

Project: Mustang
 Site: DD Section 30
 Well: Gutteresen State DD30-745
 Wellbore: Gutteresen State DD30-745
 Design: Plan #1

Northern Region - DJ Basin

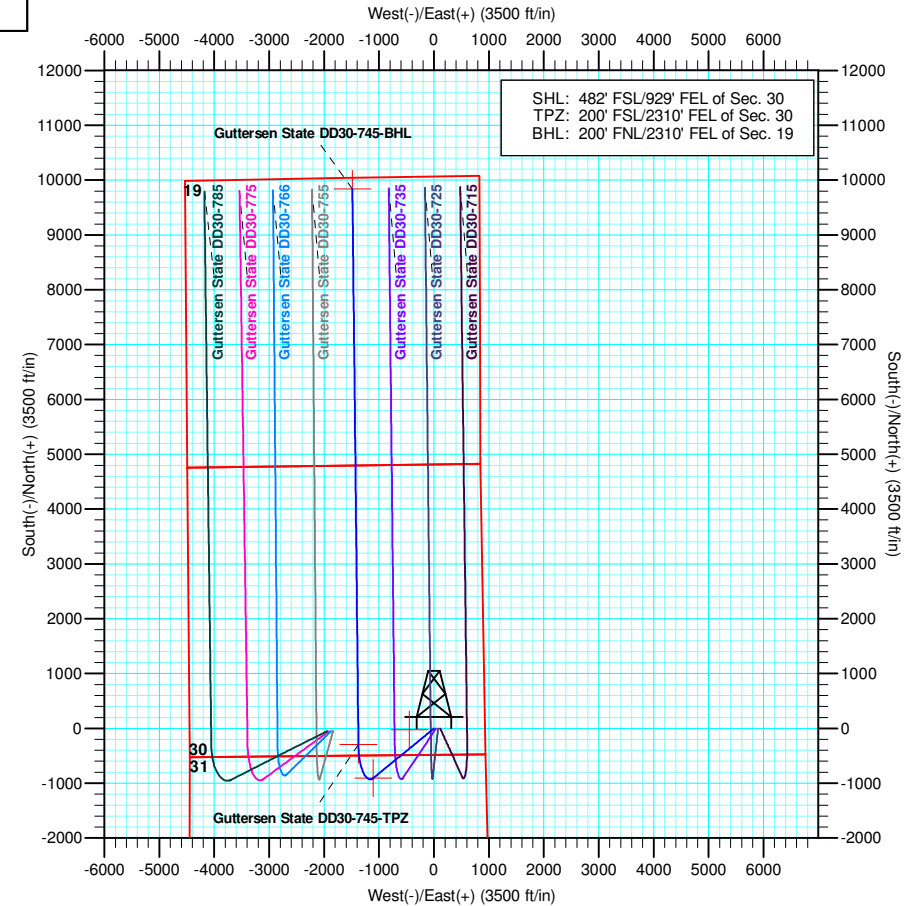
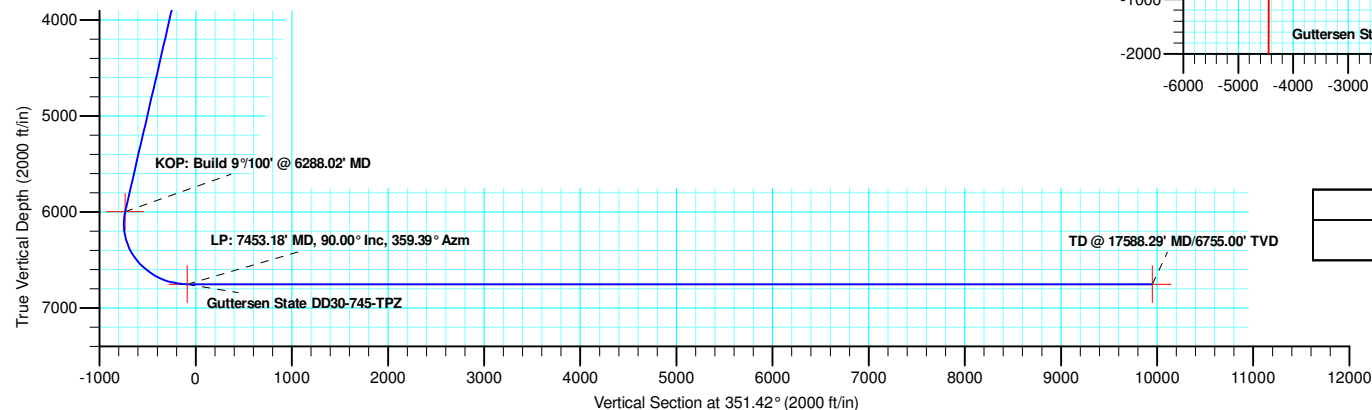
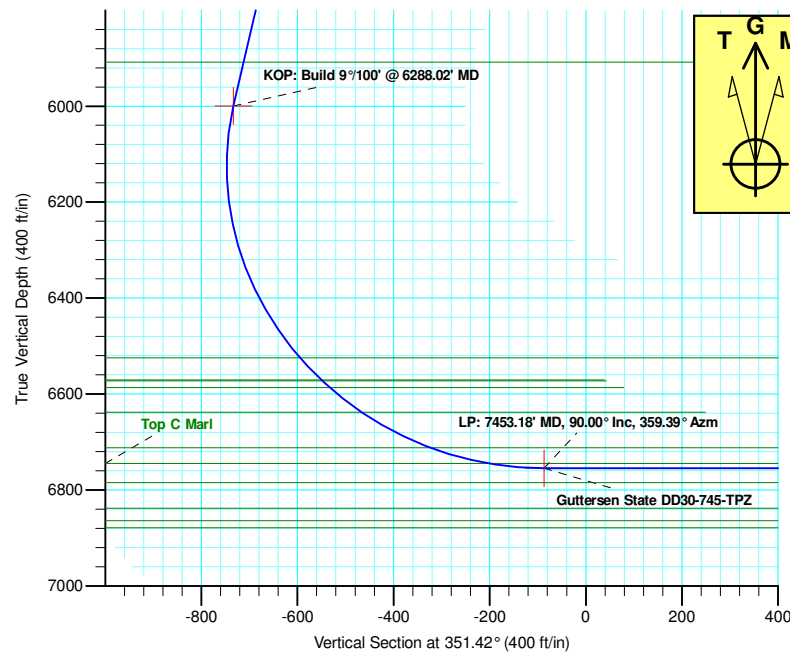
Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Colorado Northern Zone
 System Datum: Mean Sea Level

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	2200.00	0.00	0.00	2200.00	0.00	0.00	0.00	0.00	0.00	
3	3408.76	24.18	230.60	3373.21	-159.46	-194.16	2.00	230.60	-128.72	
4	6288.02	24.18	230.60	5999.96	-907.85	-1105.36	0.00	0.00	-732.80	
5	7453.18	90.00	359.39	6755.00	-295.38	-1376.11	9.00	126.25	-86.81	Gutteresen State DD30-745-TPZ
6	17588.29	90.00	359.39	6755.00	9839.15	-1484.31	0.00	0.00	9950.48	Gutteresen State DD30-745-BHL

WELL DETAILS: Gutteresen State DD30-745

+N/-S	+E/-W	Northing	Ground Level: Easting	4823.00 Latitude	Longitude	Slot
0.00	0.00	1313884.82	3286510.13	40.1904621	-104.4744235	



Plan: Plan #1 (Gutteresen State DD30-745/Gutteresen State DD30-745)

Created By: Keith Noack Date: 12:55, August 28 2018

Northern Region - DJ Basin

Mustang

DD Section 30

Guttersen State DD30-745

Guttersen State DD30-745

Plan: Plan #1

Standard Planning Report

28 August, 2018

Noble Energy, Inc.

Planning Report

Database:	EDMP	Local Co-ordinate Reference:	Well Guttersen State DD30-745
Company:	Northern Region - DJ Basin	TVD Reference:	KB @ 4853.00ft
Project:	Mustang	MD Reference:	KB @ 4853.00ft
Site:	DD Section 30	North Reference:	Grid
Well:	Guttersen State DD30-745	Survey Calculation Method:	Minimum Curvature
Wellbore:	Guttersen State DD30-745		
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		DD Section 30				
Site Position:		Northing:	1,316,013.13 usft	Latitude:	40.1963600	
From:	Lat/Long	Easting:	3,284,747.15 usft	Longitude:	-104.4806460	
Position Uncertainty:		0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.66 °

Well	Guttersen State DD30-745					
Well Position	+N/-S	-2,128.32 ft	Northing:	1,313,884.82 usft	Latitude:	40.1904621
	+E/-W	1,762.98 ft	Easting:	3,286,510.13 usft	Longitude:	-104.4744235
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	4,823.00 ft

Wellbore	Guttersen State DD30-745				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	7/12/2018	7.92	66.70	52,191.74577749

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	351.42

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	
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,408.76	24.18	230.60	3,373.21	-159.46	-194.16	2.00	2.00	0.00	230.60	
6,288.02	24.18	230.60	5,999.96	-907.85	-1,105.36	0.00	0.00	0.00	0.00	
7,453.18	90.00	359.39	6,755.00	-295.38	-1,376.11	9.00	5.65	11.05	126.25	Guttersen State DD
17,588.29	90.00	359.39	6,755.00	9,839.15	-1,484.31	0.00	0.00	0.00	0.00	Guttersen State DD

Noble Energy, Inc.

Planning Report

Database:	EDMP	Local Co-ordinate Reference:	Well Guttersen State DD30-745
Company:	Northern Region - DJ Basin	TVD Reference:	KB @ 4853.00ft
Project:	Mustang	MD Reference:	KB @ 4853.00ft
Site:	DD Section 30	North Reference:	Grid
Well:	Guttersen State DD30-745	Survey Calculation Method:	Minimum Curvature
Wellbore:	Guttersen State DD30-745		
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
630.00	0.00	0.00	630.00	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
716.00	0.00	0.00	716.00	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
1,653.00	0.00	0.00	1,653.00	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
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
Build: 2°/100'									
2,300.00	2.00	230.60	2,299.98	-1.11	-1.35	-0.89	2.00	2.00	0.00
2,400.00	4.00	230.60	2,399.84	-4.43	-5.39	-3.58	2.00	2.00	0.00
2,500.00	6.00	230.60	2,499.45	-9.96	-12.13	-8.04	2.00	2.00	0.00
2,600.00	8.00	230.60	2,598.70	-17.69	-21.54	-14.28	2.00	2.00	0.00
2,700.00	10.00	230.60	2,697.47	-27.62	-33.63	-22.30	2.00	2.00	0.00
2,800.00	12.00	230.60	2,795.62	-39.73	-48.38	-32.07	2.00	2.00	0.00
2,900.00	14.00	230.60	2,893.06	-54.01	-65.76	-43.60	2.00	2.00	0.00
3,000.00	16.00	230.60	2,989.64	-70.44	-85.76	-56.85	2.00	2.00	0.00
3,100.00	18.00	230.60	3,085.27	-88.99	-108.35	-71.83	2.00	2.00	0.00
3,200.00	20.00	230.60	3,179.82	-109.65	-133.51	-88.51	2.00	2.00	0.00
3,300.00	22.00	230.60	3,273.17	-132.40	-161.20	-106.87	2.00	2.00	0.00
3,408.76	24.18	230.60	3,373.21	-159.46	-194.16	-128.72	2.00	2.00	0.00
Hold: 24.18° Inc, 230.60° Azm									
3,500.00	24.18	230.60	3,456.45	-183.18	-223.03	-147.86	0.00	0.00	0.00
3,600.00	24.18	230.60	3,547.68	-209.17	-254.68	-168.84	0.00	0.00	0.00
3,693.52	24.18	230.60	3,633.00	-233.48	-284.28	-188.46	0.00	0.00	0.00
Parkman									
3,700.00	24.18	230.60	3,638.91	-235.16	-286.33	-189.82	0.00	0.00	0.00
3,800.00	24.18	230.60	3,730.14	-261.16	-317.97	-210.80	0.00	0.00	0.00
3,900.00	24.18	230.60	3,821.37	-287.15	-349.62	-231.78	0.00	0.00	0.00
4,000.00	24.18	230.60	3,912.60	-313.14	-381.27	-252.76	0.00	0.00	0.00
4,100.00	24.18	230.60	4,003.83	-339.13	-412.91	-273.74	0.00	0.00	0.00
4,156.09	24.18	230.60	4,055.00	-353.71	-430.67	-285.51	0.00	0.00	0.00

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Project:	Mustang	MD Reference:	KB @ 4853.00ft
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Well:	Guttersen State DD30-745	Survey Calculation Method:	Minimum Curvature
Wellbore:	Guttersen State DD30-745		
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)
Sussex									
4,200.00	24.18	230.60	4,095.06	-365.12	-444.56	-294.72	0.00	0.00	0.00
4,300.00	24.18	230.60	4,186.29	-391.12	-476.21	-315.70	0.00	0.00	0.00
4,358.88	24.18	230.60	4,240.00	-406.42	-494.84	-328.06	0.00	0.00	0.00
Shannon									
4,400.00	24.18	230.60	4,277.52	-417.11	-507.86	-336.68	0.00	0.00	0.00
4,500.00	24.18	230.60	4,368.75	-443.10	-539.50	-357.67	0.00	0.00	0.00
4,600.00	24.18	230.60	4,459.98	-469.09	-571.15	-378.65	0.00	0.00	0.00
4,700.00	24.18	230.60	4,551.21	-495.08	-602.80	-399.63	0.00	0.00	0.00
4,800.00	24.18	230.60	4,642.44	-521.08	-634.44	-420.61	0.00	0.00	0.00
4,900.00	24.18	230.60	4,733.67	-547.07	-666.09	-441.59	0.00	0.00	0.00
5,000.00	24.18	230.60	4,824.90	-573.06	-697.74	-462.57	0.00	0.00	0.00
5,100.00	24.18	230.60	4,916.13	-599.05	-729.39	-483.55	0.00	0.00	0.00
5,200.00	24.18	230.60	5,007.36	-625.05	-761.03	-504.53	0.00	0.00	0.00
5,300.00	24.18	230.60	5,098.59	-651.04	-792.68	-525.51	0.00	0.00	0.00
5,400.00	24.18	230.60	5,189.82	-677.03	-824.33	-546.49	0.00	0.00	0.00
5,500.00	24.18	230.60	5,281.05	-703.02	-855.97	-567.47	0.00	0.00	0.00
5,600.00	24.18	230.60	5,372.28	-729.01	-887.62	-588.45	0.00	0.00	0.00
5,700.00	24.18	230.60	5,463.51	-755.01	-919.27	-609.43	0.00	0.00	0.00
5,800.00	24.18	230.60	5,554.74	-781.00	-950.91	-630.41	0.00	0.00	0.00
5,900.00	24.18	230.60	5,645.97	-806.99	-982.56	-651.39	0.00	0.00	0.00
6,000.00	24.18	230.60	5,737.20	-832.98	-1,014.21	-672.37	0.00	0.00	0.00
6,100.00	24.18	230.60	5,828.42	-858.97	-1,045.86	-693.35	0.00	0.00	0.00
6,187.23	24.18	230.60	5,908.00	-881.65	-1,073.46	-711.65	0.00	0.00	0.00
Teepee Buttes									
6,200.00	24.18	230.60	5,919.65	-884.97	-1,077.50	-714.33	0.00	0.00	0.00
6,288.02	24.18	230.60	5,999.96	-907.85	-1,105.36	-732.80	0.00	0.00	0.00
KOP: Build 9°/100' @ 6288.02' MD									
6,300.00	23.55	232.78	6,010.91	-910.85	-1,109.16	-735.21	9.00	-5.20	18.17
6,350.00	21.33	243.05	6,057.14	-921.02	-1,125.23	-742.86	9.00	-4.45	20.54
6,400.00	19.85	255.16	6,103.97	-927.32	-1,141.55	-746.66	9.00	-2.96	24.23
6,450.00	19.29	268.52	6,151.10	-929.70	-1,158.02	-746.56	9.00	-1.12	26.72
6,500.00	19.72	281.96	6,198.26	-928.17	-1,174.53	-742.58	9.00	0.87	26.88
6,550.00	21.09	294.28	6,245.14	-922.72	-1,191.00	-734.73	9.00	2.74	24.64
6,600.00	23.24	304.80	6,291.46	-913.38	-1,207.31	-723.07	9.00	4.28	21.03
6,650.00	25.96	313.43	6,336.93	-900.23	-1,223.36	-707.67	9.00	5.44	17.26
6,700.00	29.09	320.42	6,381.28	-883.33	-1,239.06	-688.61	9.00	6.28	13.99
6,750.00	32.53	326.11	6,424.23	-862.79	-1,254.31	-666.03	9.00	6.87	11.38
6,800.00	36.17	330.80	6,465.51	-838.74	-1,269.01	-640.05	9.00	7.29	9.37
6,850.00	39.97	334.71	6,504.87	-811.32	-1,283.08	-610.85	9.00	7.60	7.84
6,876.68	42.04	336.56	6,525.00	-795.37	-1,290.29	-594.00	9.00	7.78	6.91
Sharon Springs									
6,900.00	43.88	338.05	6,542.07	-780.71	-1,296.42	-578.59	9.00	7.87	6.40
6,941.30	47.17	340.46	6,571.00	-753.15	-1,306.84	-549.78	9.00	7.98	5.84
Top A Chalk									
6,944.25	47.41	340.63	6,573.00	-751.11	-1,307.56	-547.66	9.00	8.04	5.50
Top A Marl									
6,950.00	47.87	340.94	6,576.87	-747.10	-1,308.96	-543.48	9.00	8.05	5.44
6,965.28	49.11	341.75	6,587.00	-736.25	-1,312.62	-532.21	9.00	8.08	5.30
Top B Chalk									
7,000.00	51.93	343.48	6,609.07	-710.68	-1,320.62	-505.73	9.00	8.13	4.99
7,049.16	55.97	345.72	6,638.00	-672.37	-1,331.15	-466.28	9.00	8.21	4.55
Top B Marl									

Noble Energy, Inc.

Planning Report

Database:	EDMP	Local Co-ordinate Reference:	Well Guttersen State DD30-745
Company:	Northern Region - DJ Basin	TVD Reference:	KB @ 4853.00ft
Project:	Mustang	MD Reference:	KB @ 4853.00ft
Site:	DD Section 30	North Reference:	Grid
Well:	Guttersen State DD30-745	Survey Calculation Method:	Minimum Curvature
Wellbore:	Guttersen State DD30-745		
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)
7,050.00	56.04	345.76	6,638.47	-671.69	-1,331.32	-465.59	9.00	8.26	4.32
7,100.00	60.19	347.82	6,664.88	-630.37	-1,341.00	-423.28	9.00	8.29	4.13
7,150.00	64.36	349.72	6,688.14	-586.97	-1,349.60	-379.08	9.00	8.35	3.80
7,200.00	68.56	351.49	6,708.10	-541.76	-1,357.07	-333.26	9.00	8.40	3.54
7,210.88	69.47	351.86	6,712.00	-531.70	-1,358.54	-323.10	9.00	8.42	3.41
Top C Chalk									
7,250.00	72.77	353.16	6,724.66	-495.01	-1,363.36	-286.10	9.00	8.43	3.32
7,300.00	77.00	354.76	6,737.69	-447.02	-1,368.44	-237.89	9.00	8.46	3.19
7,336.88	80.13	355.90	6,745.00	-411.00	-1,371.38	-201.83	9.00	8.47	3.10
Top C Marl									
7,350.00	81.24	356.30	6,747.12	-398.08	-1,372.26	-188.93	9.00	8.48	3.05
7,400.00	85.48	357.80	6,752.90	-348.49	-1,374.81	-139.51	9.00	8.49	3.01
7,453.18	90.00	359.39	6,755.00	-295.38	-1,376.11	-86.81	9.00	8.49	2.98
LP: 7453.18' MD, 90.00° Inc, 359.39° Azm									
7,500.00	90.00	359.39	6,755.00	-248.57	-1,376.61	-40.44	0.00	0.00	0.00
7,600.00	90.00	359.39	6,755.00	-148.57	-1,377.68	58.60	0.00	0.00	0.00
7,700.00	90.00	359.39	6,755.00	-48.58	-1,378.75	157.63	0.00	0.00	0.00
7,800.00	90.00	359.39	6,755.00	51.41	-1,379.82	256.67	0.00	0.00	0.00
7,900.00	90.00	359.39	6,755.00	151.41	-1,380.88	355.70	0.00	0.00	0.00
8,000.00	90.00	359.39	6,755.00	251.40	-1,381.95	454.74	0.00	0.00	0.00
8,100.00	90.00	359.39	6,755.00	351.40	-1,383.02	553.77	0.00	0.00	0.00
8,200.00	90.00	359.39	6,755.00	451.39	-1,384.09	652.80	0.00	0.00	0.00
8,300.00	90.00	359.39	6,755.00	551.39	-1,385.15	751.84	0.00	0.00	0.00
8,400.00	90.00	359.39	6,755.00	651.38	-1,386.22	850.87	0.00	0.00	0.00
8,500.00	90.00	359.39	6,755.00	751.37	-1,387.29	949.91	0.00	0.00	0.00
8,600.00	90.00	359.39	6,755.00	851.37	-1,388.36	1,048.94	0.00	0.00	0.00
8,700.00	90.00	359.39	6,755.00	951.36	-1,389.42	1,147.98	0.00	0.00	0.00
8,800.00	90.00	359.39	6,755.00	1,051.36	-1,390.49	1,247.01	0.00	0.00	0.00
8,900.00	90.00	359.39	6,755.00	1,151.35	-1,391.56	1,346.05	0.00	0.00	0.00
9,000.00	90.00	359.39	6,755.00	1,251.35	-1,392.63	1,445.08	0.00	0.00	0.00
9,100.00	90.00	359.39	6,755.00	1,351.34	-1,393.69	1,544.12	0.00	0.00	0.00
9,200.00	90.00	359.39	6,755.00	1,451.33	-1,394.76	1,643.15	0.00	0.00	0.00
9,300.00	90.00	359.39	6,755.00	1,551.33	-1,395.83	1,742.19	0.00	0.00	0.00
9,400.00	90.00	359.39	6,755.00	1,651.32	-1,396.90	1,841.22	0.00	0.00	0.00
9,500.00	90.00	359.39	6,755.00	1,751.32	-1,397.96	1,940.26	0.00	0.00	0.00
9,600.00	90.00	359.39	6,755.00	1,851.31	-1,399.03	2,039.29	0.00	0.00	0.00
9,700.00	90.00	359.39	6,755.00	1,951.31	-1,400.10	2,138.33	0.00	0.00	0.00
9,800.00	90.00	359.39	6,755.00	2,051.30	-1,401.17	2,237.36	0.00	0.00	0.00
9,900.00	90.00	359.39	6,755.00	2,151.29	-1,402.23	2,336.40	0.00	0.00	0.00
10,000.00	90.00	359.39	6,755.00	2,251.29	-1,403.30	2,435.43	0.00	0.00	0.00
10,100.00	90.00	359.39	6,755.00	2,351.28	-1,404.37	2,534.47	0.00	0.00	0.00
10,200.00	90.00	359.39	6,755.00	2,451.28	-1,405.44	2,633.50	0.00	0.00	0.00
10,300.00	90.00	359.39	6,755.00	2,551.27	-1,406.50	2,732.53	0.00	0.00	0.00
10,400.00	90.00	359.39	6,755.00	2,651.27	-1,407.57	2,831.57	0.00	0.00	0.00
10,500.00	90.00	359.39	6,755.00	2,751.26	-1,408.64	2,930.60	0.00	0.00	0.00
10,600.00	90.00	359.39	6,755.00	2,851.25	-1,409.71	3,029.64	0.00	0.00	0.00
10,700.00	90.00	359.39	6,755.00	2,951.25	-1,410.77	3,128.67	0.00	0.00	0.00
10,800.00	90.00	359.39	6,755.00	3,051.24	-1,411.84	3,227.71	0.00	0.00	0.00
10,900.00	90.00	359.39	6,755.00	3,151.24	-1,412.91	3,326.74	0.00	0.00	0.00
11,000.00	90.00	359.39	6,755.00	3,251.23	-1,413.98	3,425.78	0.00	0.00	0.00
11,100.00	90.00	359.39	6,755.00	3,351.23	-1,415.04	3,524.81	0.00	0.00	0.00
11,200.00	90.00	359.39	6,755.00	3,451.22	-1,416.11	3,623.85	0.00	0.00	0.00
11,300.00	90.00	359.39	6,755.00	3,551.21	-1,417.18	3,722.88	0.00	0.00	0.00

Noble Energy, Inc.

Planning Report

Database:	EDMP	Local Co-ordinate Reference:	Well Guttersen State DD30-745
Company:	Northern Region - DJ Basin	TVD Reference:	KB @ 4853.00ft
Project:	Mustang	MD Reference:	KB @ 4853.00ft
Site:	DD Section 30	North Reference:	Grid
Well:	Guttersen State DD30-745	Survey Calculation Method:	Minimum Curvature
Wellbore:	Guttersen State DD30-745		
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)
11,400.00	90.00	359.39	6,755.00	3,651.21	-1,418.25	3,821.92	0.00	0.00	0.00
11,500.00	90.00	359.39	6,755.00	3,751.20	-1,419.31	3,920.95	0.00	0.00	0.00
11,600.00	90.00	359.39	6,755.00	3,851.20	-1,420.38	4,019.99	0.00	0.00	0.00
11,700.00	90.00	359.39	6,755.00	3,951.19	-1,421.45	4,119.02	0.00	0.00	0.00
11,800.00	90.00	359.39	6,755.00	4,051.19	-1,422.52	4,218.06	0.00	0.00	0.00
11,900.00	90.00	359.39	6,755.00	4,151.18	-1,423.58	4,317.09	0.00	0.00	0.00
12,000.00	90.00	359.39	6,755.00	4,251.17	-1,424.65	4,416.13	0.00	0.00	0.00
12,100.00	90.00	359.39	6,755.00	4,351.17	-1,425.72	4,515.16	0.00	0.00	0.00
12,200.00	90.00	359.39	6,755.00	4,451.16	-1,426.79	4,614.20	0.00	0.00	0.00
12,300.00	90.00	359.39	6,755.00	4,551.16	-1,427.85	4,713.23	0.00	0.00	0.00
12,400.00	90.00	359.39	6,755.00	4,651.15	-1,428.92	4,812.27	0.00	0.00	0.00
12,500.00	90.00	359.39	6,755.00	4,751.15	-1,429.99	4,911.30	0.00	0.00	0.00
12,600.00	90.00	359.39	6,755.00	4,851.14	-1,431.06	5,010.33	0.00	0.00	0.00
12,700.00	90.00	359.39	6,755.00	4,951.13	-1,432.13	5,109.37	0.00	0.00	0.00
12,800.00	90.00	359.39	6,755.00	5,051.13	-1,433.19	5,208.40	0.00	0.00	0.00
12,900.00	90.00	359.39	6,755.00	5,151.12	-1,434.26	5,307.44	0.00	0.00	0.00
13,000.00	90.00	359.39	6,755.00	5,251.12	-1,435.33	5,406.47	0.00	0.00	0.00
13,100.00	90.00	359.39	6,755.00	5,351.11	-1,436.40	5,505.51	0.00	0.00	0.00
13,200.00	90.00	359.39	6,755.00	5,451.11	-1,437.46	5,604.54	0.00	0.00	0.00
13,300.00	90.00	359.39	6,755.00	5,551.10	-1,438.53	5,703.58	0.00	0.00	0.00
13,400.00	90.00	359.39	6,755.00	5,651.10	-1,439.60	5,802.61	0.00	0.00	0.00
13,500.00	90.00	359.39	6,755.00	5,751.09	-1,440.67	5,901.65	0.00	0.00	0.00
13,600.00	90.00	359.39	6,755.00	5,851.08	-1,441.73	6,000.68	0.00	0.00	0.00
13,700.00	90.00	359.39	6,755.00	5,951.08	-1,442.80	6,099.72	0.00	0.00	0.00
13,800.00	90.00	359.39	6,755.00	6,051.07	-1,443.87	6,198.75	0.00	0.00	0.00
13,900.00	90.00	359.39	6,755.00	6,151.07	-1,444.94	6,297.79	0.00	0.00	0.00
14,000.00	90.00	359.39	6,755.00	6,251.06	-1,446.00	6,396.82	0.00	0.00	0.00
14,100.00	90.00	359.39	6,755.00	6,351.06	-1,447.07	6,495.86	0.00	0.00	0.00
14,200.00	90.00	359.39	6,755.00	6,451.05	-1,448.14	6,594.89	0.00	0.00	0.00
14,300.00	90.00	359.39	6,755.00	6,551.04	-1,449.21	6,693.93	0.00	0.00	0.00
14,400.00	90.00	359.39	6,755.00	6,651.04	-1,450.27	6,792.96	0.00	0.00	0.00
14,500.00	90.00	359.39	6,755.00	6,751.03	-1,451.34	6,892.00	0.00	0.00	0.00
14,600.00	90.00	359.39	6,755.00	6,851.03	-1,452.41	6,991.03	0.00	0.00	0.00
14,700.00	90.00	359.39	6,755.00	6,951.02	-1,453.48	7,090.06	0.00	0.00	0.00
14,800.00	90.00	359.39	6,755.00	7,051.02	-1,454.54	7,189.10	0.00	0.00	0.00
14,900.00	90.00	359.39	6,755.00	7,151.01	-1,455.61	7,288.13	0.00	0.00	0.00
15,000.00	90.00	359.39	6,755.00	7,251.00	-1,456.68	7,387.17	0.00	0.00	0.00
15,100.00	90.00	359.39	6,755.00	7,351.00	-1,457.75	7,486.20	0.00	0.00	0.00
15,200.00	90.00	359.39	6,755.00	7,450.99	-1,458.81	7,585.24	0.00	0.00	0.00
15,300.00	90.00	359.39	6,755.00	7,550.99	-1,459.88	7,684.27	0.00	0.00	0.00
15,400.00	90.00	359.39	6,755.00	7,650.98	-1,460.95	7,783.31	0.00	0.00	0.00
15,500.00	90.00	359.39	6,755.00	7,750.98	-1,462.02	7,882.34	0.00	0.00	0.00
15,600.00	90.00	359.39	6,755.00	7,850.97	-1,463.08	7,981.38	0.00	0.00	0.00
15,700.00	90.00	359.39	6,755.00	7,950.96	-1,464.15	8,080.41	0.00	0.00	0.00
15,800.00	90.00	359.39	6,755.00	8,050.96	-1,465.22	8,179.45	0.00	0.00	0.00
15,900.00	90.00	359.39	6,755.00	8,150.95	-1,466.29	8,278.48	0.00	0.00	0.00
16,000.00	90.00	359.39	6,755.00	8,250.95	-1,467.35	8,377.52	0.00	0.00	0.00
16,100.00	90.00	359.39	6,755.00	8,350.94	-1,468.42	8,476.55	0.00	0.00	0.00
16,200.00	90.00	359.39	6,755.00	8,450.94	-1,469.49	8,575.59	0.00	0.00	0.00
16,300.00	90.00	359.39	6,755.00	8,550.93	-1,470.56	8,674.62	0.00	0.00	0.00
16,400.00	90.00	359.39	6,755.00	8,650.92	-1,471.62	8,773.66	0.00	0.00	0.00
16,500.00	90.00	359.39	6,755.00	8,750.92	-1,472.69	8,872.69	0.00	0.00	0.00
16,600.00	90.00	359.39	6,755.00	8,850.91	-1,473.76	8,971.73	0.00	0.00	0.00
16,700.00	90.00	359.39	6,755.00	8,950.91	-1,474.83	9,070.76	0.00	0.00	0.00

Noble Energy, Inc.

Planning Report

Database:	EDMP	Local Co-ordinate Reference:	Well Guttersen State DD30-745
Company:	Northern Region - DJ Basin	TVD Reference:	KB @ 4853.00ft
Project:	Mustang	MD Reference:	KB @ 4853.00ft
Site:	DD Section 30	North Reference:	Grid
Well:	Guttersen State DD30-745	Survey Calculation Method:	Minimum Curvature
Wellbore:	Guttersen State DD30-745		
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)
16,800.00	90.00	359.39	6,755.00	9,050.90	-1,475.89	9,169.80	0.00	0.00	0.00
16,900.00	90.00	359.39	6,755.00	9,150.90	-1,476.96	9,268.83	0.00	0.00	0.00
17,000.00	90.00	359.39	6,755.00	9,250.89	-1,478.03	9,367.86	0.00	0.00	0.00
17,100.00	90.00	359.39	6,755.00	9,350.88	-1,479.10	9,466.90	0.00	0.00	0.00
17,200.00	90.00	359.39	6,755.00	9,450.88	-1,480.16	9,565.93	0.00	0.00	0.00
17,300.00	90.00	359.39	6,755.00	9,550.87	-1,481.23	9,664.97	0.00	0.00	0.00
17,400.00	90.00	359.39	6,755.00	9,650.87	-1,482.30	9,764.00	0.00	0.00	0.00
17,500.00	90.00	359.39	6,755.00	9,750.86	-1,483.37	9,863.04	0.00	0.00	0.00
17,588.29	90.00	359.39	6,755.00	9,839.15	-1,484.31	9,950.48	0.00	0.00	0.00
TD @ 17588.29' MD/6755.00' TVD									

Design Targets									
Target Name	- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	
	- Shape								Latitude Longitude
Guttersen State DD30	- plan misses target center by 446.28ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)	0.00	0.01	0.00	-23.33	-445.66	1,313,861.49	3,286,064.47	40.1904122 -104.4760195
	- Point								
Guttersen State DD30	- plan hits target center	0.00	0.00	5,999.96	-907.85	-1,105.36	1,312,976.97	3,285,404.77	40.1880052 -104.4784172
	- Point								
Guttersen State DD30	- plan hits target center	0.00	0.01	6,755.00	-295.38	-1,376.11	1,313,589.44	3,285,134.02	40.1896949 -104.4793610
	- Point								
Guttersen State DD30	- plan misses target center by 0.92ft at 17588.29ft MD (6755.00 TVD, 9839.15 N, -1484.31 E)	0.00	0.00	6,755.00	9,839.28	-1,483.40	1,323,724.08	3,285,026.74	40.2175172 -104.4793275
	- Point								

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
630.00	630.00	Pierre				
716.00	716.00	Upper Pierre Aquifer Top				
1,653.00	1,653.00	Upper Pierre Aquifer Base				
3,693.52	3,633.00	Parkman				
4,156.09	4,055.00	Sussex				
4,358.88	4,240.00	Shannon				
6,187.23	5,908.00	Teepee Buttes				
6,876.68	6,525.00	Sharon Springs				
6,941.30	6,571.00	Top A Chalk				
6,944.25	6,573.00	Top A Marl				
6,965.28	6,587.00	Top B Chalk				
7,049.16	6,638.00	Top B Marl				
7,210.88	6,712.00	Top C Chalk				
7,336.88	6,745.00	Top C Marl				

Noble Energy, Inc.

Planning Report

Database:	EDMP	Local Co-ordinate Reference:	Well Guttersen State DD30-745
Company:	Northern Region - DJ Basin	TVD Reference:	KB @ 4853.00ft
Project:	Mustang	MD Reference:	KB @ 4853.00ft
Site:	DD Section 30	North Reference:	Grid
Well:	Guttersen State DD30-745	Survey Calculation Method:	Minimum Curvature
Wellbore:	Guttersen State DD30-745		
Design:	Plan #1		

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
2,200.00	2,200.00	0.00	0.00	Build: 2°/100'	
3,408.76	3,373.21	-159.46	-194.16	Hold: 24.18° Inc, 230.60° Azm	
6,288.02	5,999.96	-907.85	-1,105.36	KOP: Build 9°/100' @ 6288.02' MD	
7,453.18	6,755.00	-295.38	-1,376.11	LP: 7453.18' MD, 90.00° Inc, 359.39° Azm	
17,588.29	6,755.00	9,839.15	-1,484.31	TD @ 17588.29' MD/6755.00' TVD	

Northern Region - DJ Basin

Mustang

DD Section 30

Guttersen State DD30-745

Guttersen State DD30-745

Plan: Plan #1

Standard Planning Report

28 August, 2018

Noble Energy, Inc.

Planning Report

Database:	EDMP	Local Co-ordinate Reference:	Well Guttersen State DD30-745
Company:	Northern Region - DJ Basin	TVD Reference:	KB @ 4853.00ft
Project:	Mustang	MD Reference:	KB @ 4853.00ft
Site:	DD Section 30	North Reference:	Grid
Well:	Guttersen State DD30-745	Survey Calculation Method:	Minimum Curvature
Wellbore:	Guttersen State DD30-745		
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	DD Section 30		
Site Position:		Northing:	1,316,013.13 usft
From:	Lat/Long	Easting:	3,284,747.15 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in
		Latitude:	40.1963600
		Longitude:	-104.4806460
		Grid Convergence:	0.66 °

Well	Guttersen State DD30-745		
Well Position	+N/-S	-2,128.32 ft	Northing: 1,313,884.82 usft
	+E/-W	1,762.98 ft	Easting: 3,286,510.13 usft
Position Uncertainty	0.00 ft	Wellhead Elevation:	Latitude: 40.1904621
			Longitude: -104.4744235
			Ground Level: 4,823.00 ft

Wellbore	Guttersen State DD30-745				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	7/12/2018	7.92	66.70	52,191.74577749

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	351.42

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	
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,408.76	24.18	230.60	3,373.21	-159.46	-194.16	2.00	2.00	0.00	230.60	
6,288.02	24.18	230.60	5,999.96	-907.85	-1,105.36	0.00	0.00	0.00	0.00	
7,453.18	90.00	359.39	6,755.00	-295.38	-1,376.11	9.00	5.65	11.05	126.25	Guttersen State DD
17,588.29	90.00	359.39	6,755.00	9,839.15	-1,484.31	0.00	0.00	0.00	0.00	Guttersen State DD

Noble Energy, Inc.

Planning Report

Database:	EDMP	Local Co-ordinate Reference:	Well Guttersen State DD30-745
Company:	Northern Region - DJ Basin	TVD Reference:	KB @ 4853.00ft
Project:	Mustang	MD Reference:	KB @ 4853.00ft
Site:	DD Section 30	North Reference:	Grid
Well:	Guttersen State DD30-745	Survey Calculation Method:	Minimum Curvature
Wellbore:	Guttersen State DD30-745		
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
630.00	0.00	0.00	630.00	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
716.00	0.00	0.00	716.00	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
1,653.00	0.00	0.00	1,653.00	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
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
Build: 2°/100'									
2,300.00	2.00	230.60	2,299.98	-1.11	-1.35	-0.89	2.00	2.00	0.00
2,400.00	4.00	230.60	2,399.84	-4.43	-5.39	-3.58	2.00	2.00	0.00
2,500.00	6.00	230.60	2,499.45	-9.96	-12.13	-8.04	2.00	2.00	0.00
2,600.00	8.00	230.60	2,598.70	-17.69	-21.54	-14.28	2.00	2.00	0.00
2,700.00	10.00	230.60	2,697.47	-27.62	-33.63	-22.30	2.00	2.00	0.00
2,800.00	12.00	230.60	2,795.62	-39.73	-48.38	-32.07	2.00	2.00	0.00
2,900.00	14.00	230.60	2,893.06	-54.01	-65.76	-43.60	2.00	2.00	0.00
3,000.00	16.00	230.60	2,989.64	-70.44	-85.76	-56.85	2.00	2.00	0.00
3,100.00	18.00	230.60	3,085.27	-88.99	-108.35	-71.83	2.00	2.00	0.00
3,200.00	20.00	230.60	3,179.82	-109.65	-133.51	-88.51	2.00	2.00	0.00
3,300.00	22.00	230.60	3,273.17	-132.40	-161.20	-106.87	2.00	2.00	0.00
3,408.76	24.18	230.60	3,373.21	-159.46	-194.16	-128.72	2.00	2.00	0.00
Hold: 24.18° Inc, 230.60° Azm									
3,500.00	24.18	230.60	3,456.45	-183.18	-223.03	-147.86	0.00	0.00	0.00
3,600.00	24.18	230.60	3,547.68	-209.17	-254.68	-168.84	0.00	0.00	0.00
3,693.52	24.18	230.60	3,633.00	-233.48	-284.28	-188.46	0.00	0.00	0.00
Parkman									
3,700.00	24.18	230.60	3,638.91	-235.16	-286.33	-189.82	0.00	0.00	0.00
3,800.00	24.18	230.60	3,730.14	-261.16	-317.97	-210.80	0.00	0.00	0.00
3,900.00	24.18	230.60	3,821.37	-287.15	-349.62	-231.78	0.00	0.00	0.00
4,000.00	24.18	230.60	3,912.60	-313.14	-381.27	-252.76	0.00	0.00	0.00
4,100.00	24.18	230.60	4,003.83	-339.13	-412.91	-273.74	0.00	0.00	0.00
4,156.09	24.18	230.60	4,055.00	-353.71	-430.67	-285.51	0.00	0.00	0.00

Noble Energy, Inc.

Planning Report

Database:	EDMP	Local Co-ordinate Reference:	Well Guttersen State DD30-745
Company:	Northern Region - DJ Basin	TVD Reference:	KB @ 4853.00ft
Project:	Mustang	MD Reference:	KB @ 4853.00ft
Site:	DD Section 30	North Reference:	Grid
Well:	Guttersen State DD30-745	Survey Calculation Method:	Minimum Curvature
Wellbore:	Guttersen State DD30-745		
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)
Sussex									
4,200.00	24.18	230.60	4,095.06	-365.12	-444.56	-294.72	0.00	0.00	0.00
4,300.00	24.18	230.60	4,186.29	-391.12	-476.21	-315.70	0.00	0.00	0.00
4,358.88	24.18	230.60	4,240.00	-406.42	-494.84	-328.06	0.00	0.00	0.00
Shannon									
4,400.00	24.18	230.60	4,277.52	-417.11	-507.86	-336.68	0.00	0.00	0.00
4,500.00	24.18	230.60	4,368.75	-443.10	-539.50	-357.67	0.00	0.00	0.00
4,600.00	24.18	230.60	4,459.98	-469.09	-571.15	-378.65	0.00	0.00	0.00
4,700.00	24.18	230.60	4,551.21	-495.08	-602.80	-399.63	0.00	0.00	0.00
4,800.00	24.18	230.60	4,642.44	-521.08	-634.44	-420.61	0.00	0.00	0.00
4,900.00	24.18	230.60	4,733.67	-547.07	-666.09	-441.59	0.00	0.00	0.00
5,000.00	24.18	230.60	4,824.90	-573.06	-697.74	-462.57	0.00	0.00	0.00
5,100.00	24.18	230.60	4,916.13	-599.05	-729.39	-483.55	0.00	0.00	0.00
5,200.00	24.18	230.60	5,007.36	-625.05	-761.03	-504.53	0.00	0.00	0.00
5,300.00	24.18	230.60	5,098.59	-651.04	-792.68	-525.51	0.00	0.00	0.00
5,400.00	24.18	230.60	5,189.82	-677.03	-824.33	-546.49	0.00	0.00	0.00
5,500.00	24.18	230.60	5,281.05	-703.02	-855.97	-567.47	0.00	0.00	0.00
5,600.00	24.18	230.60	5,372.28	-729.01	-887.62	-588.45	0.00	0.00	0.00
5,700.00	24.18	230.60	5,463.51	-755.01	-919.27	-609.43	0.00	0.00	0.00
5,800.00	24.18	230.60	5,554.74	-781.00	-950.91	-630.41	0.00	0.00	0.00
5,900.00	24.18	230.60	5,645.97	-806.99	-982.56	-651.39	0.00	0.00	0.00
6,000.00	24.18	230.60	5,737.20	-832.98	-1,014.21	-672.37	0.00	0.00	0.00
6,100.00	24.18	230.60	5,828.42	-858.97	-1,045.86	-693.35	0.00	0.00	0.00
6,187.23	24.18	230.60	5,908.00	-881.65	-1,073.46	-711.65	0.00	0.00	0.00
Teepee Buttes									
6,200.00	24.18	230.60	5,919.65	-884.97	-1,077.50	-714.33	0.00	0.00	0.00
6,288.02	24.18	230.60	5,999.96	-907.85	-1,105.36	-732.80	0.00	0.00	0.00
KOP: Build 9°/100' @ 6288.02' MD									
6,300.00	23.55	232.78	6,010.91	-910.85	-1,109.16	-735.21	9.00	-5.20	18.17
6,350.00	21.33	243.05	6,057.14	-921.02	-1,125.23	-742.86	9.00	-4.45	20.54
6,400.00	19.85	255.16	6,103.97	-927.32	-1,141.55	-746.66	9.00	-2.96	24.23
6,450.00	19.29	268.52	6,151.10	-929.70	-1,158.02	-746.56	9.00	-1.12	26.72
6,500.00	19.72	281.96	6,198.26	-928.17	-1,174.53	-742.58	9.00	0.87	26.88
6,550.00	21.09	294.28	6,245.14	-922.72	-1,191.00	-734.73	9.00	2.74	24.64
6,600.00	23.24	304.80	6,291.46	-913.38	-1,207.31	-723.07	9.00	4.28	21.03
6,650.00	25.96	313.43	6,336.93	-900.23	-1,223.36	-707.67	9.00	5.44	17.26
6,700.00	29.09	320.42	6,381.28	-883.33	-1,239.06	-688.61	9.00	6.28	13.99
6,750.00	32.53	326.11	6,424.23	-862.79	-1,254.31	-666.03	9.00	6.87	11.38
6,800.00	36.17	330.80	6,465.51	-838.74	-1,269.01	-640.05	9.00	7.29	9.37
6,850.00	39.97	334.71	6,504.87	-811.32	-1,283.08	-610.85	9.00	7.60	7.84
6,876.68	42.04	336.56	6,525.00	-795.37	-1,290.29	-594.00	9.00	7.78	6.91
Sharon Springs									
6,900.00	43.88	338.05	6,542.07	-780.71	-1,296.42	-578.59	9.00	7.87	6.40
6,941.30	47.17	340.46	6,571.00	-753.15	-1,306.84	-549.78	9.00	7.98	5.84
Top A Chalk									
6,944.25	47.41	340.63	6,573.00	-751.11	-1,307.56	-547.66	9.00	8.04	5.50
Top A Marl									
6,950.00	47.87	340.94	6,576.87	-747.10	-1,308.96	-543.48	9.00	8.05	5.44
6,965.28	49.11	341.75	6,587.00	-736.25	-1,312.62	-532.21	9.00	8.08	5.30
Top B Chalk									
7,000.00	51.93	343.48	6,609.07	-710.68	-1,320.62	-505.73	9.00	8.13	4.99
7,049.16	55.97	345.72	6,638.00	-672.37	-1,331.15	-466.28	9.00	8.21	4.55
Top B Marl									

Noble Energy, Inc.

Planning Report

Database:	EDMP	Local Co-ordinate Reference:	Well Guttersen State DD30-745
Company:	Northern Region - DJ Basin	TVD Reference:	KB @ 4853.00ft
Project:	Mustang	MD Reference:	KB @ 4853.00ft
Site:	DD Section 30	North Reference:	Grid
Well:	Guttersen State DD30-745	Survey Calculation Method:	Minimum Curvature
Wellbore:	Guttersen State DD30-745		
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)
7,050.00	56.04	345.76	6,638.47	-671.69	-1,331.32	-465.59	9.00	8.26	4.32
7,100.00	60.19	347.82	6,664.88	-630.37	-1,341.00	-423.28	9.00	8.29	4.13
7,150.00	64.36	349.72	6,688.14	-586.97	-1,349.60	-379.08	9.00	8.35	3.80
7,200.00	68.56	351.49	6,708.10	-541.76	-1,357.07	-333.26	9.00	8.40	3.54
7,210.88	69.47	351.86	6,712.00	-531.70	-1,358.54	-323.10	9.00	8.42	3.41
Top C Chalk									
7,250.00	72.77	353.16	6,724.66	-495.01	-1,363.36	-286.10	9.00	8.43	3.32
7,300.00	77.00	354.76	6,737.69	-447.02	-1,368.44	-237.89	9.00	8.46	3.19
7,336.88	80.13	355.90	6,745.00	-411.00	-1,371.38	-201.83	9.00	8.47	3.10
Top C Marl									
7,350.00	81.24	356.30	6,747.12	-398.08	-1,372.26	-188.93	9.00	8.48	3.05
7,400.00	85.48	357.80	6,752.90	-348.49	-1,374.81	-139.51	9.00	8.49	3.01
7,453.18	90.00	359.39	6,755.00	-295.38	-1,376.11	-86.81	9.00	8.49	2.98
LP: 7453.18' MD, 90.00° Inc, 359.39° Azm									
7,500.00	90.00	359.39	6,755.00	-248.57	-1,376.61	-40.44	0.00	0.00	0.00
7,600.00	90.00	359.39	6,755.00	-148.57	-1,377.68	58.60	0.00	0.00	0.00
7,700.00	90.00	359.39	6,755.00	-48.58	-1,378.75	157.63	0.00	0.00	0.00
7,800.00	90.00	359.39	6,755.00	51.41	-1,379.82	256.67	0.00	0.00	0.00
7,900.00	90.00	359.39	6,755.00	151.41	-1,380.88	355.70	0.00	0.00	0.00
8,000.00	90.00	359.39	6,755.00	251.40	-1,381.95	454.74	0.00	0.00	0.00
8,100.00	90.00	359.39	6,755.00	351.40	-1,383.02	553.77	0.00	0.00	0.00
8,200.00	90.00	359.39	6,755.00	451.39	-1,384.09	652.80	0.00	0.00	0.00
8,300.00	90.00	359.39	6,755.00	551.39	-1,385.15	751.84	0.00	0.00	0.00
8,400.00	90.00	359.39	6,755.00	651.38	-1,386.22	850.87	0.00	0.00	0.00
8,500.00	90.00	359.39	6,755.00	751.37	-1,387.29	949.91	0.00	0.00	0.00
8,600.00	90.00	359.39	6,755.00	851.37	-1,388.36	1,048.94	0.00	0.00	0.00
8,700.00	90.00	359.39	6,755.00	951.36	-1,389.42	1,147.98	0.00	0.00	0.00
8,800.00	90.00	359.39	6,755.00	1,051.36	-1,390.49	1,247.01	0.00	0.00	0.00
8,900.00	90.00	359.39	6,755.00	1,151.35	-1,391.56	1,346.05	0.00	0.00	0.00
9,000.00	90.00	359.39	6,755.00	1,251.35	-1,392.63	1,445.08	0.00	0.00	0.00
9,100.00	90.00	359.39	6,755.00	1,351.34	-1,393.69	1,544.12	0.00	0.00	0.00
9,200.00	90.00	359.39	6,755.00	1,451.33	-1,394.76	1,643.15	0.00	0.00	0.00
9,300.00	90.00	359.39	6,755.00	1,551.33	-1,395.83	1,742.19	0.00	0.00	0.00
9,400.00	90.00	359.39	6,755.00	1,651.32	-1,396.90	1,841.22	0.00	0.00	0.00
9,500.00	90.00	359.39	6,755.00	1,751.32	-1,397.96	1,940.26	0.00	0.00	0.00
9,600.00	90.00	359.39	6,755.00	1,851.31	-1,399.03	2,039.29	0.00	0.00	0.00
9,700.00	90.00	359.39	6,755.00	1,951.31	-1,400.10	2,138.33	0.00	0.00	0.00
9,800.00	90.00	359.39	6,755.00	2,051.30	-1,401.17	2,237.36	0.00	0.00	0.00
9,900.00	90.00	359.39	6,755.00	2,151.29	-1,402.23	2,336.40	0.00	0.00	0.00
10,000.00	90.00	359.39	6,755.00	2,251.29	-1,403.30	2,435.43	0.00	0.00	0.00
10,100.00	90.00	359.39	6,755.00	2,351.28	-1,404.37	2,534.47	0.00	0.00	0.00
10,200.00	90.00	359.39	6,755.00	2,451.28	-1,405.44	2,633.50	0.00	0.00	0.00
10,300.00	90.00	359.39	6,755.00	2,551.27	-1,406.50	2,732.53	0.00	0.00	0.00
10,400.00	90.00	359.39	6,755.00	2,651.27	-1,407.57	2,831.57	0.00	0.00	0.00
10,500.00	90.00	359.39	6,755.00	2,751.26	-1,408.64	2,930.60	0.00	0.00	0.00
10,600.00	90.00	359.39	6,755.00	2,851.25	-1,409.71	3,029.64	0.00	0.00	0.00
10,700.00	90.00	359.39	6,755.00	2,951.25	-1,410.77	3,128.67	0.00	0.00	0.00
10,800.00	90.00	359.39	6,755.00	3,051.24	-1,411.84	3,227.71	0.00	0.00	0.00
10,900.00	90.00	359.39	6,755.00	3,151.24	-1,412.91	3,326.74	0.00	0.00	0.00
11,000.00	90.00	359.39	6,755.00	3,251.23	-1,413.98	3,425.78	0.00	0.00	0.00
11,100.00	90.00	359.39	6,755.00	3,351.23	-1,415.04	3,524.81	0.00	0.00	0.00
11,200.00	90.00	359.39	6,755.00	3,451.22	-1,416.11	3,623.85	0.00	0.00	0.00
11,300.00	90.00	359.39	6,755.00	3,551.21	-1,417.18	3,722.88	0.00	0.00	0.00

Noble Energy, Inc.

Planning Report

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Company:	Northern Region - DJ Basin	TVD Reference:	KB @ 4853.00ft
Project:	Mustang	MD Reference:	KB @ 4853.00ft
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Well:	Guttersen State DD30-745	Survey Calculation Method:	Minimum Curvature
Wellbore:	Guttersen State DD30-745		
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)
11,400.00	90.00	359.39	6,755.00	3,651.21	-1,418.25	3,821.92	0.00	0.00	0.00
11,500.00	90.00	359.39	6,755.00	3,751.20	-1,419.31	3,920.95	0.00	0.00	0.00
11,600.00	90.00	359.39	6,755.00	3,851.20	-1,420.38	4,019.99	0.00	0.00	0.00
11,700.00	90.00	359.39	6,755.00	3,951.19	-1,421.45	4,119.02	0.00	0.00	0.00
11,800.00	90.00	359.39	6,755.00	4,051.19	-1,422.52	4,218.06	0.00	0.00	0.00
11,900.00	90.00	359.39	6,755.00	4,151.18	-1,423.58	4,317.09	0.00	0.00	0.00
12,000.00	90.00	359.39	6,755.00	4,251.17	-1,424.65	4,416.13	0.00	0.00	0.00
12,100.00	90.00	359.39	6,755.00	4,351.17	-1,425.72	4,515.16	0.00	0.00	0.00
12,200.00	90.00	359.39	6,755.00	4,451.16	-1,426.79	4,614.20	0.00	0.00	0.00
12,300.00	90.00	359.39	6,755.00	4,551.16	-1,427.85	4,713.23	0.00	0.00	0.00
12,400.00	90.00	359.39	6,755.00	4,651.15	-1,428.92	4,812.27	0.00	0.00	0.00
12,500.00	90.00	359.39	6,755.00	4,751.15	-1,429.99	4,911.30	0.00	0.00	0.00
12,600.00	90.00	359.39	6,755.00	4,851.14	-1,431.06	5,010.33	0.00	0.00	0.00
12,700.00	90.00	359.39	6,755.00	4,951.13	-1,432.13	5,109.37	0.00	0.00	0.00
12,800.00	90.00	359.39	6,755.00	5,051.13	-1,433.19	5,208.40	0.00	0.00	0.00
12,900.00	90.00	359.39	6,755.00	5,151.12	-1,434.26	5,307.44	0.00	0.00	0.00
13,000.00	90.00	359.39	6,755.00	5,251.12	-1,435.33	5,406.47	0.00	0.00	0.00
13,100.00	90.00	359.39	6,755.00	5,351.11	-1,436.40	5,505.51	0.00	0.00	0.00
13,200.00	90.00	359.39	6,755.00	5,451.11	-1,437.46	5,604.54	0.00	0.00	0.00
13,300.00	90.00	359.39	6,755.00	5,551.10	-1,438.53	5,703.58	0.00	0.00	0.00
13,400.00	90.00	359.39	6,755.00	5,651.10	-1,439.60	5,802.61	0.00	0.00	0.00
13,500.00	90.00	359.39	6,755.00	5,751.09	-1,440.67	5,901.65	0.00	0.00	0.00
13,600.00	90.00	359.39	6,755.00	5,851.08	-1,441.73	6,000.68	0.00	0.00	0.00
13,700.00	90.00	359.39	6,755.00	5,951.08	-1,442.80	6,099.72	0.00	0.00	0.00
13,800.00	90.00	359.39	6,755.00	6,051.07	-1,443.87	6,198.75	0.00	0.00	0.00
13,900.00	90.00	359.39	6,755.00	6,151.07	-1,444.94	6,297.79	0.00	0.00	0.00
14,000.00	90.00	359.39	6,755.00	6,251.06	-1,446.00	6,396.82	0.00	0.00	0.00
14,100.00	90.00	359.39	6,755.00	6,351.06	-1,447.07	6,495.86	0.00	0.00	0.00
14,200.00	90.00	359.39	6,755.00	6,451.05	-1,448.14	6,594.89	0.00	0.00	0.00
14,300.00	90.00	359.39	6,755.00	6,551.04	-1,449.21	6,693.93	0.00	0.00	0.00
14,400.00	90.00	359.39	6,755.00	6,651.04	-1,450.27	6,792.96	0.00	0.00	0.00
14,500.00	90.00	359.39	6,755.00	6,751.03	-1,451.34	6,892.00	0.00	0.00	0.00
14,600.00	90.00	359.39	6,755.00	6,851.03	-1,452.41	6,991.03	0.00	0.00	0.00
14,700.00	90.00	359.39	6,755.00	6,951.02	-1,453.48	7,090.06	0.00	0.00	0.00
14,800.00	90.00	359.39	6,755.00	7,051.02	-1,454.54	7,189.10	0.00	0.00	0.00
14,900.00	90.00	359.39	6,755.00	7,151.01	-1,455.61	7,288.13	0.00	0.00	0.00
15,000.00	90.00	359.39	6,755.00	7,251.00	-1,456.68	7,387.17	0.00	0.00	0.00
15,100.00	90.00	359.39	6,755.00	7,351.00	-1,457.75	7,486.20	0.00	0.00	0.00
15,200.00	90.00	359.39	6,755.00	7,450.99	-1,458.81	7,585.24	0.00	0.00	0.00
15,300.00	90.00	359.39	6,755.00	7,550.99	-1,459.88	7,684.27	0.00	0.00	0.00
15,400.00	90.00	359.39	6,755.00	7,650.98	-1,460.95	7,783.31	0.00	0.00	0.00
15,500.00	90.00	359.39	6,755.00	7,750.98	-1,462.02	7,882.34	0.00	0.00	0.00
15,600.00	90.00	359.39	6,755.00	7,850.97	-1,463.08	7,981.38	0.00	0.00	0.00
15,700.00	90.00	359.39	6,755.00	7,950.96	-1,464.15	8,080.41	0.00	0.00	0.00
15,800.00	90.00	359.39	6,755.00	8,050.96	-1,465.22	8,179.45	0.00	0.00	0.00
15,900.00	90.00	359.39	6,755.00	8,150.95	-1,466.29	8,278.48	0.00	0.00	0.00
16,000.00	90.00	359.39	6,755.00	8,250.95	-1,467.35	8,377.52	0.00	0.00	0.00
16,100.00	90.00	359.39	6,755.00	8,350.94	-1,468.42	8,476.55	0.00	0.00	0.00
16,200.00	90.00	359.39	6,755.00	8,450.94	-1,469.49	8,575.59	0.00	0.00	0.00
16,300.00	90.00	359.39	6,755.00	8,550.93	-1,470.56	8,674.62	0.00	0.00	0.00
16,400.00	90.00	359.39	6,755.00	8,650.92	-1,471.62	8,773.66	0.00	0.00	0.00
16,500.00	90.00	359.39	6,755.00	8,750.92	-1,472.69	8,872.69	0.00	0.00	0.00
16,600.00	90.00	359.39	6,755.00	8,850.91	-1,473.76	8,971.73	0.00	0.00	0.00
16,700.00	90.00	359.39	6,755.00	8,950.91	-1,474.83	9,070.76	0.00	0.00	0.00

Noble Energy, Inc.

Planning Report

Database:	EDMP	Local Co-ordinate Reference:	Well Guttersen State DD30-745
Company:	Northern Region - DJ Basin	TVD Reference:	KB @ 4853.00ft
Project:	Mustang	MD Reference:	KB @ 4853.00ft
Site:	DD Section 30	North Reference:	Grid
Well:	Guttersen State DD30-745	Survey Calculation Method:	Minimum Curvature
Wellbore:	Guttersen State DD30-745		
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)
16,800.00	90.00	359.39	6,755.00	9,050.90	-1,475.89	9,169.80	0.00	0.00	0.00
16,900.00	90.00	359.39	6,755.00	9,150.90	-1,476.96	9,268.83	0.00	0.00	0.00
17,000.00	90.00	359.39	6,755.00	9,250.89	-1,478.03	9,367.86	0.00	0.00	0.00
17,100.00	90.00	359.39	6,755.00	9,350.88	-1,479.10	9,466.90	0.00	0.00	0.00
17,200.00	90.00	359.39	6,755.00	9,450.88	-1,480.16	9,565.93	0.00	0.00	0.00
17,300.00	90.00	359.39	6,755.00	9,550.87	-1,481.23	9,664.97	0.00	0.00	0.00
17,400.00	90.00	359.39	6,755.00	9,650.87	-1,482.30	9,764.00	0.00	0.00	0.00
17,500.00	90.00	359.39	6,755.00	9,750.86	-1,483.37	9,863.04	0.00	0.00	0.00
17,588.29	90.00	359.39	6,755.00	9,839.15	-1,484.31	9,950.48	0.00	0.00	0.00
TD @ 17588.29' MD/6755.00' TVD									

Design Targets									
Target Name	- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	
	- Shape								Latitude Longitude
Guttersen State DD30	- plan misses target center by 446.28ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)	0.00	0.01	0.00	-23.33	-445.66	1,313,861.49	3,286,064.47	40.1904122 -104.4760195
	- Point								
Guttersen State DD30	- plan hits target center	0.00	0.00	5,999.96	-907.85	-1,105.36	1,312,976.97	3,285,404.77	40.1880052 -104.4784172
	- Point								
Guttersen State DD30	- plan hits target center	0.00	0.01	6,755.00	-295.38	-1,376.11	1,313,589.44	3,285,134.02	40.1896949 -104.4793610
	- Point								
Guttersen State DD30	- plan misses target center by 0.92ft at 17588.29ft MD (6755.00 TVD, 9839.15 N, -1484.31 E)	0.00	0.00	6,755.00	9,839.28	-1,483.40	1,323,724.08	3,285,026.74	40.2175172 -104.4793275
	- Point								

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
630.00	630.00	Pierre				
716.00	716.00	Upper Pierre Aquifer Top				
1,653.00	1,653.00	Upper Pierre Aquifer Base				
3,693.52	3,633.00	Parkman				
4,156.09	4,055.00	Sussex				
4,358.88	4,240.00	Shannon				
6,187.23	5,908.00	Teepee Buttes				
6,876.68	6,525.00	Sharon Springs				
6,941.30	6,571.00	Top A Chalk				
6,944.25	6,573.00	Top A Marl				
6,965.28	6,587.00	Top B Chalk				
7,049.16	6,638.00	Top B Marl				
7,210.88	6,712.00	Top C Chalk				
7,336.88	6,745.00	Top C Marl				

Noble Energy, Inc.

Planning Report

Database:	EDMP	Local Co-ordinate Reference:	Well Guttersen State DD30-745
Company:	Northern Region - DJ Basin	TVD Reference:	KB @ 4853.00ft
Project:	Mustang	MD Reference:	KB @ 4853.00ft
Site:	DD Section 30	North Reference:	Grid
Well:	Guttersen State DD30-745	Survey Calculation Method:	Minimum Curvature
Wellbore:	Guttersen State DD30-745		
Design:	Plan #1		

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
2,200.00	2,200.00	0.00	0.00	Build: 2°/100'	
3,408.76	3,373.21	-159.46	-194.16	Hold: 24.18° Inc, 230.60° Azm	
6,288.02	5,999.96	-907.85	-1,105.36	KOP: Build 9°/100' @ 6288.02' MD	
7,453.18	6,755.00	-295.38	-1,376.11	LP: 7453.18' MD, 90.00° Inc, 359.39° Azm	
17,588.29	6,755.00	9,839.15	-1,484.31	TD @ 17588.29' MD/6755.00' TVD	