

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 27-T2N-R65W

Powers 29N-27HZ

Plan A Rev 0

Plan: Plan A Rev 0 Permit

Sperry Drilling Services

Proposal Report

03 August, 2012

Well Coordinates: 1,281,754.70 N, 3,237,060.49 E (40° 06' 13.32" N, 104° 39' 09.06" W)

Ground Level: 4,949.00 ft

Local Coordinate Origin:

Centered on Well Powers 29N-27HZ

Viewing Datum:

RKB=17' @ 4966.00ft (Drilling Rig)

TVDs to System:

N

North Reference:

True

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 431

HALLIBURTON

Project: Weld County, CO (NAD 83)
Site: Sec. 27-T2N-R65W
Well: Powers 29N-27HZ
Wellbore: Plan A Rev 0
Design: Plan A Rev 0 Permit

Anadarko Petroleum Corp.

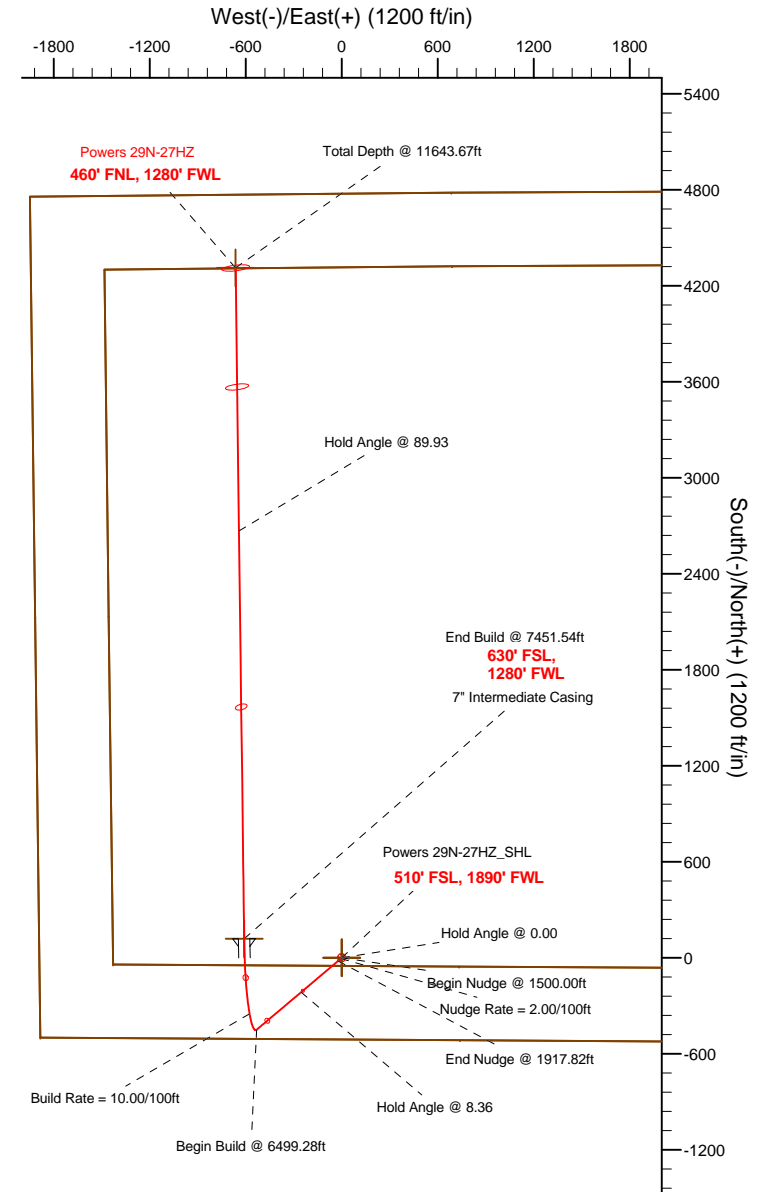
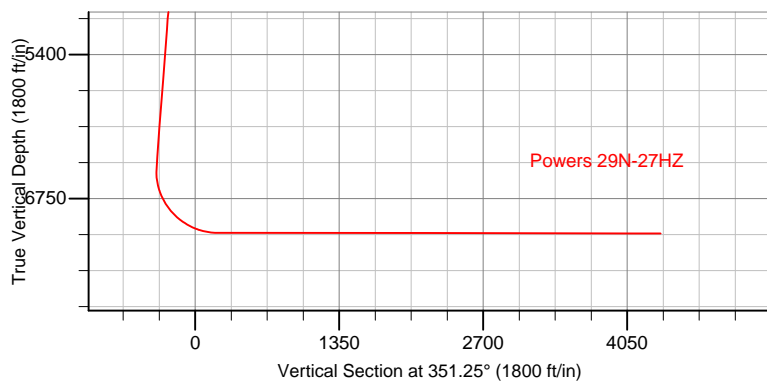
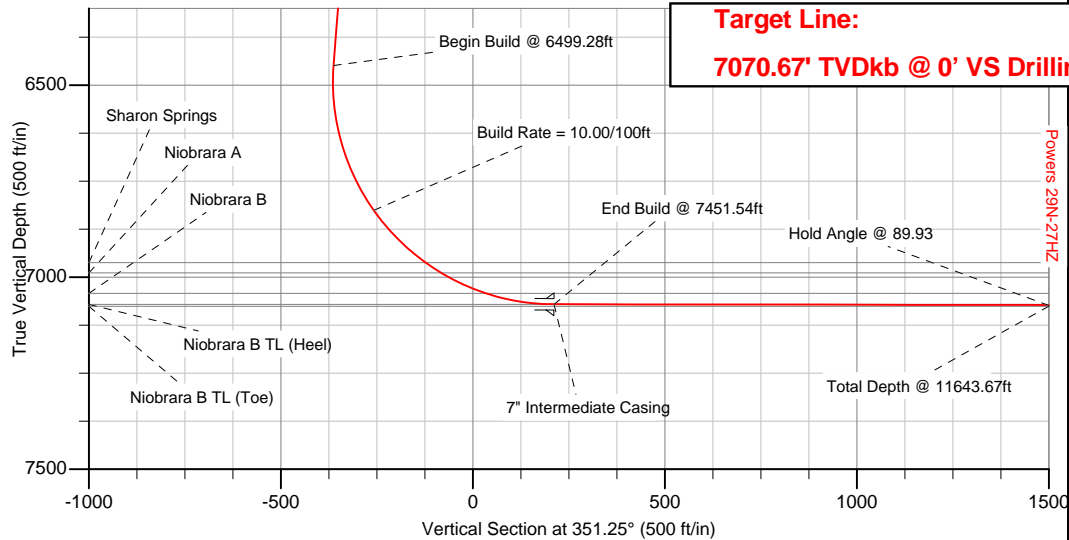
HALLIBURTON
Sperry Drilling

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1500.00	0.00	0.00	1500.00	0.00	0.00	0.00	0.00	0.00	
3	1917.82	8.36	229.85	1916.34	-19.61	-23.25	2.00	229.85	-15.84	
4	6499.28	8.36	229.85	6449.16	-448.88	-532.22	0.00	0.00	-362.69	
5	7451.54	89.93	359.27	7071.00	120.00	-610.00	10.00	129.12	211.41	Powers 29N-27HZ_Casing Point
6	11643.67	89.93	359.27	7076.00	4311.78	-663.70	0.00	0.00	4362.57	Powers 29N-27HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Powers 29N-27HZ_Section Lines	0.00	0.00	0.00	40.103699	-104.652518	Polygon
Powers 29N-27HZ_Setback Lines	0.00	0.00	0.00	40.103699	-104.652518	Polygon
Powers 29N-27HZ_SHL	0.00	0.00	0.00	40.103699	-104.652518	Point
Powers 29N-27HZ_Casing Point	7071.00	120.00	-610.00	40.104028	-104.654699	Point
Powers 29N-27HZ_BHL	7076.00	4311.78	-663.70	40.115535	-104.654891	Point



WELL DETAILS: Powers 29N-27HZ

Ground Level: 4949.00 RKB=17' @ 4966.00ft (Drilling Rig)

Plan: Plan A Rev 0 Permit (Powers 29N-27HZ/Plan A Rev 0)

Created By: Fred Hartmann Date: 08/03/2012
Reviewed: _____ Date: _____

Plan Report for Powers 29N-27HZ - Plan A Rev 0 Permit

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)	Toolface Azimuth (°)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Powers 29N-27HZ_SHL - Powers 29N-27HZ_Section Lines - Powers 29N-27HZ_Setback Lines										
100.00	0.00	0.00	100.00	0.00	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	0.00
300.00	0.00	0.00	300.00	0.00	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	0.00
500.00	0.00	0.00	500.00	0.00	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	0.00
700.00	0.00	0.00	700.00	0.00	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	0.00
Hold Angle @ 0.00										
900.00	0.00	0.00	900.00	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	0.00
1,100.00	0.00	0.00	1,100.00	0.00	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	0.00
1,300.00	0.00	0.00	1,300.00	0.00	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	0.00
1,406.00	0.00	0.00	1,406.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills										
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 1500.00ft										
1,600.00	2.00	229.85	1,599.98	-1.13	-1.33	-0.91	2.00	2.00	0.00	229.85
1,700.00	4.00	229.85	1,699.84	-4.50	-5.33	-3.64	2.00	2.00	0.00	0.00
Nudge Rate = 2.00/100ft										
1,800.00	6.00	229.85	1,799.45	-10.12	-12.00	-8.18	2.00	2.00	0.00	0.00
1,900.00	8.00	229.85	1,898.70	-17.97	-21.31	-14.52	2.00	2.00	0.00	0.00
1,917.82	8.36	229.85	1,916.34	-19.61	-23.25	-15.84	2.00	2.00	0.00	0.00
End Nudge @ 1917.82ft										
2,000.00	8.36	229.85	1,997.65	-27.31	-32.38	-22.07	0.00	0.00	0.00	0.00
2,100.00	8.36	229.85	2,096.59	-36.68	-43.49	-29.64	0.00	0.00	0.00	0.00
2,200.00	8.36	229.85	2,195.52	-46.05	-54.60	-37.21	0.00	0.00	0.00	0.00
2,300.00	8.36	229.85	2,294.46	-55.42	-65.71	-44.78	0.00	0.00	0.00	0.00
2,400.00	8.36	229.85	2,393.40	-64.79	-76.82	-52.35	0.00	0.00	0.00	0.00
2,500.00	8.36	229.85	2,492.34	-74.16	-87.93	-59.92	0.00	0.00	0.00	0.00
2,600.00	8.36	229.85	2,591.28	-83.53	-99.04	-67.49	0.00	0.00	0.00	0.00
2,700.00	8.36	229.85	2,690.22	-92.90	-110.14	-75.06	0.00	0.00	0.00	0.00
2,800.00	8.36	229.85	2,789.15	-102.27	-121.25	-82.63	0.00	0.00	0.00	0.00
2,900.00	8.36	229.85	2,888.09	-111.64	-132.36	-90.20	0.00	0.00	0.00	0.00
3,000.00	8.36	229.85	2,987.03	-121.01	-143.47	-97.77	0.00	0.00	0.00	0.00
3,100.00	8.36	229.85	3,085.97	-130.38	-154.58	-105.34	0.00	0.00	0.00	0.00
3,200.00	8.36	229.85	3,184.91	-139.75	-165.69	-112.91	0.00	0.00	0.00	0.00
3,300.00	8.36	229.85	3,283.85	-149.12	-176.80	-120.48	0.00	0.00	0.00	0.00
3,400.00	8.36	229.85	3,382.78	-158.49	-187.91	-128.05	0.00	0.00	0.00	0.00
3,500.00	8.36	229.85	3,481.72	-167.86	-199.02	-135.63	0.00	0.00	0.00	0.00
3,600.00	8.36	229.85	3,580.66	-177.23	-210.13	-143.20	0.00	0.00	0.00	0.00
3,700.00	8.36	229.85	3,679.60	-186.60	-221.24	-150.77	0.00	0.00	0.00	0.00
3,800.00	8.36	229.85	3,778.54	-195.97	-232.35	-158.34	0.00	0.00	0.00	0.00
3,900.00	8.36	229.85	3,877.48	-205.34	-243.46	-165.91	0.00	0.00	0.00	0.00
4,000.00	8.36	229.85	3,976.41	-214.71	-254.57	-173.48	0.00	0.00	0.00	0.00
Hold Angle @ 8.36										
4,100.00	8.36	229.85	4,075.35	-224.08	-265.67	-181.05	0.00	0.00	0.00	0.00
4,200.00	8.36	229.85	4,174.29	-233.45	-276.78	-188.62	0.00	0.00	0.00	0.00
4,300.00	8.36	229.85	4,273.23	-242.82	-287.89	-196.19	0.00	0.00	0.00	0.00
4,400.00	8.36	229.85	4,372.17	-252.19	-299.00	-203.76	0.00	0.00	0.00	0.00
4,500.00	8.36	229.85	4,471.11	-261.56	-310.11	-211.33	0.00	0.00	0.00	0.00
4,600.00	8.36	229.85	4,570.04	-270.93	-321.22	-218.90	0.00	0.00	0.00	0.00
4,700.00	8.36	229.85	4,668.98	-280.30	-332.33	-226.47	0.00	0.00	0.00	0.00

Plan Report for Powers 29N-27HZ - Plan A Rev 0 Permit

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)	Toolface Azimuth (°)
4,800.00	8.36	229.85	4,767.92	-289.67	-343.44	-234.04	0.00	0.00	0.00	0.00
4,900.00	8.36	229.85	4,866.86	-299.03	-354.55	-241.61	0.00	0.00	0.00	0.00
5,000.00	8.36	229.85	4,965.80	-308.40	-365.66	-249.18	0.00	0.00	0.00	0.00
5,100.00	8.36	229.85	5,064.74	-317.77	-376.77	-256.76	0.00	0.00	0.00	0.00
5,151.81	8.36	229.85	5,116.00	-322.63	-382.52	-260.68	0.00	0.00	0.00	0.00
Sussex										
5,200.00	8.36	229.85	5,163.67	-327.14	-387.88	-264.33	0.00	0.00	0.00	0.00
5,300.00	8.36	229.85	5,262.61	-336.51	-398.99	-271.90	0.00	0.00	0.00	0.00
5,400.00	8.36	229.85	5,361.55	-345.88	-410.10	-279.47	0.00	0.00	0.00	0.00
5,500.00	8.36	229.85	5,460.49	-355.25	-421.21	-287.04	0.00	0.00	0.00	0.00
5,600.00	8.36	229.85	5,559.43	-364.62	-432.31	-294.61	0.00	0.00	0.00	0.00
5,700.00	8.36	229.85	5,658.37	-373.99	-443.42	-302.18	0.00	0.00	0.00	0.00
5,800.00	8.36	229.85	5,757.30	-383.36	-454.53	-309.75	0.00	0.00	0.00	0.00
5,900.00	8.36	229.85	5,856.24	-392.73	-465.64	-317.32	0.00	0.00	0.00	0.00
6,000.00	8.36	229.85	5,955.18	-402.10	-476.75	-324.89	0.00	0.00	0.00	0.00
6,100.00	8.36	229.85	6,054.12	-411.47	-487.86	-332.46	0.00	0.00	0.00	0.00
6,200.00	8.36	229.85	6,153.06	-420.84	-498.97	-340.03	0.00	0.00	0.00	0.00
6,300.00	8.36	229.85	6,252.00	-430.21	-510.08	-347.60	0.00	0.00	0.00	0.00
6,400.00	8.36	229.85	6,350.93	-439.58	-521.19	-355.17	0.00	0.00	0.00	0.00
6,499.28	8.36	229.85	6,449.16	-448.88	-532.22	-362.69	0.00	0.00	0.00	0.00
Begin Build @ 6499.28ft										
6,500.00	8.31	230.24	6,449.87	-448.95	-532.30	-362.74	10.00	-6.28	53.67	129.12
6,600.00	8.04	305.82	6,549.11	-449.48	-543.55	-361.56	10.00	-0.27	75.58	128.74
6,700.00	16.10	336.13	6,646.90	-432.67	-554.87	-343.21	10.00	8.06	30.31	53.73
6,800.00	25.56	345.55	6,740.29	-399.01	-565.89	-308.27	10.00	9.45	9.42	23.98
6,900.00	35.30	350.05	6,826.42	-349.54	-576.29	-257.79	10.00	9.74	4.50	15.15
Build Rate = 10.00/100ft										
7,000.00	45.14	352.79	6,902.69	-285.75	-585.76	-193.31	10.00	9.84	2.74	11.25
7,091.76	54.22	354.58	6,962.00	-216.28	-593.37	-123.49	10.00	9.89	1.95	9.15
Sharon Springs										
7,100.00	55.03	354.72	6,966.77	-209.59	-593.99	-116.79	10.00	9.90	1.70	7.99
7,140.89	59.09	355.38	6,989.00	-175.41	-596.95	-82.55	10.00	9.91	1.60	7.91
Niobrara A										
7,200.00	64.95	356.23	7,016.72	-123.38	-600.75	-30.54	10.00	9.92	1.45	7.55
7,268.56	71.75	357.13	7,042.00	-59.79	-604.43	32.86	10.00	9.93	1.31	7.15
Niobrara B										
7,300.00	74.88	357.52	7,051.02	-29.72	-605.84	62.80	10.00	9.93	1.23	6.82
7,400.00	84.81	358.68	7,068.64	68.54	-609.08	160.40	10.00	9.93	1.17	6.71
7,451.54	89.93	359.27	7,071.00	120.00	-610.00	211.41	10.00	9.94	1.13	6.50
End Build @ 7451.54ft - Niobrara B TL (Heel) - 7" Intermediate Casing - Powers 29N-27HZ_Casing Point										
7,500.00	89.93	359.27	7,071.06	168.45	-610.62	259.39	0.00	0.00	0.00	6.47
7,600.00	89.93	359.27	7,071.18	268.45	-611.90	358.41	0.00	0.00	0.00	0.00
7,700.00	89.93	359.27	7,071.30	368.44	-613.18	457.44	0.00	0.00	0.00	0.00
7,800.00	89.93	359.27	7,071.42	468.43	-614.46	556.46	0.00	0.00	0.00	0.00
7,900.00	89.93	359.27	7,071.53	568.42	-615.75	655.48	0.00	0.00	0.00	0.00
8,000.00	89.93	359.27	7,071.65	668.41	-617.03	754.50	0.00	0.00	0.00	0.00
8,100.00	89.93	359.27	7,071.77	768.40	-618.31	853.53	0.00	0.00	0.00	0.00
8,200.00	89.93	359.27	7,071.89	868.40	-619.59	952.55	0.00	0.00	0.00	0.00
8,300.00	89.93	359.27	7,072.01	968.39	-620.87	1,051.57	0.00	0.00	0.00	0.00
8,400.00	89.93	359.27	7,072.13	1,068.38	-622.15	1,150.59	0.00	0.00	0.00	0.00
8,500.00	89.93	359.27	7,072.25	1,168.37	-623.43	1,249.62	0.00	0.00	0.00	0.00
8,600.00	89.93	359.27	7,072.37	1,268.36	-624.71	1,348.64	0.00	0.00	0.00	0.00
8,700.00	89.93	359.27	7,072.49	1,368.35	-625.99	1,447.66	0.00	0.00	0.00	0.00
8,800.00	89.93	359.27	7,072.61	1,468.35	-627.27	1,546.69	0.00	0.00	0.00	0.00
8,900.00	89.93	359.27	7,072.73	1,568.34	-628.56	1,645.71	0.00	0.00	0.00	0.00
9,000.00	89.93	359.27	7,072.85	1,668.33	-629.84	1,744.73	0.00	0.00	0.00	0.00
9,100.00	89.93	359.27	7,072.97	1,768.32	-631.12	1,843.75	0.00	0.00	0.00	0.00
9,200.00	89.93	359.27	7,073.09	1,868.31	-632.40	1,942.78	0.00	0.00	0.00	0.00
9,300.00	89.93	359.27	7,073.20	1,968.31	-633.68	2,041.80	0.00	0.00	0.00	0.00

Plan Report for Powers 29N-27HZ - Plan A Rev 0 Permit

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)	Toolface Azimuth (°)
9,400.00	89.93	359.27	7,073.32	2,068.30	-634.96	2,140.82	0.00	0.00	0.00	0.00
9,500.00	89.93	359.27	7,073.44	2,168.29	-636.24	2,239.84	0.00	0.00	0.00	0.00
9,600.00	89.93	359.27	7,073.56	2,268.28	-637.52	2,338.87	0.00	0.00	0.00	0.00
9,700.00	89.93	359.27	7,073.68	2,368.27	-638.80	2,437.89	0.00	0.00	0.00	0.00
9,800.00	89.93	359.27	7,073.80	2,468.26	-640.09	2,536.91	0.00	0.00	0.00	0.00
9,900.00	89.93	359.27	7,073.92	2,568.26	-641.37	2,635.94	0.00	0.00	0.00	0.00
10,000.00	89.93	359.27	7,074.04	2,668.25	-642.65	2,734.96	0.00	0.00	0.00	0.00
Hold Angle @ 89.93										
10,100.00	89.93	359.27	7,074.16	2,768.24	-643.93	2,833.98	0.00	0.00	0.00	0.00
10,200.00	89.93	359.27	7,074.28	2,868.23	-645.21	2,933.00	0.00	0.00	0.00	0.00
10,300.00	89.93	359.27	7,074.40	2,968.22	-646.49	3,032.03	0.00	0.00	0.00	0.00
10,400.00	89.93	359.27	7,074.52	3,068.21	-647.77	3,131.05	0.00	0.00	0.00	0.00
10,500.00	89.93	359.27	7,074.64	3,168.21	-649.05	3,230.07	0.00	0.00	0.00	0.00
10,600.00	89.93	359.27	7,074.76	3,268.20	-650.33	3,329.09	0.00	0.00	0.00	0.00
10,700.00	89.93	359.27	7,074.87	3,368.19	-651.62	3,428.12	0.00	0.00	0.00	0.00
10,800.00	89.93	359.27	7,074.99	3,468.18	-652.90	3,527.14	0.00	0.00	0.00	0.00
10,900.00	89.93	359.27	7,075.11	3,568.17	-654.18	3,626.16	0.00	0.00	0.00	0.00
11,000.00	89.93	359.27	7,075.23	3,668.16	-655.46	3,725.18	0.00	0.00	0.00	0.00
11,100.00	89.93	359.27	7,075.35	3,768.16	-656.74	3,824.21	0.00	0.00	0.00	0.00
11,200.00	89.93	359.27	7,075.47	3,868.15	-658.02	3,923.23	0.00	0.00	0.00	0.00
11,300.00	89.93	359.27	7,075.59	3,968.14	-659.30	4,022.25	0.00	0.00	0.00	0.00
11,400.00	89.93	359.27	7,075.71	4,068.13	-660.58	4,121.28	0.00	0.00	0.00	0.00
11,500.00	89.93	359.27	7,075.83	4,168.12	-661.86	4,220.30	0.00	0.00	0.00	0.00
11,600.00	89.93	359.27	7,075.95	4,268.11	-663.15	4,319.32	0.00	0.00	0.00	0.00
11,643.67	89.93	359.27	7,076.00	4,311.78	-663.70	4,362.56	0.00	0.00	0.00	0.00
Total Depth @ 11643.67ft - Powers 29N-27HZ_BHL										

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
800.00	800.00	0.00	0.00	Hold Angle @ 0.00
1,500.00	1,500.00	0.00	0.00	Begin Nudge @ 1500.00ft
1,700.00	1,699.84	-4.50	-5.33	Nudge Rate = 2.00/100ft
1,917.82	1,916.34	-19.61	-23.25	End Nudge @ 1917.82ft
4,000.00	3,976.41	-214.71	-254.57	Hold Angle @ 8.36
6,499.28	6,449.16	-448.88	-532.22	Begin Build @ 6499.28ft
6,900.00	6,826.42	-349.54	-576.29	Build Rate = 10.00/100ft
7,451.54	7,071.00	120.00	-610.00	End Build @ 7451.54ft
10,000.00	7,074.04	2,668.25	-642.65	Hold Angle @ 89.93
11,643.67	7,076.00	4,311.78	-663.70	Total Depth @ 11643.67ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Powers 29N-27HZ_BHL	351.25	Slot	0.00	0.00	7,076.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	11,643.67	Plan A Rev 0 Permit	MWD

Plan Report for Powers 29N-27HZ - Plan A Rev 0 Permit**Casing Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,451.54	7,071.00	7" Intermediate Casing	7	8-3/4

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,406.00	1,406.00	Fox Hills		0.00	
5,151.81	5,116.00	Sussex		0.00	
7,091.76	6,962.00	Sharon Springs		0.00	
7,140.89	6,989.00	Niobrara A		0.00	
7,268.56	7,042.00	Niobrara B		0.00	
7,451.54	7,071.00	Niobrara B TL (Heel)		0.00	
11,643.67	7,076.00	Niobrara B TL (Toe)		0.00	

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Powers 29N-27HZ_Setback Lines	0.00	0.00	0.00	Polygon
Powers 29N-27HZ_BHL	7,076.00	4,311.78	-663.70	Point
Powers 29N-27HZ_Casing Point	7,071.00	120.00	-610.00	Point
Powers 29N-27HZ_SHL	0.00	0.00	0.00	Point
Powers 29N-27HZ_Section Lines	0.00	0.00	0.00	Polygon

North Reference Sheet for Sec. 27-T2N-R65W - Powers 29N-27HZ - Plan A Rev 0

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.

Vertical Depths are relative to RKB=17' @ 4966.00ft (Drilling Rig). Northing and Easting are relative to Powers 29N-27HZ

Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is -105.50°, Longitude Origin:0.000000°, Latitude Origin:40.783333°

False Easting: 3,000,000.000644ft, False Northing: 1,000,000.001308ft, Scale Reduction: 0.99996012

Grid Coordinates of Well: 1,281,754.698226 ft N, 3,237,060.493773 ft E

Geographical Coordinates of Well: 40° 06' 13.32" N, 104° 39' 09.06" W

Grid Convergence at Surface is: 0.55°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,643.67ft
the Bottom Hole Displacement is 4,362.56ft in the Direction of 351.25° (True).

Magnetic Convergence at surface is: -8.07° (2 August 2012, , BGGM2011)

