

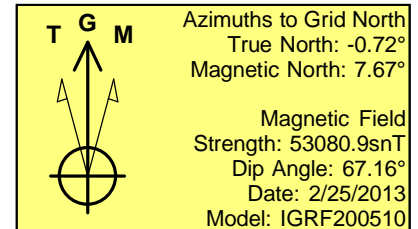
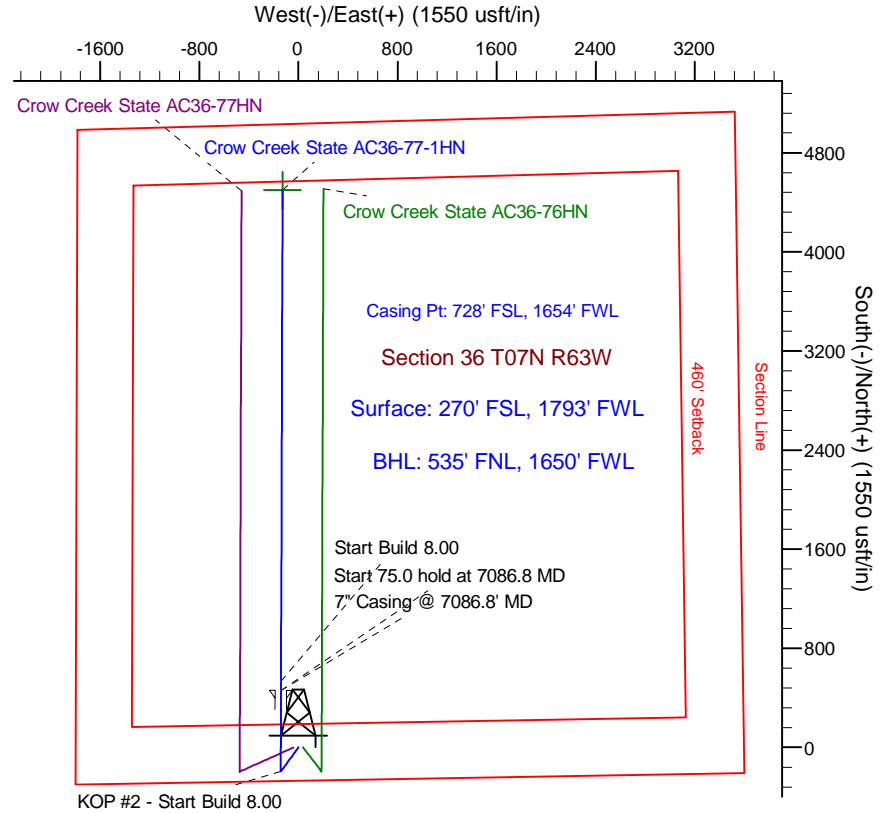
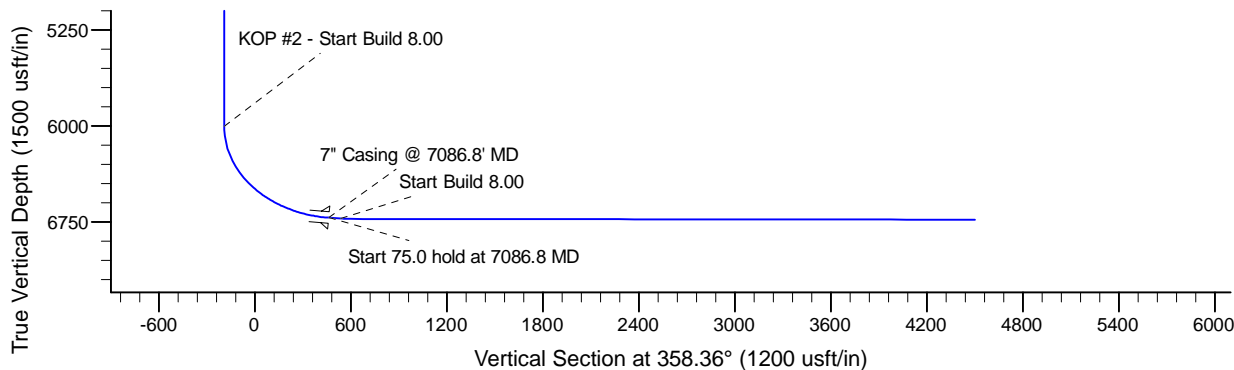
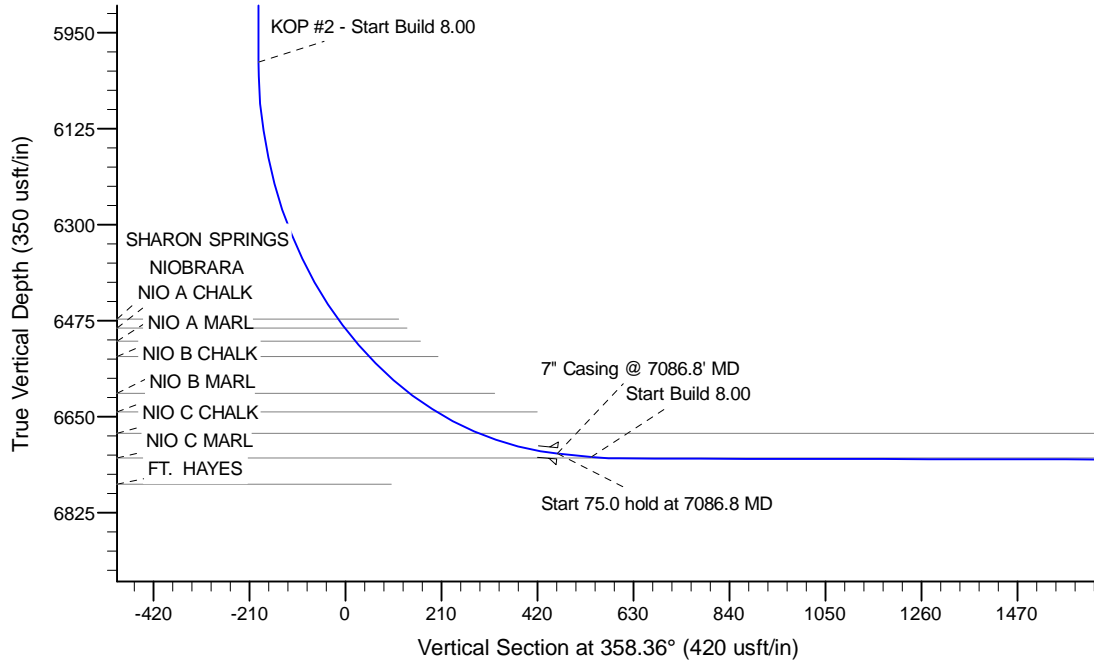
Project: Wattenberg Field  
Site: AC (Sec.36-T07N-R63W) Weld County, CO  
Well: Crow Creek State AC36-77-1HN  
Wellbore: Original Drilling  
Design: APD - Rev 0

# 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	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	2000.0	0.00	0.00	2000.0	0.0	0.0	0.00	0.00	0.0	
3	2599.8	12.00	216.25	2595.5	-50.5	-37.0	2.00	216.25	-49.4	
4	3161.2	12.00	216.25	3144.5	-144.5	-106.0	0.00	0.00	-141.5	
5	3761.0	0.00	0.00	3740.0	-195.0	-143.0	2.00	180.00	-190.8	
6	6024.3	0.00	0.00	6003.3	-195.0	-143.0	0.00	0.00	-190.8	
7	7086.8	85.00	0.17	6716.7	458.8	-141.0	8.00	0.17	462.6	
8	7161.8	85.00	0.17	6723.3	533.5	-140.8	0.00	0.00	537.3	
9	7223.0	89.90	0.17	6726.0	594.7	-140.6	8.00	0.00	598.4	
10	11126.5	89.90	0.17	6732.8	4498.1	-128.7	0.00	0.00	4499.9	Crow Creek State AC36-77-1HN BHL 535'FNL, 1650'FWL



## WELL DETAILS: Crow Creek State AC36-77-1HN

Ground Level: 4789.0			
Northing	Easting	Latitude	Longitude
0.0	0.0	1435519.84	3309186.44
		40.523580	-104.387800

Plan: APD - Rev 0 (Crow Creek State AC36-77-1HN/Original Drilling)

Created By: Shailey Jewell Date: 9:14, February 26 2013

Checked: \_\_\_\_\_ Date: \_\_\_\_\_

Reviewed: \_\_\_\_\_ Date: \_\_\_\_\_

Approved: \_\_\_\_\_ Date: \_\_\_\_\_

# **Northern Region Drilling**

**Wattenberg Field**

**AC (07N-63W)**

**Crow Creek State AC36-77-1HN**

**Original Drilling**

**Plan: APD - Rev 0**

## **Standard Planning Report**

**26 February, 2013**

# Noble Energy Inc

## Planning Report

<b>Database:</b>	edm10p	<b>Local Co-ordinate Reference:</b>	Well Crow Creek State AC36-77-1HN
<b>Company:</b>	Northern Region Drilling	<b>TVD Reference:</b>	WELL @ 4819.0usft (Original Well Elev)
<b>Project:</b>	Wattenberg Field	<b>MD Reference:</b>	WELL @ 4819.0usft (Original Well Elev)
<b>Site:</b>	AC (07N-63W)	<b>North Reference:</b>	Grid
<b>Well:</b>	Crow Creek State AC36-77-1HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	APD - Rev 0		

<b>Project</b>	Wattenberg Field, Weld County CO		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

<b>Site</b>	AC (07N-63W)		
<b>Site Position:</b>		<b>Northing:</b>	1,435,093.74 usft
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,291,559.33 usft
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "
		<b>Latitude:</b>	40.523000
		<b>Longitude:</b>	-104.451220
		<b>Grid Convergence:</b>	0.68 °

<b>Well</b>	Crow Creek State AC36-77-1HN		
<b>Well Position</b>	<b>+N/-S</b>	426.1 usft	<b>Northing:</b> 1,435,519.84 usft
	<b>+E/-W</b>	17,627.7 usft	<b>Easting:</b> 3,309,186.45 usft
<b>Position Uncertainty</b>	0.0 usft	<b>Wellhead Elevation:</b>	<b>Latitude:</b> 40.523580
			<b>Longitude:</b> -104.387800
			<b>Ground Level:</b> 4,789.0 usft

<b>Wellbore</b>	Original Drilling				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF200510	2/25/2013	8.39	67.16	53,081

<b>Design</b>	APD - Rev 0			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	358.36

<b>Plan Sections</b>										
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	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,599.8	12.00	216.25	2,595.5	-50.5	-37.0	2.00	2.00	0.00	216.25	
3,161.2	12.00	216.25	3,144.5	-144.5	-106.0	0.00	0.00	0.00	0.00	
3,761.0	0.00	0.00	3,740.0	-195.0	-143.0	2.00	-2.00	0.00	180.00	
6,024.3	0.00	0.00	6,003.3	-195.0	-143.0	0.00	0.00	0.00	0.00	
7,086.8	85.00	0.17	6,716.7	458.8	-141.0	8.00	8.00	0.00	0.17	
7,161.8	85.00	0.17	6,723.3	533.5	-140.8	0.00	0.00	0.00	0.00	
7,223.0	89.90	0.17	6,726.0	594.7	-140.6	8.00	8.00	0.00	0.00	
11,126.5	89.90	0.17	6,732.8	4,498.1	-128.7	0.00	0.00	0.00	0.00	Crow Creek State AC

# Noble Energy Inc

## Planning Report

<b>Database:</b>	edm10p	<b>Local Co-ordinate Reference:</b>	Well Crow Creek State AC36-77-1HN
<b>Company:</b>	Northern Region Drilling	<b>TVD Reference:</b>	WELL @ 4819.0usft (Original Well Elev)
<b>Project:</b>	Wattenberg Field	<b>MD Reference:</b>	WELL @ 4819.0usft (Original Well Elev)
<b>Site:</b>	AC (07N-63W)	<b>North Reference:</b>	Grid
<b>Well:</b>	Crow Creek State AC36-77-1HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	APD - Rev 0		

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
1,550.0	0.00	0.00	1,550.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,650.0	0.00	0.00	1,650.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,750.0	0.00	0.00	1,750.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,850.0	0.00	0.00	1,850.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,950.0	0.00	0.00	1,950.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP - Start Build 2.00									
2,050.0	1.00	216.25	2,050.0	-0.4	-0.3	-0.3	2.00	2.00	0.00
2,100.0	2.00	216.25	2,100.0	-1.4	-1.0	-1.4	2.00	2.00	0.00
2,150.0	3.00	216.25	2,149.9	-3.2	-2.3	-3.1	2.00	2.00	0.00
2,200.0	4.00	216.25	2,199.8	-5.6	-4.1	-5.5	2.00	2.00	0.00
2,250.0	5.00	216.25	2,249.7	-8.8	-6.4	-8.6	2.00	2.00	0.00
2,300.0	6.00	216.25	2,299.5	-12.7	-9.3	-12.4	2.00	2.00	0.00
2,350.0	7.00	216.25	2,349.1	-17.2	-12.6	-16.9	2.00	2.00	0.00
2,400.0	8.00	216.25	2,398.7	-22.5	-16.5	-22.0	2.00	2.00	0.00
2,450.0	9.00	216.25	2,448.2	-28.4	-20.9	-27.8	2.00	2.00	0.00
2,492.4	9.85	216.25	2,490.0	-34.0	-25.0	-33.3	2.00	2.00	0.00
PIERRE									
2,500.0	10.00	216.25	2,497.5	-35.1	-25.7	-34.3	2.00	2.00	0.00

# Noble Energy Inc

## Planning Report

<b>Database:</b>	edm10p	<b>Local Co-ordinate Reference:</b>	Well Crow Creek State AC36-77-1HN
<b>Company:</b>	Northern Region Drilling	<b>TVD Reference:</b>	WELL @ 4819.0usft (Original Well Elev)
<b>Project:</b>	Wattenberg Field	<b>MD Reference:</b>	WELL @ 4819.0usft (Original Well Elev)
<b>Site:</b>	AC (07N-63W)	<b>North Reference:</b>	Grid
<b>Well:</b>	Crow Creek State AC36-77-1HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	APD - Rev 0		

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)
2,550.0	11.00	216.25	2,546.6	-42.4	-31.1	-41.5	2.00	2.00	0.00
2,599.8	12.00	216.25	2,595.5	-50.5	-37.0	-49.4	2.00	2.00	0.00
2,600.0	12.00	216.25	2,595.6	-50.5	-37.0	-49.4	0.00	0.00	0.00
2,650.0	12.00	216.25	2,644.5	-58.9	-43.2	-57.6	0.00	0.00	0.00
2,700.0	12.00	216.25	2,693.4	-67.2	-49.3	-65.8	0.00	0.00	0.00
2,750.0	12.00	216.25	2,742.3	-75.6	-55.5	-74.0	0.00	0.00	0.00
2,800.0	12.00	216.25	2,791.3	-84.0	-61.6	-82.2	0.00	0.00	0.00
2,850.0	12.00	216.25	2,840.2	-92.4	-67.8	-90.4	0.00	0.00	0.00
2,900.0	12.00	216.25	2,889.1	-100.8	-73.9	-98.6	0.00	0.00	0.00
2,950.0	12.00	216.25	2,938.0	-109.1	-80.0	-106.8	0.00	0.00	0.00
3,000.0	12.00	216.25	2,986.9	-117.5	-86.2	-115.0	0.00	0.00	0.00
3,050.0	12.00	216.25	3,035.8	-125.9	-92.3	-123.2	0.00	0.00	0.00
3,100.0	12.00	216.25	3,084.7	-134.3	-98.5	-131.4	0.00	0.00	0.00
3,150.0	12.00	216.25	3,133.6	-142.7	-104.6	-139.6	0.00	0.00	0.00
3,161.2	12.00	216.25	3,144.6	-144.5	-106.0	-141.5	0.00	0.00	0.00
Start Drop -2.00									
3,200.0	11.22	216.25	3,182.6	-150.8	-110.6	-147.6	2.00	-2.00	0.00
3,250.0	10.22	216.25	3,231.7	-158.3	-116.1	-155.0	2.00	-2.00	0.00
3,300.0	9.22	216.25	3,281.0	-165.2	-121.1	-161.6	2.00	-2.00	0.00
3,350.0	8.22	216.25	3,330.4	-171.3	-125.6	-167.6	2.00	-2.00	0.00
3,400.0	7.22	216.25	3,379.9	-176.7	-129.6	-172.9	2.00	-2.00	0.00
3,450.0	6.22	216.25	3,429.6	-181.4	-133.0	-177.5	2.00	-2.00	0.00
3,500.0	5.22	216.25	3,479.4	-185.4	-136.0	-181.5	2.00	-2.00	0.00
3,550.0	4.22	216.25	3,529.2	-188.7	-138.4	-184.7	2.00	-2.00	0.00
3,600.0	3.22	216.25	3,579.1	-191.4	-140.3	-187.3	2.00	-2.00	0.00
3,627.0	2.68	216.25	3,606.0	-192.5	-141.1	-188.4	2.00	-2.00	0.00
PARKMAN									
3,650.0	2.22	216.25	3,629.0	-193.3	-141.7	-189.1	2.00	-2.00	0.00
3,700.0	1.22	216.25	3,679.0	-194.5	-142.6	-190.3	2.00	-2.00	0.00
3,750.0	0.22	216.25	3,729.0	-195.0	-143.0	-190.8	2.00	-2.00	0.00
3,761.0	0.00	0.00	3,740.0	-195.0	-143.0	-190.8	2.00	-2.00	0.00
3,800.0	0.00	0.00	3,779.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
3,850.0	0.00	0.00	3,829.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
3,900.0	0.00	0.00	3,879.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
3,950.0	0.00	0.00	3,929.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
4,000.0	0.00	0.00	3,979.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
4,050.0	0.00	0.00	4,029.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
4,100.0	0.00	0.00	4,079.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
4,150.0	0.00	0.00	4,129.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
4,200.0	0.00	0.00	4,179.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
4,250.0	0.00	0.00	4,229.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
4,300.0	0.00	0.00	4,279.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
4,350.0	0.00	0.00	4,329.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
4,400.0	0.00	0.00	4,379.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
4,419.0	0.00	0.00	4,398.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
SUSSEX									
4,450.0	0.00	0.00	4,429.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
4,500.0	0.00	0.00	4,479.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
4,550.0	0.00	0.00	4,529.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
4,600.0	0.00	0.00	4,579.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
4,650.0	0.00	0.00	4,629.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
4,700.0	0.00	0.00	4,679.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
4,750.0	0.00	0.00	4,729.0	-195.0	-143.0	-190.8	0.00	0.00	0.00

# Noble Energy Inc

## Planning Report

<b>Database:</b>	edm10p	<b>Local Co-ordinate Reference:</b>	Well Crow Creek State AC36-77-1HN
<b>Company:</b>	Northern Region Drilling	<b>TVD Reference:</b>	WELL @ 4819.0usft (Original Well Elev)
<b>Project:</b>	Wattenberg Field	<b>MD Reference:</b>	WELL @ 4819.0usft (Original Well Elev)
<b>Site:</b>	AC (07N-63W)	<b>North Reference:</b>	Grid
<b>Well:</b>	Crow Creek State AC36-77-1HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	APD - Rev 0		

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)
4,800.0	0.00	0.00	4,779.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
4,850.0	0.00	0.00	4,829.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
4,900.0	0.00	0.00	4,879.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
4,944.0	0.00	0.00	4,923.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
<b>SHANNON</b>									
4,950.0	0.00	0.00	4,929.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
5,000.0	0.00	0.00	4,979.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
5,050.0	0.00	0.00	5,029.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
5,100.0	0.00	0.00	5,079.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
5,150.0	0.00	0.00	5,129.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
5,200.0	0.00	0.00	5,179.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
5,250.0	0.00	0.00	5,229.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
5,300.0	0.00	0.00	5,279.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
5,350.0	0.00	0.00	5,329.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
5,400.0	0.00	0.00	5,379.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
5,450.0	0.00	0.00	5,429.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
5,500.0	0.00	0.00	5,479.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
5,550.0	0.00	0.00	5,529.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
5,600.0	0.00	0.00	5,579.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
5,650.0	0.00	0.00	5,629.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
5,700.0	0.00	0.00	5,679.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
5,750.0	0.00	0.00	5,729.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
5,800.0	0.00	0.00	5,779.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
5,850.0	0.00	0.00	5,829.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
5,900.0	0.00	0.00	5,879.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
5,907.0	0.00	0.00	5,886.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
<b>TEEPPEE BUTTES</b>									
5,950.0	0.00	0.00	5,929.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
6,000.0	0.00	0.00	5,979.0	-195.0	-143.0	-190.8	0.00	0.00	0.00
6,024.3	0.00	0.00	6,003.3	-195.0	-143.0	-190.8	0.00	0.00	0.00
<b>KOP #2 - Start Build 8.00</b>									
6,050.0	2.06	0.17	6,029.0	-194.5	-143.0	-190.4	8.01	8.01	0.00
6,100.0	6.06	0.17	6,078.9	-191.0	-143.0	-186.8	8.00	8.00	0.00
6,150.0	10.06	0.17	6,128.3	-184.0	-143.0	-179.8	8.00	8.00	0.00
6,200.0	14.06	0.17	6,177.2	-173.5	-142.9	-169.4	8.00	8.00	0.00
6,250.0	18.06	0.17	6,225.3	-159.7	-142.9	-155.6	8.00	8.00	0.00
6,300.0	22.06	0.17	6,272.2	-142.6	-142.8	-138.4	8.00	8.00	0.00
6,350.0	26.06	0.17	6,317.9	-122.2	-142.8	-118.1	8.00	8.00	0.00
6,400.0	30.06	0.17	6,362.0	-98.7	-142.7	-94.6	8.00	8.00	0.00
6,450.0	34.06	0.17	6,404.4	-72.1	-142.6	-68.0	8.00	8.00	0.00
6,500.0	38.06	0.17	6,444.8	-42.7	-142.5	-38.6	8.00	8.00	0.00
6,535.3	40.88	0.17	6,472.0	-20.3	-142.5	-16.2	8.00	8.00	0.00
<b>SHARON SPRINGS</b>									
6,550.0	42.06	0.17	6,483.0	-10.5	-142.4	-6.5	8.00	8.00	0.00
6,556.7	42.60	0.17	6,488.0	-6.0	-142.4	-1.9	8.00	8.00	0.00
<b>NIOBRARA</b>									
6,590.0	45.26	0.17	6,512.0	17.1	-142.4	21.2	8.00	8.00	0.00
<b>NIO A CHALK</b>									
6,600.0	46.06	0.17	6,519.0	24.2	-142.3	28.3	8.00	8.00	0.00
6,631.0	48.54	0.17	6,540.0	47.0	-142.3	51.1	8.00	8.00	0.00
<b>NIO A MARL</b>									
6,650.0	50.06	0.17	6,552.4	61.4	-142.2	65.4	8.00	8.00	0.00
6,700.0	54.06	0.17	6,583.1	100.8	-142.1	104.8	8.00	8.00	0.00

# Noble Energy Inc

## Planning Report

<b>Database:</b>	edm10p	<b>Local Co-ordinate Reference:</b>	Well Crow Creek State AC36-77-1HN
<b>Company:</b>	Northern Region Drilling	<b>TVD Reference:</b>	WELL @ 4819.0usft (Original Well Elev)
<b>Project:</b>	Wattenberg Field	<b>MD Reference:</b>	WELL @ 4819.0usft (Original Well Elev)
<b>Site:</b>	AC (07N-63W)	<b>North Reference:</b>	Grid
<b>Well:</b>	Crow Creek State AC36-77-1HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	APD - Rev 0		

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)	
6,742.5	57.46	0.17	6,607.0	135.9	-142.0	139.9	8.00	8.00	0.00	
<b>NIO B CHALK</b>										
6,750.0	58.06	0.17	6,611.0	142.3	-142.0	146.3	8.00	8.00	0.00	
6,800.0	62.06	0.17	6,636.0	185.6	-141.8	189.6	8.00	8.00	0.00	
6,810.9	62.93	0.17	6,641.0	195.3	-141.8	199.3	8.00	8.00	0.00	
<b>NIO B MARL</b>										
6,850.0	66.06	0.17	6,657.8	230.6	-141.7	234.5	8.00	8.00	0.00	
6,900.0	70.06	0.17	6,676.5	276.9	-141.6	280.9	8.00	8.00	0.00	
6,910.4	70.89	0.17	6,680.0	286.8	-141.5	290.7	8.00	8.00	0.00	
<b>NIO C CHALK</b>										
6,950.0	74.06	0.17	6,691.9	324.5	-141.4	328.4	8.00	8.00	0.00	
7,000.0	78.06	0.17	6,704.0	373.0	-141.3	376.9	8.00	8.00	0.00	
7,050.0	82.06	0.17	6,712.6	422.3	-141.1	426.1	8.00	8.00	0.00	
7,086.8	85.00	0.17	6,716.7	458.8	-141.0	462.7	7.99	7.99	0.00	
<b>Start 75.0 hold at 7086.8 MD - 7" Casing @ 7086.8' MD</b>										
7,100.0	85.00	0.17	6,717.9	472.0	-141.0	475.8	0.00	0.00	0.00	
7,150.0	85.00	0.17	6,722.2	521.8	-140.8	525.6	0.00	0.00	0.00	
7,161.8	85.00	0.17	6,723.3	533.5	-140.8	537.3	0.00	0.00	0.00	
<b>Start Build 8.00</b>										
7,186.6	86.99	0.17	6,725.0	558.3	-140.7	562.1	8.01	8.01	0.00	
<b>NIO C MARL</b>										
7,200.0	88.06	0.17	6,725.6	571.7	-140.7	575.4	8.00	8.00	0.00	
7,223.0	89.90	0.17	6,726.0	594.7	-140.6	598.4	8.00	8.00	0.00	
7,250.0	89.90	0.17	6,726.0	621.6	-140.5	625.4	0.00	0.00	0.00	
7,300.0	89.90	0.17	6,726.1	671.6	-140.4	675.4	0.00	0.00	0.00	
7,350.0	89.90	0.17	6,726.2	721.6	-140.2	725.4	0.00	0.00	0.00	
7,400.0	89.90	0.17	6,726.3	771.6	-140.1	775.3	0.00	0.00	0.00	
7,450.0	89.90	0.17	6,726.4	821.6	-139.9	825.3	0.00	0.00	0.00	
7,500.0	89.90	0.17	6,726.5	871.6	-139.7	875.3	0.00	0.00	0.00	
7,550.0	89.90	0.17	6,726.6	921.6	-139.6	925.3	0.00	0.00	0.00	
7,600.0	89.90	0.17	6,726.6	971.6	-139.4	975.2	0.00	0.00	0.00	
7,650.0	89.90	0.17	6,726.7	1,021.6	-139.3	1,025.2	0.00	0.00	0.00	
7,700.0	89.90	0.17	6,726.8	1,071.6	-139.1	1,075.2	0.00	0.00	0.00	
7,750.0	89.90	0.17	6,726.9	1,121.6	-139.0	1,125.2	0.00	0.00	0.00	
7,800.0	89.90	0.17	6,727.0	1,171.6	-138.8	1,175.1	0.00	0.00	0.00	
7,850.0	89.90	0.17	6,727.1	1,221.6	-138.7	1,225.1	0.00	0.00	0.00	
7,900.0	89.90	0.17	6,727.2	1,271.6	-138.5	1,275.1	0.00	0.00	0.00	
7,950.0	89.90	0.17	6,727.3	1,321.6	-138.4	1,325.1	0.00	0.00	0.00	
8,000.0	89.90	0.17	6,727.3	1,371.6	-138.2	1,375.0	0.00	0.00	0.00	
8,050.0	89.90	0.17	6,727.4	1,421.6	-138.1	1,425.0	0.00	0.00	0.00	
8,100.0	89.90	0.17	6,727.5	1,471.6	-137.9	1,475.0	0.00	0.00	0.00	
8,150.0	89.90	0.17	6,727.6	1,521.6	-137.8	1,525.0	0.00	0.00	0.00	
8,200.0	89.90	0.17	6,727.7	1,571.6	-137.6	1,574.9	0.00	0.00	0.00	
8,250.0	89.90	0.17	6,727.8	1,621.6	-137.5	1,624.9	0.00	0.00	0.00	
8,300.0	89.90	0.17	6,727.9	1,671.6	-137.3	1,674.9	0.00	0.00	0.00	
8,350.0	89.90	0.17	6,728.0	1,721.6	-137.2	1,724.9	0.00	0.00	0.00	
8,400.0	89.90	0.17	6,728.0	1,771.6	-137.0	1,774.8	0.00	0.00	0.00	
8,450.0	89.90	0.17	6,728.1	1,821.6	-136.9	1,824.8	0.00	0.00	0.00	
8,500.0	89.90	0.17	6,728.2	1,871.6	-136.7	1,874.8	0.00	0.00	0.00	
8,550.0	89.90	0.17	6,728.3	1,921.6	-136.5	1,924.8	0.00	0.00	0.00	
8,600.0	89.90	0.17	6,728.4	1,971.6	-136.4	1,974.7	0.00	0.00	0.00	
8,650.0	89.90	0.17	6,728.5	2,021.6	-136.2	2,024.7	0.00	0.00	0.00	
8,700.0	89.90	0.17	6,728.6	2,071.6	-136.1	2,074.7	0.00	0.00	0.00	

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<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	APD - Rev 0		

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)
8,750.0	89.90	0.17	6,728.7	2,121.6	-135.9	2,124.7	0.00	0.00	0.00
8,800.0	89.90	0.17	6,728.7	2,171.6	-135.8	2,174.6	0.00	0.00	0.00
8,850.0	89.90	0.17	6,728.8	2,221.6	-135.6	2,224.6	0.00	0.00	0.00
8,900.0	89.90	0.17	6,728.9	2,271.6	-135.5	2,274.6	0.00	0.00	0.00
8,950.0	89.90	0.17	6,729.0	2,321.6	-135.3	2,324.6	0.00	0.00	0.00
9,000.0	89.90	0.17	6,729.1	2,371.6	-135.2	2,374.5	0.00	0.00	0.00
9,050.0	89.90	0.17	6,729.2	2,421.6	-135.0	2,424.5	0.00	0.00	0.00
9,100.0	89.90	0.17	6,729.3	2,471.6	-134.9	2,474.5	0.00	0.00	0.00
9,150.0	89.90	0.17	6,729.4	2,521.6	-134.7	2,524.5	0.00	0.00	0.00
9,200.0	89.90	0.17	6,729.4	2,571.6	-134.6	2,574.4	0.00	0.00	0.00
9,250.0	89.90	0.17	6,729.5	2,621.6	-134.4	2,624.4	0.00	0.00	0.00
9,300.0	89.90	0.17	6,729.6	2,671.6	-134.3	2,674.4	0.00	0.00	0.00
9,350.0	89.90	0.17	6,729.7	2,721.6	-134.1	2,724.4	0.00	0.00	0.00
9,400.0	89.90	0.17	6,729.8	2,771.6	-134.0	2,774.3	0.00	0.00	0.00
9,450.0	89.90	0.17	6,729.9	2,821.6	-133.8	2,824.3	0.00	0.00	0.00
9,500.0	89.90	0.17	6,730.0	2,871.6	-133.7	2,874.3	0.00	0.00	0.00
9,550.0	89.90	0.17	6,730.0	2,921.6	-133.5	2,924.3	0.00	0.00	0.00
9,600.0	89.90	0.17	6,730.1	2,971.6	-133.3	2,974.2	0.00	0.00	0.00
9,650.0	89.90	0.17	6,730.2	3,021.6	-133.2	3,024.2	0.00	0.00	0.00
9,700.0	89.90	0.17	6,730.3	3,071.6	-133.0	3,074.2	0.00	0.00	0.00
9,750.0	89.90	0.17	6,730.4	3,121.6	-132.9	3,124.2	0.00	0.00	0.00
9,800.0	89.90	0.17	6,730.5	3,171.6	-132.7	3,174.1	0.00	0.00	0.00
9,850.0	89.90	0.17	6,730.6	3,221.6	-132.6	3,224.1	0.00	0.00	0.00
9,900.0	89.90	0.17	6,730.7	3,271.6	-132.4	3,274.1	0.00	0.00	0.00
9,950.0	89.90	0.17	6,730.7	3,321.6	-132.3	3,324.1	0.00	0.00	0.00
10,000.0	89.90	0.17	6,730.8	3,371.6	-132.1	3,374.0	0.00	0.00	0.00
10,050.0	89.90	0.17	6,730.9	3,421.6	-132.0	3,424.0	0.00	0.00	0.00
10,100.0	89.90	0.17	6,731.0	3,471.6	-131.8	3,474.0	0.00	0.00	0.00
10,150.0	89.90	0.17	6,731.1	3,521.6	-131.7	3,524.0	0.00	0.00	0.00
10,200.0	89.90	0.17	6,731.2	3,571.6	-131.5	3,573.9	0.00	0.00	0.00
10,250.0	89.90	0.17	6,731.3	3,621.6	-131.4	3,623.9	0.00	0.00	0.00
10,300.0	89.90	0.17	6,731.4	3,671.6	-131.2	3,673.9	0.00	0.00	0.00
10,350.0	89.90	0.17	6,731.4	3,721.6	-131.1	3,723.9	0.00	0.00	0.00
10,400.0	89.90	0.17	6,731.5	3,771.6	-130.9	3,773.8	0.00	0.00	0.00
10,450.0	89.90	0.17	6,731.6	3,821.6	-130.8	3,823.8	0.00	0.00	0.00
10,500.0	89.90	0.17	6,731.7	3,871.6	-130.6	3,873.8	0.00	0.00	0.00
10,550.0	89.90	0.17	6,731.8	3,921.6	-130.5	3,923.8	0.00	0.00	0.00
10,600.0	89.90	0.17	6,731.9	3,971.6	-130.3	3,973.7	0.00	0.00	0.00
10,650.0	89.90	0.17	6,732.0	4,021.6	-130.1	4,023.7	0.00	0.00	0.00
10,700.0	89.90	0.17	6,732.1	4,071.6	-130.0	4,073.7	0.00	0.00	0.00
10,750.0	89.90	0.17	6,732.1	4,121.6	-129.8	4,123.7	0.00	0.00	0.00
10,800.0	89.90	0.17	6,732.2	4,171.6	-129.7	4,173.6	0.00	0.00	0.00
10,850.0	89.90	0.17	6,732.3	4,221.6	-129.5	4,223.6	0.00	0.00	0.00
10,900.0	89.90	0.17	6,732.4	4,271.6	-129.4	4,273.6	0.00	0.00	0.00
10,950.0	89.90	0.17	6,732.5	4,321.6	-129.2	4,323.6	0.00	0.00	0.00
11,000.0	89.90	0.17	6,732.6	4,371.6	-129.1	4,373.5	0.00	0.00	0.00
11,050.0	89.90	0.17	6,732.7	4,421.6	-128.9	4,423.5	0.00	0.00	0.00
11,100.0	89.90	0.17	6,732.8	4,471.6	-128.8	4,473.5	0.00	0.00	0.00
11,126.5	89.90	0.17	6,732.8	4,498.1	-128.7	4,499.9	0.00	0.00	0.00
TD at 11126.5 - Crow Creek State AC36-77-1HN BHL 535'FNL, 1650'FWL									



# Noble Energy Inc

## Planning Report

<b>Database:</b>	edm10p	<b>Local Co-ordinate Reference:</b>	Well Crow Creek State AC36-77-1HN
<b>Company:</b>	Northern Region Drilling	<b>TVD Reference:</b>	WELL @ 4819.0usft (Original Well Elev)
<b>Project:</b>	Wattenberg Field	<b>MD Reference:</b>	WELL @ 4819.0usft (Original Well Elev)
<b>Site:</b>	AC (07N-63W)	<b>North Reference:</b>	Grid
<b>Well:</b>	Crow Creek State AC36-77-1HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	APD - Rev 0		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
Crow Creek State AC36	0.00	0.00	6,732.8	4,498.1	-128.7	1,440,017.80	3,309,057.76	40.535930	-104.388060
- plan hits target center									
- Point									

Casing Points				
Measured Depth	Vertical Depth	Name	Casing Diameter	Hole Diameter
(usft)	(usft)		(")	(")
7,086.8	6,716.7	7" Casing @ 7086.8' MD	7	8-3/4

Formations						
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction	
(usft)	(usft)			(°)	(°)	
2,492.4	2,490.0	PIERRE		0.00		
3,627.0	3,606.0	PARKMAN		0.00		
4,419.0	4,398.0	SUSSEX		0.00		
4,944.0	4,923.0	SHANNON		0.00		
5,907.0	5,886.0	TEEPEE BUTTES		0.00		
6,535.3	6,472.0	SHARON SPRINGS		0.00		
6,556.7	6,488.0	NIOBRARA		0.00		
6,590.0	6,512.0	NIO A CHALK		0.00		
6,631.0	6,540.0	NIO A MARL		0.00		
6,742.5	6,607.0	NIO B CHALK		0.00		
6,810.9	6,641.0	NIO B MARL		0.00		
6,910.4	6,680.0	NIO C CHALK		0.00		
7,186.6	6,725.0	NIO C MARL		0.00		

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(usft)	(usft)	+N/-S	+E/-W	
(usft)	(usft)	(usft)	(usft)	
2,000.0	2,000.0	0.0	0.0	KOP - Start Build 2.00
3,161.2	3,144.6	-144.5	-106.0	Start Drop -2.00
6,024.3	6,003.3	-195.0	-143.0	KOP #2 - Start Build 8.00
7,086.8	6,716.7	458.8	-141.0	Start 75.0 hold at 7086.8 MD
7,161.8	6,723.3	533.5	-140.8	Start Build 8.00
11,126.5	6,732.8	4,498.1	-128.7	TD at 11126.5

# **Northern Region Drilling**

**Wattenberg Field**

**AC (07N-63W)**

**Crow Creek State AC36-77-1HN**

**Original Drilling**

**APD - Rev 0**

## **Anticollision Summary Report**

**26 February, 2013**

**Noble Energy Inc**  
Anticollision Summary Report

<b>Company:</b>	Northern Region Drilling	<b>Local Co-ordinate Reference:</b>	Well Crow Creek State AC36-77-1HN
<b>Project:</b>	Wattenberg Field	<b>TVD Reference:</b>	WELL @ 4819.0usft (Original Well Elev)
<b>Reference Site:</b>	AC (07N-63W)	<b>MD Reference:</b>	WELL @ 4819.0usft (Original Well Elev)
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Crow Creek State AC36-77-1HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.54 sigma
<b>Reference Wellbore</b>	Original Drilling	<b>Database:</b>	edm10p
<b>Reference Design:</b>	APD - Rev 0	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	APD - Rev 0		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	Stations	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 10,000.0 usft	<b>Error Surface:</b>	Elliptical Conic
<b>Warning Levels Evaluated at:</b>	2.00 Sigma	<b>Casing Method:</b>	Not applied

<b>Survey Tool Program</b>	<b>Date</b>	2/25/2013		
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.0	11,126.3	APD - Rev 0 (Original Drilling)	MWD	MWD - Standard

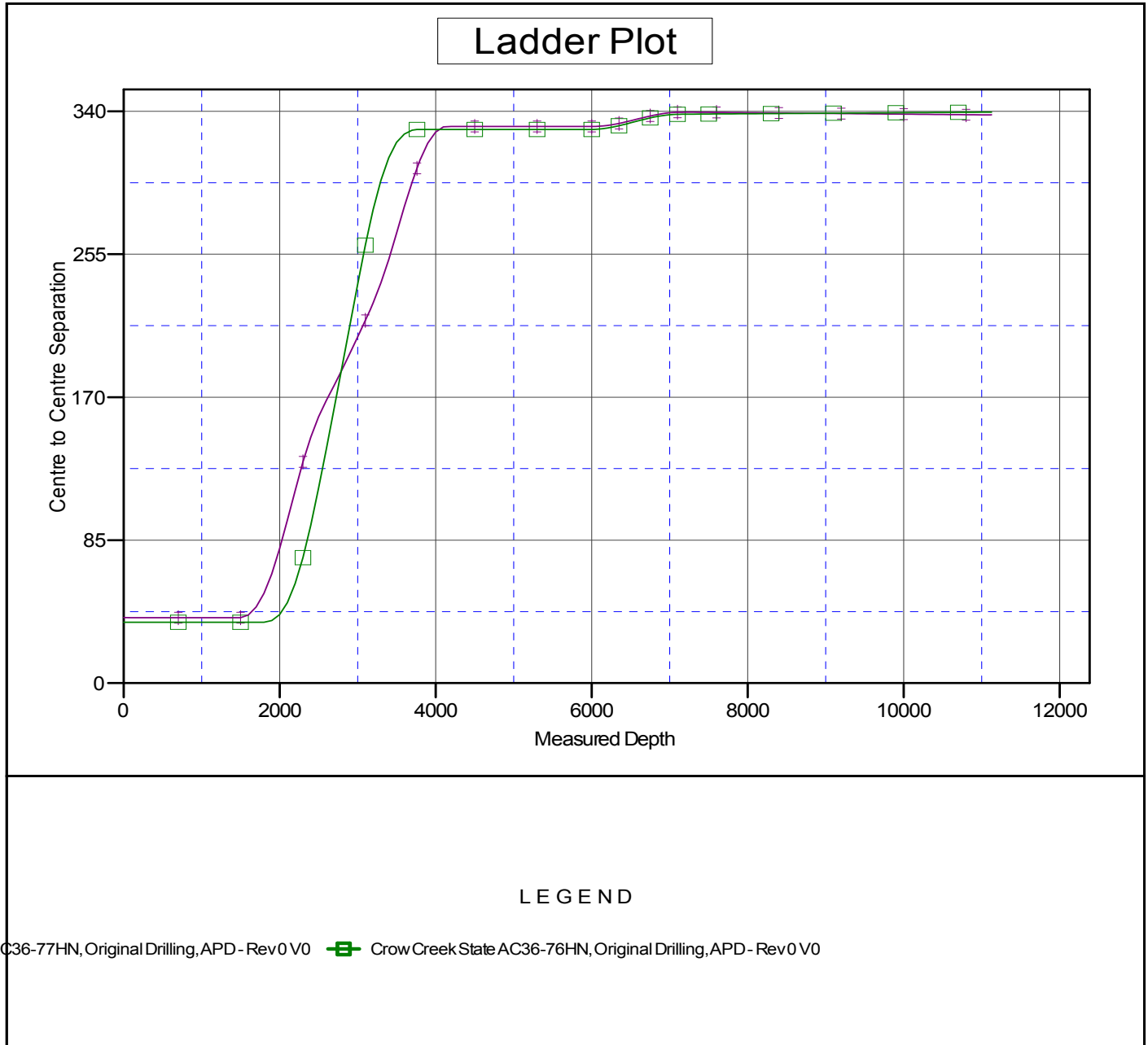
<b>Summary</b>						
<b>Site Name</b>	<b>Reference Measured Depth (usft)</b>	<b>Offset Measured Depth (usft)</b>	<b>Distance Between Centres (usft)</b>	<b>Distance Between Ellipses (usft)</b>	<b>Separation Factor</b>	<b>Warning</b>
<b>Offset Well - Wellbore - Design</b>						
AC (07N-63W)						
Crow Creek State AC36-76HN - Original Drilling - APD -	1,800.0	1,800.0	36.1	28.3	4.634	CC, ES
Crow Creek State AC36-76HN - Original Drilling - APD -	11,126.8	11,048.8	339.5	167.6	1.975	SF
Crow Creek State AC36-77HN - Original Drilling - APD -	1,500.0	1,499.0	38.9	32.5	6.036	CC, ES
Crow Creek State AC36-77HN - Original Drilling - APD -	11,126.8	11,072.8	337.9	165.3	1.957	SF

**Noble Energy Inc**  
Anticollision Summary Report

<b>Company:</b>	Northern Region Drilling	<b>Local Co-ordinate Reference:</b>	Well Crow Creek State AC36-77-1HN
<b>Project:</b>	Wattenberg Field	<b>TVD Reference:</b>	WELL @ 4819.0usft (Original Well Elev)
<b>Reference Site:</b>	AC (07N-63W)	<b>MD Reference:</b>	WELL @ 4819.0usft (Original Well Elev)
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Crow Creek State AC36-77-1HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.54 sigma
<b>Reference Wellbore</b>	Original Drilling	<b>Database:</b>	edm10p
<b>Reference Design:</b>	APD - Rev 0	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4819.0usft (Original Well Ele)  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.500000

Coordinates are relative to: Crow Creek State AC36-77-1HN  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: 0.72°



**Noble Energy Inc**  
Anticollision Summary Report

<b>Company:</b>	Northern Region Drilling	<b>Local Co-ordinate Reference:</b>	Well Crow Creek State AC36-77-1HN
<b>Project:</b>	Wattenberg Field	<b>TVD Reference:</b>	WELL @ 4819.0usft (Original Well Elev)
<b>Reference Site:</b>	AC (07N-63W)	<b>MD Reference:</b>	WELL @ 4819.0usft (Original Well Elev)
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Crow Creek State AC36-77-1HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.54 sigma
<b>Reference Wellbore</b>	Original Drilling	<b>Database:</b>	edm10p
<b>Reference Design:</b>	APD - Rev 0	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4819.0usft (Original Well Ele  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.500000

Coordinates are relative to: Crow Creek State AC36-77-1HN  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: 0.72°

