

Noble Energy, Inc

Weld County, CO (NAD 83)

Sec 24, T6N-R65W (Storis E24 Pad)

Storis E24-76-1HN

Wellbore #1

Design: OH

Standard Survey Report

04 June, 2014

IDS

Survey Report

Company:	Noble Energy, Inc	Local Co-ordinate Reference:	Well Storis E24-76-1HN
Project:	Weld County, CO (NAD 83)	TVD Reference:	Well @ 4721.0usft (H&P 330)
Site:	Sec 24, T6N-R65W (Storis E24 Pad)	MD Reference:	Well @ 4721.0usft (H&P 330)
Well:	Storis E24-76-1HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Project	Weld County, CO (NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		Sec 24, T6N-R65W (Storis E24 Pad)			
Site Position:		Northing:	1,413,520.50 usft	Latitude:	40° 27' 54.576 N
From:	Lat/Long	Easting:	3,245,595.18 usft	Longitude:	104° 37' 2.352 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.57 °

Well		Storis E24-76-1HN				
Well Position	+N-S	0.0 usft	Northing:	1,413,520.50 usft	Latitude:	40° 27' 54.576 N
	+E-W	0.0 usft	Easting:	3,245,595.18 usft	Longitude:	104° 37' 2.352 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	4,691.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/18/2014	8.42	67.03	52,891

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	15.85	

Survey Program	Date	6/4/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
386.0	772.0	Surface (Wellbore #1)	Flexi-Shot	VES Flexi-Shot Tool	
815.0	7,312.0	Intermediate (Wellbore #1)	MWD	MWD - Standard	
7,324.0	11,429.0	Lateral (Wellbore #1)	MWD	MWD - Standard	

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
386.0	0.20	220.10	386.0	-0.5	-0.4	-0.6	0.05	0.05	0.00
772.0	0.40	220.40	772.0	-2.1	-1.7	-2.5	0.05	0.05	0.08
815.0	0.70	200.68	815.0	-2.4	-1.9	-2.9	0.82	0.70	-45.86
First MWD									
907.0	0.70	199.80	907.0	-3.5	-2.3	-4.0	0.01	0.00	-0.96
1,000.0	0.79	218.79	1,000.0	-4.5	-2.9	-5.1	0.28	0.10	20.42
1,093.0	0.88	220.28	1,093.0	-5.6	-3.8	-6.4	0.10	0.10	1.60
1,185.0	1.14	109.19	1,185.0	-6.4	-3.4	-7.1	1.82	0.28	-120.75

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
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Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,278.0	1.93	89.76	1,277.9	-6.7	-0.9	-6.7	1.01	0.85	-20.89
1,370.0	3.25	88.09	1,369.8	-6.6	3.2	-5.5	1.44	1.43	-1.82
1,463.0	4.75	96.80	1,462.6	-7.0	9.7	-4.1	1.74	1.61	9.37
1,556.0	5.80	104.71	1,555.2	-8.6	18.1	-3.4	1.37	1.13	8.51
1,651.0	7.91	98.90	1,649.5	-10.8	29.2	-2.5	2.34	2.22	-6.12
1,746.0	9.23	103.12	1,743.5	-13.6	43.0	-1.3	1.54	1.39	4.44
1,841.0	10.99	101.19	1,837.0	-17.1	59.3	-0.2	1.89	1.85	-2.03
1,936.0	11.87	102.86	1,930.1	-21.0	77.7	1.0	0.99	0.93	1.76
2,032.0	12.22	95.39	2,024.0	-24.2	97.5	3.4	1.66	0.36	-7.78
2,127.0	10.64	93.54	2,117.1	-25.6	116.3	7.1	1.71	-1.66	-1.95
2,222.0	11.96	101.98	2,210.3	-28.2	134.6	9.6	2.22	1.39	8.88
2,317.0	12.66	104.53	2,303.1	-32.9	154.3	10.5	0.93	0.74	2.68
2,412.0	10.29	104.18	2,396.2	-37.6	172.7	11.0	2.50	-2.49	-0.37
2,507.0	11.87	104.71	2,489.4	-42.1	190.3	11.5	1.67	1.66	0.56
2,602.0	13.28	100.22	2,582.1	-46.5	210.5	12.7	1.80	1.48	-4.73
2,697.0	11.96	99.34	2,674.8	-50.1	231.0	14.9	1.40	-1.39	-0.93
2,792.0	13.37	98.55	2,767.5	-53.3	251.5	17.4	1.50	1.48	-0.83
2,888.0	13.45	96.80	2,860.9	-56.3	273.6	20.6	0.43	0.08	-1.82
2,983.0	12.05	97.32	2,953.6	-58.9	294.4	23.8	1.48	-1.47	0.55
3,078.0	12.57	96.88	3,046.4	-61.4	314.5	26.9	0.56	0.55	-0.46
3,173.0	11.78	95.21	3,139.2	-63.5	334.4	30.3	0.91	-0.83	-1.76
3,268.0	11.17	102.51	3,232.3	-66.4	353.1	32.6	1.66	-0.64	7.68
3,363.0	11.78	109.01	3,325.4	-71.5	371.2	32.6	1.50	0.64	6.84
3,458.0	12.80	108.31	3,418.3	-78.0	390.4	31.6	1.09	1.07	-0.74
3,553.0	13.28	98.55	3,510.8	-82.9	411.2	32.6	2.37	0.51	-10.27
3,648.0	11.17	94.60	3,603.7	-85.3	431.1	35.8	2.39	-2.22	-4.16
3,743.0	12.13	101.28	3,696.7	-87.9	450.1	38.3	1.74	1.01	7.03
3,838.0	14.20	104.97	3,789.2	-92.9	471.1	39.3	2.35	2.18	3.88
3,934.0	15.21	104.88	3,882.1	-99.2	494.7	39.7	1.05	1.05	-0.09
4,029.0	14.30	99.87	3,973.9	-104.4	518.3	41.2	1.65	-0.96	-5.27
4,124.0	12.13	93.19	4,066.4	-107.0	539.8	44.6	2.79	-2.28	-7.03
4,219.0	11.96	97.59	4,159.3	-108.8	559.6	48.2	0.98	-0.18	4.63
4,314.0	12.75	100.49	4,252.1	-112.0	579.6	50.6	1.06	0.83	3.05
4,409.0	10.82	96.71	4,345.1	-115.0	598.8	53.0	2.19	-2.03	-3.98
4,504.0	9.76	101.98	4,438.6	-117.7	615.5	54.9	1.49	-1.12	5.55
4,600.0	10.46	102.24	4,533.1	-121.2	632.0	56.0	0.73	0.73	0.27
4,695.0	10.46	107.25	4,626.5	-125.6	648.7	56.3	0.96	0.00	5.27
4,790.0	10.82	105.32	4,719.9	-130.5	665.5	56.2	0.53	0.38	-2.03
4,885.0	11.87	105.14	4,813.0	-135.4	683.5	56.4	1.11	1.11	-0.19
4,980.0	11.87	99.26	4,906.0	-139.6	702.6	57.7	1.27	0.00	-6.19
5,076.0	12.66	101.01	4,999.8	-143.2	722.7	59.7	0.91	0.82	1.82
5,171.0	9.58	100.22	5,093.0	-146.6	740.7	61.3	3.25	-3.24	-0.83
5,266.0	9.06	103.56	5,186.8	-149.7	755.7	62.4	0.79	-0.55	3.52

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Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,361.0	9.32	106.29	5,280.6	-153.6	770.4	62.7	0.53	0.27	2.87
5,456.0	11.26	107.96	5,374.0	-158.6	786.6	62.3	2.07	2.04	1.76
5,551.0	12.93	101.81	5,466.9	-163.7	805.8	62.7	2.22	1.76	-6.47
5,646.0	13.72	102.24	5,559.4	-168.2	827.2	64.1	0.84	0.83	0.45
5,741.0	14.60	96.97	5,651.5	-172.1	850.1	66.7	1.64	0.93	-5.55
5,836.0	14.25	97.67	5,743.5	-175.1	873.6	70.2	0.41	-0.37	0.74
5,931.0	13.63	98.82	5,835.7	-178.4	896.2	73.2	0.71	-0.65	1.21
6,026.0	13.63	97.41	5,928.0	-181.5	918.4	76.2	0.35	0.00	-1.48
6,117.0	11.52	95.48	6,016.8	-183.8	938.1	79.5	2.36	-2.32	-2.12
6,164.0	12.57	86.69	6,062.8	-183.9	947.9	82.0	4.49	2.23	-18.70
6,212.0	14.77	77.11	6,109.4	-182.3	959.0	86.6	6.56	4.58	-19.96
6,259.0	17.94	70.34	6,154.5	-178.5	971.7	93.7	7.86	6.74	-14.40
6,307.0	20.58	66.30	6,199.8	-172.6	986.4	103.4	6.16	5.50	-8.42
6,354.0	23.92	67.35	6,243.3	-165.6	1,002.8	114.6	7.16	7.11	2.23
6,402.0	26.20	71.66	6,286.8	-158.5	1,021.8	126.6	6.08	4.75	8.98
6,449.0	29.19	74.65	6,328.4	-152.2	1,042.7	138.4	7.01	6.36	6.36
6,497.0	32.62	73.68	6,369.6	-145.5	1,066.4	151.3	7.22	7.15	-2.02
6,544.0	36.76	71.83	6,408.2	-137.6	1,092.0	166.0	9.09	8.81	-3.94
6,592.0	40.80	72.80	6,445.7	-128.4	1,120.6	182.6	8.51	8.42	2.02
6,639.0	45.64	72.80	6,479.9	-118.9	1,151.3	200.1	10.30	10.30	0.00
6,687.0	49.68	68.93	6,512.2	-107.3	1,184.8	220.5	10.31	8.42	-8.06
6,734.0	53.38	64.10	6,541.5	-92.6	1,218.5	243.8	11.25	7.87	-10.28
6,782.0	55.66	58.74	6,569.3	-73.9	1,252.8	271.2	10.26	4.75	-11.17
6,829.0	56.63	52.94	6,595.5	-51.9	1,285.1	301.1	10.45	2.06	-12.34
6,877.0	57.24	46.96	6,621.7	-26.1	1,315.9	334.4	10.52	1.27	-12.46
6,924.0	56.37	41.78	6,647.5	2.0	1,343.3	368.9	9.41	-1.85	-11.02
6,972.0	53.82	37.73	6,675.0	32.3	1,368.5	404.9	8.72	-5.31	-8.44
7,019.0	52.60	32.50	6,703.1	63.0	1,390.2	440.4	9.28	-2.60	-11.13
7,067.0	55.80	26.00	6,731.2	97.0	1,409.1	478.2	12.84	6.67	-13.54
7,093.8	59.48	22.83	6,745.6	117.6	1,418.5	500.6	16.97	13.73	-11.82
Cross 460' HL @ 7094' MD / 6746' TVD									
7,114.0	62.30	20.60	6,755.4	134.0	1,425.0	518.1	16.97	13.96	-11.05
7,162.0	69.80	16.80	6,774.9	175.5	1,439.0	561.9	17.22	15.63	-7.92
7,209.0	77.56	13.48	6,788.1	219.0	1,450.8	607.0	17.85	16.51	-7.06
7,257.0	84.42	8.64	6,795.6	265.5	1,459.8	654.2	17.42	14.29	-10.08
7,312.0	88.67	2.58	6,798.9	320.1	1,465.2	708.2	13.44	7.73	-11.02
Actual 7" csg @ 7312' MD / 6799' TVD / 622' FSL & 2440' FWL Sec 24 - 7"									
7,324.0	89.60	1.26	6,799.1	332.1	1,465.6	719.8	13.44	7.76	-10.98
7,419.0	90.13	356.60	6,799.3	427.0	1,463.8	810.7	4.94	0.56	-4.91
7,514.0	90.66	352.56	6,798.6	521.6	1,454.8	899.2	4.29	0.56	-4.25
7,610.0	88.46	350.27	6,799.4	616.5	1,440.5	986.5	3.31	-2.29	-2.39
7,705.0	87.76	349.83	6,802.5	710.0	1,424.1	1,072.0	0.87	-0.74	-0.46
7,800.0	87.41	349.22	6,806.5	803.4	1,406.8	1,157.1	0.74	-0.37	-0.64
7,895.0	88.46	349.83	6,809.9	896.7	1,389.6	1,242.2	1.28	1.11	0.64

IDS

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7,990.0	89.43	351.15	6,811.7	990.4	1,373.9	1,328.0	1.72	1.02	1.39	
8,086.0	90.75	353.44	6,811.5	1,085.5	1,361.0	1,416.0	2.75	1.38	2.39	
8,181.0	91.45	355.02	6,809.7	1,180.0	1,351.5	1,504.3	1.82	0.74	1.66	
8,276.0	91.36	358.53	6,807.4	1,274.8	1,346.1	1,594.0	3.69	-0.09	3.69	
8,371.0	91.19	358.97	6,805.3	1,369.8	1,344.1	1,684.8	0.50	-0.18	0.46	
8,466.0	91.01	358.53	6,803.4	1,464.7	1,342.0	1,775.6	0.50	-0.19	-0.46	
8,561.0	88.81	359.32	6,803.6	1,559.7	1,340.2	1,866.5	2.46	-2.32	0.83	
8,657.0	90.04	359.76	6,804.6	1,655.7	1,339.4	1,958.6	1.36	1.28	0.46	
8,752.0	88.02	358.62	6,806.2	1,750.7	1,338.1	2,049.6	2.44	-2.13	-1.20	
8,847.0	88.02	358.97	6,809.5	1,845.6	1,336.1	2,140.4	0.37	0.00	0.37	
8,942.0	87.76	358.62	6,812.9	1,940.5	1,334.1	2,231.1	0.46	-0.27	-0.37	
9,037.0	87.76	358.89	6,816.7	2,035.4	1,332.0	2,321.9	0.28	0.00	0.28	
9,132.0	90.40	358.09	6,818.2	2,130.4	1,329.5	2,412.5	2.90	2.78	-0.84	
9,227.0	90.57	357.57	6,817.4	2,225.3	1,325.9	2,502.8	0.58	0.18	-0.55	
9,322.0	90.66	357.22	6,816.4	2,320.2	1,321.6	2,593.0	0.38	0.09	-0.37	
9,418.0	90.75	357.39	6,815.2	2,416.1	1,317.1	2,684.0	0.20	0.09	0.18	
9,513.0	88.81	357.92	6,815.5	2,511.0	1,313.2	2,774.2	2.12	-2.04	0.56	
9,608.0	88.99	357.74	6,817.4	2,605.9	1,309.6	2,864.5	0.27	0.19	-0.19	
9,703.0	89.34	357.65	6,818.8	2,700.8	1,305.8	2,954.8	0.38	0.37	-0.09	
9,798.0	89.87	357.39	6,819.4	2,795.7	1,301.7	3,045.0	0.62	0.56	-0.27	
9,893.0	89.60	359.41	6,819.8	2,890.7	1,299.0	3,135.6	2.15	-0.28	2.13	
9,988.0	90.40	359.24	6,819.8	2,985.7	1,297.9	3,226.7	0.86	0.84	-0.18	
10,084.0	89.60	359.32	6,819.8	3,081.7	1,296.7	3,318.7	0.84	-0.83	0.08	
10,179.0	90.13	359.15	6,820.1	3,176.6	1,295.5	3,409.7	0.59	0.56	-0.18	
10,274.0	91.01	359.32	6,819.1	3,271.6	1,294.2	3,500.7	0.94	0.93	0.18	
10,369.0	90.04	358.53	6,818.3	3,366.6	1,292.4	3,591.6	1.32	-1.02	-0.83	
10,464.0	87.41	359.76	6,820.4	3,461.6	1,291.0	3,682.6	3.06	-2.77	1.29	
10,559.0	87.76	359.68	6,824.4	3,556.5	1,290.5	3,773.7	0.38	0.37	-0.08	
10,654.0	86.97	357.83	6,828.7	3,651.4	1,288.5	3,864.4	2.12	-0.83	-1.95	
10,750.0	89.60	358.89	6,831.6	3,747.3	1,285.7	3,956.0	2.95	2.74	1.10	
10,845.0	90.13	358.45	6,831.8	3,842.2	1,283.5	4,046.7	0.73	0.56	-0.46	
10,940.0	90.22	358.45	6,831.5	3,937.2	1,280.9	4,137.4	0.09	0.09	0.00	
11,035.0	89.52	357.65	6,831.8	4,032.1	1,277.7	4,227.8	1.12	-0.74	-0.84	
11,130.0	89.08	357.22	6,832.9	4,127.0	1,273.5	4,317.9	0.65	-0.46	-0.45	
11,225.0	89.69	357.22	6,833.9	4,221.9	1,268.8	4,408.0	0.64	0.64	0.00	
11,321.0	89.60	356.34	6,834.5	4,317.8	1,263.5	4,498.7	0.92	-0.09	-0.92	
11,359.0	89.69	356.42	6,834.8	4,355.7	1,261.1	4,534.5	0.32	0.24	0.21	
Last MWD @ 11359' MD / 6835' TVD										
11,429.0	89.69	356.42	6,835.2	4,425.6	1,256.7	4,600.5	0.00	0.00	0.00	
PTD @ 11429' MD / 6835' TVD / 536' FNL & 2298' FWL Sec 24										

IDS

Survey Report

Company:	Noble Energy, Inc	Local Co-ordinate Reference:	Well Storis E24-76-1HN
Project:	Weld County, CO (NAD 83)	TVD Reference:	Well @ 4721.0usft (H&P 330)
Site:	Sec 24, T6N-R65W (Storis E24 Pad)	MD Reference:	Well @ 4721.0usft (H&P 330)
Well:	Storis E24-76-1HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name		Casing Diameter (")	Hole Diameter (")
7,312.0	6,798.9	7"		7	8-3/4

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
815.0	815.0	-2.4	-1.9	First MWD	
7,093.8	6,745.6	117.6	1,418.5	Cross 460' HL @ 7094' MD / 6746' TVD	
7,312.0	6,798.9	320.1	1,465.2	Actual 7" csg @ 7312' MD / 6799' TVD / 622' FSL & 2440' FWL Sec 24	
11,359.0	6,834.8	4,355.7	1,261.1	Last MWD @ 11359' MD / 6835' TVD	
11,429.0	6,835.2	4,425.6	1,256.7	PTD @ 11429' MD / 6835' TVD / 536' FNL & 2298' FWL Sec 24	

Checked By: _____	Approved By: _____	Date: _____
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Weld County, CO (NAD 83)
 Sec 24, T6N-R65W (Storis E24 Pad)
 Storis E24-76-1HN
 H&P 330
 Plan #2



SHL @ 350' FSL & 972 FWL Sec 24
 Actual 7" Csg @ 662' FSL & 2440 FWL Sec 24
 BHL @ 536' FNL & 2298' FWL Sec 24

