

Project: Mustang
Site: D Section 21
Well: Vogler State D33-728
Wellbore: Wellbore #1
Design: Plan 1

Northern Region - DJ Basin

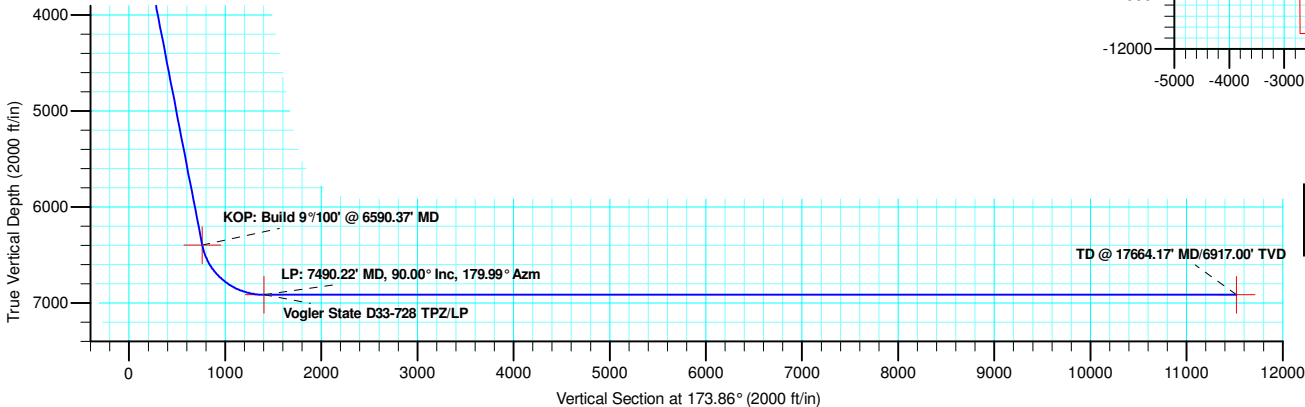
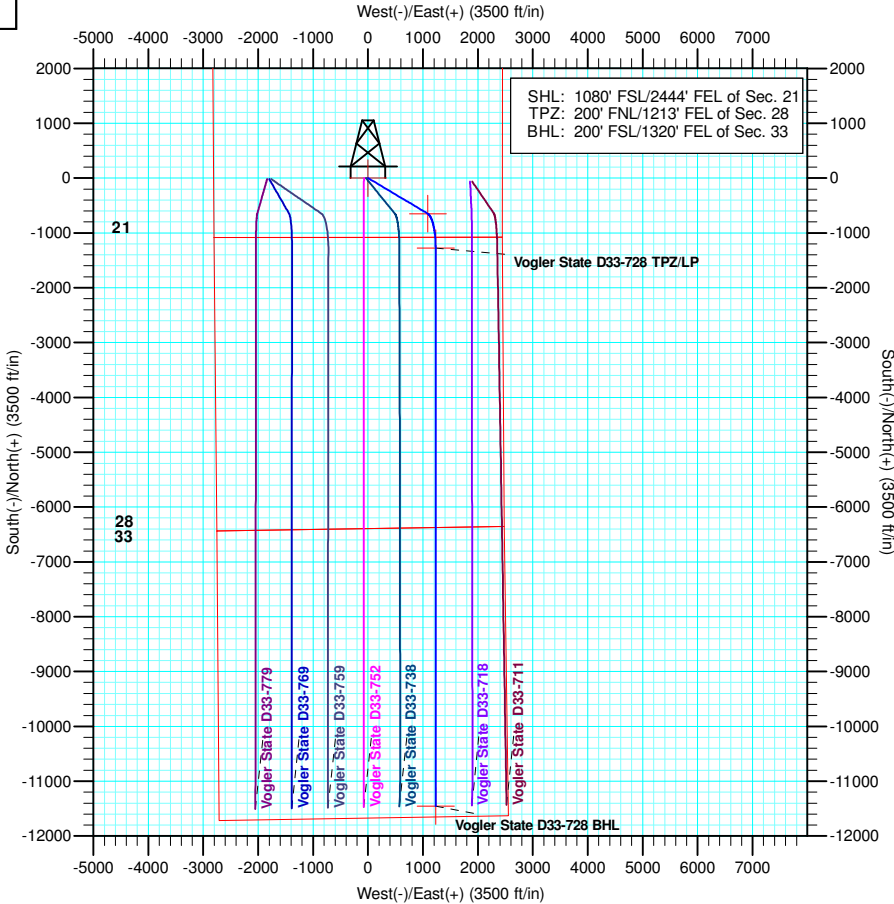
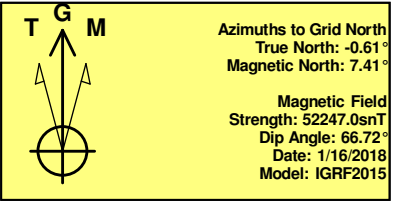
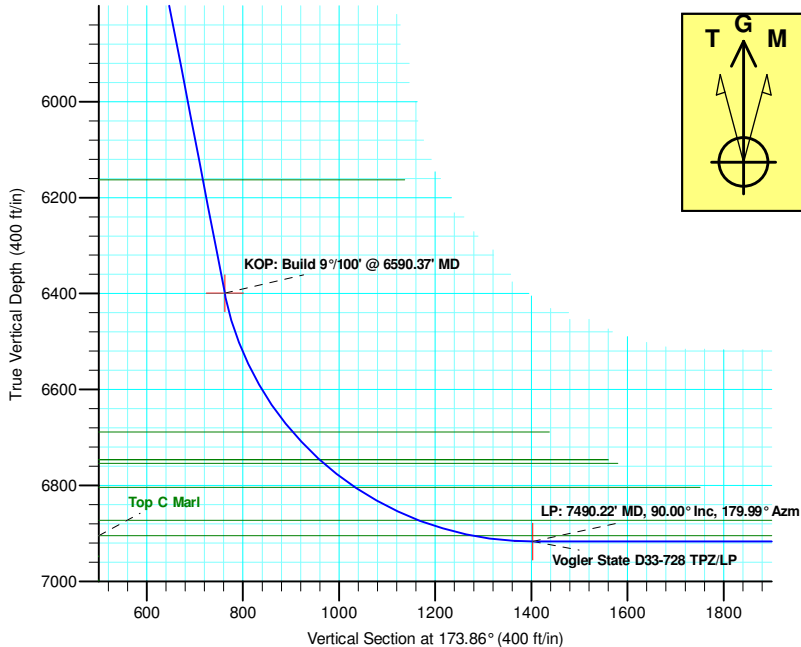
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Northern Zone
System Datum: Mean Sea Level

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	2000.00	0.00	0.00	2000.00	0.00	0.00	0.00	0.00	0.00	
3	2889.02	17.78	120.86	2874.82	-70.19	117.46	2.00	120.86	82.35	
4	6590.37	17.78	120.86	6399.37	-649.96	1087.72	0.00	0.00	762.52	
5	7490.22	90.00	179.99	6917.00	-1278.71	1230.27	9.00	60.35	1402.90	Vogler State D33-728 TPZ/LP
6	17664.17	90.00	179.99	6917.00	-11452.66	1231.41	0.00	0.00	11518.67	Vogler State D33-728 BHL

WELL DETAILS: Vogler State D33-728

+N/-S	+E/-W	Northing	Ground Level: Easting	4829.00 Latitude	Longitude	Slot
0.00	0.00	1319526.93	3263757.27	40.2066432	-104.5556469	



Plan: Plan 1 (Vogler State D33-728/Wellbore #1)

Created By: Keith Noack Date: 10:37, August 09 2018

Northern Region - DJ Basin

Mustang

D Section 21

Vogler State D33-728

Wellbore #1

Plan: Plan 1

Standard Planning Report

09 August, 2018

Noble Energy, Inc.

Planning Report

Database:	EDMP	Local Co-ordinate Reference:	Well Vogler State D33-728
Company:	Northern Region - DJ Basin	TVD Reference:	Well @ 4859.00ft
Project:	Mustang	MD Reference:	Well @ 4859.00ft
Site:	D Section 21	North Reference:	Grid
Well:	Vogler State D33-728	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 1		

Project	Mustang, 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		D Section 21			
Site Position:		Northing:	1,323,041.88 usft	Latitude:	40.2163540
From:	Lat/Long	Easting:	3,261,613.48 usft	Longitude:	-104.5631890
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.61 °

Well	Vogler State D33-728					
Well Position	+N/-S	-3,514.97 ft	Northing:	1,319,526.93 usft	Latitude:	40.2066432
	+E/-W	2,143.80 ft	Easting:	3,263,757.27 usft	Longitude:	-104.5556469
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	4,829.00 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	1/16/2018	8.02	66.72	52,246.97316223

Design	Plan 1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	173.86

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	
2,889.02	17.78	120.86	2,874.82	-70.19	117.46	2.00	2.00	0.00	120.86	
6,590.37	17.78	120.86	6,399.37	-649.96	1,087.72	0.00	0.00	0.00	0.00	
7,490.22	90.00	179.99	6,917.00	-1,278.71	1,230.27	9.00	8.03	6.57	60.35	Vogler State D33-7:
17,664.17	90.00	179.99	6,917.00	-11,452.66	1,231.41	0.00	0.00	0.00	0.00	Vogler State D33-7:

Noble Energy, Inc.

Planning Report

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Company:	Northern Region - DJ Basin	TVD Reference:	Well @ 4859.00ft
Project:	Mustang	MD Reference:	Well @ 4859.00ft
Site:	D Section 21	North Reference:	Grid
Well:	Vogler State D33-728	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
636.00	0.00	0.00	636.00	0.00	0.00	0.00	0.00	0.00	0.00
Pierre									
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
771.00	0.00	0.00	771.00	0.00	0.00	0.00	0.00	0.00	0.00
Upper Pierre Aquifer Top									
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
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,638.00	0.00	0.00	1,638.00	0.00	0.00	0.00	0.00	0.00	0.00
Upper Pierre Aquifer Base									
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	120.86	2,099.98	-0.90	1.50	1.05	2.00	2.00	0.00
2,200.00	4.00	120.86	2,199.84	-3.58	5.99	4.20	2.00	2.00	0.00
2,300.00	6.00	120.86	2,299.45	-8.05	13.47	9.44	2.00	2.00	0.00
2,400.00	8.00	120.86	2,398.70	-14.30	23.93	16.78	2.00	2.00	0.00
2,500.00	10.00	120.86	2,497.47	-22.32	37.36	26.19	2.00	2.00	0.00
2,600.00	12.00	120.86	2,595.62	-32.11	53.74	37.67	2.00	2.00	0.00
2,700.00	14.00	120.86	2,693.06	-43.65	73.05	51.21	2.00	2.00	0.00
2,800.00	16.00	120.86	2,789.64	-56.93	95.26	66.78	2.00	2.00	0.00
2,889.02	17.78	120.86	2,874.82	-70.19	117.46	82.35	2.00	2.00	0.00
Hold: 17.78° Inc, 120.86° Azm									
2,900.00	17.78	120.86	2,885.28	-71.91	120.34	84.36	0.00	0.00	0.00
3,000.00	17.78	120.86	2,980.50	-87.58	146.56	102.74	0.00	0.00	0.00
3,100.00	17.78	120.86	3,075.72	-103.24	172.77	121.12	0.00	0.00	0.00
3,200.00	17.78	120.86	3,170.95	-118.90	198.98	139.49	0.00	0.00	0.00
3,300.00	17.78	120.86	3,266.17	-134.57	225.20	157.87	0.00	0.00	0.00
3,400.00	17.78	120.86	3,361.39	-150.23	251.41	176.25	0.00	0.00	0.00
3,500.00	17.78	120.86	3,456.62	-165.89	277.62	194.62	0.00	0.00	0.00
3,600.00	17.78	120.86	3,551.84	-181.56	303.84	213.00	0.00	0.00	0.00
3,700.00	17.78	120.86	3,647.06	-197.22	330.05	231.38	0.00	0.00	0.00
3,800.00	17.78	120.86	3,742.29	-212.89	356.26	249.75	0.00	0.00	0.00
3,900.00	17.78	120.86	3,837.51	-228.55	382.48	268.13	0.00	0.00	0.00
3,922.57	17.78	120.86	3,859.00	-232.08	388.39	272.28	0.00	0.00	0.00
Parkman									
4,000.00	17.78	120.86	3,932.73	-244.21	408.69	286.51	0.00	0.00	0.00
4,100.00	17.78	120.86	4,027.96	-259.88	434.90	304.88	0.00	0.00	0.00

Noble Energy, Inc.

Planning Report

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Project:	Mustang	MD Reference:	Well @ 4859.00ft
Site:	D Section 21	North Reference:	Grid
Well:	Vogler State D33-728	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,167.26	17.78	120.86	4,092.00	-270.41	452.54	317.24	0.00	0.00	0.00
Sussex									
4,200.00	17.78	120.86	4,123.18	-275.54	461.12	323.26	0.00	0.00	0.00
4,300.00	17.78	120.86	4,218.40	-291.20	487.33	341.63	0.00	0.00	0.00
4,400.00	17.78	120.86	4,313.63	-306.87	513.55	360.01	0.00	0.00	0.00
4,500.00	17.78	120.86	4,408.85	-322.53	539.76	378.39	0.00	0.00	0.00
4,600.00	17.78	120.86	4,504.07	-338.20	565.97	396.76	0.00	0.00	0.00
4,700.00	17.78	120.86	4,599.30	-353.86	592.19	415.14	0.00	0.00	0.00
4,800.00	17.78	120.86	4,694.52	-369.52	618.40	433.52	0.00	0.00	0.00
4,900.00	17.78	120.86	4,789.74	-385.19	644.61	451.89	0.00	0.00	0.00
5,000.00	17.78	120.86	4,884.97	-400.85	670.83	470.27	0.00	0.00	0.00
5,100.00	17.78	120.86	4,980.19	-416.51	697.04	488.65	0.00	0.00	0.00
5,164.91	17.78	120.86	5,042.00	-426.68	714.05	500.57	0.00	0.00	0.00
Shannon									
5,200.00	17.78	120.86	5,075.41	-432.18	723.25	507.02	0.00	0.00	0.00
5,300.00	17.78	120.86	5,170.64	-447.84	749.47	525.40	0.00	0.00	0.00
5,400.00	17.78	120.86	5,265.86	-463.51	775.68	543.77	0.00	0.00	0.00
5,500.00	17.78	120.86	5,361.08	-479.17	801.89	562.15	0.00	0.00	0.00
5,600.00	17.78	120.86	5,456.31	-494.83	828.11	580.53	0.00	0.00	0.00
5,700.00	17.78	120.86	5,551.53	-510.50	854.32	598.90	0.00	0.00	0.00
5,800.00	17.78	120.86	5,646.75	-526.16	880.53	617.28	0.00	0.00	0.00
5,900.00	17.78	120.86	5,741.98	-541.83	906.75	635.66	0.00	0.00	0.00
6,000.00	17.78	120.86	5,837.20	-557.49	932.96	654.03	0.00	0.00	0.00
6,100.00	17.78	120.86	5,932.43	-573.15	959.17	672.41	0.00	0.00	0.00
6,200.00	17.78	120.86	6,027.65	-588.82	985.39	690.79	0.00	0.00	0.00
6,300.00	17.78	120.86	6,122.87	-604.48	1,011.60	709.16	0.00	0.00	0.00
6,342.14	17.78	120.86	6,163.00	-611.08	1,022.65	716.91	0.00	0.00	0.00
Teepee Buttes									
6,400.00	17.78	120.86	6,218.10	-620.14	1,037.81	727.54	0.00	0.00	0.00
6,500.00	17.78	120.86	6,313.32	-635.81	1,064.03	745.91	0.00	0.00	0.00
6,590.37	17.78	120.86	6,399.37	-649.96	1,087.72	762.52	0.00	0.00	0.00
KOP: Build 9°/100' @ 6590.37' MD									
6,600.00	18.22	123.27	6,408.53	-651.54	1,090.24	764.36	9.00	4.61	25.02
6,650.00	20.94	134.01	6,455.65	-662.05	1,103.21	776.19	9.00	5.44	21.47
6,700.00	24.18	142.18	6,501.83	-676.35	1,115.92	791.77	9.00	6.47	16.35
6,750.00	27.75	148.45	6,546.78	-694.37	1,128.30	811.01	9.00	7.14	12.54
6,800.00	31.55	153.35	6,590.23	-715.99	1,140.26	833.79	9.00	7.59	9.81
6,850.00	35.49	157.28	6,631.92	-741.08	1,151.74	859.96	9.00	7.89	7.86
6,900.00	39.54	160.51	6,671.57	-769.49	1,162.66	889.37	9.00	8.10	6.46
6,922.91	41.42	161.81	6,689.00	-783.56	1,167.45	903.88	9.00	8.21	5.67
Sharon Springs									
6,950.00	43.66	163.23	6,708.96	-801.03	1,172.95	921.84	9.00	8.28	5.23
7,000.00	47.84	165.56	6,743.84	-835.52	1,182.56	957.16	9.00	8.36	4.66
7,003.22	48.11	165.70	6,746.00	-837.84	1,183.15	959.53	9.00	8.41	4.33
Top A Chalk									
7,004.72	48.24	165.77	6,747.00	-838.93	1,183.43	960.63	9.00	8.41	4.30
Top A Marl									
7,015.33	49.13	166.21	6,754.00	-846.65	1,185.35	968.52	9.00	8.42	4.23
Top B Chalk									
7,050.00	52.06	167.60	6,776.01	-872.75	1,191.42	995.11	9.00	8.45	4.00
7,097.73	56.12	169.34	6,804.00	-910.62	1,199.12	1,033.59	9.00	8.50	3.65
Top B Marl									
7,100.00	56.31	169.42	6,805.26	-912.47	1,199.47	1,035.47	9.00	8.53	3.46

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Planning Report

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Project:	Mustang	MD Reference:	Well @ 4859.00ft
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Well:	Vogler State D33-728	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
7,150.00	60.59	171.07	6,831.42	-954.45	1,206.68	1,077.99	9.00	8.55	3.29
7,200.00	64.88	172.58	6,854.32	-998.44	1,212.98	1,122.39	9.00	8.59	3.03
7,247.70	68.99	173.93	6,873.00	-1,042.01	1,218.13	1,166.27	9.00	8.62	2.82
Top C Chalk									
7,250.00	69.19	173.99	6,873.82	-1,044.15	1,218.36	1,168.41	9.00	8.63	2.74
7,300.00	73.51	175.32	6,889.80	-1,091.31	1,222.76	1,215.77	9.00	8.64	2.66
7,350.00	77.84	176.59	6,902.17	-1,139.62	1,226.17	1,264.17	9.00	8.66	2.55
7,364.13	79.06	176.94	6,905.00	-1,153.44	1,226.95	1,278.00	9.00	8.66	2.49
Top C Marl									
7,400.00	82.17	177.83	6,910.85	-1,188.79	1,228.57	1,313.32	9.00	8.67	2.45
7,450.00	86.51	179.03	6,915.78	-1,238.51	1,229.93	1,362.90	9.00	8.67	2.41
7,490.22	90.00	179.99	6,917.00	-1,278.71	1,230.27	1,402.90	9.00	8.68	2.39
LP: 7490.22' MD, 90.00° Inc, 179.99° Azm									
7,500.00	90.00	179.99	6,917.00	-1,288.49	1,230.27	1,412.63	0.00	0.00	0.00
7,600.00	90.00	179.99	6,917.00	-1,388.49	1,230.28	1,512.05	0.00	0.00	0.00
7,700.00	90.00	179.99	6,917.00	-1,488.49	1,230.29	1,611.48	0.00	0.00	0.00
7,800.00	90.00	179.99	6,917.00	-1,588.49	1,230.31	1,710.91	0.00	0.00	0.00
7,900.00	90.00	179.99	6,917.00	-1,688.49	1,230.32	1,810.34	0.00	0.00	0.00
8,000.00	90.00	179.99	6,917.00	-1,788.49	1,230.33	1,909.77	0.00	0.00	0.00
8,100.00	90.00	179.99	6,917.00	-1,888.49	1,230.34	2,009.19	0.00	0.00	0.00
8,200.00	90.00	179.99	6,917.00	-1,988.49	1,230.35	2,108.62	0.00	0.00	0.00
8,300.00	90.00	179.99	6,917.00	-2,088.49	1,230.36	2,208.05	0.00	0.00	0.00
8,400.00	90.00	179.99	6,917.00	-2,188.49	1,230.37	2,307.48	0.00	0.00	0.00
8,500.00	90.00	179.99	6,917.00	-2,288.49	1,230.38	2,406.91	0.00	0.00	0.00
8,600.00	90.00	179.99	6,917.00	-2,388.49	1,230.39	2,506.34	0.00	0.00	0.00
8,700.00	90.00	179.99	6,917.00	-2,488.49	1,230.41	2,605.76	0.00	0.00	0.00
8,800.00	90.00	179.99	6,917.00	-2,588.49	1,230.42	2,705.19	0.00	0.00	0.00
8,900.00	90.00	179.99	6,917.00	-2,688.49	1,230.43	2,804.62	0.00	0.00	0.00
9,000.00	90.00	179.99	6,917.00	-2,788.49	1,230.44	2,904.05	0.00	0.00	0.00
9,100.00	90.00	179.99	6,917.00	-2,888.49	1,230.45	3,003.48	0.00	0.00	0.00
9,200.00	90.00	179.99	6,917.00	-2,988.49	1,230.46	3,102.90	0.00	0.00	0.00
9,300.00	90.00	179.99	6,917.00	-3,088.49	1,230.47	3,202.33	0.00	0.00	0.00
9,400.00	90.00	179.99	6,917.00	-3,188.49	1,230.48	3,301.76	0.00	0.00	0.00
9,500.00	90.00	179.99	6,917.00	-3,288.49	1,230.50	3,401.19	0.00	0.00	0.00
9,600.00	90.00	179.99	6,917.00	-3,388.49	1,230.51	3,500.62	0.00	0.00	0.00
9,700.00	90.00	179.99	6,917.00	-3,488.49	1,230.52	3,600.04	0.00	0.00	0.00
9,800.00	90.00	179.99	6,917.00	-3,588.49	1,230.53	3,699.47	0.00	0.00	0.00
9,900.00	90.00	179.99	6,917.00	-3,688.49	1,230.54	3,798.90	0.00	0.00	0.00
10,000.00	90.00	179.99	6,917.00	-3,788.49	1,230.55	3,898.33	0.00	0.00	0.00
10,100.00	90.00	179.99	6,917.00	-3,888.49	1,230.56	3,997.76	0.00	0.00	0.00
10,200.00	90.00	179.99	6,917.00	-3,988.49	1,230.57	4,097.19	0.00	0.00	0.00
10,300.00	90.00	179.99	6,917.00	-4,088.49	1,230.58	4,196.61	0.00	0.00	0.00
10,400.00	90.00	179.99	6,917.00	-4,188.49	1,230.60	4,296.04	0.00	0.00	0.00
10,500.00	90.00	179.99	6,917.00	-4,288.49	1,230.61	4,395.47	0.00	0.00	0.00
10,600.00	90.00	179.99	6,917.00	-4,388.49	1,230.62	4,494.90	0.00	0.00	0.00
10,700.00	90.00	179.99	6,917.00	-4,488.49	1,230.63	4,594.33	0.00	0.00	0.00
10,800.00	90.00	179.99	6,917.00	-4,588.49	1,230.64	4,693.75	0.00	0.00	0.00
10,900.00	90.00	179.99	6,917.00	-4,688.49	1,230.65	4,793.18	0.00	0.00	0.00
11,000.00	90.00	179.99	6,917.00	-4,788.49	1,230.66	4,892.61	0.00	0.00	0.00
11,100.00	90.00	179.99	6,917.00	-4,888.49	1,230.67	4,992.04	0.00	0.00	0.00
11,200.00	90.00	179.99	6,917.00	-4,988.49	1,230.69	5,091.47	0.00	0.00	0.00
11,300.00	90.00	179.99	6,917.00	-5,088.49	1,230.70	5,190.89	0.00	0.00	0.00
11,400.00	90.00	179.99	6,917.00	-5,188.49	1,230.71	5,290.32	0.00	0.00	0.00

Noble Energy, Inc.

Planning Report

Database:	EDMP	Local Co-ordinate Reference:	Well Vogler State D33-728
Company:	Northern Region - DJ Basin	TVD Reference:	Well @ 4859.00ft
Project:	Mustang	MD Reference:	Well @ 4859.00ft
Site:	D Section 21	North Reference:	Grid
Well:	Vogler State D33-728	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 1		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
11,500.00	90.00	179.99	6,917.00	-5,288.49	1,230.72	5,389.75	0.00	0.00	0.00	
11,600.00	90.00	179.99	6,917.00	-5,388.49	1,230.73	5,489.18	0.00	0.00	0.00	
11,700.00	90.00	179.99	6,917.00	-5,488.49	1,230.74	5,588.61	0.00	0.00	0.00	
11,800.00	90.00	179.99	6,917.00	-5,588.49	1,230.75	5,688.04	0.00	0.00	0.00	
11,900.00	90.00	179.99	6,917.00	-5,688.49	1,230.76	5,787.46	0.00	0.00	0.00	
12,000.00	90.00	179.99	6,917.00	-5,788.49	1,230.77	5,886.89	0.00	0.00	0.00	
12,100.00	90.00	179.99	6,917.00	-5,888.49	1,230.79	5,986.32	0.00	0.00	0.00	
12,200.00	90.00	179.99	6,917.00	-5,988.49	1,230.80	6,085.75	0.00	0.00	0.00	
12,300.00	90.00	179.99	6,917.00	-6,088.49	1,230.81	6,185.18	0.00	0.00	0.00	
12,400.00	90.00	179.99	6,917.00	-6,188.49	1,230.82	6,284.60	0.00	0.00	0.00	
12,500.00	90.00	179.99	6,917.00	-6,288.49	1,230.83	6,384.03	0.00	0.00	0.00	
12,600.00	90.00	179.99	6,917.00	-6,388.49	1,230.84	6,483.46	0.00	0.00	0.00	
12,700.00	90.00	179.99	6,917.00	-6,488.49	1,230.85	6,582.89	0.00	0.00	0.00	
12,800.00	90.00	179.99	6,917.00	-6,588.49	1,230.86	6,682.32	0.00	0.00	0.00	
12,900.00	90.00	179.99	6,917.00	-6,688.49	1,230.88	6,781.74	0.00	0.00	0.00	
13,000.00	90.00	179.99	6,917.00	-6,788.49	1,230.89	6,881.17	0.00	0.00	0.00	
13,100.00	90.00	179.99	6,917.00	-6,888.49	1,230.90	6,980.60	0.00	0.00	0.00	
13,200.00	90.00	179.99	6,917.00	-6,988.49	1,230.91	7,080.03	0.00	0.00	0.00	
13,300.00	90.00	179.99	6,917.00	-7,088.49	1,230.92	7,179.46	0.00	0.00	0.00	
13,400.00	90.00	179.99	6,917.00	-7,188.49	1,230.93	7,278.89	0.00	0.00	0.00	
13,500.00	90.00	179.99	6,917.00	-7,288.49	1,230.94	7,378.31	0.00	0.00	0.00	
13,600.00	90.00	179.99	6,917.00	-7,388.49	1,230.95	7,477.74	0.00	0.00	0.00	
13,700.00	90.00	179.99	6,917.00	-7,488.49	1,230.96	7,577.17	0.00	0.00	0.00	
13,800.00	90.00	179.99	6,917.00	-7,588.49	1,230.98	7,676.60	0.00	0.00	0.00	
13,900.00	90.00	179.99	6,917.00	-7,688.49	1,230.99	7,776.03	0.00	0.00	0.00	
14,000.00	90.00	179.99	6,917.00	-7,788.49	1,231.00	7,875.45	0.00	0.00	0.00	
14,100.00	90.00	179.99	6,917.00	-7,888.49	1,231.01	7,974.88	0.00	0.00	0.00	
14,200.00	90.00	179.99	6,917.00	-7,988.49	1,231.02	8,074.31	0.00	0.00	0.00	
14,300.00	90.00	179.99	6,917.00	-8,088.49	1,231.03	8,173.74	0.00	0.00	0.00	
14,400.00	90.00	179.99	6,917.00	-8,188.49	1,231.04	8,273.17	0.00	0.00	0.00	
14,500.00	90.00	179.99	6,917.00	-8,288.49	1,231.05	8,372.59	0.00	0.00	0.00	
14,600.00	90.00	179.99	6,917.00	-8,388.49	1,231.07	8,472.02	0.00	0.00	0.00	
14,700.00	90.00	179.99	6,917.00	-8,488.49	1,231.08	8,571.45	0.00	0.00	0.00	
14,800.00	90.00	179.99	6,917.00	-8,588.49	1,231.09	8,670.88	0.00	0.00	0.00	
14,900.00	90.00	179.99	6,917.00	-8,688.49	1,231.10	8,770.31	0.00	0.00	0.00	
15,000.00	90.00	179.99	6,917.00	-8,788.49	1,231.11	8,869.74	0.00	0.00	0.00	
15,100.00	90.00	179.99	6,917.00	-8,888.49	1,231.12	8,969.16	0.00	0.00	0.00	
15,200.00	90.00	179.99	6,917.00	-8,988.49	1,231.13	9,068.59	0.00	0.00	0.00	
15,300.00	90.00	179.99	6,917.00	-9,088.49	1,231.14	9,168.02	0.00	0.00	0.00	
15,400.00	90.00	179.99	6,917.00	-9,188.49	1,231.15	9,267.45	0.00	0.00	0.00	
15,500.00	90.00	179.99	6,917.00	-9,288.49	1,231.17	9,366.88	0.00	0.00	0.00	
15,600.00	90.00	179.99	6,917.00	-9,388.49	1,231.18	9,466.30	0.00	0.00	0.00	
15,700.00	90.00	179.99	6,917.00	-9,488.49	1,231.19	9,565.73	0.00	0.00	0.00	
15,800.00	90.00	179.99	6,917.00	-9,588.49	1,231.20	9,665.16	0.00	0.00	0.00	
15,900.00	90.00	179.99	6,917.00	-9,688.49	1,231.21	9,764.59	0.00	0.00	0.00	
16,000.00	90.00	179.99	6,917.00	-9,788.49	1,231.22	9,864.02	0.00	0.00	0.00	
16,100.00	90.00	179.99	6,917.00	-9,888.49	1,231.23	9,963.44	0.00	0.00	0.00	
16,200.00	90.00	179.99	6,917.00	-9,988.49	1,231.24	10,062.87	0.00	0.00	0.00	
16,300.00	90.00	179.99	6,917.00	-10,088.49	1,231.26	10,162.30	0.00	0.00	0.00	
16,400.00	90.00	179.99	6,917.00	-10,188.49	1,231.27	10,261.73	0.00	0.00	0.00	
16,500.00	90.00	179.99	6,917.00	-10,288.49	1,231.28	10,361.16	0.00	0.00	0.00	
16,600.00	90.00	179.99	6,917.00	-10,388.49	1,231.29	10,460.58	0.00	0.00	0.00	
16,700.00	90.00	179.99	6,917.00	-10,488.49	1,231.30	10,560.01	0.00	0.00	0.00	
16,800.00	90.00	179.99	6,917.00	-10,588.49	1,231.31	10,659.44	0.00	0.00	0.00	

Noble Energy, Inc.

Planning Report

Database:	EDMP	Local Co-ordinate Reference:	Well Vogler State D33-728
Company:	Northern Region - DJ Basin	TVD Reference:	Well @ 4859.00ft
Project:	Mustang	MD Reference:	Well @ 4859.00ft
Site:	D Section 21	North Reference:	Grid
Well:	Vogler State D33-728	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
16,900.00	90.00	179.99	6,917.00	-10,688.49	1,231.32	10,758.87	0.00	0.00	0.00
17,000.00	90.00	179.99	6,917.00	-10,788.49	1,231.33	10,858.30	0.00	0.00	0.00
17,100.00	90.00	179.99	6,917.00	-10,888.49	1,231.34	10,957.73	0.00	0.00	0.00
17,200.00	90.00	179.99	6,917.00	-10,988.49	1,231.36	11,057.15	0.00	0.00	0.00
17,300.00	90.00	179.99	6,917.00	-11,088.49	1,231.37	11,156.58	0.00	0.00	0.00
17,400.00	90.00	179.99	6,917.00	-11,188.49	1,231.38	11,256.01	0.00	0.00	0.00
17,500.00	90.00	179.99	6,917.00	-11,288.49	1,231.39	11,355.44	0.00	0.00	0.00
17,600.00	90.00	179.99	6,917.00	-11,388.49	1,231.40	11,454.87	0.00	0.00	0.00
17,664.17	90.00	179.99	6,917.00	-11,452.66	1,231.41	11,518.67	0.00	0.00	0.00
TD @ 17664.17' MD/6917.00' TVD									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
Vogler State D33-728	0.00	0.00	0.00	0.00	0.00	1,319,526.93	3,263,757.27	40.2066432	-104.5556469
- plan hits target center									
- Point									
Vogler State D33-728	0.00	0.00	6,399.37	-649.96	1,087.72	1,318,876.96	3,264,844.99	40.2048272	-104.5517776
- plan hits target center									
- Point									
Vogler State D33-728	0.00	0.00	6,917.00	-11,452.66	1,231.41	1,308,074.29	3,264,988.68	40.1751700	-104.5516768
- plan hits target center									
- Point									
Vogler State D33-728	0.00	0.00	6,917.00	-1,278.71	1,230.27	1,318,248.22	3,264,987.54	40.2030971	-104.5512914
- plan hits target center									
- Point									

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
636.00	636.00	Pierre				
771.00	771.00	Upper Pierre Aquifer Top				
1,638.00	1,638.00	Upper Pierre Aquifer Base				
3,922.57	3,859.00	Parkman				
4,167.26	4,092.00	Sussex				
5,164.91	5,042.00	Shannon				
6,342.14	6,163.00	Teepee Buttes				
6,922.91	6,689.00	Sharon Springs				
7,003.22	6,746.00	Top A Chalk				
7,004.72	6,747.00	Top A Marl				
7,015.33	6,754.00	Top B Chalk				
7,097.73	6,804.00	Top B Marl				
7,247.70	6,873.00	Top C Chalk				
7,364.13	6,905.00	Top C Marl				

Noble Energy, Inc.

Planning Report

Database:	EDMP	Local Co-ordinate Reference:	Well Vogler State D33-728
Company:	Northern Region - DJ Basin	TVD Reference:	Well @ 4859.00ft
Project:	Mustang	MD Reference:	Well @ 4859.00ft
Site:	D Section 21	North Reference:	Grid
Well:	Vogler State D33-728	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 1		

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
2,000.00	2,000.00	0.00	0.00	Build: 2°/100'
2,889.02	2,874.82	-70.19	117.46	Hold: 17.78° Inc, 120.86° Azm
6,590.37	6,399.37	-649.96	1,087.72	KOP: Build 9°/100' @ 6590.37' MD
7,490.22	6,917.00	-1,278.71	1,230.27	LP: 7490.22' MD, 90.00° Inc, 179.99° Azm
17,664.17	6,917.00	-11,452.66	1,231.41	TD @ 17664.17' MD/6917.00' TVD

Northern Region - DJ Basin

Mustang

D Section 21

Vogler State D33-728

Wellbore #1

Plan 1

Anticollision Summary Report

01 August, 2018

Noble Energy, Inc.
Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Vogler State D33-728
Project:	Mustang	TVD Reference:	Well @ 4859.00ft
Reference Site:	D Section 21	MD Reference:	Well @ 4859.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Vogler State D33-728	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMP
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

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

Survey Tool Program	Date	8/1/2018		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	17,663.97	Plan 1 (Wellbore #1)	2_MWD+IFR1+MS	A008Mb: IFR dec & multi-station analysis

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
D Section 21						
Casey Blue D 21-11 (PR) - Wellbore #1 - No Surveys	2,000.00	1,955.00	1,303.01	1,256.98	28.304	CC
Casey Blue D 21-11 (PR) - Wellbore #1 - No Surveys	2,100.00	2,054.98	1,304.67	1,256.29	26.966	ES
Casey Blue D 21-11 (PR) - Wellbore #1 - No Surveys	6,650.00	6,410.84	2,554.62	2,402.35	16.777	SF
Casey Blue D21-13 (PR) - Wellbore #1 - Gyro Surveys	100.00	26.25	2,205.56	2,205.39	10,000.000	CC
Casey Blue D21-13 (PR) - Wellbore #1 - Gyro Surveys	1,900.00	1,812.10	2,212.95	2,200.20	173.623	ES
Casey Blue D21-13 (PR) - Wellbore #1 - Gyro Surveys	7,300.00	6,890.16	3,449.21	3,398.47	67.980	SF
Casey Blue D21-14 (SI) - Wellbore #1 - Gyro Surveys	100.00	52.77	841.25	841.03	3,849.799	CC
Casey Blue D21-14 (SI) - Wellbore #1 - Gyro Surveys	2,000.00	1,950.51	846.16	832.59	62.316	ES
Casey Blue D21-14 (SI) - Wellbore #1 - Gyro Surveys	6,589.99	6,368.72	1,806.70	1,760.52	39.126	SF
Casey Blue D21-3J (PR) - Wellbore #1 - Gyro Surveys	1,560.87	1,506.03	1,976.69	1,966.23	189.027	CC
Casey Blue D21-3J (PR) - Wellbore #1 - Gyro Surveys	2,001.68	1,947.83	1,977.50	1,963.92	145.689	ES
Casey Blue D21-3J (PR) - Wellbore #1 - Gyro Surveys	6,900.00	6,644.34	3,298.21	3,250.03	68.461	SF
Guttersen 21-31 (SI) - Wellbore #1 - Gyro Surveys	296.14	230.14	3,560.55	3,559.09	2,440.602	CC
Guttersen 21-31 (SI) - Wellbore #1 - Gyro Surveys	2,100.00	2,038.52	3,564.18	3,549.95	250.526	ES
Guttersen 21-31 (SI) - Wellbore #1 - Gyro Surveys	6,900.00	6,618.75	4,343.21	4,294.65	89.434	SF
Guttersen 21-42 (SI) - Wellbore #1 - Gyro Surveys	3,982.34	3,884.91	2,829.23	2,801.63	102.519	CC
Guttersen 21-42 (SI) - Wellbore #1 - Gyro Surveys	4,500.00	4,401.58	2,831.04	2,799.56	89.916	ES
Guttersen 21-42 (SI) - Wellbore #1 - Gyro Surveys	6,850.00	6,590.65	3,023.03	2,974.29	62.023	SF
Guttersen 32-21 (PR) - Wellbore #1 - No Surveys	2,000.00	1,959.00	2,214.53	2,168.42	48.020	CC
Guttersen 32-21 (PR) - Wellbore #1 - No Surveys	2,200.00	2,158.84	2,216.78	2,165.99	43.643	ES
Guttersen 32-21 (PR) - Wellbore #1 - No Surveys	6,750.00	6,505.96	2,934.57	2,779.49	18.922	SF
Guttersen 33-21 (PR) - Wellbore #1 - Gyro Surveys	100.00	59.09	1,020.85	1,020.62	4,452.555	CC
Guttersen 33-21 (PR) - Wellbore #1 - Gyro Surveys	1,800.00	1,754.14	1,029.85	1,017.66	84.513	ES
Guttersen 33-21 (PR) - Wellbore #1 - Gyro Surveys	6,600.00	6,374.55	1,733.58	1,687.19	37.375	SF
Guttersen 34-21 (PR) - Wellbore #1 - Gyro Surveys	4,507.15	4,383.10	81.19	49.77	2.584	CC, ES, SF
Guttersen 41-21 (PR) - Wellbore #1 - Gyro Surveys	173.70	124.70	3,974.56	3,973.91	6,078.364	CC
Guttersen 41-21 (PR) - Wellbore #1 - Gyro Surveys	2,000.00	1,922.43	3,979.44	3,965.96	295.206	ES
Guttersen 41-21 (PR) - Wellbore #1 - Gyro Surveys	6,900.00	6,603.89	4,402.86	4,353.95	90.019	SF
Guttersen 43-21 (PR) - Wellbore #1 - Gyro Surveys	5,749.50	5,574.36	1,568.88	1,528.10	38.468	CC
Guttersen 43-21 (PR) - Wellbore #1 - Gyro Surveys	5,800.00	5,618.33	1,569.01	1,527.87	38.132	ES
Guttersen 43-21 (PR) - Wellbore #1 - Gyro Surveys	6,750.00	6,514.03	1,631.23	1,583.05	33.858	SF
Guttersen D21-32D (SI) - Wellbore #1 - MWD Surveys	100.00	56.95	1,210.34	1,210.11	5,306.955	CC, ES
Guttersen D21-32D (SI) - Wellbore #1 - MWD Surveys	6,900.00	6,986.08	4,489.54	4,437.64	86.515	SF
Guttersen USX D21-17 (PR) - Wellbore #1 - No Surveys	2,000.00	1,943.00	3,141.49	3,095.69	68.597	CC
Guttersen USX D21-17 (PR) - Wellbore #1 - No Surveys	2,400.00	2,341.70	3,145.96	3,090.83	57.067	ES
Guttersen USX D21-17 (PR) - Wellbore #1 - No Surveys	6,800.00	6,533.41	3,631.03	3,474.90	23.257	SF
Guttersen USX D21-20D (PR) - Wellbore #1 - MWD Surv	711.58	672.93	1,141.78	1,137.33	256.837	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

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Vogler State D33-728
Project:	Mustang	TVD Reference:	Well @ 4859.00ft
Reference Site:	D Section 21	MD Reference:	Well @ 4859.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Vogler State D33-728	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMP
Reference Design:	Plan 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)	Distance Between Ellipses (ft)	Separation Factor	Warning
D Section 21						
Guttersen USX D21-20D (PR) - Wellbore #1 - MWD Surv	6,750.00	6,668.46	3,383.84	3,333.12	66.713	SF
Guttersen USX D21-21D (SI) - Wellbore #1 - MWD Surve	2,223.61	2,293.64	1,058.86	1,042.26	63.798	CC, ES
Guttersen USX D21-21D (SI) - Wellbore #1 - MWD Surve	6,600.00	6,574.66	2,497.67	2,441.88	44.764	SF
Guttersen USX D21-24D (PR) - Wellbore #1 - MWD Surv	2,645.59	2,826.46	872.55	853.52	45.861	CC, ES
Guttersen USX D21-24D (PR) - Wellbore #1 - MWD Surv	4,600.00	4,656.71	1,064.63	1,030.29	31.005	SF
Guttersen USX D21-25 (PR) - Wellbore #1 - MWD Surve	844.67	806.68	1,166.99	1,161.52	213.102	CC
Guttersen USX D21-25 (PR) - Wellbore #1 - MWD Surve	2,000.00	1,952.99	1,169.82	1,156.11	85.332	ES
Guttersen USX D21-25 (PR) - Wellbore #1 - MWD Surve	6,700.00	6,482.08	2,420.64	2,373.53	51.379	SF
Guttersen USX D21-27D (PR) - Wellbore #1 - MWD Surv	271.44	213.44	3,164.41	3,163.15	2,520.818	CC
Guttersen USX D21-27D (PR) - Wellbore #1 - MWD Surv	900.00	828.43	3,164.85	3,159.20	560.235	ES
Guttersen USX D21-27D (PR) - Wellbore #1 - MWD Surv	6,850.00	6,718.17	4,869.19	4,819.19	97.394	SF
Guttersen USX D21-28D (PR) - Wellbore #1 - MWD Surv	100.00	41.39	3,122.71	3,122.51	10,000.000	CC
Guttersen USX D21-28D (PR) - Wellbore #1 - MWD Surv	500.00	426.42	3,123.87	3,121.55	1,343.277	ES
Guttersen USX D21-28D (PR) - Wellbore #1 - MWD Surv	6,800.00	6,875.45	4,994.27	4,939.57	91.294	SF
Guttersen USX D21-33D (SI) - Wellbore #1 - MWD Surve	100.00	60.78	1,189.16	1,188.93	5,071.040	CC
Guttersen USX D21-33D (SI) - Wellbore #1 - MWD Surve	600.00	553.23	1,191.55	1,187.85	322.669	ES
Guttersen USX D21-33D (SI) - Wellbore #1 - MWD Surve	7,250.00	6,978.23	4,173.76	4,119.68	77.183	SF
Guttersen USX D22-30D (PR) - Wellbore #1 - MWD Surv	100.00	41.41	3,183.56	3,183.36	10,000.000	CC
Guttersen USX D22-30D (PR) - Wellbore #1 - MWD Surv	800.00	737.46	3,184.52	3,179.69	659.979	ES
Guttersen USX D22-30D (PR) - Wellbore #1 - MWD Surv	6,950.00	6,927.02	5,075.47	5,019.52	90.718	SF
Gutterson 18-21 (SI) - Wellbore #1 - Gyro Surveys	2,035.47	2,019.31	3,224.32	3,210.36	231.071	CC, ES
Gutterson 18-21 (SI) - Wellbore #1 - Gyro Surveys	6,900.00	6,644.02	4,502.52	4,454.36	93.484	SF
HSR Guttersen B 5-21 (PR) - Wellbore #1 - Gyro Survey	444.71	386.73	3,067.23	3,064.69	1,207.292	CC
HSR Guttersen B 5-21 (PR) - Wellbore #1 - Gyro Survey	2,000.00	1,924.18	3,069.33	3,055.85	227.717	ES
HSR Guttersen B 5-21 (PR) - Wellbore #1 - Gyro Survey	6,900.00	6,634.86	4,444.69	4,396.68	92.578	SF
HSR Gutterson 4-21 (PR) - Wellbore #1 - Gyro Surveys	2,079.97	2,131.11	4,070.40	4,055.83	279.269	CC
HSR Gutterson 4-21 (PR) - Wellbore #1 - Gyro Surveys	2,100.00	2,150.20	4,070.47	4,055.75	276.680	ES
HSR Gutterson 4-21 (PR) - Wellbore #1 - Gyro Surveys	6,900.00	6,625.99	5,383.18	5,335.12	111.998	SF
HSR-Guttersen 3-21 (SI) - Wellbore #1 - Gyro Surveys	2,048.54	2,037.25	3,596.35	3,582.29	255.710	CC
HSR-Guttersen 3-21 (SI) - Wellbore #1 - Gyro Surveys	2,100.00	2,090.49	3,596.66	3,582.24	249.280	ES
HSR-Guttersen 3-21 (SI) - Wellbore #1 - Gyro Surveys	7,000.00	7,002.76	4,670.50	4,619.56	91.694	SF
HSR-Guttersen 6-21 (SI) - Wellbore #1 - Gyro Surveys	1,675.43	1,619.46	2,357.07	2,345.81	209.237	CC
HSR-Guttersen 6-21 (SI) - Wellbore #1 - Gyro Surveys	2,000.00	1,932.66	2,357.70	2,344.19	174.430	ES
HSR-Guttersen 6-21 (SI) - Wellbore #1 - Gyro Surveys	6,800.00	6,537.65	3,510.97	3,463.53	74.007	SF
Two E Ranch 1-21C (SI) - Wellbore #1 - Gyro Surveys	5,954.25	5,758.87	938.03	895.77	22.194	CC
Two E Ranch 1-21C (SI) - Wellbore #1 - Gyro Surveys	6,000.00	5,801.56	938.16	895.56	22.022	ES
Two E Ranch 1-21C (SI) - Wellbore #1 - Gyro Surveys	6,650.00	6,415.10	968.06	920.70	20.441	SF
Vogler State D21-720 - Wellbore #1 - Plan 1	7,371.66	7,226.05	558.43	505.08	10.468	CC, ES
Vogler State D21-720 - Wellbore #1 - Plan 1	7,400.00	7,204.51	558.82	505.35	10.451	SF
Vogler State D21-731 - Wellbore #1 - Plan 1	7,120.35	7,567.60	120.86	66.67	2.230	CC, ES, SF
Vogler State D21-740 - Wellbore #1 - Plan 1	2,278.04	2,270.57	152.27	136.50	9.656	CC
Vogler State D21-740 - Wellbore #1 - Plan 1	2,300.00	2,291.56	152.33	136.42	9.572	ES
Vogler State D21-740 - Wellbore #1 - Plan 1	2,500.00	2,482.62	158.57	141.38	9.225	SF
Vogler State D21-750 - Wellbore #1 - Plan 1	2,000.00	1,995.00	167.86	154.01	12.116	CC, ES
Vogler State D21-750 - Wellbore #1 - Plan 1	2,300.00	2,279.26	180.13	164.36	11.427	SF
Vogler State D21-760 - Wellbore #1 - Plan 1	2,000.00	1,965.00	1,768.90	1,755.16	128.672	CC, ES
Vogler State D21-760 - Wellbore #1 - Plan 1	6,900.00	7,751.25	2,005.90	1,952.82	37.791	SF
Vogler State D21-770 - Wellbore #1 - Plan 1	2,000.00	1,963.00	1,806.74	1,793.00	131.493	CC, ES
Vogler State D21-770 - Wellbore #1 - Plan 1	6,900.00	7,567.03	2,653.38	2,601.67	51.307	SF
Vogler State D21-780 - Wellbore #1 - Plan 1	2,000.00	1,961.00	1,843.59	1,829.86	134.245	CC, ES
Vogler State D21-780 - Wellbore #1 - Plan 1	7,900.00	6,772.81	3,368.51	3,315.19	63.179	SF
Vogler State D21-790 - Wellbore #1 - Plan 1	7,422.86	7,125.66	1,206.99	1,153.32	22.487	CC, ES
Vogler State D21-790 - Wellbore #1 - Plan 1	7,600.00	6,996.37	1,213.69	1,159.52	22.408	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 Vogler State D33-728
Project:	Mustang	TVD Reference:	Well @ 4859.00ft
Reference Site:	D Section 21	MD Reference:	Well @ 4859.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Vogler State D33-728	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMP
Reference Design:	Plan 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
D Section 21						
Vogler State D33-711 - Wellbore #1 - Plan 1	7,411.20	7,214.96	1,121.09	1,067.55	20.939	CC
Vogler State D33-711 - Wellbore #1 - Plan 1	7,450.00	7,260.90	1,121.28	1,067.49	20.846	ES
Vogler State D33-711 - Wellbore #1 - Plan 1	17,663.97	17,484.34	1,290.00	1,095.91	6.646	SF
Vogler State D33-718 - Wellbore #1 - Plan 1	17,653.76	17,482.05	659.93	466.23	3.407	CC
Vogler State D33-718 - Wellbore #1 - Plan 1	17,663.97	17,482.05	660.01	466.12	3.404	ES, SF
Vogler State D33-738 - Wellbore #1 - Plan 1	2,000.00	2,000.00	38.00	24.13	2.739	CC, ES
Vogler State D33-738 - Wellbore #1 - Plan 1	2,100.00	2,100.02	39.51	24.93	2.710	SF
Vogler State D33-752 - Wellbore #1 - Plan 1	2,000.00	2,000.00	75.00	61.13	5.406	CC, ES
Vogler State D33-752 - Wellbore #1 - Plan 1	2,100.00	2,100.02	76.50	61.93	5.249	SF
Vogler State D33-759 - Wellbore #1 - Plan 1	2,750.36	3,109.24	1,729.40	1,709.49	86.862	CC, ES
Vogler State D33-759 - Wellbore #1 - Plan 1	17,663.97	17,586.12	1,961.25	1,767.33	10.114	SF
Vogler State D33-769 - Wellbore #1 - Plan 1	2,000.00	1,967.00	1,800.22	1,786.46	130.882	CC, ES
Vogler State D33-769 - Wellbore #1 - Plan 1	17,663.97	17,505.09	2,621.22	2,427.12	13.504	SF
Vogler State D33-779 - Wellbore #1 - Plan 1	2,000.00	1,967.00	1,837.22	1,823.46	133.572	CC, ES
Vogler State D33-779 - Wellbore #1 - Plan 1	17,663.97	17,488.08	3,281.17	3,086.83	16.884	SF

Noble Energy, Inc.
Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Vogler State D33-728
Project:	Mustang	TVD Reference:	Well @ 4859.00ft
Reference Site:	D Section 21	MD Reference:	Well @ 4859.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Vogler State D33-728	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMP
Reference Design:	Plan 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
D Section 28						
O'SH D 28-7 (P&A) - Wellbore #1 - No Surveys	9,257.13	6,868.00	741.59	568.63	4.288	CC, ES, SF
Spike ST GWS D 28-12 (SI) - Wellbore #1 - Gyro Surve	10,643.52	6,851.50	3,469.12	3,401.18	51.060	CC, ES
Spike ST GWS D 28-12 (SI) - Wellbore #1 - Gyro Surve	11,200.00	6,856.80	3,513.47	3,443.22	50.017	SF
Guttersen D State 28-29D (PR) - Wellbore #1 - MWD Su	4,151.52	4,500.89	2,165.17	2,134.61	70.853	CC
Guttersen D State 28-29D (PR) - Wellbore #1 - MWD Su	4,200.00	4,528.28	2,165.48	2,134.59	70.101	ES
Guttersen D State 28-29D (PR) - Wellbore #1 - MWD Su	7,600.00	6,950.70	2,709.72	2,656.55	50.960	SF
Guttersen D State 28-30D - Wellbore #1 - Guttersen D S	901.73	841.76	2,601.72	2,597.05	557.238	CC
Guttersen D State 28-30D - Wellbore #1 - Guttersen D S	1,200.00	1,121.95	2,602.31	2,595.55	385.046	ES
Guttersen D State 28-30D - Wellbore #1 - Guttersen D S	8,100.00	6,994.87	4,197.93	4,144.61	78.721	SF
Guttersen State D28-18D (PR) - Wellbore #1 - MWD Sur	8,440.08	6,928.61	1,563.88	1,505.60	26.837	CC, ES, SF
Guttersen State D28-21D (SI) - Wellbore #1 - MWD Surv	9,762.19	6,968.86	1,448.21	1,382.75	22.122	CC, ES
Guttersen State D28-21D (SI) - Wellbore #1 - MWD Surv	9,800.00	6,968.63	1,448.70	1,383.12	22.088	SF
Guttersen State D28-24D (SI) - Wellbore #1 - MWD Surv	11,323.13	6,945.42	1,455.48	1,378.10	18.809	CC, ES, SF
Guttersen State D28-28D (PR) - Wellbore #1 - MWD Sur	4,467.10	4,504.88	1,041.11	1,008.10	31.539	CC
Guttersen State D28-28D (PR) - Wellbore #1 - MWD Sur	4,500.00	4,529.19	1,041.27	1,008.01	31.311	ES
Guttersen State D28-28D (PR) - Wellbore #1 - MWD Sur	7,150.00	6,848.19	1,486.38	1,433.62	28.169	SF
Guttersen State D28-79HN - Wellbore #1 - Actual	7,700.00	11,085.64	3,948.74	3,836.48	35.174	SF
Guttersen State D28-79HN - Wellbore #1 - Actual	11,388.26	7,562.00	3,767.93	3,689.97	48.332	CC, ES
HSR Guttersen State 10-28 (SI) - Wellbore #1 - Gyro Su	10,542.29	6,830.89	1,003.56	936.55	14.975	CC, ES, SF
HSR Guttersen State 15-28 (SI) - Wellbore #1 - Gyro Su	12,180.37	6,898.82	400.24	321.00	5.051	CC, ES, SF
HSR Guttersen State 7-28 (PR) - Wellbore #1 - Gyro Sur	9,192.50	6,924.76	943.16	882.96	15.667	CC, ES, SF
O'SH D 28-1 (SI) - Wellbore #1 - Gyro Surveys	8,282.67	6,914.89	248.75	194.13	4.554	CC, ES
O'SH D 28-1 (SI) - Wellbore #1 - Gyro Surveys	8,300.00	6,914.97	249.35	194.39	4.537	SF
O'SH D 28-2 (SI) - Wellbore #1 - Gyro Surveys	7,917.09	6,873.91	734.20	681.57	13.949	CC, ES, SF
O'SH D 28-8 (SI) - Wellbore #1 - Gyro Surveys	9,316.64	6,879.66	612.52	552.70	10.240	CC, ES
O'SH D 28-8 (SI) - Wellbore #1 - Gyro Surveys	9,400.00	6,883.03	618.16	557.30	10.158	SF
Spike ST GWS D 28-03 (PR) - Wellbore #1 - Gyro Surve	3,137.46	3,049.73	1,746.38	1,724.77	80.814	CC
Spike ST GWS D 28-03 (PR) - Wellbore #1 - Gyro Surve	3,300.00	3,204.12	1,747.12	1,723.72	74.672	ES
Spike ST GWS D 28-03 (PR) - Wellbore #1 - Gyro Surve	7,900.00	6,839.00	1,980.36	1,912.02	28.978	SF
Spike ST GWS D 28-4 (SI) - Wellbore #1 - Gyro Surveys	461.26	388.26	2,653.01	2,650.41	1,019.802	CC
Spike ST GWS D 28-4 (SI) - Wellbore #1 - Gyro Surveys	2,000.00	1,922.50	2,655.46	2,641.99	197.075	ES
Spike ST GWS D 28-4 (SI) - Wellbore #1 - Gyro Surveys	8,300.00	6,956.31	3,398.91	3,344.84	62.866	SF
Spike State D 28-13 (SI) - Wellbore #1 - Gyro Surveys	12,086.18	6,867.46	3,380.60	3,302.54	43.305	CC
Spike State D 28-13 (SI) - Wellbore #1 - Gyro Surveys	12,100.00	6,867.51	3,380.63	3,302.50	43.267	ES
Spike State D 28-13 (SI) - Wellbore #1 - Gyro Surveys	12,600.00	6,869.28	3,419.43	3,339.24	42.642	SF
Spike State D28-05 (PR) - Wellbore #1 - Gyro Surveys	9,099.84	6,867.51	3,488.97	3,430.50	59.668	CC
Spike State D28-05 (PR) - Wellbore #1 - Gyro Surveys	9,100.00	6,867.51	3,488.97	3,430.50	59.668	ES
Spike State D28-05 (PR) - Wellbore #1 - Gyro Surveys	9,800.00	6,873.56	3,558.53	3,497.53	58.336	SF
Spike State D28-06 (SI) - Wellbore #1 - Gyro Surveys	9,128.67	6,883.29	1,797.39	1,738.53	30.537	CC, ES
Spike State D28-06 (SI) - Wellbore #1 - Gyro Surveys	9,200.00	6,883.84	1,798.80	1,739.76	30.469	SF
Spike State D28-11 (SI) - Wellbore #1 - Gyro Surveys	10,433.17	6,804.89	1,875.38	1,809.19	28.331	CC, ES
Spike State D28-11 (SI) - Wellbore #1 - Gyro Surveys	10,600.00	6,816.18	1,882.76	1,816.07	28.235	SF
Spike State GWS D 28-14 (P&A) - Wellbore #1 - Gyro Su	12,140.33	6,865.95	1,845.98	1,767.49	23.518	CC, ES
Spike State GWS D 28-14 (P&A) - Wellbore #1 - Gyro Su	12,200.00	6,869.06	1,846.94	1,768.25	23.470	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 Vogler State D33-728
Project:	Mustang	TVD Reference:	Well @ 4859.00ft
Reference Site:	D Section 21	MD Reference:	Well @ 4859.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Vogler State D33-728	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMP
Reference Design:	Plan 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						
D Section 33						
Cydney White D33-01 (PR) - Wellbore #1 - Gyro Surveys	13,297.04	6,912.61	638.95	551.89	7.339	CC
Cydney White D33-01 (PR) - Wellbore #1 - Gyro Surveys	13,300.00	6,912.63	638.95	551.84	7.334	ES
Cydney White D33-01 (PR) - Wellbore #1 - Gyro Surveys	13,400.00	6,913.51	647.19	558.79	7.321	SF
Cydney White D33-02 (PR) - Wellbore #1 - Gyro Surveys	13,251.41	6,881.69	670.97	584.26	7.738	CC, ES, SF
Cydney White D33-07 (PR) - Wellbore #1 - Gyro Surveys	14,541.49	6,903.62	735.75	639.16	7.618	CC, ES, SF
Guttersen D 33-09 (PR) - Wellbore #1 - Gyro Surveys	16,065.61	6,922.87	775.74	667.32	7.155	CC, ES
Guttersen D 33-09 (PR) - Wellbore #1 - Gyro Surveys	16,100.00	6,922.95	776.50	667.53	7.125	SF
Guttersen D 33-16 (PR) - Wellbore #1 - Gyro Surveys	17,245.33	6,910.17	648.88	548.16	6.442	CC, ES
Guttersen D 33-16 (PR) - Wellbore #1 - Gyro Surveys	17,300.00	6,909.59	651.18	549.62	6.412	SF
Guttersen D 33-23 (PR) - Wellbore #1 - Gyro Surveys	16,530.90	6,904.43	28.40	-83.56	0.254	Level 1, CC, ES, SF
Guttersen D33-10 (SI) - Wellbore #1 - No Surveys	15,795.03	6,889.00	682.91	462.79	3.102	CC, ES, SF
Guttersen D33-15 (PR) - Wellbore #1 - No Surveys	17,120.92	6,894.00	666.12	435.49	2.888	CC, ES, SF
HSR Guttersen 11-33 (SI) - Wellbore #1 - No Surveys	15,794.14	6,883.00	1,982.26	1,762.27	9.010	CC
HSR Guttersen 11-33 (SI) - Wellbore #1 - No Surveys	15,800.00	6,883.00	1,982.27	1,762.26	9.010	ES, SF
HSR Guttersen 13-33 (SI) - Wellbore #1 - Gyro Surveys	17,205.00	6,917.75	3,378.94	3,261.56	28.786	CC, ES
HSR Guttersen 13-33 (SI) - Wellbore #1 - Gyro Surveys	17,500.00	6,917.74	3,391.79	3,273.13	28.582	SF
HSR Guttersen 14-33 (SI) - Wellbore #1 - Gyro Surveys	17,285.80	6,919.75	1,889.41	1,771.63	16.041	CC, ES
HSR Guttersen 14-33 (SI) - Wellbore #1 - Gyro Surveys	17,300.00	6,919.75	1,889.46	1,771.63	16.035	SF
HSR Guttersen 3-33 (SI) - Wellbore #1 - Gyro Surveys	13,240.79	6,911.04	1,979.35	1,892.48	22.783	CC, ES
HSR Guttersen 3-33 (SI) - Wellbore #1 - Gyro Surveys	13,300.00	6,915.10	1,980.24	1,893.13	22.734	SF
HSR Guttersen 4-33 (P&A) - Wellbore #1 - No Surveys	13,314.90	6,898.00	3,462.03	3,260.74	17.200	CC, ES
HSR Guttersen 4-33 (P&A) - Wellbore #1 - No Surveys	13,600.00	6,898.00	3,473.75	3,271.13	17.145	SF
HSR-Guttersen 12-33 (SI) - Wellbore #1 - Gyro Surveys	16,037.33	6,939.88	3,321.30	3,213.01	30.669	CC, ES
HSR-Guttersen 12-33 (SI) - Wellbore #1 - Gyro Surveys	16,400.00	6,939.98	3,341.04	3,231.24	30.428	SF
HSR-Guttersen 5-33 (SI) - Wellbore #1 - Gyro Surveys	14,765.05	6,893.08	3,020.24	2,921.97	30.732	CC, ES
HSR-Guttersen 5-33 (SI) - Wellbore #1 - Gyro Surveys	15,000.00	6,891.33	3,029.37	2,930.11	30.520	SF
HSR-Guttersen 6-33 (SI) - Wellbore #1 - Gyro Surveys	14,671.83	6,886.93	1,876.38	1,779.13	19.296	CC, ES
HSR-Guttersen 6-33 (SI) - Wellbore #1 - Gyro Surveys	14,700.00	6,887.22	1,876.59	1,779.25	19.280	SF
Y Section 04						
HSR-Guttersen 01-04 - Original Drilling - Original Drilling	17,663.97	6,938.44	928.07	859.13	13.462	CC, ES, SF
HSR-Guttersen 02-04 - Original Drilling - Original Drilling	17,663.97	6,921.49	1,083.66	987.28	11.243	CC, ES, SF
HSR-Guttersen 03-04 - Original Drilling - Original Drilling	17,663.97	6,958.81	2,322.21	2,204.93	19.800	CC, ES, SF
HSR-Guttersen 05-04 - Original Drilling - Original Drilling	17,663.97	7,180.61	3,961.22	3,850.37	35.734	CC, ES, SF
HSR-Guttersen 07-04 - Original Drilling - Original Drilling	17,663.97	6,937.65	2,230.23	2,153.66	29.126	CC, ES, SF
Melvin Y04-04 - Original Drilling - Original Drilling - As Dr	17,663.97	7,092.34	3,153.96	3,034.93	26.497	CC, ES, SF

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

Noble Energy, Inc.

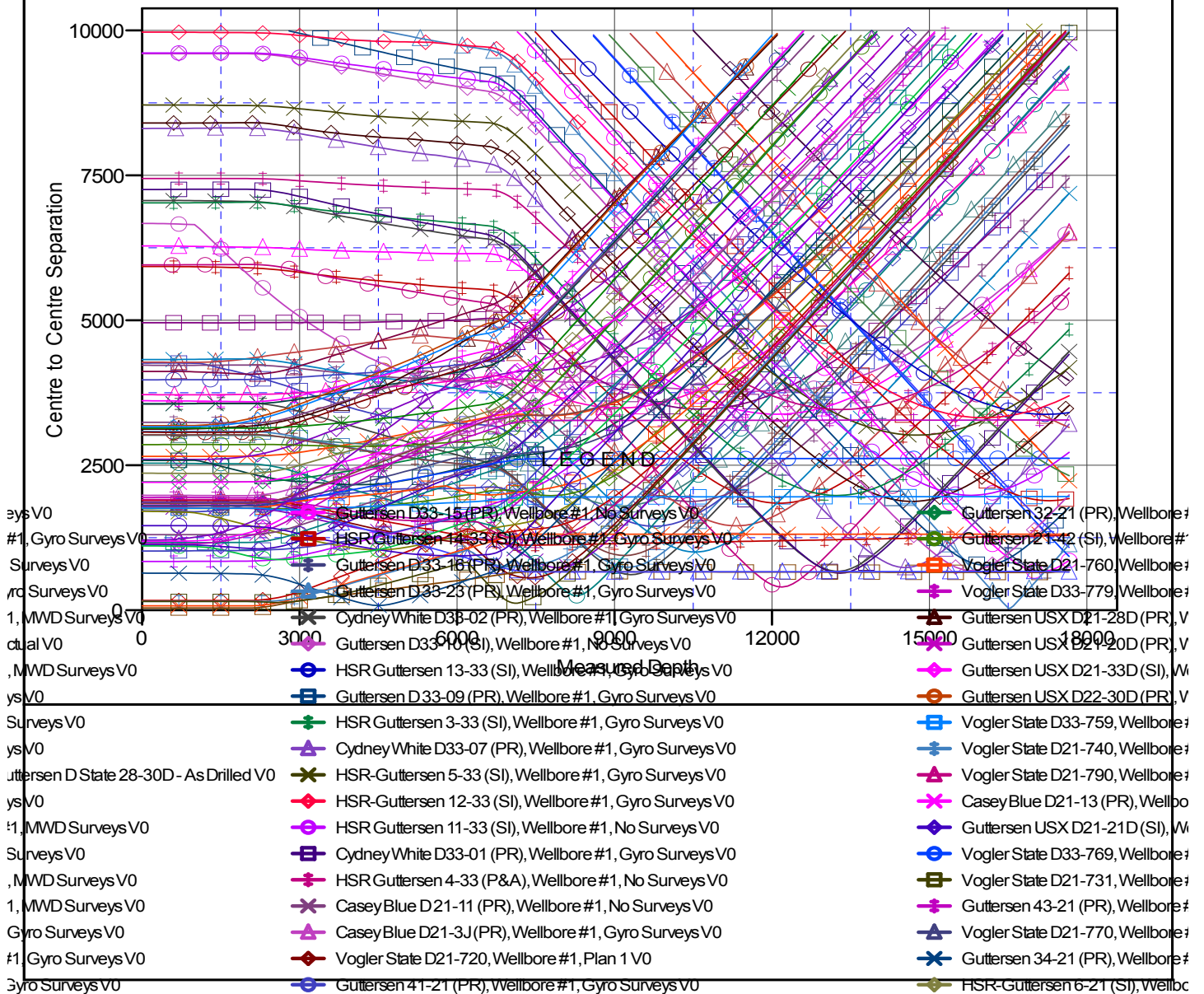
Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Vogler State D33-728
Project:	Mustang	TVD Reference:	Well @ 4859.00ft
Reference Site:	D Section 21	MD Reference:	Well @ 4859.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Vogler State D33-728	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMP
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to Well @ 4859.00ft
Offset Depths are relative to Offset Datum
Central Meridian is -105.5000000

Coordinates are relative to: Vogler State D33-728
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.61°

Ladder Plot



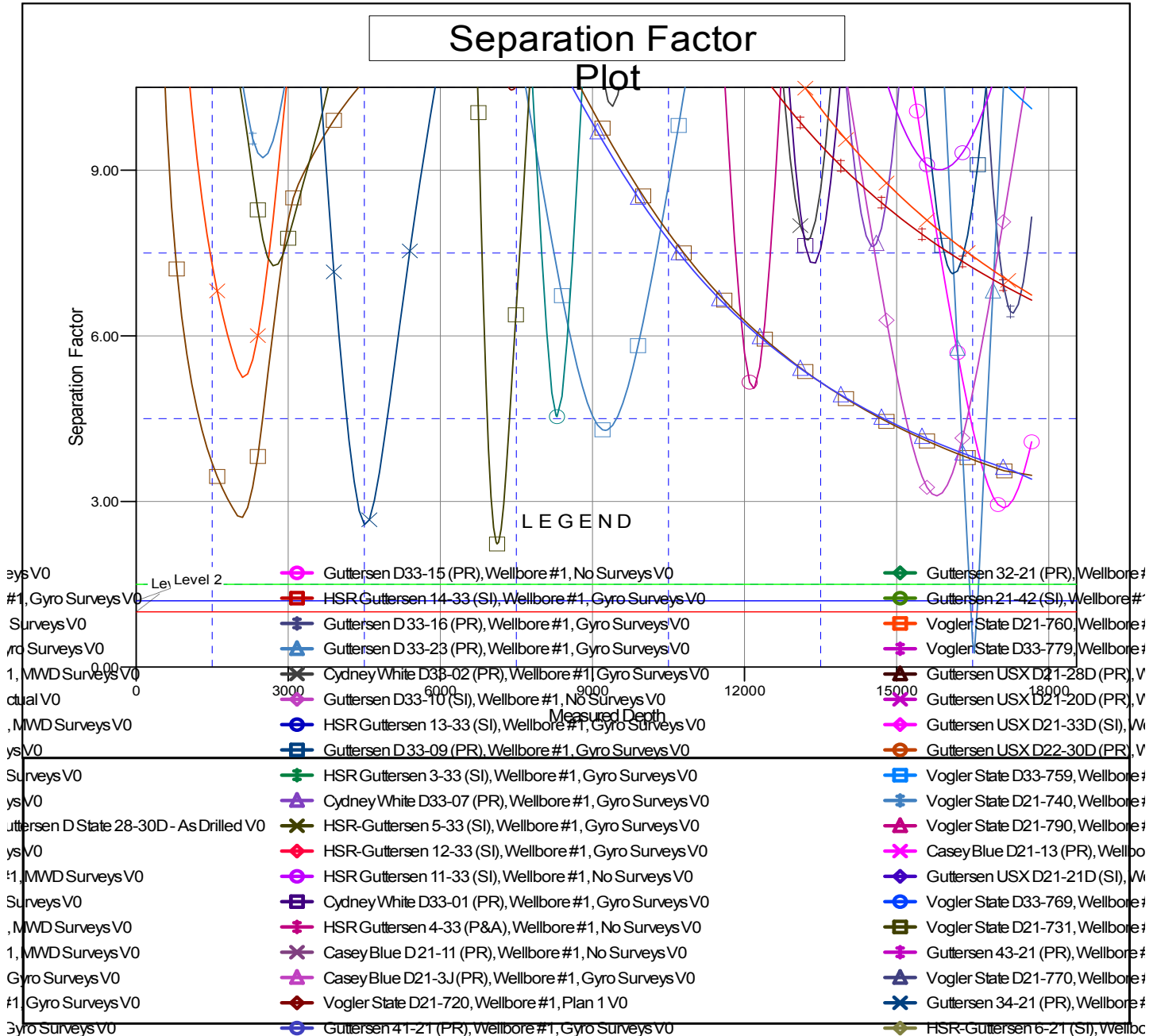
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Noble Energy, Inc.
Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Vogler State D33-728
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Reference Well:	Vogler State D33-728	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMP
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to Well @ 4859.00ft
Offset Depths are relative to Offset Datum
Central Meridian is -105.5000000

Coordinates are relative to: Vogler State D33-728
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.61°



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