

Project: Mustang  
 Site: Y Section 07  
 Well: Pioneer D31-716  
 Wellbore: Pioneer D31-716  
 Design: Plan #1

# Northern Region - DJ Basin

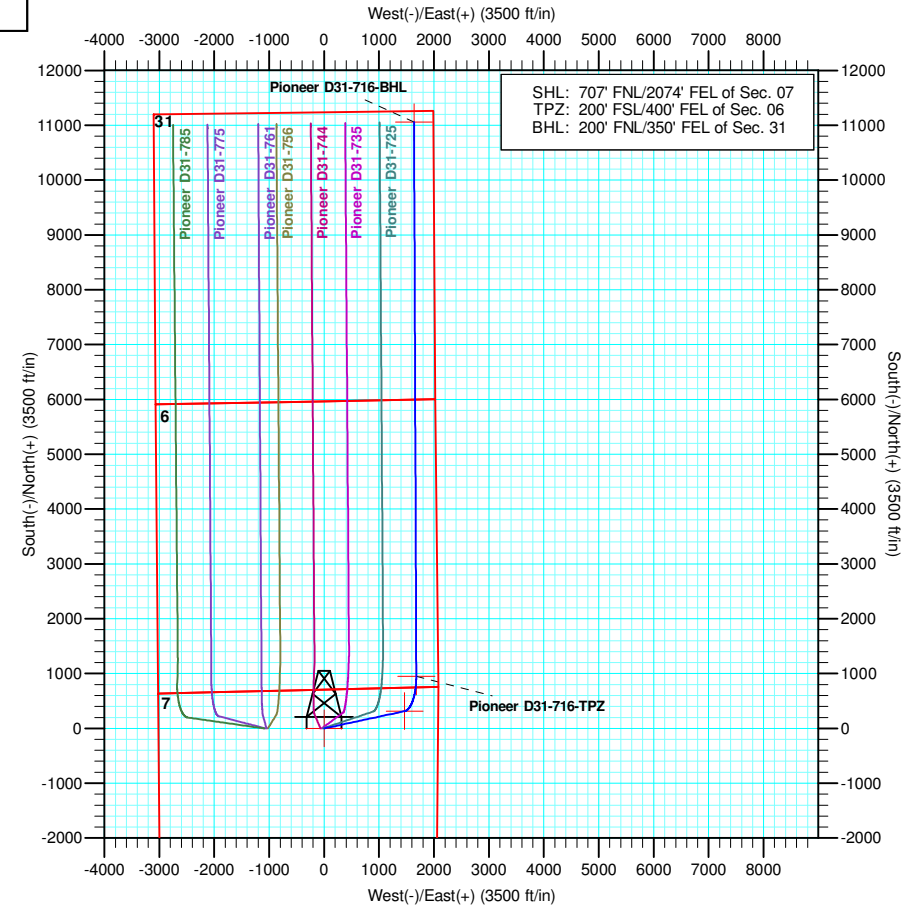
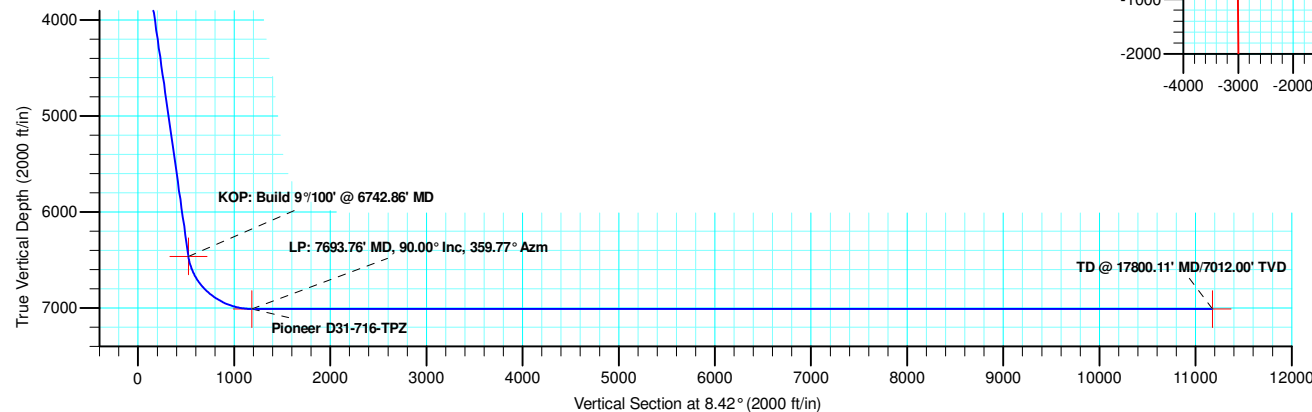
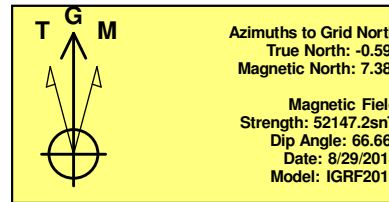
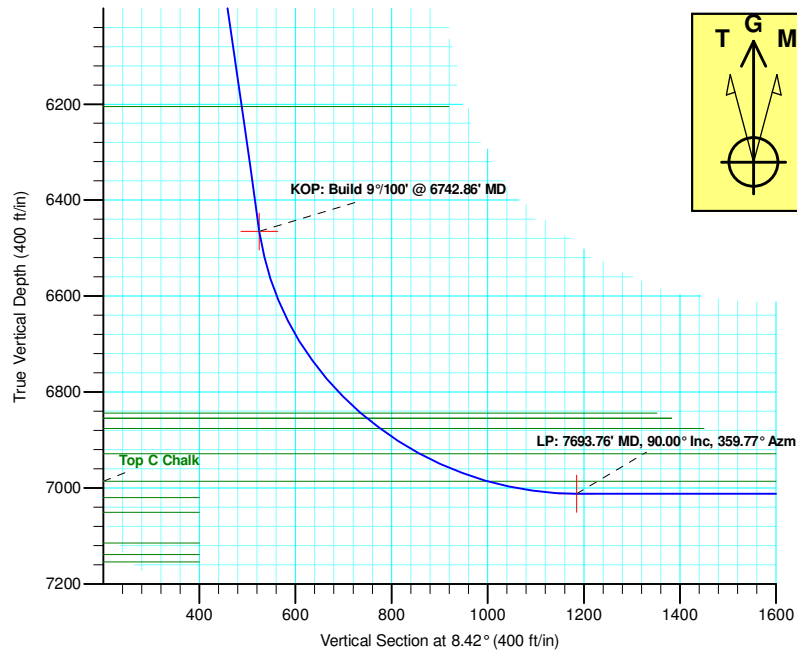
Geodetic System: US State Plane 1983  
 Datum: North American Datum 1983  
 Ellipsoid: GRS 1980  
 Zone: Colorado Northern Zone  
 System Datum: Mean Sea Level

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	2200.00	0.00	0.00	2200.00	0.00	0.00	0.00	0.00	0.00	
3	3299.51	21.99	77.89	3272.72	43.71	203.79	2.00	77.89	73.08	
4	6742.86	21.99	77.89	6465.55	314.10	1464.47	0.00	0.00	525.20	
5	7693.76	90.00	359.77	7012.00	949.69	1677.85	9.00	-78.97	1185.19	Pioneer D31-716-TPZ
6	17800.11	90.00	359.77	7012.00	11055.96	1636.92	0.00	0.00	11176.48	Pioneer D31-716-BHL

WELL DETAILS: Pioneer D31-716

+N/-S	+E/-W	Northing	Ground Level: Easting	4880.00 Latitude	Longitude	Slot
0.00	0.00	1301718.00	3253750.29	40.1580450	-104.5921260	



Plan: Plan #1 (Pioneer D31-716/Pioneer D31-716)

Created By: Keith Noack Date: 14:15, September 26 2018

# **Northern Region - DJ Basin**

**Mustang**

**Y Section 07**

**Pioneer D31-716**

**Pioneer D31-716**

**Plan: Plan #1**

## **Standard Planning Report**

**26 September, 2018**

# Noble Energy, Inc.

## Planning Report

<b>Database:</b>	EDMP	<b>Local Co-ordinate Reference:</b>	Well Pioneer D31-716
<b>Company:</b>	Northern Region - DJ Basin	<b>TVD Reference:</b>	Well @ 4910.00ft
<b>Project:</b>	Mustang	<b>MD Reference:</b>	Well @ 4910.00ft
<b>Site:</b>	Y Section 07	<b>North Reference:</b>	Grid
<b>Well:</b>	Pioneer D31-716	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Pioneer D31-716		
<b>Design:</b>	Plan #1		

<b>Project</b>	Mustang, Weld County Colorado		
<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		

Site		Y Section 07			
Site Position:		Northing:	1,301,764.67 usft	Latitude:	40.1582400
From:	Lat/Long	Easting:	3,251,358.82 usft	Longitude:	-104.6006800
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.58

Well	Pioneer D31-716					
Well Position	+N/-S	-46.67 ft	Northing:	1,301,718.00 usft	Latitude:	40.1580450
	+E/-W	2,391.48 ft	Easting:	3,253,750.29 usft	Longitude:	-104.5921260
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	4,880.00 ft

<b>Wellbore</b>	Pioneer D31-716				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	8/29/2018	7.97	66.66	52,147.20898741

<b>Design</b>	Plan #1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	8.42

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,299.51	21.99	77.89	3,272.72	43.71	203.79	2.00	2.00	0.00	77.89	
6,742.86	21.99	77.89	6,465.55	314.10	1,464.47	0.00	0.00	0.00	0.00	
7,693.76	90.00	359.77	7,012.00	949.69	1,677.85	9.00	7.15	-8.22	-78.97	Pioneer D31-716-TI
17,800.11	90.00	359.77	7,012.00	11,055.96	1,636.92	0.00	0.00	0.00	0.00	Pioneer D31-716-B

# Noble Energy, Inc.

## Planning Report

<b>Database:</b>	EDMP	<b>Local Co-ordinate Reference:</b>	Well Pioneer D31-716
<b>Company:</b>	Northern Region - DJ Basin	<b>TVD Reference:</b>	Well @ 4910.00ft
<b>Project:</b>	Mustang	<b>MD Reference:</b>	Well @ 4910.00ft
<b>Site:</b>	Y Section 07	<b>North Reference:</b>	Grid
<b>Well:</b>	Pioneer D31-716	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Pioneer D31-716		
<b>Design:</b>	Plan #1		

Planned 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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
693.00	0.00	0.00	693.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Fox Hills - Pierre</b>									
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,041.00	0.00	0.00	1,041.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Upper Pierre Aquifer Top</b>									
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,850.00	0.00	0.00	1,850.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Upper Pierre Aquifer Base</b>									
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Build: 2°/100'</b>									
2,300.00	2.00	77.89	2,299.98	0.37	1.71	0.61	2.00	2.00	0.00
2,400.00	4.00	77.89	2,399.84	1.46	6.82	2.45	2.00	2.00	0.00
2,500.00	6.00	77.89	2,499.45	3.29	15.34	5.50	2.00	2.00	0.00
2,600.00	8.00	77.89	2,598.70	5.85	27.26	9.78	2.00	2.00	0.00
2,700.00	10.00	77.89	2,697.47	9.13	42.55	15.26	2.00	2.00	0.00
2,800.00	12.00	77.89	2,795.62	13.13	61.21	21.95	2.00	2.00	0.00
2,900.00	14.00	77.89	2,893.06	17.85	83.20	29.84	2.00	2.00	0.00
3,000.00	16.00	77.89	2,989.64	23.27	108.51	38.91	2.00	2.00	0.00
3,100.00	18.00	77.89	3,085.27	29.40	137.10	49.17	2.00	2.00	0.00
3,200.00	20.00	77.89	3,179.82	36.23	168.93	60.58	2.00	2.00	0.00
3,299.51	21.99	77.89	3,272.72	43.71	203.79	73.08	2.00	2.00	0.00
<b>Hold: 21.99° Inc, 77.89° Azm</b>									
3,400.00	21.99	77.89	3,365.89	51.60	240.58	86.28	0.00	0.00	0.00
3,500.00	21.99	77.89	3,458.62	59.45	277.19	99.41	0.00	0.00	0.00
3,600.00	21.99	77.89	3,551.34	67.30	313.80	112.54	0.00	0.00	0.00
3,700.00	21.99	77.89	3,644.07	75.16	350.41	125.67	0.00	0.00	0.00
3,800.00	21.99	77.89	3,736.79	83.01	387.03	138.80	0.00	0.00	0.00
3,900.00	21.99	77.89	3,829.52	90.86	423.64	151.93	0.00	0.00	0.00
4,000.00	21.99	77.89	3,922.24	98.71	460.25	165.06	0.00	0.00	0.00
4,007.29	21.99	77.89	3,929.00	99.29	462.92	166.01	0.00	0.00	0.00
<b>Parkman</b>									
4,100.00	21.99	77.89	4,014.97	106.57	496.86	178.19	0.00	0.00	0.00
4,200.00	21.99	77.89	4,107.69	114.42	533.48	191.32	0.00	0.00	0.00

# Noble Energy, Inc.

## Planning Report

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<b>Company:</b>	Northern Region - DJ Basin	<b>TVD Reference:</b>	Well @ 4910.00ft
<b>Project:</b>	Mustang	<b>MD Reference:</b>	Well @ 4910.00ft
<b>Site:</b>	Y Section 07	<b>North Reference:</b>	Grid
<b>Well:</b>	Pioneer D31-716	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Pioneer D31-716		
<b>Design:</b>	Plan #1		

Planned 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)
4,300.00	21.99	77.89	4,200.42	122.27	570.09	204.45	0.00	0.00	0.00
4,400.00	21.99	77.89	4,293.14	130.12	606.70	217.58	0.00	0.00	0.00
4,500.00	21.99	77.89	4,385.87	137.98	643.31	230.71	0.00	0.00	0.00
4,600.00	21.99	77.89	4,478.59	145.83	679.92	243.84	0.00	0.00	0.00
4,618.78	21.99	77.89	4,496.00	147.30	686.80	246.30	0.00	0.00	0.00
<b>Sussex</b>									
4,700.00	21.99	77.89	4,571.32	153.68	716.54	256.97	0.00	0.00	0.00
4,800.00	21.99	77.89	4,664.04	161.53	753.15	270.10	0.00	0.00	0.00
4,900.00	21.99	77.89	4,756.76	169.39	789.76	283.23	0.00	0.00	0.00
5,000.00	21.99	77.89	4,849.49	177.24	826.37	296.36	0.00	0.00	0.00
5,100.00	21.99	77.89	4,942.21	185.09	862.99	309.49	0.00	0.00	0.00
5,200.00	21.99	77.89	5,034.94	192.94	899.60	322.62	0.00	0.00	0.00
5,300.00	21.99	77.89	5,127.66	200.80	936.21	335.75	0.00	0.00	0.00
5,400.00	21.99	77.89	5,220.39	208.65	972.82	348.88	0.00	0.00	0.00
5,461.05	21.99	77.89	5,277.00	213.44	995.18	356.89	0.00	0.00	0.00
<b>Shannon</b>									
5,500.00	21.99	77.89	5,313.11	216.50	1,009.44	362.01	0.00	0.00	0.00
5,600.00	21.99	77.89	5,405.84	224.35	1,046.05	375.14	0.00	0.00	0.00
5,700.00	21.99	77.89	5,498.56	232.21	1,082.66	388.27	0.00	0.00	0.00
5,800.00	21.99	77.89	5,591.29	240.06	1,119.27	401.40	0.00	0.00	0.00
5,900.00	21.99	77.89	5,684.01	247.91	1,155.88	414.53	0.00	0.00	0.00
6,000.00	21.99	77.89	5,776.74	255.76	1,192.50	427.66	0.00	0.00	0.00
6,100.00	21.99	77.89	5,869.46	263.62	1,229.11	440.79	0.00	0.00	0.00
6,200.00	21.99	77.89	5,962.19	271.47	1,265.72	453.92	0.00	0.00	0.00
6,300.00	21.99	77.89	6,054.91	279.32	1,302.33	467.05	0.00	0.00	0.00
6,400.00	21.99	77.89	6,147.64	287.17	1,338.95	480.18	0.00	0.00	0.00
6,461.87	21.99	77.89	6,205.00	292.03	1,361.60	488.30	0.00	0.00	0.00
<b>Teepee Buttes</b>									
6,500.00	21.99	77.89	6,240.36	295.03	1,375.56	493.31	0.00	0.00	0.00
6,600.00	21.99	77.89	6,333.09	302.88	1,412.17	506.44	0.00	0.00	0.00
6,700.00	21.99	77.89	6,425.81	310.73	1,448.78	519.57	0.00	0.00	0.00
6,742.86	21.99	77.89	6,465.55	314.10	1,464.47	525.20	0.00	0.00	0.00
<b>KOP: Build 9°/100' @ 6742.86' MD</b>									
6,750.00	22.12	76.22	6,472.17	314.70	1,467.09	526.17	9.00	1.84	-23.46
6,800.00	23.50	65.15	6,518.28	321.13	1,485.28	535.20	9.00	2.75	-22.15
6,850.00	25.56	55.49	6,563.78	331.44	1,503.23	548.03	9.00	4.13	-19.30
6,900.00	28.16	47.35	6,608.40	345.55	1,520.80	564.56	9.00	5.20	-16.28
6,950.00	31.16	40.57	6,651.86	363.38	1,537.90	584.70	9.00	6.01	-13.56
7,000.00	34.47	34.92	6,693.88	384.81	1,554.42	608.33	9.00	6.60	-11.30
7,050.00	37.99	30.17	6,734.22	409.73	1,570.26	635.29	9.00	7.04	-9.50
7,100.00	41.67	26.13	6,772.62	437.97	1,585.32	665.43	9.00	7.37	-8.08
7,150.00	45.47	22.64	6,808.84	469.36	1,599.51	698.56	9.00	7.61	-6.98
7,200.00	49.37	19.59	6,842.67	503.70	1,612.74	734.47	9.00	7.80	-6.11
7,202.05	49.53	19.47	6,844.00	505.16	1,613.26	736.00	9.00	7.88	-5.73
<b>Sharon Springs</b>									
7,219.24	50.89	18.51	6,855.00	517.65	1,617.56	748.98	9.00	7.90	-5.60
<b>Top A Chalk - Top A Marl</b>									
7,250.00	53.34	16.87	6,873.89	540.79	1,624.93	772.94	9.00	7.96	-5.31
7,253.55	53.63	16.69	6,876.00	543.51	1,625.75	775.76	9.00	8.00	-5.12
<b>Top B Chalk</b>									
7,300.00	57.37	14.43	6,902.31	580.39	1,636.00	813.74	9.00	8.05	-4.88
7,350.00	61.44	12.19	6,927.76	622.26	1,645.89	856.61	9.00	8.14	-4.47
7,352.60	61.65	12.08	6,929.00	624.50	1,646.37	858.89	9.00	8.18	-4.28

# Noble Energy, Inc.

## Planning Report

<b>Database:</b>	EDMP	<b>Local Co-ordinate Reference:</b>	Well Pioneer D31-716
<b>Company:</b>	Northern Region - DJ Basin	<b>TVD Reference:</b>	Well @ 4910.00ft
<b>Project:</b>	Mustang	<b>MD Reference:</b>	Well @ 4910.00ft
<b>Site:</b>	Y Section 07	<b>North Reference:</b>	Grid
<b>Well:</b>	Pioneer D31-716	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Pioneer D31-716		
<b>Design:</b>	Plan #1		

Planned 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)
<b>Top B Marl</b>									
7,400.00	65.54	10.12	6,950.08	666.15	1,654.53	901.29	9.00	8.21	-4.13
7,450.00	69.67	8.19	6,969.13	711.78	1,661.87	947.50	9.00	8.26	-3.87
7,500.00	73.82	6.35	6,984.79	758.87	1,667.87	994.96	9.00	8.30	-3.67
7,504.40	74.18	6.20	6,986.00	763.07	1,668.33	999.19	9.00	8.32	-3.58
<b>Top C Chalk</b>									
7,550.00	77.98	4.59	6,996.97	807.13	1,672.49	1,043.38	9.00	8.33	-3.51
7,600.00	82.16	2.89	7,005.59	856.26	1,675.70	1,092.45	9.00	8.35	-3.41
7,650.00	86.34	1.22	7,010.60	905.96	1,677.48	1,141.88	9.00	8.36	-3.34
7,693.76	90.00	359.77	7,012.00	949.69	1,677.85	1,185.19	9.00	8.37	-3.31
<b>LP: 7693.76' MD, 90.00° Inc, 359.77° Azm</b>									
7,700.00	90.00	359.77	7,012.00	955.93	1,677.83	1,191.36	0.00	0.00	0.00
7,800.00	90.00	359.77	7,012.00	1,055.93	1,677.42	1,290.22	0.00	0.00	0.00
7,900.00	90.00	359.77	7,012.00	1,155.93	1,677.02	1,389.08	0.00	0.00	0.00
8,000.00	90.00	359.77	7,012.00	1,255.93	1,676.61	1,487.94	0.00	0.00	0.00
8,100.00	90.00	359.77	7,012.00	1,355.93	1,676.21	1,586.80	0.00	0.00	0.00
8,200.00	90.00	359.77	7,012.00	1,455.93	1,675.80	1,685.67	0.00	0.00	0.00
8,300.00	90.00	359.77	7,012.00	1,555.92	1,675.40	1,784.53	0.00	0.00	0.00
8,400.00	90.00	359.77	7,012.00	1,655.92	1,674.99	1,883.39	0.00	0.00	0.00
8,500.00	90.00	359.77	7,012.00	1,755.92	1,674.59	1,982.25	0.00	0.00	0.00
8,600.00	90.00	359.77	7,012.00	1,855.92	1,674.18	2,081.11	0.00	0.00	0.00
8,700.00	90.00	359.77	7,012.00	1,955.92	1,673.78	2,179.97	0.00	0.00	0.00
8,800.00	90.00	359.77	7,012.00	2,055.92	1,673.37	2,278.83	0.00	0.00	0.00
8,900.00	90.00	359.77	7,012.00	2,155.92	1,672.97	2,377.70	0.00	0.00	0.00
9,000.00	90.00	359.77	7,012.00	2,255.92	1,672.56	2,476.56	0.00	0.00	0.00
9,100.00	90.00	359.77	7,012.00	2,355.92	1,672.16	2,575.42	0.00	0.00	0.00
9,200.00	90.00	359.77	7,012.00	2,455.92	1,671.75	2,674.28	0.00	0.00	0.00
9,300.00	90.00	359.77	7,012.00	2,555.92	1,671.35	2,773.14	0.00	0.00	0.00
9,400.00	90.00	359.77	7,012.00	2,655.92	1,670.94	2,872.00	0.00	0.00	0.00
9,500.00	90.00	359.77	7,012.00	2,755.91	1,670.54	2,970.86	0.00	0.00	0.00
9,600.00	90.00	359.77	7,012.00	2,855.91	1,670.13	3,069.73	0.00	0.00	0.00
9,700.00	90.00	359.77	7,012.00	2,955.91	1,669.73	3,168.59	0.00	0.00	0.00
9,800.00	90.00	359.77	7,012.00	3,055.91	1,669.32	3,267.45	0.00	0.00	0.00
9,900.00	90.00	359.77	7,012.00	3,155.91	1,668.92	3,366.31	0.00	0.00	0.00
10,000.00	90.00	359.77	7,012.00	3,255.91	1,668.51	3,465.17	0.00	0.00	0.00
10,100.00	90.00	359.77	7,012.00	3,355.91	1,668.11	3,564.03	0.00	0.00	0.00
10,200.00	90.00	359.77	7,012.00	3,455.91	1,667.70	3,662.90	0.00	0.00	0.00
10,300.00	90.00	359.77	7,012.00	3,555.91	1,667.30	3,761.76	0.00	0.00	0.00
10,400.00	90.00	359.77	7,012.00	3,655.91	1,666.89	3,860.62	0.00	0.00	0.00
10,500.00	90.00	359.77	7,012.00	3,755.91	1,666.49	3,959.48	0.00	0.00	0.00
10,600.00	90.00	359.77	7,012.00	3,855.91	1,666.08	4,058.34	0.00	0.00	0.00
10,700.00	90.00	359.77	7,012.00	3,955.91	1,665.68	4,157.20	0.00	0.00	0.00
10,800.00	90.00	359.77	7,012.00	4,055.90	1,665.27	4,256.06	0.00	0.00	0.00
10,900.00	90.00	359.77	7,012.00	4,155.90	1,664.87	4,354.93	0.00	0.00	0.00
11,000.00	90.00	359.77	7,012.00	4,255.90	1,664.46	4,453.79	0.00	0.00	0.00
11,100.00	90.00	359.77	7,012.00	4,355.90	1,664.06	4,552.65	0.00	0.00	0.00
11,200.00	90.00	359.77	7,012.00	4,455.90	1,663.65	4,651.51	0.00	0.00	0.00
11,300.00	90.00	359.77	7,012.00	4,555.90	1,663.25	4,750.37	0.00	0.00	0.00
11,400.00	90.00	359.77	7,012.00	4,655.90	1,662.84	4,849.23	0.00	0.00	0.00
11,500.00	90.00	359.77	7,012.00	4,755.90	1,662.44	4,948.10	0.00	0.00	0.00
11,600.00	90.00	359.77	7,012.00	4,855.90	1,662.03	5,046.96	0.00	0.00	0.00
11,700.00	90.00	359.77	7,012.00	4,955.90	1,661.63	5,145.82	0.00	0.00	0.00
11,800.00	90.00	359.77	7,012.00	5,055.90	1,661.22	5,244.68	0.00	0.00	0.00

# Noble Energy, Inc.

## Planning Report

<b>Database:</b>	EDMP	<b>Local Co-ordinate Reference:</b>	Well Pioneer D31-716
<b>Company:</b>	Northern Region - DJ Basin	<b>TVD Reference:</b>	Well @ 4910.00ft
<b>Project:</b>	Mustang	<b>MD Reference:</b>	Well @ 4910.00ft
<b>Site:</b>	Y Section 07	<b>North Reference:</b>	Grid
<b>Well:</b>	Pioneer D31-716	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Pioneer D31-716		
<b>Design:</b>	Plan #1		

Planned 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)
11,900.00	90.00	359.77	7,012.00	5,155.90	1,660.82	5,343.54	0.00	0.00	0.00
12,000.00	90.00	359.77	7,012.00	5,255.89	1,660.41	5,442.40	0.00	0.00	0.00
12,100.00	90.00	359.77	7,012.00	5,355.89	1,660.01	5,541.26	0.00	0.00	0.00
12,200.00	90.00	359.77	7,012.00	5,455.89	1,659.60	5,640.13	0.00	0.00	0.00
12,300.00	90.00	359.77	7,012.00	5,555.89	1,659.20	5,738.99	0.00	0.00	0.00
12,400.00	90.00	359.77	7,012.00	5,655.89	1,658.79	5,837.85	0.00	0.00	0.00
12,500.00	90.00	359.77	7,012.00	5,755.89	1,658.39	5,936.71	0.00	0.00	0.00
12,600.00	90.00	359.77	7,012.00	5,855.89	1,657.98	6,035.57	0.00	0.00	0.00
12,700.00	90.00	359.77	7,012.00	5,955.89	1,657.58	6,134.43	0.00	0.00	0.00
12,800.00	90.00	359.77	7,012.00	6,055.89	1,657.17	6,233.29	0.00	0.00	0.00
12,900.00	90.00	359.77	7,012.00	6,155.89	1,656.77	6,332.16	0.00	0.00	0.00
13,000.00	90.00	359.77	7,012.00	6,255.89	1,656.36	6,431.02	0.00	0.00	0.00
13,100.00	90.00	359.77	7,012.00	6,355.89	1,655.96	6,529.88	0.00	0.00	0.00
13,200.00	90.00	359.77	7,012.00	6,455.88	1,655.55	6,628.74	0.00	0.00	0.00
13,300.00	90.00	359.77	7,012.00	6,555.88	1,655.15	6,727.60	0.00	0.00	0.00
13,400.00	90.00	359.77	7,012.00	6,655.88	1,654.74	6,826.46	0.00	0.00	0.00
13,500.00	90.00	359.77	7,012.00	6,755.88	1,654.34	6,925.33	0.00	0.00	0.00
13,600.00	90.00	359.77	7,012.00	6,855.88	1,653.93	7,024.19	0.00	0.00	0.00
13,700.00	90.00	359.77	7,012.00	6,955.88	1,653.53	7,123.05	0.00	0.00	0.00
13,800.00	90.00	359.77	7,012.00	7,055.88	1,653.12	7,221.91	0.00	0.00	0.00
13,900.00	90.00	359.77	7,012.00	7,155.88	1,652.72	7,320.77	0.00	0.00	0.00
14,000.00	90.00	359.77	7,012.00	7,255.88	1,652.31	7,419.63	0.00	0.00	0.00
14,100.00	90.00	359.77	7,012.00	7,355.88	1,651.90	7,518.49	0.00	0.00	0.00
14,200.00	90.00	359.77	7,012.00	7,455.88	1,651.50	7,617.36	0.00	0.00	0.00
14,300.00	90.00	359.77	7,012.00	7,555.88	1,651.09	7,716.22	0.00	0.00	0.00
14,400.00	90.00	359.77	7,012.00	7,655.87	1,650.69	7,815.08	0.00	0.00	0.00
14,500.00	90.00	359.77	7,012.00	7,755.87	1,650.28	7,913.94	0.00	0.00	0.00
14,600.00	90.00	359.77	7,012.00	7,855.87	1,649.88	8,012.80	0.00	0.00	0.00
14,700.00	90.00	359.77	7,012.00	7,955.87	1,649.47	8,111.66	0.00	0.00	0.00
14,800.00	90.00	359.77	7,012.00	8,055.87	1,649.07	8,210.52	0.00	0.00	0.00
14,900.00	90.00	359.77	7,012.00	8,155.87	1,648.66	8,309.39	0.00	0.00	0.00
15,000.00	90.00	359.77	7,012.00	8,255.87	1,648.26	8,408.25	0.00	0.00	0.00
15,100.00	90.00	359.77	7,012.00	8,355.87	1,647.85	8,507.11	0.00	0.00	0.00
15,200.00	90.00	359.77	7,012.00	8,455.87	1,647.45	8,605.97	0.00	0.00	0.00
15,300.00	90.00	359.77	7,012.00	8,555.87	1,647.04	8,704.83	0.00	0.00	0.00
15,400.00	90.00	359.77	7,012.00	8,655.87	1,646.64	8,803.69	0.00	0.00	0.00
15,500.00	90.00	359.77	7,012.00	8,755.87	1,646.23	8,902.56	0.00	0.00	0.00
15,600.00	90.00	359.77	7,012.00	8,855.87	1,645.83	9,001.42	0.00	0.00	0.00
15,700.00	90.00	359.77	7,012.00	8,955.86	1,645.42	9,100.28	0.00	0.00	0.00
15,800.00	90.00	359.77	7,012.00	9,055.86	1,645.02	9,199.14	0.00	0.00	0.00
15,900.00	90.00	359.77	7,012.00	9,155.86	1,644.61	9,298.00	0.00	0.00	0.00
16,000.00	90.00	359.77	7,012.00	9,255.86	1,644.21	9,396.86	0.00	0.00	0.00
16,100.00	90.00	359.77	7,012.00	9,355.86	1,643.80	9,495.72	0.00	0.00	0.00
16,200.00	90.00	359.77	7,012.00	9,455.86	1,643.40	9,594.59	0.00	0.00	0.00
16,300.00	90.00	359.77	7,012.00	9,555.86	1,642.99	9,693.45	0.00	0.00	0.00
16,400.00	90.00	359.77	7,012.00	9,655.86	1,642.59	9,792.31	0.00	0.00	0.00
16,500.00	90.00	359.77	7,012.00	9,755.86	1,642.18	9,891.17	0.00	0.00	0.00
16,600.00	90.00	359.77	7,012.00	9,855.86	1,641.78	9,990.03	0.00	0.00	0.00
16,700.00	90.00	359.77	7,012.00	9,955.86	1,641.37	10,088.89	0.00	0.00	0.00
16,800.00	90.00	359.77	7,012.00	10,055.86	1,640.97	10,187.76	0.00	0.00	0.00
16,900.00	90.00	359.77	7,012.00	10,155.85	1,640.56	10,286.62	0.00	0.00	0.00
17,000.00	90.00	359.77	7,012.00	10,255.85	1,640.16	10,385.48	0.00	0.00	0.00
17,100.00	90.00	359.77	7,012.00	10,355.85	1,639.75	10,484.34	0.00	0.00	0.00
17,200.00	90.00	359.77	7,012.00	10,455.85	1,639.35	10,583.20	0.00	0.00	0.00

# Noble Energy, Inc.

## Planning Report

<b>Database:</b>	EDMP	<b>Local Co-ordinate Reference:</b>	Well Pioneer D31-716
<b>Company:</b>	Northern Region - DJ Basin	<b>TVD Reference:</b>	Well @ 4910.00ft
<b>Project:</b>	Mustang	<b>MD Reference:</b>	Well @ 4910.00ft
<b>Site:</b>	Y Section 07	<b>North Reference:</b>	Grid
<b>Well:</b>	Pioneer D31-716	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Pioneer D31-716		
<b>Design:</b>	Plan #1		

Planned 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)
17,300.00	90.00	359.77	7,012.00	10,555.85	1,638.94	10,682.06	0.00	0.00	0.00
17,400.00	90.00	359.77	7,012.00	10,655.85	1,638.54	10,780.92	0.00	0.00	0.00
17,500.00	90.00	359.77	7,012.00	10,755.85	1,638.13	10,879.79	0.00	0.00	0.00
17,600.00	90.00	359.77	7,012.00	10,855.85	1,637.73	10,978.65	0.00	0.00	0.00
17,700.00	90.00	359.77	7,012.00	10,955.85	1,637.32	11,077.51	0.00	0.00	0.00
17,800.11	90.00	359.77	7,012.00	11,055.96	1,636.92	11,176.48	0.00	0.00	0.00
TD @ 17800.11' MD/7012.00' TVD									

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Pioneer D31-716-SHL - plan hits target center - Point	0.00	0.01	0.00	0.00	0.00	1,301,718.00	3,253,750.29	40.1580450	-104.5921260
Pioneer D31-716-KOF - plan hits target center - Point	0.00	0.01	6,465.55	314.10	1,464.48	1,302,032.09	3,255,214.77	40.1588659	-104.5868752
Pioneer D31-716-TPZ - plan hits target center - Point	0.00	0.00	7,012.00	949.69	1,677.85	1,302,667.69	3,255,428.14	40.1606046	-104.5860883
Pioneer D31-716-BHL - plan hits target center - Point	0.00	0.00	7,012.00	11,055.96	1,636.92	1,312,773.93	3,255,387.21	40.1883472	-104.5858620

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
693.00	693.00	Fox Hills				
693.00	693.00	Pierre				
1,041.00	1,041.00	Upper Pierre Aquifer Top				
1,850.00	1,850.00	Upper Pierre Aquifer Base				
4,007.29	3,929.00	Parkman				
4,618.78	4,496.00	Sussex				
5,461.05	5,277.00	Shannon				
6,461.87	6,205.00	Teepee Buttes				
7,202.05	6,844.00	Sharon Springs				
7,219.24	6,855.00	Top A Chalk				
7,219.24	6,855.00	Top A Marl				
7,253.55	6,876.00	Top B Chalk				
7,352.60	6,929.00	Top B Marl				
7,504.40	6,986.00	Top C Chalk				



# Noble Energy, Inc.

## Planning Report

<b>Database:</b>	EDMP	<b>Local Co-ordinate Reference:</b>	Well Pioneer D31-716
<b>Company:</b>	Northern Region - DJ Basin	<b>TVD Reference:</b>	Well @ 4910.00ft
<b>Project:</b>	Mustang	<b>MD Reference:</b>	Well @ 4910.00ft
<b>Site:</b>	Y Section 07	<b>North Reference:</b>	Grid
<b>Well:</b>	Pioneer D31-716	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Pioneer D31-716		
<b>Design:</b>	Plan #1		

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
2,200.00	2,200.00	0.00	0.00	Build: 2°/100'
3,299.51	3,272.72	43.71	203.79	Hold: 21.99° Inc, 77.89° Azm
6,742.86	6,465.55	314.10	1,464.47	KOP: Build 9°/100' @ 6742.86' MD
7,693.76	7,012.00	949.69	1,677.85	LP: 7693.76' MD, 90.00° Inc, 359.77° Azm
17,800.11	7,012.00	11,055.96	1,636.92	TD @ 17800.11' MD/7012.00' TVD

# **Northern Region - DJ Basin**

**Mustang**

**Y Section 07**

**Pioneer D31-716**

**Pioneer D31-716**

**Plan #1**

## **Anticollision Summary Report**

**26 September, 2018**

# Noble Energy, Inc.

## Anticollision Summary Report

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Pioneer D31-716
<b>Project:</b>	Mustang	<b>TVD Reference:</b>	Well @ 4910.00ft
<b>Reference Site:</b>	Y Section 07	<b>MD Reference:</b>	Well @ 4910.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Pioneer D31-716	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Pioneer D31-716	<b>Database:</b>	EDMP
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Reference	Plan #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 10,000.00 ft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	9/26/2018		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.00	17,800.11	Plan #1 (Pioneer D31-716)	2_MWD+IFR1+MS	A008Mb: IFR dec & multi-station analysis	

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
D Section 30						
Adams D30-27D - Adams D30-27D - Adams D30-27D -	17,800.11	6,975.35	5,775.34	5,707.41	85.016	CC, ES, SF
Adams D30-29D - Wellbore #1 - Wellbore #1 - As Drilled	17,800.11	6,988.78	6,426.29	6,335.77	70.996	CC, ES, SF
Adams D30-30D - Adams D30-30D Gyros - Gyros	17,800.11	4,800.00	7,260.81	7,143.63	61.967	CC, ES, SF
Adams D30-30D - Adams D30-30D OH - As Drilled	17,800.11	4,813.00	7,260.78	7,143.61	61.966	CC, ES, SF
Adams D30-31D - Adams D30-31D Gyros - Gyros	17,800.11	7,342.41	6,225.07	6,056.23	36.869	CC, ES, SF
Adams D30-31D - Adams D30-31D OH - As-drilled	17,800.11	7,355.41	6,225.06	6,056.22	36.869	CC, ES, SF
Corbin D30-23D - Corbin D30-23D - Corbin D30-23D - A	17,800.11	7,288.62	1,509.11	1,363.76	10.383	CC, ES, SF
Corbin Red D30-04J - Corbin Red D30-04J - Corbin Red	17,800.11	7,150.50	2,203.67	2,112.50	24.171	CC, ES, SF
Corbin Red D30-09 - Corbin Red D30-09 - Corbin Red D	17,800.11	6,961.75	2,221.66	2,159.99	36.028	CC, ES, SF
Corbin Red D30-15 - Corbin Red D30-15 - Corbin Red D	17,800.11	6,939.65	1,816.32	1,704.65	16.266	CC, ES, SF
Corbin Red D30-16 - Corbin Red D30-16 - Corbin Red D	17,800.11	6,901.21	857.61	777.90	10.759	CC, ES, SF
Dechant D30-17D - Dechant D30-17D - Dechant D30-17	17,800.11	7,344.95	4,008.94	3,914.80	42.585	CC, ES, SF
Dechant D30-20D - Dechant D30-20D - Dechant D30-20	17,800.11	6,974.08	4,556.27	4,446.50	41.507	CC, ES, SF
Dechant D30-24D - Dechant D30-24D - Dechant D30-24	17,800.11	7,136.60	2,766.48	2,652.43	24.257	CC, ES, SF
Dechant D30-25D - Dechant D30-25D - Dechant D30-25	17,800.11	7,194.33	3,832.03	3,713.25	32.262	CC, ES, SF
Dechant D31-27D - Dechant D31-27D - Dechant D31-27	17,800.11	7,226.54	1,013.55	892.18	8.351	CC, ES, SF
Dechant D31-28D - Dechant D31-28D - Dechant D31-28	17,800.11	6,959.33	2,398.53	2,280.81	20.375	CC, ES, SF
Dechant D31-29D - Dechant D31-29D - Dechant D31-29	17,800.11	7,042.76	3,557.59	3,437.95	29.735	CC, ES, SF
Dechant D31-77HN - Original Drilling - Original Drilling - /	12,900.00	11,360.01	3,349.77	3,206.33	23.353	SF
Dechant D31-77HN - Original Drilling - Original Drilling - /	17,800.11	6,606.51	2,964.06	2,851.50	26.332	CC, ES
Hanson D30-11 - Hanson D30-11 - Hanson D30-11 - As	17,800.11	6,988.63	3,753.83	3,648.46	35.624	CC, ES, SF
Hanson D30-12 - Hanson D30-12 - Hanson D30-12 - As	17,800.11	6,886.58	4,778.34	4,668.40	43.463	CC, ES, SF
Hanson D30-13 - Hanson D30-13 - Hanson D30-13 - As	17,800.11	6,959.33	4,324.94	4,207.49	36.824	CC, ES, SF
Hanson D30-14 - Hanson D30-14 - Hanson D30-14 - As	17,800.11	7,229.64	2,899.61	2,781.94	24.643	CC, ES, SF
Hettinger C Unit 1 - Hettinger C Unit 1 - Hettinger C Unit	17,800.11	6,905.32	4,750.17	4,687.02	75.217	CC, ES, SF
Hettinger D30-02 - Hettinger D30-02 - Hettinger D30-02 -	17,800.11	6,881.00	5,267.59	5,159.57	48.766	CC, ES, SF
Hettinger D30-03 - Hettinger D30-03 - Hettinger D30-03 -	17,800.11	6,927.15	5,857.04	5,771.68	68.620	CC, ES, SF
Hettinger D30-04 - Hettinger D30-04 - Hettinger D30-04 -	17,800.11	6,984.75	6,554.59	6,460.28	69.503	CC, ES, SF
Hettinger D30-05 - Hettinger D30-05 - Hettinger D30-05 -	17,800.11	6,875.95	5,281.36	5,177.05	50.633	CC, ES, SF
Hettinger D30-06 - Hettinger D30-06 - Hettinger D30-06 -	17,800.11	6,907.50	4,446.71	4,350.80	46.363	CC, ES, SF
Hettinger D30-08 - Hettinger D30-08 - Hettinger D30-08 -	17,800.11	6,891.21	3,469.02	3,407.01	55.949	CC, ES, SF
Leslie E Hanson Gas Unit 1 - Leslie E Hanson Gas Unit	17,800.11	6,899.00	4,034.10	3,883.31	26.753	CC, ES, SF
McWilliams D29-32 - McWilliams D29-32 - McWilliams D	17,800.11	6,910.72	2,963.53	2,907.06	52.485	CC, ES, SF
McWilliams D30-07 - McWilliams D30-07 - McWilliams D	17,800.11	6,889.00	4,022.02	3,907.77	35.204	CC, ES, SF
McWilliams D30-18 - McWilliams D30-18 - McWilliams D	17,800.11	6,917.40	4,753.83	4,670.44	57.005	CC, ES, SF
McWilliams D30-19 - McWilliams D30-19 - McWilliams D	17,800.11	6,915.10	5,457.53	5,361.41	56.783	CC, ES, SF
McWilliams D30-21 - McWilliams D30-21 - McWilliams D	17,800.11	6,963.79	3,228.62	3,136.29	34.968	CC, ES, SF

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Noble Energy, Inc.

## Anticollision Summary Report

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Pioneer D31-716
<b>Project:</b>	Mustang	<b>TVD Reference:</b>	Well @ 4910.00ft
<b>Reference Site:</b>	Y Section 07	<b>MD Reference:</b>	Well @ 4910.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Pioneer D31-716	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Pioneer D31-716	<b>Database:</b>	EDMP
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
D Section 30						
McWilliams D30-22 - McWilliams D30-22 - McWilliams D	17,800.11	6,950.04	3,145.35	3,070.41	41.975	CC, ES, SF
D Section 31						
Dechant 1-31A (PR) - Wellbore #1 - Gyro Surveys	13,669.62	7,099.80	3,686.71	3,600.02	42.526	CC
Dechant 1-31A (PR) - Wellbore #1 - Gyro Surveys	13,700.00	7,099.24	3,686.84	3,599.98	42.449	ES
Dechant 1-31A (PR) - Wellbore #1 - Gyro Surveys	14,200.00	7,090.07	3,724.65	3,635.64	41.846	SF
Dechant D 31-22D (PR) - Wellbore #1 - Gyro Surveys	15,416.56	7,036.68	1,092.60	989.44	10.592	CC, ES
Dechant D 31-22D (PR) - Wellbore #1 - Gyro Surveys	15,500.00	7,036.20	1,095.78	992.29	10.589	SF
Dechant D31-18D (PR) - Wellbore #1 - As Drilled	16,645.20	7,342.94	2,371.70	2,247.38	19.077	CC, ES
Dechant D31-18D (PR) - Wellbore #1 - As Drilled	16,900.00	7,334.93	2,385.34	2,259.46	18.949	SF
Dechant D31-24D (PR) - Wellbore #1 - Gyro Surveys	14,140.76	6,893.30	2,180.41	2,090.25	24.185	CC, ES
Dechant D31-24D (PR) - Wellbore #1 - Gyro Surveys	14,300.00	6,887.78	2,186.21	2,095.38	24.070	SF
Dechant D31-31D (SI) - Wellbore #1 - Gyro Surveys	16,527.29	7,052.62	4,658.51	4,546.56	41.613	CC, ES
Dechant D31-31D (SI) - Wellbore #1 - Gyro Surveys	17,300.00	7,054.40	4,722.16	4,606.19	40.721	SF
Dechant D31-31D(PR) - Wellbore #1 - As Drilled	15,491.28	7,023.59	2,116.90	2,014.82	20.736	CC
Dechant D31-31D(PR) - Wellbore #1 - As Drilled	15,500.00	7,023.46	2,116.92	2,014.79	20.727	ES
Dechant D31-31D(PR) - Wellbore #1 - As Drilled	15,600.00	7,021.95	2,119.69	2,017.10	20.662	SF
Dechant State D31-32 (SI) - Wellbore #1 - Wellbore #1 -	15,529.50	6,915.72	4,347.67	4,259.71	49.428	CC, ES
Dechant State D31-32 (SI) - Wellbore #1 - Wellbore #1 -	16,200.00	6,911.47	4,399.06	4,307.94	48.275	SF
Dechant Y 06-27D (PR) - Wellbore #1 - As Drilled	12,808.85	7,055.67	940.10	856.86	11.293	CC, ES, SF
Dechant Y 06-28D (PR) - Wellbore #1 - As Drilled	12,737.15	7,023.33	2,158.41	2,075.87	26.149	CC, ES
Dechant Y 06-28D (PR) - Wellbore #1 - As Drilled	12,800.00	7,020.73	2,159.33	2,076.70	26.133	SF
Riva Blue 31-15 (PR) - Wellbore #1 - Gyro Surveys	13,682.12	6,941.64	1,591.21	1,505.43	18.551	CC, ES
Riva Blue 31-15 (PR) - Wellbore #1 - Gyro Surveys	13,700.00	6,941.66	1,591.31	1,505.49	18.542	SF
Riva Blue 31-16 (PR) - Wellbore #1 - Gyro Surveys	13,453.83	6,923.75	553.93	470.00	6.600	CC, ES, SF
Riva Blue 31-9 (PR) - Wellbore #1 - Gyro Surveys	14,700.00	6,925.94	510.70	417.24	5.464	ES, SF
Riva Blue 31-9 (PR) - Wellbore #1 - Gyro Surveys	14,705.55	6,925.89	510.67	417.25	5.466	CC
Riva Blue D 31-04J (PR) - Wellbore #1 - Gyro Surveys	14,369.06	6,947.55	1,283.61	1,192.57	14.098	CC, ES, SF
Riva Blue D 31-11 (PR) - Wellbore #1 - Gyro Surveys	14,871.44	6,940.53	2,614.05	2,517.71	27.132	CC, ES
Riva Blue D 31-11 (PR) - Wellbore #1 - Gyro Surveys	15,100.00	6,944.05	2,624.02	2,526.79	26.988	SF
Riva Blue D 31-12 (SI) - Wellbore #1 - Gyro Surveys	14,730.71	6,936.73	4,245.28	4,151.77	45.398	CC, ES
Riva Blue D 31-12 (SI) - Wellbore #1 - Gyro Surveys	15,400.00	6,930.65	4,297.71	4,201.09	44.480	SF
Riva D 31-10 (PR) - Wellbore #1 - No Surveys	14,883.36	6,909.00	1,724.74	1,516.01	8.263	CC, ES
Riva D 31-10 (PR) - Wellbore #1 - No Surveys	14,900.00	6,909.00	1,724.82	1,516.04	8.261	SF
Riva Red D 31-2J (PA) - Wellbore #1 - Gyro Surveys	16,592.47	6,953.37	3,648.22	3,540.23	33.784	CC
Riva Red D 31-2J (PA) - Wellbore #1 - Gyro Surveys	16,600.00	6,953.25	3,648.23	3,540.20	33.771	ES
Riva Red D 31-2J (PA) - Wellbore #1 - Gyro Surveys	17,000.00	6,946.63	3,670.91	3,561.12	33.438	SF
Riva Red D 31-3 (PA) - Wellbore #1 - Gyro Surveys	17,626.53	6,835.81	2,782.34	2,667.14	24.152	CC, ES
Riva Red D 31-3 (PA) - Wellbore #1 - Gyro Surveys	17,800.11	6,831.57	2,787.75	2,671.87	24.057	SF
Riva Red D 31-6 (PA) - Wellbore #1 - No Surveys	15,884.97	6,910.00	2,757.76	2,541.34	12.743	CC
Riva Red D 31-6 (PA) - Wellbore #1 - No Surveys	15,900.00	6,910.00	2,757.80	2,541.31	12.739	ES
Riva Red D 31-6 (PA) - Wellbore #1 - No Surveys	16,000.00	6,910.00	2,760.16	2,543.23	12.724	SF
Riva Red D31-06X (SI) - Wellbore #1 - Gyro Surveys	16,107.72	7,034.53	2,859.05	2,754.38	27.316	CC, ES
Riva Red D31-06X (SI) - Wellbore #1 - Gyro Surveys	16,300.00	7,028.56	2,865.50	2,760.05	27.173	SF
Riva White D 31-1 (PR) - Wellbore #1 - Gyro Surveys	17,381.99	6,908.00	387.93	273.96	3.404	CC, ES, SF
Riva White D 31-7 (PR) - Wellbore #1 - Gyro Surveys	16,118.99	6,909.31	1,482.63	1,378.65	14.259	CC, ES, SF
Riva White D 31-8 (PA) - Wellbore #1 - Gyro Surveys	15,935.90	6,888.68	448.31	346.32	4.396	CC, ES, SF
River Blue d31-14 (PR) - Wellbore #1 - Gyro Surveys	13,069.91	6,941.16	2,773.99	2,692.73	34.137	CC, ES
River Blue d31-14 (PR) - Wellbore #1 - Gyro Surveys	13,400.00	6,947.36	2,793.55	2,711.00	33.841	SF
River Red D 31-4 (PA) - Wellbore #1 - Gyro Surveys	17,506.59	6,517.13	4,588.99	4,427.61	28.437	CC, ES
River Red D 31-4 (PA) - Wellbore #1 - Gyro Surveys	17,800.11	6,523.19	4,598.36	4,435.17	28.177	SF
UPRR 53 Pan Am UT R 1 (PA) - Wellbore #1 - No Surve	16,683.18	6,903.00	982.62	760.15	4.417	CC, ES, SF

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Noble Energy, Inc.

## Anticollision Summary Report

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Pioneer D31-716
<b>Project:</b>	Mustang	<b>TVD Reference:</b>	Well @ 4910.00ft
<b>Reference Site:</b>	Y Section 07	<b>MD Reference:</b>	Well @ 4910.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Pioneer D31-716	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Pioneer D31-716	<b>Database:</b>	EDMP
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
D Section 32						
HP D32-21D - Wellbore #1 - MWD Surveys	15,466.89	7,019.08	3,072.64	2,970.02	29.940	CC
HP D32-21D - Wellbore #1 - MWD Surveys	15,500.00	7,018.21	3,072.82	2,969.90	29.857	ES
HP D32-21D - Wellbore #1 - MWD Surveys	16,000.00	7,005.38	3,118.51	3,012.14	29.318	SF
HP D32-23D - Wellbore #1 - MWD Surveys	14,393.37	6,955.08	4,252.34	4,159.74	45.924	CC
HP D32-23D - Wellbore #1 - MWD Surveys	14,400.00	6,955.06	4,252.34	4,159.69	45.895	ES
HP D32-23D - Wellbore #1 - MWD Surveys	15,400.00	6,952.32	4,369.86	4,270.05	43.782	SF
HP Farms D 32-22D - Wellbore #1 - MWD Surveys	15,546.56	7,156.35	4,349.48	4,237.89	38.978	CC
HP Farms D 32-22D - Wellbore #1 - MWD Surveys	15,600.00	7,155.91	4,349.81	4,237.75	38.818	ES
HP Farms D 32-22D - Wellbore #1 - MWD Surveys	16,400.00	7,150.07	4,432.42	4,314.86	37.704	SF
HP Farms D32-03 - Wellbore #1 - Gyro Surveys	17,232.50	6,879.88	2,490.57	2,377.79	22.083	CC, ES
HP Farms D32-03 - Wellbore #1 - Gyro Surveys	17,600.00	6,872.85	2,517.53	2,401.57	21.711	SF
HP Farms D32-18D - Wellbore #1 - MWD Surveys	16,717.31	7,126.80	3,102.10	2,991.20	27.971	CC, ES
HP Farms D32-18D - Wellbore #1 - MWD Surveys	17,200.00	7,123.71	3,139.43	3,024.70	27.365	SF
HP Farms D32-24D - Wellbore #1 - MWD Surveys	14,119.34	7,172.30	3,111.84	3,020.58	34.101	CC, ES
HP Farms D32-24D - Wellbore #1 - MWD Surveys	14,800.00	7,167.04	3,185.40	3,088.81	32.979	SF
Norris 14-32 - Wellbore #1 - Projection Survey	13,230.36	6,929.00	927.29	808.60	7.813	CC, ES
Norris 14-32 - Wellbore #1 - Projection Survey	13,300.00	6,929.00	929.90	810.28	7.774	SF
Norris A Unit 2 - Wellbore #1 - As-Drilled	13,961.54	6,812.46	1,582.27	1,494.04	17.934	CC, ES
Norris A Unit 2 - Wellbore #1 - As-Drilled	14,200.00	6,816.74	1,600.13	1,509.66	17.686	SF
Norris D32-1 (SI) - Wellbore #1 - Gyro Surveys	17,361.60	6,887.70	4,972.64	4,858.94	43.733	CC
Norris D32-1 (SI) - Wellbore #1 - Gyro Surveys	17,400.00	6,888.12	4,972.79	4,858.73	43.597	ES
Norris D32-1 (SI) - Wellbore #1 - Gyro Surveys	17,800.11	6,892.57	4,991.94	4,874.41	42.473	SF
Norris D32-10 - Wellbore #1 - Gyro Surveys	14,672.49	6,750.00	3,661.11	3,568.17	39.392	CC
Norris D32-10 - Wellbore #1 - Gyro Surveys	14,700.00	6,750.00	3,661.22	3,568.01	39.282	ES
Norris D32-10 - Wellbore #1 - Gyro Surveys	15,500.00	6,750.00	3,753.47	3,654.12	37.779	SF
Norris D32-15 - Wellbore #1 - Gyro Surveys	13,386.51	6,800.00	3,660.81	3,577.39	43.881	CC
Norris D32-15 - Wellbore #1 - Gyro Surveys	13,400.00	6,800.00	3,660.84	3,577.29	43.816	ES
Norris D32-15 - Wellbore #1 - Gyro Surveys	14,300.00	6,800.00	3,773.07	3,682.65	41.730	SF
Norris D32-1J - Wellbore #1 - Gyro Surveys	16,565.92	6,962.59	4,550.50	4,442.84	42.265	CC
Norris D32-1J - Wellbore #1 - Gyro Surveys	16,600.00	6,963.64	4,550.63	4,442.64	42.140	ES
Norris D32-1J - Wellbore #1 - Gyro Surveys	17,600.00	6,994.41	4,666.41	4,550.82	40.372	SF
Norris D32-2 - Wellbore #1 - Gyro Surveys	17,429.65	6,957.68	3,659.72	3,545.41	32.018	CC
Norris D32-2 - Wellbore #1 - Gyro Surveys	17,500.00	6,958.26	3,660.39	3,545.40	31.831	ES
Norris D32-2 - Wellbore #1 - Gyro Surveys	17,800.11	6,958.25	3,678.42	3,560.84	31.283	SF
Norris D32-2J - Wellbore #1 - Gyro Surveys	16,934.58	6,895.65	1,758.87	1,648.34	15.913	CC, ES
Norris D32-2J - Wellbore #1 - Gyro Surveys	17,100.00	6,893.19	1,766.63	1,654.41	15.742	SF
Norris D32-4 (P&A) - Wellbore #1 - No Surveys	17,365.83	6,912.00	994.01	766.03	4.360	CC, ES
Norris D32-4 (P&A) - Wellbore #1 - No Surveys	17,400.00	6,912.00	994.60	766.12	4.353	SF
Norris D32-5 - Wellbore #1 - Gyro Surveys	16,021.76	6,927.20	1,032.43	929.20	10.002	CC, ES
Norris D32-5 - Wellbore #1 - Gyro Surveys	16,100.00	6,927.75	1,035.39	931.17	9.934	SF
Norris D32-6 - Wellbore #1 - Gyro Surveys	16,007.56	6,962.26	2,250.09	2,146.91	21.807	CC, ES
Norris D32-6 - Wellbore #1 - Gyro Surveys	16,300.00	6,961.38	2,269.02	2,163.14	21.430	SF
Norris D32-7 - Wellbore #1 - Gyro Surveys	16,053.00	6,876.77	3,594.44	3,490.96	34.735	CC
Norris D32-7 - Wellbore #1 - Gyro Surveys	16,100.00	6,874.72	3,594.75	3,490.81	34.585	ES
Norris D32-7 - Wellbore #1 - Gyro Surveys	16,800.00	6,849.76	3,671.06	3,561.74	33.579	SF
Norris D32-9 (SI) - Wellbore #1 - Gyro Surveys	14,706.85	6,914.53	5,067.48	4,974.29	54.380	CC, ES
Norris D32-9 (SI) - Wellbore #1 - Gyro Surveys	16,400.00	16,400.00	5,342.86	5,204.66	38.659	SF

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



# Noble Energy, Inc.

## Anticollision Summary Report

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Pioneer D31-716
<b>Project:</b>	Mustang	<b>TVD Reference:</b>	Well @ 4910.00ft
<b>Reference Site:</b>	Y Section 07	<b>MD Reference:</b>	Well @ 4910.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Pioneer D31-716	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Pioneer D31-716	<b>Database:</b>	EDMP
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
H Section 36						
Dechant 07-36 - Original Drilling - Original Drilling - As D	15,743.08	7,039.34	6,920.98	6,819.24	68.026	CC
Dechant 07-36 - Original Drilling - Original Drilling - As D	15,800.00	7,039.01	6,921.21	6,819.10	67.781	ES
Dechant 07-36 - Original Drilling - Original Drilling - As D	17,500.00	7,029.31	7,140.49	7,029.49	64.327	SF
Dechant 13N-1HZ - Production Hole - Production Hole -	3,991.69	11,468.00	8,719.44	8,622.20	89.672	CC
Dechant 13N-1HZ - Production Hole - Production Hole -	4,100.00	11,468.00	8,720.11	8,622.06	88.939	ES
Dechant 13N-1HZ - Production Hole - Production Hole -	12,200.00	12,200.00	9,494.18	9,353.06	67.275	SF
Dechant 13N-1HZ - Surface Hole - Surface Hole - As Dri	100.00	0.00	9,301.23	9,301.10	10,000.000	CC
Dechant 13N-1HZ - Surface Hole - Surface Hole - As Dri	200.00	52.58	9,301.62	9,301.04	10,000.000	ES
Dechant 13N-1HZ - Surface Hole - Surface Hole - As Dri	3,700.00	600.00	9,975.13	9,960.85	698.470	SF
Dechant 14C-1HZ - Production Hole - Production Hole -	4,582.57	11,731.00	7,652.52	7,579.78	105.203	CC
Dechant 14C-1HZ - Production Hole - Production Hole -	4,600.00	11,731.00	7,652.54	7,579.70	105.062	ES
Dechant 14C-1HZ - Production Hole - Production Hole -	13,000.00	13,000.00	8,145.35	8,047.62	83.347	SF
Dechant 14C-1HZ - Surface Hole - Surface Hole - As Dri	100.00	0.00	9,234.35	9,234.22	10,000.000	CC
Dechant 14C-1HZ - Surface Hole - Surface Hole - As Dri	700.00	611.50	9,237.44	9,233.20	2,176.551	ES
Dechant 14C-1HZ - Surface Hole - Surface Hole - As Dri	3,800.00	610.00	9,956.02	9,941.40	681.006	SF
Dechant 15-36 - Original Drilling - Original Drilling - As D	13,290.32	6,965.94	6,925.98	6,825.66	69.040	CC
Dechant 15-36 - Original Drilling - Original Drilling - As D	13,300.00	6,965.90	6,925.98	6,825.61	68.999	ES
Dechant 15-36 - Original Drilling - Original Drilling - As D	15,200.00	6,957.76	7,184.43	7,074.21	65.183	SF
Dechant 24-36 - Original Drilling - Original Drilling - As D	15,409.95	6,964.02	6,230.87	6,130.02	61.780	CC
Dechant 24-36 - Original Drilling - Original Drilling - As D	15,500.00	6,964.43	6,231.52	6,129.97	61.359	ES
Dechant 24-36 - Original Drilling - Original Drilling - As D	17,200.00	6,972.69	6,482.90	6,370.58	57.718	SF
Dechant 35N-E1HZ - Production Hole - Production Hole	4,317.88	11,619.00	7,776.07	7,675.89	77.627	CC
Dechant 35N-E1HZ - Production Hole - Production Hole	4,400.00	11,619.00	7,776.50	7,675.70	77.144	ES
Dechant 35N-E1HZ - Production Hole - Production Hole	8,200.00	11,619.00	8,295.66	8,175.69	69.151	SF
Dechant 35N-E1HZ - Surface Hole - Surface Hole - As D	100.00	16.44	9,256.57	9,256.42	10,000.000	CC
Dechant 35N-E1HZ - Surface Hole - Surface Hole - As D	700.00	612.00	9,257.36	9,253.12	2,183.300	ES
Dechant 35N-E1HZ - Surface Hole - Surface Hole - As D	3,800.00	612.00	9,974.58	9,959.96	682.084	SF
Dechant 35N-W1HZ - Original Drilling - Original Drilling -	4,194.78	11,494.00	8,225.23	8,126.75	83.520	CC
Dechant 35N-W1HZ - Original Drilling - Original Drilling -	4,300.00	11,494.00	8,225.91	8,126.63	82.858	ES
Dechant 35N-W1HZ - Original Drilling - Original Drilling -	11,100.00	11,100.00	8,833.87	8,710.54	71.626	SF
Dechant 36N-W1HZ - Original Drilling - Original Drilling -	4,598.76	11,651.36	7,144.98	7,043.51	70.418	CC
Dechant 36N-W1HZ - Original Drilling - Original Drilling -	4,700.00	11,651.36	7,145.70	7,043.44	69.877	ES
Dechant 36N-W1HZ - Original Drilling - Original Drilling -	8,100.00	11,651.36	7,605.88	7,485.33	63.090	SF
Dechant 37N-E1HZ - Production Hole - Production Hole	5,193.30	11,723.00	5,427.33	5,324.76	52.913	CC
Dechant 37N-E1HZ - Production Hole - Production Hole	5,200.00	11,723.00	5,427.34	5,324.71	52.883	ES
Dechant 37N-E1HZ - Production Hole - Production Hole	11,000.00	11,000.00	5,755.06	5,635.86	48.280	SF
Dechant 37N-E1HZ - Surface Hole - Surface Hole - As D	730.99	648.00	8,325.85	8,321.37	1,858.369	CC, ES
Dechant 37N-E1HZ - Surface Hole - Surface Hole - As D	15,600.00	648.00	9,980.47	9,915.00	152.456	SF
Dechant 37N-W1HZ - Production Hole - Production Hole	5,056.34	12,384.00	5,981.57	5,874.73	55.988	CC
Dechant 37N-W1HZ - Production Hole - Production Hole	5,100.00	12,384.00	5,981.73	5,874.51	55.794	ES
Dechant 37N-W1HZ - Production Hole - Production Hole	8,500.00	12,384.00	6,372.62	6,247.37	50.883	SF
Dechant 37N-W1HZ - Surface Hole - Surface Hole - As C	406.03	323.03	8,297.13	8,294.95	3,809.973	CC
Dechant 37N-W1HZ - Surface Hole - Surface Hole - As C	800.00	655.00	8,297.67	8,292.92	1,748.093	ES
Dechant 37N-W1HZ - Surface Hole - Surface Hole - As C	15,700.00	655.00	9,992.36	9,926.42	151.540	SF
Dechant State 15C-1HZ - Wellbore #1 - As Drilled	5,143.22	16,665.00	6,451.42	6,327.61	52.104	CC
Dechant State 15C-1HZ - Wellbore #1 - As Drilled	5,200.00	16,665.00	6,451.67	6,327.43	51.929	ES
Dechant State 15C-1HZ - Wellbore #1 - As Drilled	15,895.65	15,895.65	6,736.48	6,573.98	41.457	SF
Dechant State 16C-1HZ - Original Drilling - Original Drilling	5,483.55	16,839.03	5,376.44	5,191.69	29.102	CC
Dechant State 16C-1HZ - Original Drilling - Original Drilling	5,600.00	16,839.03	5,377.70	5,191.31	28.852	ES
Dechant State 16C-1HZ - Original Drilling - Original Drilling	16,100.00	16,100.00	5,556.39	5,333.39	24.916	SF
Dechant State 36N-E1HZ - Wellbore #1 - Wellbore #1	4,820.16	16,517.00	6,810.92	6,689.51	56.097	CC
Dechant State 36N-E1HZ - Wellbore #1 - Wellbore #1	4,900.00	16,517.00	6,811.39	6,689.39	55.828	ES
Dechant State 36N-E1HZ - Wellbore #1 - Wellbore #1	15,300.00	15,300.00	7,139.51	6,979.51	44.620	SF

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Noble Energy, Inc.

## Anticollision Summary Report

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Pioneer D31-716
<b>Project:</b>	Mustang	<b>TVD Reference:</b>	Well @ 4910.00ft
<b>Reference Site:</b>	Y Section 07	<b>MD Reference:</b>	Well @ 4910.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Pioneer D31-716	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Pioneer D31-716	<b>Database:</b>	EDMP
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

### Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
H Section 36						
Dechant State 37N-E36HZ - Wellbore #1 - As Drilled	15,244.82	9,393.07	5,783.66	5,673.74	52.621	CC
Dechant State 37N-E36HZ - Wellbore #1 - As Drilled	15,500.00	15,500.00	5,788.18	5,625.80	35.646	ES, SF
Dechant State 37N-W36HZ - Wellbore #1 - As Drilled	17,721.27	6,869.00	6,295.22	6,180.98	55.103	CC
Dechant State 37N-W36HZ - Wellbore #1 - As Drilled	17,800.11	6,869.00	6,295.72	6,180.96	54.861	ES, SF
Dechant State 38N-1HZ - Wellbore #1 - As Drilled	5,565.51	16,675.00	4,771.15	4,644.91	37.795	CC
Dechant State 38N-1HZ - Wellbore #1 - As Drilled	5,600.00	16,675.00	4,771.27	4,644.73	37.704	ES
Dechant State 38N-1HZ - Wellbore #1 - As Drilled	14,000.00	14,000.00	5,055.51	4,910.79	34.933	SF
Dechant State H36-11D - Original Drilling - Original Drillir	14,554.37	7,079.77	8,084.24	7,991.39	87.068	CC
Dechant State H36-11D - Original Drilling - Original Drillir	14,600.00	7,080.43	8,084.36	7,991.21	86.784	ES
Dechant State H36-11D - Original Drilling - Original Drillir	17,200.00	7,130.18	8,505.97	8,398.70	79.290	SF
Dechant State H36-18D - Dechant State H36-18D Gyros	16,602.71	7,182.20	7,533.36	7,422.46	67.929	CC
Dechant State H36-18D - Dechant State H36-18D Gyros	16,700.00	7,179.78	7,533.98	7,422.10	67.340	ES
Dechant State H36-18D - Dechant State H36-18D Gyros	17,800.11	7,152.42	7,627.83	7,504.84	62.017	SF
Dechant State H36-18D - Dechant State H36-18D OH - /	16,602.75	7,195.20	7,533.32	7,422.42	67.928	CC
Dechant State H36-18D - Dechant State H36-18D OH - /	16,700.00	7,192.78	7,533.95	7,422.07	67.340	ES
Dechant State H36-18D - Dechant State H36-18D OH - /	17,800.11	7,165.42	7,627.79	7,504.79	62.017	SF
Dechant State H36-19 - Original Drilling - Original Drilling	16,954.34	6,461.45	8,901.56	8,793.31	82.238	CC
Dechant State H36-19 - Original Drilling - Original Drilling	17,000.00	6,461.81	8,901.67	8,793.12	82.000	ES
Dechant State H36-19 - Original Drilling - Original Drilling	17,800.11	6,467.52	8,941.64	8,827.87	78.593	SF
Dechant State H36-20D - Dechant State H36-20D Gyros	15,166.28	6,820.34	8,711.03	8,610.90	86.993	CC
Dechant State H36-20D - Dechant State H36-20D Gyros	15,200.00	6,820.26	8,711.10	8,610.80	86.855	ES
Dechant State H36-20D - Dechant State H36-20D Gyros	17,700.00	6,800.00	9,072.05	8,961.59	82.129	SF
Dechant State H36-20D - Dechant State H36-20D OH - /	15,166.27	6,833.34	8,711.03	8,610.89	86.993	CC
Dechant State H36-20D - Dechant State H36-20D OH - /	15,200.00	6,833.26	8,711.09	8,610.80	86.855	ES
Dechant State H36-20D - Dechant State H36-20D OH - /	17,700.00	6,813.00	9,072.05	8,961.59	82.129	SF
Dechant State H36-21D - Dechant State H36-21D Gyros	15,177.87	7,019.83	7,506.20	7,403.02	72.753	CC
Dechant State H36-21D - Dechant State H36-21D Gyros	15,200.00	7,019.91	7,506.23	7,402.94	72.673	ES
Dechant State H36-21D - Dechant State H36-21D Gyros	16,900.00	7,025.27	7,701.21	7,590.89	69.804	SF
Dechant State H36-21D - Dechant State H36-21D OH - /	15,177.85	7,032.83	7,506.22	7,403.05	72.753	CC
Dechant State H36-21D - Dechant State H36-21D OH - /	15,200.00	7,032.91	7,506.25	7,402.96	72.674	ES
Dechant State H36-21D - Dechant State H36-21D OH - /	16,900.00	7,038.27	7,701.24	7,590.91	69.805	SF
Dechant State H36-24 - Original Drilling - Original Drilling	13,979.17	7,079.93	7,439.94	7,350.52	83.199	CC
Dechant State H36-24 - Original Drilling - Original Drilling	14,000.00	7,080.07	7,439.97	7,350.41	83.071	ES
Dechant State H36-24 - Original Drilling - Original Drilling	16,500.00	7,094.58	7,855.37	7,751.76	75.816	SF
Dechant State H36-31D - Dechant State H36-31D OH - /	16,583.53	7,180.29	9,928.63	9,819.94	91.343	CC
Dechant State H36-31D - Dechant State H36-31D OH - /	16,600.00	7,180.20	9,928.65	9,819.84	91.252	ES
Dechant State H36-31D - Dechant State H36-31D OH - /	17,700.00	7,173.83	9,991.21	9,875.54	86.377	SF
Dechant State H36-32D - Dechant State H36-32D Gyros	15,340.99	6,900.00	9,942.25	9,838.48	95.813	CC
Dechant State H36-32D - Dechant State H36-32D Gyros	15,400.00	6,900.00	9,942.42	9,838.21	95.405	ES
Dechant State H36-32D - Dechant State H36-32D Gyros	16,400.00	6,900.00	9,998.49	9,887.10	89.762	SF
Dechant State H36-32D - Dechant State H36-32D OH - /	15,340.96	6,913.00	9,942.23	9,838.47	95.813	CC
Dechant State H36-32D - Dechant State H36-32D OH - /	15,400.00	6,913.00	9,942.41	9,838.20	95.405	ES
Dechant State H36-32D - Dechant State H36-32D OH - /	16,400.00	6,913.00	9,998.48	9,887.09	89.761	SF
Dechant State H36-33 - Dechant State H36-33D Gyros	14,122.36	6,900.00	9,886.46	9,798.08	111.868	CC
Dechant State H36-33 - Dechant State H36-33D Gyros	14,200.00	6,900.00	9,886.76	9,797.80	111.130	ES
Dechant State H36-33 - Dechant State H36-33D Gyros	15,600.00	6,900.00	9,996.27	9,895.99	99.683	SF
Dechant State H36-33 - Dechant State H36-33D OH - As	14,122.33	6,913.00	9,886.45	9,798.07	111.868	CC
Dechant State H36-33 - Dechant State H36-33D OH - As	14,200.00	6,913.00	9,886.75	9,797.79	111.130	ES
Dechant State H36-33 - Dechant State H36-33D OH - As	15,600.00	6,913.00	9,996.27	9,895.99	99.683	SF
HSR Dechant State 01-36 - Wellbore #1 - As Drilled	17,476.65	6,983.41	5,256.83	5,141.80	45.699	CC
HSR Dechant State 01-36 - Wellbore #1 - As Drilled	17,500.00	6,983.38	5,256.89	5,141.71	45.641	ES
HSR Dechant State 01-36 - Wellbore #1 - As Drilled	17,800.11	6,982.98	5,266.78	5,149.83	45.038	SF
HSR Dechant State 02-36 - Original Drilling - Original Dri	17,493.60	7,054.74	6,973.23	6,857.78	60.398	CC

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Noble Energy, Inc.

## Anticollision Summary Report

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Pioneer D31-716
<b>Project:</b>	Mustang	<b>TVD Reference:</b>	Well @ 4910.00ft
<b>Reference Site:</b>	Y Section 07	<b>MD Reference:</b>	Well @ 4910.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Pioneer D31-716	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Pioneer D31-716	<b>Database:</b>	EDMP
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
H Section 36						
HSR Dechant State 02-36 - Original Drilling - Original Dri	17,500.00	7,054.65	6,973.24	6,857.74	60.376	ES
HSR Dechant State 02-36 - Original Drilling - Original Dri	17,800.11	7,050.31	6,979.97	6,862.55	59.445	SF
HSR Dechant/State 07-36 (PA) - Original Drilling - Origin	16,305.92	6,911.00	6,383.92	6,164.22	29.058	CC, ES
HSR Dechant/State 07-36 (PA) - Original Drilling - Origin	17,200.00	6,911.00	6,446.22	6,221.39	28.671	SF
Spike State GWS H36-03 - Original Drilling - Original Dri	17,349.97	17,349.97	7,893.21	7,742.89	52.510	CC
Spike State GWS H36-03 - Original Drilling - Original Dri	17,400.00	17,400.00	7,893.37	7,742.54	52.332	ES
Spike State GWS H36-03 - Original Drilling - Original Dri	17,800.11	17,800.11	7,906.00	7,751.18	51.067	SF
Spike State GWS H36-04 - Original Drilling - Original Dri	17,501.54	6,731.03	9,392.25	9,272.04	78.133	CC
Spike State GWS H36-04 - Original Drilling - Original Dri	17,600.00	6,731.74	9,392.77	9,271.86	77.689	ES
Spike State GWS H36-04 - Original Drilling - Original Dri	17,800.11	6,733.20	9,397.00	9,274.71	76.844	SF
Spike State GWS H36-13 - Original Drilling - Original Dri	13,370.48	7,444.00	9,348.33	9,260.96	106.995	CC
Spike State GWS H36-13 - Original Drilling - Original Dri	13,400.00	7,444.00	9,348.38	9,260.82	106.772	ES
Spike State GWS H36-13 - Original Drilling - Original Dri	16,900.00	7,444.00	9,992.44	9,886.85	94.639	SF
Spike State GWS H36-14 - Original Drilling - Original Dri	13,200.64	7,062.79	7,823.48	7,740.74	94.557	CC
Spike State GWS H36-14 - Original Drilling - Original Dri	13,300.00	7,067.93	7,824.11	7,740.72	93.820	ES
Spike State GWS H36-14 - Original Drilling - Original Dri	16,100.00	7,212.65	8,342.10	8,243.53	84.626	SF
Spike State H36-02J - Original Drilling - Original Drilling -	16,281.28	7,008.17	8,444.53	8,304.51	60.309	CC
Spike State H36-02J - Original Drilling - Original Drilling -	16,300.00	7,007.85	8,444.55	8,304.42	60.259	ES
Spike State H36-02J - Original Drilling - Original Drilling -	17,800.11	6,982.00	8,579.99	8,431.65	57.839	SF
Spike State H36-05 - Original Drilling - Original Drilling - /	16,102.68	6,800.01	9,446.76	9,343.44	91.439	CC
Spike State H36-05 - Original Drilling - Original Drilling - /	16,200.00	6,800.01	9,447.26	9,343.28	90.856	ES
Spike State H36-05 - Original Drilling - Original Drilling - /	17,800.11	6,800.01	9,598.05	9,484.18	84.294	SF
Spike State H36-11J - Original Drilling - Original Drilling -	13,945.63	6,981.95	8,674.22	8,586.45	98.829	CC
Spike State H36-11J - Original Drilling - Original Drilling -	14,000.00	6,982.59	8,674.39	8,586.26	98.427	ES
Spike State H36-11J - Original Drilling - Original Drilling -	17,200.00	7,023.60	9,264.51	9,159.11	87.896	SF
Spike State H36-12 - Original Drilling - Original Drilling - /	14,831.50	14,831.50	9,557.81	9,436.14	78.553	CC
Spike State H36-12 - Original Drilling - Original Drilling - /	14,900.00	14,900.00	9,558.05	9,435.68	78.102	ES
Spike State H36-12 - Original Drilling - Original Drilling - /	15,600.00	15,600.00	9,588.65	9,459.23	74.089	SF

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation



# Noble Energy, Inc.

## Anticollision Summary Report

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Pioneer D31-716
<b>Project:</b>	Mustang	<b>TVD Reference:</b>	Well @ 4910.00ft
<b>Reference Site:</b>	Y Section 07	<b>MD Reference:</b>	Well @ 4910.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Pioneer D31-716	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Pioneer D31-716	<b>Database:</b>	EDMP
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Y Section 05						
Olsen Red Y05-02D - Olsen Red Y05-02D - Olsen Red Y05-02D	11,813.68	6,927.85	2,002.46	1,930.15	27.691	CC, ES
Olsen Red Y05-02D - Olsen Red Y05-02D - Olsen Red Y05-02D	12,200.00	6,921.69	2,039.38	1,963.70	26.950	SF
Olsen Y5-05JI - Olsen Y5-05JI - Olsen Y5-05JI - As Drille	10,827.49	6,932.00	980.42	926.61	18.221	CC, ES
Olsen Y5-05JI - Olsen Y5-05JI - Olsen Y5-05JI - As Drille	11,000.00	6,932.00	995.48	939.86	17.896	SF
Perkins 32-05 - Perkins 32-05 - Perkins 32-05 - As Drille	10,840.96	6,984.00	3,677.17	3,574.43	35.791	CC, ES
Perkins 32-05 - Perkins 32-05 - Perkins 32-05 - As Drille	11,700.00	6,984.00	3,776.18	3,667.08	34.614	SF
Perkins 42-05 - Perkins 42-05 - Perkins 42-05 - As Drille	10,845.72	7,001.00	4,982.24	4,879.32	48.410	CC
Perkins 42-05 - Perkins 42-05 - Perkins 42-05 - As Drille	10,900.00	7,001.00	4,982.54	4,879.21	48.222	ES
Perkins 42-05 - Perkins 42-05 - Perkins 42-05 - As Drille	12,300.00	7,001.00	5,190.15	5,076.97	45.857	SF
Perkins 43-05 - Perkins 43-05 - Perkins 43-05 - As Drille	9,537.94	7,006.00	4,985.10	4,889.67	52.242	CC, ES
Perkins 43-05 - Perkins 43-05 - Perkins 43-05 - As Drille	11,100.00	7,006.00	5,224.10	5,118.76	49.594	SF
Perkins USX Y05-16 - Perkins USX Y05-16 - Perkins US	8,609.81	6,937.55	4,454.46	4,400.14	81.998	CC, ES
Perkins USX Y05-16 - Perkins USX Y05-16 - Perkins US	10,500.00	6,929.22	4,838.90	4,774.31	74.919	SF
Pioneer Y17-715 - Pioneer Y17-715 - Plan #1	7,985.67	5,169.70	4,873.48	4,825.57	101.722	CC
Pioneer Y17-715 - Pioneer Y17-715 - Plan #1	8,000.00	5,169.95	4,873.50	4,825.54	101.608	ES
Pioneer Y17-715 - Pioneer Y17-715 - Plan #1	10,400.00	5,211.75	5,438.57	5,378.36	90.337	SF
Pioneer Y17-725 - Pioneer Y17-725 - Plan #1	7,991.13	5,928.39	4,474.72	4,423.89	88.035	CC
Pioneer Y17-725 - Pioneer Y17-725 - Plan #1	8,000.00	5,928.51	4,474.73	4,423.87	87.983	ES
Pioneer Y17-725 - Pioneer Y17-725 - Plan #1	10,000.00	5,956.47	4,904.88	4,844.35	81.033	SF
Pioneer Y17-735 - Pioneer Y17-735 - Plan #1	7,946.56	6,514.24	3,973.26	3,921.29	76.452	CC, ES
Pioneer Y17-735 - Pioneer Y17-735 - Plan #1	9,500.00	6,350.00	4,254.90	4,196.30	72.604	SF
Pioneer Y17-740 - Pioneer Y17-740 - Plan #1	7,974.81	6,572.49	3,629.75	3,577.78	69.841	CC, ES
Pioneer Y17-740 - Pioneer Y17-740 - Plan #1	9,300.00	6,500.00	3,861.60	3,803.81	66.818	SF
Pioneer Y17-745 - Pioneer Y17-745 - Plan #1	7,668.41	7,025.69	3,346.14	3,294.14	64.349	CC, ES
Pioneer Y17-745 - Pioneer Y17-745 - Plan #1	8,900.00	6,584.26	3,509.06	3,452.98	62.570	SF
Pioneer Y17-755 - Pioneer Y17-755 - Plan #1	7,500.00	7,500.00	2,686.54	2,631.36	48.688	SF
Pioneer Y17-755 - Pioneer Y17-755 - Plan #1	7,961.51	6,452.85	2,644.81	2,592.14	50.217	CC, ES
Pioneer Y17-765 - Pioneer Y17-765 - Plan #1	7,836.27	6,786.99	2,029.24	1,976.88	38.756	CC, ES
Pioneer Y17-765 - Pioneer Y17-765 - Plan #1	8,200.00	6,642.81	2,053.94	2,000.54	38.460	SF
Pioneer Y17-775 - Pioneer Y17-775 - Plan #1	7,566.93	7,056.76	1,413.84	1,361.94	27.241	CC, ES
Pioneer Y17-775 - Pioneer Y17-775 - Plan #1	7,650.00	7,007.13	1,416.44	1,364.36	27.199	SF
Pioneer Y17-780 - Pioneer Y17-780 - Plan #1	7,638.63	7,193.32	1,083.25	1,031.17	20.801	CC, ES
Pioneer Y17-780 - Pioneer Y17-780 - Plan #1	7,700.00	7,148.50	1,085.07	1,032.79	20.756	SF
Pioneer Y17-785 - Pioneer Y17-785 - Plan #1	7,584.03	7,206.90	760.24	707.68	14.465	CC, ES
Pioneer Y17-785 - Pioneer Y17-785 - Plan #1	7,600.00	7,195.61	760.38	707.77	14.452	SF
Y Section 06						
Gray 10-6 (PA) - Wellbore #1 - Gyro Surveys	9,496.76	6,942.74	1,506.26	1,448.13	25.910	CC
Gray 10-6 (PA) - Wellbore #1 - Gyro Surveys	9,500.00	6,942.87	1,506.27	1,448.13	25.907	ES
Gray 10-6 (PA) - Wellbore #1 - Gyro Surveys	9,600.00	6,946.75	1,509.79	1,451.45	25.876	SF
Norris 14-6 (PA) - Wellbore #1 - Gyro Surveys	100.00	45.90	2,625.37	2,625.16	10,000.000	CC
Norris 14-6 (PA) - Wellbore #1 - Gyro Surveys	2,202.00	2,164.29	2,632.37	2,617.32	174.918	ES
Norris 14-6 (PA) - Wellbore #1 - Gyro Surveys	9,100.00	6,979.62	3,747.58	3,692.00	67.424	SF
Norris 41-6 (PA) - Wellbore #1 - Gyro Surveys	11,745.32	6,941.01	527.31	455.48	7.341	CC, ES, SF
Norris Y 6-5 (PA) - Wellbore #1 - Gyro Surveys	11,177.45	6,896.67	3,835.11	3,767.32	56.574	CC
Norris Y 6-5 (PA) - Wellbore #1 - Gyro Surveys	11,200.00	6,896.41	3,835.18	3,767.28	56.486	ES
Norris Y 6-5 (PA) - Wellbore #1 - Gyro Surveys	11,900.00	6,888.07	3,902.57	3,831.79	55.137	SF

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Noble Energy, Inc.

## Anticollision Summary Report

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Pioneer D31-716
<b>Project:</b>	Mustang	<b>TVD Reference:</b>	Well @ 4910.00ft
<b>Reference Site:</b>	Y Section 07	<b>MD Reference:</b>	Well @ 4910.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Pioneer D31-716	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Pioneer D31-716	<b>Database:</b>	EDMP
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Y Section 07						
Harkis 11-7 (PA) - Wellbore #1 - Gyro Surveys	2,020.01	2,010.06	2,373.22	2,359.35	171.149	CC, ES
Harkis 11-7 (PA) - Wellbore #1 - Gyro Surveys	7,350.00	6,887.13	4,065.73	4,015.21	80.485	SF
Harkis 1-7 (PA) - Wellbore #1 - Gyro Surveys	1,145.39	1,152.40	2,142.99	2,135.27	277.314	CC
Harkis 1-7 (PA) - Wellbore #1 - Gyro Surveys	1,900.00	1,894.89	2,145.61	2,132.59	164.816	ES
Harkis 1-7 (PA) - Wellbore #1 - Gyro Surveys	7,150.00	6,807.19	3,783.42	3,733.63	75.976	SF
HP Farms Y 7-15JI (PR) - Wellbore #1 - No Surveys	2,200.00	2,201.00	3,973.94	3,922.27	76.905	CC
HP Farms Y 7-15JI (PR) - Wellbore #1 - No Surveys	2,500.00	2,500.45	3,977.52	3,918.81	67.749	ES
HP Farms Y 7-15JI (PR) - Wellbore #1 - No Surveys	7,000.00	6,694.88	4,649.93	4,488.91	28.878	SF
HP Y07-09 (PR) - Wellbore #1 - No Surveys	5,178.69	4,965.18	2,868.15	2,749.50	24.174	CC
HP Y07-09 (PR) - Wellbore #1 - No Surveys	5,600.00	5,355.84	2,872.48	2,744.16	22.385	ES
HP Y07-09 (PR) - Wellbore #1 - No Surveys	6,950.00	6,601.86	2,976.81	2,817.57	18.693	SF
HP Y07-10D (SI) - Wellbore #1 - Gyro Surveys	3,984.49	4,185.71	2,601.08	2,548.58	49.543	CC
HP Y07-10D (SI) - Wellbore #1 - Gyro Surveys	4,100.00	4,280.53	2,602.02	2,547.54	47.760	ES
HP Y07-10D (SI) - Wellbore #1 - Gyro Surveys	5,900.00	5,686.80	2,932.70	2,852.56	36.593	SF
Perkins 31-7 (SI) - Wellbore #1 - No Surveys	3,018.95	2,962.85	30.20	-39.59	0.433	Level 1, CC, ES, SF
Perkins USX Y 7-17 (SI) - Wellbore #1 - Gyro Surveys	4,522.35	4,385.92	708.16	676.46	22.344	CC
Perkins USX Y 7-17 (SI) - Wellbore #1 - Gyro Surveys	4,600.00	4,458.51	708.68	676.40	21.951	ES
Perkins USX Y 7-17 (SI) - Wellbore #1 - Gyro Surveys	5,300.00	5,096.03	759.23	721.73	20.246	SF
Pioneer 22-7 (SI) - Wellbore #1 - No Surveys	2,200.00	2,177.00	1,792.83	1,741.63	35.021	CC
Pioneer 22-7 (SI) - Wellbore #1 - No Surveys	2,300.00	2,276.98	1,794.11	1,740.57	33.507	ES
Pioneer 22-7 (SI) - Wellbore #1 - No Surveys	6,850.00	6,540.78	3,109.89	2,953.54	19.891	SF
Pioneer D31-725 - Pioneer D31-725 - Plan #1	2,240.49	2,241.81	22.64	7.04	1.451	Level 3, CC
Pioneer D31-725 - Pioneer D31-725 - Plan #1	2,700.00	2,704.69	24.00	5.37	1.288	Level 3, ES, SF
Pioneer D31-735 - Pioneer D31-735 - Plan #1	2,205.07	2,206.15	45.00	29.65	2.932	CC
Pioneer D31-735 - Pioneer D31-735 - Plan #1	2,300.00	2,302.29	45.26	29.24	2.826	ES
Pioneer D31-735 - Pioneer D31-735 - Plan #1	2,500.00	2,504.70	47.85	30.48	2.754	SF
Pioneer D31-744 - Pioneer D31-744 - Plan #1	2,200.00	2,201.00	67.64	52.33	4.418	CC, ES
Pioneer D31-744 - Pioneer D31-744 - Plan #1	2,300.00	2,300.98	69.35	53.33	4.329	SF
Pioneer D31-756 - Pioneer D31-756 - Plan #1	2,200.00	2,206.00	1,024.98	1,009.66	66.869	CC, ES
Pioneer D31-756 - Pioneer D31-756 - Plan #1	17,800.11	17,457.25	2,508.12	2,323.10	13.556	SF
Pioneer D31-761 - Pioneer D31-761 - Plan #1	2,200.00	2,206.00	1,047.64	1,032.32	68.347	CC, ES
Pioneer D31-761 - Pioneer D31-761 - Plan #1	17,800.11	17,676.10	2,840.04	2,653.76	15.246	SF
Pioneer D31-775 - Pioneer D31-775 - Plan #1	2,200.00	2,207.00	1,070.00	1,054.67	69.790	CC, ES
Pioneer D31-775 - Pioneer D31-775 - Plan #1	17,800.11	17,578.19	3,760.83	3,574.78	20.214	SF
Pioneer D31-785 - Pioneer D31-785 - Plan #1	2,200.00	2,207.00	1,091.25	1,075.92	71.175	CC, ES
Pioneer D31-785 - Pioneer D31-785 - Plan #1	17,800.11	17,850.81	4,386.93	4,200.25	23.500	SF
Pioneer USX Y07-08D (PR) - Wellbore #1 - As Drilled	5,986.09	5,941.43	1,608.68	1,564.92	36.762	CC
Pioneer USX Y07-08D (PR) - Wellbore #1 - As Drilled	6,000.00	5,950.47	1,608.70	1,564.86	36.699	ES
Pioneer USX Y07-08D (PR) - Wellbore #1 - As Drilled	6,850.00	6,672.64	1,668.25	1,618.64	33.627	SF
Pioneer Y07-07D (PR) - Wellbore #1 - Gyro Surveys	4,732.28	5,259.95	1,598.16	1,519.16	20.229	CC
Pioneer Y07-07D (PR) - Wellbore #1 - Gyro Surveys	4,800.00	5,300.00	1,599.07	1,518.46	19.837	ES
Pioneer Y07-07D (PR) - Wellbore #1 - Gyro Surveys	5,600.00	5,884.66	1,701.27	1,606.67	17.983	SF
Pioneer Y18-715 - Pioneer Y18-715 - Plan #1	7,411.12	7,741.14	72.89	16.16	1.285	Level 3, CC, ES, SF
Pioneer Y18-725 - Pioneer Y18-725 - Plan #1	2,207.47	2,210.83	142.55	127.18	9.274	CC
Pioneer Y18-725 - Pioneer Y18-725 - Plan #1	2,300.00	2,306.56	142.97	126.94	8.918	ES
Pioneer Y18-725 - Pioneer Y18-725 - Plan #1	2,700.00	2,718.81	156.39	137.59	8.321	SF
Pioneer Y18-730 - Pioneer Y18-730 - Plan #1	2,205.96	2,210.30	164.91	149.55	10.734	CC
Pioneer Y18-730 - Pioneer Y18-730 - Plan #1	2,300.00	2,307.48	165.52	149.49	10.321	ES
Pioneer Y18-730 - Pioneer Y18-730 - Plan #1	2,600.00	2,616.38	176.53	158.40	9.736	SF
Pioneer Y18-735 - Pioneer Y18-735 - Plan #1	2,204.50	2,209.79	187.55	172.20	12.212	CC, ES
Pioneer Y18-735 - Pioneer Y18-735 - Plan #1	2,600.00	2,615.64	202.65	184.50	11.168	SF
Pioneer Y18-744 - Pioneer Y18-744 - Plan #1	2,200.36	2,205.39	209.92	194.59	13.696	CC, ES
Pioneer Y18-744 - Pioneer Y18-744 - Plan #1	2,500.00	2,505.22	224.57	207.14	12.881	SF

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Noble Energy, Inc.

## Anticollision Summary Report

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Pioneer D31-716
<b>Project:</b>	Mustang	<b>TVD Reference:</b>	Well @ 4910.00ft
<b>Reference Site:</b>	Y Section 07	<b>MD Reference:</b>	Well @ 4910.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Pioneer D31-716	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Pioneer D31-716	<b>Database:</b>	EDMP
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Y Section 07						
Pioneer Y18-756 - Pioneer Y18-756 - Plan #1	2,200.41	2,203.54	882.45	867.13	57.598	CC, ES
Pioneer Y18-756 - Pioneer Y18-756 - Plan #1	6,900.00	7,573.73	2,310.42	2,259.56	45.427	SF
Pioneer Y18-766 - Pioneer Y18-766 - Plan #1	2,200.00	2,204.00	905.09	889.77	59.075	CC, ES
Pioneer Y18-766 - Pioneer Y18-766 - Plan #1	2,900.00	2,817.67	1,015.22	995.38	51.157	SF
Pioneer Y18-770 - Pioneer Y18-770 - Plan #1	2,200.00	2,204.00	927.45	912.13	60.534	CC, ES
Pioneer Y18-770 - Pioneer Y18-770 - Plan #1	2,800.00	2,707.16	1,016.00	996.90	53.190	SF
Pioneer Y18-775 - Pioneer Y18-775 - Plan #1	2,200.00	2,205.00	948.69	933.37	61.906	CC, ES
Pioneer Y18-775 - Pioneer Y18-775 - Plan #1	2,800.00	2,688.74	1,042.38	1,023.37	54.842	SF
Pioneer Y18-785 - Pioneer Y18-785 - Plan #1	2,200.00	2,205.00	972.45	957.13	63.457	CC, ES
Pioneer Y18-785 - Pioneer Y18-785 - Plan #1	2,800.00	2,664.79	1,072.19	1,053.31	56.791	SF
UPRC 7-10Q (PR) - Wellbore #1 - No Surveys	2,200.00	2,160.00	3,236.86	3,186.01	63.651	CC
UPRC 7-10Q (PR) - Wellbore #1 - No Surveys	2,900.00	2,853.06	3,243.60	3,176.43	48.286	ES
UPRC 7-10Q (PR) - Wellbore #1 - No Surveys	6,950.00	6,611.86	3,723.35	3,564.10	23.381	SF
UPRR 53 PAN AM E 1 (PA) - Wellbore #1 - Gyro Survey	2,237.81	2,300.86	3,819.97	3,804.32	243.985	CC
UPRR 53 PAN AM E 1 (PA) - Wellbore #1 - Gyro Survey	2,300.00	2,366.05	3,820.40	3,804.30	237.240	ES
UPRR 53 PAN AM E 1 (PA) - Wellbore #1 - Gyro Survey	7,050.00	6,784.22	5,060.56	5,010.38	100.851	SF
Y Section 08						
Alfred Krough 1 (PA) - Wellbore #1 - No Surveys	6,786.91	6,467.25	4,138.53	3,982.86	26.586	CC
Alfred Krough 1 (PA) - Wellbore #1 - No Surveys	6,800.00	6,479.28	4,138.66	3,982.69	26.535	ES
Alfred Krough 1 (PA) - Wellbore #1 - No Surveys	7,100.00	6,733.62	4,211.71	4,049.35	25.941	SF
Lazy 15-8 (PR) - Wellbore #1 - Gyro Surveys	6,949.55	6,636.01	5,610.28	5,560.96	113.768	CC
Lazy 15-8 (PR) - Wellbore #1 - Gyro Surveys	6,950.00	6,636.39	5,610.28	5,560.96	113.760	ES
Lazy 15-8 (PR) - Wellbore #1 - Gyro Surveys	7,450.00	7,054.44	5,754.33	5,701.68	109.301	SF
Norris C Unit 01 (SI) - Wellbore #1 - Gyro Surveys	7,378.47	6,865.21	4,811.63	4,760.71	94.487	CC, ES
Norris C Unit 01 (SI) - Wellbore #1 - Gyro Surveys	8,200.00	6,936.39	5,001.93	4,948.19	93.088	SF
Norris C Unit 02 (PA) - Wellbore #1 - Gyro Surveys	7,089.79	6,687.49	1,519.96	1,470.27	30.591	CC
Norris C Unit 02 (PA) - Wellbore #1 - Gyro Surveys	7,100.00	6,695.01	1,520.02	1,470.26	30.547	ES
Norris C Unit 02 (PA) - Wellbore #1 - Gyro Surveys	7,250.00	6,790.32	1,535.37	1,484.59	30.234	SF
Pioneer Y 08-02 (PR) - Wellbore #1 - Gyro Surveys	7,401.01	6,887.44	3,600.92	3,549.94	70.633	CC, ES
Pioneer Y 08-02 (PR) - Wellbore #1 - Gyro Surveys	7,650.00	6,942.19	3,627.95	3,576.02	69.856	SF
Pioneer Y 08-03 (SI) - Wellbore #1 - Gyro Surveys	7,406.20	6,870.96	2,498.75	2,447.78	49.023	CC, ES
Pioneer Y 08-03 (SI) - Wellbore #1 - Gyro Surveys	7,600.00	6,918.57	2,517.09	2,465.32	48.615	SF
Pioneer Y 08-05 (SI) - Wellbore #1 - Gyro Surveys	6,852.19	6,522.02	1,891.24	1,842.33	38.668	CC, ES
Pioneer Y 08-05 (SI) - Wellbore #1 - Gyro Surveys	7,050.00	6,711.00	1,919.55	1,869.08	38.029	SF
Pioneer Y 08-08 (PR) - Wellbore #1 - No Surveys	7,203.74	6,847.10	5,358.44	5,194.83	32.751	CC, ES
Pioneer Y 08-08 (PR) - Wellbore #1 - No Surveys	7,500.00	6,986.79	5,397.16	5,229.73	32.235	SF
Y Section 09						
Perkins 34-09 - Wellbore #1 - Wellbore #1 - As Drilled						Out of range
Perkins USX Y09-23 - Original Drilling - Original Drilling -						Out of range

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Noble Energy, Inc.

## Anticollision Summary Report

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Pioneer D31-716
<b>Project:</b>	Mustang	<b>TVD Reference:</b>	Well @ 4910.00ft
<b>Reference Site:</b>	Y Section 07	<b>MD Reference:</b>	Well @ 4910.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Pioneer D31-716	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Pioneer D31-716	<b>Database:</b>	EDMP
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Y Section 16						
Hullabaloo State Y21-716 - Original Drilling - Original Drill						Out of range
Hullabaloo State Y21-726 - Original Drilling - Original Drill						Out of range
Hullabaloo State Y21-736 - Original Drilling - Original Drill						Out of range
Hullabaloo State Y21-746 - Original Drilling - Original Drill						Out of range
Hullabaloo State Y21-756 - Original Drilling - Original Drill	7,013.56	6,454.03	9,437.14	9,393.45	216.004	CC, ES
Hullabaloo State Y21-756 - Original Drilling - Original Drill	7,550.00	6,520.00	9,575.78	9,529.95	208.938	SF
Hullabaloo State Y21-763 - Original Drilling - Original Drill	7,026.12	6,803.00	8,984.70	8,939.28	197.778	CC, ES
Hullabaloo State Y21-763 - Original Drilling - Original Drill	7,600.00	6,803.00	9,148.56	9,101.09	192.698	SF
Hullabaloo State Y21-769 - Original Drilling - Original Drill	6,976.28	6,322.00	8,518.55	8,474.99	195.547	CC, ES
Hullabaloo State Y21-769 - Original Drilling - Original Drill	7,693.76	6,363.03	8,762.06	8,715.83	189.556	SF
Hullabaloo State Y21-775 - Original Drilling - Original Drill	6,962.00	6,323.00	8,258.71	8,215.48	191.046	CC, ES
Hullabaloo State Y21-775 - Original Drilling - Original Drill	7,550.00	6,323.00	8,435.29	8,389.88	185.761	SF
Hullabaloo State Y21-781 - Original Drilling - Original Drill	6,958.64	6,416.00	7,953.57	7,909.85	181.908	CC, ES
Hullabaloo State Y21-781 - Original Drilling - Original Drill	7,500.00	6,511.00	8,108.38	8,062.37	176.244	SF
Hullabaloo State Y21-787 - Original Drilling - Original Drill	6,940.33	6,416.00	7,638.48	7,594.54	173.844	CC, ES
Hullabaloo State Y21-787 - Original Drilling - Original Drill	7,450.00	6,466.19	7,778.88	7,732.89	169.140	SF
State 01 - Original Drilling - Original Drilling - As Drilled						Out of range
State 21 (PA) - Original Drilling - Original Drilling - As Drilled						Out of range
State Y16-05D - Wellbore #1 - Wellbore #1 - As Drilled	6,923.41	6,768.85	9,360.60	9,310.83	188.089	CC, ES
State Y16-05D - Wellbore #1 - Wellbore #1 - As Drilled	7,550.00	7,149.99	9,587.14	9,533.27	177.954	SF
Y Section 17						
UPRC 17-15Q (PA) - Wellbore #1 - No Surveys						Out of range
UPRC 17-5Q (PR) - Wellbore #1 - No Surveys	6,751.79	6,438.83	6,519.25	6,364.19	42.043	CC, ES
UPRC 17-5Q (PR) - Wellbore #1 - No Surveys	7,200.00	6,807.67	6,669.37	6,505.10	40.599	SF
HP Farms Y 17-03 (PR) - Wellbore #1 - No Surveys	6,807.50	6,485.15	5,946.55	5,790.52	38.111	CC, ES
HP Farms Y 17-03 (PR) - Wellbore #1 - No Surveys	7,250.00	6,833.89	6,085.22	5,920.40	36.921	SF
HP Farms Y 17-04 (PR) - Wellbore #1 - Gyro Surveys	6,773.90	6,600.00	5,453.98	5,404.73	110.744	CC, ES
HP Farms Y 17-04 (PR) - Wellbore #1 - Gyro Surveys	7,150.00	6,965.41	5,558.88	5,506.77	106.672	SF
HP Farms Y 17-06 (PR) - Wellbore #1 - Gyro Surveys	6,782.22	6,398.16	7,306.17	7,257.65	150.557	CC, ES
HP Farms Y 17-06 (PR) - Wellbore #1 - Gyro Surveys	6,950.00	6,950.00	7,326.80	7,275.60	143.106	SF
Lana Y 17-14JI (SI) - Wellbore #1 - Gyro Surveys	6,761.25	6,570.30	9,864.93	9,815.82	200.892	CC, ES
Lana Y 17-14JI (SI) - Wellbore #1 - Gyro Surveys	7,150.00	6,837.43	9,978.99	9,927.33	193.141	SF
Semmen USX Y 17-07 (PR) - Wellbore #1 - Gyro Survey	6,838.76	6,400.00	7,622.02	7,573.56	157.268	CC, ES
Semmen USX Y 17-07 (PR) - Wellbore #1 - Gyro Survey	7,400.00	6,803.96	7,827.17	7,775.15	150.448	SF
Sloan 41-17 - Wellbore #1 - Wellbore #1 - As Drilled	6,898.70	6,400.83	7,490.00	7,441.51	154.473	CC
Sloan 41-17 - Wellbore #1 - Wellbore #1 - As Drilled	6,900.00	6,402.12	7,490.00	7,441.50	154.440	ES
Sloan 41-17 - Wellbore #1 - Wellbore #1 - As Drilled	7,150.00	7,150.00	7,527.26	7,475.11	144.349	SF
UPRC 17-12Q (SI) - Wellbore #1 - Gyro Surveys	5,348.95	4,880.42	8,188.91	8,151.99	221.799	CC
UPRC 17-12Q (SI) - Wellbore #1 - Gyro Surveys	6,750.00	6,750.00	8,194.77	8,145.08	164.935	ES
UPRC 17-12Q (SI) - Wellbore #1 - Gyro Surveys	7,150.00	7,150.00	8,316.99	8,264.23	157.649	SF
UPRC 17-13Q (SI) - Wellbore #1 - Wellbore #1	6,319.84	6,050.30	9,230.52	9,085.13	63.492	CC
UPRC 17-13Q (SI) - Wellbore #1 - Wellbore #1	6,750.00	6,449.17	9,231.96	9,076.67	59.450	ES
UPRC 17-13Q (SI) - Wellbore #1 - Wellbore #1	7,300.00	6,879.31	9,462.63	9,296.62	57.003	SF
UPRR USX Y 17-02 (PR) - Wellbore #1 - Gyro Surveys	6,839.96	6,400.00	6,379.37	6,330.90	131.619	CC, ES
UPRR USX Y 17-02 (PR) - Wellbore #1 - Gyro Surveys	7,450.00	7,450.00	6,621.29	6,566.88	121.683	SF

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

**Noble Energy, Inc.**  
Anticollision Summary Report

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Pioneer D31-716
<b>Project:</b>	Mustang	<b>TVD Reference:</b>	Well @ 4910.00ft
<b>Reference Site:</b>	Y Section 07	<b>MD Reference:</b>	Well @ 4910.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Pioneer D31-716	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Pioneer D31-716	<b>Database:</b>	EDMP
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

**Summary**

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Between Ellipses (ft)	Separation Factor	Warning
Y Section 18						
ADA Harkins Unit A1 (PA) - Wellbore #1 - Gyro Surveys	0.00	35.35	6,107.71			
ADA Harkins Unit A1 (PA) - Wellbore #1 - Gyro Surveys	2,200.00	2,240.24	6,113.97	6,098.66	399.413	ES
ADA Harkins Unit A1 (PA) - Wellbore #1 - Gyro Surveys	7,500.00	7,500.00	7,474.25	7,420.25	138.406	SF
Charles R Milliken Unit 1 (PR) - Wellbore #1 - Gyro Surveys	2,411.51	2,741.50	8,591.25	8,573.44	482.378	CC, ES
Charles R Milliken Unit 1 (PR) - Wellbore #1 - Gyro Surveys	7,200.00	7,100.00	9,535.57	9,483.15	181.917	SF
HSR Harkis 15-18 (PR) - Wellbore #1 - No Surveys	2,200.00	2,215.00	8,540.31	8,488.35	164.384	CC
HSR Harkis 15-18 (PR) - Wellbore #1 - No Surveys	2,700.00	2,712.47	8,546.11	8,482.46	134.263	ES
HSR Harkis 15-18 (PR) - Wellbore #1 - No Surveys	7,250.00	6,888.89	9,102.45	8,936.49	54.847	SF
Lyle V Cooksey Gas Unit 1 (PR) - Wellbore #1 - Gyro Surveys	0.00	0.00	6,293.65			
Lyle V Cooksey Gas Unit 1 (PR) - Wellbore #1 - Gyro Surveys	200.00	133.79	6,294.13	6,293.36	8,085.100	ES
Lyle V Cooksey Gas Unit 1 (PR) - Wellbore #1 - Gyro Surveys	7,200.00	7,001.19	6,768.56	6,716.16	129.164	SF

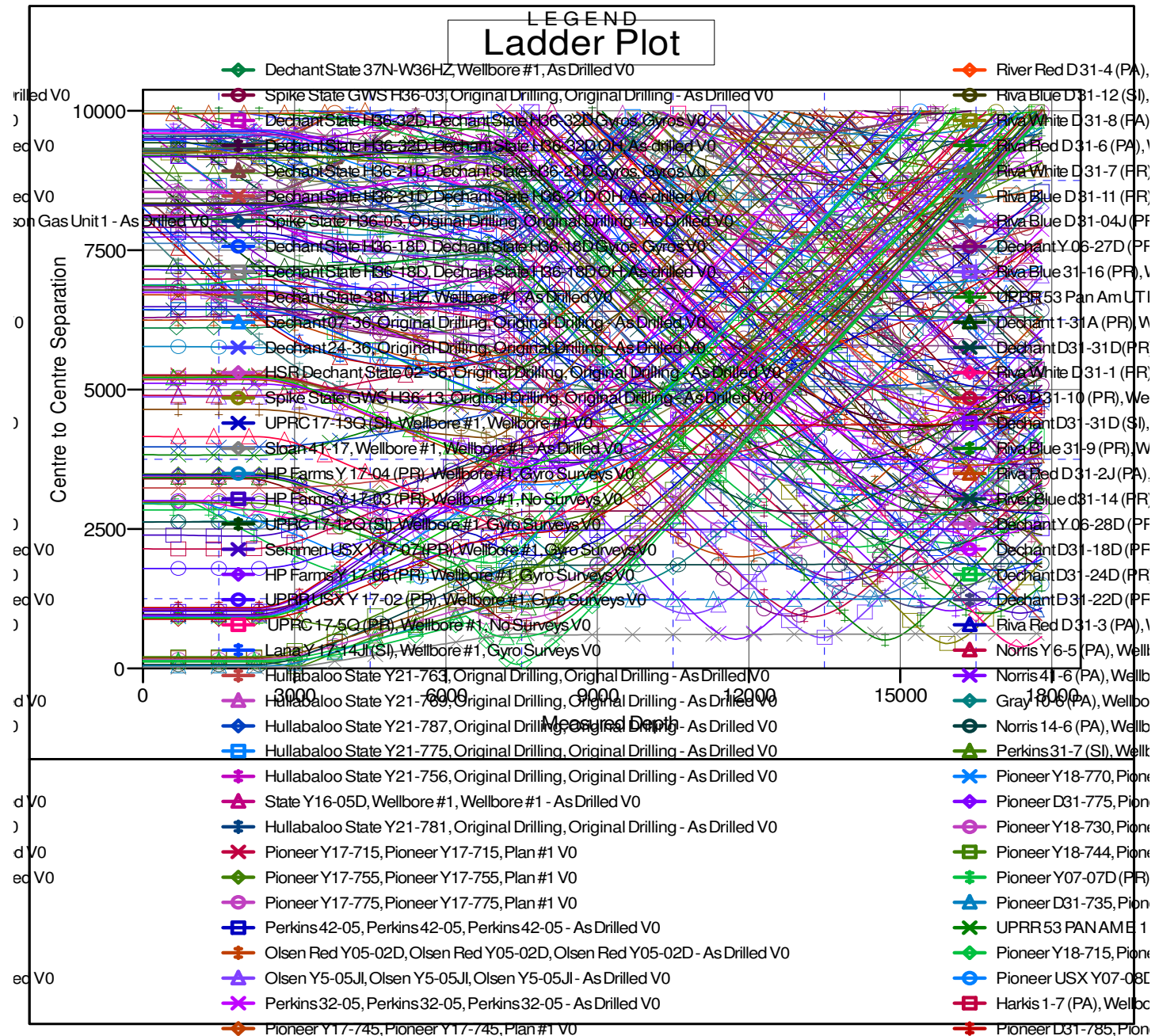


**Noble Energy, Inc.**  
**Anticollision Summary Report**

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Pioneer D31-716
<b>Project:</b>	Mustang	<b>TVD Reference:</b>	Well @ 4910.00ft
<b>Reference Site:</b>	Y Section 07	<b>MD Reference:</b>	Well @ 4910.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Pioneer D31-716	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Pioneer D31-716	<b>Database:</b>	EDMP
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to Well @ 4910.00ft  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.5000000

Coordinates are relative to: Pioneer D31-716  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: 0.59°



CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

**Noble Energy, Inc.**  
**Anticollision Summary Report**

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Pioneer D31-716
<b>Project:</b>	Mustang	<b>TVD Reference:</b>	Well @ 4910.00ft
<b>Reference Site:</b>	Y Section 07	<b>MD Reference:</b>	Well @ 4910.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Pioneer D31-716	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Pioneer D31-716	<b>Database:</b>	EDMP
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to Well @ 4910.00ft  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.5000000

Coordinates are relative to: Pioneer D31-716  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: 0.59°

