

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 17-T1N-R67W

Griffiths 34N-20HZ

Plan A Rev 0

Plan: Plan A Rev 0 Permit

Sperry Drilling Services

Proposal Report

11 September, 2012

Well Coordinates: 1,264,176.95 N, 3,161,706.66 E (40° 03' 25.59" N, 104° 55' 20.30" W)

Ground Level: 5,070.00 ft

Local Coordinate Origin:

Centered on Well Griffiths 34N-20HZ

Viewing Datum:

RKB=17 @ 5087.00ft (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. 17-T1N-R67W
Well: Griffiths 34N-20HZ
Wellbore: Plan A Rev 0
Design: Plan A Rev 0 Permit

Anadarko Petroleum Corp.

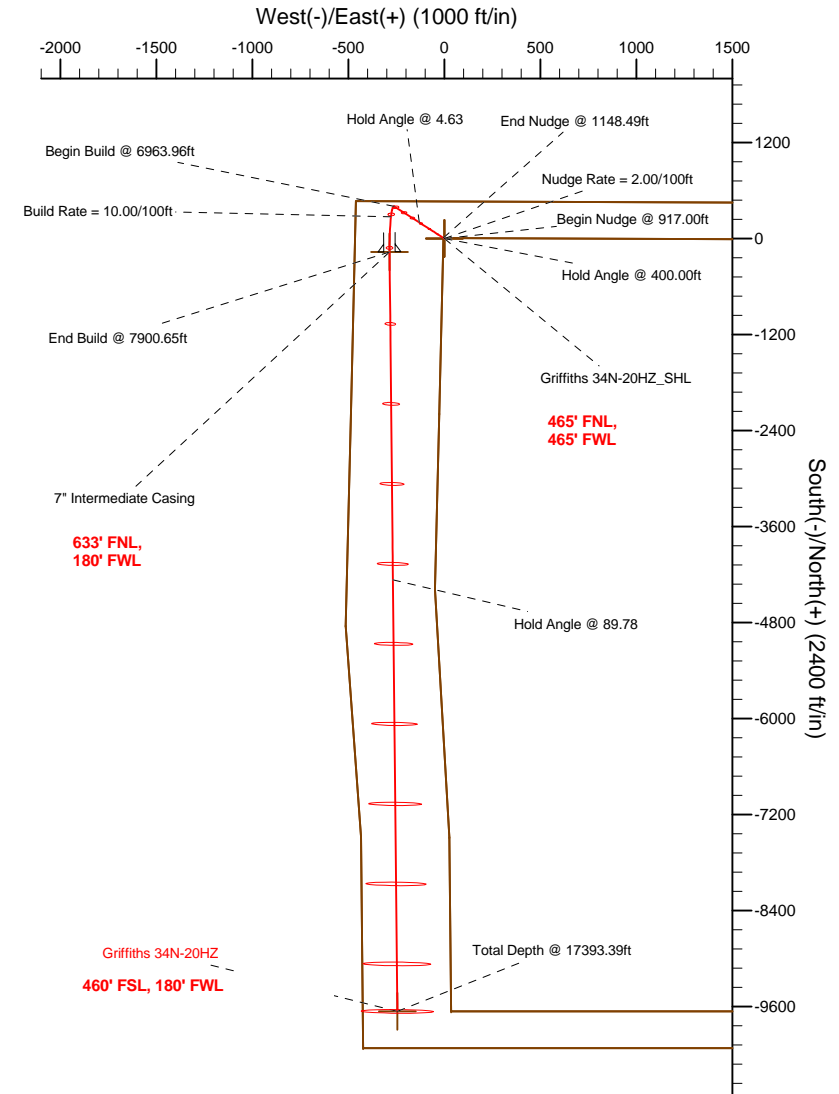
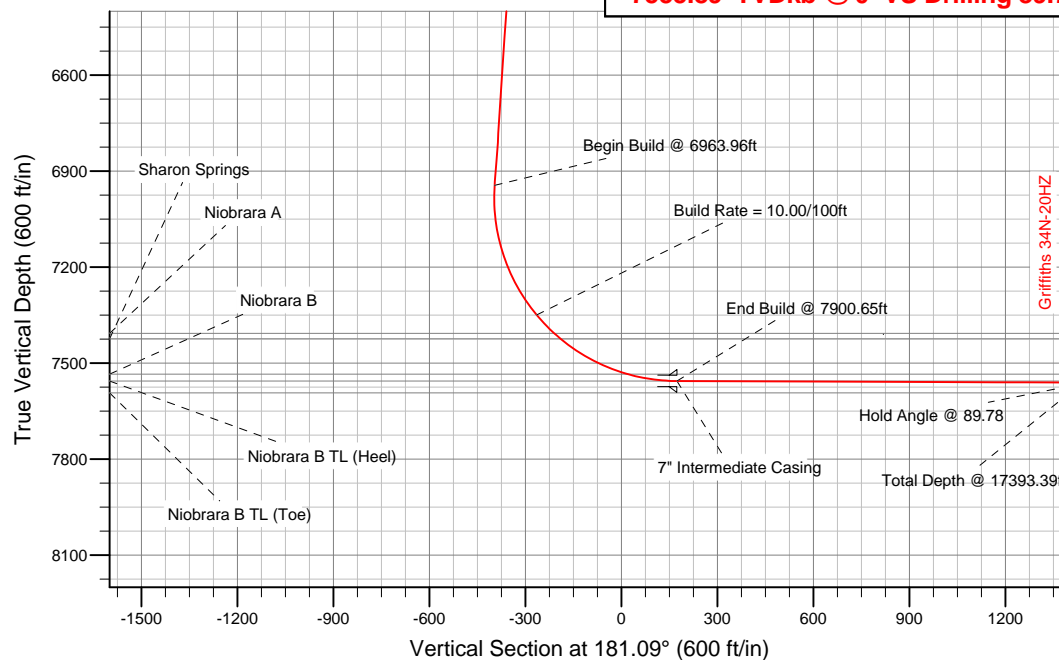
HALLIBURTON
Sperry Drilling

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	917.00	0.00	0.00	917.00	0.00	0.00	0.00	0.00	0.00	
3	1148.49	4.63	327.00	1148.24	7.84	-5.09	2.00	327.00	-7.74	
4	6963.96	4.63	327.00	6944.74	401.51	-260.75	0.00	0.00	-396.46	
5	7900.65	89.78	179.76	7556.00	-168.00	-285.00	10.00	-147.17	173.41	Griffiths 34N-20HZ_Casing Point
6	17393.39	89.78	179.76	7593.00	-9660.58	-244.47	0.00	0.00	9663.49	Griffiths 34N-20HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Griffiths 34N-20HZ_Section Lines	0.00	0.00	0.00	40.057109	-104.922305	Polygon
Griffiths 34N-20HZ_Setback Line	0.00	0.00	0.00	40.057109	-104.922305	Polygon
Griffiths 34N-20HZ_SHL	0.00	0.00	0.00	40.057109	-104.922305	Point
Griffiths 34N-20HZ_Casing Point	7556.00	-168.00	-285.00	40.056648	-104.923323	Point
Griffiths 34N-20HZ_BHL	7593.00	-9660.58	-244.47	40.030590	-104.923178	Point



WELL DETAILS: Griffiths 34N-20HZ

Ground Level 5070.00 RKB=17 @ 5087.00ft (Drilling Rig)

Plan: Plan A Rev 0 Permit (Griffiths 34N-20HZ/Plan A Rev 0)

Created By: Fred Hartmann Date: 09/11/2012
Reviewed: _____ Date: _____

Plan Report for Griffiths 34N-20HZ - 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
Griffiths 34N-20HZ_SHL - Griffiths 34N-20HZ_Section Lines - Griffiths 34N-20HZ_Setback Line										
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
Hold Angle @ 400.00ft										
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
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
917.00	0.00	0.00	917.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 917.00ft										
1,000.00	1.66	327.00	999.99	1.01	-0.65	-1.00	2.00	2.00	0.00	327.00
Nudge Rate = 2.00/100ft										
1,100.00	3.66	327.00	1,099.88	4.90	-3.18	-4.84	2.00	2.00	0.00	0.00
1,148.49	4.63	327.00	1,148.24	7.84	-5.09	-7.74	2.00	2.00	0.00	0.00
End Nudge @ 1148.49ft										
1,200.00	4.63	327.00	1,199.58	11.33	-7.36	-11.18	0.00	0.00	0.00	0.00
1,300.00	4.63	327.00	1,299.25	18.10	-11.75	-17.87	0.00	0.00	0.00	0.00
1,400.00	4.63	327.00	1,398.93	24.87	-16.15	-24.55	0.00	0.00	0.00	0.00
1,500.00	4.63	327.00	1,498.60	31.63	-20.54	-31.24	0.00	0.00	0.00	0.00
1,600.00	4.63	327.00	1,598.27	38.40	-24.94	-37.92	0.00	0.00	0.00	0.00
1,700.00	4.63	327.00	1,697.95	45.17	-29.34	-44.60	0.00	0.00	0.00	0.00
1,800.00	4.63	327.00	1,797.62	51.94	-33.73	-51.29	0.00	0.00	0.00	0.00
1,900.00	4.63	327.00	1,897.30	58.71	-38.13	-57.97	0.00	0.00	0.00	0.00
2,000.00	4.63	327.00	1,996.97	65.48	-42.53	-64.66	0.00	0.00	0.00	0.00
2,100.00	4.63	327.00	2,096.64	72.25	-46.92	-71.34	0.00	0.00	0.00	0.00
2,200.00	4.63	327.00	2,196.32	79.02	-51.32	-78.03	0.00	0.00	0.00	0.00
2,300.00	4.63	327.00	2,295.99	85.79	-55.71	-84.71	0.00	0.00	0.00	0.00
2,400.00	4.63	327.00	2,395.66	92.56	-60.11	-91.39	0.00	0.00	0.00	0.00
2,500.00	4.63	327.00	2,495.34	99.33	-64.51	-98.08	0.00	0.00	0.00	0.00
2,600.00	4.63	327.00	2,595.01	106.10	-68.90	-104.76	0.00	0.00	0.00	0.00
2,700.00	4.63	327.00	2,694.69	112.87	-73.30	-111.45	0.00	0.00	0.00	0.00
2,800.00	4.63	327.00	2,794.36	119.64	-77.70	-118.13	0.00	0.00	0.00	0.00
2,900.00	4.63	327.00	2,894.03	126.41	-82.09	-124.82	0.00	0.00	0.00	0.00
3,000.00	4.63	327.00	2,993.71	133.18	-86.49	-131.50	0.00	0.00	0.00	0.00
3,100.00	4.63	327.00	3,093.38	139.95	-90.88	-138.18	0.00	0.00	0.00	0.00
3,200.00	4.63	327.00	3,193.05	146.72	-95.28	-144.87	0.00	0.00	0.00	0.00
3,300.00	4.63	327.00	3,292.73	153.48	-99.68	-151.55	0.00	0.00	0.00	0.00
3,400.00	4.63	327.00	3,392.40	160.25	-104.07	-158.24	0.00	0.00	0.00	0.00
3,500.00	4.63	327.00	3,492.08	167.02	-108.47	-164.92	0.00	0.00	0.00	0.00
3,600.00	4.63	327.00	3,591.75	173.79	-112.87	-171.60	0.00	0.00	0.00	0.00
3,700.00	4.63	327.00	3,691.42	180.56	-117.26	-178.29	0.00	0.00	0.00	0.00
3,800.00	4.63	327.00	3,791.10	187.33	-121.66	-184.97	0.00	0.00	0.00	0.00
3,900.00	4.63	327.00	3,890.77	194.10	-126.05	-191.66	0.00	0.00	0.00	0.00
4,000.00	4.63	327.00	3,990.44	200.87	-130.45	-198.34	0.00	0.00	0.00	0.00
Hold Angle @ 4.63										
4,100.00	4.63	327.00	4,090.12	207.64	-134.85	-205.03	0.00	0.00	0.00	0.00
4,200.00	4.63	327.00	4,189.79	214.41	-139.24	-211.71	0.00	0.00	0.00	0.00
4,300.00	4.63	327.00	4,289.47	221.18	-143.64	-218.39	0.00	0.00	0.00	0.00
4,400.00	4.63	327.00	4,389.14	227.95	-148.03	-225.08	0.00	0.00	0.00	0.00
4,500.00	4.63	327.00	4,488.81	234.72	-152.43	-231.76	0.00	0.00	0.00	0.00
4,580.45	4.63	327.00	4,569.00	240.16	-155.97	-237.14	0.00	0.00	0.00	0.00
Sussex										
4,600.00	4.63	327.00	4,588.49	241.49	-156.83	-238.45	0.00	0.00	0.00	0.00

Plan Report for Griffiths 34N-20HZ - 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 (°)
4,700.00	4.63	327.00	4,688.16	248.26	-161.22	-245.13	0.00	0.00	0.00	0.00
4,800.00	4.63	327.00	4,787.83	255.03	-165.62	-251.82	0.00	0.00	0.00	0.00
4,900.00	4.63	327.00	4,887.51	261.80	-170.02	-258.50	0.00	0.00	0.00	0.00
5,000.00	4.63	327.00	4,987.18	268.56	-174.41	-265.18	0.00	0.00	0.00	0.00
5,100.00	4.63	327.00	5,086.85	275.33	-178.81	-271.87	0.00	0.00	0.00	0.00
5,173.38	4.63	327.00	5,160.00	280.30	-182.03	-276.77	0.00	0.00	0.00	0.00
Shannon										
5,200.00	4.63	327.00	5,186.53	282.10	-183.20	-278.55	0.00	0.00	0.00	0.00
5,300.00	4.63	327.00	5,286.20	288.87	-187.60	-285.24	0.00	0.00	0.00	0.00
5,400.00	4.63	327.00	5,385.88	295.64	-192.00	-291.92	0.00	0.00	0.00	0.00
5,500.00	4.63	327.00	5,485.55	302.41	-196.39	-298.60	0.00	0.00	0.00	0.00
5,600.00	4.63	327.00	5,585.22	309.18	-200.79	-305.29	0.00	0.00	0.00	0.00
5,700.00	4.63	327.00	5,684.90	315.95	-205.19	-311.97	0.00	0.00	0.00	0.00
5,800.00	4.63	327.00	5,784.57	322.72	-209.58	-318.66	0.00	0.00	0.00	0.00
5,900.00	4.63	327.00	5,884.24	329.49	-213.98	-325.34	0.00	0.00	0.00	0.00
6,000.00	4.63	327.00	5,983.92	336.26	-218.37	-332.03	0.00	0.00	0.00	0.00
6,100.00	4.63	327.00	6,083.59	343.03	-222.77	-338.71	0.00	0.00	0.00	0.00
6,200.00	4.63	327.00	6,183.27	349.80	-227.17	-345.39	0.00	0.00	0.00	0.00
6,300.00	4.63	327.00	6,282.94	356.57	-231.56	-352.08	0.00	0.00	0.00	0.00
6,400.00	4.63	327.00	6,382.61	363.34	-235.96	-358.76	0.00	0.00	0.00	0.00
6,500.00	4.63	327.00	6,482.29	370.11	-240.36	-365.45	0.00	0.00	0.00	0.00
6,600.00	4.63	327.00	6,581.96	376.88	-244.75	-372.13	0.00	0.00	0.00	0.00
6,700.00	4.63	327.00	6,681.63	383.65	-249.15	-378.82	0.00	0.00	0.00	0.00
6,800.00	4.63	327.00	6,781.31	390.41	-253.54	-385.50	0.00	0.00	0.00	0.00
6,900.00	4.63	327.00	6,880.98	397.18	-257.94	-392.18	0.00	0.00	0.00	0.00
6,963.96	4.63	327.00	6,944.73	401.51	-260.75	-396.46	0.00	0.00	0.00	0.00
Begin Build @ 6963.96ft										
7,000.00	2.52	276.32	6,980.71	402.82	-262.33	-397.74	10.00	-5.84	-140.62	-147.17
7,100.00	10.03	194.09	7,080.15	394.60	-266.65	-389.43	10.00	7.50	-82.23	-96.57
7,200.00	19.86	186.71	7,176.66	369.22	-270.77	-363.98	10.00	9.84	-7.38	-14.56
7,300.00	29.81	184.13	7,267.30	327.45	-274.55	-322.15	10.00	9.94	-2.58	-7.40
7,400.00	39.78	182.76	7,349.32	270.56	-277.89	-265.21	10.00	9.97	-1.37	-5.05
Build Rate = 10.00/100ft										
7,479.94	47.75	182.03	7,407.00	215.36	-280.18	-209.97	10.00	9.98	-0.92	-3.92
Niobrara A										
7,500.00	49.76	181.87	7,420.22	200.29	-280.69	-194.89	10.00	9.98	-0.77	-3.39
7,505.88	50.34	181.83	7,424.00	195.78	-280.83	-190.38	10.00	9.98	-0.74	-3.29
Sharon Springs										
7,600.00	59.74	181.21	7,477.87	118.76	-282.85	-113.33	10.00	9.99	-0.66	-3.26
7,700.00	69.73	180.67	7,520.49	28.45	-284.32	-23.01	10.00	9.99	-0.54	-2.90
7,743.51	74.08	180.46	7,534.00	-12.90	-284.72	18.33	10.00	9.99	-0.48	-2.67
Niobrara B										
7,800.00	79.72	180.20	7,546.80	-67.90	-285.04	73.33	10.00	9.99	-0.46	-2.61
7,900.00	89.71	179.76	7,556.00	-167.35	-285.00	172.76	10.00	9.99	-0.44	-2.55
7,900.65	89.78	179.76	7,556.00	-168.00	-285.00	173.41	9.93	9.92	-0.43	-2.51
End Build @ 7900.65ft - Niobrara B TL (Heel) - 7" Intermediate Casing - Griffiths 34N-20HZ_Casing Point										
8,000.00	89.78	179.76	7,556.39	-267.34	-284.58	272.73	0.00	0.00	0.00	-2.51
8,100.00	89.78	179.76	7,556.78	-367.34	-284.15	372.70	0.00	0.00	0.00	0.00
8,200.00	89.78	179.76	7,557.17	-467.34	-283.72	472.68	0.00	0.00	0.00	0.00
8,300.00	89.78	179.76	7,557.56	-567.34	-283.30	572.65	0.00	0.00	0.00	0.00
8,400.00	89.78	179.76	7,557.95	-667.34	-282.87	672.62	0.00	0.00	0.00	0.00
8,500.00	89.78	179.76	7,558.34	-767.34	-282.44	772.59	0.00	0.00	0.00	0.00
8,600.00	89.78	179.76	7,558.73	-867.33	-282.01	872.56	0.00	0.00	0.00	0.00
8,700.00	89.78	179.76	7,559.12	-967.33	-281.59	972.53	0.00	0.00	0.00	0.00
8,800.00	89.78	179.76	7,559.51	-1,067.33	-281.16	1,072.51	0.00	0.00	0.00	0.00
8,900.00	89.78	179.76	7,559.90	-1,167.33	-280.73	1,172.48	0.00	0.00	0.00	0.00
9,000.00	89.78	179.76	7,560.28	-1,267.33	-280.31	1,272.45	0.00	0.00	0.00	0.00
9,100.00	89.78	179.76	7,560.67	-1,367.33	-279.88	1,372.42	0.00	0.00	0.00	0.00
9,200.00	89.78	179.76	7,561.06	-1,467.32	-279.45	1,472.39	0.00	0.00	0.00	0.00

Plan Report for Griffiths 34N-20HZ - 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 (°)
9,300.00	89.78	179.76	7,561.45	-1,567.32	-279.03	1,572.37	0.00	0.00	0.00	0.00
9,400.00	89.78	179.76	7,561.84	-1,667.32	-278.60	1,672.34	0.00	0.00	0.00	0.00
9,500.00	89.78	179.76	7,562.23	-1,767.32	-278.17	1,772.31	0.00	0.00	0.00	0.00
9,600.00	89.78	179.76	7,562.62	-1,867.32	-277.75	1,872.28	0.00	0.00	0.00	0.00
9,700.00	89.78	179.76	7,563.01	-1,967.32	-277.32	1,972.25	0.00	0.00	0.00	0.00
9,800.00	89.78	179.76	7,563.40	-2,067.31	-276.89	2,072.23	0.00	0.00	0.00	0.00
9,900.00	89.78	179.76	7,563.79	-2,167.31	-276.46	2,172.20	0.00	0.00	0.00	0.00
10,000.00	89.78	179.76	7,564.18	-2,267.31	-276.04	2,272.17	0.00	0.00	0.00	0.00
10,100.00	89.78	179.76	7,564.57	-2,367.31	-275.61	2,372.14	0.00	0.00	0.00	0.00
10,200.00	89.78	179.76	7,564.96	-2,467.31	-275.18	2,472.11	0.00	0.00	0.00	0.00
10,300.00	89.78	179.76	7,565.35	-2,567.31	-274.76	2,572.09	0.00	0.00	0.00	0.00
10,400.00	89.78	179.76	7,565.74	-2,667.30	-274.33	2,672.06	0.00	0.00	0.00	0.00
10,500.00	89.78	179.76	7,566.13	-2,767.30	-273.90	2,772.03	0.00	0.00	0.00	0.00
10,600.00	89.78	179.76	7,566.52	-2,867.30	-273.48	2,872.00	0.00	0.00	0.00	0.00
10,700.00	89.78	179.76	7,566.91	-2,967.30	-273.05	2,971.97	0.00	0.00	0.00	0.00
10,800.00	89.78	179.76	7,567.30	-3,067.30	-272.62	3,071.95	0.00	0.00	0.00	0.00
10,900.00	89.78	179.76	7,567.69	-3,167.30	-272.20	3,171.92	0.00	0.00	0.00	0.00
11,000.00	89.78	179.76	7,568.08	-3,267.29	-271.77	3,271.89	0.00	0.00	0.00	0.00
11,100.00	89.78	179.76	7,568.47	-3,367.29	-271.34	3,371.86	0.00	0.00	0.00	0.00
11,200.00	89.78	179.76	7,568.86	-3,467.29	-270.91	3,471.83	0.00	0.00	0.00	0.00
11,300.00	89.78	179.76	7,569.25	-3,567.29	-270.49	3,571.80	0.00	0.00	0.00	0.00
11,400.00	89.78	179.76	7,569.64	-3,667.29	-270.06	3,671.78	0.00	0.00	0.00	0.00
11,500.00	89.78	179.76	7,570.03	-3,767.29	-269.63	3,771.75	0.00	0.00	0.00	0.00
11,600.00	89.78	179.76	7,570.42	-3,867.28	-269.21	3,871.72	0.00	0.00	0.00	0.00
11,700.00	89.78	179.76	7,570.81	-3,967.28	-268.78	3,971.69	0.00	0.00	0.00	0.00
11,800.00	89.78	179.76	7,571.20	-4,067.28	-268.35	4,071.66	0.00	0.00	0.00	0.00
11,900.00	89.78	179.76	7,571.59	-4,167.28	-267.93	4,171.64	0.00	0.00	0.00	0.00
12,000.00	89.78	179.76	7,571.98	-4,267.28	-267.50	4,271.61	0.00	0.00	0.00	0.00
Hold Angle @ 89.78										
12,100.00	89.78	179.76	7,572.37	-4,367.28	-267.07	4,371.58	0.00	0.00	0.00	0.00
12,200.00	89.78	179.76	7,572.76	-4,467.27	-266.65	4,471.55	0.00	0.00	0.00	0.00
12,300.00	89.78	179.76	7,573.15	-4,567.27	-266.22	4,571.52	0.00	0.00	0.00	0.00
12,400.00	89.78	179.76	7,573.54	-4,667.27	-265.79	4,671.50	0.00	0.00	0.00	0.00
12,500.00	89.78	179.76	7,573.93	-4,767.27	-265.36	4,771.47	0.00	0.00	0.00	0.00
12,600.00	89.78	179.76	7,574.32	-4,867.27	-264.94	4,871.44	0.00	0.00	0.00	0.00
12,700.00	89.78	179.76	7,574.71	-4,967.27	-264.51	4,971.41	0.00	0.00	0.00	0.00
12,800.00	89.78	179.76	7,575.10	-5,067.26	-264.08	5,071.38	0.00	0.00	0.00	0.00
12,900.00	89.78	179.76	7,575.49	-5,167.26	-263.66	5,171.36	0.00	0.00	0.00	0.00
13,000.00	89.78	179.76	7,575.88	-5,267.26	-263.23	5,271.33	0.00	0.00	0.00	0.00
13,100.00	89.78	179.76	7,576.27	-5,367.26	-262.80	5,371.30	0.00	0.00	0.00	0.00
13,200.00	89.78	179.76	7,576.66	-5,467.26	-262.38	5,471.27	0.00	0.00	0.00	0.00
13,300.00	89.78	179.76	7,577.05	-5,567.26	-261.95	5,571.24	0.00	0.00	0.00	0.00
13,400.00	89.78	179.76	7,577.43	-5,667.25	-261.52	5,671.22	0.00	0.00	0.00	0.00
13,500.00	89.78	179.76	7,577.82	-5,767.25	-261.10	5,771.19	0.00	0.00	0.00	0.00
13,600.00	89.78	179.76	7,578.21	-5,867.25	-260.67	5,871.16	0.00	0.00	0.00	0.00
13,700.00	89.78	179.76	7,578.60	-5,967.25	-260.24	5,971.13	0.00	0.00	0.00	0.00
13,800.00	89.78	179.76	7,578.99	-6,067.25	-259.81	6,071.10	0.00	0.00	0.00	0.00
13,900.00	89.78	179.76	7,579.38	-6,167.25	-259.39	6,171.07	0.00	0.00	0.00	0.00
14,000.00	89.78	179.76	7,579.77	-6,267.24	-258.96	6,271.05	0.00	0.00	0.00	0.00
14,100.00	89.78	179.76	7,580.16	-6,367.24	-258.53	6,371.02	0.00	0.00	0.00	0.00
14,200.00	89.78	179.76	7,580.55	-6,467.24	-258.11	6,470.99	0.00	0.00	0.00	0.00
14,300.00	89.78	179.76	7,580.94	-6,567.24	-257.68	6,570.96	0.00	0.00	0.00	0.00
14,400.00	89.78	179.76	7,581.33	-6,667.24	-257.25	6,670.93	0.00	0.00	0.00	0.00
14,500.00	89.78	179.76	7,581.72	-6,767.24	-256.83	6,770.91	0.00	0.00	0.00	0.00
14,600.00	89.78	179.76	7,582.11	-6,867.23	-256.40	6,870.88	0.00	0.00	0.00	0.00
14,700.00	89.78	179.76	7,582.50	-6,967.23	-255.97	6,970.85	0.00	0.00	0.00	0.00
14,800.00	89.78	179.76	7,582.89	-7,067.23	-255.55	7,070.82	0.00	0.00	0.00	0.00
14,900.00	89.78	179.76	7,583.28	-7,167.23	-255.12	7,170.79	0.00	0.00	0.00	0.00
15,000.00	89.78	179.76	7,583.67	-7,267.23	-254.69	7,270.77	0.00	0.00	0.00	0.00

Plan Report for Griffiths 34N-20HZ - 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 (°)
15,100.00	89.78	179.76	7,584.06	-7,367.23	-254.26	7,370.74	0.00	0.00	0.00	0.00
15,200.00	89.78	179.76	7,584.45	-7,467.22	-253.84	7,470.71	0.00	0.00	0.00	0.00
15,300.00	89.78	179.76	7,584.84	-7,567.22	-253.41	7,570.68	0.00	0.00	0.00	0.00
15,400.00	89.78	179.76	7,585.23	-7,667.22	-252.98	7,670.65	0.00	0.00	0.00	0.00
15,500.00	89.78	179.76	7,585.62	-7,767.22	-252.56	7,770.63	0.00	0.00	0.00	0.00
15,600.00	89.78	179.76	7,586.01	-7,867.22	-252.13	7,870.60	0.00	0.00	0.00	0.00
15,700.00	89.78	179.76	7,586.40	-7,967.22	-251.70	7,970.57	0.00	0.00	0.00	0.00
15,800.00	89.78	179.76	7,586.79	-8,067.21	-251.28	8,070.54	0.00	0.00	0.00	0.00
15,900.00	89.78	179.76	7,587.18	-8,167.21	-250.85	8,170.51	0.00	0.00	0.00	0.00
16,000.00	89.78	179.76	7,587.57	-8,267.21	-250.42	8,270.49	0.00	0.00	0.00	0.00
16,100.00	89.78	179.76	7,587.96	-8,367.21	-250.00	8,370.46	0.00	0.00	0.00	0.00
16,200.00	89.78	179.76	7,588.35	-8,467.21	-249.57	8,470.43	0.00	0.00	0.00	0.00
16,300.00	89.78	179.76	7,588.74	-8,567.21	-249.14	8,570.40	0.00	0.00	0.00	0.00
16,400.00	89.78	179.76	7,589.13	-8,667.20	-248.71	8,670.37	0.00	0.00	0.00	0.00
16,500.00	89.78	179.76	7,589.52	-8,767.20	-248.29	8,770.35	0.00	0.00	0.00	0.00
16,600.00	89.78	179.76	7,589.91	-8,867.20	-247.86	8,870.32	0.00	0.00	0.00	0.00
16,700.00	89.78	179.76	7,590.30	-8,967.20	-247.43	8,970.29	0.00	0.00	0.00	0.00
16,800.00	89.78	179.76	7,590.69	-9,067.20	-247.01	9,070.26	0.00	0.00	0.00	0.00
16,900.00	89.78	179.76	7,591.08	-9,167.20	-246.58	9,170.23	0.00	0.00	0.00	0.00
17,000.00	89.78	179.76	7,591.47	-9,267.19	-246.15	9,270.20	0.00	0.00	0.00	0.00
17,100.00	89.78	179.76	7,591.86	-9,367.19	-245.73	9,370.18	0.00	0.00	0.00	0.00
17,200.00	89.78	179.76	7,592.25	-9,467.19	-245.30	9,470.15	0.00	0.00	0.00	0.00
17,300.00	89.78	179.76	7,592.64	-9,567.19	-244.87	9,570.12	0.00	0.00	0.00	0.00
17,393.39	89.78	179.76	7,593.00	-9,660.58	-244.47	9,663.48	0.00	0.00	0.00	0.00
Total Depth @ 17393.39ft - Griffiths 34N-20HZ_BHL										

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	+E/-W (ft)	Comment
400.00	400.00	0.00	0.00	Hold Angle @ 400.00ft
917.00	917.00	0.00	0.00	Begin Nudge @ 917.00ft
1,000.00	999.99	1.01	-0.65	Nudge Rate = 2.00/100ft
1,148.49	1,148.24	7.84	-5.09	End Nudge @ 1148.49ft
4,000.00	3,990.44	200.87	-130.45	Hold Angle @ 4.63
6,963.96	6,944.73	401.51	-260.75	Begin Build @ 6963.96ft
7,400.00	7,349.32	270.56	-277.89	Build Rate = 10.00/100ft
7,900.65	7,556.00	-168.00	-285.00	End Build @ 7900.65ft
12,000.00	7,571.98	-4,267.28	-267.50	Hold Angle @ 89.78
17,393.39	7,593.00	-9,660.58	-244.47	Total Depth @ 17393.39ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (ft)	+E/-W (ft)	Start TVD (ft)
User	Griffiths 34N-20HZ_BHL	181.09	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	17,393.39	Plan A Rev 0 Permit	MWD

Plan Report for Griffiths 34N-20HZ - Plan A Rev 0 Permit**Casing Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,900.65	7,556.00	7" Intermediate Casing	7	8-3/4

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,580.45	4,569.00	Sussex		0.00	
5,173.38	5,160.00	Shannon		0.00	
7,479.94	7,407.00	Niobrara A		0.00	
7,505.88	7,424.00	Sharon Springs		0.00	
7,743.51	7,534.00	Niobrara B		0.00	
7,900.65	7,556.00	Niobrara B TL (Heel)		0.00	
17,393.39	7,593.00	Niobrara B TL (Toe)		0.00	

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Griffiths 34N-20HZ_Section Lines	0.00	0.00	0.00	Polygon
Griffiths 34N-20HZ_Setback Line	0.00	0.00	0.00	Polygon
Griffiths 34N-20HZ_Casing Point	7,556.00	-168.00	-285.00	Point
Griffiths 34N-20HZ_BHL	7,593.00	-9,660.58	-244.47	Point
Griffiths 34N-20HZ_SHL	0.00	0.00	0.00	Point

North Reference Sheet for Sec. 17-T1N-R67W - Griffiths 34N-20HZ - 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 @ 5087.00ft (Drilling Rig). Northing and Easting are relative to Griffiths 34N-20HZ

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: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99996253

Grid Coordinates of Well: 1,264,176.95 ft N, 3,161,706.66 ft E

Geographical Coordinates of Well: 40° 03' 25.59" N, 104° 55' 20.30" W

Grid Convergence at Surface is: 0.37°

Based upon Minimum Curvature type calculations, at a Measured Depth of 17,393.39ft
the Bottom Hole Displacement is 9,663.67ft in the Direction of 181.45° (True).

Magnetic Convergence at surface is: -8.38° (30 August 2012, , BGGM2011)

