

ConocoPhillips RBU Gold Data

Niobrara Central Zone

Grande

Grande 4-65 20-19 2CH

Grande 4-65 20-19 2CH

Plan: Design A

Standard Planning Report

15 September, 2018

ConocoPhillips

Planning Report

Database:	EDT 14 Central Planning	Local Co-ordinate Reference:	Well Grande 4-65 20-19 2CH
Company:	ConocoPhillips RBU Gold Data	TVD Reference:	25' RKB @ 5689.40ft (25' RKB)
Project:	Niobrara Central Zone	MD Reference:	25' RKB @ 5689.40ft (25' RKB)
Site:	Grande	North Reference:	True
Well:	Grande 4-65 20-19 2CH	Survey Calculation Method:	Minimum Curvature
Wellbore:	Grande 4-65 20-19 2CH		
Design:	Design A		

Project	Niobrara Central Zone, Colorado Central Zone, FIPS Zone: 0502		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		Using geodetic scale factor

Site	Grande				
Site Position:		Northing:	1,679,554.079 usft	Latitude:	39° 41' 47.630 N
From:	Lat/Long	Easting:	3,220,569.758 usft	Longitude:	104° 42' 58.140 W
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.49 °

Well	Grande 4-65 20-19 2CH					
Well Position	+N/-S	-964.57 ft	Northing:	1,678,688.520 usft	Latitude:	39° 41' 38.072 N
	+E/-W	11,469.44 ft	Easting:	3,232,046.956 usft	Longitude:	104° 40' 31.415 W
Position Uncertainty		2.00 ft	Wellhead Elevation:	5,664.40 ft	Ground Level:	5,664.40 ft

Wellbore	Grande 4-65 20-19 2CH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2018	12/1/2018	8.14	66.28	51,851.29284929

Design	Design A			
Audit Notes:				
Version:	0	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	263.88

Plan Survey Tool Program		Date	9/15/2018		
Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	2,199.00	Design A (Grande 4-65 20-19 2C)	Gyro-BM-MS	Gyro - bat/mem drop m/s
2	2,199.00	4,325.00	Design A (Grande 4-65 20-19 2C)	MWD+IFR_No SAG	MWD + IFR (No SAG) correctic
3	4,325.00	6,324.73	Design A (Grande 4-65 20-19 2C)	MWD+IFR_No SAG	MWD + IFR (No SAG) correctic
4	6,324.73	7,877.81	Design A (Grande 4-65 20-19 2C)	MWD+IFR_No SAG	MWD + IFR (No SAG) correctic
5	7,877.81	8,604.70	Design A (Grande 4-65 20-19 2C)	MWD+IFR_No SAG	MWD + IFR (No SAG) correctic
6	8,604.70	18,436.80	Design A (Grande 4-65 20-19 2C)	MWD+IFR_No SAG	MWD + IFR (No SAG) correctic

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Project:	Niobrara Central Zone	MD Reference:	25' RKB @ 5689.40ft (25' RKB)
Site:	Grande	North Reference:	True
Well:	Grande 4-65 20-19 2CH	Survey Calculation Method:	Minimum Curvature
Wellbore:	Grande 4-65 20-19 2CH		
Design:	Design A		

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	
4,325.00	0.00	0.00	4,325.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,324.73	30.00	216.52	6,234.63	-411.18	-304.43	1.50	1.50	0.00	216.52	
7,877.81	30.00	216.52	7,579.69	-1,035.21	-766.44	0.00	0.00	0.00	0.00	
8,604.70	89.97	270.05	7,945.00	-1,204.23	-1,313.40	10.00	8.25	7.36	57.39	Grande 4-65 20-19 2CH
18,436.80	89.97	270.05	7,950.00	-1,195.64	-11,145.50	0.00	0.00	0.00	0.00	Grande 4-65 20-19 2CH

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Site:	Grande	North Reference:	True
Well:	Grande 4-65 20-19 2CH	Survey Calculation Method:	Minimum Curvature
Wellbore:	Grande 4-65 20-19 2CH		
Design:	Design A		

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
SHL: 964' FNL, 851' FWL									
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
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,762.00	0.00	0.00	1,762.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills Top									
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
1,999.00	0.00	0.00	1,999.00	0.00	0.00	0.00	0.00	0.00	0.00
Pierre Top - Fox Hills Base									
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
2,199.00	0.00	0.00	2,199.00	0.00	0.00	0.00	0.00	0.00	0.00
Surface Casing - 9-5/8" Casing									
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00
4,325.00	0.00	0.00	4,325.00	0.00	0.00	0.00	0.00	0.00	0.00
4,400.00	1.13	216.52	4,400.00	-0.59	-0.44	0.50	1.50	1.50	0.00
4,500.00	2.63	216.52	4,499.94	-3.22	-2.38	2.71	1.50	1.50	0.00

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Wellbore:	Grande 4-65 20-19 2CH		
Design:	Design A		

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)
4,600.00	4.13	216.52	4,599.76	-7.95	-5.89	6.70	1.50	1.50	0.00
4,700.00	5.63	216.52	4,699.40	-14.78	-10.94	12.46	1.50	1.50	0.00
4,800.00	7.13	216.52	4,798.78	-23.71	-17.55	19.98	1.50	1.50	0.00
4,900.00	8.63	216.52	4,897.83	-34.72	-25.70	29.26	1.50	1.50	0.00
5,000.00	10.13	216.52	4,996.49	-47.81	-35.40	40.29	1.50	1.50	0.00
5,100.00	11.63	216.52	5,094.69	-62.97	-46.62	53.07	1.50	1.50	0.00
5,200.00	13.13	216.52	5,192.37	-80.20	-59.37	67.59	1.50	1.50	0.00
5,300.00	14.63	216.52	5,289.45	-99.47	-73.64	83.83	1.50	1.50	0.00
5,400.00	16.13	216.52	5,385.87	-120.78	-89.42	101.79	1.50	1.50	0.00
5,500.00	17.63	216.52	5,481.56	-144.11	-106.69	121.45	1.50	1.50	0.00
5,600.00	19.13	216.52	5,576.46	-169.44	-125.45	142.81	1.50	1.50	0.00
5,700.00	20.63	216.52	5,670.50	-196.76	-145.68	165.83	1.50	1.50	0.00
5,800.00	22.13	216.52	5,763.62	-226.05	-167.36	190.52	1.50	1.50	0.00
5,900.00	23.63	216.52	5,855.75	-257.29	-190.49	216.85	1.50	1.50	0.00
6,000.00	25.13	216.52	5,946.83	-290.46	-215.05	244.80	1.50	1.50	0.00
6,100.00	26.63	216.52	6,036.80	-325.54	-241.02	274.36	1.50	1.50	0.00
6,200.00	28.13	216.52	6,125.60	-362.49	-268.38	305.51	1.50	1.50	0.00
6,300.00	29.63	216.52	6,213.17	-401.30	-297.11	338.22	1.50	1.50	0.00
6,324.73	30.00	216.52	6,234.63	-411.18	-304.43	346.55	1.50	1.50	0.00
EOB: 1375' FNL, 547' FWL									
6,400.00	30.00	216.52	6,299.81	-441.42	-326.82	372.03	0.00	0.00	0.00
6,500.00	30.00	216.52	6,386.42	-481.60	-356.57	405.90	0.00	0.00	0.00
6,600.00	30.00	216.52	6,473.03	-521.78	-386.31	439.76	0.00	0.00	0.00
6,700.00	30.00	216.52	6,559.63	-561.96	-416.06	473.63	0.00	0.00	0.00
6,800.00	30.00	216.52	6,646.24	-602.14	-445.81	507.49	0.00	0.00	0.00
6,900.00	30.00	216.52	6,732.84	-642.32	-475.56	541.35	0.00	0.00	0.00
7,000.00	30.00	216.52	6,819.45	-682.50	-505.31	575.22	0.00	0.00	0.00
7,100.00	30.00	216.52	6,906.06	-722.68	-535.06	609.08	0.00	0.00	0.00
7,200.00	30.00	216.52	6,992.66	-762.86	-564.80	642.95	0.00	0.00	0.00
7,300.00	30.00	216.52	7,079.27	-803.04	-594.55	676.81	0.00	0.00	0.00
7,400.00	30.00	216.52	7,165.87	-843.22	-624.30	710.67	0.00	0.00	0.00
7,500.00	30.00	216.52	7,252.48	-883.40	-654.05	744.54	0.00	0.00	0.00
7,600.00	30.00	216.52	7,339.09	-923.58	-683.80	778.40	0.00	0.00	0.00
7,700.00	30.00	216.52	7,425.69	-963.76	-713.54	812.27	0.00	0.00	0.00
7,800.00	30.00	216.52	7,512.30	-1,003.94	-743.29	846.13	0.00	0.00	0.00
7,877.81	30.00	216.52	7,579.69	-1,035.21	-766.44	872.48	0.00	0.00	0.00
KOP: 1999' FNL, 85' FWL									
7,900.00	31.24	220.12	7,598.78	-1,044.07	-773.45	880.39	10.00	5.62	16.25
7,950.00	34.38	227.32	7,640.82	-1,063.57	-792.19	901.11	10.00	6.27	14.40
8,000.00	37.87	233.40	7,681.21	-1,082.30	-814.91	925.69	10.00	6.98	12.16
8,050.00	41.63	238.56	7,719.66	-1,100.12	-841.41	953.95	10.00	7.52	10.33
8,100.00	45.58	243.00	7,755.87	-1,116.90	-871.51	985.66	10.00	7.91	8.87
8,150.00	49.69	246.86	7,789.56	-1,132.50	-904.97	1,020.60	10.00	8.21	7.73
8,200.00	53.91	250.28	7,820.48	-1,146.82	-941.54	1,058.49	10.00	8.44	6.83
8,216.44	55.32	251.32	7,830.00	-1,151.23	-954.20	1,071.54	10.00	8.56	6.34
Niobrara Top									
8,250.00	58.22	253.34	7,848.39	-1,159.74	-980.94	1,099.04	10.00	8.64	6.02
8,300.00	62.59	256.13	7,873.09	-1,171.16	-1,022.88	1,141.95	10.00	8.75	5.58
8,350.00	67.01	258.70	7,894.37	-1,180.99	-1,067.02	1,186.89	10.00	8.85	5.15
8,400.00	71.48	261.11	7,912.09	-1,189.16	-1,113.04	1,233.52	10.00	8.93	4.82
8,450.00	75.97	263.40	7,926.10	-1,195.62	-1,160.58	1,281.48	10.00	8.99	4.57
8,492.43	79.80	265.27	7,935.00	-1,199.71	-1,201.86	1,322.96	10.00	9.02	4.41
C Chalk Top									

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Wellbore:	Grande 4-65 20-19 2CH		
Design:	Design A		

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)
8,500.00	80.48	265.60	7,936.30	-1,200.30	-1,209.29	1,330.41	10.00	9.04	4.34
8,550.00	85.01	267.74	7,942.61	-1,203.17	-1,258.79	1,379.94	10.00	9.05	4.28
8,604.70	89.97	270.05	7,945.00	-1,204.23	-1,313.41	1,434.36	10.00	9.07	4.22
BPI/LP: 2165' FNL, 460' FEL									
8,700.00	89.97	270.05	7,945.05	-1,204.14	-1,408.71	1,529.10	0.00	0.00	0.00
8,800.00	89.97	270.05	7,945.10	-1,204.06	-1,508.71	1,628.52	0.00	0.00	0.00
8,900.00	89.97	270.05	7,945.15	-1,203.97	-1,608.71	1,727.94	0.00	0.00	0.00
9,000.00	89.97	270.05	7,945.20	-1,203.88	-1,708.71	1,827.36	0.00	0.00	0.00
9,100.00	89.97	270.05	7,945.25	-1,203.79	-1,808.71	1,926.78	0.00	0.00	0.00
9,200.00	89.97	270.05	7,945.30	-1,203.71	-1,908.71	2,026.21	0.00	0.00	0.00
9,300.00	89.97	270.05	7,945.35	-1,203.62	-2,008.71	2,125.63	0.00	0.00	0.00
9,400.00	89.97	270.05	7,945.40	-1,203.53	-2,108.71	2,225.05	0.00	0.00	0.00
9,500.00	89.97	270.05	7,945.46	-1,203.45	-2,208.71	2,324.47	0.00	0.00	0.00
9,600.00	89.97	270.05	7,945.51	-1,203.36	-2,308.71	2,423.89	0.00	0.00	0.00
9,700.00	89.97	270.05	7,945.56	-1,203.27	-2,408.71	2,523.31	0.00	0.00	0.00
9,800.00	89.97	270.05	7,945.61	-1,203.19	-2,508.71	2,622.73	0.00	0.00	0.00
9,900.00	89.97	270.05	7,945.66	-1,203.10	-2,608.71	2,722.15	0.00	0.00	0.00
10,000.00	89.97	270.05	7,945.71	-1,203.01	-2,708.71	2,821.57	0.00	0.00	0.00
10,100.00	89.97	270.05	7,945.76	-1,202.92	-2,808.71	2,920.99	0.00	0.00	0.00
10,200.00	89.97	270.05	7,945.81	-1,202.84	-2,908.71	3,020.41	0.00	0.00	0.00
10,300.00	89.97	270.05	7,945.86	-1,202.75	-3,008.71	3,119.83	0.00	0.00	0.00
10,400.00	89.97	270.05	7,945.91	-1,202.66	-3,108.71	3,219.25	0.00	0.00	0.00
10,500.00	89.97	270.05	7,945.96	-1,202.58	-3,208.71	3,318.67	0.00	0.00	0.00
10,600.00	89.97	270.05	7,946.01	-1,202.49	-3,308.71	3,418.09	0.00	0.00	0.00
10,700.00	89.97	270.05	7,946.07	-1,202.40	-3,408.71	3,517.51	0.00	0.00	0.00
10,800.00	89.97	270.05	7,946.12	-1,202.31	-3,508.71	3,616.93	0.00	0.00	0.00
10,900.00	89.97	270.05	7,946.17	-1,202.23	-3,608.71	3,716.35	0.00	0.00	0.00
11,000.00	89.97	270.05	7,946.22	-1,202.14	-3,708.71	3,815.77	0.00	0.00	0.00
11,100.00	89.97	270.05	7,946.27	-1,202.05	-3,808.71	3,915.19	0.00	0.00	0.00
11,200.00	89.97	270.05	7,946.32	-1,201.97	-3,908.71	4,014.61	0.00	0.00	0.00
11,300.00	89.97	270.05	7,946.37	-1,201.88	-4,008.71	4,114.03	0.00	0.00	0.00
11,400.00	89.97	270.05	7,946.42	-1,201.79	-4,108.71	4,213.45	0.00	0.00	0.00
11,500.00	89.97	270.05	7,946.47	-1,201.71	-4,208.71	4,312.87	0.00	0.00	0.00
11,600.00	89.97	270.05	7,946.52	-1,201.62	-4,308.71	4,412.29	0.00	0.00	0.00
11,700.00	89.97	270.05	7,946.57	-1,201.53	-4,408.71	4,511.71	0.00	0.00	0.00
11,800.00	89.97	270.05	7,946.63	-1,201.44	-4,508.71	4,611.13	0.00	0.00	0.00
11,900.00	89.97	270.05	7,946.68	-1,201.36	-4,608.71	4,710.55	0.00	0.00	0.00
12,000.00	89.97	270.05	7,946.73	-1,201.27	-4,708.71	4,809.97	0.00	0.00	0.00
12,100.00	89.97	270.05	7,946.78	-1,201.18	-4,808.71	4,909.39	0.00	0.00	0.00
12,200.00	89.97	270.05	7,946.83	-1,201.10	-4,908.71	5,008.81	0.00	0.00	0.00
12,300.00	89.97	270.05	7,946.88	-1,201.01	-5,008.71	5,108.23	0.00	0.00	0.00
12,400.00	89.97	270.05	7,946.93	-1,200.92	-5,108.71	5,207.65	0.00	0.00	0.00
12,500.00	89.97	270.05	7,946.98	-1,200.83	-5,208.71	5,307.07	0.00	0.00	0.00
12,600.00	89.97	270.05	7,947.03	-1,200.75	-5,308.71	5,406.49	0.00	0.00	0.00
12,700.00	89.97	270.05	7,947.08	-1,200.66	-5,408.71	5,505.91	0.00	0.00	0.00
12,800.00	89.97	270.05	7,947.13	-1,200.57	-5,508.71	5,605.33	0.00	0.00	0.00
12,900.00	89.97	270.05	7,947.18	-1,200.49	-5,608.71	5,704.75	0.00	0.00	0.00
13,000.00	89.97	270.05	7,947.24	-1,200.40	-5,708.71	5,804.17	0.00	0.00	0.00
13,100.00	89.97	270.05	7,947.29	-1,200.31	-5,808.71	5,903.60	0.00	0.00	0.00
13,200.00	89.97	270.05	7,947.34	-1,200.23	-5,908.71	6,003.02	0.00	0.00	0.00
13,300.00	89.97	270.05	7,947.39	-1,200.14	-6,008.71	6,102.44	0.00	0.00	0.00
13,400.00	89.97	270.05	7,947.44	-1,200.05	-6,108.71	6,201.86	0.00	0.00	0.00
13,500.00	89.97	270.05	7,947.49	-1,199.96	-6,208.71	6,301.28	0.00	0.00	0.00

ConocoPhillips

Planning Report

Database:	EDT 14 Central Planning	Local Co-ordinate Reference:	Well Grande 4-65 20-19 2CH
Company:	ConocoPhillips RBU Gold Data	TVD Reference:	25' RKB @ 5689.40ft (25' RKB)
Project:	Niobrara Central Zone	MD Reference:	25' RKB @ 5689.40ft (25' RKB)
Site:	Grande	North Reference:	True
Well:	Grande 4-65 20-19 2CH	Survey Calculation Method:	Minimum Curvature
Wellbore:	Grande 4-65 20-19 2CH		
Design:	Design A		

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)
13,600.00	89.97	270.05	7,947.54	-1,199.88	-6,308.71	6,400.70	0.00	0.00	0.00
13,700.00	89.97	270.05	7,947.59	-1,199.79	-6,408.71	6,500.12	0.00	0.00	0.00
13,800.00	89.97	270.05	7,947.64	-1,199.70	-6,508.71	6,599.54	0.00	0.00	0.00
13,900.00	89.97	270.05	7,947.69	-1,199.62	-6,608.71	6,698.96	0.00	0.00	0.00
14,000.00	89.97	270.05	7,947.74	-1,199.53	-6,708.71	6,798.38	0.00	0.00	0.00
14,100.00	89.97	270.05	7,947.79	-1,199.44	-6,808.71	6,897.80	0.00	0.00	0.00
14,200.00	89.97	270.05	7,947.85	-1,199.36	-6,908.71	6,997.22	0.00	0.00	0.00
14,300.00	89.97	270.05	7,947.90	-1,199.27	-7,008.71	7,096.64	0.00	0.00	0.00
14,400.00	89.97	270.05	7,947.95	-1,199.18	-7,108.71	7,196.06	0.00	0.00	0.00
14,500.00	89.97	270.05	7,948.00	-1,199.09	-7,208.71	7,295.48	0.00	0.00	0.00
14,600.00	89.97	270.05	7,948.05	-1,199.01	-7,308.71	7,394.90	0.00	0.00	0.00
14,700.00	89.97	270.05	7,948.10	-1,198.92	-7,408.71	7,494.32	0.00	0.00	0.00
14,800.00	89.97	270.05	7,948.15	-1,198.83	-7,508.71	7,593.74	0.00	0.00	0.00
14,900.00	89.97	270.05	7,948.20	-1,198.75	-7,608.71	7,693.16	0.00	0.00	0.00
15,000.00	89.97	270.05	7,948.25	-1,198.66	-7,708.71	7,792.58	0.00	0.00	0.00
15,100.00	89.97	270.05	7,948.30	-1,198.57	-7,808.71	7,892.00	0.00	0.00	0.00
15,200.00	89.97	270.05	7,948.35	-1,198.48	-7,908.71	7,991.42	0.00	0.00	0.00
15,300.00	89.97	270.05	7,948.40	-1,198.40	-8,008.71	8,090.84	0.00	0.00	0.00
15,400.00	89.97	270.05	7,948.46	-1,198.31	-8,108.71	8,190.26	0.00	0.00	0.00
15,500.00	89.97	270.05	7,948.51	-1,198.22	-8,208.71	8,289.68	0.00	0.00	0.00
15,600.00	89.97	270.05	7,948.56	-1,198.14	-8,308.71	8,389.10	0.00	0.00	0.00
15,700.00	89.97	270.05	7,948.61	-1,198.05	-8,408.71	8,488.52	0.00	0.00	0.00
15,800.00	89.97	270.05	7,948.66	-1,197.96	-8,508.71	8,587.94	0.00	0.00	0.00
15,900.00	89.97	270.05	7,948.71	-1,197.88	-8,608.71	8,687.36	0.00	0.00	0.00
16,000.00	89.97	270.05	7,948.76	-1,197.79	-8,708.71	8,786.78	0.00	0.00	0.00
16,100.00	89.97	270.05	7,948.81	-1,197.70	-8,808.71	8,886.20	0.00	0.00	0.00
16,200.00	89.97	270.05	7,948.86	-1,197.61	-8,908.71	8,985.62	0.00	0.00	0.00
16,300.00	89.97	270.05	7,948.91	-1,197.53	-9,008.71	9,085.04	0.00	0.00	0.00
16,400.00	89.97	270.05	7,948.96	-1,197.44	-9,108.71	9,184.46	0.00	0.00	0.00
16,500.00	89.97	270.05	7,949.02	-1,197.35	-9,208.71	9,283.88	0.00	0.00	0.00
16,600.00	89.97	270.05	7,949.07	-1,197.27	-9,308.71	9,383.30	0.00	0.00	0.00
16,700.00	89.97	270.05	7,949.12	-1,197.18	-9,408.71	9,482.72	0.00	0.00	0.00
16,800.00	89.97	270.05	7,949.17	-1,197.09	-9,508.71	9,582.14	0.00	0.00	0.00
16,900.00	89.97	270.05	7,949.22	-1,197.00	-9,608.71	9,681.56	0.00	0.00	0.00
17,000.00	89.97	270.05	7,949.27	-1,196.92	-9,708.71	9,780.99	0.00	0.00	0.00
17,100.00	89.97	270.05	7,949.32	-1,196.83	-9,808.71	9,880.41	0.00	0.00	0.00
17,200.00	89.97	270.05	7,949.37	-1,196.74	-9,908.70	9,979.83	0.00	0.00	0.00
17,300.00	89.97	270.05	7,949.42	-1,196.66	-10,008.70	10,079.25	0.00	0.00	0.00
17,400.00	89.97	270.05	7,949.47	-1,196.57	-10,108.70	10,178.67	0.00	0.00	0.00
17,500.00	89.97	270.05	7,949.52	-1,196.48	-10,208.70	10,278.09	0.00	0.00	0.00
17,600.00	89.97	270.05	7,949.57	-1,196.40	-10,308.70	10,377.51	0.00	0.00	0.00
17,700.00	89.97	270.05	7,949.63	-1,196.31	-10,408.70	10,476.93	0.00	0.00	0.00
17,800.00	89.97	270.05	7,949.68	-1,196.22	-10,508.70	10,576.35	0.00	0.00	0.00
17,900.00	89.97	270.05	7,949.73	-1,196.13	-10,608.70	10,675.77	0.00	0.00	0.00
18,000.00	89.97	270.05	7,949.78	-1,196.05	-10,708.70	10,775.19	0.00	0.00	0.00
18,100.00	89.97	270.05	7,949.83	-1,195.96	-10,808.70	10,874.61	0.00	0.00	0.00
18,200.00	89.97	270.05	7,949.88	-1,195.87	-10,908.70	10,974.03	0.00	0.00	0.00
18,300.00	89.97	270.05	7,949.93	-1,195.79	-11,008.70	11,073.45	0.00	0.00	0.00
18,400.00	89.97	270.05	7,949.98	-1,195.70	-11,108.70	11,172.87	0.00	0.00	0.00
18,436.80	89.97	270.05	7,950.00	-1,195.64	-11,145.50	11,209.45	0.00	0.00	0.00
BHL: 2165' FNL, 325' FWL									

ConocoPhillips

Planning Report

Database:	EDT 14 Central Planning	Local Co-ordinate Reference:	Well Grande 4-65 20-19 2CH
Company:	ConocoPhillips RBU Gold Data	TVD Reference:	25' RKB @ 5689.40ft (25' RKB)
Project:	Niobrara Central Zone	MD Reference:	25' RKB @ 5689.40ft (25' RKB)
Site:	Grande	North Reference:	True
Well:	Grande 4-65 20-19 2CH	Survey Calculation Method:	Minimum Curvature
Wellbore:	Grande 4-65 20-19 2CH		
Design:	Design A		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)		
- Shape									
Grande 4-65 20-19 2CH	0.00	0.00	7,945.00	-1,204.23	-1,313.40	1,677,472.438	3,230,744.552	39° 41' 26.171 N	104° 40' 48.216 W
- plan hits target center									
- Point									
Grande 4-65 20-19 2CH	0.00	0.00	7,950.00	-1,195.64	-11,145.50	1,677,391.782	3,220,912.904	39° 41' 26.232 N	104° 42' 53.989 W
- plan hits target center									
- Point									

Casing Points					
Measured Depth	Vertical Depth	Name		Casing Diameter	Hole Diameter
(ft)	(ft)			(")	(")
2,199.00	2,199.00	9-5/8" Casing		9-5/8	12-1/4
18,436.80	7,950.00	5-1/2" Casing		5-1/2	8-1/2

Formations					
Measured Depth	Vertical Depth	Name		Lithology	Dip
(ft)	(ft)				(°)
1,762.00	1,762.00	Fox Hills Top			0.00
1,999.00	1,999.00	Pierre Top - Fox Hills Base			0.00
2,199.00	2,199.00	Surface Casing			0.00
8,216.44	7,830.00	Niobrara Top			0.00
8,492.43	7,935.00	C Chalk Top			0.00

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(ft)	(ft)	+N/-S	+E/-W		
(ft)	(ft)	(ft)	(ft)		
100.00	100.00	0.00	0.00	SHL: 964' FNL, 851' FWL	
6,324.73	6,234.63	-411.18	-304.43	EOB: 1375' FNL, 547' FWL	
7,877.81	7,579.69	-1,035.21	-766.44	KOP: 1999' FNL, 85' FWL	
8,604.70	7,945.00	-1,204.23	-1,313.41	BPI/LP: 2165' FNL, 460' FEL	
18,436.80	7,950.00	-1,195.64	-11,145.50	BHL: 2165' FNL, 325' FWL	