

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 27-T2N-R65W

Powers 3C-27HZ

Plan A Rev 0

Plan: Plan A Rev 0 Permit

Sperry Drilling Services

Proposal Report

03 August, 2012

Well Coordinates: 1,281,754.83 N, 3,237,150.29 E (40° 06' 13.31" N, 104° 39' 07.91" W)

Ground Level: 4,950.00 ft

Local Coordinate Origin:

Centered on Well Powers 3C-27HZ

Viewing Datum:

RKB=17 @ 4967.00ft (Drilling Rig)

TVDs to System:

N

North Reference:

True

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 43I

HALLIBURTON

Project: Weld County, CO (NAD 83)
 Site: Sec. 27-T2N-R65W
 Well: Powers 3C-27HZ
 Wellbore: Plan A Rev 0
 Design: Plan A Rev 0 Permit

Anadarko Petroleum Corp.

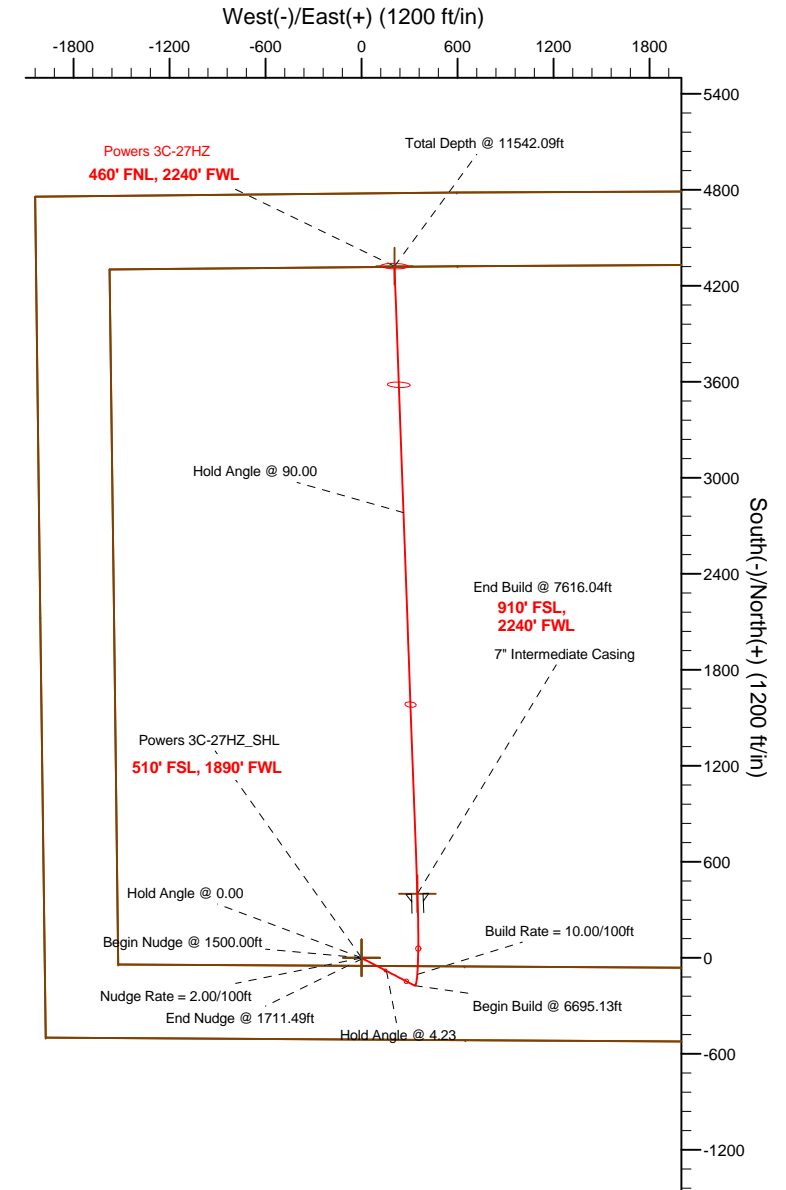
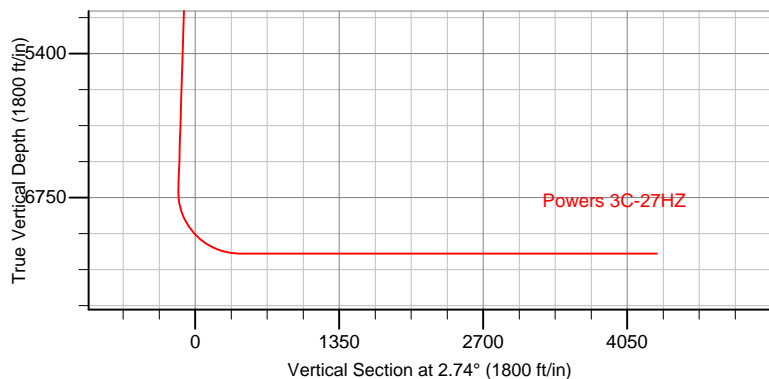
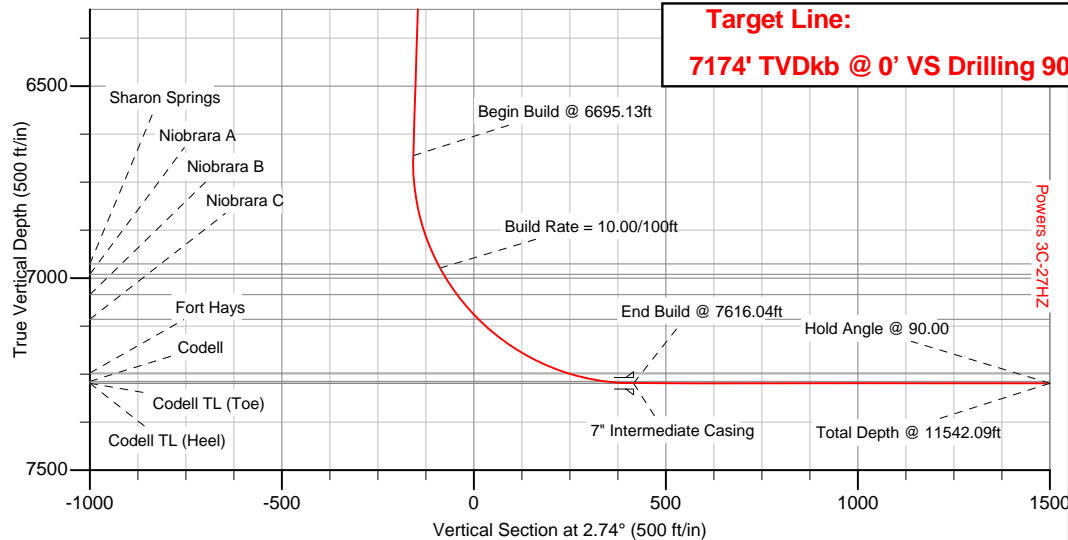
HALLIBURTON
 Sperry Drilling

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	1711.49	4.23	117.54	1711.30	-3.61	6.92	2.00	117.54	-3.27	
4	6695.13	4.23	117.54	6681.37	-173.59	332.83	0.00	0.00	-157.49	
5	7616.04	90.00	357.91	7274.00	400.00	350.00	10.00	-119.57	416.26	Powers 3C-27HZ_Casing Point
6	11542.09	90.00	357.91	7274.00	4323.43	206.69	0.00	0.00	4328.37	Powers 3C-27HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Powers 3C-27HZ_Section Lines	0.00	0.00	0.00	40.103697	-104.652197	Polygon
Powers 3C-27HZ_Setback Lines	0.00	0.00	0.00	40.103697	-104.652197	Polygon
Powers 3C-27HZ_SHL	0.00	0.00	0.00	40.103697	-104.652197	Point
Powers 3C-27HZ_BHL	7274.00	4323.43	206.69	40.115565	-104.651458	Point
Powers 3C-27HZ_Casing Point	7274.00	400.00	350.00	40.104795	-104.650946	Point



WELL DETAILS: Powers 3C-27HZ

Ground Level: 4950.00 RKB=17 @ 4967.00ft (Drilling Rig)

Plan: Plan A Rev 0 Permit (Powers 3C-27HZ/Plan A Rev 0)

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

Plan Report for Powers 3C-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 3C-27HZ_SHL - Powers 3C-27HZ_Section Lines - Powers 3C-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
1,407.00	0.00	0.00	1,407.00	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	117.54	1,599.98	-0.81	1.55	-0.73	2.00	2.00	0.00	117.54
Nudge Rate = 2.00/100ft										
1,700.00	4.00	117.54	1,699.84	-3.23	6.19	-2.93	2.00	2.00	0.00	0.00
1,711.49	4.23	117.54	1,711.30	-3.61	6.92	-3.27	2.00	2.00	0.00	0.00
End Nudge @ 1711.49ft										
1,800.00	4.23	117.54	1,799.57	-6.63	12.71	-6.01	0.00	0.00	0.00	0.00
1,900.00	4.23	117.54	1,899.29	-10.04	19.25	-9.11	0.00	0.00	0.00	0.00
2,000.00	4.23	117.54	1,999.02	-13.45	25.79	-12.20	0.00	0.00	0.00	0.00
2,100.00	4.23	117.54	2,098.75	-16.86	32.33	-15.30	0.00	0.00	0.00	0.00
2,200.00	4.23	117.54	2,198.48	-20.27	38.87	-18.39	0.00	0.00	0.00	0.00
2,300.00	4.23	117.54	2,298.21	-23.68	45.40	-21.49	0.00	0.00	0.00	0.00
2,400.00	4.23	117.54	2,397.93	-27.09	51.94	-24.58	0.00	0.00	0.00	0.00
2,500.00	4.23	117.54	2,497.66	-30.50	58.48	-27.67	0.00	0.00	0.00	0.00
2,600.00	4.23	117.54	2,597.39	-33.91	65.02	-30.77	0.00	0.00	0.00	0.00
2,700.00	4.23	117.54	2,697.12	-37.32	71.56	-33.86	0.00	0.00	0.00	0.00
2,800.00	4.23	117.54	2,796.84	-40.73	78.10	-36.96	0.00	0.00	0.00	0.00
2,900.00	4.23	117.54	2,896.57	-44.14	84.64	-40.05	0.00	0.00	0.00	0.00
3,000.00	4.23	117.54	2,996.30	-47.56	91.18	-43.15	0.00	0.00	0.00	0.00
3,100.00	4.23	117.54	3,096.03	-50.97	97.72	-46.24	0.00	0.00	0.00	0.00
3,200.00	4.23	117.54	3,195.75	-54.38	104.26	-49.34	0.00	0.00	0.00	0.00
3,300.00	4.23	117.54	3,295.48	-57.79	110.80	-52.43	0.00	0.00	0.00	0.00
3,400.00	4.23	117.54	3,395.21	-61.20	117.34	-55.53	0.00	0.00	0.00	0.00
3,500.00	4.23	117.54	3,494.94	-64.61	123.88	-58.62	0.00	0.00	0.00	0.00
3,600.00	4.23	117.54	3,594.66	-68.02	130.42	-61.71	0.00	0.00	0.00	0.00
3,700.00	4.23	117.54	3,694.39	-71.43	136.96	-64.81	0.00	0.00	0.00	0.00
3,800.00	4.23	117.54	3,794.12	-74.84	143.50	-67.90	0.00	0.00	0.00	0.00
3,900.00	4.23	117.54	3,893.85	-78.25	150.04	-71.00	0.00	0.00	0.00	0.00
4,000.00	4.23	117.54	3,993.57	-81.66	156.58	-74.09	0.00	0.00	0.00	0.00
Hold Angle @ 4.23										
4,100.00	4.23	117.54	4,093.30	-85.07	163.12	-77.19	0.00	0.00	0.00	0.00
4,200.00	4.23	117.54	4,193.03	-88.48	169.66	-80.28	0.00	0.00	0.00	0.00
4,300.00	4.23	117.54	4,292.76	-91.89	176.20	-83.38	0.00	0.00	0.00	0.00
4,400.00	4.23	117.54	4,392.49	-95.31	182.74	-86.47	0.00	0.00	0.00	0.00
4,500.00	4.23	117.54	4,492.21	-98.72	189.28	-89.57	0.00	0.00	0.00	0.00
4,600.00	4.23	117.54	4,591.94	-102.13	195.82	-92.66	0.00	0.00	0.00	0.00
4,700.00	4.23	117.54	4,691.67	-105.54	202.36	-95.75	0.00	0.00	0.00	0.00

Plan Report for Powers 3C-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	4.23	117.54	4,791.40	-108.95	208.90	-98.85	0.00	0.00	0.00	0.00
4,900.00	4.23	117.54	4,891.12	-112.36	215.43	-101.94	0.00	0.00	0.00	0.00
5,000.00	4.23	117.54	4,990.85	-115.77	221.97	-105.04	0.00	0.00	0.00	0.00
5,100.00	4.23	117.54	5,090.58	-119.18	228.51	-108.13	0.00	0.00	0.00	0.00
5,126.49	4.23	117.54	5,117.00	-120.08	230.25	-108.95	0.00	0.00	0.00	0.00
Sussex										
5,200.00	4.23	117.54	5,190.31	-122.59	235.05	-111.23	0.00	0.00	0.00	0.00
5,300.00	4.23	117.54	5,290.03	-126.00	241.59	-114.32	0.00	0.00	0.00	0.00
5,400.00	4.23	117.54	5,389.76	-129.41	248.13	-117.42	0.00	0.00	0.00	0.00
5,500.00	4.23	117.54	5,489.49	-132.82	254.67	-120.51	0.00	0.00	0.00	0.00
5,600.00	4.23	117.54	5,589.22	-136.23	261.21	-123.60	0.00	0.00	0.00	0.00
5,700.00	4.23	117.54	5,688.94	-139.64	267.75	-126.70	0.00	0.00	0.00	0.00
5,800.00	4.23	117.54	5,788.67	-143.06	274.29	-129.79	0.00	0.00	0.00	0.00
5,900.00	4.23	117.54	5,888.40	-146.47	280.83	-132.89	0.00	0.00	0.00	0.00
6,000.00	4.23	117.54	5,988.13	-149.88	287.37	-135.98	0.00	0.00	0.00	0.00
6,100.00	4.23	117.54	6,087.86	-153.29	293.91	-139.08	0.00	0.00	0.00	0.00
6,200.00	4.23	117.54	6,187.58	-156.70	300.45	-142.17	0.00	0.00	0.00	0.00
6,300.00	4.23	117.54	6,287.31	-160.11	306.99	-145.27	0.00	0.00	0.00	0.00
6,400.00	4.23	117.54	6,387.04	-163.52	313.53	-148.36	0.00	0.00	0.00	0.00
6,500.00	4.23	117.54	6,486.77	-166.93	320.07	-151.46	0.00	0.00	0.00	0.00
6,600.00	4.23	117.54	6,586.49	-170.34	326.61	-154.55	0.00	0.00	0.00	0.00
6,695.13	4.23	117.54	6,681.36	-173.59	332.83	-157.49	0.00	0.00	0.00	0.00
Begin Build @ 6695.13ft										
6,700.00	4.01	111.48	6,686.22	-173.73	333.15	-157.62	9.99	-4.47	-124.42	-119.57
6,800.00	9.16	21.40	6,785.71	-167.58	339.32	-151.19	10.00	5.15	-90.09	-113.53
6,900.00	18.75	8.83	6,882.67	-144.23	344.71	-127.61	10.00	9.59	-12.57	-23.76
6,987.38	27.36	5.04	6,963.00	-110.29	348.63	-93.51	10.00	9.86	-4.33	-11.51
Sharon Springs										
7,000.00	28.61	4.68	6,974.14	-104.39	349.13	-87.60	10.00	9.91	-2.91	-8.02
Build Rate = 10.00/100ft										
7,018.22	30.42	4.19	6,990.00	-95.43	349.83	-78.62	10.00	9.91	-2.65	-7.70
Niobrara A										
7,081.87	36.74	2.85	7,043.00	-60.31	351.95	-43.44	10.00	9.93	-2.11	-7.28
Niobrara B										
7,100.00	38.55	2.54	7,057.35	-49.25	352.47	-32.37	10.00	9.94	-1.72	-6.16
7,166.70	45.18	1.57	7,107.00	-4.79	354.04	12.12	10.00	9.95	-1.45	-5.91
Niobrara C										
7,200.00	48.50	1.17	7,129.77	19.49	354.62	36.40	10.00	9.96	-1.21	-5.19
7,300.00	58.47	0.17	7,189.20	99.75	355.51	116.61	10.00	9.97	-1.00	-4.91
7,400.00	68.44	359.36	7,233.83	189.09	355.12	205.84	10.00	9.97	-0.81	-4.32
7,439.26	72.36	359.08	7,247.00	226.07	354.62	242.74	10.00	9.98	-0.72	-3.96
Fort Hays										
7,500.00	78.42	358.66	7,262.31	284.80	353.46	301.36	10.00	9.98	-0.69	-3.86
7,540.21	82.43	358.40	7,269.00	324.43	352.44	340.89	10.00	9.98	-0.66	-3.75
Codell										
7,600.00	88.40	358.01	7,273.78	383.98	350.57	400.28	10.00	9.98	-0.65	-3.71
7,616.04	90.00	357.91	7,274.00	400.00	350.00	416.26	10.00	9.98	-0.64	-3.68
End Build @ 7616.04ft - Codell TL (Heel) - 7" Intermediate Casing - Powers 3C-27HZ Casing Point										
7,700.00	90.00	357.91	7,274.00	483.91	346.94	499.92	0.00	0.00	0.00	-3.68
7,800.00	90.00	357.91	7,274.00	583.84	343.28	599.57	0.00	0.00	0.00	0.00
7,900.00	90.00	357.91	7,274.00	683.77	339.63	699.21	0.00	0.00	0.00	0.00
8,000.00	90.00	357.91	7,274.00	783.71	335.98	798.86	0.00	0.00	0.00	0.00
8,100.00	90.00	357.91	7,274.00	883.64	332.33	898.50	0.00	0.00	0.00	0.00
8,200.00	90.00	357.91	7,274.00	983.57	328.68	998.15	0.00	0.00	0.00	0.00
8,300.00	90.00	357.91	7,274.00	1,083.51	325.03	1,097.79	0.00	0.00	0.00	0.00
8,400.00	90.00	357.91	7,274.00	1,183.44	321.38	1,197.44	0.00	0.00	0.00	0.00
8,500.00	90.00	357.91	7,274.00	1,283.37	317.73	1,297.08	0.00	0.00	0.00	0.00
8,600.00	90.00	357.91	7,274.00	1,383.31	314.08	1,396.73	0.00	0.00	0.00	0.00
8,700.00	90.00	357.91	7,274.00	1,483.24	310.43	1,496.37	0.00	0.00	0.00	0.00

Plan Report for Powers 3C-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 (°)
8,800.00	90.00	357.91	7,274.00	1,583.18	306.78	1,596.02	0.00	0.00	0.00	0.00
8,900.00	90.00	357.91	7,274.00	1,683.11	303.13	1,695.66	0.00	0.00	0.00	0.00
9,000.00	90.00	357.91	7,274.00	1,783.04	299.48	1,795.31	0.00	0.00	0.00	0.00
9,100.00	90.00	357.91	7,274.00	1,882.98	295.83	1,894.95	0.00	0.00	0.00	0.00
9,200.00	90.00	357.91	7,274.00	1,982.91	292.18	1,994.60	0.00	0.00	0.00	0.00
9,300.00	90.00	357.91	7,274.00	2,082.84	288.53	2,094.24	0.00	0.00	0.00	0.00
9,400.00	90.00	357.91	7,274.00	2,182.78	284.88	2,193.89	0.00	0.00	0.00	0.00
9,500.00	90.00	357.91	7,274.00	2,282.71	281.23	2,293.53	0.00	0.00	0.00	0.00
9,600.00	90.00	357.91	7,274.00	2,382.64	277.58	2,393.18	0.00	0.00	0.00	0.00
9,700.00	90.00	357.91	7,274.00	2,482.58	273.93	2,492.82	0.00	0.00	0.00	0.00
9,800.00	90.00	357.91	7,274.00	2,582.51	270.28	2,592.47	0.00	0.00	0.00	0.00
9,900.00	90.00	357.91	7,274.00	2,682.44	266.63	2,692.11	0.00	0.00	0.00	0.00
10,000.00	90.00	357.91	7,274.00	2,782.38	262.98	2,791.76	0.00	0.00	0.00	0.00
Hold Angle @ 90.00										
10,100.00	90.00	357.91	7,274.00	2,882.31	259.33	2,891.40	0.00	0.00	0.00	0.00
10,200.00	90.00	357.91	7,274.00	2,982.24	255.68	2,991.05	0.00	0.00	0.00	0.00
10,300.00	90.00	357.91	7,274.00	3,082.18	252.03	3,090.69	0.00	0.00	0.00	0.00
10,400.00	90.00	357.91	7,274.00	3,182.11	248.38	3,190.34	0.00	0.00	0.00	0.00
10,500.00	90.00	357.91	7,274.00	3,282.04	244.73	3,289.98	0.00	0.00	0.00	0.00
10,600.00	90.00	357.91	7,274.00	3,381.98	241.08	3,389.63	0.00	0.00	0.00	0.00
10,700.00	90.00	357.91	7,274.00	3,481.91	237.43	3,489.27	0.00	0.00	0.00	0.00
10,800.00	90.00	357.91	7,274.00	3,581.84	233.78	3,588.92	0.00	0.00	0.00	0.00
10,900.00	90.00	357.91	7,274.00	3,681.78	230.13	3,688.56	0.00	0.00	0.00	0.00
11,000.00	90.00	357.91	7,274.00	3,781.71	226.48	3,788.21	0.00	0.00	0.00	0.00
11,100.00	90.00	357.91	7,274.00	3,881.64	222.83	3,887.85	0.00	0.00	0.00	0.00
11,200.00	90.00	357.91	7,274.00	3,981.58	219.18	3,987.50	0.00	0.00	0.00	0.00
11,300.00	90.00	357.91	7,274.00	4,081.51	215.53	4,087.14	0.00	0.00	0.00	0.00
11,400.00	90.00	357.91	7,274.00	4,181.44	211.88	4,186.79	0.00	0.00	0.00	0.00
11,500.00	90.00	357.91	7,274.00	4,281.38	208.23	4,286.43	0.00	0.00	0.00	0.00
11,542.08	90.00	357.91	7,274.00	4,323.43	206.69	4,328.37	0.00	0.00	0.00	0.00
Codell TL (Toe)										
11,542.09	90.00	357.91	7,274.00	4,323.43	206.69	4,328.37	0.00	0.00	0.00	0.00
Powers 3C-27HZ_BHL										

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	+E/-W (ft)	Comment
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
1,600.00	1,599.98	-0.81	1.55	Nudge Rate = 2.00/100ft
1,711.49	1,711.30	-3.61	6.92	End Nudge @ 1711.49ft
4,000.00	3,993.57	-81.66	156.58	Hold Angle @ 4.23
6,695.13	6,681.36	-173.59	332.83	Begin Build @ 6695.13ft
7,000.00	6,974.14	-104.39	349.13	Build Rate = 10.00/100ft
7,616.04	7,274.00	400.00	350.00	End Build @ 7616.04ft
10,000.00	7,274.00	2,782.38	262.98	Hold Angle @ 90.00
11,542.09	7,274.00	4,323.44	206.69	Total Depth @ 11542.09ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (ft)	+E/-W (ft)	Start TVD (ft)
Target	Powers 3C-27HZ_BHL	2.74	Slot	0.00	0.00	7,274.00

Plan Report for Powers 3C-27HZ - Plan A Rev 0 Permit

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	11,542.09	Plan A Rev 0 Permit	MWD

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,616.04	7,274.00	7" Intermediate Casing	7	8-3/4

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,407.00	1,407.00	Fox Hills		0.00	
5,126.49	5,117.00	Sussex		0.00	
6,987.38	6,963.00	Sharon Springs		0.00	
7,018.22	6,990.00	Niobrara A		0.00	
7,081.87	7,043.00	Niobrara B		0.00	
7,166.70	7,107.00	Niobrara C		0.00	
7,439.26	7,247.00	Fort Hays		0.00	
7,540.21	7,269.00	Codell		0.00	
7,616.04	7,274.00	Codell TL (Heel)		0.00	
11,542.08	7,274.00	Codell TL (Toe)		0.00	

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Powers 3C-27HZ_Casing Point	7,274.00	400.00	350.00	Point
Powers 3C-27HZ_BHL	7,274.00	4,323.43	206.69	Point
Powers 3C-27HZ_Setback Lines	0.00	0.00	0.00	Point
Powers 3C-27HZ_Section Lines	0.00	0.00	0.00	Point
Powers 3C-27HZ_SHL	0.00	0.00	0.00	Point

North Reference Sheet for Sec. 27-T2N-R65W - Powers 3C-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 @ 4967.00ft (Drilling Rig). Northing and Easting are relative to Powers 3C-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: 1,281,754.828017 ft N, 3,237,150.289194 ft E

Geographical Coordinates of Well: 40° 06' 13.31" N, 104° 39' 07.91" W

Grid Convergence at Surface is: 0.55°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,542.09ft
the Bottom Hole Displacement is 4,328.37ft in the Direction of 2.74° (True).

Magnetic Convergence at surface is: -8.07° (3 August 2012, , BGGM2011)

