

Project: Wells Ranch
 Site: A Section 21
 Well: Harper A21-618
 Wellbore: Original Drilling
 Design: APD - Rev 1

Northern Region - DJ Basin

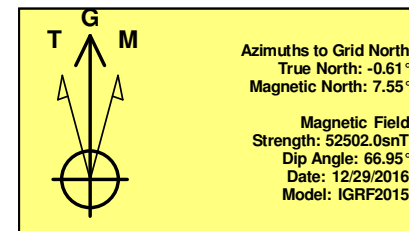
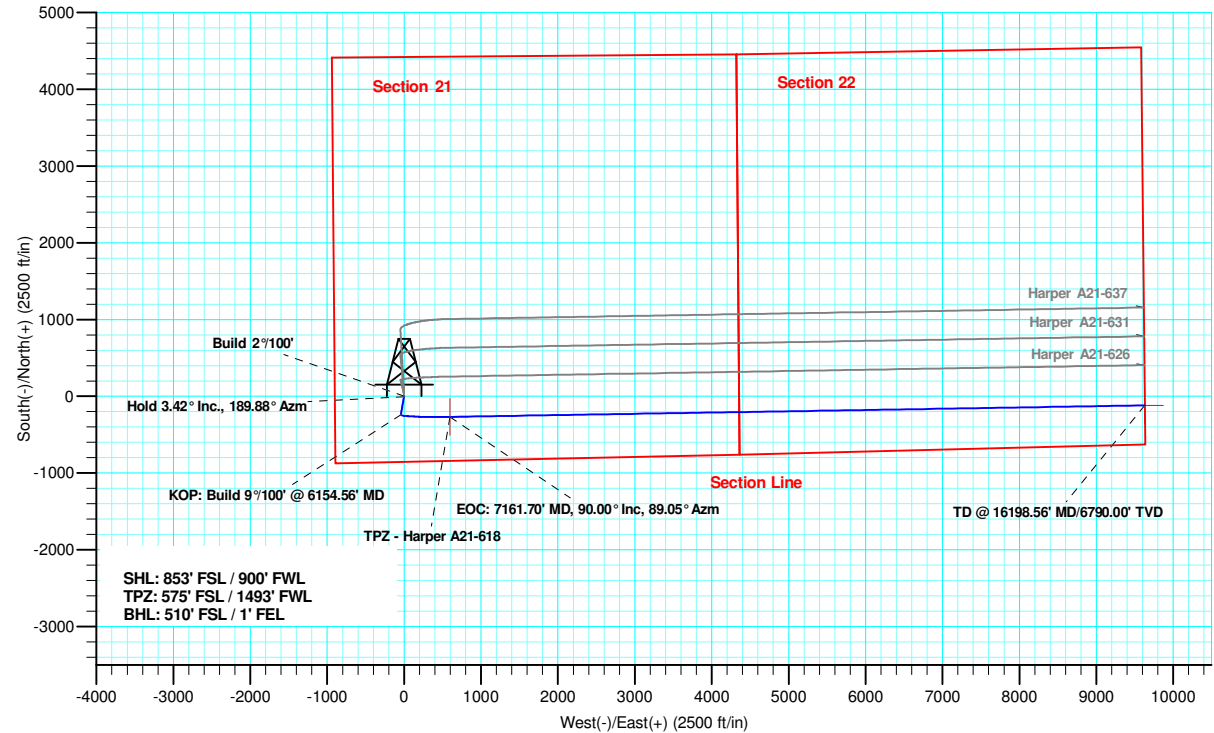
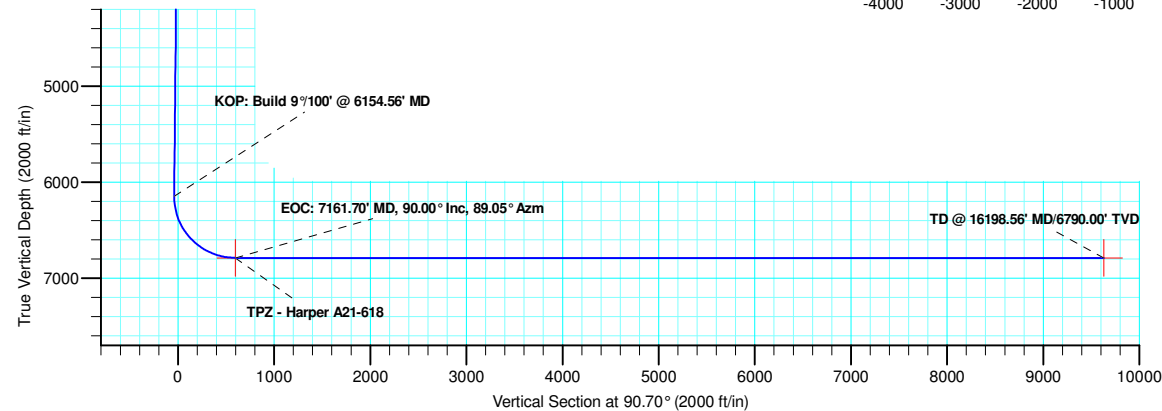
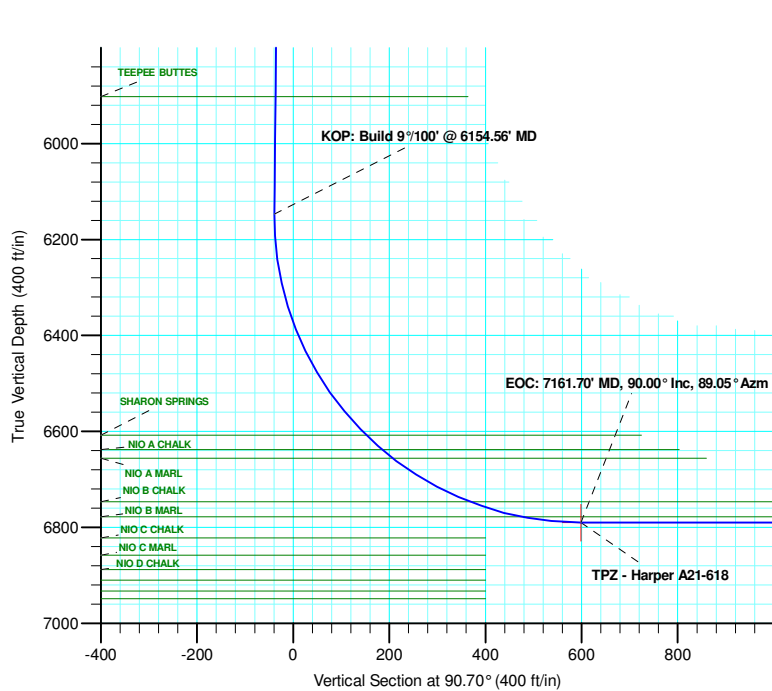
Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Colorado Northern Zone
 System Datum: Mean Sea Level

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	2000.00	0.00	0.00	2000.00	0.00	0.00	0.00	0.00	0.00	
3	2171.20	3.42	189.88	2171.09	-5.04	-0.88	2.00	189.88	-0.82	
4	6154.56	3.42	189.88	6147.35	-239.41	-41.70	0.00	0.00	-38.78	
5	7161.70	90.00	89.05	6790.00	-266.66	595.42	9.00	-100.81	598.63	TPZ - Harper A21-618
6	16198.56	90.00	89.05	6790.00	-117.49	9631.04	0.00	0.00	9631.76	BHL - Harper A21-618

WELL DETAILS: Harper A21-618

+N/-S	+E/-W	Northing	Ground Level:	4727.00	Latitude	Longitude	Slot
0.00	0.00	1414201.19	Easting	3261147.06	40.4665900	-104.5614040	



Plan: APD - Rev 1 (Harper A21-618/Original Drilling)

Created By: Shelly C. Peterkin Date: 8:48, January 23 2018

Northern Region - DJ Basin

Wells Ranch

A Section 21

Harper A21-618

Original Drilling

Plan: APD - Rev 1

Standard Planning Report

22 January, 2018

Noble Energy, Inc.

Planning Report

Database:	EDMP	Local Co-ordinate Reference:	Well Harper A21-618
Company:	Northern Region - DJ Basin	TVD Reference:	WELL @ 4757.00ft (Original Well Elev.)
Project:	Wells Ranch	MD Reference:	WELL @ 4757.00ft (Original Well Elev.)
Site:	A Section 21	North Reference:	Grid
Well:	Harper A21-618	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 1		

Project	Wells Ranch, Weld County Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

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

Well	Harper A21-618			
Well Position	+N/-S	-1.64 ft	Northing:	1,414,201.19 usft
	+E/-W	-84.84 ft	Easting:	3,261,147.07 usft
Position Uncertainty		0.00 ft	Wellhead Elevation:	Ground Level: 4,727.00 ft

Wellbore	Original Drilling				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	12/29/2016	8.16	66.95	52,501.95610690

Design	APD - Rev 1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(ft)	(ft)	(ft)	(°)
	0.00	0.00	0.00	90.70

Plan Sections										
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	
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,171.20	3.42	189.88	2,171.09	-5.04	-0.88	2.00	2.00	0.00	189.88	
6,154.56	3.42	189.88	6,147.35	-239.41	-41.70	0.00	0.00	0.00	0.00	
7,161.70	90.00	89.05	6,790.00	-266.66	595.42	9.00	8.60	-10.01	-100.81	TPZ - Harper A21-618
16,198.56	90.00	89.05	6,790.00	-117.49	9,631.04	0.00	0.00	0.00	0.00	BHL - Harper A21-618

Noble Energy, Inc.

Planning Report

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Project:	Wells Ranch	MD Reference:	WELL @ 4757.00ft (Original Well Elev.)
Site:	A Section 21	North Reference:	Grid
Well:	Harper A21-618	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 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
429.00	0.00	0.00	429.00	0.00	0.00	0.00	0.00	0.00	0.00
PIERRE									
489.00	0.00	0.00	489.00	0.00	0.00	0.00	0.00	0.00	0.00
UPPER PIERRE AQUIFER TOP									
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
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
1,516.00	0.00	0.00	1,516.00	0.00	0.00	0.00	0.00	0.00	0.00
UPPER PIERRE AQUIFER BASE									
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
Build 2°/100'									
2,100.00	2.00	189.88	2,099.98	-1.72	-0.30	-0.28	2.00	2.00	0.00
2,171.20	3.42	189.88	2,171.09	-5.04	-0.88	-0.82	2.00	2.00	0.00
Hold 3.42° Inc., 189.88° Azm									
2,200.00	3.42	189.88	2,199.85	-6.73	-1.17	-1.09	0.00	0.00	0.00
2,300.00	3.42	189.88	2,299.67	-12.62	-2.20	-2.04	0.00	0.00	0.00
2,400.00	3.42	189.88	2,399.49	-18.50	-3.22	-3.00	0.00	0.00	0.00
2,500.00	3.42	189.88	2,499.31	-24.38	-4.25	-3.95	0.00	0.00	0.00
2,600.00	3.42	189.88	2,599.13	-30.27	-5.27	-4.90	0.00	0.00	0.00
2,700.00	3.42	189.88	2,698.95	-36.15	-6.30	-5.86	0.00	0.00	0.00
2,800.00	3.42	189.88	2,798.78	-42.04	-7.32	-6.81	0.00	0.00	0.00
2,900.00	3.42	189.88	2,898.60	-47.92	-8.35	-7.76	0.00	0.00	0.00
3,000.00	3.42	189.88	2,998.42	-53.80	-9.37	-8.71	0.00	0.00	0.00
3,100.00	3.42	189.88	3,098.24	-59.69	-10.40	-9.67	0.00	0.00	0.00
3,200.00	3.42	189.88	3,198.06	-65.57	-11.42	-10.62	0.00	0.00	0.00
3,300.00	3.42	189.88	3,297.88	-71.45	-12.45	-11.57	0.00	0.00	0.00
3,400.00	3.42	189.88	3,397.70	-77.34	-13.47	-12.53	0.00	0.00	0.00
3,500.00	3.42	189.88	3,497.53	-83.22	-14.50	-13.48	0.00	0.00	0.00
3,600.00	3.42	189.88	3,597.35	-89.11	-15.52	-14.43	0.00	0.00	0.00
3,632.71	3.42	189.88	3,630.00	-91.03	-15.86	-14.74	0.00	0.00	0.00
PARKMAN									
3,700.00	3.42	189.88	3,697.17	-94.99	-16.54	-15.38	0.00	0.00	0.00
3,800.00	3.42	189.88	3,796.99	-100.87	-17.57	-16.34	0.00	0.00	0.00
3,900.00	3.42	189.88	3,896.81	-106.76	-18.59	-17.29	0.00	0.00	0.00
4,000.00	3.42	189.88	3,996.63	-112.64	-19.62	-18.24	0.00	0.00	0.00
4,100.00	3.42	189.88	4,096.46	-118.52	-20.64	-19.20	0.00	0.00	0.00

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Planning Report

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Wellbore:	Original Drilling		
Design:	APD - Rev 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)
4,185.70	3.42	189.88	4,182.00	-123.57	-21.52	-20.01	0.00	0.00	0.00
SUSSEX									
4,200.00	3.42	189.88	4,196.28	-124.41	-21.67	-20.15	0.00	0.00	0.00
4,300.00	3.42	189.88	4,296.10	-130.29	-22.69	-21.10	0.00	0.00	0.00
4,400.00	3.42	189.88	4,395.92	-136.18	-23.72	-22.06	0.00	0.00	0.00
4,500.00	3.42	189.88	4,495.74	-142.06	-24.74	-23.01	0.00	0.00	0.00
4,600.00	3.42	189.88	4,595.56	-147.94	-25.77	-23.96	0.00	0.00	0.00
4,700.00	3.42	189.88	4,695.38	-153.83	-26.79	-24.91	0.00	0.00	0.00
4,800.00	3.42	189.88	4,795.21	-159.71	-27.82	-25.87	0.00	0.00	0.00
4,900.00	3.42	189.88	4,895.03	-165.59	-28.84	-26.82	0.00	0.00	0.00
4,926.02	3.42	189.88	4,921.00	-167.12	-29.11	-27.07	0.00	0.00	0.00
SHANNON									
5,000.00	3.42	189.88	4,994.85	-171.48	-29.87	-27.77	0.00	0.00	0.00
5,100.00	3.42	189.88	5,094.67	-177.36	-30.89	-28.73	0.00	0.00	0.00
5,200.00	3.42	189.88	5,194.49	-183.24	-31.92	-29.68	0.00	0.00	0.00
5,300.00	3.42	189.88	5,294.31	-189.13	-32.94	-30.63	0.00	0.00	0.00
5,400.00	3.42	189.88	5,394.13	-195.01	-33.97	-31.58	0.00	0.00	0.00
5,500.00	3.42	189.88	5,493.96	-200.90	-34.99	-32.54	0.00	0.00	0.00
5,600.00	3.42	189.88	5,593.78	-206.78	-36.02	-33.49	0.00	0.00	0.00
5,700.00	3.42	189.88	5,693.60	-212.66	-37.04	-34.44	0.00	0.00	0.00
5,800.00	3.42	189.88	5,793.42	-218.55	-38.07	-35.40	0.00	0.00	0.00
5,900.00	3.42	189.88	5,893.24	-224.43	-39.09	-36.35	0.00	0.00	0.00
5,908.77	3.42	189.88	5,902.00	-224.95	-39.18	-36.43	0.00	0.00	0.00
TEEPEE BUTTES									
6,000.00	3.42	189.88	5,993.06	-230.31	-40.12	-37.30	0.00	0.00	0.00
6,100.00	3.42	189.88	6,092.89	-236.20	-41.14	-38.26	0.00	0.00	0.00
6,154.56	3.42	189.88	6,147.35	-239.41	-41.70	-38.78	0.00	0.00	0.00
KOP: Build 9°/100' @ 6154.56' MD									
6,200.00	4.81	133.30	6,192.69	-242.05	-40.54	-37.59	9.00	3.06	-124.52
6,250.00	8.63	111.85	6,242.34	-244.89	-35.53	-32.54	9.00	7.62	-42.90
6,300.00	12.89	103.94	6,291.45	-247.63	-26.64	-23.62	9.00	8.52	-15.82
6,350.00	17.27	99.95	6,339.72	-250.26	-13.91	-10.86	9.00	8.76	-7.97
6,400.00	21.70	97.55	6,386.85	-252.75	2.57	5.65	9.00	8.86	-4.81
6,450.00	26.15	95.93	6,432.54	-255.11	22.70	25.81	9.00	8.90	-3.24
6,500.00	30.61	94.75	6,476.52	-257.30	46.36	49.49	9.00	8.93	-2.35
6,550.00	35.09	93.85	6,518.52	-259.32	73.40	76.56	9.00	8.95	-1.80
6,600.00	39.57	93.13	6,558.26	-261.16	103.65	106.83	9.00	8.96	-1.44
6,650.00	44.05	92.54	6,595.52	-262.80	136.94	140.13	9.00	8.96	-1.19
6,667.59	45.63	92.35	6,608.00	-263.33	149.33	152.53	9.00	8.97	-1.06
SHARON SPRINGS									
6,700.00	48.53	92.03	6,630.06	-264.23	173.04	176.25	9.00	8.97	-0.99
6,712.11	49.62	91.92	6,638.00	-264.55	182.19	185.40	9.00	8.97	-0.92
NIO A CHALK									
6,740.66	52.18	91.67	6,656.00	-265.24	204.33	207.55	9.00	8.97	-0.88
NIO A MARL									
6,750.00	53.02	91.59	6,661.67	-265.45	211.75	214.97	9.00	8.98	-0.84
6,800.00	57.51	91.20	6,690.15	-266.45	252.81	256.05	9.00	8.98	-0.78
6,850.00	62.00	90.84	6,715.33	-267.22	295.99	299.23	9.00	8.98	-0.71
6,900.00	66.49	90.52	6,737.05	-267.75	341.01	344.25	9.00	8.98	-0.65
6,926.17	68.84	90.36	6,747.00	-267.93	365.21	368.46	9.00	8.98	-0.62
NIO B CHALK									
6,950.00	70.98	90.21	6,755.18	-268.05	387.59	390.83	9.00	8.98	-0.60
7,000.00	75.47	89.93	6,769.61	-268.10	435.45	438.69	9.00	8.98	-0.58

Noble Energy, Inc.

Planning Report

Database:	EDMP	Local Co-ordinate Reference:	Well Harper A21-618
Company:	Northern Region - DJ Basin	TVD Reference:	WELL @ 4757.00ft (Original Well Elev.)
Project:	Wells Ranch	MD Reference:	WELL @ 4757.00ft (Original Well Elev.)
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Well:	Harper A21-618	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 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)
7,037.79	78.87	89.72	6,778.00	-267.99	472.29	475.53	9.00	8.98	-0.56
NIO B MARL									
7,050.00	79.96	89.65	6,780.24	-267.92	484.29	487.53	9.00	8.98	-0.55
7,100.00	84.46	89.38	6,787.02	-267.50	533.82	537.04	9.00	8.98	-0.54
7,150.00	88.95	89.12	6,789.89	-266.85	583.72	586.93	9.00	8.98	-0.53
7,161.70	90.00	89.05	6,790.00	-266.66	595.42	598.63	9.00	8.98	-0.53
EOC: 7161.70' MD, 90.00° Inc, 89.05° Azm									
7,200.00	90.00	89.05	6,790.00	-266.03	633.71	636.91	0.00	0.00	0.00
7,300.00	90.00	89.05	6,790.00	-264.38	733.70	736.87	0.00	0.00	0.00
7,400.00	90.00	89.05	6,790.00	-262.73	833.68	836.83	0.00	0.00	0.00
7,500.00	90.00	89.05	6,790.00	-261.08	933.67	936.79	0.00	0.00	0.00
7,600.00	90.00	89.05	6,790.00	-259.43	1,033.66	1,036.74	0.00	0.00	0.00
7,700.00	90.00	89.05	6,790.00	-257.78	1,133.64	1,136.70	0.00	0.00	0.00
7,800.00	90.00	89.05	6,790.00	-256.13	1,233.63	1,236.66	0.00	0.00	0.00
7,900.00	90.00	89.05	6,790.00	-254.47	1,333.62	1,336.62	0.00	0.00	0.00
8,000.00	90.00	89.05	6,790.00	-252.82	1,433.60	1,436.58	0.00	0.00	0.00
8,100.00	90.00	89.05	6,790.00	-251.17	1,533.59	1,536.54	0.00	0.00	0.00
8,200.00	90.00	89.05	6,790.00	-249.52	1,633.57	1,636.50	0.00	0.00	0.00
8,300.00	90.00	89.05	6,790.00	-247.87	1,733.56	1,736.46	0.00	0.00	0.00
8,400.00	90.00	89.05	6,790.00	-246.22	1,833.55	1,836.41	0.00	0.00	0.00
8,500.00	90.00	89.05	6,790.00	-244.57	1,933.53	1,936.37	0.00	0.00	0.00
8,600.00	90.00	89.05	6,790.00	-242.92	2,033.52	2,036.33	0.00	0.00	0.00
8,700.00	90.00	89.05	6,790.00	-241.27	2,133.51	2,136.29	0.00	0.00	0.00
8,800.00	90.00	89.05	6,790.00	-239.62	2,233.49	2,236.25	0.00	0.00	0.00
8,900.00	90.00	89.05	6,790.00	-237.97	2,333.48	2,336.21	0.00	0.00	0.00
9,000.00	90.00	89.05	6,790.00	-236.32	2,433.47	2,436.17	0.00	0.00	0.00
9,100.00	90.00	89.05	6,790.00	-234.67	2,533.45	2,536.13	0.00	0.00	0.00
9,200.00	90.00	89.05	6,790.00	-233.02	2,633.44	2,636.08	0.00	0.00	0.00
9,300.00	90.00	89.05	6,790.00	-231.37	2,733.42	2,736.04	0.00	0.00	0.00
9,400.00	90.00	89.05	6,790.00	-229.71	2,833.41	2,836.00	0.00	0.00	0.00
9,500.00	90.00	89.05	6,790.00	-228.06	2,933.40	2,935.96	0.00	0.00	0.00
9,600.00	90.00	89.05	6,790.00	-226.41	3,033.38	3,035.92	0.00	0.00	0.00
9,700.00	90.00	89.05	6,790.00	-224.76	3,133.37	3,135.88	0.00	0.00	0.00
9,800.00	90.00	89.05	6,790.00	-223.11	3,233.36	3,235.84	0.00	0.00	0.00
9,900.00	90.00	89.05	6,790.00	-221.46	3,333.34	3,335.80	0.00	0.00	0.00
10,000.00	90.00	89.05	6,790.00	-219.81	3,433.33	3,435.76	0.00	0.00	0.00
10,100.00	90.00	89.05	6,790.00	-218.16	3,533.32	3,535.71	0.00	0.00	0.00
10,200.00	90.00	89.05	6,790.00	-216.51	3,633.30	3,635.67	0.00	0.00	0.00
10,300.00	90.00	89.05	6,790.00	-214.86	3,733.29	3,735.63	0.00	0.00	0.00
10,400.00	90.00	89.05	6,790.00	-213.21	3,833.27	3,835.59	0.00	0.00	0.00
10,500.00	90.00	89.05	6,790.00	-211.56	3,933.26	3,935.55	0.00	0.00	0.00
10,600.00	90.00	89.05	6,790.00	-209.91	4,033.25	4,035.51	0.00	0.00	0.00
10,700.00	90.00	89.05	6,790.00	-208.26	4,133.23	4,135.47	0.00	0.00	0.00
10,800.00	90.00	89.05	6,790.00	-206.61	4,233.22	4,235.43	0.00	0.00	0.00
10,900.00	90.00	89.05	6,790.00	-204.95	4,333.21	4,335.38	0.00	0.00	0.00
11,000.00	90.00	89.05	6,790.00	-203.30	4,433.19	4,435.34	0.00	0.00	0.00
11,100.00	90.00	89.05	6,790.00	-201.65	4,533.18	4,535.30	0.00	0.00	0.00
11,200.00	90.00	89.05	6,790.00	-200.00	4,633.17	4,635.26	0.00	0.00	0.00
11,300.00	90.00	89.05	6,790.00	-198.35	4,733.15	4,735.22	0.00	0.00	0.00
11,400.00	90.00	89.05	6,790.00	-196.70	4,833.14	4,835.18	0.00	0.00	0.00
11,500.00	90.00	89.05	6,790.00	-195.05	4,933.12	4,935.14	0.00	0.00	0.00
11,600.00	90.00	89.05	6,790.00	-193.40	5,033.11	5,035.10	0.00	0.00	0.00
11,700.00	90.00	89.05	6,790.00	-191.75	5,133.10	5,135.05	0.00	0.00	0.00
11,800.00	90.00	89.05	6,790.00	-190.10	5,233.08	5,235.01	0.00	0.00	0.00

Noble Energy, Inc.

Planning Report

Database:	EDMP	Local Co-ordinate Reference:	Well Harper A21-618
Company:	Northern Region - DJ Basin	TVD Reference:	WELL @ 4757.00ft (Original Well Elev.)
Project:	Wells Ranch	MD Reference:	WELL @ 4757.00ft (Original Well Elev.)
Site:	A Section 21	North Reference:	Grid
Well:	Harper A21-618	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 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	89.05	6,790.00	-188.45	5,333.07	5,334.97	0.00	0.00	0.00
12,000.00	90.00	89.05	6,790.00	-186.80	5,433.06	5,434.93	0.00	0.00	0.00
12,100.00	90.00	89.05	6,790.00	-185.15	5,533.04	5,534.89	0.00	0.00	0.00
12,200.00	90.00	89.05	6,790.00	-183.50	5,633.03	5,634.85	0.00	0.00	0.00
12,300.00	90.00	89.05	6,790.00	-181.85	5,733.02	5,734.81	0.00	0.00	0.00
12,400.00	90.00	89.05	6,790.00	-180.20	5,833.00	5,834.77	0.00	0.00	0.00
12,500.00	90.00	89.05	6,790.00	-178.54	5,932.99	5,934.73	0.00	0.00	0.00
12,600.00	90.00	89.05	6,790.00	-176.89	6,032.97	6,034.68	0.00	0.00	0.00
12,700.00	90.00	89.05	6,790.00	-175.24	6,132.96	6,134.64	0.00	0.00	0.00
12,800.00	90.00	89.05	6,790.00	-173.59	6,232.95	6,234.60	0.00	0.00	0.00
12,900.00	90.00	89.05	6,790.00	-171.94	6,332.93	6,334.56	0.00	0.00	0.00
13,000.00	90.00	89.05	6,790.00	-170.29	6,432.92	6,434.52	0.00	0.00	0.00
13,100.00	90.00	89.05	6,790.00	-168.64	6,532.91	6,534.48	0.00	0.00	0.00
13,200.00	90.00	89.05	6,790.00	-166.99	6,632.89	6,634.44	0.00	0.00	0.00
13,300.00	90.00	89.05	6,790.00	-165.34	6,732.88	6,734.40	0.00	0.00	0.00
13,400.00	90.00	89.05	6,790.00	-163.69	6,832.87	6,834.35	0.00	0.00	0.00
13,500.00	90.00	89.05	6,790.00	-162.04	6,932.85	6,934.31	0.00	0.00	0.00
13,600.00	90.00	89.05	6,790.00	-160.39	7,032.84	7,034.27	0.00	0.00	0.00
13,700.00	90.00	89.05	6,790.00	-158.74	7,132.83	7,134.23	0.00	0.00	0.00
13,800.00	90.00	89.05	6,790.00	-157.09	7,232.81	7,234.19	0.00	0.00	0.00
13,900.00	90.00	89.05	6,790.00	-155.44	7,332.80	7,334.15	0.00	0.00	0.00
14,000.00	90.00	89.05	6,790.00	-153.78	7,432.78	7,434.11	0.00	0.00	0.00
14,100.00	90.00	89.05	6,790.00	-152.13	7,532.77	7,534.07	0.00	0.00	0.00
14,200.00	90.00	89.05	6,790.00	-150.48	7,632.76	7,634.02	0.00	0.00	0.00
14,300.00	90.00	89.05	6,790.00	-148.83	7,732.74	7,733.98	0.00	0.00	0.00
14,400.00	90.00	89.05	6,790.00	-147.18	7,832.73	7,833.94	0.00	0.00	0.00
14,500.00	90.00	89.05	6,790.00	-145.53	7,932.72	7,933.90	0.00	0.00	0.00
14,600.00	90.00	89.05	6,790.00	-143.88	8,032.70	8,033.86	0.00	0.00	0.00
14,700.00	90.00	89.05	6,790.00	-142.23	8,132.69	8,133.82	0.00	0.00	0.00
14,800.00	90.00	89.05	6,790.00	-140.58	8,232.68	8,233.78	0.00	0.00	0.00
14,900.00	90.00	89.05	6,790.00	-138.93	8,332.66	8,333.74	0.00	0.00	0.00
15,000.00	90.00	89.05	6,790.00	-137.28	8,432.65	8,433.70	0.00	0.00	0.00
15,100.00	90.00	89.05	6,790.00	-135.63	8,532.63	8,533.65	0.00	0.00	0.00
15,200.00	90.00	89.05	6,790.00	-133.98	8,632.62	8,633.61	0.00	0.00	0.00
15,300.00	90.00	89.05	6,790.00	-132.33	8,732.61	8,733.57	0.00	0.00	0.00
15,400.00	90.00	89.05	6,790.00	-130.68	8,832.59	8,833.53	0.00	0.00	0.00
15,500.00	90.00	89.05	6,790.00	-129.02	8,932.58	8,933.49	0.00	0.00	0.00
15,600.00	90.00	89.05	6,790.00	-127.37	9,032.57	9,033.45	0.00	0.00	0.00
15,700.00	90.00	89.05	6,790.00	-125.72	9,132.55	9,133.41	0.00	0.00	0.00
15,800.00	90.00	89.05	6,790.00	-124.07	9,232.54	9,233.37	0.00	0.00	0.00
15,900.00	90.00	89.05	6,790.00	-122.42	9,332.53	9,333.32	0.00	0.00	0.00
16,000.00	90.00	89.05	6,790.00	-120.77	9,432.51	9,433.28	0.00	0.00	0.00
16,100.00	90.00	89.05	6,790.00	-119.12	9,532.50	9,533.24	0.00	0.00	0.00
16,198.56	90.00	89.05	6,790.00	-117.49	9,631.04	9,631.76	0.00	0.00	0.00
TD @ 16198.56' MD/6790.00' TVD									

Noble Energy, Inc.

Planning Report

Database:	EDMP	Local Co-ordinate Reference:	Well Harper A21-618
Company:	Northern Region - DJ Basin	TVD Reference:	WELL @ 4757.00ft (Original Well Elev.)
Project:	Wells Ranch	MD Reference:	WELL @ 4757.00ft (Original Well Elev.)
Site:	A Section 21	North Reference:	Grid
Well:	Harper A21-618	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 1		

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)		
BHL - Harper A21-618	0.00	0.00	6,790.00	-117.49	9,631.04	1,414,083.70	3,270,778.09	40.4659825	-104.5267962
- plan hits target center									
- Point									
TPZ - Harper A21-618	0.00	0.01	6,790.00	-266.66	595.42	1,413,934.53	3,261,742.48	40.4658407	-104.5592743
- plan hits target center									
- Point									

Formations					
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction
(ft)	(ft)			(°)	(°)
429.00	429.00	PIERRE		0.00	
489.00	489.00	UPPER PIERRE AQUIFER TOP		0.00	
1,516.00	1,516.00	UPPER PIERRE AQUIFER BASE		0.00	
3,632.71	3,630.00	PARKMAN		0.00	
4,185.70	4,182.00	SUSSEX		0.00	
4,926.02	4,921.00	SHANNON		0.00	
5,908.77	5,902.00	TEEPEE BUTTES		0.00	
6,667.59	6,608.00	SHARON SPRINGS		0.00	
6,712.11	6,638.00	NIO A CHALK		0.00	
6,740.66	6,656.00	NIO A MARL		0.00	
6,926.17	6,747.00	NIO B CHALK		0.00	
7,037.79	6,778.00	NIO B MARL		0.00	

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	
2,000.00	2,000.00	0.00	0.00	Build 2°/100'
2,171.20	2,171.09	-5.04	-0.88	Hold 3.42° Inc., 189.88° Azm
6,154.56	6,147.35	-239.41	-41.70	KOP: Build 9°/100' @ 6154.56' MD
7,161.70	6,790.00	-266.66	595.42	EOC: 7161.70' MD, 90.00° Inc, 89.05° Azm
16,198.56	6,790.00	-117.49	9,631.04	TD @ 16198.56' MD/6790.00' TVD

Northern Region - DJ Basin

Wells Ranch

A Section 21

Harper A21-618

Original Drilling

APD - Rev 1

Anticollision Summary Report

22 January, 2018

Noble Energy, Inc.
Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Harper A21-618
Project:	Wells Ranch	TVD Reference:	WELL @ 4757.00ft (Original Well Elev.)
Reference Site:	A Section 21	MD Reference:	WELL @ 4757.00ft (Original Well Elev.)
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Harper A21-618	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Original Drilling	Database:	EDMP
Reference Design:	APD - Rev 1	Offset TVD Reference:	Offset Datum

Reference	APD - Rev 1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.00 ft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	1/22/2018		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	16,198.56	APD - Rev 1 (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	11,413.44	7,000.49	7,815.10	7,726.79	88.498	CC
Kerbs 12-15 - Original Drilling - Original Drilling - As Drille	11,500.00	7,000.08	7,815.58	7,726.28	87.528	ES
Kerbs 12-15 - Original Drilling - Original Drilling - As Drille	15,200.00	7,023.51	8,684.08	8,561.29	70.723	SF
Kerbs 14-15 - Original Drilling - Original Drilling - As Drille	11,438.23	6,804.05	5,179.16	5,091.26	58.919	CC
Kerbs 14-15 - Original Drilling - Original Drilling - As Drille	11,500.00	6,803.74	5,179.53	5,090.93	58.460	ES
Kerbs 14-15 - Original Drilling - Original Drilling - As Drille	13,300.00	6,795.84	5,503.62	5,398.78	52.495	SF
Kerbs 22-15 - Original Drilling - Original Drilling - As Drille	13,166.45	6,970.35	7,820.09	7,711.29	71.877	CC
Kerbs 22-15 - Original Drilling - Original Drilling - As Drille	13,300.00	6,970.97	7,821.23	7,710.86	70.867	ES
Kerbs 22-15 - Original Drilling - Original Drilling - As Drille	16,198.56	6,984.53	8,387.32	8,250.00	61.076	SF
Kerbs 23-15 - Original Drilling - Original Drilling - As Drille	13,153.81	6,853.76	6,487.22	6,378.98	59.934	CC
Kerbs 23-15 - Original Drilling - Original Drilling - As Drille	13,200.00	6,853.57	6,487.39	6,378.61	59.638	ES
Kerbs 23-15 - Original Drilling - Original Drilling - As Drille	15,500.00	6,840.50	6,898.45	6,768.66	53.151	SF
Kerbs 24-15 - Original Drilling - Original Drilling - As Drille	13,164.10	6,806.68	5,133.00	5,024.79	47.437	CC
Kerbs 24-15 - Original Drilling - Original Drilling - As Drille	13,200.00	6,807.08	5,133.12	5,024.50	47.255	ES
Kerbs 24-15 - Original Drilling - Original Drilling - As Drille	14,700.00	6,822.20	5,357.83	5,235.44	43.777	SF
Kerbs 33-15 - Original Drilling - Original Drilling - As Drille	14,285.87	6,900.00	6,631.52	6,509.53	54.364	CC
Kerbs 33-15 - Original Drilling - Original Drilling - As Drille	14,400.00	6,900.00	6,632.50	6,509.17	53.780	ES
Kerbs 33-15 - Original Drilling - Original Drilling - As Drille	16,198.56	6,932.43	6,901.62	6,761.13	49.124	SF
Kerbs 34-15 - Original Drilling - Original Drilling - As Drille	14,244.61	6,791.24	5,248.41	5,123.56	42.037	CC
Kerbs 34-15 - Original Drilling - Original Drilling - As Drille	14,300.00	6,791.34	5,248.71	5,123.20	41.820	ES
Kerbs 34-15 - Original Drilling - Original Drilling - As Drille	15,700.00	6,793.85	5,446.47	5,308.20	39.390	SF
Kerbs 43-15 - Original Drilling - Original Drilling - As Drille	15,501.28	6,926.94	6,451.53	6,314.74	47.165	CC
Kerbs 43-15 - Original Drilling - Original Drilling - As Drille	15,600.00	6,929.49	6,452.28	6,314.32	46.768	ES
Kerbs 43-15 - Original Drilling - Original Drilling - As Drille	16,198.56	6,944.97	6,489.08	6,344.53	44.892	SF
Kerbs 44-15 - Original Drilling - Original Drilling - As Drille	15,388.69	6,751.58	5,115.42	4,980.61	37.946	CC
Kerbs 44-15 - Original Drilling - Original Drilling - As Drille	15,400.00	6,751.59	5,115.43	4,980.48	37.908	ES
Kerbs 44-15 - Original Drilling - Original Drilling - As Drille	16,198.56	6,752.03	5,179.13	5,036.05	36.198	SF
Kerbs USX A15-12D - Original Drilling - Original Drilling	11,698.19	7,820.02	6,686.61	6,576.49	60.723	CC
Kerbs USX A15-12D - Original Drilling - Original Drilling	11,800.00	7,820.02	6,687.38	6,575.76	59.908	ES
Kerbs USX A15-12D - Original Drilling - Original Drilling	14,600.00	7,820.02	7,289.12	7,144.78	50.500	SF
McDaniel 32-15 - Original Drilling - Original Drilling - As D	14,263.60	6,857.99	7,940.42	7,818.83	65.305	CC
McDaniel 32-15 - Original Drilling - Original Drilling - As D	14,400.00	6,860.20	7,941.59	7,818.38	64.456	ES
McDaniel 32-15 - Original Drilling - Original Drilling - As D	16,198.56	6,889.31	8,172.72	8,031.07	57.696	SF
McDaniel 42-15 - Original Drilling - Original Drilling - As D	15,643.40	6,822.48	8,053.19	7,915.02	58.288	CC
McDaniel 42-15 - Original Drilling - Original Drilling - As D	15,700.00	6,823.31	8,053.38	7,914.54	58.004	ES
McDaniel 42-15 - Original Drilling - Original Drilling - As D	16,198.56	6,830.44	8,072.30	7,927.70	55.825	SF
Speicher 31-15 - Original Drilling - Original Drilling	14,509.44	6,650.01	9,303.03	9,179.06	75.042	CC

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

Noble Energy, Inc.
Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Harper A21-618
Project:	Wells Ranch	TVD Reference:	WELL @ 4757.00ft (Original Well Elev.)
Reference Site:	A Section 21	MD Reference:	WELL @ 4757.00ft (Original Well Elev.)
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Harper A21-618	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Original Drilling	Database:	EDMP
Reference Design:	APD - Rev 1	Offset TVD Reference:	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
A Section 15						
Speicher 31-15 - Original Drilling - Original Drilling	14,600.00	6,650.01	9,303.47	9,178.42	74.398	ES
Speicher 31-15 - Original Drilling - Original Drilling	16,198.56	6,650.01	9,455.13	9,312.71	66.387	SF
Speicher 41-15 - Original Drilling - Original Drilling	15,542.75	6,900.01	9,258.43	9,121.26	67.496	CC
Speicher 41-15 - Original Drilling - Original Drilling	15,700.00	6,900.01	9,259.76	9,120.72	66.595	ES
Speicher 41-15 - Original Drilling - Original Drilling	16,198.56	6,900.01	9,281.63	9,136.84	64.107	SF
Tye USX A15-03D - Original Drilling - Original MWD	12,924.51	6,921.97	9,454.12	9,346.10	87.524	CC
Tye USX A15-03D - Original Drilling - Original MWD	13,000.00	6,923.26	9,454.42	9,345.55	86.838	ES
Tye USX A15-03D - Original Drilling - Original MWD	16,100.00	6,964.28	9,973.09	9,834.06	71.732	SF
Tye USX A15-04D - Original Drilling - Original Drilling	11,644.31	7,272.21	9,398.51	9,288.48	85.418	CC
Tye USX A15-04D - Original Drilling - Original Drilling	11,700.00	7,272.36	9,398.67	9,288.07	84.978	ES
Tye USX A15-04D - Original Drilling - Original Drilling	14,400.00	7,279.57	9,794.17	9,659.56	72.762	SF
A Section 20						
Foe 16-20 - Original Drilling - Original Drilling - As Drilled	6,163.76	6,117.74	1,521.28	1,478.64	35.673	CC, ES
Foe 16-20 - Original Drilling - Original Drilling - As Drilled	6,300.00	6,251.86	1,535.75	1,492.16	35.233	SF
Foe 33-20 - Original Drilling - Original Drilling - As Drilled	528.67	491.68	2,942.51	2,939.30	917.794	CC
Foe 33-20 - Original Drilling - Original Drilling - As Drilled	2,200.00	2,167.52	2,950.61	2,935.60	196.679	ES
Foe 33-20 - Original Drilling - Original Drilling - As Drilled	6,450.00	6,425.47	3,054.93	3,010.25	68.375	SF
Foe 34-20 (PA) - Original Drilling - Original Drilling - As D	6,163.41	6,099.18	2,838.21	2,694.77	19.787	CC, ES
Foe 34-20 (PA) - Original Drilling - Original Drilling - As D	6,450.00	6,375.54	2,901.64	2,751.71	19.354	SF
Foe 43-20 - Original Drilling - Original Drilling - As Drilled	332.04	304.33	1,897.65	1,895.80	1,027.725	CC
Foe 43-20 - Original Drilling - Original Drilling - As Drilled	1,700.00	1,663.24	1,899.65	1,888.15	165.238	ES
Foe 43-20 - Original Drilling - Original Drilling - As Drilled	6,400.00	6,375.79	2,051.08	2,006.74	46.262	SF
Linda Rae 1 - Original Drilling - Original Drilling - As Drille	6,166.54	6,171.86	7,027.83	6,982.72	155.803	CC, ES
Linda Rae 1 - Original Drilling - Original Drilling - As Drille	6,850.00	6,731.34	7,360.61	7,307.83	139.459	SF
Simmons 42-20D - Original Drilling - Original Drilling - As	1,704.67	1,708.37	2,872.39	2,860.97	251.526	CC
Simmons 42-20D - Original Drilling - Original Drilling - As	2,000.00	1,983.09	2,873.59	2,860.13	213.480	ES
Simmons 42-20D - Original Drilling - Original Drilling - As	6,600.00	6,604.67	3,201.33	3,154.92	68.991	SF
Snider 1-20EG - Original Drilling - Original Drilling - As D	6,161.23	6,100.00	4,152.73	4,110.14	97.509	CC, ES
Snider 1-20EG - Original Drilling - Original Drilling - As D	6,500.00	6,320.68	4,244.79	4,200.33	95.473	SF
Stump A20-11 - Original Drilling - Original Drilling - As Dr	6,167.95	6,229.39	4,473.64	4,430.57	103.871	CC, ES
Stump A20-11 - Original Drilling - Original Drilling - As Dr	6,650.00	6,719.50	4,639.76	4,593.51	100.317	SF
Stump A20-12 - Original Drilling - Original Drilling - As Dr	3,167.01	3,139.15	5,531.62	5,509.98	255.538	CC
Stump A20-12 - Original Drilling - Original Drilling - As Dr	6,154.56	6,100.00	5,541.69	5,499.13	130.201	ES
Stump A20-12 - Original Drilling - Original Drilling - As Dr	6,750.00	6,816.56	5,793.70	5,746.94	123.890	SF
Stump A20-13 - Original Drilling - Original Drilling - As Dr	6,159.98	6,085.18	5,442.72	5,400.19	127.967	CC, ES
Stump A20-13 - Original Drilling - Original Drilling - As Dr	6,550.00	6,458.84	5,557.86	5,512.78	123.284	SF
Winter 20-19 - Original Drilling - Original Drilling - As Dril	352.99	300.00	7,138.52	7,136.61	3,736.809	CC
Winter 20-19 - Original Drilling - Original Drilling - As Dril	400.00	327.72	7,138.57	7,136.38	3,268.940	ES
Winter 20-19 - Original Drilling - Original Drilling - As Dril	6,750.00	6,714.52	7,588.08	7,539.29	155.528	SF
Winter 24-19 - Original Drilling - Original Drilling - As Dril	100.00	42.20	7,123.49	7,123.29	10,000.000	CC
Winter 24-19 - Original Drilling - Original Drilling - As Dril	600.00	484.46	7,125.22	7,121.49	1,908.326	ES
Winter 24-19 - Original Drilling - Original Drilling - As Dril	6,500.00	6,728.96	7,486.98	7,427.34	125.528	SF
Winter 39-19 - Original Drilling - Original Drilling - As Dril	6,167.36	6,328.47	6,168.72	6,121.02	129.321	CC, ES
Winter 39-19 - Original Drilling - Original Drilling - As Dril	6,550.00	6,600.00	6,281.92	6,232.24	126.442	SF
Winter 40-19 - Original Drilling - Original Drilling - As Dril	5,881.52	6,200.00	6,249.83	6,177.11	85.953	CC
Winter 40-19 - Original Drilling - Original Drilling - As Dril	6,100.00	6,382.76	6,250.41	6,176.63	84.721	ES
Winter 40-19 - Original Drilling - Original Drilling - As Dril	6,450.00	6,729.72	6,317.48	6,242.01	83.707	SF

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

Noble Energy, Inc.
Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Harper A21-618
Project:	Wells Ranch	TVD Reference:	WELL @ 4757.00ft (Original Well Elev.)
Reference Site:	A Section 21	MD Reference:	WELL @ 4757.00ft (Original Well Elev.)
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Harper A21-618	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Original Drilling	Database:	EDMP
Reference Design:	APD - Rev 1	Offset TVD Reference:	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	7,891.24	6,777.26	1,478.14	1,426.23	28.471	CC
Culbreath 23-21 - Original Drilling - Original Drilling - As D	7,900.00	6,777.27	1,478.17	1,426.20	28.440	ES
Culbreath 23-21 - Original Drilling - Original Drilling - As D	8,100.00	6,777.56	1,492.81	1,439.56	28.033	SF
Culbreath 33-21 (PA) - Original Drilling - Original Drilling	8,945.98	6,751.00	1,351.78	1,179.46	7.845	CC, ES
Culbreath 33-21 (PA) - Original Drilling - Original Drilling	9,000.00	6,751.00	1,352.86	1,180.07	7.830	SF
Harper A21-626 - Original Drilling - APD - Rev 1	2,000.00	2,000.00	23.00	9.13	1.658	CC, ES, SF
Harper A21-631 - Original Drilling - APD - Rev 1	2,000.00	2,000.00	45.00	31.13	3.244	CC, ES
Harper A21-631 - Original Drilling - APD - Rev 1	2,100.00	2,100.02	46.72	32.15	3.206	SF
Harper A21-637 - Original Drilling - APD - Rev 1	2,000.00	2,000.00	68.01	54.13	4.902	CC, ES, SF
Harper A21-643 - Original Drilling - APD - Rev 1	1,911.28	1,925.28	1,403.60	1,390.31	105.638	CC
Harper A21-643 - Original Drilling - APD - Rev 1	2,000.00	2,013.99	1,403.60	1,389.68	100.820	ES
Harper A21-643 - Original Drilling - APD - Rev 1	16,198.56	16,402.04	1,695.27	1,450.89	6.937	SF
Harper A21-649 - Original Drilling - APD - Rev 1	2,000.00	2,015.00	1,425.59	1,411.66	102.364	CC, ES
Harper A21-649 - Original Drilling - APD - Rev 1	16,198.56	16,509.91	2,056.56	1,812.28	8.419	SF
Harper A21-656 - Original Drilling - APD - Rev 1	2,000.00	2,015.00	1,448.58	1,434.65	104.015	CC, ES
Harper A21-656 - Original Drilling - APD - Rev 1	16,198.56	16,493.83	2,432.92	2,188.15	9.940	SF
Harper A21-664 - Original Drilling - APD - Rev 1	2,000.00	2,015.00	1,470.56	1,456.64	105.594	CC, ES
Harper A21-664 - Original Drilling - APD - Rev 1	16,198.56	16,773.23	2,926.90	2,682.32	11.967	SF
Harper A21-669 - Original Drilling - APD - Rev 1	2,000.00	2,016.00	1,493.55	1,479.62	107.217	CC, ES
Harper A21-669 - Original Drilling - APD - Rev 1	16,198.56	16,703.40	3,273.03	3,027.83	13.349	SF
Harper A21-674 - Original Drilling - APD - Rev 1	2,000.00	2,016.00	1,515.54	1,501.61	108.796	CC, ES
Harper A21-674 - Original Drilling - APD - Rev 1	16,198.56	16,889.78	3,633.52	3,388.42	14.824	SF
Harper A21-681 - Original Drilling - APD - Rev 1	1,909.84	1,926.84	1,538.53	1,525.25	115.789	CC
Harper A21-681 - Original Drilling - APD - Rev 1	2,000.00	2,011.08	1,538.57	1,524.65	110.589	ES
Harper A21-681 - Original Drilling - APD - Rev 1	16,198.56	16,738.88	4,057.98	3,814.74	16.683	SF
Kona A19-616 - Kona A19-616 - Kona A19-616 - As Drille	1,982.07	1,978.41	140.20	127.83	11.332	CC
Kona A19-616 - Kona A19-616 - Kona A19-616 - As Drille	2,000.00	1,995.30	140.27	127.82	11.272	ES
Kona A19-616 - Kona A19-616 - Kona A19-616 - As Drille	6,815.35	6,794.23	182.38	140.76	4.382	SF
Kona A19-624 - Kona A19-624 - Kona A19-624 - As Drille	1,418.23	1,414.31	156.02	147.22	17.730	CC
Kona A19-624 - Kona A19-624 - Kona A19-624 - As Drille	1,900.00	1,895.29	157.08	144.91	12.907	ES
Kona A19-624 - Kona A19-624 - Kona A19-624 - As Drille	6,995.36	6,796.35	385.14	343.09	9.161	SF
Kona A19-636 - Kona A19-636 - Kona A19-636 - As Drille	0.00	0.00	174.10			
Kona A19-636 - Kona A19-636 - Kona A19-636 - As Drille	2,000.00	1,995.75	183.74	171.88	15.499	ES
Kona A19-636 - Kona A19-636 - Kona A19-636 - As Drille	2,171.20	2,158.30	189.40	176.58	14.775	SF
Kona A19-646 - Original Drilling - Original Drilling - As Dr	2,018.28	2,042.52	1,429.90	1,416.25	104.801	CC, ES
Kona A19-646 - Original Drilling - Original Drilling - As Dr	7,500.00	6,517.00	1,852.90	1,810.18	43.376	SF
Kona A19-662 - Original Drilling - Original Drilling - As Dr	2,016.62	2,042.61	1,526.50	1,512.84	111.765	CC, ES
Kona A19-662 - Original Drilling - Original Drilling - As Dr	7,300.00	6,610.47	2,718.83	2,675.34	62.527	SF
Kona A19-670 - Kona A19-670 - Original Drilling - As Dril	1,984.09	2,001.17	1,549.44	1,535.92	114.586	CC
Kona A19-670 - Kona A19-670 - Original Drilling - As Dril	2,000.00	2,009.32	1,549.48	1,535.90	114.100	ES
Kona A19-670 - Kona A19-670 - Original Drilling - As Dril	8,000.00	8,000.00	3,203.49	3,150.02	59.910	SF
Kona A19-685 - Original Drilling - Original Drilling - As Dr	2,001.41	2,018.26	1,501.91	1,488.28	110.140	CC, ES
Kona A19-685 - Original Drilling - Original Drilling - As Dr	9,600.00	5,921.95	4,015.00	3,959.85	72.803	SF
McKee 12-21 (PA) - Original Drilling - Original Drilling - A	2,000.00	1,997.00	2,213.62	2,166.75	47.222	CC
McKee 12-21 (PA) - Original Drilling - Original Drilling - A	2,100.00	2,096.98	2,215.28	2,166.07	45.011	ES
McKee 12-21 (PA) - Original Drilling - Original Drilling - A	6,800.00	6,687.15	2,522.13	2,365.00	16.051	SF
McKee 21-21 (PA) - Original Drilling - Original Drilling - A	2,000.00	2,013.00	3,767.48	3,720.28	79.825	CC
McKee 21-21 (PA) - Original Drilling - Original Drilling - A	7,900.00	6,803.00	3,809.90	3,645.39	23.159	ES
McKee 21-21 (PA) - Original Drilling - Original Drilling - A	8,600.00	6,803.00	3,877.63	3,707.92	22.849	SF
McKee 22-21 - Original Drilling - Original Drilling - As Dril	0.00	0.00	2,510.29			
McKee 22-21 - Original Drilling - Original Drilling - As Dril	1,600.00	1,573.34	2,518.97	2,508.12	232.311	ES
McKee 22-21 - Original Drilling - Original Drilling - As Dril	8,500.00	6,785.64	2,734.87	2,679.04	48.985	SF
McKee 31-21 - Original Drilling - Original Drilling - As Dril	8,924.28	6,977.46	4,176.35	4,115.01	68.078	CC

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

Noble Energy, Inc.
Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Harper A21-618
Project:	Wells Ranch	TVD Reference:	WELL @ 4757.00ft (Original Well Elev.)
Reference Site:	A Section 21	MD Reference:	WELL @ 4757.00ft (Original Well Elev.)
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Harper A21-618	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Original Drilling	Database:	EDMP
Reference Design:	APD - Rev 1	Offset TVD Reference:	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 31-21 - Original Drilling - Original Drilling - As Dril	9,000.00	6,975.72	4,177.04	4,114.99	67.315	ES
McKee 31-21 - Original Drilling - Original Drilling - As Dril	10,700.00	6,936.73	4,538.00	4,461.92	59.649	SF
McKee 32-21 - Original Drilling - Original Drilling - As Dril	8,928.63	6,801.09	2,634.83	2,574.07	43.362	CC, ES
McKee 32-21 - Original Drilling - Original Drilling - As Dril	9,700.00	6,803.47	2,745.42	2,678.37	40.946	SF
McKee 41-21 - Original Drilling - Original Drilling - As Dril	10,222.98	6,667.61	4,113.90	4,040.24	55.856	CC
McKee 41-21 - Original Drilling - Original Drilling - As Dril	10,300.00	6,668.17	4,114.62	4,040.14	55.247	ES
McKee 41-21 - Original Drilling - Original Drilling - As Dril	11,700.00	6,678.05	4,371.00	4,284.27	50.400	SF
McKee 42-21 - Original Drilling - Original Drilling - As Dril	10,285.99	6,787.10	2,455.25	2,380.41	32.806	CC
McKee 42-21 - Original Drilling - Original Drilling - As Dril	10,300.00	6,787.08	2,455.29	2,380.30	32.742	ES
McKee 42-21 - Original Drilling - Original Drilling - As Dril	10,800.00	6,786.27	2,508.47	2,429.08	31.593	SF
Sexton 43-21 (PA) - Original Drilling - Original Drilling - A	10,236.87	6,743.00	1,575.63	1,390.04	8.490	CC, ES
Sexton 43-21 (PA) - Original Drilling - Original Drilling - A	10,400.00	6,743.00	1,584.05	1,396.97	8.467	SF
Wells Trust 13-21 - Original Drilling - Original Drilling - As	2,024.75	2,007.44	995.14	981.28	71.799	CC, ES
Wells Trust 13-21 - Original Drilling - Original Drilling - As	6,450.00	6,417.37	1,212.37	1,167.74	27.166	SF
Wells Trust 14-21 - Original Drilling - Original Drilling - As	6,161.11	6,110.67	391.94	349.33	9.198	CC, ES
Wells Trust 14-21 - Original Drilling - Original Drilling - As	6,200.00	6,148.83	393.16	350.28	9.169	SF
Wells Trust 24-21 - Original Drilling - Original Drilling - As	6,982.84	6,712.03	128.62	81.39	2.723	CC, ES, SF

Noble Energy, Inc.
Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Harper A21-618
Project:	Wells Ranch	TVD Reference:	WELL @ 4757.00ft (Original Well Elev.)
Reference Site:	A Section 21	MD Reference:	WELL @ 4757.00ft (Original Well Elev.)
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Harper A21-618	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Original Drilling	Database:	EDMP
Reference Design:	APD - Rev 1	Offset TVD Reference:	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 Dril	15,537.55	6,733.42	202.77	66.19	1.485	Level 3, CC, ES, SF
Carpio 22-04-19 - Original Drilling - Original Drilling - As D	14,052.68	6,753.26	777.21	656.90	6.460	CC, ES
Carpio 22-04-19 - Original Drilling - Original Drilling - As D	14,100.00	6,753.14	778.65	658.00	6.454	SF
Carpio 22-41 - Original Drilling - Original Drilling - As Dril	15,698.20	6,736.33	1,226.97	1,070.40	7.837	CC
Carpio 22-41 - Original Drilling - Original Drilling - As Dril	15,700.00	6,736.33	1,226.97	1,070.39	7.836	ES
Carpio 22-41 - Original Drilling - Original Drilling - As Dril	15,800.00	6,735.93	1,231.19	1,073.85	7.825	SF
Carpio 22-43 - Original Drilling - Original Drilling - As Dril	14,216.65	6,766.41	177.88	57.21	1.474	Level 3, CC, ES, SF
Carpio 22-45 - Original Drilling - Original Drilling - As Dril	15,187.41	6,732.02	620.96	488.69	4.695	CC, ES
Carpio 22-45 - Original Drilling - Original Drilling - As Dril	15,200.00	6,732.17	621.08	488.71	4.692	SF
Eisenstat 22-11 (PA) - Original Drilling - Original Drilling -	15,574.52	6,757.00	4,206.30	3,957.50	16.907	CC
Eisenstat 22-11 (PA) - Original Drilling - Original Drilling -	15,600.00	6,757.00	4,206.38	3,957.28	16.887	ES
Eisenstat 22-11 (PA) - Original Drilling - Original Drilling -	16,198.56	6,757.00	4,252.34	3,997.35	16.676	SF
Eisenstat 22-13 - Original Drilling - Original Drilling - As D	14,108.06	6,765.86	2,311.08	2,191.70	19.359	CC, ES
Eisenstat 22-13 - Original Drilling - Original Drilling - As D	14,400.00	6,764.89	2,329.44	2,207.40	19.088	SF
Eisenstat 22-15 - Original Drilling - Original Drilling - As D	14,919.07	6,738.47	3,539.62	3,410.56	27.427	CC
Eisenstat 22-15 - Original Drilling - Original Drilling - As D	15,000.00	6,738.85	3,540.54	3,410.56	27.238	ES
Eisenstat 22-15 - Original Drilling - Original Drilling - As D	15,500.00	6,741.14	3,586.97	3,452.43	26.661	SF
Eisenstat 22-21 - Original Drilling - Original Drilling - As D	13,115.77	6,838.87	3,810.58	3,702.84	35.369	CC
Eisenstat 22-21 - Original Drilling - Original Drilling - As D	13,200.00	6,838.34	3,811.51	3,702.81	35.064	ES
Eisenstat 22-21 - Original Drilling - Original Drilling - As D	14,000.00	6,833.33	3,911.82	3,796.00	33.775	SF
Eisenstat 22-23 - Original Drilling - Original Drilling - As D	11,705.27	6,770.97	2,833.17	2,742.30	31.179	CC, ES
Eisenstat 22-23 - Original Drilling - Original Drilling - As D	12,300.00	6,775.16	2,894.91	2,798.67	30.080	SF
Gill Land Assoc. 1 (PA) - Original Drilling - Original Drillin	15,564.69	6,758.00	2,687.55	2,438.85	10.807	CC
Gill Land Assoc. 1 (PA) - Original Drilling - Original Drillin	15,600.00	6,758.00	2,687.78	2,438.68	10.790	ES
Gill Land Assoc. 1 (PA) - Original Drilling - Original Drillin	15,800.00	6,758.00	2,697.83	2,446.78	10.746	SF
Gill Land Assoc. 22-02 (PA) - Original Drilling - Original D	12,888.93	6,768.00	2,657.03	2,440.34	12.262	CC
Gill Land Assoc. 22-02 (PA) - Original Drilling - Original D	12,900.00	6,768.00	2,657.05	2,440.23	12.255	ES
Gill Land Assoc. 22-02 (PA) - Original Drilling - Original D	13,200.00	6,768.00	2,675.17	2,455.42	12.173	SF
Gill Land Assoc. 22-03 - Original Drilling - Original Drilling	11,603.13	6,773.54	3,947.58	3,857.86	44.000	CC, ES
Gill Land Assoc. 22-03 - Original Drilling - Original Drilling	12,700.00	6,772.04	4,097.13	3,997.40	41.083	SF
Gill Land Assoc. 22-04 (PA) - Original Drilling - Original D	14,184.47	6,766.00	3,975.81	3,743.65	17.125	CC
Gill Land Assoc. 22-04 (PA) - Original Drilling - Original D	14,200.00	6,766.00	3,975.84	3,743.50	17.112	ES
Gill Land Assoc. 22-04 (PA) - Original Drilling - Original D	14,800.00	6,766.00	4,023.17	3,784.89	16.884	SF
Gruen 22-01 - Original Drilling - Original Drilling - As Dril	11,540.49	6,775.84	1,382.66	1,293.68	15.538	CC, ES
Gruen 22-01 - Original Drilling - Original Drilling - As Dril	11,700.00	6,776.49	1,391.83	1,301.49	15.406	SF
Gruen 22-02 - Original Drilling - Original Drilling - As Dril	12,843.20	6,769.55	97.45	-6.82	0.935	Level 1, CC, ES, SF
Gruen 22-31 - Original Drilling - Original Drilling - As Dril	12,865.15	6,784.73	1,395.74	1,291.16	13.346	CC, ES
Gruen 22-31 - Original Drilling - Original Drilling - As Dril	13,000.00	6,784.20	1,402.24	1,296.50	13.261	SF
Gruen 22-33 - Original Drilling - Original Drilling - As Dril	11,576.95	6,753.84	125.62	36.29	1.406	Level 3, CC, ES, SF
Gruen 22-35 - Original Drilling - Original Drilling - As Dril	12,189.49	6,675.62	653.11	556.95	6.792	CC
Gruen 22-35 - Original Drilling - Original Drilling - As Dril	12,200.00	6,675.64	653.20	556.94	6.786	ES, SF
Ottinger 22-01 - Original Drilling - Original Drilling - As Dr	14,218.37	6,774.23	1,502.60	1,381.87	12.446	CC, ES
Ottinger 22-01 - Original Drilling - Original Drilling - As Dr	14,300.00	6,774.41	1,504.81	1,383.29	12.383	SF

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

Noble Energy, Inc.
Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Harper A21-618
Project:	Wells Ranch	TVD Reference:	WELL @ 4757.00ft (Original Well Elev.)
Reference Site:	A Section 21	MD Reference:	WELL @ 4757.00ft (Original Well Elev.)
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Harper A21-618	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Original Drilling	Database:	EDMP
Reference Design:	APD - Rev 1	Offset TVD Reference:	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 23						
Cecil 23-13 - Original Drilling - Original Drilling - As Drille	16,198.56	6,685.79	4,221.10	4,110.69	38.232	CC, ES, SF
Champlin 23-02 (PA) - Original Drilling - Original Drilling -	16,198.56	6,717.00	1,624.12	1,377.02	6.573	CC, ES, SF
Champlin 23-03 - Original Drilling - Original Drilling - As D	16,198.56	6,677.48	1,765.00	1,709.99	32.089	CC, ES, SF
Champlin Amoco A 1 #308 - Original Drilling - Original Dr	16,198.56	6,692.00	1,595.89	1,431.37	9.700	CC, ES, SF
Cooper 23-1-17 - Original Drilling - Original Drilling - As Dr	16,198.56	6,668.14	5,903.96	5,788.42	51.099	CC, ES, SF
Cooper 23-1-19 - Original Drilling - Original Drilling - As D	16,198.56	6,606.21	4,535.06	4,415.26	37.853	CC, ES, SF
Cooper 23-12 - Original Drilling - Original Drilling - As Dri	16,198.56	6,681.82	5,239.53	5,121.08	44.233	CC, ES, SF
Cooper 23-1-20 - Original Drilling - Original Drilling - As D	16,198.56	6,684.23	3,587.18	3,485.88	35.411	CC, ES, SF
Cooper 23-15 - Original Drilling - Original Drilling - As Dri	16,198.56	6,583.76	5,304.77	5,199.21	50.256	CC, ES, SF
Foss 41-23D - Original Drilling - Original Drilling - As Drill	16,198.56	6,872.71	6,165.70	6,053.42	54.912	CC, ES, SF
Foss 42-23 - Original Drilling - Original Drilling - As Drille	16,198.56	6,678.75	5,147.19	5,057.67	57.502	CC, ES, SF
J&L Farms 23-11 - Original Drilling - Original Drilling - As	16,198.56	6,707.50	4,105.92	3,962.37	28.602	CC, ES, SF
J&L Farms 23-12 - Original Drilling - Original Drilling - As	16,198.56	6,647.11	2,617.85	2,475.12	18.341	CC, ES, SF
J&L Farms 23-21 - Original Drilling - Original Drilling - As	16,198.56	6,629.54	4,802.33	4,670.10	36.319	CC, ES, SF
J&L Farms 23-22 - Original Drilling - Original Drilling - As	16,198.56	6,667.73	3,400.34	3,275.62	27.264	CC, ES, SF
McIntosh 33-23 - Original Drilling - Original Drilling - As D	16,198.56	7,019.00	3,540.25	3,465.25	47.208	CC, ES, SF
McIntosh 34-23 - Original Drilling - Original Drilling - As D	16,198.56	6,693.01	3,455.97	3,404.33	66.924	CC, ES, SF
McIntosh 43-23 - Original Drilling - Original Drilling - As D	16,198.56	6,662.69	5,055.04	4,985.79	72.998	CC, ES, SF
McIntosh 44-23 - Original Drilling - Original Drilling - As D	16,198.56	6,700.00	4,873.77	4,822.81	95.639	CC, ES, SF
Schroeder 23-31 - Original Drilling - Original Drilling - As	16,198.56	6,728.39	2,482.15	2,394.38	28.280	CC, ES, SF
Schroeder 23-33 - Original Drilling - Original Drilling - As	16,198.56	6,710.08	513.19	455.54	8.902	CC, ES, SF
A Section 24						
Larson A23-622 - Original Drilling - APD - Rev 0	16,198.56	17,335.78	306.29	185.36	2.533	CC, ES, SF
Larson A23-627 - Original Drilling - APD - Rev 0	16,198.56	17,351.00	640.55	519.33	5.284	CC, ES, SF
Larson A23-633 - Original Drilling - APD - Rev 0	16,198.56	17,303.35	990.41	869.20	8.171	CC, ES, SF
Larson A23-639 - Original Drilling - APD - Rev 0	16,198.56	17,357.51	1,390.76	1,269.51	11.470	CC, ES, SF
Larson A23-645 - Original Drilling - APD - Rev 0	16,198.56	18,110.97	1,791.49	1,670.24	14.775	CC, ES, SF
Larson A23-651 - Original Drilling - APD - Rev 0	16,198.56	18,048.86	2,101.19	1,979.95	17.330	CC, ES, SF
Larson A23-656 - Original Drilling - APD - Rev 0	16,198.56	18,069.05	2,410.81	2,289.56	19.883	CC, ES, SF
Larson A23-662 - Original Drilling - APD - Rev 0	16,198.56	18,064.84	2,833.54	2,712.30	23.371	CC, ES, SF
Larson A23-668 - Original Drilling - APD - Rev 0	16,198.56	17,466.37	3,204.97	3,083.72	26.433	CC, ES, SF
Larson A23-672 - Original Drilling - APD - Rev 0	16,198.56	17,459.11	3,504.54	3,383.52	28.958	CC, ES, SF
Larson A23-678 - Original Drilling - APD - Rev 0	16,198.56	17,179.62	3,868.00	3,746.76	31.901	CC, ES, SF
Larson A23-683 - Original Drilling - APD - Rev 0	16,198.56	17,320.24	4,178.25	4,057.01	34.464	CC, ES, SF

Noble Energy, Inc.
Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Harper A21-618
Project:	Wells Ranch	TVD Reference:	WELL @ 4757.00ft (Original Well Elev.)
Reference Site:	A Section 21	MD Reference:	WELL @ 4757.00ft (Original Well Elev.)
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Harper A21-618	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Original Drilling	Database:	EDMP
Reference Design:	APD - Rev 1	Offset TVD Reference:	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
A Section 27						
Howard 02-27 (PA) - Original Drilling - Original Drilling - A	14,240.38	6,773.00	1,181.30	948.33	5.071	CC, ES
Howard 02-27 (PA) - Original Drilling - Original Drilling - A	14,300.00	6,773.00	1,182.81	949.18	5.063	SF
Howard 03-27 - Original Drilling - Original Drilling - As Dr	12,831.85	6,750.38	1,259.25	1,155.20	12.102	CC, ES
Howard 03-27 - Original Drilling - Original Drilling - As Dr	12,900.00	6,749.55	1,261.10	1,156.29	12.033	SF
Howard 04-27 (PA) - Original Drilling - Original Drilling - A	11,590.20	6,733.00	1,142.61	941.88	5.692	CC
Howard 04-27 (PA) - Original Drilling - Original Drilling - A	11,600.00	6,733.00	1,142.65	941.81	5.689	ES
Howard 04-27 (PA) - Original Drilling - Original Drilling - A	11,700.00	6,733.00	1,147.87	946.05	5.687	SF
Howard 08-27 - Original Drilling - Original Drilling - As Dr	15,527.45	6,721.09	2,583.69	2,447.32	18.946	CC, ES
Howard 08-27 - Original Drilling - Original Drilling - As Dr	15,900.00	6,721.64	2,610.41	2,470.50	18.658	SF
Howard 10-27 - Original Drilling - Original Drilling - As Dr	14,292.48	6,673.18	3,887.72	3,766.45	32.059	CC
Howard 10-27 - Original Drilling - Original Drilling - As Dr	14,300.00	6,673.18	3,887.73	3,766.37	32.035	ES
Howard 10-27 - Original Drilling - Original Drilling - As Dr	15,100.00	6,673.75	3,970.70	3,841.58	30.751	SF
Howard 15-27 - Original Drilling - Original Drilling - As Dr	14,126.28	6,810.79	5,052.55	4,935.21	43.058	CC
Howard 15-27 - Original Drilling - Original Drilling - As Dr	14,200.00	6,809.80	5,053.09	4,934.85	42.737	ES
Howard 15-27 - Original Drilling - Original Drilling - As Dr	15,500.00	6,792.43	5,235.94	5,105.42	40.117	SF
Howard 4B-27 (DA) - Original Drilling - Original Drilling - A	11,581.62	3,765.00	3,194.01	3,120.69	43.560	CC
Howard 4B-27 (DA) - Original Drilling - Original Drilling - A	11,600.00	3,765.00	3,194.07	3,120.59	43.470	ES
Howard 4B-27 (DA) - Original Drilling - Original Drilling - A	13,300.00	3,765.00	3,626.92	3,529.80	37.343	SF
Howard A27-01 - Original Drilling - Original Drilling - As D	15,568.59	6,773.97	1,191.07	1,054.01	8.690	CC, ES
Howard A27-01 - Original Drilling - Original Drilling - As D	15,600.00	6,773.91	1,191.49	1,054.05	8.670	SF
Howard A27-05 - Original Drilling - Original Drilling - As D	11,593.55	6,708.07	2,542.37	2,453.01	28.448	CC
Howard A27-05 - Original Drilling - Original Drilling - As D	11,600.00	6,708.07	2,542.38	2,452.94	28.424	ES
Howard A27-05 - Original Drilling - Original Drilling - As D	12,100.00	6,708.29	2,592.33	2,498.08	27.506	SF
Howard A27-06 - Original Drilling - Original Drilling - As D	12,972.19	6,832.20	2,507.87	2,396.52	22.522	CC
Howard A27-06 - Original Drilling - Original Drilling - As D	13,000.00	6,832.13	2,508.02	2,396.27	22.443	ES
Howard A27-06 - Original Drilling - Original Drilling - As D	13,400.00	6,831.13	2,544.09	2,427.77	21.870	SF
Howard A27-07 - Original Drilling - Original Drilling - As D	14,321.04	6,759.94	2,586.95	2,465.04	21.219	CC, ES
Howard A27-07 - Original Drilling - Original Drilling - As D	14,700.00	6,761.75	2,614.56	2,488.93	20.812	SF
Howard A27-09 - Original Drilling - Original Drilling - As D	15,420.38	6,684.03	3,955.96	3,820.98	29.309	CC
Howard A27-09 - Original Drilling - Original Drilling - As D	15,500.00	6,684.01	3,956.76	3,820.82	29.106	ES
Howard A27-09 - Original Drilling - Original Drilling - As D	16,198.56	6,683.79	4,031.77	3,889.29	28.297	SF
Howard A27-16 - Original Drilling - Original Drilling - As D	15,690.39	15,690.39	5,228.86	5,059.16	30.812	CC
Howard A27-16 - Original Drilling - Original Drilling - As D	15,800.00	15,800.00	5,230.01	5,058.59	30.511	ES
Howard A27-16 - Original Drilling - Original Drilling - As D	16,198.56	16,198.56	5,253.49	5,076.27	29.644	SF
Howard A27-17D - Original Drilling - Original Drilling - As	14,980.17	6,875.42	1,778.87	1,644.48	13.236	CC
Howard A27-17D - Original Drilling - Original Drilling - As	15,000.00	6,875.42	1,778.98	1,644.42	13.220	ES
Howard A27-17D - Original Drilling - Original Drilling - As	15,100.00	6,875.46	1,782.90	1,647.67	13.184	SF
A Section 28						
Ankenney 28-01 (PA) - Original Drilling - Original Drilling	10,266.72	6,710.00	2,652.34	2,467.09	14.317	CC
Ankenney 28-01 (PA) - Original Drilling - Original Drilling	10,300.00	6,710.00	2,652.55	2,466.92	14.289	ES
Ankenney 28-01 (PA) - Original Drilling - Original Drilling	10,600.00	6,710.00	2,673.20	2,484.47	14.164	SF
Wardlaw 16-28 - Original Drilling - Original Drilling - As D	10,056.62	6,698.00	5,299.66	5,116.94	29.004	CC
Wardlaw 16-28 - Original Drilling - Original Drilling - As D	10,100.00	6,698.00	5,299.83	5,116.64	28.930	ES
Wardlaw 16-28 - Original Drilling - Original Drilling - As D	11,400.00	6,698.00	5,467.27	5,270.87	27.838	SF
Wardlaw 20-28 - Original Drilling - Original Drilling - As D	9,749.27	6,693.00	4,645.40	4,466.08	25.906	CC
Wardlaw 20-28 - Original Drilling - Original Drilling - As D	9,800.00	6,693.00	4,645.67	4,465.81	25.829	ES
Wardlaw 20-28 - Original Drilling - Original Drilling - As D	10,800.00	6,693.00	4,762.75	4,572.82	25.077	SF
Webster 09-28 - Original Drilling - Original Drilling - As D	10,043.03	6,708.00	3,847.81	3,665.04	21.053	CC
Webster 09-28 - Original Drilling - Original Drilling - As D	10,100.00	6,708.00	3,848.23	3,664.83	20.983	ES
Webster 09-28 - Original Drilling - Original Drilling - As D	10,800.00	6,708.00	3,921.56	3,731.09	20.589	SF

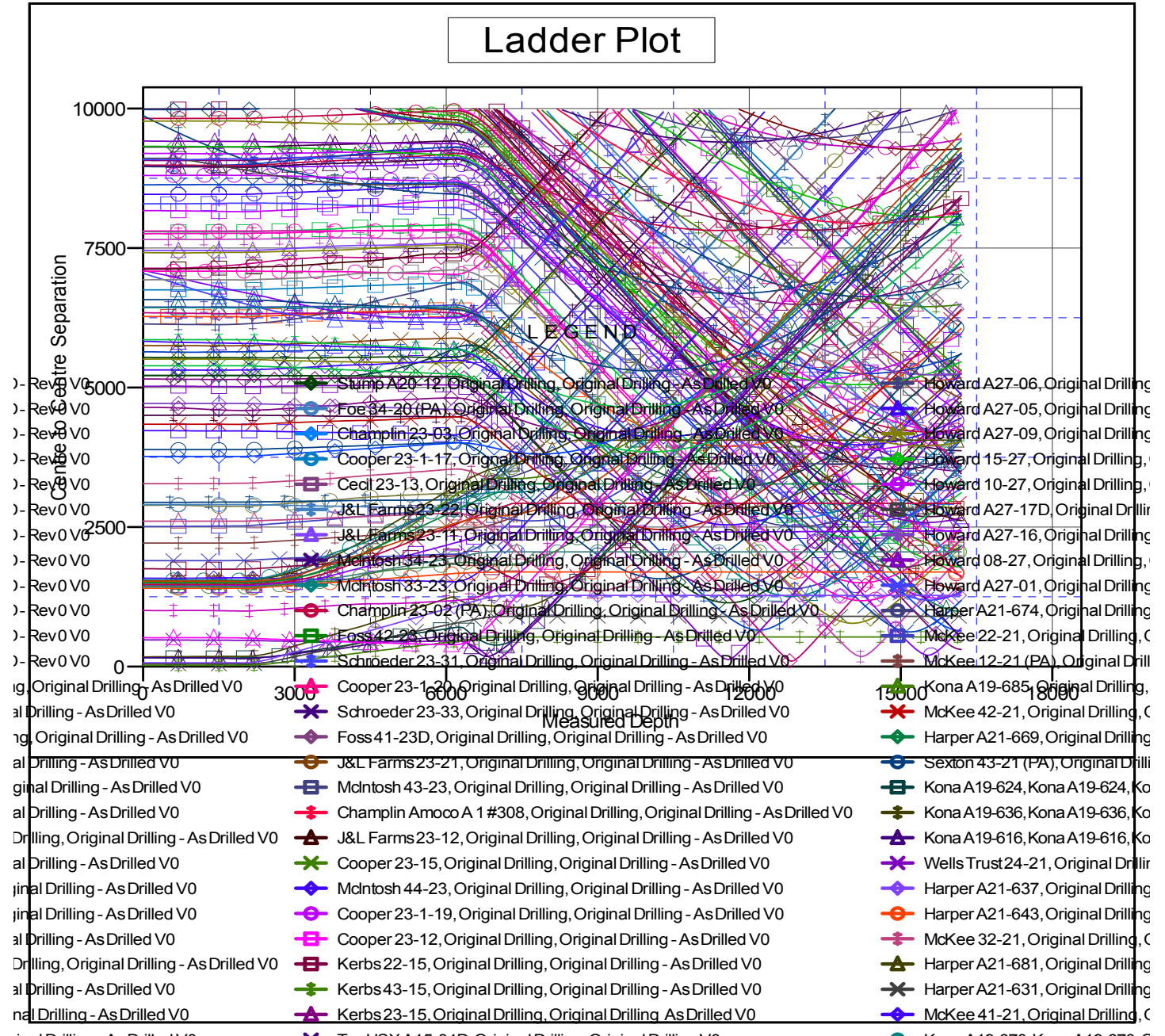
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Noble Energy, Inc.
Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Harper A21-618
Project:	Wells Ranch	TVD Reference:	WELL @ 4757.00ft (Original Well Elev.)
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Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Harper A21-618	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Original Drilling	Database:	EDMP
Reference Design:	APD - Rev 1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4757.00ft (Original Well Elev)
Offset Depths are relative to Offset Datum
Central Meridian is -105.5000000

Coordinates are relative to: Harper A21-618
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.61°



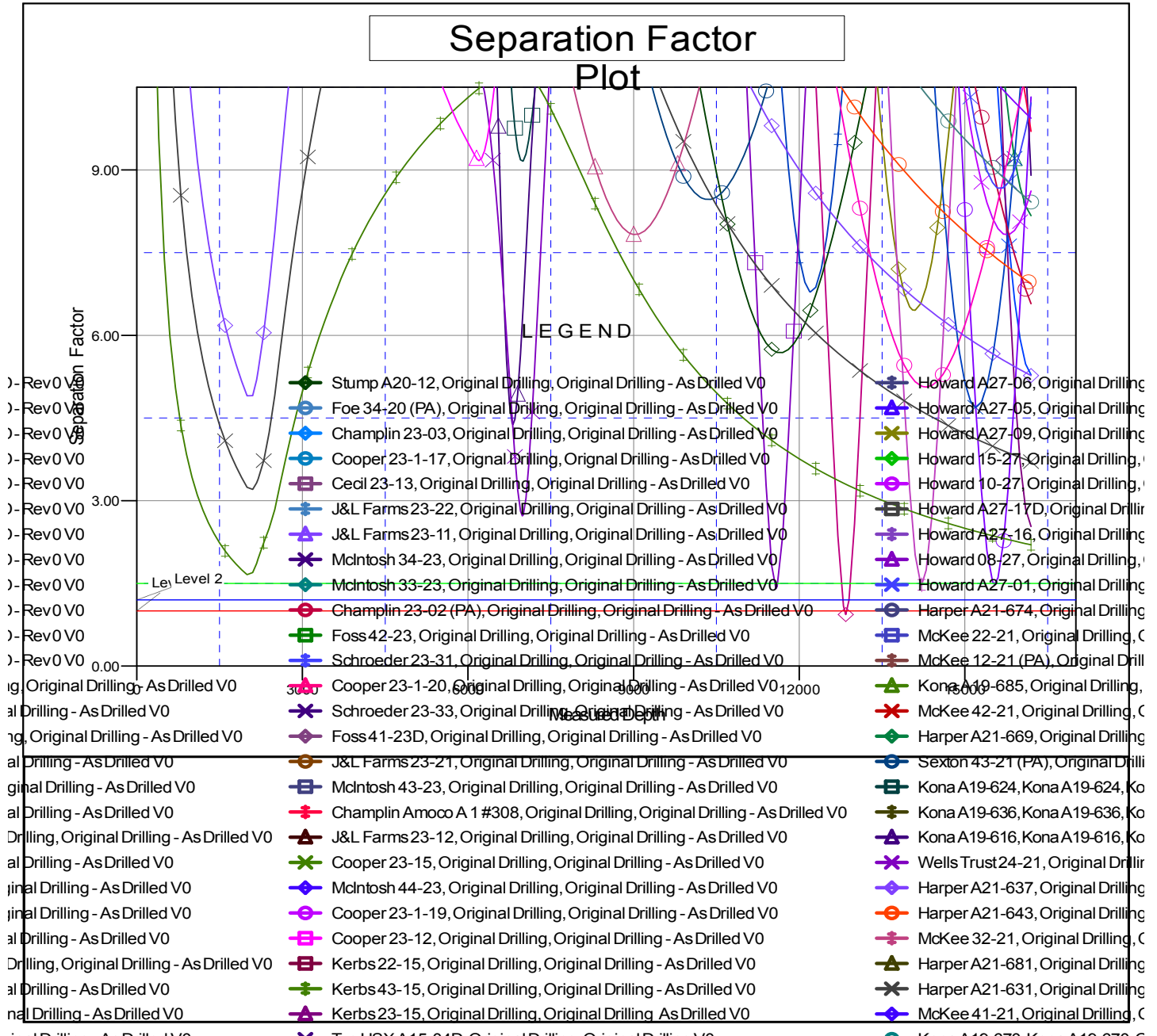
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Noble Energy, Inc.
Anticollision Summary Report

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