



Noble Energy Inc.

Weld County, CO

Sec 6, T6N, R66W, 6th PM

Cecil Farms PC I06-68-1HN

Wellbore #1

Design: Wellbore #1 FINAL

DDC Survey Report

05 March, 2014



Company:	Noble Energy Inc.	Local Co-ordinate Reference:	Well Cecil Farms PC I06-68-1HN
Project:	Weld County, CO	TVD Reference:	WELL @ 4900.0usft (H&P #326)
Site:	Sec 6, T6N, R66W, 6th PM	MD Reference:	WELL @ 4900.0usft (H&P #326)
Well:	Cecil Farms PC I06-68-1HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

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

Site		Sec 6, T6N, R66W, 6th PM							
Site Position:		Northing:	1,434,045.34	usft	Latitude:	40° 31' 22.188 N			
From:	Lat/Long	Easting:	3,190,715.59	usft	Longitude:	104° 48' 50.328 W			
Position Uncertainty:		0.0	usft	Slot Radius:	13-3/16	"	Grid Convergence:	0.44	°

Well		Cecil Farms PC I06-68-1HN				
Well Position	+N/-S	0.0 usft	Northing:	1,434,081.74 usft	Latitude:	40° 31' 22.548 N
	+E/-W	0.0 usft	Easting:	3,190,712.53 usft	Longitude:	104° 48' 50.364 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	4,870.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/14/2014	8.54	67.05	52,909

Design	Wellbore #1				
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	259.72	

Survey Program	Date	3/5/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
1,013.0	7,573.0	MWD Survey - Vert/ Build (Wellbore #1)	MWD default	MWD - Standard	
7,657.0	11,923.0	MWD SURVEY- Lateral (Wellbore #1)	MWD default	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	
FIRST MWD @ 1013' MD / 1013' TVD BEGIN INT HOLE										
1,013.0	0.00	0.00	1,013.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,021.0	0.30	61.20	1,021.0	0.0	0.0	0.0	3.75	3.75	0.00	
1,113.0	0.40	36.90	1,113.0	0.4	0.4	-0.5	0.19	0.11	-26.41	
1,206.0	0.50	31.50	1,206.0	1.0	0.8	-1.0	0.12	0.11	-5.81	
1,300.0	0.60	28.30	1,300.0	1.8	1.3	-1.6	0.11	0.11	-3.40	
1,392.0	0.60	15.10	1,392.0	2.7	1.6	-2.1	0.15	0.00	-14.35	
1,485.0	2.60	78.10	1,484.9	3.6	3.8	-4.4	2.57	2.15	67.74	
1,578.0	5.10	83.70	1,577.7	4.5	10.0	-10.6	2.72	2.69	6.02	

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

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)
1,671.0	7.20	87.20	1,670.2	5.2	19.9	-20.5	2.29	2.26	3.76
1,763.0	9.50	92.70	1,761.2	5.1	33.3	-33.6	2.64	2.50	5.98
1,855.0	9.40	102.70	1,852.0	3.1	48.2	-48.0	1.79	-0.11	10.87
1,948.0	9.10	102.10	1,943.8	-0.1	62.8	-61.8	0.34	-0.32	-0.65
2,040.0	8.80	100.70	2,034.6	-2.9	76.8	-75.1	0.40	-0.33	-1.52
2,132.0	9.30	116.20	2,125.5	-7.5	90.4	-87.6	2.70	0.54	16.85
2,226.0	9.90	131.90	2,218.2	-16.3	103.2	-98.7	2.85	0.64	16.70
2,319.0	8.80	147.00	2,310.0	-27.6	113.1	-106.3	2.88	-1.18	16.24
2,412.0	9.80	158.90	2,401.8	-40.9	119.8	-110.6	2.32	1.08	12.80
2,507.0	10.30	170.50	2,495.3	-56.9	124.1	-112.0	2.19	0.53	12.21
2,601.0	11.20	166.80	2,587.7	-74.0	127.6	-112.3	1.21	0.96	-3.94
2,696.0	12.10	169.50	2,680.7	-92.8	131.5	-112.8	1.11	0.95	2.84
2,790.0	14.00	163.50	2,772.3	-113.4	136.5	-114.1	2.48	2.02	-6.38
2,885.0	14.90	163.50	2,864.3	-136.1	143.2	-116.7	0.95	0.95	0.00
2,979.0	12.20	167.40	2,955.7	-157.4	148.8	-118.4	3.03	-2.87	4.15
3,074.0	13.30	166.60	3,048.3	-177.8	153.6	-119.4	1.17	1.16	-0.84
3,169.0	14.60	167.40	3,140.5	-200.2	158.7	-120.4	1.38	1.37	0.84
3,264.0	13.70	167.40	3,232.6	-222.8	163.8	-121.4	0.95	-0.95	0.00
3,358.0	13.10	166.50	3,324.1	-244.0	168.7	-122.4	0.68	-0.64	-0.96
3,453.0	13.70	166.60	3,416.5	-265.5	173.8	-123.7	0.63	0.63	0.11
3,548.0	14.30	164.00	3,508.7	-287.7	179.7	-125.4	0.91	0.63	-2.74
3,643.0	13.40	163.50	3,600.9	-309.5	186.0	-127.8	0.96	-0.95	-0.53
3,737.0	13.80	165.40	3,692.3	-330.8	191.9	-129.8	0.64	0.43	2.02
3,832.0	14.30	167.90	3,784.4	-353.2	197.3	-131.0	0.83	0.53	2.63
3,926.0	15.90	167.90	3,875.2	-377.2	202.4	-131.8	1.70	1.70	0.00
4,021.0	16.30	171.60	3,966.4	-403.1	207.1	-131.8	1.16	0.42	3.89
4,116.0	14.80	172.50	4,058.0	-428.3	210.6	-130.8	1.60	-1.58	0.95
4,210.0	13.40	172.10	4,149.1	-451.0	213.7	-129.7	1.49	-1.49	-0.43
4,305.0	11.80	161.60	4,241.9	-471.1	218.2	-130.7	2.93	-1.68	-11.05
4,399.0	13.10	162.60	4,333.6	-490.4	224.5	-133.3	1.40	1.38	1.06
4,494.0	12.30	160.90	4,426.3	-510.3	231.0	-136.2	0.93	-0.84	-1.79
4,589.0	13.40	161.20	4,518.9	-530.2	237.8	-139.4	1.16	1.16	0.32
4,684.0	15.00	164.20	4,611.0	-552.5	244.7	-142.2	1.85	1.68	3.16
4,778.0	13.90	174.20	4,702.1	-575.4	249.2	-142.5	2.90	-1.17	10.64
4,873.0	11.10	180.40	4,794.8	-595.9	250.3	-139.9	3.26	-2.95	6.53
4,968.0	10.50	174.90	4,888.1	-613.7	251.0	-137.4	1.25	-0.63	-5.79
5,062.0	9.80	171.40	4,980.7	-630.1	252.9	-136.4	0.99	-0.74	-3.72
5,157.0	9.20	171.60	5,074.4	-645.6	255.3	-135.9	0.63	-0.63	0.21
5,252.0	7.30	171.20	5,168.4	-659.1	257.3	-135.5	2.00	-2.00	-0.42
5,346.0	5.40	170.20	5,261.8	-669.4	259.0	-135.4	2.02	-2.02	-1.06
5,440.0	3.90	168.40	5,355.5	-676.9	260.4	-135.4	1.60	-1.60	-1.91
5,535.0	2.80	172.80	5,450.3	-682.3	261.3	-135.3	1.19	-1.16	4.63
5,629.0	3.10	159.30	5,544.2	-687.0	262.5	-135.7	0.80	0.32	-14.36

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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)
5,724.0	4.00	148.20	5,639.0	-692.2	265.1	-137.4	1.19	0.95	-11.68
5,819.0	3.40	136.20	5,733.8	-697.1	268.8	-140.1	1.03	-0.63	-12.63
5,914.0	2.50	154.90	5,828.7	-701.0	271.7	-142.2	1.38	-0.95	19.68
6,008.0	1.40	160.10	5,922.6	-703.9	272.9	-142.9	1.18	-1.17	5.53
6,102.0	0.50	132.60	6,016.6	-705.3	273.6	-143.4	1.05	-0.96	-29.26
6,196.0	0.30	77.90	6,110.6	-705.5	274.2	-143.9	0.43	-0.21	-58.19
6,290.0	0.30	39.00	6,204.6	-705.3	274.6	-144.3	0.21	0.00	-41.38
6,385.0	0.60	67.20	6,299.6	-704.9	275.2	-145.0	0.38	0.32	29.68
6,479.0	0.80	66.50	6,393.6	-704.4	276.2	-146.1	0.21	0.21	-0.74
6,573.0	0.50	227.10	6,487.6	-704.4	276.5	-146.4	1.36	-0.32	170.85
6,668.0	6.20	236.80	6,582.4	-707.5	271.9	-141.3	6.01	6.00	10.21
6,761.0	9.30	236.30	6,674.5	-714.5	261.5	-129.8	3.33	3.33	-0.54
6,855.0	15.80	239.30	6,766.2	-725.2	244.1	-110.8	6.95	6.91	3.19
6,949.0	22.10	243.10	6,855.1	-739.8	217.3	-81.8	6.83	6.70	4.04
7,010.0	26.60	236.10	6,910.7	-752.6	195.7	-58.3	8.75	7.38	-11.48
7,043.0	29.30	235.20	6,939.8	-761.3	183.0	-44.2	8.28	8.18	-2.73
7,099.0	31.60	238.40	6,988.1	-776.8	159.2	-18.0	5.02	4.11	5.71
7,137.0	31.30	242.60	7,020.5	-786.6	142.0	0.7	5.82	-0.79	11.05
7,182.0	35.60	243.30	7,058.1	-797.8	119.9	24.4	9.59	9.56	1.56
7,231.0	41.80	246.50	7,096.3	-810.8	92.1	54.0	13.29	12.65	6.53
7,276.0	47.10	249.40	7,128.4	-822.6	62.9	84.9	12.61	11.78	6.44
7,325.0	53.90	251.70	7,159.6	-835.1	27.3	122.2	14.34	13.88	4.69
7,370.0	59.80	253.10	7,184.2	-846.5	-8.6	159.5	13.37	13.11	3.11
7,419.0	65.90	256.80	7,206.5	-857.8	-50.7	202.9	14.14	12.45	7.55
7,464.0	71.10	261.20	7,223.0	-865.7	-91.8	244.8	14.70	11.56	9.78
CROSSED HARDLINE @ 7501.5' MD / 7233.7' TVD									
7,501.5	75.75	266.05	7,233.7	-869.7	-127.5	280.6	17.54	12.41	12.95
7,513.0	77.20	267.50	7,236.4	-870.3	-138.6	291.7	17.54	12.59	12.57
7,559.0	82.00	273.70	7,244.7	-869.8	-183.8	336.1	16.87	10.43	13.48
7" Casing Point @ 7573' MD / 7246.4' TVD									
7,573.0	83.40	276.00	7,246.5	-868.7	-197.7	349.5	19.12	10.00	16.43
7,657.0	89.90	281.02	7,251.4	-856.2	-280.5	428.8	9.77	7.74	5.98
7,751.0	89.50	280.94	7,251.9	-838.3	-372.8	516.4	0.43	-0.43	-0.09
7,845.0	89.20	281.09	7,253.0	-820.4	-465.1	604.0	0.36	-0.32	0.16
7,939.0	89.10	281.43	7,254.3	-802.0	-557.2	691.4	0.38	-0.11	0.36
8,033.0	88.70	281.56	7,256.2	-783.3	-649.3	778.7	0.45	-0.43	0.14
8,126.0	89.40	280.93	7,257.7	-765.2	-740.5	865.2	1.01	0.75	-0.68
8,220.0	89.90	278.70	7,258.3	-749.1	-833.2	953.5	2.43	0.53	-2.37
8,313.0	90.30	275.80	7,258.1	-737.4	-925.4	1,042.1	3.15	0.43	-3.12
8,407.0	91.40	273.70	7,256.7	-729.6	-1,019.1	1,132.9	2.52	1.17	-2.23
8,501.0	93.10	268.62	7,253.0	-727.7	-1,112.9	1,224.9	5.69	1.81	-5.40
8,595.0	92.30	267.13	7,248.6	-731.2	-1,206.8	1,317.9	1.80	-0.85	-1.59
8,690.0	91.60	265.21	7,245.4	-737.5	-1,301.5	1,412.2	2.15	-0.74	-2.02
8,785.0	89.50	263.98	7,244.4	-746.5	-1,396.1	1,506.9	2.56	-2.21	-1.29

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8,879.0	90.30	264.17	7,244.6	-756.2	-1,489.6	1,600.6	0.87	0.85	0.20	
8,974.0	89.00	263.75	7,245.2	-766.2	-1,584.0	1,695.3	1.44	-1.37	-0.44	
9,069.0	90.10	265.32	7,245.9	-775.2	-1,678.6	1,790.0	2.02	1.16	1.65	
9,163.0	89.10	266.44	7,246.6	-782.0	-1,772.3	1,883.4	1.60	-1.06	1.19	
9,258.0	87.30	265.32	7,249.6	-788.8	-1,867.0	1,977.8	2.23	-1.89	-1.18	
9,353.0	88.50	267.07	7,253.1	-795.1	-1,961.8	2,072.2	2.23	1.26	1.84	
9,448.0	89.50	267.26	7,254.7	-799.8	-2,056.6	2,166.3	1.07	1.05	0.20	
9,542.0	91.30	268.98	7,254.1	-802.9	-2,150.6	2,259.3	2.65	1.91	1.83	
9,637.0	90.20	268.69	7,252.8	-804.8	-2,245.5	2,353.1	1.20	-1.16	-0.31	
9,732.0	90.30	269.48	7,252.4	-806.3	-2,340.5	2,446.9	0.84	0.11	0.83	
9,826.0	91.00	269.57	7,251.3	-807.1	-2,434.5	2,539.5	0.75	0.74	0.10	
9,921.0	91.20	271.13	7,249.5	-806.5	-2,529.5	2,632.8	1.66	0.21	1.64	
10,016.0	88.90	271.61	7,249.4	-804.3	-2,624.5	2,725.9	2.47	-2.42	0.51	
10,110.0	89.10	271.85	7,251.1	-801.4	-2,718.4	2,817.8	0.33	0.21	0.26	
10,205.0	90.40	271.94	7,251.5	-798.3	-2,813.3	2,910.6	1.37	1.37	0.09	
10,300.0	89.50	273.08	7,251.6	-794.1	-2,908.3	3,003.3	1.53	-0.95	1.20	
10,394.0	89.10	273.23	7,252.7	-789.0	-3,002.1	3,094.7	0.45	-0.43	0.16	
10,489.0	90.60	273.97	7,253.0	-783.0	-3,096.9	3,186.9	1.76	1.58	0.78	
10,583.0	90.30	273.49	7,252.2	-776.9	-3,190.7	3,278.1	0.60	-0.32	-0.51	
10,678.0	85.90	269.30	7,255.4	-774.6	-3,285.6	3,371.1	6.39	-4.63	-4.41	
10,772.0	85.40	265.66	7,262.5	-778.7	-3,379.2	3,463.9	3.90	-0.53	-3.87	
10,867.0	89.00	265.37	7,267.1	-786.1	-3,473.8	3,558.3	3.80	3.79	-0.31	
10,962.0	91.40	266.80	7,266.8	-792.6	-3,568.6	3,652.7	2.94	2.53	1.51	
11,056.0	92.40	266.56	7,263.7	-798.0	-3,662.3	3,746.0	1.09	1.06	-0.26	
11,151.0	93.40	266.87	7,258.9	-803.5	-3,757.1	3,840.1	1.10	1.05	0.33	
11,245.0	93.40	269.03	7,253.3	-806.8	-3,850.8	3,933.0	2.29	0.00	2.30	
11,340.0	90.60	269.18	7,250.0	-808.3	-3,945.8	4,026.7	2.95	-2.95	0.16	
11,435.0	89.70	269.78	7,249.8	-809.2	-4,040.8	4,120.3	1.14	-0.95	0.63	
11,529.0	89.40	270.12	7,250.5	-809.2	-4,134.7	4,212.8	0.48	-0.32	0.36	
11,624.0	90.40	269.97	7,250.7	-809.2	-4,229.7	4,306.3	1.06	1.05	-0.16	
11,718.0	88.30	269.90	7,251.7	-809.3	-4,323.7	4,398.8	2.24	-2.23	-0.07	
11,813.0	88.70	269.76	7,254.2	-809.6	-4,418.7	4,492.2	0.45	0.42	-0.15	
11,859.0	89.30	269.95	7,255.0	-809.7	-4,464.7	4,537.5	1.37	1.30	0.41	
TD @ 11923' MD / 7255.8' TVD										
11,923.0	89.30	269.95	7,255.8	-809.7	-4,528.7	4,600.5	0.00	0.00	0.00	

Company:	Noble Energy Inc.	Local Co-ordinate Reference:	Well Cecil Farms PC I06-68-1HN
Project:	Weld County, CO	TVD Reference:	WELL @ 4900.0usft (H&P #326)
Site:	Sec 6, T6N, R66W, 6th PM	MD Reference:	WELL @ 4900.0usft (H&P #326)
Well:	Cecil Farms PC I06-68-1HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,013.0	1,013.0	0.0	0.0	FIRST MWD @ 1013' MD / 1013' TVD BEGIN INT HOLE
7,501.5	7,233.7	-869.7	-127.5	CROSSED HARDLINE @ 7501.5' MD / 7233.7' TVD
7,573.0	7,246.5	-868.7	-197.7	7" Casing Point @ 7573' MD / 7246.4' TVD
11,923.0	7,255.8	-809.7	-4,528.7	TD @ 11923' MD / 7255.8' TVD

Checked By: _____	Approved By: _____	Date: _____
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Survey Certification Sheet

Noble Energy Inc
Company

RM-140141
Job Number

4/03/14
Date

Sec6,T6N,R66W, 6th PM
Lease

Cecil Farms PC I06-68-1HN
Well Name

Weld, CO
County & State

API: 05-123-35998

Surveyed from a depth of: 1013' to 7573' MD (DDC Certified Survey Data)
7573' to 11923' MD (DDC Certified Raw Survey Data)

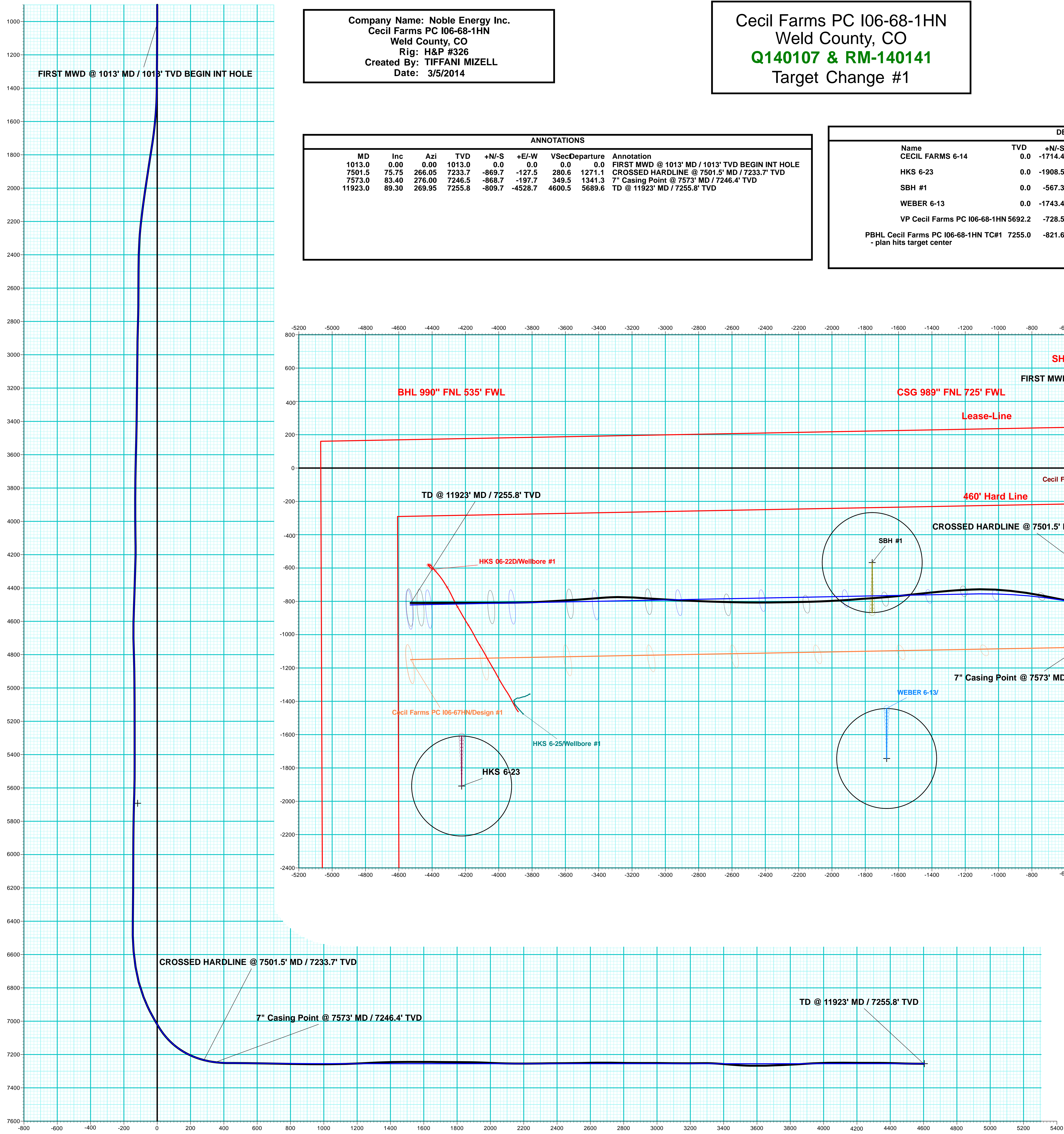
Type of Survey: MWD

Directional Supervisor/Surveyor: Bob Kubistek

The data and calculations for this survey have been checked by me and conform to the standards and procedures set forth by **The Directional Drilling Company (DDC)**. This report represents a true and correct Directional survey of this well based on the original data obtained at the well site. Wellbore Coordinates are calculated using minimum curvature.

Digitally signed by Larry Wright
DN: cn=Larry Wright, o=The
Directional Drilling Company,
ou=GM of Guidance Services,
email=larryw@directionaldrillers.
com, c=US
Date: 2014.04.04 08:54:17 -05'00'

Larry Wright
MWD General Manager



Company Name: Noble Energy Inc.
Cecil Farms PC I06-68-1HN
Weld County, CO
Rig: H&P #326
Created By: TIFFANI MIZELL
Date: 3/5/2014

Cecil Farms PC I06-68-1HN
Weld County, CO
Q140107 & RM-140141
Target Change #1

PROJECT DETAILS: Weld County, CO
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Northern Zone
System Datum: Mean Sea Level

ANNOTATIONS								
MD	Inc	Azi	TVD	+N/-S	+E/-W	VSec	Departure	Annotation
1013.0	0.00	0.00	1013.0	0.0	0.0	0.0	0.0	FIRST MWD @ 1013' MD / 1013' TVD BEGIN INT HOLE
7501.5	75.75	266.05	7233.7	-869.7	-127.5	280.6	1271.1	CROSSED HARDLINE @ 7501.5' MD / 7233.7' TVD
7573.0	83.40	276.00	7246.5	-868.7	-197.7	349.5	1341.3	7" Casing Point @ 7573' MD / 7246.4' TVD
11923.0	89.30	269.95	7255.8	-809.7	-4526.7	4600.5	5689.6	TD @ 11923' MD / 7255.8' TVD

DESIGN TARGET DETAILS							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
CECIL FARMS 6-14	0.0	-1714.4	-275.9	1432367.32	3190436.64	40° 31' 5.628 N	104° 48' 54.108 W
HKS 6-23	0.0	-1908.5	-4222.5	1432173.21	3186490.05	40° 31' 4.008 N	104° 49' 45.228 W
SBH #1	0.0	-567.3	-1758.3	1433514.44	3188954.27	40° 31' 17.076 N	104° 49' 13.188 W
WEBER 6-13	0.0	-1743.4	-1671.4	1432338.36	3189041.14	40° 31' 5.448 N	104° 49' 12.180 W
VP Cecil Farms PC I06-68-1HN 5692.2	-728.5	251.5	1433353.24	3190964.03	40° 31' 15.330 N	104° 48' 47.180 W	
PBHL Cecil Farms PC I06-68-1HN TC#1	7255.0	-821.6	-4531.0	1433260.18	3186181.56	40° 31' 14.772 N	104° 49' 49.116 W
- plan hits target center							



TGM

Azimuths to Grid North

Magnetic North: 8.10°

Magnetic Field

Strength: 52908.7snT

Dip Angle: 67.05°

Date: 2/14/2014

Model: IGRF2010

WELL DETAILS: Cecil Farms PC I06-68-1HN							
Ground Level: 4870.0							
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude		
0.0	0.0	1434081.74	3190712.53	40° 31' 22.548 N	104° 48' 50.364 W		

