

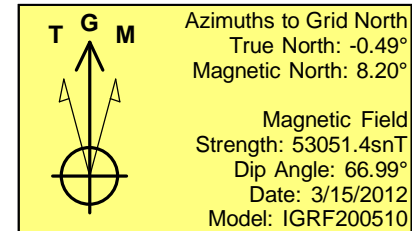
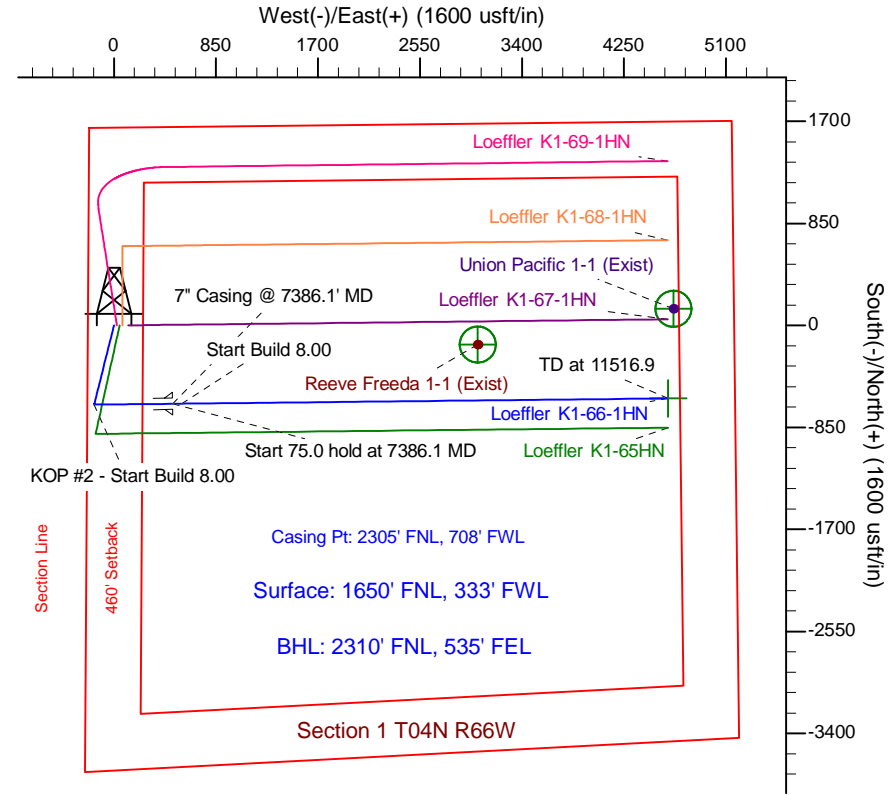
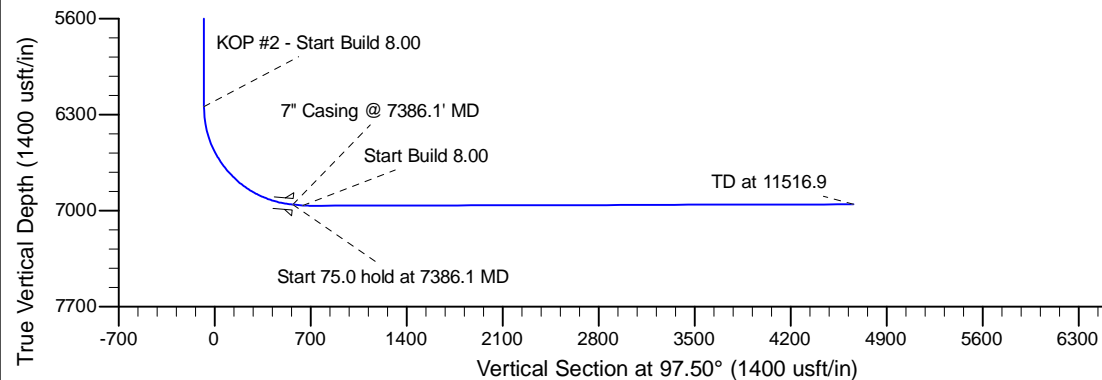
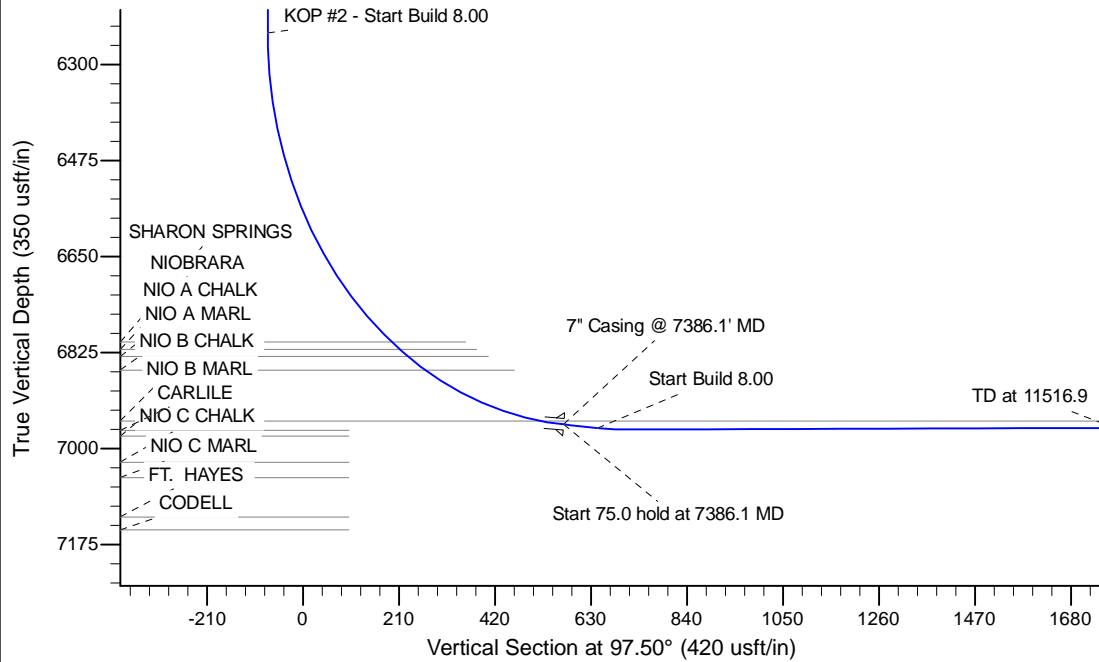
Project: Wattenberg Field
Site: K (Sec.1-T04-R66W) Weld County, CO
Well: Loeffler K1-66-1HN
Wellbore: Original Drilling
Design: APD - Rev 1

Northern Region Drilling

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Northern Zone
System Datum: Mean Sea Level

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1500.0	0.00	0.00	1500.0	0.0	0.0	0.00	0.00	0.0	
3	2251.3	15.03	194.04	2242.7	-95.0	-23.8	2.00	194.04	-11.1	
4	4119.8	15.03	194.04	4047.3	-565.0	-141.2	0.00	0.00	-66.3	
5	4871.1	0.00	0.00	4790.0	-660.0	-165.0	2.00	180.00	-77.4	
6	6323.6	0.00	0.00	6242.5	-660.0	-165.0	0.00	0.00	-77.4	
7	7386.1	85.00	89.38	6956.0	-652.9	488.7	8.00	89.38	569.8	
8	7461.1	85.00	89.38	6962.5	-652.1	563.4	0.00	0.00	643.8	
9	7525.4	90.15	89.38	6965.2	-651.4	627.7	8.00	0.00	707.4	
10	11516.9	90.15	89.38	6954.8	-608.1	4618.9	0.00	0.00	4658.8	Loeffler K1-66-1HN BHL 2310'FNL & 535'FEL



WELL DETAILS: Loeffler K1-66-1HN				
Ground Level: 4667.0				
0.0	0.0	Northing	Easting	Latitude
		1369045.52	3213498.88	40.343900
				Longitude
				-104.734050
Plan: APD - Rev 1 (Loeffler K1-66-1HN/Original Drilling)				
Created By: Shailey Jewell		Date: 8:45, April 23 2013		
Checked: _____		Date: _____		
Reviewed: _____		Date: _____		
Approved: _____		Date: _____		

Northern Region Drilling

Wattenberg Field

K (04-66W)

Loeffler K1-66-1HN

Original Drilling

Plan: APD - Rev 1

Standard Planning Report

23 April, 2013

Noble Energy Inc

Planning Report

Database:	EDM Production	Local Co-ordinate Reference:	Well Loeffler K1-66-1HN
Company:	Northern Region Drilling	TVD Reference:	WELLI @ 4683.0usft
Project:	Wattenberg Field	MD Reference:	WELLI @ 4683.0usft
Site:	K (04-66W)	North Reference:	Grid
Well:	Loeffler K1-66-1HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 1		

Project	Wattenberg Field, 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		Using geodetic scale factor

Site	K (04-66W)					
Site Position:		Northing:	1,345,613.68 usft	Latitude:	40.279820	
From:	Lat/Long	Easting:	3,203,135.01 usft	Longitude:	-104.771920	
Position Uncertainty:		0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.47 °

Well		Loeffler K1-66-1HN				
Well Position	+N/-S	23,432.8 usft	Northing:	1,369,045.52 usft	Latitude:	40.343900
	+E/-W	10,364.3 usft	Easting:	3,213,498.88 usft	Longitude:	-104.734050
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	4,667.0 usft

Wellbore	Original Drilling				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	3/15/2012	8.70	66.99	53,051

Design	APD - Rev 1			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	97.50

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,251.3	15.03	194.04	2,242.7	-95.0	-23.8	2.00	2.00	0.00	194.04	
4,119.8	15.03	194.04	4,047.3	-565.0	-141.2	0.00	0.00	0.00	0.00	
4,871.1	0.00	0.00	4,790.0	-660.0	-165.0	2.00	-2.00	0.00	180.00	
6,323.6	0.00	0.00	6,242.5	-660.0	-165.0	0.00	0.00	0.00	0.00	
7,386.1	85.00	89.38	6,956.0	-652.9	488.7	8.00	8.00	0.00	89.38	
7,461.1	85.00	89.38	6,962.5	-652.1	563.4	0.00	0.00	0.00	0.00	
7,525.4	90.15	89.38	6,965.2	-651.4	627.7	8.00	8.00	0.00	0.00	
11,516.9	90.15	89.38	6,954.8	-608.1	4,618.9	0.00	0.00	0.00	0.00	Loeffler K1-66-1HN B

Noble Energy Inc

Planning Report

Database:	EDM Production	Local Co-ordinate Reference:	Well Loeffler K1-66-1HN
Company:	Northern Region Drilling	TVD Reference:	WELLI @ 4683.0usft
Project:	Wattenberg Field	MD Reference:	WELLI @ 4683.0usft
Site:	K (04-66W)	North Reference:	Grid
Well:	Loeffler K1-66-1HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 1		

Planned 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
50.0	0.00	0.00	50.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
150.0	0.00	0.00	150.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
250.0	0.00	0.00	250.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
350.0	0.00	0.00	350.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
450.0	0.00	0.00	450.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
550.0	0.00	0.00	550.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
650.0	0.00	0.00	650.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
750.0	0.00	0.00	750.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
850.0	0.00	0.00	850.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
950.0	0.00	0.00	950.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,050.0	0.00	0.00	1,050.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,150.0	0.00	0.00	1,150.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,250.0	0.00	0.00	1,250.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,350.0	0.00	0.00	1,350.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,450.0	0.00	0.00	1,450.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP - Start Build 2.00									
1,550.0	1.00	194.04	1,550.0	-0.4	-0.1	0.0	2.00	2.00	0.00
1,600.0	2.00	194.04	1,600.0	-1.7	-0.4	-0.2	2.00	2.00	0.00
1,650.0	3.00	194.04	1,649.9	-3.8	-1.0	-0.4	2.00	2.00	0.00
1,700.0	4.00	194.04	1,699.8	-6.8	-1.7	-0.8	2.00	2.00	0.00
1,750.0	5.00	194.04	1,749.7	-10.6	-2.6	-1.2	2.00	2.00	0.00
1,800.0	6.00	194.04	1,799.5	-15.2	-3.8	-1.8	2.00	2.00	0.00
1,850.0	7.00	194.04	1,849.1	-20.7	-5.2	-2.4	2.00	2.00	0.00
1,900.0	8.00	194.04	1,898.7	-27.0	-6.8	-3.2	2.00	2.00	0.00
1,950.0	9.00	194.04	1,948.2	-34.2	-8.6	-4.0	2.00	2.00	0.00
2,000.0	10.00	194.04	1,997.5	-42.2	-10.6	-5.0	2.00	2.00	0.00
2,050.0	11.00	194.04	2,046.6	-51.1	-12.8	-6.0	2.00	2.00	0.00
2,100.0	12.00	194.04	2,095.6	-60.7	-15.2	-7.1	2.00	2.00	0.00
2,150.0	13.00	194.04	2,144.4	-71.2	-17.8	-8.4	2.00	2.00	0.00
2,200.0	14.00	194.04	2,193.1	-82.6	-20.6	-9.7	2.00	2.00	0.00
2,250.0	15.00	194.04	2,241.5	-94.7	-23.7	-11.1	2.00	2.00	0.00
2,251.3	15.03	194.04	2,242.7	-95.0	-23.8	-11.1	2.00	2.00	0.00
2,300.0	15.03	194.04	2,289.8	-107.3	-26.8	-12.6	0.00	0.00	0.00
2,350.0	15.03	194.04	2,338.0	-119.9	-30.0	-14.1	0.00	0.00	0.00
2,400.0	15.03	194.04	2,386.3	-132.4	-33.1	-15.5	0.00	0.00	0.00
2,450.0	15.03	194.04	2,434.6	-145.0	-36.3	-17.0	0.00	0.00	0.00
2,500.0	15.03	194.04	2,482.9	-157.6	-39.4	-18.5	0.00	0.00	0.00
2,541.5	15.03	194.04	2,523.0	-168.0	-42.0	-19.7	0.00	0.00	0.00

Noble Energy Inc

Planning Report

Database:	EDM Production	Local Co-ordinate Reference:	Well Loeffler K1-66-1HN
Company:	Northern Region Drilling	TVD Reference:	WELLI @ 4683.0usft
Project:	Wattenberg Field	MD Reference:	WELLI @ 4683.0usft
Site:	K (04-66W)	North Reference:	Grid
Well:	Loeffler K1-66-1HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 1		

Planned 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)
PIERRE									
2,550.0	15.03	194.04	2,531.2	-170.2	-42.5	-20.0	0.00	0.00	0.00
2,600.0	15.03	194.04	2,579.5	-182.7	-45.7	-21.4	0.00	0.00	0.00
2,650.0	15.03	194.04	2,627.8	-195.3	-48.8	-22.9	0.00	0.00	0.00
2,700.0	15.03	194.04	2,676.1	-207.9	-52.0	-24.4	0.00	0.00	0.00
2,750.0	15.03	194.04	2,724.4	-220.5	-55.1	-25.9	0.00	0.00	0.00
2,800.0	15.03	194.04	2,772.7	-233.0	-58.3	-27.3	0.00	0.00	0.00
2,850.0	15.03	194.04	2,820.9	-245.6	-61.4	-28.8	0.00	0.00	0.00
2,900.0	15.03	194.04	2,869.2	-258.2	-64.5	-30.3	0.00	0.00	0.00
2,950.0	15.03	194.04	2,917.5	-270.8	-67.7	-31.8	0.00	0.00	0.00
3,000.0	15.03	194.04	2,965.8	-283.3	-70.8	-33.2	0.00	0.00	0.00
3,050.0	15.03	194.04	3,014.1	-295.9	-74.0	-34.7	0.00	0.00	0.00
3,100.0	15.03	194.04	3,062.4	-308.5	-77.1	-36.2	0.00	0.00	0.00
3,150.0	15.03	194.04	3,110.7	-321.1	-80.3	-37.7	0.00	0.00	0.00
3,200.0	15.03	194.04	3,159.0	-333.6	-83.4	-39.1	0.00	0.00	0.00
3,250.0	15.03	194.04	3,207.3	-346.2	-86.6	-40.6	0.00	0.00	0.00
3,300.0	15.03	194.04	3,255.6	-358.8	-89.7	-42.1	0.00	0.00	0.00
3,350.0	15.03	194.04	3,303.9	-371.4	-92.8	-43.6	0.00	0.00	0.00
3,400.0	15.03	194.04	3,352.1	-383.9	-96.0	-45.0	0.00	0.00	0.00
3,450.0	15.03	194.04	3,400.4	-396.5	-99.1	-46.5	0.00	0.00	0.00
3,500.0	15.03	194.04	3,448.7	-409.1	-102.3	-48.0	0.00	0.00	0.00
3,550.0	15.03	194.04	3,497.0	-421.7	-105.4	-49.5	0.00	0.00	0.00
3,600.0	15.03	194.04	3,545.3	-434.2	-108.6	-50.9	0.00	0.00	0.00
3,612.1	15.03	194.04	3,557.0	-437.3	-109.3	-51.3	0.00	0.00	0.00
PARKMAN									
3,650.0	15.03	194.04	3,593.6	-446.8	-111.7	-52.4	0.00	0.00	0.00
3,700.0	15.03	194.04	3,641.9	-459.4	-114.8	-53.9	0.00	0.00	0.00
3,750.0	15.03	194.04	3,690.2	-472.0	-118.0	-55.4	0.00	0.00	0.00
3,800.0	15.03	194.04	3,738.5	-484.6	-121.1	-56.8	0.00	0.00	0.00
3,850.0	15.03	194.04	3,786.8	-497.1	-124.3	-58.3	0.00	0.00	0.00
3,900.0	15.03	194.04	3,835.0	-509.7	-127.4	-59.8	0.00	0.00	0.00
3,950.0	15.03	194.04	3,883.3	-522.3	-130.6	-61.3	0.00	0.00	0.00
4,000.0	15.03	194.04	3,931.6	-534.9	-133.7	-62.8	0.00	0.00	0.00
4,050.0	15.03	194.04	3,979.9	-547.4	-136.9	-64.2	0.00	0.00	0.00
4,100.0	15.03	194.04	4,028.2	-560.0	-140.0	-65.7	0.00	0.00	0.00
4,119.8	15.03	194.04	4,047.3	-565.0	-141.2	-66.3	0.00	0.00	0.00
Start Drop -2.00									
4,150.0	14.42	194.04	4,076.5	-572.4	-143.1	-67.2	2.00	-2.00	0.00
4,200.0	13.42	194.04	4,125.1	-584.1	-146.0	-68.5	2.00	-2.00	0.00
4,250.0	12.42	194.04	4,173.8	-594.9	-148.7	-69.8	2.00	-2.00	0.00
4,300.0	11.42	194.04	4,222.7	-605.0	-151.2	-71.0	2.00	-2.00	0.00
4,350.0	10.42	194.04	4,271.8	-614.2	-153.5	-72.1	2.00	-2.00	0.00
4,363.4	10.15	194.04	4,285.0	-616.5	-154.1	-72.3	2.00	-2.00	0.00
SUSSEX									
4,400.0	9.42	194.04	4,321.1	-622.5	-155.6	-73.0	2.00	-2.00	0.00
4,450.0	8.42	194.04	4,370.5	-630.0	-157.5	-73.9	2.00	-2.00	0.00
4,500.0	7.42	194.04	4,420.0	-636.7	-159.2	-74.7	2.00	-2.00	0.00
4,550.0	6.42	194.04	4,469.6	-642.6	-160.6	-75.4	2.00	-2.00	0.00
4,600.0	5.42	194.04	4,519.4	-647.6	-161.9	-76.0	2.00	-2.00	0.00
4,650.0	4.42	194.04	4,569.2	-651.7	-162.9	-76.5	2.00	-2.00	0.00
4,700.0	3.42	194.04	4,619.1	-655.0	-163.8	-76.9	2.00	-2.00	0.00
4,750.0	2.42	194.04	4,669.0	-657.5	-164.4	-77.1	2.00	-2.00	0.00
4,800.0	1.42	194.04	4,719.0	-659.1	-164.8	-77.3	2.00	-2.00	0.00

Noble Energy Inc

Planning Report

Database:	EDM Production	Local Co-ordinate Reference:	Well Loeffler K1-66-1HN
Company:	Northern Region Drilling	TVD Reference:	WELLI @ 4683.0usft
Project:	Wattenberg Field	MD Reference:	WELLI @ 4683.0usft
Site:	K (04-66W)	North Reference:	Grid
Well:	Loeffler K1-66-1HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 1		

Planned 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)
4,850.0	0.42	194.04	4,769.0	-659.9	-165.0	-77.4	2.00	-2.00	0.00
4,871.1	0.00	0.00	4,790.0	-660.0	-165.0	-77.4	2.00	-2.00	0.00
4,900.0	0.00	0.00	4,818.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
4,924.1	0.00	0.00	4,843.0	-660.0	-165.0	-77.4	0.00	0.00	0.00
SHANNON									
4,950.0	0.00	0.00	4,868.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
5,000.0	0.00	0.00	4,918.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
5,050.0	0.00	0.00	4,968.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
5,100.0	0.00	0.00	5,018.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
5,150.0	0.00	0.00	5,068.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
5,200.0	0.00	0.00	5,118.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
5,250.0	0.00	0.00	5,168.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
5,300.0	0.00	0.00	5,218.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
5,350.0	0.00	0.00	5,268.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
5,400.0	0.00	0.00	5,318.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
5,450.0	0.00	0.00	5,368.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
5,500.0	0.00	0.00	5,418.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
5,550.0	0.00	0.00	5,468.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
5,600.0	0.00	0.00	5,518.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
5,650.0	0.00	0.00	5,568.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
5,700.0	0.00	0.00	5,618.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
5,750.0	0.00	0.00	5,668.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
5,800.0	0.00	0.00	5,718.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
5,850.0	0.00	0.00	5,768.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
5,900.0	0.00	0.00	5,818.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
5,950.0	0.00	0.00	5,868.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
6,000.0	0.00	0.00	5,918.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
6,050.0	0.00	0.00	5,968.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
6,100.0	0.00	0.00	6,018.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
6,116.0	0.00	0.00	6,035.0	-660.0	-165.0	-77.4	0.00	0.00	0.00
TEEPEE BUTTES									
6,150.0	0.00	0.00	6,068.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
6,200.0	0.00	0.00	6,118.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
6,250.0	0.00	0.00	6,168.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
6,300.0	0.00	0.00	6,218.9	-660.0	-165.0	-77.4	0.00	0.00	0.00
6,323.6	0.00	0.00	6,242.5	-660.0	-165.0	-77.4	0.00	0.00	0.00
KOP #2 - Start Build 8.00									
6,350.0	2.11	89.38	6,268.9	-660.0	-164.5	-77.0	8.01	8.01	0.00
6,400.0	6.11	89.38	6,318.8	-660.0	-160.9	-73.4	8.00	8.00	0.00
6,450.0	10.11	89.38	6,368.3	-659.9	-153.9	-66.4	8.00	8.00	0.00
6,500.0	14.11	89.38	6,417.2	-659.8	-143.4	-56.0	8.00	8.00	0.00
6,550.0	18.11	89.38	6,465.2	-659.6	-129.5	-42.3	8.00	8.00	0.00
6,600.0	22.11	89.38	6,512.1	-659.4	-112.3	-25.3	8.00	8.00	0.00
6,650.0	26.11	89.38	6,557.8	-659.2	-91.9	-5.1	8.00	8.00	0.00
6,700.0	30.11	89.38	6,601.9	-659.0	-68.3	18.3	8.00	8.00	0.00
6,750.0	34.11	89.38	6,644.2	-658.7	-41.8	44.6	8.00	8.00	0.00
6,800.0	38.11	89.38	6,684.6	-658.3	-12.3	73.7	8.00	8.00	0.00
6,850.0	42.11	89.38	6,722.8	-658.0	19.9	105.6	8.00	8.00	0.00
6,900.0	46.11	89.38	6,758.7	-657.6	54.7	140.1	8.00	8.00	0.00
6,950.0	50.11	89.38	6,792.1	-657.2	91.9	176.9	8.00	8.00	0.00
6,972.1	51.88	89.38	6,806.0	-657.0	109.1	193.9	8.00	8.00	0.00
SHARON SPRINGS									
6,993.6	53.60	89.38	6,819.0	-656.8	126.2	210.9	8.00	8.00	0.00

Noble Energy Inc

Planning Report

Database:	EDM Production	Local Co-ordinate Reference:	Well Loeffler K1-66-1HN
Company:	Northern Region Drilling	TVD Reference:	WELLI @ 4683.0usft
Project:	Wattenberg Field	MD Reference:	WELLI @ 4683.0usft
Site:	K (04-66W)	North Reference:	Grid
Well:	Loeffler K1-66-1HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 1		

Planned 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)	
NIOBRARA										
7,000.0	54.11	89.38	6,822.8	-656.8	131.4	216.0	8.00	8.00	0.00	
7,016.0	55.39	89.38	6,832.0	-656.6	144.4	228.9	8.00	8.00	0.00	
NIO A CHALK										
7,050.0	58.11	89.38	6,850.6	-656.3	172.9	257.1	8.00	8.00	0.00	
7,062.2	59.09	89.38	6,857.0	-656.2	183.3	267.4	8.00	8.00	0.00	
NIO A MARL										
7,100.0	62.11	89.38	6,875.6	-655.9	216.2	300.0	8.00	8.00	0.00	
7,150.0	66.11	89.38	6,897.4	-655.4	261.2	344.5	8.00	8.00	0.00	
7,200.0	70.11	89.38	6,916.0	-654.9	307.6	390.4	8.00	8.00	0.00	
7,250.0	74.11	89.38	6,931.4	-654.4	355.1	437.5	8.00	8.00	0.00	
7,300.0	78.11	89.38	6,943.4	-653.8	403.7	485.6	8.00	8.00	0.00	
7,336.7	81.05	89.38	6,950.0	-653.4	439.8	521.3	8.00	8.00	0.00	
NIO B CHALK										
7,350.0	82.11	89.38	6,951.9	-653.3	452.9	534.3	8.00	8.00	0.00	
7,386.1	85.00	89.38	6,956.0	-652.9	488.8	569.8	7.99	7.99	0.00	
Start 75.0 hold at 7386.1 MD - 7" Casing @ 7386.1' MD										
7,400.0	85.00	89.38	6,957.2	-652.8	502.6	583.5	0.00	0.00	0.00	
7,450.0	85.00	89.38	6,961.6	-652.2	552.4	632.8	0.00	0.00	0.00	
7,461.1	85.00	89.38	6,962.5	-652.1	563.5	643.8	0.00	0.00	0.00	
Start Build 8.00										
7,500.0	88.11	89.38	6,964.9	-651.7	602.3	682.2	8.01	8.01	0.00	
7,525.4	90.15	89.38	6,965.2	-651.4	627.7	707.4	8.00	8.00	0.00	
7,550.0	90.15	89.38	6,965.2	-651.1	652.3	731.7	0.00	0.00	0.00	
7,600.0	90.15	89.38	6,965.1	-650.6	702.3	781.2	0.00	0.00	0.00	
7,650.0	90.15	89.38	6,964.9	-650.1	752.3	830.7	0.00	0.00	0.00	
7,700.0	90.15	89.38	6,964.8	-649.5	802.3	880.2	0.00	0.00	0.00	
7,750.0	90.15	89.38	6,964.7	-649.0	852.3	929.7	0.00	0.00	0.00	
7,800.0	90.15	89.38	6,964.5	-648.4	902.3	979.2	0.00	0.00	0.00	
7,850.0	90.15	89.38	6,964.4	-647.9	952.3	1,028.7	0.00	0.00	0.00	
7,900.0	90.15	89.38	6,964.3	-647.3	1,002.3	1,078.2	0.00	0.00	0.00	
7,950.0	90.15	89.38	6,964.1	-646.8	1,052.3	1,127.7	0.00	0.00	0.00	
8,000.0	90.15	89.38	6,964.0	-646.3	1,102.3	1,177.2	0.00	0.00	0.00	
8,050.0	90.15	89.38	6,963.9	-645.7	1,152.3	1,226.7	0.00	0.00	0.00	
8,100.0	90.15	89.38	6,963.7	-645.2	1,202.3	1,276.2	0.00	0.00	0.00	
8,150.0	90.15	89.38	6,963.6	-644.6	1,252.3	1,325.7	0.00	0.00	0.00	
8,200.0	90.15	89.38	6,963.5	-644.1	1,302.3	1,375.2	0.00	0.00	0.00	
8,250.0	90.15	89.38	6,963.4	-643.6	1,352.3	1,424.7	0.00	0.00	0.00	
8,300.0	90.15	89.38	6,963.2	-643.0	1,402.2	1,474.2	0.00	0.00	0.00	
8,350.0	90.15	89.38	6,963.1	-642.5	1,452.2	1,523.7	0.00	0.00	0.00	
8,400.0	90.15	89.38	6,963.0	-641.9	1,502.2	1,573.2	0.00	0.00	0.00	
8,450.0	90.15	89.38	6,962.8	-641.4	1,552.2	1,622.7	0.00	0.00	0.00	
8,500.0	90.15	89.38	6,962.7	-640.8	1,602.2	1,672.2	0.00	0.00	0.00	
8,550.0	90.15	89.38	6,962.6	-640.3	1,652.2	1,721.7	0.00	0.00	0.00	
8,600.0	90.15	89.38	6,962.4	-639.8	1,702.2	1,771.2	0.00	0.00	0.00	
8,650.0	90.15	89.38	6,962.3	-639.2	1,752.2	1,820.7	0.00	0.00	0.00	
8,700.0	90.15	89.38	6,962.2	-638.7	1,802.2	1,870.2	0.00	0.00	0.00	
8,750.0	90.15	89.38	6,962.0	-638.1	1,852.2	1,919.7	0.00	0.00	0.00	
8,800.0	90.15	89.38	6,961.9	-637.6	1,902.2	1,969.2	0.00	0.00	0.00	
8,850.0	90.15	89.38	6,961.8	-637.0	1,952.2	2,018.7	0.00	0.00	0.00	
8,900.0	90.15	89.38	6,961.7	-636.5	2,002.2	2,068.2	0.00	0.00	0.00	
8,950.0	90.15	89.38	6,961.5	-636.0	2,052.2	2,117.7	0.00	0.00	0.00	
9,000.0	90.15	89.38	6,961.4	-635.4	2,102.2	2,167.2	0.00	0.00	0.00	

Noble Energy Inc

Planning Report

Database:	EDM Production	Local Co-ordinate Reference:	Well Loeffler K1-66-1HN
Company:	Northern Region Drilling	TVD Reference:	WELLI @ 4683.0usft
Project:	Wattenberg Field	MD Reference:	WELLI @ 4683.0usft
Site:	K (04-66W)	North Reference:	Grid
Well:	Loeffler K1-66-1HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 1		

Planned 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)	
9,050.0	90.15	89.38	6,961.3	-634.9	2,152.2	2,216.7	0.00	0.00	0.00	
9,100.0	90.15	89.38	6,961.1	-634.3	2,202.2	2,266.2	0.00	0.00	0.00	
9,150.0	90.15	89.38	6,961.0	-633.8	2,252.2	2,315.7	0.00	0.00	0.00	
9,200.0	90.15	89.38	6,960.9	-633.3	2,302.2	2,365.2	0.00	0.00	0.00	
9,250.0	90.15	89.38	6,960.7	-632.7	2,352.2	2,414.7	0.00	0.00	0.00	
9,300.0	90.15	89.38	6,960.6	-632.2	2,402.2	2,464.2	0.00	0.00	0.00	
9,350.0	90.15	89.38	6,960.5	-631.6	2,452.2	2,513.7	0.00	0.00	0.00	
9,400.0	90.15	89.38	6,960.3	-631.1	2,502.2	2,563.2	0.00	0.00	0.00	
9,450.0	90.15	89.38	6,960.2	-630.5	2,552.2	2,612.6	0.00	0.00	0.00	
9,500.0	90.15	89.38	6,960.1	-630.0	2,602.2	2,662.1	0.00	0.00	0.00	
9,550.0	90.15	89.38	6,959.9	-629.5	2,652.2	2,711.6	0.00	0.00	0.00	
9,600.0	90.15	89.38	6,959.8	-628.9	2,702.2	2,761.1	0.00	0.00	0.00	
9,650.0	90.15	89.38	6,959.7	-628.4	2,752.2	2,810.6	0.00	0.00	0.00	
9,700.0	90.15	89.38	6,959.6	-627.8	2,802.2	2,860.1	0.00	0.00	0.00	
9,750.0	90.15	89.38	6,959.4	-627.3	2,852.2	2,909.6	0.00	0.00	0.00	
9,800.0	90.15	89.38	6,959.3	-626.8	2,902.2	2,959.1	0.00	0.00	0.00	
9,850.0	90.15	89.38	6,959.2	-626.2	2,952.2	3,008.6	0.00	0.00	0.00	
9,900.0	90.15	89.38	6,959.0	-625.7	3,002.1	3,058.1	0.00	0.00	0.00	
9,933.6	90.15	89.38	6,958.9	-625.3	3,035.8	3,091.4	0.00	0.00	0.00	
Reeve Freeda 1-1 (Exist)										
9,950.0	90.15	89.38	6,958.9	-625.1	3,052.1	3,107.6	0.00	0.00	0.00	
10,000.0	90.15	89.38	6,958.8	-624.6	3,102.1	3,157.1	0.00	0.00	0.00	
10,050.0	90.15	89.38	6,958.6	-624.0	3,152.1	3,206.6	0.00	0.00	0.00	
10,100.0	90.15	89.38	6,958.5	-623.5	3,202.1	3,256.1	0.00	0.00	0.00	
10,150.0	90.15	89.38	6,958.4	-623.0	3,252.1	3,305.6	0.00	0.00	0.00	
10,200.0	90.15	89.38	6,958.2	-622.4	3,302.1	3,355.1	0.00	0.00	0.00	
10,250.0	90.15	89.38	6,958.1	-621.9	3,352.1	3,404.6	0.00	0.00	0.00	
10,300.0	90.15	89.38	6,958.0	-621.3	3,402.1	3,454.1	0.00	0.00	0.00	
10,350.0	90.15	89.38	6,957.9	-620.8	3,452.1	3,503.6	0.00	0.00	0.00	
10,400.0	90.15	89.38	6,957.7	-620.2	3,502.1	3,553.1	0.00	0.00	0.00	
10,450.0	90.15	89.38	6,957.6	-619.7	3,552.1	3,602.6	0.00	0.00	0.00	
10,500.0	90.15	89.38	6,957.5	-619.2	3,602.1	3,652.1	0.00	0.00	0.00	
10,550.0	90.15	89.38	6,957.3	-618.6	3,652.1	3,701.6	0.00	0.00	0.00	
10,600.0	90.15	89.38	6,957.2	-618.1	3,702.1	3,751.1	0.00	0.00	0.00	
10,650.0	90.15	89.38	6,957.1	-617.5	3,752.1	3,800.6	0.00	0.00	0.00	
10,700.0	90.15	89.38	6,956.9	-617.0	3,802.1	3,850.1	0.00	0.00	0.00	
10,750.0	90.15	89.38	6,956.8	-616.5	3,852.1	3,899.6	0.00	0.00	0.00	
10,800.0	90.15	89.38	6,956.7	-615.9	3,902.1	3,949.1	0.00	0.00	0.00	
10,850.0	90.15	89.38	6,956.5	-615.4	3,952.1	3,998.6	0.00	0.00	0.00	
10,900.0	90.15	89.38	6,956.4	-614.8	4,002.1	4,048.1	0.00	0.00	0.00	
10,950.0	90.15	89.38	6,956.3	-614.3	4,052.1	4,097.6	0.00	0.00	0.00	
11,000.0	90.15	89.38	6,956.2	-613.7	4,102.1	4,147.1	0.00	0.00	0.00	
11,050.0	90.15	89.38	6,956.0	-613.2	4,152.1	4,196.6	0.00	0.00	0.00	
11,100.0	90.15	89.38	6,955.9	-612.7	4,202.1	4,246.1	0.00	0.00	0.00	
11,150.0	90.15	89.38	6,955.8	-612.1	4,252.1	4,295.6	0.00	0.00	0.00	
11,200.0	90.15	89.38	6,955.6	-611.6	4,302.1	4,345.1	0.00	0.00	0.00	
11,250.0	90.15	89.38	6,955.5	-611.0	4,352.1	4,394.6	0.00	0.00	0.00	
11,300.0	90.15	89.38	6,955.4	-610.5	4,402.1	4,444.1	0.00	0.00	0.00	
11,350.0	90.15	89.38	6,955.2	-610.0	4,452.1	4,493.6	0.00	0.00	0.00	
11,400.0	90.15	89.38	6,955.1	-609.4	4,502.1	4,543.1	0.00	0.00	0.00	
11,450.0	90.15	89.38	6,955.0	-608.9	4,552.1	4,592.6	0.00	0.00	0.00	
11,500.0	90.15	89.38	6,954.8	-608.3	4,602.1	4,642.1	0.00	0.00	0.00	
11,516.9	90.15	89.38	6,954.8	-608.1	4,618.9	4,658.8	0.00	0.00	0.00	
TD at 11516.9 - Union Pacific 1-1 (Exist) - Loeffler K1-66-1HN BHL 2310'FNL, 535'FEL - Loeffler K1-66-1HN BHL 2310'FNL & 535'FEL										

Noble Energy Inc

Planning Report

Database:	EDM Production	Local Co-ordinate Reference:	Well Loeffler K1-66-1HN
Company:	Northern Region Drilling	TVD Reference:	WELLI @ 4683.0usft
Project:	Wattenberg Field	MD Reference:	WELLI @ 4683.0usft
Site:	K (04-66W)	North Reference:	Grid
Well:	Loeffler K1-66-1HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 1		

Planned 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)

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
Loeffler K1-66-1HN BHL	0.00	0.00	6,954.8	-608.1	4,618.9	1,368,437.40	3,218,117.59	40.342120	-104.717500
- plan hits target center									
- Point									
Union Pacific 1-1 (Exist)	0.00	0.00	7,267.0	139.1	4,662.5	1,369,184.61	3,218,161.17	40.344170	-104.717320
- plan misses target center by 811.0usft at 11516.9usft MD (6954.8 TVD, -608.1 N, 4618.9 E)									
- Circle (radius 150.0)									
Reeve Freeda 1-1 (Exist)	0.00	0.00	7,268.0	-159.4	3,031.6	1,368,886.11	3,216,530.31	40.343390	-104.723180
- plan misses target center by 559.1usft at 9933.6usft MD (6958.9 TVD, -625.3 N, 3035.8 E)									
- Circle (radius 150.0)									

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
7,386.1	6,956.0	7" Casing @ 7386.1' MD	7	8-3/4

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,541.5	2,523.0	PIERRE		0.00	
3,612.1	3,557.0	PARKMAN		0.00	
4,363.4	4,285.0	SUSSEX		0.00	
4,924.1	4,843.0	SHANNON		0.00	
6,116.0	6,035.0	TEEPEE BUTTES		0.00	
6,972.1	6,806.0	SHARON SPRINGS		0.00	
6,993.6	6,819.0	NIOBRARA		0.00	
7,016.0	6,832.0	NIO A CHALK		0.00	
7,062.2	6,857.0	NIO A MARL		0.00	
7,336.7	6,950.0	NIO B CHALK		0.00	

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,500.0	1,500.0	0.0	0.0	KOP - Start Build 2.00
4,119.8	4,047.3	-565.0	-141.2	Start Drop -2.00
6,323.6	6,242.5	-660.0	-165.0	KOP #2 - Start Build 8.00
7,386.1	6,956.0	-652.9	488.8	Start 75.0 hold at 7386.1 MD
7,461.1	6,962.5	-652.1	563.5	Start Build 8.00
11,516.9	6,954.8	-608.1	4,618.9	TD at 11516.9

Northern Region Drilling

Wattenberg Field

K (04-66W)

Loeffler K1-66-1HN

Original Drilling

APD - Rev 1

Anticollision Summary Report

23 April, 2013

Noble Energy Inc
Anticollision Summary Report

Company:	Northern Region Drilling	Local Co-ordinate Reference:	Well Loeffler K1-66-1HN
Project:	Wattenberg Field	TVD Reference:	WELLI @ 4683.0usft
Reference Site:	K (04-66W)	MD Reference:	WELLI @ 4683.0usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Loeffler K1-66-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.54 sigma
Reference Wellbore	Original Drilling	Database:	EDM Production
Reference Design:	APD - Rev 1	Offset TVD Reference:	Offset Datum

Reference	APD - Rev 1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.0 usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	4/17/2013		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	11,516.9	APD - Rev 1 (Original Drilling)	MWD	MWD - Standard

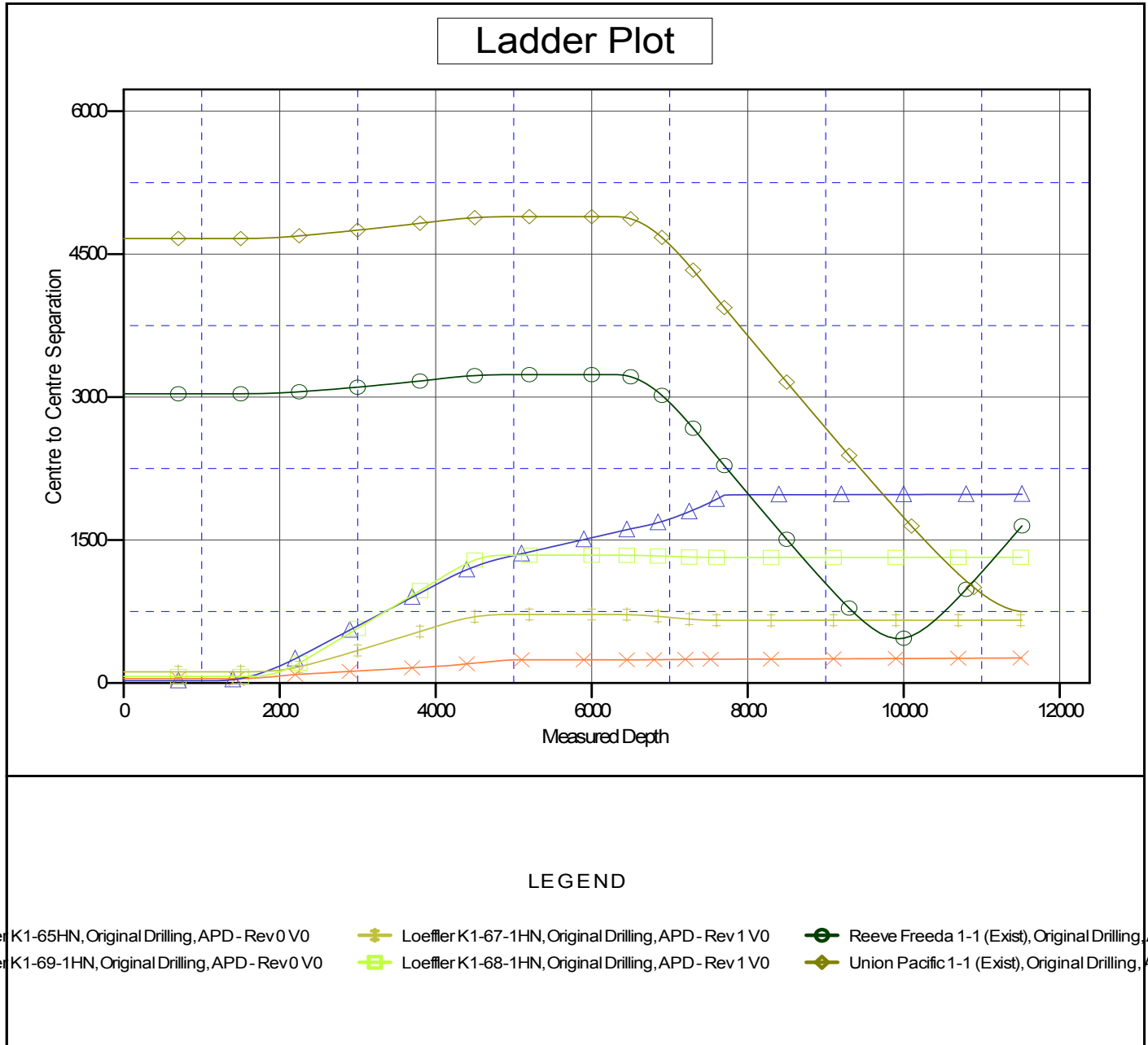
Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
K (04-66W)						
Loeffler K1-65HN - Original Drilling - APD - Rev 0	1,447.8	1,447.1	46.2	40.0	7.511	CC
Loeffler K1-65HN - Original Drilling - APD - Rev 0	11,516.9	11,606.1	263.3	21.0	1.087	Level 2, ES, SF
Loeffler K1-67-1HN - Original Drilling - APD - Rev 1	1,500.0	1,499.0	117.1	110.6	18.067	CC, ES
Loeffler K1-67-1HN - Original Drilling - APD - Rev 1	11,516.9	11,139.7	659.4	404.1	2.583	SF
Loeffler K1-68-1HN - Original Drilling - APD - Rev 1	1,500.0	1,499.0	69.7	63.2	10.754	CC, ES
Loeffler K1-68-1HN - Original Drilling - APD - Rev 1	11,516.9	11,259.5	1,318.8	1,062.2	5.140	SF
Loeffler K1-69-1HN - Original Drilling - APD - Rev 0	1,146.4	1,145.5	24.8	19.9	5.075	CC
Loeffler K1-69-1HN - Original Drilling - APD - Rev 0	1,200.0	1,198.9	25.0	19.9	4.877	ES, SF
Reeve Freeda 1-1 (Exist) - Original Drilling - As Drilled	9,934.5	6,948.9	465.9	240.1	2.063	CC, ES, SF
Union Pacific 1-1 (Exist) - Original Drilling - As Drilled	11,516.9	6,963.8	748.5	478.5	2.772	CC, ES, SF

Noble Energy Inc
Anticollision Summary Report

Company:	Northern Region Drilling	Local Co-ordinate Reference:	Well Loeffler K1-66-1HN
Project:	Wattenberg Field	TVD Reference:	WELLI @ 4683.0usft
Reference Site:	K (04-66W)	MD Reference:	WELLI @ 4683.0usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Loeffler K1-66-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.54 sigma
Reference Wellbore	Original Drilling	Database:	EDM Production
Reference Design:	APD - Rev 1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL1 @ 4683.0usft
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000

Coordinates are relative to: Loeffler K1-66-1HN
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.49°



Noble Energy Inc
Anticollision Summary Report

Company:	Northern Region Drilling	Local Co-ordinate Reference:	Well Loeffler K1-66-1HN
Project:	Wattenberg Field	TVD Reference:	WELLI @ 4683.0usft
Reference Site:	K (04-66W)	MD Reference:	WELLI @ 4683.0usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Loeffler K1-66-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.54 sigma
Reference Wellbore	Original Drilling	Database:	EDM Production
Reference Design:	APD - Rev 1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL1 @ 4683.0usft
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000

Coordinates are relative to: Loeffler K1-66-1HN
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.49°

