

Project: Wells Ranch  
Site: A Section 21  
Well: Harper A21-664  
Wellbore: Original Drilling  
Design: APD - Rev 2

# Northern Region - DJ Basin

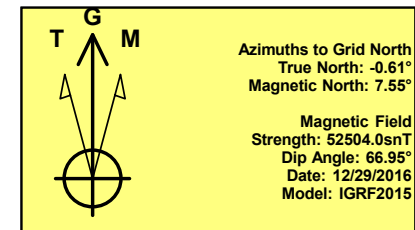
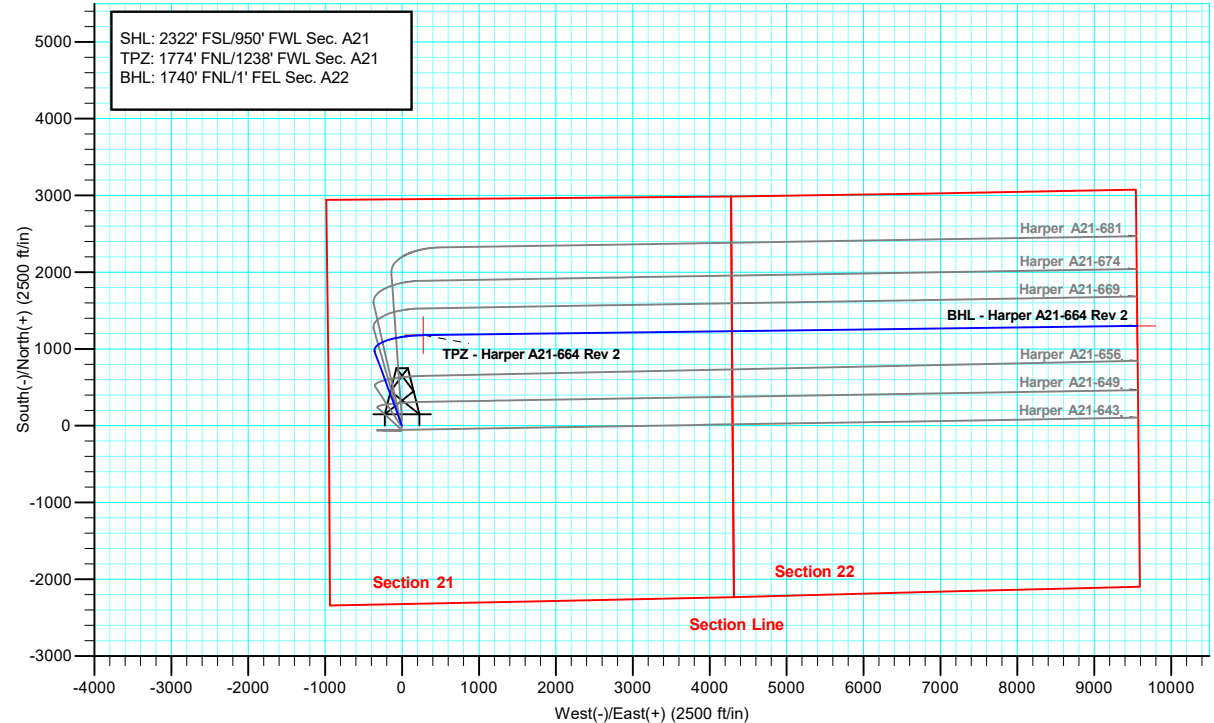
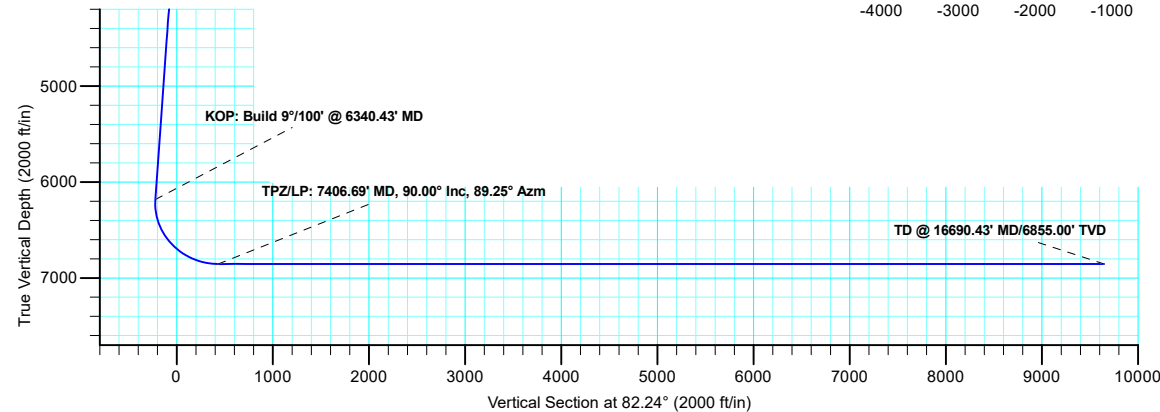
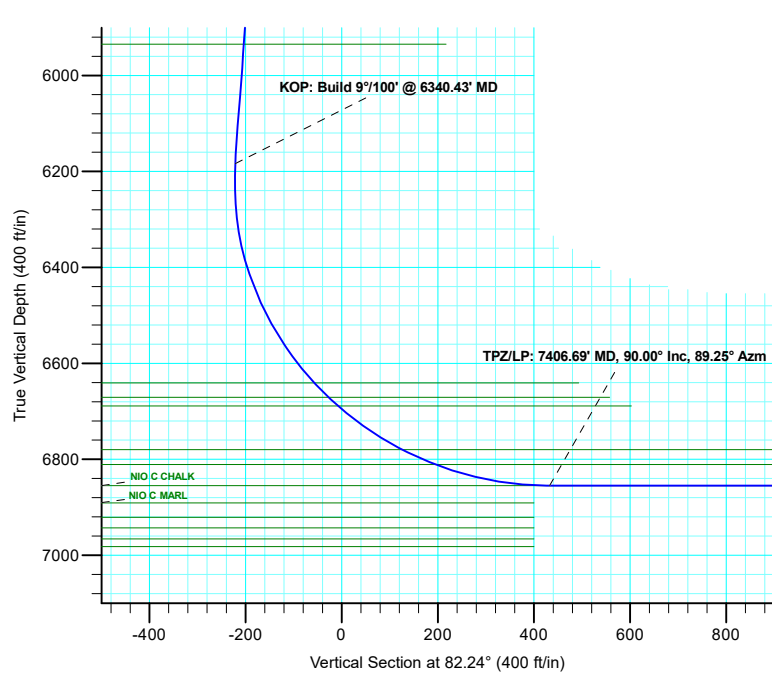
Geodetic System: US State Plane 1983  
Datum: North American Datum 1983  
Ellipsoid: GRS 1980  
Zone: Colorado Northern Zone  
System Datum: Mean Sea Level

## 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	2600.00	0.00	0.00	2600.00	0.00	0.00	0.00	0.00	0.00	
3	3509.58	18.19	339.81	3494.37	134.39	-49.42	2.00	339.81	-30.83	
4	6340.43	18.19	339.81	6183.73	963.86	-354.44	0.00	0.00	-221.13	
5	7406.69	90.00	89.25	6855.00	1180.16	275.95	9.00	108.54	432.69	TPZ - Harper A21-664 Rev 2
6	16690.43	90.00	89.25	6855.00	1301.85	9558.89	0.00	0.00	9647.14	BHL - Harper A21-664 Rev 2

## WELL DETAILS: Harper A21-664

+N/-S	+E/-W	Northing	Ground Level: Easting	4742.00 Latitude	Longitude	Slot
0.00	0.00	1415673.51	3261196.55	40.4706298	-104.5611701	



Plan: APD - Rev 2 (Harper A21-664/Original Drilling)

Created By: Shelly C. Peterkin Date: 13:47, October 25 2018

# **Northern Region - DJ Basin**

**Wells Ranch**

**A Section 21**

**Harper A21-664**

**Original Drilling**

**Plan: APD - Rev 2**

## **Standard Planning Report**

**25 October, 2018**

# Noble Energy, Inc.

## Planning Report

<b>Database:</b>	EDMP	<b>Local Co-ordinate Reference:</b>	Well Harper A21-664
<b>Company:</b>	Northern Region - DJ Basin	<b>TVD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Project:</b>	Wells Ranch	<b>MD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Site:</b>	A Section 21	<b>North Reference:</b>	Grid
<b>Well:</b>	Harper A21-664	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	APD - Rev 2		

<b>Project</b>	Wells Ranch, 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		

<b>Site</b>	A Section 21			
<b>Site Position:</b>		<b>Northing:</b>	1,414,202.83 usft	<b>Latitude:</b> 40.4665920
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,261,231.91 usft	<b>Longitude:</b> -104.5610990
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13.200 in	<b>Grid Convergence:</b> 0.61 °

<b>Well</b>	Harper A21-664			
<b>Well Position</b>	<b>+N/-S</b>	1,470.69 ft	<b>Northing:</b>	1,415,673.51 usft
	<b>+E/-W</b>	-35.36 ft	<b>Easting:</b>	3,261,196.56 usft
<b>Position Uncertainty</b>		0.00 ft	<b>Wellhead Elevation:</b>	<b>Ground Level:</b> 4,742.00 ft

<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>
	IGRF2015	12/29/2016	8.16	66.95	52,503.95187890

<b>Design</b>	APD - Rev 2			
<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	82.24

<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	
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,509.58	18.19	339.81	3,494.37	134.39	-49.42	2.00	2.00	0.00	339.81	
6,340.43	18.19	339.81	6,183.73	963.86	-354.44	0.00	0.00	0.00	0.00	
7,406.69	90.00	89.25	6,855.00	1,180.16	275.95	9.00	6.73	10.26	108.54	TPZ - Harper A21-664
16,690.43	90.00	89.25	6,855.00	1,301.85	9,558.89	0.00	0.00	0.00	0.00	BHL - Harper A21-664

# Noble Energy, Inc.

## Planning Report

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<b>Company:</b>	Northern Region - DJ Basin	<b>TVD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Project:</b>	Wells Ranch	<b>MD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Site:</b>	A Section 21	<b>North Reference:</b>	Grid
<b>Well:</b>	Harper A21-664	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	APD - Rev 2		

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
504.00	0.00	0.00	504.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>PIERRE</b>									
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
691.00	0.00	0.00	691.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>UPPER PIERRE AQUIFER TOP</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
1,100.00	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
1,531.00	0.00	0.00	1,531.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>UPPER PIERRE AQUIFER BASE</b>									
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
1,900.00	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
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Build 2°/100'</b>									
2,700.00	2.00	339.81	2,699.98	1.64	-0.60	-0.38	2.00	2.00	0.00
2,800.00	4.00	339.81	2,799.84	6.55	-2.41	-1.50	2.00	2.00	0.00
2,900.00	6.00	339.81	2,899.45	14.73	-5.42	-3.38	2.00	2.00	0.00
3,000.00	8.00	339.81	2,998.70	26.17	-9.62	-6.00	2.00	2.00	0.00
3,100.00	10.00	339.81	3,097.47	40.85	-15.02	-9.37	2.00	2.00	0.00
3,200.00	12.00	339.81	3,195.62	58.76	-21.61	-13.48	2.00	2.00	0.00
3,300.00	14.00	339.81	3,293.06	79.87	-29.37	-18.32	2.00	2.00	0.00
3,400.00	16.00	339.81	3,389.64	104.16	-38.30	-23.90	2.00	2.00	0.00
3,509.58	18.19	339.81	3,494.37	134.39	-49.42	-30.83	2.00	2.00	0.00
<b>Hold 18.19° Inc., 339.81° Azm</b>									
3,600.00	18.19	339.81	3,580.28	160.88	-59.16	-36.91	0.00	0.00	0.00
3,687.08	18.19	339.81	3,663.00	186.40	-68.54	-42.76	0.00	0.00	0.00
<b>PARKMAN</b>									
3,700.00	18.19	339.81	3,675.28	190.19	-69.94	-43.63	0.00	0.00	0.00
3,800.00	18.19	339.81	3,770.28	219.49	-80.71	-50.35	0.00	0.00	0.00
3,900.00	18.19	339.81	3,865.28	248.79	-91.49	-57.08	0.00	0.00	0.00
4,000.00	18.19	339.81	3,960.28	278.09	-102.26	-63.80	0.00	0.00	0.00
4,100.00	18.19	339.81	4,055.28	307.39	-113.04	-70.52	0.00	0.00	0.00
4,200.00	18.19	339.81	4,150.29	336.69	-123.81	-77.24	0.00	0.00	0.00

# Noble Energy, Inc.

## Planning Report

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<b>Well:</b>	Harper A21-664	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	APD - Rev 2		

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)
4,268.12	18.19	339.81	4,215.00	356.65	-131.15	-81.82	0.00	0.00	0.00
<b>SUSSEX</b>									
4,300.00	18.19	339.81	4,245.29	365.99	-134.59	-83.97	0.00	0.00	0.00
4,400.00	18.19	339.81	4,340.29	395.29	-145.36	-90.69	0.00	0.00	0.00
4,500.00	18.19	339.81	4,435.29	424.59	-156.14	-97.41	0.00	0.00	0.00
4,600.00	18.19	339.81	4,530.29	453.90	-166.91	-104.13	0.00	0.00	0.00
4,700.00	18.19	339.81	4,625.30	483.20	-177.69	-110.86	0.00	0.00	0.00
4,800.00	18.19	339.81	4,720.30	512.50	-188.46	-117.58	0.00	0.00	0.00
4,900.00	18.19	339.81	4,815.30	541.80	-199.24	-124.30	0.00	0.00	0.00
5,000.00	18.19	339.81	4,910.30	571.10	-210.01	-131.02	0.00	0.00	0.00
5,046.00	18.19	339.81	4,954.00	584.58	-214.97	-134.11	0.00	0.00	0.00
<b>SHANNON</b>									
5,100.00	18.19	339.81	5,005.30	600.40	-220.79	-137.74	0.00	0.00	0.00
5,200.00	18.19	339.81	5,100.30	629.70	-231.56	-144.47	0.00	0.00	0.00
5,300.00	18.19	339.81	5,195.31	659.00	-242.34	-151.19	0.00	0.00	0.00
5,400.00	18.19	339.81	5,290.31	688.31	-253.11	-157.91	0.00	0.00	0.00
5,500.00	18.19	339.81	5,385.31	717.61	-263.89	-164.63	0.00	0.00	0.00
5,600.00	18.19	339.81	5,480.31	746.91	-274.66	-171.36	0.00	0.00	0.00
5,700.00	18.19	339.81	5,575.31	776.21	-285.44	-178.08	0.00	0.00	0.00
5,800.00	18.19	339.81	5,670.31	805.51	-296.21	-184.80	0.00	0.00	0.00
5,900.00	18.19	339.81	5,765.32	834.81	-306.99	-191.52	0.00	0.00	0.00
6,000.00	18.19	339.81	5,860.32	864.11	-317.76	-198.24	0.00	0.00	0.00
6,078.61	18.19	339.81	5,935.00	887.15	-326.23	-203.53	0.00	0.00	0.00
<b>TEEPEE BUTTES</b>									
6,100.00	18.19	339.81	5,955.32	893.41	-328.54	-204.97	0.00	0.00	0.00
6,200.00	18.19	339.81	6,050.32	922.71	-339.31	-211.69	0.00	0.00	0.00
6,300.00	18.19	339.81	6,145.32	952.02	-350.09	-218.41	0.00	0.00	0.00
6,340.43	18.19	339.81	6,183.73	963.86	-354.44	-221.13	0.00	0.00	0.00
<b>KOP: Build 9°/100' @ 6340.43' MD</b>									
6,350.00	17.94	342.46	6,192.83	966.67	-355.40	-221.70	9.00	-2.67	27.72
6,400.00	17.23	357.22	6,240.52	981.41	-358.08	-222.37	9.00	-1.42	29.50
6,450.00	17.64	12.21	6,288.25	996.22	-356.84	-219.14	9.00	0.82	29.99
6,500.00	19.10	25.76	6,335.72	1,011.00	-351.68	-212.03	9.00	2.92	27.09
6,550.00	21.40	36.98	6,382.64	1,025.66	-342.63	-201.09	9.00	4.59	22.44
6,600.00	24.29	45.88	6,428.73	1,040.11	-329.76	-186.38	9.00	5.79	17.81
6,650.00	27.59	52.88	6,473.70	1,054.27	-313.14	-168.00	9.00	6.61	14.00
6,700.00	31.18	58.44	6,517.27	1,068.04	-292.87	-146.06	9.00	7.17	11.12
6,750.00	34.95	62.93	6,559.17	1,081.33	-269.07	-120.69	9.00	7.55	8.98
6,800.00	38.87	66.64	6,599.15	1,094.08	-241.90	-92.05	9.00	7.83	7.41
6,850.00	42.88	69.75	6,636.95	1,106.19	-211.53	-60.31	9.00	8.02	6.24
6,855.54	43.33	70.07	6,641.00	1,107.50	-207.97	-56.61	9.00	8.11	5.71
<b>SHARON SPRINGS</b>									
6,898.02	46.80	72.33	6,671.00	1,117.17	-179.51	-27.11	9.00	8.17	5.32
<b>NIO A CHALK</b>									
6,900.00	46.96	72.43	6,672.35	1,117.60	-178.13	-25.68	9.00	8.23	5.00
6,924.87	49.02	73.63	6,689.00	1,122.99	-160.45	-7.44	9.00	8.25	4.83
<b>NIO A MARL</b>									
6,950.00	51.10	74.77	6,705.13	1,128.24	-141.92	11.63	9.00	8.30	4.53
7,000.00	55.28	76.85	6,735.08	1,138.03	-103.12	51.40	9.00	8.36	4.16
7,050.00	59.49	78.73	6,762.02	1,146.92	-61.96	93.38	9.00	8.43	3.76
7,087.16	62.64	80.02	6,780.00	1,152.91	-30.00	125.86	9.00	8.47	3.48
<b>NIO B CHALK</b>									
7,100.00	63.73	80.45	6,785.79	1,154.85	-18.71	137.31	9.00	8.49	3.34

# Noble Energy, Inc.

## Planning Report

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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)
7,150.00	67.99	82.05	6,806.24	1,161.78	26.38	182.92	9.00	8.51	3.20
7,163.03	69.10	82.45	6,811.00	1,163.41	38.39	195.04	9.00	8.53	3.08
<b>NIO B MARL</b>									
7,200.00	72.26	83.56	6,823.23	1,167.66	73.02	229.92	9.00	8.55	2.99
7,250.00	76.54	85.00	6,836.67	1,172.45	120.93	278.04	9.00	8.56	2.87
7,300.00	80.83	86.38	6,846.48	1,176.13	169.80	326.97	9.00	8.58	2.77
7,350.00	85.13	87.74	6,852.59	1,178.67	219.35	376.40	9.00	8.59	2.71
7,400.00	89.42	89.07	6,854.97	1,180.06	269.26	426.05	9.00	8.60	2.67
7,406.69	90.00	89.25	6,855.00	1,180.16	275.95	432.69	9.00	8.60	2.66
<b>TPZ/LP: 7406.69' MD, 90.00° Inc, 89.25° Azm - NIO C CHALK</b>									
7,500.00	90.00	89.25	6,855.00	1,181.38	369.25	525.30	0.00	0.00	0.00
7,600.00	90.00	89.25	6,855.00	1,182.70	469.25	624.55	0.00	0.00	0.00
7,700.00	90.00	89.25	6,855.00	1,184.01	569.24	723.81	0.00	0.00	0.00
7,800.00	90.00	89.25	6,855.00	1,185.32	669.23	823.06	0.00	0.00	0.00
7,900.00	90.00	89.25	6,855.00	1,186.63	769.22	922.32	0.00	0.00	0.00
8,000.00	90.00	89.25	6,855.00	1,187.94	869.21	1,021.57	0.00	0.00	0.00
8,100.00	90.00	89.25	6,855.00	1,189.25	969.20	1,120.82	0.00	0.00	0.00
8,200.00	90.00	89.25	6,855.00	1,190.56	1,069.19	1,220.08	0.00	0.00	0.00
8,300.00	90.00	89.25	6,855.00	1,191.87	1,169.19	1,319.33	0.00	0.00	0.00
8,400.00	90.00	89.25	6,855.00	1,193.18	1,269.18	1,418.58	0.00	0.00	0.00
8,500.00	90.00	89.25	6,855.00	1,194.49	1,369.17	1,517.84	0.00	0.00	0.00
8,600.00	90.00	89.25	6,855.00	1,195.80	1,469.16	1,617.09	0.00	0.00	0.00
8,700.00	90.00	89.25	6,855.00	1,197.11	1,569.15	1,716.35	0.00	0.00	0.00
8,800.00	90.00	89.25	6,855.00	1,198.43	1,669.14	1,815.60	0.00	0.00	0.00
8,900.00	90.00	89.25	6,855.00	1,199.74	1,769.13	1,914.85	0.00	0.00	0.00
9,000.00	90.00	89.25	6,855.00	1,201.05	1,869.13	2,014.11	0.00	0.00	0.00
9,100.00	90.00	89.25	6,855.00	1,202.36	1,969.12	2,113.36	0.00	0.00	0.00
9,200.00	90.00	89.25	6,855.00	1,203.67	2,069.11	2,212.61	0.00	0.00	0.00
9,300.00	90.00	89.25	6,855.00	1,204.98	2,169.10	2,311.87	0.00	0.00	0.00
9,400.00	90.00	89.25	6,855.00	1,206.29	2,269.09	2,411.12	0.00	0.00	0.00
9,500.00	90.00	89.25	6,855.00	1,207.60	2,369.08	2,510.37	0.00	0.00	0.00
9,600.00	90.00	89.25	6,855.00	1,208.91	2,469.07	2,609.63	0.00	0.00	0.00
9,700.00	90.00	89.25	6,855.00	1,210.22	2,569.07	2,708.88	0.00	0.00	0.00
9,800.00	90.00	89.25	6,855.00	1,211.53	2,669.06	2,808.14	0.00	0.00	0.00
9,900.00	90.00	89.25	6,855.00	1,212.84	2,769.05	2,907.39	0.00	0.00	0.00
10,000.00	90.00	89.25	6,855.00	1,214.15	2,869.04	3,006.64	0.00	0.00	0.00
10,100.00	90.00	89.25	6,855.00	1,215.47	2,969.03	3,105.90	0.00	0.00	0.00
10,200.00	90.00	89.25	6,855.00	1,216.78	3,069.02	3,205.15	0.00	0.00	0.00
10,300.00	90.00	89.25	6,855.00	1,218.09	3,169.01	3,304.40	0.00	0.00	0.00
10,400.00	90.00	89.25	6,855.00	1,219.40	3,269.01	3,403.66	0.00	0.00	0.00
10,500.00	90.00	89.25	6,855.00	1,220.71	3,369.00	3,502.91	0.00	0.00	0.00
10,600.00	90.00	89.25	6,855.00	1,222.02	3,468.99	3,602.16	0.00	0.00	0.00
10,700.00	90.00	89.25	6,855.00	1,223.33	3,568.98	3,701.42	0.00	0.00	0.00
10,800.00	90.00	89.25	6,855.00	1,224.64	3,668.97	3,800.67	0.00	0.00	0.00
10,900.00	90.00	89.25	6,855.00	1,225.95	3,768.96	3,899.93	0.00	0.00	0.00
11,000.00	90.00	89.25	6,855.00	1,227.26	3,868.95	3,999.18	0.00	0.00	0.00
11,100.00	90.00	89.25	6,855.00	1,228.57	3,968.95	4,098.43	0.00	0.00	0.00
11,200.00	90.00	89.25	6,855.00	1,229.88	4,068.94	4,197.69	0.00	0.00	0.00
11,300.00	90.00	89.25	6,855.00	1,231.20	4,168.93	4,296.94	0.00	0.00	0.00
11,400.00	90.00	89.25	6,855.00	1,232.51	4,268.92	4,396.19	0.00	0.00	0.00
11,500.00	90.00	89.25	6,855.00	1,233.82	4,368.91	4,495.45	0.00	0.00	0.00
11,600.00	90.00	89.25	6,855.00	1,235.13	4,468.90	4,594.70	0.00	0.00	0.00
11,700.00	90.00	89.25	6,855.00	1,236.44	4,568.89	4,693.96	0.00	0.00	0.00
11,800.00	90.00	89.25	6,855.00	1,237.75	4,668.89	4,793.21	0.00	0.00	0.00

# Noble Energy, Inc.

## Planning Report

<b>Database:</b>	EDMP	<b>Local Co-ordinate Reference:</b>	Well Harper A21-664
<b>Company:</b>	Northern Region - DJ Basin	<b>TVD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Project:</b>	Wells Ranch	<b>MD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Site:</b>	A Section 21	<b>North Reference:</b>	Grid
<b>Well:</b>	Harper A21-664	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	APD - Rev 2		

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	89.25	6,855.00	1,239.06	4,768.88	4,892.46	0.00	0.00	0.00
12,000.00	90.00	89.25	6,855.00	1,240.37	4,868.87	4,991.72	0.00	0.00	0.00
12,100.00	90.00	89.25	6,855.00	1,241.68	4,968.86	5,090.97	0.00	0.00	0.00
12,200.00	90.00	89.25	6,855.00	1,242.99	5,068.85	5,190.22	0.00	0.00	0.00
12,300.00	90.00	89.25	6,855.00	1,244.30	5,168.84	5,289.48	0.00	0.00	0.00
12,400.00	90.00	89.25	6,855.00	1,245.61	5,268.83	5,388.73	0.00	0.00	0.00
12,500.00	90.00	89.25	6,855.00	1,246.93	5,368.82	5,487.98	0.00	0.00	0.00
12,600.00	90.00	89.25	6,855.00	1,248.24	5,468.82	5,587.24	0.00	0.00	0.00
12,700.00	90.00	89.25	6,855.00	1,249.55	5,568.81	5,686.49	0.00	0.00	0.00
12,800.00	90.00	89.25	6,855.00	1,250.86	5,668.80	5,785.75	0.00	0.00	0.00
12,900.00	90.00	89.25	6,855.00	1,252.17	5,768.79	5,885.00	0.00	0.00	0.00
13,000.00	90.00	89.25	6,855.00	1,253.48	5,868.78	5,984.25	0.00	0.00	0.00
13,100.00	90.00	89.25	6,855.00	1,254.79	5,968.77	6,083.51	0.00	0.00	0.00
13,200.00	90.00	89.25	6,855.00	1,256.10	6,068.76	6,182.76	0.00	0.00	0.00
13,300.00	90.00	89.25	6,855.00	1,257.41	6,168.76	6,282.01	0.00	0.00	0.00
13,400.00	90.00	89.25	6,855.00	1,258.72	6,268.75	6,381.27	0.00	0.00	0.00
13,500.00	90.00	89.25	6,855.00	1,260.03	6,368.74	6,480.52	0.00	0.00	0.00
13,600.00	90.00	89.25	6,855.00	1,261.34	6,468.73	6,579.77	0.00	0.00	0.00
13,700.00	90.00	89.25	6,855.00	1,262.65	6,568.72	6,679.03	0.00	0.00	0.00
13,800.00	90.00	89.25	6,855.00	1,263.97	6,668.71	6,778.28	0.00	0.00	0.00
13,900.00	90.00	89.25	6,855.00	1,265.28	6,768.70	6,877.54	0.00	0.00	0.00
14,000.00	90.00	89.25	6,855.00	1,266.59	6,868.70	6,976.79	0.00	0.00	0.00
14,100.00	90.00	89.25	6,855.00	1,267.90	6,968.69	7,076.04	0.00	0.00	0.00
14,200.00	90.00	89.25	6,855.00	1,269.21	7,068.68	7,175.30	0.00	0.00	0.00
14,300.00	90.00	89.25	6,855.00	1,270.52	7,168.67	7,274.55	0.00	0.00	0.00
14,400.00	90.00	89.25	6,855.00	1,271.83	7,268.66	7,373.80	0.00	0.00	0.00
14,500.00	90.00	89.25	6,855.00	1,273.14	7,368.65	7,473.06	0.00	0.00	0.00
14,600.00	90.00	89.25	6,855.00	1,274.45	7,468.64	7,572.31	0.00	0.00	0.00
14,700.00	90.00	89.25	6,855.00	1,275.76	7,568.64	7,671.56	0.00	0.00	0.00
14,800.00	90.00	89.25	6,855.00	1,277.07	7,668.63	7,770.82	0.00	0.00	0.00
14,900.00	90.00	89.25	6,855.00	1,278.38	7,768.62	7,870.07	0.00	0.00	0.00
15,000.00	90.00	89.25	6,855.00	1,279.70	7,868.61	7,969.33	0.00	0.00	0.00
15,100.00	90.00	89.25	6,855.00	1,281.01	7,968.60	8,068.58	0.00	0.00	0.00
15,200.00	90.00	89.25	6,855.00	1,282.32	8,068.59	8,167.83	0.00	0.00	0.00
15,300.00	90.00	89.25	6,855.00	1,283.63	8,168.58	8,267.09	0.00	0.00	0.00
15,400.00	90.00	89.25	6,855.00	1,284.94	8,268.58	8,366.34	0.00	0.00	0.00
15,500.00	90.00	89.25	6,855.00	1,286.25	8,368.57	8,465.59	0.00	0.00	0.00
15,600.00	90.00	89.25	6,855.00	1,287.56	8,468.56	8,564.85	0.00	0.00	0.00
15,700.00	90.00	89.25	6,855.00	1,288.87	8,568.55	8,664.10	0.00	0.00	0.00
15,800.00	90.00	89.25	6,855.00	1,290.18	8,668.54	8,763.36	0.00	0.00	0.00
15,900.00	90.00	89.25	6,855.00	1,291.49	8,768.53	8,862.61	0.00	0.00	0.00
16,000.00	90.00	89.25	6,855.00	1,292.80	8,868.52	8,961.86	0.00	0.00	0.00
16,100.00	90.00	89.25	6,855.00	1,294.11	8,968.52	9,061.12	0.00	0.00	0.00
16,200.00	90.00	89.25	6,855.00	1,295.43	9,068.51	9,160.37	0.00	0.00	0.00
16,300.00	90.00	89.25	6,855.00	1,296.74	9,168.50	9,259.62	0.00	0.00	0.00
16,400.00	90.00	89.25	6,855.00	1,298.05	9,268.49	9,358.88	0.00	0.00	0.00
16,500.00	90.00	89.25	6,855.00	1,299.36	9,368.48	9,458.13	0.00	0.00	0.00
16,600.00	90.00	89.25	6,855.00	1,300.67	9,468.47	9,557.38	0.00	0.00	0.00
16,690.43	90.00	89.25	6,855.00	1,301.85	9,558.89	9,647.14	0.00	0.00	0.00
TD @ 16690.43' MD/6855.00' TVD									

# Noble Energy, Inc.

## Planning Report

<b>Database:</b>	EDMP	<b>Local Co-ordinate Reference:</b>	Well Harper A21-664
<b>Company:</b>	Northern Region - DJ Basin	<b>TVD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Project:</b>	Wells Ranch	<b>MD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Site:</b>	A Section 21	<b>North Reference:</b>	Grid
<b>Well:</b>	Harper A21-664	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	APD - Rev 2		

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)		
TPZ - Harper A21-664 R - plan hits target center - Point	0.00	0.01	6,855.00	1,180.16	275.95	1,416,853.67	3,261,472.51	40.4738611	-104.5601333
BHL - Harper A21-664 R - plan hits target center - Point	0.00	0.00	6,855.00	1,301.85	9,558.89	1,416,975.36	3,270,755.43	40.4739203	-104.5267636

Formations					
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction
(ft)	(ft)			(°)	(°)
504.00	504.00	PIERRE		0.00	
691.00	691.00	UPPER PIERRE AQUIFER TOP		0.00	
1,531.00	1,531.00	UPPER PIERRE AQUIFER BASE		0.00	
3,687.08	3,663.00	PARKMAN		0.00	
4,268.12	4,215.00	SUSSEX		0.00	
5,046.00	4,954.00	SHANNON		0.00	
6,078.61	5,935.00	TEEPEE BUTTES		0.00	
6,855.54	6,641.00	SHARON SPRINGS		0.00	
6,898.02	6,671.00	NIO A CHALK		0.00	
6,924.87	6,689.00	NIO A MARL		0.00	
7,087.16	6,780.00	NIO B CHALK		0.00	
7,163.03	6,811.00	NIO B MARL		0.00	
7,406.69	6,855.00	NIO C CHALK		0.00	

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	
2,600.00	2,600.00	0.00	0.00	Build 2°/100'
3,509.58	3,494.37	134.39	-49.42	Hold 18.19° Inc., 339.81° Azm
6,340.43	6,183.73	963.86	-354.44	KOP: Build 9°/100' @ 6340.43' MD
7,406.69	6,855.00	1,180.16	275.95	TPZ/LP: 7406.69' MD, 90.00° Inc, 89.25° Azm
16,690.43	6,855.00	1,301.85	9,558.89	TD @ 16690.43' MD/6855.00' TVD



# **Northern Region - DJ Basin**

**Wells Ranch**

**A Section 21**

**Harper A21-664**

**Original Drilling**

**APD - Rev 2**

## **Anticollision Summary Report**

**25 October, 2018**

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

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Harper A21-664
<b>Project:</b>	Wells Ranch	<b>TVD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Reference Site:</b>	A Section 21	<b>MD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Harper A21-664	<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>	Original Drilling	<b>Database:</b>	EDMP
<b>Reference Design:</b>	APD - Rev 2	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	APD - Rev 2		
<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 10,000.00 ft	<b>Error Surface:</b>	Pedal Curve
<b>Warning Levels Evaluated at:</b>	2.00 Sigma	<b>Casing Method:</b>	Not applied

<b>Survey Tool Program</b>	<b>Date</b>	10/25/2018		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.00	16,690.43	APD - Rev 2 (Original Drilling)	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						
A Section 15						
Kerbs 12-15 - Original Drilling - Original Drilling - As Drille	11,863.49	7,007.60	4,906.65	4,815.96	54.107	CC
Kerbs 12-15 - Original Drilling - Original Drilling - As Drille	11,900.00	7,007.36	4,906.78	4,815.66	53.848	ES
Kerbs 12-15 - Original Drilling - Original Drilling - As Drille	13,600.00	7,003.54	5,204.86	5,097.28	48.383	SF
Kerbs 14-15 - Original Drilling - Original Drilling - As Drille	11,897.09	6,847.06	2,271.10	2,180.47	25.058	CC
Kerbs 14-15 - Original Drilling - Original Drilling - As Drille	11,900.00	6,847.04	2,271.10	2,180.43	25.047	ES
Kerbs 14-15 - Original Drilling - Original Drilling - As Drille	12,300.00	6,845.37	2,306.56	2,211.66	24.305	SF
Kerbs 22-15 - Original Drilling - Original Drilling - As Drille	13,616.53	6,971.81	4,917.58	4,806.52	44.276	CC
Kerbs 22-15 - Original Drilling - Original Drilling - As Drille	13,700.00	6,972.20	4,918.29	4,806.19	43.873	ES
Kerbs 22-15 - Original Drilling - Original Drilling - As Drille	15,100.00	6,978.84	5,136.46	5,010.78	40.869	SF
Kerbs 23-15 - Original Drilling - Original Drilling - As Drilled	13,608.36	6,896.29	3,584.91	3,474.12	32.357	CC, ES
Kerbs 23-15 - Original Drilling - Original Drilling - As Drilled	14,400.00	6,897.54	3,671.28	3,552.39	30.880	SF
Kerbs 24-15 - Original Drilling - Original Drilling - As Drille	13,623.75	6,851.36	2,230.86	2,120.00	20.124	CC, ES
Kerbs 24-15 - Original Drilling - Original Drilling - As Drille	14,000.00	6,854.96	2,262.36	2,147.62	19.718	SF
Kerbs 33-15 - Original Drilling - Original Drilling - As Drille	14,739.97	6,900.00	3,732.85	3,608.57	30.036	CC
Kerbs 33-15 - Original Drilling - Original Drilling - As Drille	14,800.00	6,900.00	3,733.33	3,608.29	29.856	ES
Kerbs 33-15 - Original Drilling - Original Drilling - As Drille	15,500.00	6,923.00	3,809.30	3,677.20	28.837	SF
Kerbs 34-15 - Original Drilling - Original Drilling - As Drille	14,703.50	6,844.37	2,350.08	2,222.28	18.389	CC, ES
Kerbs 34-15 - Original Drilling - Original Drilling - As Drille	15,000.00	6,844.90	2,368.71	2,237.67	18.076	SF
Kerbs 43-15 - Original Drilling - Original Drilling - As Drille	15,955.52	6,908.75	3,557.02	3,418.13	25.610	CC
Kerbs 43-15 - Original Drilling - Original Drilling - As Drille	16,000.00	6,909.91	3,557.30	3,417.84	25.507	ES
Kerbs 43-15 - Original Drilling - Original Drilling - As Drille	16,600.00	6,925.47	3,614.90	3,469.41	24.846	SF
Kerbs 44-15 - Original Drilling - Original Drilling - As Drille	15,847.94	6,811.94	2,221.10	2,083.64	16.158	CC
Kerbs 44-15 - Original Drilling - Original Drilling - As Drille	15,900.00	6,811.93	2,221.71	2,083.57	16.083	ES
Kerbs 44-15 - Original Drilling - Original Drilling - As Drille	16,100.00	6,811.86	2,235.36	2,095.16	15.944	SF
Kerbs USX A15-12D - Original Drilling - Original Drilling	12,151.88	7,793.92	3,783.19	3,671.30	33.812	CC
Kerbs USX A15-12D - Original Drilling - Original Drilling	12,200.00	7,794.41	3,783.50	3,670.73	33.552	ES
Kerbs USX A15-12D - Original Drilling - Original Drilling	13,400.00	7,806.47	3,983.74	3,853.54	30.598	SF
McDaniel 32-15 - Original Drilling - Original Drilling - As D	14,713.83	6,893.51	5,041.87	4,917.85	40.654	CC
McDaniel 32-15 - Original Drilling - Original Drilling - As D	14,800.00	6,894.91	5,042.60	4,917.50	40.308	ES
McDaniel 32-15 - Original Drilling - Original Drilling - As D	16,100.00	6,915.97	5,228.90	5,091.11	37.947	SF
McDaniel 42-15 - Original Drilling - Original Drilling - As D	16,093.13	6,862.12	5,159.33	5,018.78	36.708	CC
McDaniel 42-15 - Original Drilling - Original Drilling - As D	16,200.00	6,863.37	5,160.44	5,018.54	36.368	ES
McDaniel 42-15 - Original Drilling - Original Drilling - As D	16,690.43	6,869.09	5,193.78	5,046.35	35.227	SF
Speicher 31-15 - Original Drilling - Original Drilling	14,954.46	6,650.01	6,407.68	6,281.22	50.670	CC
Speicher 31-15 - Original Drilling - Original Drilling	15,000.00	6,650.01	6,407.84	6,280.81	50.444	ES
Speicher 31-15 - Original Drilling - Original Drilling	16,690.43	6,650.01	6,638.67	6,494.38	46.009	SF
Speicher 41-15 - Original Drilling - Original Drilling	15,987.91	6,900.01	6,364.07	6,224.73	45.673	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 Harper A21-664
<b>Project:</b>	Wells Ranch	<b>TVD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Reference Site:</b>	A Section 21	<b>MD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Harper A21-664	<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>	Original Drilling	<b>Database:</b>	EDMP
<b>Reference Design:</b>	APD - Rev 2	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)		Separation Factor	Warning
Offset Well - Wellbore - Design						
A Section 15						
Speicher 41-15 - Original Drilling - Original Drilling	16,100.00	6,900.01	6,365.06	6,224.32	45.225	ES
Speicher 41-15 - Original Drilling - Original Drilling	16,690.43	6,900.01	6,402.73	6,255.19	43.397	SF
Tye USX A15-03D - Original Drilling - Original MWD	13,369.72	6,994.97	6,551.30	6,440.70	59.233	CC
Tye USX A15-03D - Original Drilling - Original MWD	13,400.00	6,995.26	6,551.37	6,440.41	59.045	ES
Tye USX A15-03D - Original Drilling - Original MWD	15,800.00	7,014.36	6,987.52	6,854.41	52.494	SF
Tye USX A15-04D - Original Drilling - Original Drilling	12,089.20	7,318.83	6,491.46	6,378.84	57.639	CC
Tye USX A15-04D - Original Drilling - Original Drilling	12,200.00	7,319.24	6,492.41	6,378.66	57.075	ES
Tye USX A15-04D - Original Drilling - Original Drilling	14,200.00	7,326.78	6,826.01	6,696.34	52.639	SF

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

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Harper A21-664
<b>Project:</b>	Wells Ranch	<b>TVD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Reference Site:</b>	A Section 21	<b>MD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Harper A21-664	<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>	Original Drilling	<b>Database:</b>	EDMP
<b>Reference Design:</b>	APD - Rev 2	<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
A Section 20						
Foe 16-20 - Original Drilling - Original Drilling - As Drilled	2,650.05	2,606.29	2,347.06	2,328.85	128.900	CC
Foe 16-20 - Original Drilling - Original Drilling - As Drilled	2,700.00	2,656.16	2,347.25	2,328.69	126.459	ES
Foe 16-20 - Original Drilling - Original Drilling - As Drilled	6,700.00	6,454.73	3,057.51	3,010.73	65.360	SF
Foe 33-20 - Original Drilling - Original Drilling - As Drilled	4,778.66	4,681.98	2,900.43	2,867.25	87.414	CC
Foe 33-20 - Original Drilling - Original Drilling - As Drilled	5,100.00	5,013.99	2,901.47	2,865.89	81.562	ES
Foe 33-20 - Original Drilling - Original Drilling - As Drilled	6,650.00	6,405.17	3,034.98	2,988.54	65.347	SF
Foe 34-20 (PA) - Original Drilling - Original Drilling - As D	2,600.00	2,528.00	3,480.93	3,421.28	58.358	CC
Foe 34-20 (PA) - Original Drilling - Original Drilling - As D	2,900.00	2,827.45	3,484.41	3,417.70	52.236	ES
Foe 34-20 (PA) - Original Drilling - Original Drilling - As D	6,700.00	6,445.27	3,957.94	3,804.60	25.812	SF
Foe 43-20 - Original Drilling - Original Drilling - As Drilled	4,095.08	4,016.52	1,475.33	1,447.05	52.161	CC
Foe 43-20 - Original Drilling - Original Drilling - As Drilled	4,200.00	4,113.65	1,475.84	1,446.83	50.864	ES
Foe 43-20 - Original Drilling - Original Drilling - As Drilled	6,450.00	6,255.52	1,657.02	1,611.76	36.610	SF
Linda Rae 1 - Original Drilling - Original Drilling - As Drille	6,343.83	6,175.28	7,228.44	7,181.66	154.522	CC
Linda Rae 1 - Original Drilling - Original Drilling - As Drille	6,350.00	6,181.14	7,228.46	7,181.60	154.239	ES
Linda Rae 1 - Original Drilling - Original Drilling - As Drille	7,050.00	6,752.82	7,562.35	7,507.54	137.975	SF
Rampart A32-730 - Rampart A32-730 - APD-Rev 0	2,600.00	2,564.00	3,072.07	3,055.79	188.801	CC, ES
Rampart A32-730 - Rampart A32-730 - APD-Rev 0	6,750.00	6,203.04	3,848.28	3,807.90	95.296	SF
Rampart A32-739 - Rampart A32-739 - APD-Rev 1	2,007.41	1,971.41	3,057.80	3,044.17	224.346	CC
Rampart A32-739 - Rampart A32-739 - APD-Rev 1	2,100.00	2,031.55	3,058.14	3,044.02	216.626	ES
Rampart A32-739 - Rampart A32-739 - APD-Rev 1	6,700.00	6,008.45	4,147.16	4,106.98	103.206	SF
Rampart A32-751 - Rampart A32-751 - APD-Rev 0	2,007.41	1,971.41	3,043.52	3,029.89	223.301	CC
Rampart A32-751 - Rampart A32-751 - APD-Rev 0	2,100.00	2,032.72	3,043.85	3,029.73	215.584	ES
Rampart A32-751 - Rampart A32-751 - APD-Rev 0	6,650.00	5,507.48	4,434.10	4,395.48	114.794	SF
Simmons 42-20D - Original Drilling - Original Drilling - As	6,417.32	6,280.55	1,235.72	1,190.58	27.380	CC, ES
Simmons 42-20D - Original Drilling - Original Drilling - As	6,550.00	6,406.13	1,250.11	1,204.09	27.163	SF
Snider 1-20EG - Original Drilling - Original Drilling - As Dr	2,906.47	2,853.38	4,598.10	4,578.13	230.257	CC
Snider 1-20EG - Original Drilling - Original Drilling - As Dr	3,200.00	3,131.74	4,599.11	4,577.14	209.278	ES
Snider 1-20EG - Original Drilling - Original Drilling - As Dr	6,700.00	6,231.81	4,851.04	4,805.12	105.629	SF
Stump A20-11 - Original Drilling - Original Drilling - As Dri	6,352.80	6,223.84	4,325.36	4,280.65	96.757	CC, ES
Stump A20-11 - Original Drilling - Original Drilling - As Dri	6,700.00	6,479.72	4,415.84	4,369.02	94.303	SF
Stump A20-12 - Original Drilling - Original Drilling - As Dr	6,366.96	6,155.30	5,197.09	5,152.61	116.833	CC, ES
Stump A20-12 - Original Drilling - Original Drilling - As Dr	6,850.00	6,850.00	5,369.68	5,321.24	110.843	SF
Stump A20-13 - Original Drilling - Original Drilling - As Dr	4,269.53	4,210.22	5,820.22	5,790.61	196.518	CC
Stump A20-13 - Original Drilling - Original Drilling - As Dr	4,500.00	4,400.00	5,821.34	5,790.19	186.873	ES
Stump A20-13 - Original Drilling - Original Drilling - As Dr	6,950.00	6,656.88	6,134.62	6,086.55	127.622	SF
Winter 20-19 - Original Drilling - Original Drilling - As Drill	6,348.72	6,114.48	7,305.65	7,258.32	154.368	CC
Winter 20-19 - Original Drilling - Original Drilling - As Drill	6,350.00	6,116.95	7,305.65	7,258.31	154.327	ES
Winter 20-19 - Original Drilling - Original Drilling - As Drill	6,850.00	6,729.20	7,480.91	7,430.10	147.223	SF
Winter 24-19 - Original Drilling - Original Drilling - As Drill	6,387.01	6,503.66	6,931.60	6,870.93	114.248	CC, ES
Winter 24-19 - Original Drilling - Original Drilling - As Drill	6,700.00	6,775.24	7,007.35	6,945.06	112.508	SF
Winter 39-19 - Original Drilling - Original Drilling - As Drill	5,666.22	5,561.80	6,304.05	6,263.61	155.883	CC
Winter 39-19 - Original Drilling - Original Drilling - As Drill	6,340.43	6,264.84	6,305.43	6,260.13	139.200	ES
Winter 39-19 - Original Drilling - Original Drilling - As Drill	6,800.00	6,648.91	6,456.88	6,408.83	134.381	SF
Winter 40-19 - Original Drilling - Original Drilling - As Drill	6,376.93	6,525.91	5,876.09	5,809.83	88.681	CC, ES
Winter 40-19 - Original Drilling - Original Drilling - As Drill	6,600.00	6,759.07	5,914.38	5,847.15	87.975	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 Harper A21-664
<b>Project:</b>	Wells Ranch	<b>TVD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Reference Site:</b>	A Section 21	<b>MD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Harper A21-664	<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>	Original Drilling	<b>Database:</b>	EDMP
<b>Reference Design:</b>	APD - Rev 2	<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						
A Section 21						
Culbreath 23-21 - Original Drilling - Original Drilling - As D	2,373.30	2,333.43	1,306.95	1,290.68	80.349	CC
Culbreath 23-21 - Original Drilling - Original Drilling - As D	2,600.00	2,554.37	1,307.52	1,289.67	73.257	ES
Culbreath 23-21 - Original Drilling - Original Drilling - As D	8,600.00	6,806.83	1,461.46	1,405.34	26.040	SF
Culbreath 33-21 (PA) - Original Drilling - Original Drilling -	9,418.05	6,801.00	1,564.60	1,388.35	8.877	CC, ES
Culbreath 33-21 (PA) - Original Drilling - Original Drilling -	9,500.00	6,801.00	1,566.75	1,389.87	8.858	SF
Harper A21-618 - Original Drilling - APD - Rev 1	2,000.00	1,985.00	1,473.16	1,459.34	106.603	CC, ES
Harper A21-618 - Original Drilling - APD - Rev 1	16,690.43	16,198.56	2,892.19	2,647.08	11.799	SF
Harper A21-626 - Original Drilling - APD - Rev 1	2,756.96	2,815.25	1,438.77	1,419.28	73.835	CC
Harper A21-626 - Original Drilling - APD - Rev 1	2,800.00	2,858.28	1,439.07	1,419.27	72.702	ES
Harper A21-626 - Original Drilling - APD - Rev 1	16,690.43	16,268.46	2,366.82	2,121.29	9.640	SF
Harper A21-631 - Original Drilling - APD - Rev 1	3,003.47	3,170.79	1,364.26	1,342.72	63.343	CC, ES
Harper A21-631 - Original Drilling - APD - Rev 1	16,690.43	16,211.86	1,992.72	1,747.75	8.134	SF
Harper A21-637 - Original Drilling - APD - Rev 1	3,218.35	3,470.63	1,256.40	1,233.14	54.011	CC, ES
Harper A21-637 - Original Drilling - APD - Rev 1	16,690.43	16,342.35	1,616.70	1,371.02	6.581	SF
Harper A21-643 - Original Drilling - APD - Rev 1	2,000.00	1,999.00	70.27	56.40	5.067	CC
Harper A21-643 - Original Drilling - APD - Rev 1	2,100.00	2,098.61	70.53	55.96	4.839	ES
Harper A21-643 - Original Drilling - APD - Rev 1	2,400.00	2,402.76	76.70	60.00	4.594	SF
Harper A21-649 - Original Drilling - APD - Rev 1	2,600.00	2,600.00	48.79	30.62	2.685	CC, ES
Harper A21-649 - Original Drilling - APD - Rev 1	2,700.00	2,700.02	50.23	31.34	2.659	SF
Harper A21-656 - Original Drilling - APD - Rev 1	2,600.00	2,600.00	22.01	3.83	1.211	Level 3, CC, ES, SF
Harper A21-669 - Original Drilling - APD - Rev 1	2,400.00	2,401.00	24.44	7.70	1.460	Level 3, CC, ES, SF
Harper A21-674 - Original Drilling - APD - Rev 1	2,200.00	2,201.00	44.73	29.42	2.922	CC, ES
Harper A21-674 - Original Drilling - APD - Rev 1	2,300.00	2,299.41	46.48	30.47	2.903	SF
Harper A21-681 - Original Drilling - APD - Rev 1	2,000.00	2,002.00	68.01	54.13	4.900	CC, ES
Harper A21-681 - Original Drilling - APD - Rev 1	16,690.43	16,757.16	1,170.67	923.62	4.739	SF
Kona A19-616 - Kona A19-616 - Kona A19-616 - As Drille	788.27	769.30	1,469.30	1,464.93	336.652	CC
Kona A19-616 - Kona A19-616 - Kona A19-616 - As Drille	1,000.00	972.37	1,469.84	1,464.17	259.016	ES
Kona A19-616 - Kona A19-616 - Kona A19-616 - As Drille	8,700.00	6,423.00	3,315.69	3,267.31	68.526	SF
Kona A19-624 - Kona A19-624 - Kona A19-624 - As Drille	2,709.57	2,745.66	1,436.30	1,420.39	90.272	CC, ES
Kona A19-624 - Kona A19-624 - Kona A19-624 - As Drille	8,000.00	6,776.64	2,591.57	2,545.14	55.818	SF
Kona A19-636 - Kona A19-636 - Kona A19-636 - As Drille	3,013.80	3,207.00	1,337.48	1,318.55	70.651	CC, ES
Kona A19-636 - Kona A19-636 - Kona A19-636 - As Drille	6,550.00	7,884.95	1,775.35	1,725.68	35.744	SF
Kona A19-646 - Original Drilling - Original Drilling - As Dr	1,417.07	1,417.09	154.71	145.11	16.103	CC
Kona A19-646 - Original Drilling - Original Drilling - As Dr	2,600.00	2,599.77	160.03	143.93	9.942	ES
Kona A19-646 - Original Drilling - Original Drilling - As Dr	2,800.00	2,800.00	164.68	147.61	9.651	SF
Kona A19-662 - Original Drilling - Original Drilling - As Dr	1,534.52	1,536.58	148.74	138.29	14.231	CC
Kona A19-662 - Original Drilling - Original Drilling - As Dr	7,156.11	7,097.25	159.34	112.89	3.430	ES, SF
Kona A19-670 - Kona A19-670 - Original Drilling - As Dril	1,543.76	1,545.77	163.87	153.36	15.593	CC
Kona A19-670 - Kona A19-670 - Original Drilling - As Dril	1,900.00	1,901.56	164.35	151.32	12.613	ES
Kona A19-670 - Kona A19-670 - Original Drilling - As Dril	7,574.71	6,974.94	450.33	402.33	9.383	SF
Kona A19-685 - Original Drilling - Original Drilling - As Dr	1,693.81	1,694.89	147.37	135.81	12.742	CC
Kona A19-685 - Original Drilling - Original Drilling - As Dr	2,358.61	2,359.79	149.74	134.68	9.945	ES
Kona A19-685 - Original Drilling - Original Drilling - As Dr	2,500.00	2,495.69	152.38	136.71	9.725	SF
McKee 12-21 (PA) - Original Drilling - Original Drilling - A	5,613.45	5,475.09	92.16	-37.57	0.710	Level 1, CC, ES, SF
McKee 21-21 (PA) - Original Drilling - Original Drilling - A	8,341.82	6,853.00	889.81	721.64	5.291	CC, ES
McKee 21-21 (PA) - Original Drilling - Original Drilling - A	8,400.00	6,853.00	891.71	723.04	5.287	SF
McKee 22-21 - Original Drilling - Original Drilling - As Dril	8,152.16	6,834.10	310.34	256.76	5.793	CC, ES, SF
McKee 31-21 - Original Drilling - Original Drilling - As Dril	9,388.48	6,902.24	1,260.43	1,196.84	19.820	CC
McKee 31-21 - Original Drilling - Original Drilling - As Dril	9,400.00	6,901.98	1,260.49	1,196.76	19.780	ES
McKee 31-21 - Original Drilling - Original Drilling - As Dril	9,600.00	6,897.42	1,278.05	1,212.33	19.448	SF
McKee 32-21 - Original Drilling - Original Drilling - As Dril	9,396.40	6,818.97	281.99	218.36	4.432	CC, ES, SF
McKee 41-21 - Original Drilling - Original Drilling - As Dril	10,686.68	6,788.69	1,204.36	1,127.30	15.628	CC
McKee 41-21 - Original Drilling - Original Drilling - As Dril	10,700.00	6,788.82	1,204.43	1,127.20	15.594	ES

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 Harper A21-664
<b>Project:</b>	Wells Ranch	<b>TVD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Reference Site:</b>	A Section 21	<b>MD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Harper A21-664	<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>	Original Drilling	<b>Database:</b>	EDMP
<b>Reference Design:</b>	APD - Rev 2	<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						
A Section 21						
McKee 41-21 - Original Drilling - Original Drilling - As Dril	10,800.00	6,789.79	1,209.68	1,131.28	15.431	SF
McKee 42-21 - Original Drilling - Original Drilling - As Dril	10,754.28	6,801.19	456.98	379.38	5.889	CC, ES, SF
Rampart A32-721 - Rampart A32-721 - APD-Rev 1	3,116.30	3,301.93	2,974.03	2,954.74	154.220	CC, ES
Rampart A32-721 - Rampart A32-721 - APD-Rev 1	6,550.00	6,350.00	3,483.36	3,441.81	83.821	SF
Rampart A33-730 - Rampart A33-730 - APD-Rev 1	2,000.00	1,984.00	1,673.10	1,659.43	122.436	CC
Rampart A33-730 - Rampart A33-730 - APD-Rev 1	2,100.00	2,074.18	1,673.34	1,659.13	117.748	ES
Rampart A33-730 - Rampart A33-730 - APD-Rev 1	10,900.00	7,300.00	3,510.01	3,426.58	42.071	SF
Rampart A33-740 - Rampart A33-740 - APD-Rev 0	2,000.00	1,985.00	1,671.95	1,658.28	122.320	CC
Rampart A33-740 - Rampart A33-740 - APD-Rev 0	2,100.00	2,075.34	1,672.19	1,657.98	117.650	ES
Rampart A33-740 - Rampart A33-740 - APD-Rev 0	10,500.00	7,000.00	3,498.08	3,425.49	48.192	SF
Rampart A33-750 - Rampart A33-750 - APD-Rev 0	2,000.00	1,985.00	1,671.00	1,657.33	122.251	CC
Rampart A33-750 - Rampart A33-750 - APD-Rev 0	2,100.00	2,071.07	1,671.36	1,657.15	117.655	ES
Rampart A33-750 - Rampart A33-750 - APD-Rev 0	9,900.00	6,650.00	3,599.89	3,537.24	57.456	SF
Rampart A33-760 - Rampart A33-760 - APD-Rev 1	2,000.00	1,984.00	1,670.43	1,656.77	122.240	CC
Rampart A33-760 - Rampart A33-760 - APD-Rev 1	2,100.00	2,065.65	1,670.89	1,656.70	117.704	ES
Rampart A33-760 - Rampart A33-760 - APD-Rev 1	9,400.00	6,500.00	3,627.52	3,572.05	65.399	SF
Rampart A33-770 - Rampart A33-770 - APD-Rev 0	2,000.00	1,985.00	1,670.19	1,656.52	122.191	CC, ES
Rampart A33-770 - Rampart A33-770 - APD-Rev 0	8,900.00	6,322.17	3,684.20	3,634.83	74.618	SF
Rampart A33-780 - Rampart A33-780 - APD-Rev 0	3,895.46	4,531.74	2,713.77	2,687.00	101.355	CC
Rampart A33-780 - Rampart A33-780 - APD-Rev 0	3,900.00	4,535.29	2,713.77	2,686.96	101.226	ES
Rampart A33-780 - Rampart A33-780 - APD-Rev 0	6,700.00	6,747.75	3,235.33	3,187.38	67.476	SF
Rampart A33-790 - Rampart A33-790 - APD-Rev 0	3,499.61	3,961.39	2,844.14	2,821.54	125.816	CC
Rampart A33-790 - Rampart A33-790 - APD-Rev 0	3,509.58	3,969.85	2,844.16	2,821.49	125.457	ES
Rampart A33-790 - Rampart A33-790 - APD-Rev 0	6,450.00	6,435.20	3,255.07	3,211.76	75.148	SF
Sexton 43-21 (PA) - Original Drilling - Original Drilling - As	10,708.17	6,793.00	1,336.37	1,146.94	7.055	CC, ES
Sexton 43-21 (PA) - Original Drilling - Original Drilling - As	10,800.00	6,793.00	1,339.52	1,149.39	7.045	SF
Wells Trust 13-21 - Original Drilling - Original Drilling - As	100.00	56.98	633.16	632.93	2,802.171	CC
Wells Trust 13-21 - Original Drilling - Original Drilling - As	2,600.00	2,556.41	642.25	624.41	35.990	ES
Wells Trust 13-21 - Original Drilling - Original Drilling - As	3,509.58	3,448.83	735.33	711.14	30.390	SF
Wells Trust 14-21 - Original Drilling - Original Drilling - As	2,540.74	2,482.82	1,797.24	1,779.85	103.375	CC
Wells Trust 14-21 - Original Drilling - Original Drilling - As	2,600.00	2,541.96	1,797.26	1,779.46	100.946	ES
Wells Trust 14-21 - Original Drilling - Original Drilling - As	7,000.00	6,690.27	2,880.88	2,832.45	59.490	SF
Wells Trust 24-21 - Original Drilling - Original Drilling - As	2,620.28	2,564.26	1,697.26	1,679.32	94.561	CC, ES
Wells Trust 24-21 - Original Drilling - Original Drilling - As	8,200.00	6,805.66	2,887.72	2,834.59	54.352	SF



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

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Harper A21-664
<b>Project:</b>	Wells Ranch	<b>TVD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Reference Site:</b>	A Section 21	<b>MD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Harper A21-664	<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>	Original Drilling	<b>Database:</b>	EDMP
<b>Reference Design:</b>	APD - Rev 2	<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						
A Section 22						
Carpio 22-01 - Original Drilling - Original Drilling - As Drill	16,013.64	6,742.65	2,691.62	2,552.51	19.349	CC, ES
Carpio 22-01 - Original Drilling - Original Drilling - As Drill	16,300.00	6,747.17	2,706.80	2,565.19	19.114	SF
Carpio 22-04-19 - Original Drilling - Original Drilling - As D	14,526.34	6,879.82	2,119.48	1,995.36	17.077	CC, ES
Carpio 22-04-19 - Original Drilling - Original Drilling - As D	14,700.00	6,879.36	2,126.58	2,000.97	16.930	SF
Carpio 22-41 - Original Drilling - Original Drilling - As Drill	16,170.51	6,774.10	1,666.64	1,507.02	10.441	CC
Carpio 22-41 - Original Drilling - Original Drilling - As Drill	16,200.00	6,773.99	1,666.90	1,507.01	10.425	ES
Carpio 22-41 - Original Drilling - Original Drilling - As Drill	16,300.00	6,773.59	1,671.67	1,511.09	10.411	SF
Carpio 22-43 - Original Drilling - Original Drilling - As Drill	14,693.76	6,822.27	2,720.43	2,596.87	22.018	CC
Carpio 22-43 - Original Drilling - Original Drilling - As Drill	14,700.00	6,822.40	2,720.44	2,596.81	22.006	ES
Carpio 22-43 - Original Drilling - Original Drilling - As Drill	15,100.00	6,830.66	2,750.58	2,623.67	21.673	SF
Carpio 22-45 - Original Drilling - Original Drilling - As Drill	15,663.18	6,840.43	2,272.61	2,137.19	16.783	CC
Carpio 22-45 - Original Drilling - Original Drilling - As Drill	15,700.00	6,840.85	2,272.90	2,137.11	16.738	ES
Carpio 22-45 - Original Drilling - Original Drilling - As Drill	15,900.00	6,843.15	2,284.91	2,147.56	16.636	SF
Eisenstat 22-11 (PA) - Original Drilling - Original Drilling -	16,036.86	6,807.00	1,312.43	1,060.20	5.203	CC, ES
Eisenstat 22-11 (PA) - Original Drilling - Original Drilling -	16,100.00	6,807.00	1,313.95	1,060.91	5.193	SF
Eisenstat 22-13 - Original Drilling - Original Drilling - As D	14,576.56	6,821.11	587.60	465.43	4.810	CC, ES, SF
Eisenstat 22-15 - Original Drilling - Original Drilling - As D	15,384.01	6,813.87	644.33	512.42	4.885	CC
Eisenstat 22-15 - Original Drilling - Original Drilling - As D	15,400.00	6,813.93	644.53	512.37	4.877	ES, SF
Eisenstat 22-21 - Original Drilling - Original Drilling - As D	13,579.40	6,848.25	907.94	797.72	8.238	CC
Eisenstat 22-21 - Original Drilling - Original Drilling - As D	13,600.00	6,848.13	908.18	797.66	8.217	ES, SF
Eisenstat 22-23 - Original Drilling - Original Drilling - As D	12,172.63	6,820.15	73.89	-19.82	0.788	Level 1, CC, ES, SF
Gill Land Assoc. 1 (PA) - Original Drilling - Original Drilling	16,032.18	6,808.00	206.34	-45.85	0.818	Level 1, CC, ES, SF
Gill Land Assoc. 22-02 (PA) - Original Drilling - Original D	13,356.55	6,818.00	245.96	25.65	1.116	Level 2, CC, ES, SF
Gill Land Assoc. 22-03 - Original Drilling - Original Drilling	12,066.33	6,827.21	1,040.24	947.69	11.240	CC, ES
Gill Land Assoc. 22-03 - Original Drilling - Original Drilling	12,200.00	6,827.14	1,048.80	954.79	11.156	SF
Gill Land Assoc. 22-04 (PA) - Original Drilling - Original D	14,647.59	6,816.00	1,077.22	841.56	4.571	CC, ES
Gill Land Assoc. 22-04 (PA) - Original Drilling - Original D	14,700.00	6,816.00	1,078.49	842.14	4.563	SF
Gruen 22-01 - Original Drilling - Original Drilling - As Drille	12,012.43	6,821.81	1,525.29	1,433.54	16.624	CC, ES
Gruen 22-01 - Original Drilling - Original Drilling - As Drille	12,200.00	6,820.76	1,536.78	1,443.70	16.511	SF
Gruen 22-02 - Original Drilling - Original Drilling - As Drille	13,319.19	6,780.57	2,806.08	2,699.15	26.243	CC, ES
Gruen 22-02 - Original Drilling - Original Drilling - As Drille	13,800.00	6,769.95	2,846.95	2,736.12	25.688	SF
Gruen 22-31 - Original Drilling - Original Drilling - As Drille	13,336.88	6,819.26	1,507.54	1,400.21	14.046	CC, ES
Gruen 22-31 - Original Drilling - Original Drilling - As Drille	13,500.00	6,818.50	1,516.34	1,407.90	13.983	SF
Gruen 22-33 - Original Drilling - Original Drilling - As Drille	12,052.77	6,735.88	2,782.17	2,690.30	30.285	CC
Gruen 22-33 - Original Drilling - Original Drilling - As Drille	12,100.00	6,736.63	2,782.57	2,690.21	30.129	ES
Gruen 22-33 - Original Drilling - Original Drilling - As Drille	12,600.00	6,744.78	2,835.46	2,739.04	29.409	SF
Gruen 22-35 - Original Drilling - Original Drilling - As Drille	12,664.32	6,780.11	2,250.77	2,151.35	22.640	CC
Gruen 22-35 - Original Drilling - Original Drilling - As Drille	12,700.00	6,780.25	2,251.05	2,151.28	22.562	ES
Gruen 22-35 - Original Drilling - Original Drilling - As Drille	13,000.00	6,781.50	2,275.66	2,173.57	22.290	SF
Ottinger 22-01 - Original Drilling - Original Drilling - As Dr	14,689.97	6,802.27	1,396.16	1,272.79	11.317	CC
Ottinger 22-01 - Original Drilling - Original Drilling - As Dr	14,700.00	6,802.30	1,396.19	1,272.74	11.309	ES
Ottinger 22-01 - Original Drilling - Original Drilling - As Dr	14,800.00	6,802.57	1,400.49	1,276.36	11.282	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 Harper A21-664
<b>Project:</b>	Wells Ranch	<b>TVD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Reference Site:</b>	A Section 21	<b>MD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Harper A21-664	<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>	Original Drilling	<b>Database:</b>	EDMP
<b>Reference Design:</b>	APD - Rev 2	<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
<b>Offset Well - Wellbore - Design</b>						
A Section 23						
Cecil 23-13 - Original Drilling - Original Drilling - As Drilled	16,690.43	6,700.36	3,013.60	2,961.43	57.760	CC, ES, SF
Champlin 23-02 (PA) - Original Drilling - Original Drilling -	16,690.43	6,767.00	1,517.55	1,266.53	6.045	CC, ES, SF
Champlin 23-03 - Original Drilling - Original Drilling - As D	16,690.43	6,705.26	3,182.38	3,052.21	24.447	CC, ES, SF
Champlin Amoco A 1 #308 - Original Drilling - Original Dr	16,690.43	6,742.00	3,143.98	2,899.01	12.834	CC, ES, SF
Cooper 23-1-17 - Original Drilling - Original Drilling - As Dr	16,690.43	6,715.51	4,210.97	4,138.70	58.269	CC, ES, SF
Cooper 23-1-19 - Original Drilling - Original Drilling - As D	16,690.43	6,691.35	2,881.38	2,820.45	47.292	CC, ES, SF
Cooper 23-12 - Original Drilling - Original Drilling - As Dri	16,690.43	6,730.29	3,524.29	3,455.16	50.982	CC, ES, SF
Cooper 23-1-20 - Original Drilling - Original Drilling - As D	16,690.43	6,691.19	2,897.62	2,831.28	43.675	CC, ES, SF
Cooper 23-15 - Original Drilling - Original Drilling - As Dri	16,690.43	6,704.42	4,032.46	3,977.02	72.730	CC, ES, SF
Foss 41-23D - Original Drilling - Original Drilling - As Drill	16,690.43	6,943.67	4,777.69	4,705.19	65.894	CC, ES, SF
Foss 42-23 - Original Drilling - Original Drilling - As Drilled	16,690.43	6,726.21	4,433.55	4,379.15	81.501	CC, ES, SF
J&L Farms 23-11 - Original Drilling - Original Drilling - As	16,690.43	6,767.91	1,291.66	1,155.91	9.515	CC, ES, SF
J&L Farms 23-12 - Original Drilling - Original Drilling - As	16,690.43	6,801.39	519.41	416.12	5.028	CC, ES, SF
J&L Farms 23-21 - Original Drilling - Original Drilling - As	16,690.43	6,710.93	2,507.90	2,418.67	28.106	CC, ES, SF
J&L Farms 23-22 - Original Drilling - Original Drilling - As	16,690.43	6,813.62	1,906.63	1,852.59	35.278	CC, ES, SF
McIntosh 33-23 - Original Drilling - Original Drilling - As D	16,690.43	6,802.28	3,680.99	3,593.58	42.113	CC, ES, SF
McIntosh 34-23 - Original Drilling - Original Drilling - As D	16,690.43	6,725.49	4,392.35	4,285.85	41.244	CC, ES, SF
McIntosh 43-23 - Original Drilling - Original Drilling - As D	16,690.43	6,671.22	4,978.55	4,909.41	72.011	CC, ES, SF
McIntosh 44-23 - Original Drilling - Original Drilling - As D	16,690.43	6,700.00	5,666.18	5,571.66	59.949	CC, ES, SF
Schroeder 23-31 - Original Drilling - Original Drilling - As	16,690.43	6,704.93	2,729.84	2,624.44	25.898	CC, ES, SF
Schroeder 23-33 - Original Drilling - Original Drilling - As	16,690.43	6,759.60	3,023.13	2,876.69	20.644	CC, ES, SF
A Section 24						
Larson A23-622 - Larson A23-622 OH - As-drilled	16,685.38	17,299.00	2,567.80	2,309.87	9.955	CC
Larson A23-622 - Larson A23-622 OH - As-drilled	16,690.43	17,299.00	2,567.80	2,309.82	9.953	ES, SF
Larson A23-627 - Larson A23-627 OH - As-drilled	16,686.78	17,330.00	2,226.60	1,968.16	8.615	CC
Larson A23-627 - Larson A23-627 OH - As-drilled	16,690.43	17,330.00	2,226.61	1,968.12	8.614	ES, SF
Larson A23-633 - Larson A23-633 OH - As-drilled	16,690.43	17,078.33	1,887.39	1,633.11	7.423	CC, ES, SF
Larson A23-639 - Larson A23-639 OH - As-drilled	16,690.43	17,355.00	1,493.40	1,235.40	5.788	CC, ES, SF
Larson A23-645 - Larson A23-645 OH - As-drilled	16,690.43	18,019.30	1,091.83	824.84	4.089	CC, ES, SF
Larson A23-651 - Larson A23-651 OH - As-drilled	16,690.43	18,022.51	779.86	512.94	2.922	CC, ES, SF
Larson A23-656 - Larson A23-656 OH - As-drilled	16,688.79	18,037.40	487.30	222.75	1.842	CC, ES, SF
Larson A23-662 - Larson A23-662 OH - As-drilled	16,690.43	18,100.00	69.84	-196.07	0.263	Level 1, CC, ES, SF
Larson A23-668 - Larson A23-668 OH - As-Drilled	16,690.43	17,400.00	338.51	82.21	1.321	Level 3, CC, ES, SF
Larson A23-672 - Larson A23-672 OH - As-Drilled	16,688.56	17,427.36	613.40	357.92	2.401	CC, ES, SF
Larson A23-678 - Larson A23-678 OH - As-Drilled	16,690.43	17,106.00	996.21	364.17	1.576	CC, ES, SF
Larson A23-683 - Larson A23-683 OH - As-Drilled	16,690.43	17,368.00	1,293.13	1,034.51	5.000	CC, ES, SF
Larson AA19-618 - Larson AA19-618 OH - As-Drilled						Out of range
Larson AA19-624 - Larson AA19-624 OH - As-Drilled						Out of range
Larson AA19-624 - Larson AA19-624 ST01 - As-Drilled						Out of range
Larson AA19-630 - Larson AA19-630 OH - As-Drilled	16,690.43	6,047.00	9,919.12	9,862.40	174.899	CC, ES, SF
Larson AA19-635 - Larson AA19-635 OH - As-Drilled	16,690.43	6,237.00	9,880.84	9,826.06	180.359	CC, ES, SF
Larson Farms 01-24 - Original Drilling - Original Drilling -	16,690.43	3,710.00	9,948.49	9,895.97	189.426	CC, ES, SF
Larson Farms 02-24 - Original Drilling - Original Drilling -	16,690.43	3,592.30	9,866.49	9,816.74	198.302	CC, ES, SF
Larson Farms 03-24 - Original Drilling - Original Drilling -	16,690.43	6,835.69	8,730.43	8,669.00	142.107	CC, ES, SF
Larson Farms 04-24 - Original Drilling - Original Drilling -	16,690.43	2,514.00	9,354.39	9,299.60	170.725	CC, ES, SF
Larson Farms 05-24 - Original Drilling - Original Drilling -	16,690.43	2,649.77	9,159.34	9,103.59	164.298	CC, ES, SF
Larson Farms 06-24 - Original Drilling - Original Drilling -	16,690.43	1,769.14	9,554.21	9,497.27	167.792	CC, ES, SF
Larson Farms 07-24 - Original Drilling - Original Drilling -	16,690.43	3,653.00	8,920.84	8,857.90	141.735	CC, ES, SF
Mackinaw A19-79HNA (PR) - Wellbore #1 - MWD Survey						Out of range
Mackinaw A19-79HNC (PR) - Wellbore #1 - MWD Survey						Out of range
Peppler 24-32 - Original Drilling - Original Drilling - As Dri	16,690.43	6,531.98	5,917.93	5,854.68	93.570	CC, ES, SF
Roth 24-21 - Original Drilling - Original Drilling - As Drilled	16,690.43	6,911.32	7,297.66	7,241.15	129.141	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 Harper A21-664
<b>Project:</b>	Wells Ranch	<b>TVD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Reference Site:</b>	A Section 21	<b>MD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Harper A21-664	<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>	Original Drilling	<b>Database:</b>	EDMP
<b>Reference Design:</b>	APD - Rev 2	<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						
A Section 27						
Howard 02-27 (PA) - Original Drilling - Original Drilling - A	14,721.03	6,823.00	4,079.67	3,842.99	17.237	CC
Howard 02-27 (PA) - Original Drilling - Original Drilling - A	14,800.00	6,823.00	4,080.44	3,842.89	17.178	ES
Howard 02-27 (PA) - Original Drilling - Original Drilling - A	15,300.00	6,823.00	4,120.55	3,878.38	17.015	SF
Howard 03-27 - Original Drilling - Original Drilling - As Dri	13,312.20	6,795.90	4,162.51	4,055.55	38.915	CC
Howard 03-27 - Original Drilling - Original Drilling - As Dri	13,400.00	6,794.65	4,163.44	4,055.53	38.583	ES
Howard 03-27 - Original Drilling - Original Drilling - As Dri	14,300.00	6,782.26	4,278.09	4,162.59	37.040	SF
Howard 04-27 (PA) - Original Drilling - Original Drilling - A	12,070.73	6,783.00	4,049.99	3,845.42	19.797	CC
Howard 04-27 (PA) - Original Drilling - Original Drilling - A	12,100.00	6,783.00	4,050.09	3,845.21	19.768	ES
Howard 04-27 (PA) - Original Drilling - Original Drilling - A	12,700.00	6,783.00	4,098.58	3,888.00	19.463	SF
Howard 08-27 - Original Drilling - Original Drilling - As Dri	16,012.91	6,754.12	5,477.82	5,338.63	39.358	CC
Howard 08-27 - Original Drilling - Original Drilling - As Dri	16,100.00	6,754.22	5,478.51	5,338.34	39.086	ES
Howard 08-27 - Original Drilling - Original Drilling - As Dri	16,690.43	6,754.89	5,519.55	5,373.47	37.783	SF
Howard 10-27 - Original Drilling - Original Drilling - As Dri	14,782.34	6,684.81	6,786.27	6,662.24	54.713	CC
Howard 10-27 - Original Drilling - Original Drilling - As Dri	14,900.00	6,684.88	6,787.29	6,661.92	54.136	ES
Howard 10-27 - Original Drilling - Original Drilling - As Dri	16,690.43	6,685.99	7,049.42	6,907.62	49.713	SF
Howard 15-27 - Original Drilling - Original Drilling - As Dri	14,618.71	6,912.94	7,949.91	7,829.38	65.956	CC
Howard 15-27 - Original Drilling - Original Drilling - As Dri	14,700.00	6,911.85	7,950.33	7,828.86	65.452	ES
Howard 15-27 - Original Drilling - Original Drilling - As Dri	16,690.43	6,885.13	8,215.37	8,074.51	58.325	SF
Howard 4B-27 (DA) - Original Drilling - Original Drilling - A	12,062.29	3,765.00	5,082.39	4,964.22	43.008	CC
Howard 4B-27 (DA) - Original Drilling - Original Drilling - A	12,100.00	3,765.00	5,082.53	4,963.99	42.874	ES
Howard 4B-27 (DA) - Original Drilling - Original Drilling - A	13,700.00	3,765.00	5,339.74	5,206.70	40.136	SF
Howard A27-01 - Original Drilling - Original Drilling - As D	16,049.34	6,764.11	4,085.11	3,945.45	29.250	CC
Howard A27-01 - Original Drilling - Original Drilling - As D	16,100.00	6,764.20	4,085.42	3,945.20	29.135	ES
Howard A27-01 - Original Drilling - Original Drilling - As D	16,690.43	6,765.32	4,135.11	3,989.62	28.422	SF
Howard A27-05 - Original Drilling - Original Drilling - As D	12,078.89	6,731.15	5,450.01	5,357.72	59.054	CC
Howard A27-05 - Original Drilling - Original Drilling - As D	12,100.00	6,731.20	5,450.05	5,357.53	58.907	ES
Howard A27-05 - Original Drilling - Original Drilling - As D	14,000.00	6,736.45	5,778.69	5,669.65	52.995	SF
Howard A27-06 - Original Drilling - Original Drilling - As D	13,457.19	6,883.79	5,410.48	5,296.14	47.319	CC
Howard A27-06 - Original Drilling - Original Drilling - As D	13,500.00	6,883.63	5,410.65	5,295.79	47.106	ES
Howard A27-06 - Original Drilling - Original Drilling - As D	15,100.00	6,877.90	5,654.38	5,524.33	43.479	SF
Howard A27-07 - Original Drilling - Original Drilling - As D	14,806.70	6,803.30	5,485.22	5,360.41	43.949	CC
Howard A27-07 - Original Drilling - Original Drilling - As D	14,900.00	6,803.97	5,486.01	5,360.15	43.588	ES
Howard A27-07 - Original Drilling - Original Drilling - As D	16,300.00	6,814.76	5,684.84	5,546.80	41.182	SF
Howard A27-09 - Original Drilling - Original Drilling - As D	15,910.46	6,708.87	6,850.61	6,712.83	49.721	CC
Howard A27-09 - Original Drilling - Original Drilling - As D	16,000.00	6,708.93	6,851.19	6,712.38	49.356	ES
Howard A27-09 - Original Drilling - Original Drilling - As D	16,690.43	6,709.42	6,894.87	6,748.77	47.192	SF
Howard A27-16 - Original Drilling - Original Drilling - As D	16,184.59	6,833.74	8,121.67	7,980.00	57.329	CC
Howard A27-16 - Original Drilling - Original Drilling - As D	16,300.00	6,833.50	8,122.49	7,979.48	56.798	ES
Howard A27-16 - Original Drilling - Original Drilling - As D	16,690.43	6,832.67	8,137.41	7,990.05	55.222	SF
Howard A27-17D - Original Drilling - Original Drilling - As	15,462.83	6,863.49	4,674.89	4,537.88	34.120	CC
Howard A27-17D - Original Drilling - Original Drilling - As	15,500.00	6,863.48	4,675.04	4,537.66	34.031	ES
Howard A27-17D - Original Drilling - Original Drilling - As	16,300.00	6,863.17	4,749.26	4,605.69	33.080	SF

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

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Harper A21-664
<b>Project:</b>	Wells Ranch	<b>TVD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Reference Site:</b>	A Section 21	<b>MD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Harper A21-664	<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>	Original Drilling	<b>Database:</b>	EDMP
<b>Reference Design:</b>	APD - Rev 2	<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						
A Section 28						
Ankeney 2-28 (SI) - Wellbore #1 - No Surveys	10,768.56	6,775.00	5,786.48	5,596.75	30.498	CC
Ankeney 2-28 (SI) - Wellbore #1 - No Surveys	10,800.00	6,775.00	5,786.56	5,596.51	30.446	ES
Ankeney 2-28 (SI) - Wellbore #1 - No Surveys	12,200.00	6,775.00	5,960.90	5,757.55	29.313	SF
Ankeney 28-01 (PA) - Wellbore #1 - Gyro Surveys	10,792.87	6,718.29	5,649.16	5,572.27	73.466	CC
Ankeney 28-01 (PA) - Wellbore #1 - Gyro Surveys	10,900.00	6,719.35	5,650.18	5,572.17	72.430	ES
Ankeney 28-01 (PA) - Wellbore #1 - Gyro Surveys	13,200.00	6,742.09	6,140.58	6,043.20	63.054	SF
Art Rohr 1 (PA) - Wellbore #1 - No Surveys	2,600.00	2,515.00	5,711.26	5,651.87	96.170	CC
Art Rohr 1 (PA) - Wellbore #1 - No Surveys	2,700.00	2,614.98	5,712.98	5,651.23	92.525	ES
Art Rohr 1 (PA) - Wellbore #1 - No Surveys	10,300.00	6,770.00	7,168.10	6,986.19	39.405	SF
Danley 1 (TA) - Wellbore #1 - Gyro Surveys	2,002.99	1,940.03	2,775.52	2,761.97	204.853	CC
Danley 1 (TA) - Wellbore #1 - Gyro Surveys	2,100.00	2,010.66	2,776.01	2,761.86	196.290	ES
Danley 1 (TA) - Wellbore #1 - Gyro Surveys	8,800.00	6,754.02	4,303.51	4,247.71	77.119	SF
Danley 12-28 (SI) - Wellbore #1 - Gyro Surveys	100.00	21.16	4,275.36	4,275.20	10,000.000	CC
Danley 12-28 (SI) - Wellbore #1 - Gyro Surveys	2,605.04	2,538.00	4,277.13	4,259.33	240.319	ES
Danley 12-28 (SI) - Wellbore #1 - Gyro Surveys	10,600.00	6,620.46	6,654.17	6,587.25	99.445	SF
Danley 13-28 (PR) - Wellbore #1 - Gyro Surveys	2,644.41	2,637.38	5,657.42	5,639.14	309.500	CC, ES
Danley 13-28 (PR) - Wellbore #1 - Gyro Surveys	12,000.00	6,829.53	8,571.17	8,492.93	109.556	SF
Danley 14-28 (PR) - Wellbore #1 - Gyro Surveys	358.04	249.04	6,975.48	6,973.73	3,993.822	CC
Danley 14-28 (PR) - Wellbore #1 - Gyro Surveys	2,300.00	2,149.85	6,976.89	6,961.55	454.671	ES
Danley 14-28 (PR) - Wellbore #1 - Gyro Surveys	12,500.00	6,578.58	9,967.16	9,883.84	119.616	SF
Dewey 21-28 (TA) - Wellbore #1 - Gyro Surveys	429.43	357.43	3,213.24	3,210.86	1,349.473	CC
Dewey 21-28 (TA) - Wellbore #1 - Gyro Surveys	1,700.00	1,610.91	3,214.66	3,203.35	284.239	ES
Dewey 21-28 (TA) - Wellbore #1 - Gyro Surveys	10,100.00	6,823.35	4,713.73	4,647.25	70.897	SF
Dewey 22-28 (SI) - Wellbore #1 - Gyro Surveys	190.66	111.65	4,282.19	4,281.55	6,633.048	CC
Dewey 22-28 (SI) - Wellbore #1 - Gyro Surveys	2,600.00	2,499.28	4,294.85	4,277.20	243.275	ES
Dewey 22-28 (SI) - Wellbore #1 - Gyro Surveys	11,300.00	6,657.42	6,240.50	6,165.48	83.184	SF
Hannan Rohr 1 (PA) - Wellbore #1 - Gyro Surveys	2,624.83	2,577.03	7,082.32	7,064.32	393.501	CC, ES
Hannan Rohr 1 (PA) - Wellbore #1 - Gyro Surveys	13,800.00	6,778.94	9,994.90	9,898.60	103.790	SF
Rohr A 28-25 (SI) - Wellbore #1 - Gyro Surveys	1,624.25	1,533.31	6,187.16	6,176.38	574.093	CC
Rohr A 28-25 (SI) - Wellbore #1 - Gyro Surveys	1,800.00	1,671.07	6,187.73	6,175.84	520.594	ES
Rohr A 28-25 (SI) - Wellbore #1 - Gyro Surveys	12,800.00	6,820.50	8,976.71	8,889.93	103.453	SF
Wardlaw 16-28 - Original Drilling - Original Drilling - As D	2,600.00	2,493.00	7,829.96	7,771.01	132.830	CC
Wardlaw 16-28 - Original Drilling - Original Drilling - As D	2,700.00	2,592.98	7,831.70	7,770.39	127.750	ES
Wardlaw 16-28 - Original Drilling - Original Drilling - As D	13,400.00	6,748.00	8,692.28	8,478.14	40.591	SF
Wardlaw 16-28 (SI) - Wellbore #1 - Gyro Surveys	1,094.60	987.61	7,827.16	7,820.19	1,122.785	CC
Wardlaw 16-28 (SI) - Wellbore #1 - Gyro Surveys	2,000.00	1,842.91	7,829.29	7,816.09	593.325	ES
Wardlaw 16-28 (SI) - Wellbore #1 - Gyro Surveys	15,000.00	6,850.09	9,293.27	9,179.16	81.439	SF
Wardlaw 20-28 - Original Drilling - Original Drilling - As D	2,600.00	2,488.00	7,107.16	7,048.31	120.773	CC
Wardlaw 20-28 - Original Drilling - Original Drilling - As D	2,700.00	2,587.98	7,108.89	7,047.69	116.149	ES
Wardlaw 20-28 - Original Drilling - Original Drilling - As D	12,700.00	6,743.00	7,948.70	7,741.91	38.439	SF
Wardlaw 20-28 (SI) - Wellbore #1 - Gyro Surveys	2,599.78	2,487.83	7,097.35	7,079.75	403.238	CC
Wardlaw 20-28 (SI) - Wellbore #1 - Gyro Surveys	2,600.00	2,488.02	7,097.35	7,079.75	403.204	ES
Wardlaw 20-28 (SI) - Wellbore #1 - Gyro Surveys	14,300.00	6,881.07	8,545.13	8,438.08	79.820	SF
Wardlaw 33-28 (PA) - Wellbore #1 - Gyro Surveys	312.75	210.35	5,421.33	5,419.88	3,732.092	CC
Wardlaw 33-28 (PA) - Wellbore #1 - Gyro Surveys	400.00	264.83	5,421.57	5,419.61	2,771.535	ES
Wardlaw 33-28 (PA) - Wellbore #1 - Gyro Surveys	13,900.00	13,900.00	8,097.82	7,899.16	40.762	SF
Webster 09-28 - Original Drilling - Original Drilling - As Dr	2,600.00	2,503.00	6,546.76	6,487.61	110.686	CC
Webster 09-28 - Original Drilling - Original Drilling - As Dr	2,700.00	2,602.98	6,548.47	6,486.96	106.471	ES
Webster 09-28 - Original Drilling - Original Drilling - As Dr	12,500.00	6,758.00	7,040.84	6,835.27	34.250	SF
Webster 15-28 (SI) - Wellbore #1 - Gyro Surveys	2,669.12	2,733.69	7,237.14	7,218.44	387.031	CC
Webster 15-28 (SI) - Wellbore #1 - Gyro Surveys	2,700.00	2,767.93	7,237.29	7,218.37	382.339	ES
Webster 15-28 (SI) - Wellbore #1 - Gyro Surveys	14,300.00	6,757.70	9,547.52	9,443.94	92.174	SF
Webster 9-28 (PR) - Wellbore #1 - Gyro Surveys	2,635.95	2,619.34	6,538.91	6,520.73	359.577	CC, ES

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 Harper A21-664
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<b>Reference Site:</b>	A Section 21	<b>MD Reference:</b>	WELL @ 4772.00ft (Original Well Elev.)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Harper A21-664	<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>	Original Drilling	<b>Database:</b>	EDMP
<b>Reference Design:</b>	APD - Rev 2	<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
A Section 28						
Webster 9-28 (PR) - Wellbore #1 - Gyro Surveys	13,800.00	6,800.27	7,466.07	7,362.85	72.336	SF