

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

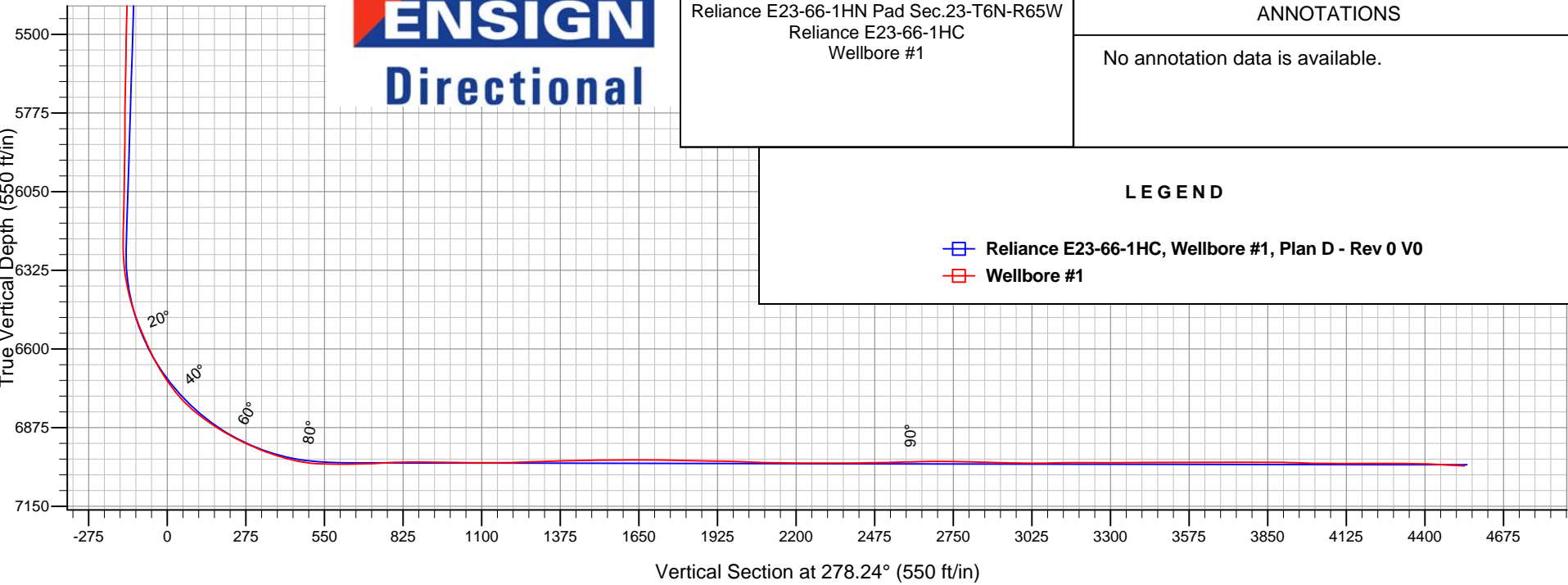
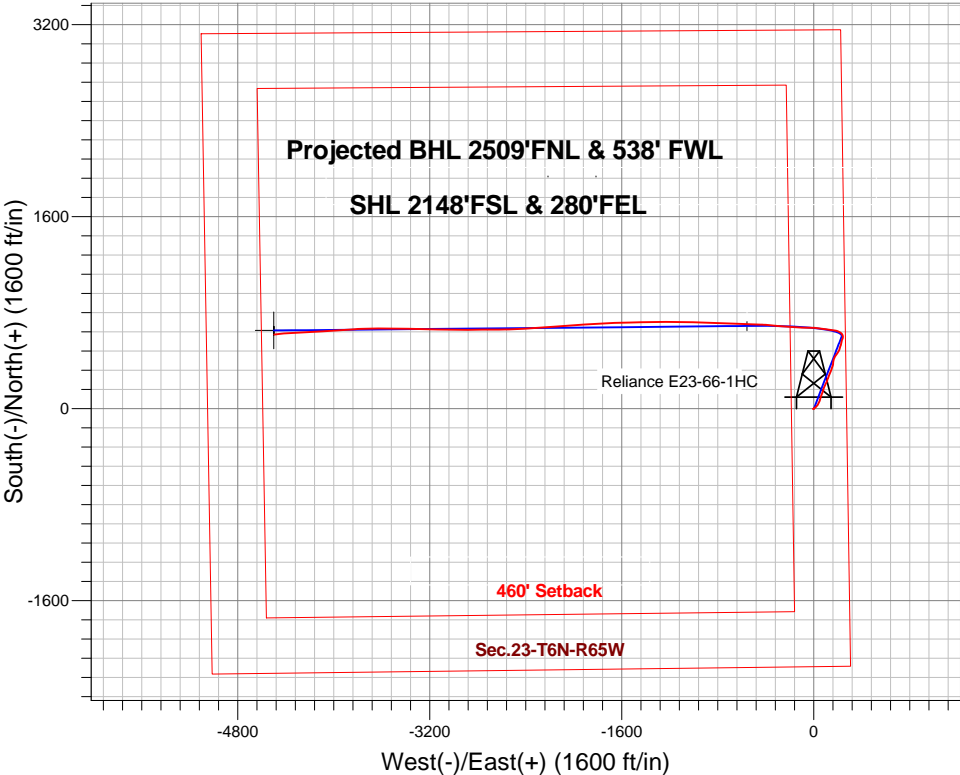
Well Name: **Reliance E23-66-1HC**

Surface Location: Reliance E23-66-1HN Pad Sec.23-T6N-R65W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4695.0
+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 1415307.54 3244316.98 40.470100 -104.621850
H&P 326 RKB - 30' WELL @ 4725.0ft (H&P 326 RKB - 30')

FINAL SURVEY

05-123-37605

Projected Bottom Hole Location
11484'MD 7008'TVD 618'N & 4497'W of SHL
87.7 degree Incl @ 263.7 degree AZM



Reliance E23-66-1HN Pad Sec.23-T6N-R65W
Reliance E23-66-1HC
Wellbore #1

ANNOTATIONS

No annotation data is available.

LEGEND



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

Sec.23-T6N-R65W

Reliance E23-66-1HN Pad Sec.23-T6N-R65W

Reliance E23-66-1HC

Wellbore #1

Design: Wellbore #1

Standard Survey Report

24 March, 2015

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
377.0	0.60	251.58	377.0	-0.6	-1.9	1.8	0.16	0.16	0.00
655.0	0.60	225.68	655.0	-2.1	-4.3	3.9	0.10	0.00	-9.32
910.0	0.30	299.70	910.0	-2.7	-5.8	5.4	0.23	-0.12	29.03
1,094.0	0.40	143.60	1,094.0	-3.0	-5.9	5.4	0.37	0.05	-84.84
1,278.0	0.30	62.90	1,278.0	-3.3	-5.1	4.5	0.25	-0.05	-43.86
1,371.0	0.30	75.10	1,371.0	-3.1	-4.6	4.1	0.07	0.00	13.12
1,464.0	2.30	59.40	1,463.9	-2.1	-2.8	2.4	2.16	2.15	-16.88
1,557.0	4.20	53.70	1,556.8	0.9	1.6	-1.4	2.07	2.04	-6.13
1,745.0	8.30	46.30	1,743.6	14.3	17.0	-14.7	2.22	2.18	-3.94

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Reliance E23-66-1HC
Project:	Sec.23-T6N-R65W	TVD Reference:	WELL @ 4725.0ft (H&P 326 RKB - 30')
Site:	Reliance E23-66-1HN Pad Sec.23-T6N-R65W	MD Reference:	WELL @ 4725.0ft (H&P 326 RKB - 30')
Well:	Reliance E23-66-1HC	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)
1,837.0	8.40	41.90	1,834.7	23.9	26.2	-22.5	0.70	0.11	-4.78
1,931.0	8.80	27.50	1,927.6	35.4	34.1	-28.7	2.32	0.43	-15.32
2,026.0	8.10	25.70	2,021.6	47.9	40.4	-33.1	0.79	-0.74	-1.89
2,120.0	8.30	28.10	2,114.6	59.8	46.5	-37.4	0.42	0.21	2.55
2,215.0	7.60	14.50	2,208.7	72.0	51.3	-40.4	2.11	-0.74	-14.32
2,309.0	7.10	9.10	2,301.9	83.7	53.8	-41.2	0.91	-0.53	-5.74
2,403.0	7.60	19.30	2,395.2	95.3	56.7	-42.5	1.48	0.53	10.85
2,498.0	8.10	27.90	2,489.3	107.2	61.9	-45.9	1.34	0.53	9.05
2,592.0	8.90	18.60	2,582.3	119.9	67.4	-49.5	1.69	0.85	-9.89
2,781.0	8.20	17.60	2,769.2	146.6	76.1	-54.3	0.38	-0.37	-0.53
2,876.0	8.50	17.10	2,863.1	159.8	80.2	-56.5	0.32	0.32	-0.53
2,971.0	7.70	15.20	2,957.2	172.6	83.9	-58.3	0.89	-0.84	-2.00
3,065.0	8.50	23.70	3,050.3	185.1	88.4	-60.9	1.53	0.85	9.04
3,159.0	7.70	26.00	3,143.3	197.1	93.9	-64.7	0.92	-0.85	2.45
3,254.0	8.00	28.10	3,237.4	208.7	99.8	-68.9	0.44	0.32	2.21
3,348.0	6.20	30.00	3,330.7	218.8	105.5	-73.0	1.93	-1.91	2.02
3,443.0	6.10	19.60	3,425.2	228.0	109.7	-75.9	1.18	-0.11	-10.95
3,537.0	7.90	17.40	3,518.5	238.9	113.3	-77.9	1.94	1.91	-2.34
3,632.0	9.40	20.80	3,612.4	252.4	118.0	-80.6	1.67	1.58	3.58
3,727.0	10.70	22.50	3,705.9	267.8	124.2	-84.5	1.40	1.37	1.79
3,821.0	11.20	21.40	3,798.2	284.3	130.8	-88.7	0.58	0.53	-1.17
3,916.0	11.70	21.00	3,891.3	301.9	137.6	-93.0	0.53	0.53	-0.42
4,011.0	12.00	21.10	3,984.3	320.1	144.7	-97.3	0.32	0.32	0.11
4,105.0	10.30	20.00	4,076.5	337.1	151.0	-101.2	1.82	-1.81	-1.17
4,200.0	9.10	17.20	4,170.2	352.3	156.2	-104.1	1.36	-1.26	-2.95
4,294.0	8.10	13.60	4,263.1	365.8	159.9	-105.8	1.21	-1.06	-3.83
4,389.0	6.80	2.40	4,357.3	378.0	161.7	-105.9	2.05	-1.37	-11.79
4,483.0	7.00	4.60	4,450.6	389.2	162.4	-105.0	0.35	0.21	2.34
4,578.0	7.60	16.20	4,544.9	401.0	164.6	-105.5	1.67	0.63	12.21
4,673.0	6.60	18.90	4,639.1	412.2	168.2	-107.3	1.11	-1.05	2.84
4,767.0	7.30	17.70	4,732.4	423.0	171.7	-109.3	0.76	0.74	-1.28
4,862.0	6.80	27.00	4,826.7	433.8	176.1	-112.1	1.31	-0.53	9.79
4,956.0	8.60	38.20	4,919.9	444.3	183.0	-117.4	2.48	1.91	11.91
5,051.0	8.80	37.00	5,013.8	455.7	191.8	-124.5	0.28	0.21	-1.26
5,146.0	7.40	38.10	5,107.8	466.3	199.9	-131.0	1.48	-1.47	1.16
5,240.0	6.10	27.40	5,201.2	475.5	205.9	-135.7	1.92	-1.38	-11.38
5,334.0	6.20	22.70	5,294.6	484.6	210.2	-138.6	0.55	0.11	-5.00
5,429.0	6.50	18.60	5,389.1	494.4	213.9	-140.8	0.57	0.32	-4.32
5,523.0	6.50	19.50	5,482.5	504.5	217.4	-142.8	0.11	0.00	0.96
5,618.0	8.00	15.40	5,576.7	515.9	220.9	-144.7	1.67	1.58	-4.32
5,712.0	7.30	17.30	5,669.9	527.9	224.4	-146.4	0.79	-0.74	2.02
5,807.0	6.30	11.10	5,764.2	538.8	227.2	-147.7	1.30	-1.05	-6.53
5,901.0	5.90	11.60	5,857.7	548.6	229.2	-148.2	0.43	-0.43	0.53
5,996.0	7.00	15.50	5,952.0	559.0	231.7	-149.2	1.25	1.16	4.11
6,091.0	8.00	16.20	6,046.2	570.9	235.1	-150.9	1.06	1.05	0.74
6,185.0	7.00	19.10	6,139.4	582.6	238.8	-152.8	1.14	-1.06	3.09
6,279.0	8.60	11.30	6,232.6	594.9	242.1	-154.3	2.04	1.70	-8.30
6,373.0	14.00	338.70	6,324.8	612.4	239.3	-149.1	8.69	5.74	-34.68
6,468.0	16.50	309.40	6,416.6	631.7	224.7	-131.8	8.43	2.63	-30.84
6,562.0	21.40	287.10	6,505.6	645.3	197.9	-103.4	9.21	5.21	-23.72
6,656.0	24.60	277.80	6,592.1	653.0	162.1	-66.9	5.14	3.40	-9.89
6,751.0	30.90	277.70	6,676.1	658.9	118.3	-22.7	6.63	6.63	-0.11
6,846.0	39.20	278.20	6,753.8	666.5	64.3	31.8	8.74	8.74	0.53
6,940.0	51.00	274.30	6,820.1	673.5	-1.7	98.2	12.89	12.55	-4.15

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Site:	Reliance E23-66-1HN Pad Sec.23-T6N-R65W	MD Reference:	WELL @ 4725.0ft (H&P 326 RKB - 30')
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Design:	Wellbore #1	Database:	Landmark

Survey									
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7,035.0	57.70	269.80	6,875.5	676.1	-78.8	174.9	8.03	7.05	-4.74
7,130.0	64.10	272.70	6,921.6	678.0	-161.7	257.2	7.24	6.74	3.05
7,224.0	69.30	276.30	6,958.8	684.8	-247.7	343.3	6.55	5.53	3.83
7,319.0	76.20	275.30	6,987.0	694.0	-338.0	433.9	7.33	7.26	-1.05
7,434.0	88.90	271.20	7,001.9	700.3	-451.5	547.3	11.59	11.04	-3.57
7,480.0	89.80	272.30	7,002.4	701.8	-497.5	593.0	3.09	1.96	2.39
7,538.1	90.73	272.24	7,002.1	704.0	-555.5	650.7	1.60	1.60	-0.11
Reliance E23-66-1HC Landing Pt.									
7,574.0	91.30	272.20	7,001.5	705.4	-591.4	686.4	1.60	1.60	-0.11
7,668.0	93.50	272.10	6,997.5	709.0	-685.3	779.8	2.34	2.34	-0.11
7,763.0	89.70	272.40	6,994.9	712.7	-780.2	874.3	4.01	-4.00	0.32
7,857.0	88.70	272.40	6,996.2	716.6	-874.1	967.8	1.06	-1.06	0.00
7,951.0	89.90	271.10	6,997.4	719.5	-968.0	1,061.1	1.88	1.28	-1.38
8,045.0	90.20	270.50	6,997.3	720.8	-1,062.0	1,154.4	0.71	0.32	-0.64
8,139.0	91.60	269.80	6,995.8	721.1	-1,156.0	1,247.4	1.67	1.49	-0.74
8,234.0	92.40	270.20	6,992.5	721.1	-1,250.9	1,341.4	0.94	0.84	0.42
8,329.0	91.30	269.70	6,989.4	721.0	-1,345.9	1,435.3	1.27	-1.16	-0.53
8,423.0	89.80	268.80	6,988.5	719.7	-1,439.9	1,528.2	1.86	-1.60	-0.96
8,518.0	90.70	269.30	6,988.1	718.2	-1,534.8	1,621.9	1.08	0.95	0.53
8,613.0	89.10	267.70	6,988.3	715.7	-1,629.8	1,715.6	2.38	-1.68	-1.68
8,707.0	88.90	266.90	6,989.9	711.3	-1,723.7	1,807.8	0.88	-0.21	-0.85
8,802.0	89.50	267.10	6,991.2	706.3	-1,818.5	1,901.0	0.67	0.63	0.21
8,897.0	87.80	266.40	6,993.5	700.9	-1,913.4	1,994.1	1.94	-1.79	-0.74
8,991.0	88.30	265.70	6,996.7	694.4	-2,007.1	2,085.9	0.91	0.53	-0.74
9,085.0	89.30	265.90	6,998.6	687.5	-2,100.8	2,177.7	1.08	1.06	0.21
9,179.0	90.20	265.60	6,999.0	680.6	-2,194.6	2,269.4	1.01	0.96	-0.32
9,274.0	90.10	266.40	6,998.8	674.0	-2,289.3	2,362.3	0.85	-0.11	0.84
9,369.0	90.70	267.00	6,998.1	668.5	-2,384.2	2,455.4	0.89	0.63	0.63
9,464.0	92.10	267.00	6,995.8	663.5	-2,479.0	2,548.5	1.47	1.47	0.00
9,558.0	90.40	268.40	6,993.8	659.7	-2,572.9	2,640.9	2.34	-1.81	1.49
9,653.0	89.90	270.20	6,993.5	658.6	-2,667.9	2,734.7	1.97	-0.53	1.89
9,747.0	88.70	270.00	6,994.7	658.7	-2,761.9	2,827.8	1.29	-1.28	-0.21
9,842.0	87.80	269.40	6,997.6	658.2	-2,856.8	2,921.7	1.14	-0.95	-0.63
9,936.0	90.00	270.20	6,999.4	657.9	-2,950.8	3,014.6	2.49	2.34	0.85
10,031.0	91.60	270.20	6,998.0	658.3	-3,045.8	3,108.7	1.68	1.68	0.00
10,125.0	89.70	271.40	6,997.0	659.6	-3,139.8	3,201.9	2.39	-2.02	1.28
10,220.0	89.80	271.30	6,997.4	661.8	-3,234.7	3,296.2	0.15	0.11	-0.11
10,314.0	90.30	271.60	6,997.3	664.2	-3,328.7	3,389.5	0.62	0.53	0.32
10,409.0	90.70	271.40	6,996.5	666.7	-3,423.7	3,483.9	0.47	0.42	-0.21
10,503.0	89.80	270.40	6,996.1	668.1	-3,517.7	3,577.1	1.43	-0.96	-1.06
10,597.0	89.90	269.20	6,996.3	667.8	-3,611.7	3,670.1	1.28	0.11	-1.28
10,692.0	90.20	268.90	6,996.2	666.2	-3,706.6	3,763.9	0.45	0.32	-0.32
10,786.0	90.00	267.70	6,996.1	663.5	-3,800.6	3,856.4	1.29	-0.21	-1.28
10,881.0	88.20	265.20	6,997.6	657.6	-3,895.4	3,949.4	3.24	-1.89	-2.63
10,976.0	89.10	266.60	6,999.8	650.8	-3,990.1	4,042.2	1.75	0.95	1.47
11,070.0	90.10	266.60	7,000.4	645.2	-4,084.0	4,134.3	1.06	1.06	0.00
11,164.0	90.50	265.80	7,000.0	639.0	-4,177.7	4,226.2	0.95	0.43	-0.85
11,259.0	89.40	268.70	7,000.0	634.4	-4,272.6	4,319.4	3.26	-1.16	3.05
11,353.0	88.10	266.20	7,002.1	630.2	-4,366.5	4,411.7	3.00	-1.38	-2.66
11,428.0	86.70	263.70	7,005.5	623.6	-4,441.1	4,484.7	3.82	-1.87	-3.33
11,483.4	87.69	263.70	7,008.2	617.6	-4,496.1	4,538.2	1.79	1.79	0.00
Reliance E23-66-1HC BHL 2475'FNL & 535' FWL									
11,484.0	87.70	263.70	7,008.2	617.5	-4,496.7	4,538.8	1.79	1.79	0.00

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Checked By: _____	Approved By: _____	Date: _____
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