

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_BARCLAY 15-27 PAD

BARCLAY 1N-27HZ

BARCLAY 1N-27HZ

Plan: BARCLAY 1N-27HZ (wp01)

Standard Planning Report

26 July, 2011





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Azimuths to True North

Magnetic North: 8.83°

Magnetic Field

Strength: 53009.0nT

Dip Angle: 66.88°

Date: 7/25/2011

Model: IGRF2010

Project: COLORADO NORTHERN ZONE - 83

Site: WELD BARCLAY 15-27 PAD

Well: BARCLAY 1N-27HZ

Wellbore: BARCLAY 1N-27HZ

Section: SHL:

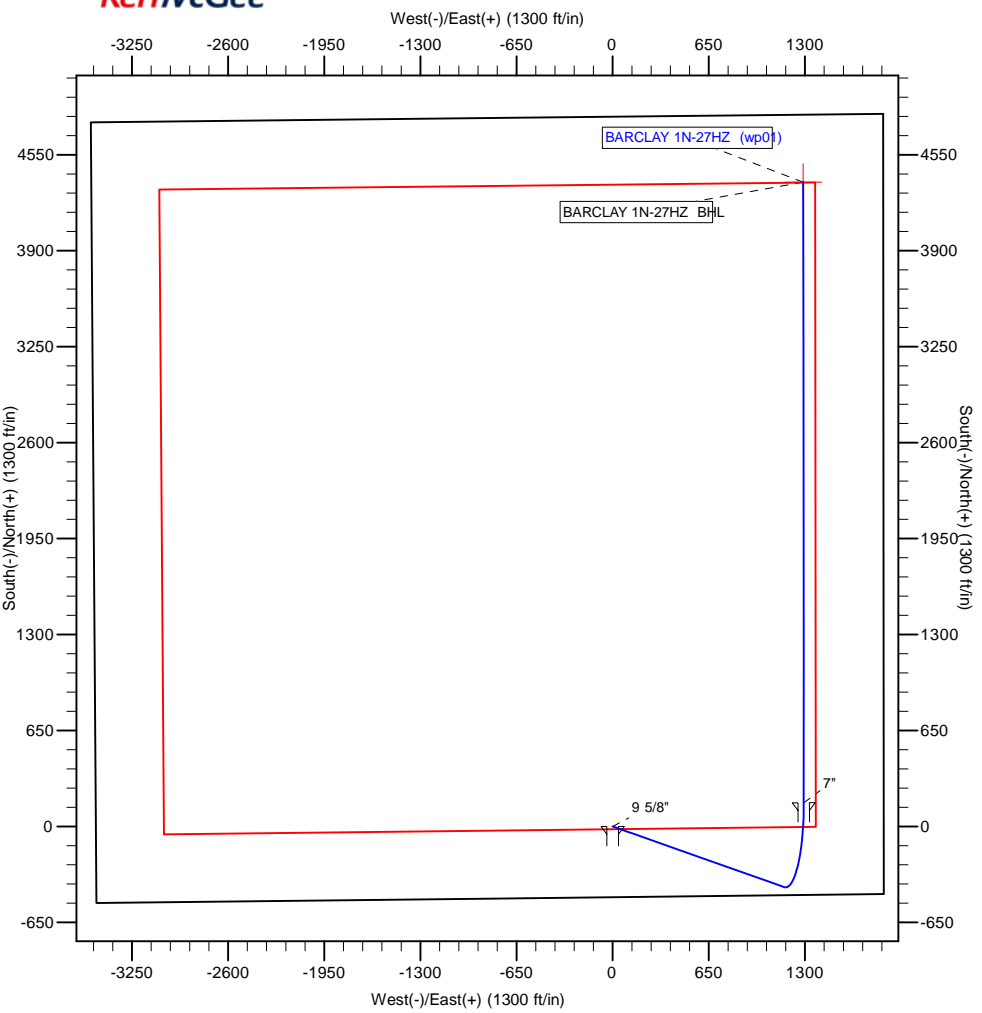
Design: BARCLAY 1N-27HZ (wp01)

Latitude: 40.190205

Longitude: -104.760351

GL: 0.00

KB: 17" RKB + 4956" GL @ 4973.00ft



WELL DETAILS: BARCLAY 1N-27HZ						
+N/-S	+E/-W	Northing	Easting	Ground Level:	Latitude	Longitude
0.00	0.00	1312996.10	3206634.99	0.00	40.190205	-104.760351

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)						
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
BARCLAY 1N-27HZ BHL	7161.00	4363.41	1288.24	40.202183	-104.755739	Point

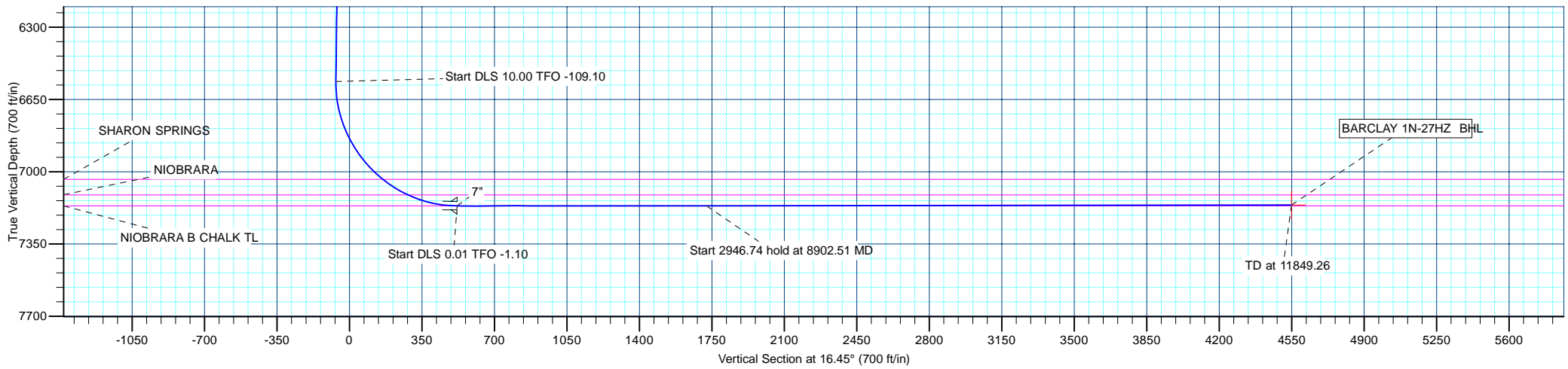
SECTION DETAILS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1000.00	0.00	0.00	1000.00	0.00	0.00	0.00	0.00	0.00	
1661.58	13.23	109.52	1655.72	-25.41	71.68	2.00	109.52	-4.07	
6702.39	13.23	109.52	6562.70	-410.88	1159.17	0.00	0.00	-65.84	
7645.84	89.95	359.95	7165.00	160.00	1292.00	10.00	-109.10	519.29	
8902.51	90.07	359.95	7164.77	1416.68	1290.89	0.01	-1.10	1724.22	
11849.26	90.07	359.95	7161.00	4363.41	1288.24	0.00	0.00	4549.61	BARCLAY 1N-27HZ BHL

CASING DETAILS			
TVD	MD	Name	Size
850.00	850.00	9 5/8"	9-5/8
7165.00	7645.80	7"	7

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
3209.00	3257.23	PARKMAN
4387.00	4467.35	SUSSEX
5029.00	5126.86	SHANNON
7037.00	7250.98	SHARON SPRINGS
7112.00	7394.95	NIOBRARA
7165.00	7645.84	NIOBRARA B CHALK TL



Weatherford®



Database:	edm5000p	Local Co-ordinate Reference:	Well BARCLAY 1N-27HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	17' RKB + 4956' GL @ 4973.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17' RKB + 4956' GL @ 4973.00ft
Site:	WELD_BARCLAY 15-27 PAD	North Reference:	True
Well:	BARCLAY 1N-27HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	BARCLAY 1N-27HZ		
Design:	BARCLAY 1N-27HZ (wp01)		

Project	COLORADO NORTHERN ZONE - 83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site						WELD_BARCLAY 15-27 PAD							
Site Position: From: Position Uncertainty:			Lat/Long 0.00 ft			Northing:		1,312,996.10 ft		Latitude:		40.190205	
						Easting:		3,206,634.99 ft		Longitude:		-104.760351	
						Slot Radius:		0 "		Grid Convergence:		0.48	

Well	BARCLAY 1N-27HZ					
Well Position	+N-S	0.00 ft	Northing:	1,312,996.10 ft	Latitude:	40.190205
	+E-W	0.00 ft	Easting:	3,206,634.99 ft	Longitude:	-104.760351
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	0.00 ft

Wellbore	BARCLAY 1N-27HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/25/2011	8.83	66.88	53,009

Design	BARCLAY 1N-27HZ (wp01)			
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	16.45

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	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,661.58	13.23	109.52	1,655.72	-25.41	71.68	2.00	2.00	0.00	109.52	
6,702.39	13.23	109.52	6,562.70	-410.88	1,159.17	0.00	0.00	0.00	0.00	
7,645.84	89.95	359.95	7,165.00	160.00	1,292.00	10.00	8.13	-11.61	-109.10	
8,902.52	90.07	359.95	7,164.77	1,416.68	1,290.89	0.01	0.01	0.00	-1.10	
11,849.26	90.07	359.95	7,161.00	4,363.41	1,288.24	0.00	0.00	0.00	0.00	BARCLAY 1N-27HZ

Database:	edm5000p	Local Co-ordinate Reference:	Well BARCLAY 1N-27HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	17' RKB + 4956' GL @ 4973.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17' RKB + 4956' GL @ 4973.00ft
Site:	WELD_BARCLAY 15-27 PAD	North Reference:	True
Well:	BARCLAY 1N-27HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	BARCLAY 1N-27HZ		
Design:	BARCLAY 1N-27HZ (wp01)		

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
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
850.00	0.00	0.00	850.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"									
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
Start Build 2.00									
1,100.00	2.00	109.52	1,099.98	-0.58	1.64	-0.09	2.00	2.00	0.00
1,200.00	4.00	109.52	1,199.84	-2.33	6.58	-0.37	2.00	2.00	0.00
1,300.00	6.00	109.52	1,299.45	-5.24	14.79	-0.84	2.00	2.00	0.00
1,400.00	8.00	109.52	1,398.70	-9.31	26.28	-1.49	2.00	2.00	0.00
1,500.00	10.00	109.52	1,497.47	-14.54	41.02	-2.33	2.00	2.00	0.00
1,600.00	12.00	109.52	1,595.62	-20.91	59.01	-3.35	2.00	2.00	0.00
1,661.58	13.23	109.52	1,655.72	-25.41	71.68	-4.07	2.00	2.00	0.00
Start 5040.80 hold at 1661.58 MD									
1,700.00	13.23	109.52	1,693.12	-28.35	79.97	-4.54	0.00	0.00	0.00
1,800.00	13.23	109.52	1,790.46	-35.99	101.54	-5.77	0.00	0.00	0.00
1,900.00	13.23	109.52	1,887.81	-43.64	123.12	-6.99	0.00	0.00	0.00
2,000.00	13.23	109.52	1,985.15	-51.29	144.69	-8.22	0.00	0.00	0.00
2,100.00	13.23	109.52	2,082.50	-58.93	166.27	-9.44	0.00	0.00	0.00
2,200.00	13.23	109.52	2,179.84	-66.58	187.84	-10.67	0.00	0.00	0.00
2,300.00	13.23	109.52	2,277.19	-74.23	209.41	-11.89	0.00	0.00	0.00
2,400.00	13.23	109.52	2,374.53	-81.87	230.99	-13.12	0.00	0.00	0.00
2,500.00	13.23	109.52	2,471.88	-89.52	252.56	-14.34	0.00	0.00	0.00
2,600.00	13.23	109.52	2,569.22	-97.17	274.13	-15.57	0.00	0.00	0.00
2,700.00	13.23	109.52	2,666.57	-104.82	295.71	-16.79	0.00	0.00	0.00
2,800.00	13.23	109.52	2,763.91	-112.46	317.28	-18.02	0.00	0.00	0.00
2,900.00	13.23	109.52	2,861.26	-120.11	338.86	-19.25	0.00	0.00	0.00
3,000.00	13.23	109.52	2,958.60	-127.76	360.43	-20.47	0.00	0.00	0.00
3,100.00	13.23	109.52	3,055.95	-135.40	382.00	-21.70	0.00	0.00	0.00
3,200.00	13.23	109.52	3,153.29	-143.05	403.58	-22.92	0.00	0.00	0.00
3,257.23	13.23	109.52	3,209.00	-147.43	415.92	-23.62	0.00	0.00	0.00
PARKMAN									
3,300.00	13.23	109.52	3,250.64	-150.70	425.15	-24.15	0.00	0.00	0.00
3,400.00	13.23	109.52	3,347.98	-158.34	446.72	-25.37	0.00	0.00	0.00
3,500.00	13.23	109.52	3,445.33	-165.99	468.30	-26.60	0.00	0.00	0.00
3,600.00	13.23	109.52	3,542.68	-173.64	489.87	-27.82	0.00	0.00	0.00
3,700.00	13.23	109.52	3,640.02	-181.28	511.45	-29.05	0.00	0.00	0.00
3,800.00	13.23	109.52	3,737.37	-188.93	533.02	-30.27	0.00	0.00	0.00
3,900.00	13.23	109.52	3,834.71	-196.58	554.59	-31.50	0.00	0.00	0.00
4,000.00	13.23	109.52	3,932.06	-204.23	576.17	-32.72	0.00	0.00	0.00
4,100.00	13.23	109.52	4,029.40	-211.87	597.74	-33.95	0.00	0.00	0.00
4,200.00	13.23	109.52	4,126.75	-219.52	619.31	-35.17	0.00	0.00	0.00
4,300.00	13.23	109.52	4,224.09	-227.17	640.89	-36.40	0.00	0.00	0.00
4,400.00	13.23	109.52	4,321.44	-234.81	662.46	-37.62	0.00	0.00	0.00
4,467.35	13.23	109.52	4,387.00	-239.96	676.99	-38.45	0.00	0.00	0.00
SUSSEX									

Database:	edm5000p	Local Co-ordinate Reference:	Well BARCLAY 1N-27HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	17' RKB + 4956' GL @ 4973.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17' RKB + 4956' GL @ 4973.00ft
Site:	WELD_BARCLAY 15-27 PAD	North Reference:	True
Well:	BARCLAY 1N-27HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	BARCLAY 1N-27HZ		
Design:	BARCLAY 1N-27HZ (wp01)		

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)
4,500.00	13.23	109.52	4,418.78	-242.46	684.04	-38.85	0.00	0.00	0.00
4,600.00	13.23	109.52	4,516.13	-250.11	705.61	-40.08	0.00	0.00	0.00
4,700.00	13.23	109.52	4,613.47	-257.75	727.18	-41.30	0.00	0.00	0.00
4,800.00	13.23	109.52	4,710.82	-265.40	748.76	-42.53	0.00	0.00	0.00
4,900.00	13.23	109.52	4,808.16	-273.05	770.33	-43.75	0.00	0.00	0.00
5,000.00	13.23	109.52	4,905.51	-280.69	791.91	-44.98	0.00	0.00	0.00
5,100.00	13.23	109.52	5,002.85	-288.34	813.48	-46.20	0.00	0.00	0.00
5,126.86	13.23	109.52	5,029.00	-290.40	819.27	-46.53	0.00	0.00	0.00
SHANNON									
5,200.00	13.23	109.52	5,100.20	-295.99	835.05	-47.43	0.00	0.00	0.00
5,300.00	13.23	109.52	5,197.54	-303.64	856.63	-48.65	0.00	0.00	0.00
5,400.00	13.23	109.52	5,294.89	-311.28	878.20	-49.88	0.00	0.00	0.00
5,500.00	13.23	109.52	5,392.23	-318.93	899.77	-51.10	0.00	0.00	0.00
5,600.00	13.23	109.52	5,489.58	-326.58	921.35	-52.33	0.00	0.00	0.00
5,700.00	13.23	109.52	5,586.93	-334.22	942.92	-53.55	0.00	0.00	0.00
5,800.00	13.23	109.52	5,684.27	-341.87	964.50	-54.78	0.00	0.00	0.00
5,900.00	13.23	109.52	5,781.62	-349.52	986.07	-56.00	0.00	0.00	0.00
6,000.00	13.23	109.52	5,878.96	-357.16	1,007.64	-57.23	0.00	0.00	0.00
6,100.00	13.23	109.52	5,976.31	-364.81	1,029.22	-58.45	0.00	0.00	0.00
6,200.00	13.23	109.52	6,073.65	-372.46	1,050.79	-59.68	0.00	0.00	0.00
6,300.00	13.23	109.52	6,171.00	-380.11	1,072.36	-60.91	0.00	0.00	0.00
6,400.00	13.23	109.52	6,268.34	-387.75	1,093.94	-62.13	0.00	0.00	0.00
6,500.00	13.23	109.52	6,365.69	-395.40	1,115.51	-63.36	0.00	0.00	0.00
6,600.00	13.23	109.52	6,463.03	-403.05	1,137.09	-64.58	0.00	0.00	0.00
6,700.00	13.23	109.52	6,560.38	-410.69	1,158.66	-65.81	0.00	0.00	0.00
6,702.39	13.23	109.52	6,562.70	-410.88	1,159.17	-65.84	0.00	0.00	0.00
Start DLS 10.00 TFO -109.10									
6,800.00	13.58	66.48	6,657.89	-410.03	1,180.26	-59.06	10.00	0.35	-44.09
6,900.00	19.70	38.15	6,753.80	-392.05	1,201.49	-35.79	10.00	6.13	-28.33
7,000.00	28.09	24.47	6,845.22	-357.27	1,221.71	3.28	10.00	8.38	-13.69
7,100.00	37.23	16.89	6,929.35	-306.77	1,240.29	56.98	10.00	9.14	-7.58
7,200.00	46.69	11.99	7,003.65	-242.07	1,256.68	123.67	10.00	9.46	-4.89
7,250.98	51.57	10.06	7,037.00	-204.25	1,264.03	162.03	10.00	9.58	-3.79
SHARON SPRINGS									
7,300.00	56.29	8.44	7,065.86	-165.15	1,270.38	201.33	10.00	9.63	-3.32
7,394.95	65.49	5.74	7,112.00	-82.91	1,280.52	283.07	10.00	9.69	-2.85
NIOBRARA									
7,400.00	65.98	5.60	7,114.08	-78.33	1,280.97	287.59	10.00	9.71	-2.60
7,500.00	75.72	3.17	7,146.84	15.74	1,288.13	379.84	10.00	9.73	-2.43
7,600.00	85.47	0.94	7,163.17	114.21	1,291.64	475.27	10.00	9.76	-2.23
7,645.80	89.94	359.95	7,165.00	159.96	1,292.00	519.25	10.00	9.76	-2.17
7"									
7,645.84	89.95	359.95	7,165.00	160.00	1,292.00	519.29	10.00	9.76	-2.16
Start DLS 0.01 TFO -1.10 - NIOBRARA B CHALK TL									
7,700.00	89.95	359.95	7,165.05	214.16	1,291.95	571.22	0.01	0.01	0.00
7,800.00	89.96	359.95	7,165.12	314.16	1,291.87	667.10	0.01	0.01	0.00
7,900.00	89.97	359.95	7,165.18	414.16	1,291.78	762.98	0.01	0.01	0.00
8,000.00	89.98	359.95	7,165.21	514.16	1,291.69	858.87	0.01	0.01	0.00
8,100.00	89.99	359.95	7,165.24	614.16	1,291.61	954.75	0.01	0.01	0.00
8,200.00	90.00	359.95	7,165.24	714.16	1,291.52	1,050.63	0.01	0.01	0.00
8,300.00	90.01	359.95	7,165.22	814.16	1,291.43	1,146.51	0.01	0.01	0.00
8,400.00	90.02	359.95	7,165.19	914.16	1,291.34	1,242.40	0.01	0.01	0.00
8,500.00	90.03	359.95	7,165.14	1,014.16	1,291.25	1,338.28	0.01	0.01	0.00

Database:	edm5000p	Local Co-ordinate Reference:	Well BARCLAY 1N-27HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	17' RKB + 4956' GL @ 4973.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17' RKB + 4956' GL @ 4973.00ft
Site:	WELD_BARCLAY 15-27 PAD	North Reference:	True
Well:	BARCLAY 1N-27HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	BARCLAY 1N-27HZ		
Design:	BARCLAY 1N-27HZ (wp01)		

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)
8,600.00	90.04	359.95	7,165.08	1,114.16	1,291.17	1,434.16	0.01	0.01	0.00
8,700.00	90.05	359.95	7,164.99	1,214.16	1,291.08	1,530.04	0.01	0.01	0.00
8,800.00	90.06	359.95	7,164.89	1,314.16	1,290.99	1,625.93	0.01	0.01	0.00
8,900.00	90.07	359.95	7,164.77	1,414.16	1,290.90	1,721.81	0.01	0.01	0.00
8,902.52	90.07	359.95	7,164.77	1,416.68	1,290.89	1,724.22	0.01	0.01	0.00
Start 2946.74 hold at 8902.51 MD									
9,000.00	90.07	359.95	7,164.65	1,514.16	1,290.81	1,817.69	0.00	0.00	0.00
9,100.00	90.07	359.95	7,164.52	1,614.16	1,290.72	1,913.57	0.00	0.00	0.00
9,200.00	90.07	359.95	7,164.39	1,714.16	1,290.63	2,009.45	0.00	0.00	0.00
9,300.00	90.07	359.95	7,164.26	1,814.16	1,290.54	2,105.33	0.00	0.00	0.00
9,400.00	90.07	359.95	7,164.13	1,914.16	1,290.45	2,201.22	0.00	0.00	0.00
9,500.00	90.07	359.95	7,164.01	2,014.16	1,290.36	2,297.10	0.00	0.00	0.00
9,600.00	90.07	359.95	7,163.88	2,114.16	1,290.27	2,392.98	0.00	0.00	0.00
9,700.00	90.07	359.95	7,163.75	2,214.16	1,290.18	2,488.86	0.00	0.00	0.00
9,800.00	90.07	359.95	7,163.62	2,314.16	1,290.08	2,584.74	0.00	0.00	0.00
9,900.00	90.07	359.95	7,163.49	2,414.16	1,289.99	2,680.63	0.00	0.00	0.00
10,000.00	90.07	359.95	7,163.37	2,514.16	1,289.90	2,776.51	0.00	0.00	0.00
10,100.00	90.07	359.95	7,163.24	2,614.16	1,289.81	2,872.39	0.00	0.00	0.00
10,200.00	90.07	359.95	7,163.11	2,714.16	1,289.72	2,968.27	0.00	0.00	0.00
10,300.00	90.07	359.95	7,162.98	2,814.16	1,289.63	3,064.15	0.00	0.00	0.00
10,400.00	90.07	359.95	7,162.85	2,914.16	1,289.54	3,160.03	0.00	0.00	0.00
10,500.00	90.07	359.95	7,162.73	3,014.16	1,289.45	3,255.92	0.00	0.00	0.00
10,600.00	90.07	359.95	7,162.60	3,114.16	1,289.36	3,351.80	0.00	0.00	0.00
10,700.00	90.07	359.95	7,162.47	3,214.16	1,289.27	3,447.68	0.00	0.00	0.00
10,800.00	90.07	359.95	7,162.34	3,314.16	1,289.18	3,543.56	0.00	0.00	0.00
10,900.00	90.07	359.95	7,162.21	3,414.16	1,289.09	3,639.44	0.00	0.00	0.00
11,000.00	90.07	359.95	7,162.09	3,514.16	1,289.00	3,735.33	0.00	0.00	0.00
11,100.00	90.07	359.95	7,161.96	3,614.16	1,288.91	3,831.21	0.00	0.00	0.00
11,200.00	90.07	359.95	7,161.83	3,714.16	1,288.82	3,927.09	0.00	0.00	0.00
11,300.00	90.07	359.95	7,161.70	3,814.16	1,288.73	4,022.97	0.00	0.00	0.00
11,400.00	90.07	359.95	7,161.57	3,914.16	1,288.64	4,118.85	0.00	0.00	0.00
11,500.00	90.07	359.95	7,161.45	4,014.16	1,288.55	4,214.73	0.00	0.00	0.00
11,600.00	90.07	359.95	7,161.32	4,114.16	1,288.46	4,310.62	0.00	0.00	0.00
11,700.00	90.07	359.95	7,161.19	4,214.16	1,288.37	4,406.50	0.00	0.00	0.00
11,800.00	90.07	359.95	7,161.06	4,314.16	1,288.28	4,502.38	0.00	0.00	0.00
11,849.26	90.07	359.95	7,161.00	4,363.41	1,288.24	4,549.61	0.00	0.00	0.00
TD at 11849.26 - BARCLAY 1N-27HZ BHL									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
BARCLAY 1N-27HZ I - hit/miss target - Shape - plan hits target center - Point	0.00	0.00	7,161.00	4,363.41	1,288.24	1,317,370.11	3,207,886.79	40.202183	-104.755739

Database:	edm5000p	Local Co-ordinate Reference:	Well BARCLAY 1N-27HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	17' RKB + 4956' GL @ 4973.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17' RKB + 4956' GL @ 4973.00ft
Site:	WELD_BARCLAY 15-27 PAD	North Reference:	True
Well:	BARCLAY 1N-27HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	BARCLAY 1N-27HZ		
Design:	BARCLAY 1N-27HZ (wp01)		

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
850.00	850.00	9 5/8"	9-5/8	12-1/4	
7,645.80	7,165.00	7"	7	8-3/4	

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,257.23	3,209.00	PARKMAN		0.00	
4,467.35	4,387.00	SUSSEX		0.00	
5,126.86	5,029.00	SHANNON		0.00	
7,250.98	7,037.00	SHARON SPRINGS		0.00	
7,394.95	7,112.00	NIOBRARA		0.00	
7,645.84	7,165.00	NIOBRARA B CHALK TL		0.00	

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
1,000.00	1,000.00	0.00	0.00	Start Build 2.00	
1,661.58	1,655.72	-25.41	71.68	Start 5040.80 hold at 1661.58 MD	
6,702.39	6,562.70	-410.88	1,159.17	Start DLS 10.00 TFO -109.10	
7,645.84	7,165.00	160.00	1,292.00	Start DLS 0.01 TFO -1.10	
8,902.52	7,164.77	1,416.68	1,290.89	Start 2946.74 hold at 8902.51 MD	
11,849.26	7,161.00	4,363.41	1,288.24	TD at 11849.26	