

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

Well Name: **Kummer PC LE23-65HN**

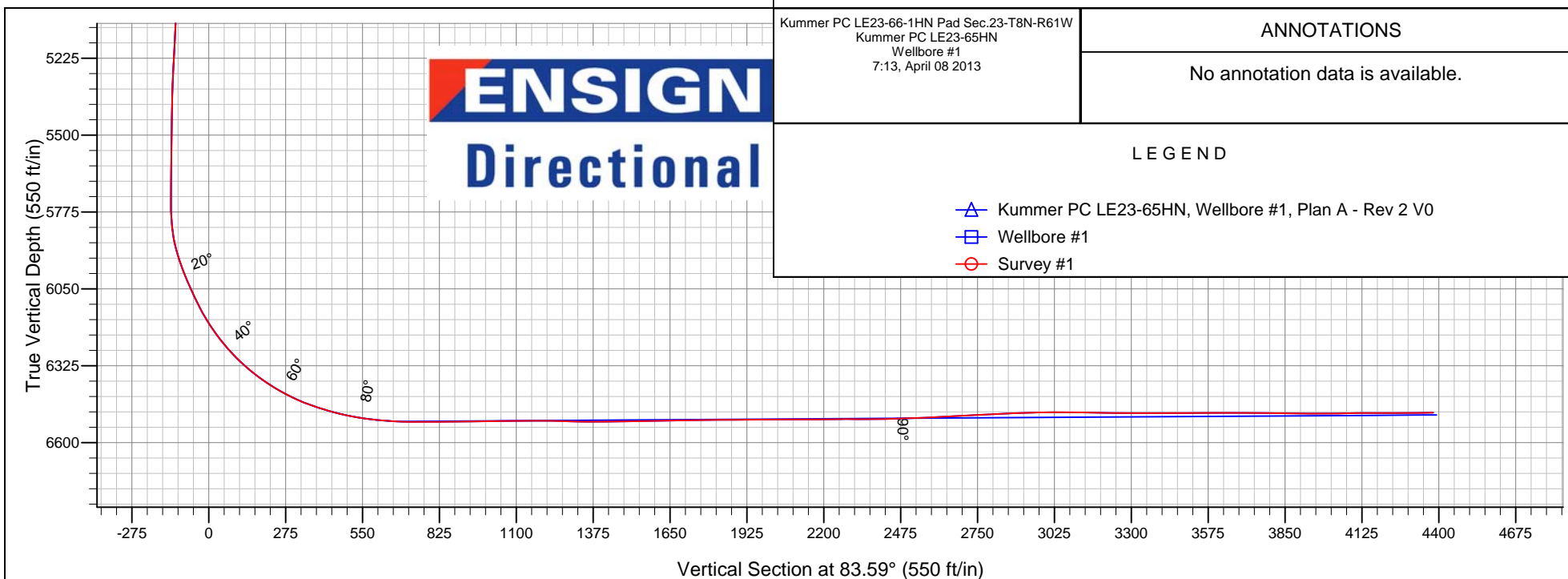
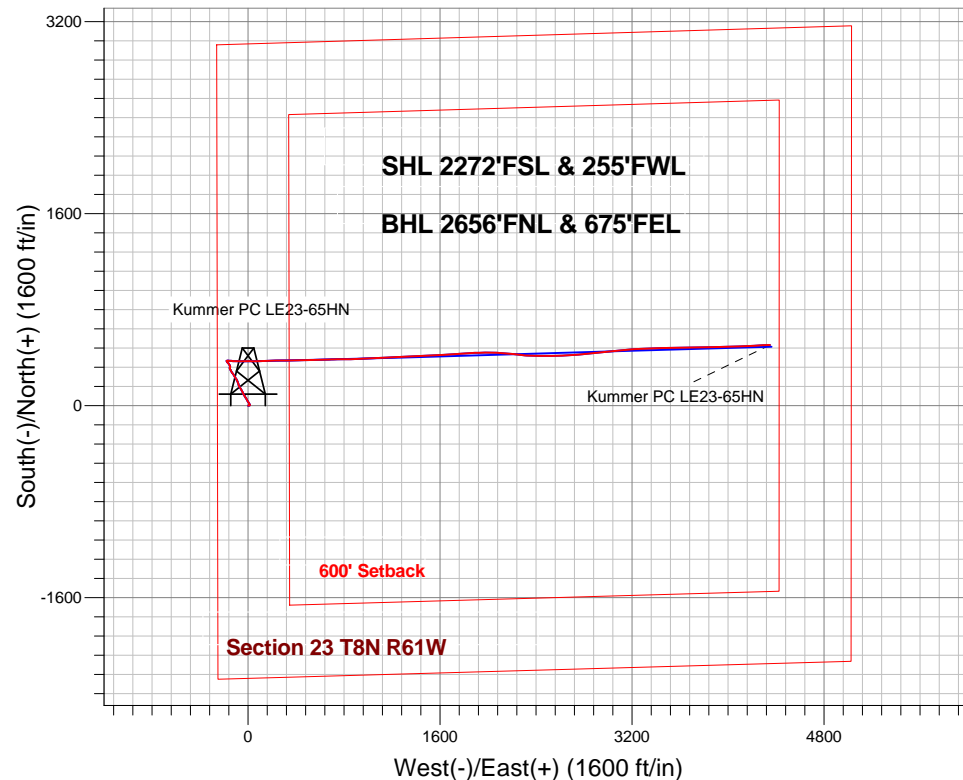
Surface Location: Kummer PC LE23-66-1HN Pad Sec.23-T8N-R61W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4982.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1481027.05	3365897.96	40.646347	-104.181392	

H&P 273 RKB - 24' WELL @ 5006.0ft (H&P 273 RKB - 24')

FINAL SURVEY

Projected Bottom Hole Location
10742' MD 6494' TVD 506' N & 4350' E of SHL
90.5 degree Incl @ 87.3 degree AZM



Kummer PC LE23-66-1HN Pad Sec.23-T8N-R61W
Kummer PC LE23-65HN
Wellbore #1
7:13, April 08 2013

ANNOTATIONS

No annotation data is available.

LEGEND

- △ Kummer PC LE23-65HN, Wellbore #1, Plan A - Rev 2 V0
- Wellbore #1
- Survey #1



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

SEC.23-T8N-R61W

Kummer PC LE23-66-1HN Pad Sec.23-T8N-R61W

Kummer PC LE23-65HN

Wellbore #1

Survey: Survey #1

Standard Survey Report

08 April, 2013

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Kummer PC LE23-65HN
Project:	SEC.23-T8N-R61W	TVD Reference:	WELL @ 5006.0ft (H&P 273 RKB - 24')
Site:	Kummer PC LE23-66-1HN Pad Sec.23-T8N-R61W	MD Reference:	WELL @ 5006.0ft (H&P 273 RKB - 24')
Well:	Kummer PC LE23-65HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.23-T8N-R61W, Weld County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	Kummer PC LE23-66-1HN Pad Sec.23-T8N-R61W				
Site Position:		Northing:	1,481,064.59 ft	Latitude:	40.646450
From:	Lat/Long	Easting:	3,365,898.23 ft	Longitude:	-104.181389
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.85 °

Well	Kummer PC LE23-65HN					
Well Position	+N-S	0.0 ft	Northing:	1,481,027.05 ft	Latitude:	40.646347
	+E-W	0.0 ft	Easting:	3,365,897.96 ft	Longitude:	-104.181392
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,982.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/26/2013	8.33	67.28	53,131

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	334.46	

Survey Program	Date 4/7/2013				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
847.0	10,742.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

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
847.0	1.00	79.20	847.0	1.4	7.3	-1.9	0.12	0.12	0.00
1,126.0	0.80	73.60	1,125.9	2.4	11.5	-2.8	0.08	-0.07	-2.01
1,405.0	1.00	78.00	1,404.9	3.4	15.8	-3.7	0.08	0.07	1.58
1,498.0	1.20	357.60	1,497.9	4.6	16.5	-3.0	1.54	0.22	-86.45
1,593.0	2.50	341.30	1,592.8	7.5	15.8	0.0	1.46	1.37	-17.16
1,688.0	3.30	327.00	1,687.7	11.8	13.7	4.8	1.13	0.84	-15.05
1,782.0	4.20	329.50	1,781.5	17.0	10.4	10.9	0.97	0.96	2.66
1,877.0	5.00	326.70	1,876.2	23.5	6.4	18.4	0.87	0.84	-2.95
1,972.0	5.80	325.80	1,970.8	30.9	1.4	27.3	0.85	0.84	-0.95
2,067.0	7.70	332.10	2,065.1	40.5	-4.2	38.4	2.14	2.00	6.63

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Kummer PC LE23-65HN
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Site:	Kummer PC LE23-66-1HN Pad Sec.23-T8N-R61W	MD Reference:	WELL @ 5006.0ft (H&P 273 RKB - 24')
Well:	Kummer PC LE23-65HN	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)
2,162.0	7.30	329.70	2,159.3	51.4	-10.3	50.8	0.53	-0.42	-2.53
2,256.0	5.50	329.70	2,252.7	60.4	-15.6	61.2	1.91	-1.91	0.00
2,351.0	7.10	329.70	2,347.1	69.4	-20.8	71.6	1.68	1.68	0.00
2,446.0	6.90	328.40	2,441.4	79.3	-26.8	83.1	0.27	-0.21	-1.37
2,541.0	5.60	323.70	2,535.9	87.9	-32.5	93.3	1.47	-1.37	-4.95
2,636.0	7.00	333.50	2,630.3	96.8	-37.8	103.7	1.85	1.47	10.32
2,731.0	6.80	337.10	2,724.6	107.2	-42.6	115.1	0.50	-0.21	3.79
2,826.0	6.30	332.10	2,819.0	117.0	-47.2	125.9	0.80	-0.53	-5.26
2,921.0	7.50	330.70	2,913.3	127.0	-52.7	137.3	1.28	1.26	-1.47
3,015.0	6.90	327.70	3,006.5	137.1	-58.7	149.0	0.75	-0.64	-3.19
3,110.0	6.60	326.90	3,100.9	146.5	-64.7	160.1	0.33	-0.32	-0.84
3,205.0	5.80	327.20	3,195.3	155.1	-70.3	170.3	0.84	-0.84	0.32
3,300.0	5.80	335.80	3,289.8	163.6	-74.9	179.9	0.91	0.00	9.05
3,395.0	7.00	345.70	3,384.3	173.5	-78.3	190.3	1.71	1.26	10.42
3,490.0	5.70	345.30	3,478.7	183.7	-80.9	200.6	1.37	-1.37	-0.42
3,585.0	6.20	341.10	3,573.2	193.1	-83.8	210.4	0.70	0.53	-4.42
3,680.0	7.20	335.00	3,667.5	203.4	-88.0	221.4	1.29	1.05	-6.42
3,775.0	9.10	328.80	3,761.5	215.2	-94.4	234.9	2.20	2.00	-6.53
3,870.0	10.60	327.60	3,855.1	229.0	-102.9	251.0	1.59	1.58	-1.26
3,965.0	11.70	328.40	3,948.4	244.6	-112.7	269.3	1.17	1.16	0.84
4,059.0	11.20	327.90	4,040.5	260.4	-122.5	287.8	0.54	-0.53	-0.53
4,154.0	9.40	327.90	4,133.9	274.8	-131.5	304.7	1.89	-1.89	0.00
4,249.0	8.40	326.90	4,227.8	287.2	-139.5	319.3	1.07	-1.05	-1.05
4,344.0	5.50	329.50	4,322.1	296.9	-145.6	330.7	3.07	-3.05	2.74
4,439.0	4.30	338.60	4,416.7	304.2	-149.2	338.8	1.50	-1.26	9.58
4,534.0	3.20	344.10	4,511.5	310.1	-151.2	344.9	1.22	-1.16	5.79
4,629.0	2.30	355.00	4,606.4	314.5	-152.1	349.3	1.09	-0.95	11.47
4,724.0	2.80	53.30	4,701.4	317.8	-150.4	351.6	2.65	0.53	61.37
4,814.0	4.20	8.00	4,791.2	322.4	-148.2	354.8	3.32	1.56	-50.33
4,909.0	5.60	337.40	4,885.9	330.1	-149.5	362.3	3.07	1.47	-32.21
5,004.0	4.90	333.00	4,980.5	338.0	-153.1	371.0	0.85	-0.74	-4.63
5,099.0	4.80	325.30	5,075.1	344.9	-157.2	378.9	0.69	-0.11	-8.11
5,194.0	4.80	318.60	5,169.8	351.1	-162.1	386.7	0.59	0.00	-7.05
5,288.0	4.70	309.50	5,263.5	356.5	-167.7	394.0	0.81	-0.11	-9.68
5,383.0	3.70	333.70	5,358.2	361.7	-172.0	400.6	2.12	-1.05	25.47
5,478.0	1.50	319.80	5,453.1	365.4	-174.2	404.8	2.39	-2.32	-14.63
5,573.0	1.60	330.90	5,548.1	367.6	-175.6	407.4	0.33	0.11	11.68
5,668.0	1.50	332.50	5,643.0	369.8	-176.8	409.9	0.11	-0.11	1.68
5,763.0	1.40	336.90	5,738.0	372.0	-177.9	412.3	0.16	-0.11	4.63
5,858.0	5.90	84.10	5,832.9	373.6	-173.5	411.8	6.79	4.74	112.84
5,953.0	17.10	93.40	5,925.8	373.2	-154.6	403.4	11.91	11.79	9.79
6,047.0	23.00	92.30	6,014.1	371.7	-122.4	388.1	6.29	6.28	-1.17
6,142.0	26.50	91.10	6,100.3	370.5	-82.7	370.0	3.72	3.68	-1.26
6,237.0	33.40	89.20	6,182.6	370.5	-35.3	349.5	7.33	7.26	-2.00
6,332.0	40.90	90.80	6,258.3	370.4	22.0	324.7	7.96	7.89	1.68
6,427.0	48.50	88.50	6,325.7	370.9	88.8	296.4	8.18	8.00	-2.42
6,522.0	56.10	87.80	6,383.8	373.4	163.9	266.2	8.02	8.00	-0.74
6,616.0	62.90	88.70	6,431.5	375.8	244.8	233.5	7.28	7.23	0.96
6,711.0	71.50	90.30	6,468.3	376.5	332.3	196.5	9.18	9.05	1.68
6,806.0	75.40	87.60	6,495.3	378.2	423.3	158.8	4.93	4.11	-2.84
6,870.0	80.10	89.20	6,508.9	380.0	485.8	133.4	7.74	7.34	2.50
6,920.0	84.00	89.20	6,515.8	380.6	535.3	112.7	7.80	7.80	0.00
7,005.0	86.20	88.50	6,523.1	382.3	619.9	77.7	2.72	2.59	-0.82

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7,041.2	87.72	88.12	6,525.0	383.4	656.1	63.1	4.34	4.21	-1.05
Kummer PC LE23-65HN Landing Pt.									
7,100.0	90.20	87.50	6,526.1	385.7	714.8	39.8	4.34	4.21	-1.05
7,195.0	90.90	90.10	6,525.1	387.7	809.8	0.6	2.83	0.74	2.74
7,290.0	90.40	88.50	6,524.1	388.8	904.8	-39.3	1.76	-0.53	-1.68
7,385.0	90.70	87.60	6,523.2	392.0	999.7	-77.3	1.00	0.32	-0.95
7,480.0	90.90	86.90	6,521.8	396.6	1,094.6	-114.1	0.77	0.21	-0.74
7,574.0	88.70	87.50	6,522.2	401.2	1,188.5	-150.4	2.43	-2.34	0.64
7,669.0	88.40	86.60	6,524.6	406.1	1,283.3	-186.9	1.00	-0.32	-0.95
7,764.0	90.50	86.70	6,525.5	411.6	1,378.1	-222.8	2.21	2.21	0.11
7,859.0	91.40	87.10	6,523.9	416.8	1,473.0	-259.0	1.04	0.95	0.42
7,954.0	91.20	88.20	6,521.7	420.7	1,567.9	-296.4	1.18	-0.21	1.16
8,049.0	90.40	87.30	6,520.4	424.4	1,662.8	-334.0	1.27	-0.84	-0.95
8,144.0	90.70	86.20	6,519.5	429.8	1,757.6	-370.0	1.20	0.32	-1.16
8,238.0	90.60	85.30	6,518.4	436.7	1,851.4	-404.1	0.96	-0.11	-0.96
8,333.0	90.30	89.70	6,517.7	440.9	1,946.3	-441.3	4.64	-0.32	4.63
8,428.0	90.20	90.30	6,517.3	440.9	2,041.3	-482.3	0.64	-0.11	0.63
8,523.0	90.30	94.00	6,516.9	437.3	2,136.2	-526.4	3.90	0.11	3.89
8,617.0	90.90	98.30	6,515.9	427.3	2,229.6	-575.8	4.62	0.64	4.57
8,712.0	89.40	92.50	6,515.6	418.3	2,324.1	-624.6	6.31	-1.58	-6.11
8,807.0	91.50	91.70	6,514.9	414.8	2,419.1	-668.7	2.37	2.21	-0.84
8,902.0	92.50	89.40	6,511.6	413.9	2,514.0	-710.4	2.64	1.05	-2.42
8,997.0	93.10	87.80	6,506.9	416.2	2,608.9	-749.2	1.80	0.63	-1.68
9,092.0	93.30	85.70	6,501.6	421.6	2,703.5	-785.2	2.22	0.21	-2.21
9,186.0	92.40	85.30	6,496.9	429.0	2,797.1	-818.9	1.05	-0.96	-0.43
9,282.0	92.20	84.30	6,493.1	437.7	2,892.7	-852.2	1.06	-0.21	-1.04
9,376.0	89.90	83.60	6,491.4	447.6	2,986.1	-883.6	2.56	-2.45	-0.74
9,471.0	89.40	83.60	6,492.0	458.2	3,080.5	-914.7	0.53	-0.53	0.00
9,566.0	88.50	85.70	6,493.7	467.0	3,175.1	-947.5	2.40	-0.95	2.21
9,660.0	90.70	88.00	6,494.3	472.2	3,268.9	-983.3	3.39	2.34	2.45
9,755.0	89.60	87.10	6,494.1	476.3	3,363.8	-1,020.6	1.50	-1.16	-0.95
9,850.0	90.10	88.30	6,494.3	480.1	3,458.8	-1,058.1	1.37	0.53	1.26
9,945.0	90.70	89.40	6,493.7	482.0	3,553.7	-1,097.3	1.32	0.63	1.16
10,040.0	89.70	88.50	6,493.4	483.7	3,648.7	-1,136.7	1.42	-1.05	-0.95
10,135.0	89.40	89.40	6,494.1	485.5	3,743.7	-1,176.1	1.00	-0.32	0.95
10,230.0	89.00	89.00	6,495.4	486.8	3,838.7	-1,215.8	0.60	-0.42	-0.42
10,325.0	89.90	87.80	6,496.3	489.4	3,933.6	-1,254.4	1.58	0.95	-1.26
10,419.0	91.50	89.20	6,495.2	491.9	4,027.6	-1,292.6	2.26	1.70	1.49
10,514.0	90.10	87.30	6,493.9	494.8	4,122.5	-1,331.0	2.48	-1.47	-2.00
10,609.0	90.00	86.90	6,493.8	499.6	4,217.4	-1,367.5	0.43	-0.11	-0.42
10,687.0	90.50	87.30	6,493.4	503.5	4,295.3	-1,397.6	0.82	0.64	0.51
10,742.0	90.50	87.30	6,493.0	506.1	4,350.3	-1,418.9	0.00	0.00	0.00
Kummer PC LE23-65HN BHL 2640'FSL & 660'FEL									

Checked By: _____ Approved By: _____ Date: _____