,714.0	89.50	359.28	7,084.2	6,052.8	-422.2	6,066.5	1.42	0.89	1.11
12,804.0	89.70	0.48	7,084.8	6,142.7	-422.4	6,156.4	1.35	0.22	1.33
12,894.0	90.20	0.03	7,084.9	6,232.7	-422.0	6,246.3	0.75	0.56	-0.50
12,984.0	89.70	0.20	7,085.0	6,322.7	-421.9	6,336.1	0.59	-0.56	0.19
13,074.0	90.20	0.14	7,085.1	6,412.7	-421.6	6,426.0	0.56	0.56	-0.07
13,163.0	90.80	359.90	7,084.3	6,501.7	-421.6	6,514.9	0.73	0.67	-0.27
13,253.0	90.40	359.43	7,083.4	6,591.7	-422.1	6,604.8	0.69	-0.44	-0.52
13,343.0	91.30	359.60	7,082.0	6,681.7	-422.8	6,694.7	1.02	1.00	0.19
13,433.0	91.10	0.16	7,080.1	6,771.7	-423.0	6,784.5	0.66	-0.22	0.62
13,523.0	90.60	0.23	7,078.8	6,861.7	-422.7	6,874.4	0.56	-0.56	0.08
13,613.0	90.80	0.15	7,077.7	6,951.7	-422.4	6,964.2	0.24	0.22	-0.09
13,703.0	90.20	0.85	7,076.9	7,041.7	-421.6	7,054.1	1.02	-0.67	0.78
13,793.0	90.60	0.52	7,076.3	7,131.7	-420.6	7,143.9	0.58	0.44	-0.37
13,883.0	89.70	0.93	7,076.0	7,221.7	-419.4	7,233.7	1.10	-1.00	0.46
13,972.0	90.30	0.83	7,076.0	7,310.6	-418.1	7,322.5	0.68	0.67	-0.11
14,062.0	89.60	0.90	7,076.1	7,400.6	-416.7	7,412.3	0.78	-0.78	0.08
14,152.0	89.90	0.84	7,076.5	7,490.6	-415.3	7,502.1	0.34	0.33	-0.07
14,242.0	89.70	1.14	7,076.8	7,580.6	-413.8	7,591.9	0.40	-0.22	0.33
14,332.0	89.10	0.43	7,077.8	7,670.6	-412.5	7,681.7	1.03	-0.67	-0.79
14,422.0	88.50	359.05	7,079.7	7,760.6	-413.0	7,771.5	1.67	-0.67	-1.53
14,512.0	89.20	358.15	7,081.5	7,850.5	-415.2	7,861.5	1.27	0.78	-1.00
14,601.0	90.00	358.78	7,082.1	7,939.5	-417.5	7,950.5	1.14	0.90	0.71
14,678.0	89.90	358.57	7,082.2	8,016.5	-419.3	8,027.4	0.30	-0.13	-0.27
14,740.0	89.90	358.40	7,082.3	8,078.4	-421.0	8,089.4	0.27	0.00	-0.27

<b>Company:</b>	Noble Energy Inc.- Weld County, CO (Grid North)	<b>Local Co-ordinate Reference:</b>	Well Oscar Y10-77-1HC
<b>Project:</b>	Sec.10-T2N-R64W	<b>TVD Reference:</b>	WELL @ 4945.0ft (Precision 828 RKB - 16')
<b>Site:</b>	Oscar Y10-77HN Pad Sec.10-T2N-R64W	<b>MD Reference:</b>	WELL @ 4945.0ft (Precision 828 RKB - 16')
<b>Well:</b>	Oscar Y10-77-1HC	<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)
Oscar Y10-77-1HC BHL 75'FNL & 1650'FWL									

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