

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 17-T1N-R67W

Griffiths 14C-20HZ

Plan B Rev 0

Plan: Plan B Rev 0 Permit

Sperry Drilling Services

Proposal Report

12 December, 2012

Well Coordinates: 1,264,173.77 N, 3,163,058.44 E (40° 03' 25.47" N, 104° 55' 02.91" W)

Ground Level: 5,056.00 ft

Local Coordinate Origin:

Centered on Well Griffiths 14C-20HZ

Viewing Datum:

RKB=17 @ 5073.00ft (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 14C-20HZ
Wellbore: Plan B Rev 0
Design: Plan B Rev 0 Permit

Anadarko Petroleum Corp.

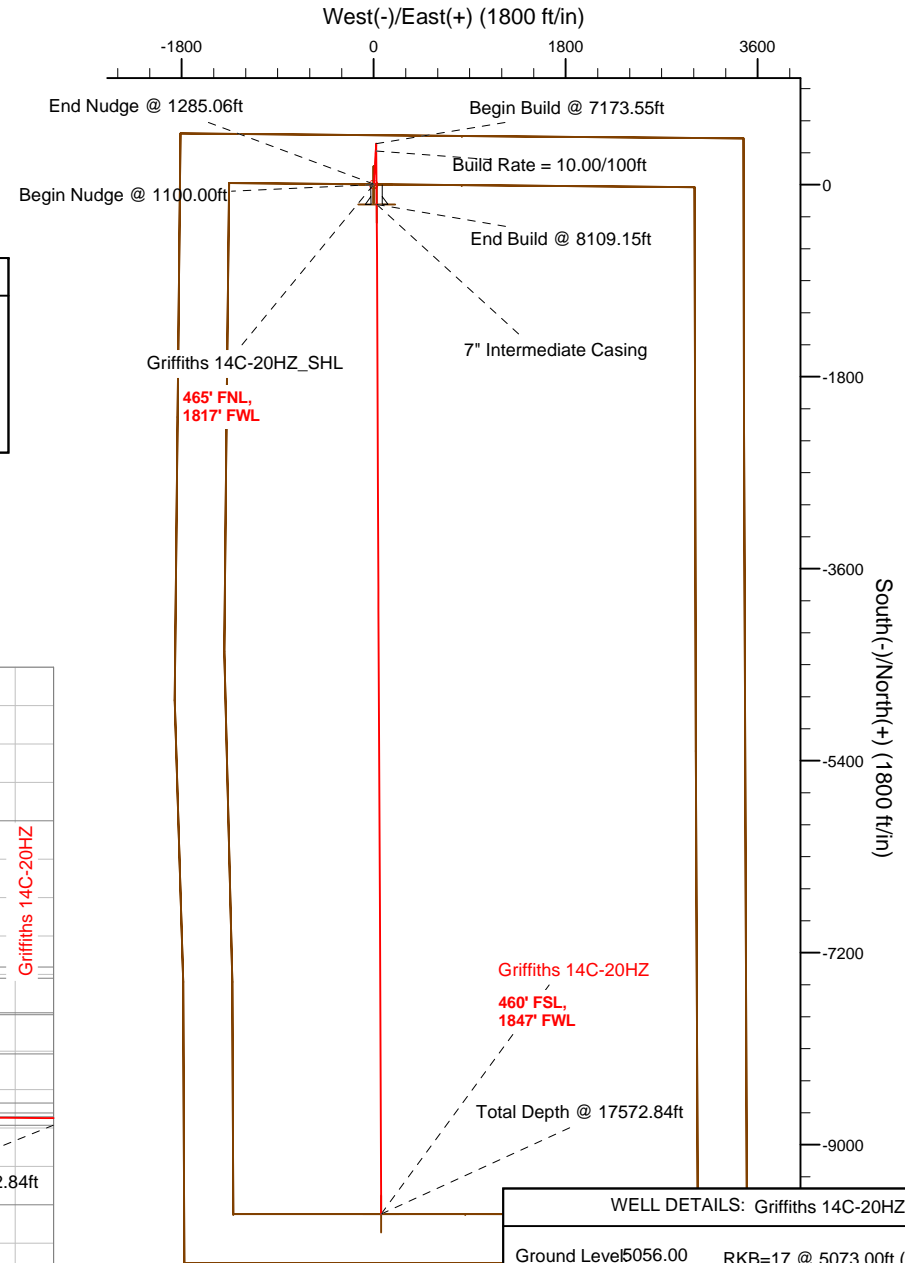
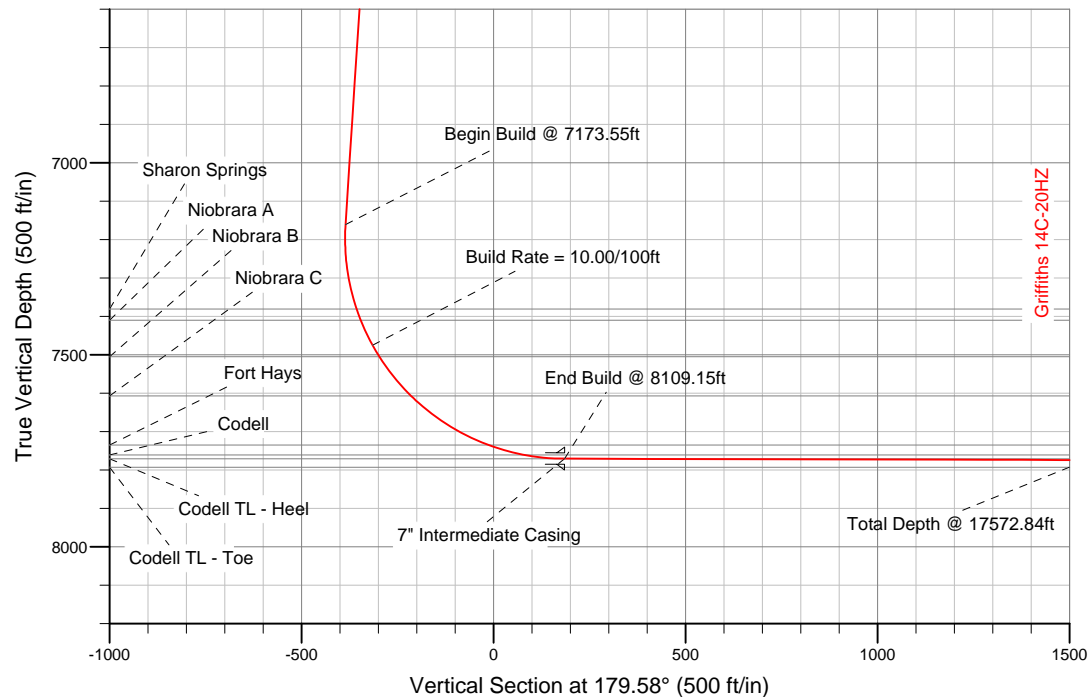
HALLIBURTON
Sperry Drilling

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	1100.00	0.00	0.00	1100.00	0.00	0.00	0.00	0.00	0.00	
3	1285.06	3.70	3.41	1284.93	5.96	0.35	2.00	3.41	-5.96	
4	7173.55	3.70	3.41	7161.14	385.42	22.94	0.00	0.00	-385.24	
5	8109.15	89.87	179.74	7771.00	-185.00	28.00	10.00	176.33	185.20	Griffiths 14C-20HZ_CP
6	17572.84	89.87	179.74	7793.00	-9648.57	70.29	0.00	0.00	9648.82	Griffiths 14C-20HZ_newBHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Griffiths 14C-20HZ_Sec 17/20 Line	0.00	0.00	0.00	40.057076	-104.917476	Point
Griffiths 14C-20HZ_Section Line	0.00	0.00	0.00	40.057076	-104.917476	Polygon
Griffiths 14C-20HZ_Setback Line	0.00	0.00	0.00	40.057076	-104.917476	Polygon
Griffiths 14C-20HZ_SHL	0.00	0.00	0.00	40.057076	-104.917476	Point
Griffiths 14C-20HZ_CP	7771.00	-185.00	28.00	40.056568	-104.917376	Point
Griffiths 14C-20HZ_newBHL	7793.00	-9648.57	70.29	40.030590	-104.917225	Point



WELL DETAILS: Griffiths 14C-20HZ

Ground Level 5056.00 RKB=17 @ 5073.00ft (Drilling Rig)

Plan: Plan B Rev 0 Permit (Griffiths 14C-20HZ/Plan B Rev 0)

Created By: Fred Hartmann Date: 12/03/2012
Reviewed: _____ Date: _____

Plan Report for Griffiths 14C-20HZ - Plan B 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
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
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
Begin Nudge @ 1100.00ft										
1,200.00	2.00	3.41	1,199.98	1.74	0.10	-1.74	2.00	2.00	0.00	3.41
1,285.06	3.70	3.41	1,284.93	5.96	0.35	-5.96	2.00	2.00	0.00	0.00
End Nudge @ 1285.06ft										
1,300.00	3.70	3.41	1,299.84	6.93	0.41	-6.92	0.00	0.00	0.00	0.00
1,400.00	3.70	3.41	1,399.63	13.37	0.80	-13.37	0.00	0.00	0.00	0.00
1,500.00	3.70	3.41	1,499.42	19.82	1.18	-19.81	0.00	0.00	0.00	0.00
1,600.00	3.70	3.41	1,599.21	26.26	1.56	-26.25	0.00	0.00	0.00	0.00
1,700.00	3.70	3.41	1,699.01	32.70	1.95	-32.69	0.00	0.00	0.00	0.00
1,800.00	3.70	3.41	1,798.80	39.15	2.33	-39.13	0.00	0.00	0.00	0.00
1,900.00	3.70	3.41	1,898.59	45.59	2.71	-45.57	0.00	0.00	0.00	0.00
2,000.00	3.70	3.41	1,998.38	52.04	3.10	-52.01	0.00	0.00	0.00	0.00
2,100.00	3.70	3.41	2,098.17	58.48	3.48	-58.45	0.00	0.00	0.00	0.00
2,200.00	3.70	3.41	2,197.96	64.92	3.86	-64.89	0.00	0.00	0.00	0.00
2,300.00	3.70	3.41	2,297.75	71.37	4.25	-71.33	0.00	0.00	0.00	0.00
2,400.00	3.70	3.41	2,397.55	77.81	4.63	-77.78	0.00	0.00	0.00	0.00
2,500.00	3.70	3.41	2,497.34	84.26	5.01	-84.22	0.00	0.00	0.00	0.00
2,600.00	3.70	3.41	2,597.13	90.70	5.40	-90.66	0.00	0.00	0.00	0.00
2,700.00	3.70	3.41	2,696.92	97.14	5.78	-97.10	0.00	0.00	0.00	0.00
2,800.00	3.70	3.41	2,796.71	103.59	6.16	-103.54	0.00	0.00	0.00	0.00
2,900.00	3.70	3.41	2,896.50	110.03	6.55	-109.98	0.00	0.00	0.00	0.00
3,000.00	3.70	3.41	2,996.29	116.48	6.93	-116.42	0.00	0.00	0.00	0.00
3,100.00	3.70	3.41	3,096.09	122.92	7.32	-122.86	0.00	0.00	0.00	0.00
3,200.00	3.70	3.41	3,195.88	129.36	7.70	-129.30	0.00	0.00	0.00	0.00
3,300.00	3.70	3.41	3,295.67	135.81	8.08	-135.74	0.00	0.00	0.00	0.00
3,400.00	3.70	3.41	3,395.46	142.25	8.47	-142.19	0.00	0.00	0.00	0.00
3,500.00	3.70	3.41	3,495.25	148.70	8.85	-148.63	0.00	0.00	0.00	0.00
3,600.00	3.70	3.41	3,595.04	155.14	9.23	-155.07	0.00	0.00	0.00	0.00
3,700.00	3.70	3.41	3,694.83	161.58	9.62	-161.51	0.00	0.00	0.00	0.00
3,800.00	3.70	3.41	3,794.63	168.03	10.00	-167.95	0.00	0.00	0.00	0.00
3,900.00	3.70	3.41	3,894.42	174.47	10.38	-174.39	0.00	0.00	0.00	0.00
4,000.00	3.70	3.41	3,994.21	180.92	10.77	-180.83	0.00	0.00	0.00	0.00
4,100.00	3.70	3.41	4,094.00	187.36	11.15	-187.27	0.00	0.00	0.00	0.00
4,200.00	3.70	3.41	4,193.79	193.80	11.53	-193.71	0.00	0.00	0.00	0.00
4,300.00	3.70	3.41	4,293.58	200.25	11.92	-200.16	0.00	0.00	0.00	0.00
4,400.00	3.70	3.41	4,393.37	206.69	12.30	-206.60	0.00	0.00	0.00	0.00
4,500.00	3.70	3.41	4,493.17	213.14	12.68	-213.04	0.00	0.00	0.00	0.00
4,561.96	3.70	3.41	4,555.00	217.13	12.92	-217.03	0.00	0.00	0.00	0.00
Sussex										
4,600.00	3.70	3.41	4,592.96	219.58	13.07	-219.48	0.00	0.00	0.00	0.00
4,700.00	3.70	3.41	4,692.75	226.02	13.45	-225.92	0.00	0.00	0.00	0.00
4,800.00	3.70	3.41	4,792.54	232.47	13.83	-232.36	0.00	0.00	0.00	0.00
4,900.00	3.70	3.41	4,892.33	238.91	14.22	-238.80	0.00	0.00	0.00	0.00
5,000.00	3.70	3.41	4,992.12	245.36	14.60	-245.24	0.00	0.00	0.00	0.00
5,100.00	3.70	3.41	5,091.91	251.80	14.99	-251.68	0.00	0.00	0.00	0.00
5,154.20	3.70	3.41	5,146.00	255.29	15.19	-255.17	0.00	0.00	0.00	0.00

Plan Report for Griffiths 14C-20HZ - Plan B 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 (°)
Shannon										
5,200.00	3.70	3.41	5,191.71	258.24	15.37	-258.12	0.00	0.00	0.00	0.00
5,300.00	3.70	3.41	5,291.50	264.69	15.75	-264.57	0.00	0.00	0.00	0.00
5,400.00	3.70	3.41	5,391.29	271.13	16.14	-271.01	0.00	0.00	0.00	0.00
5,500.00	3.70	3.41	5,491.08	277.58	16.52	-277.45	0.00	0.00	0.00	0.00
5,600.00	3.70	3.41	5,590.87	284.02	16.90	-283.89	0.00	0.00	0.00	0.00
5,700.00	3.70	3.41	5,690.66	290.46	17.29	-290.33	0.00	0.00	0.00	0.00
5,800.00	3.70	3.41	5,790.45	296.91	17.67	-296.77	0.00	0.00	0.00	0.00
5,900.00	3.70	3.41	5,890.25	303.35	18.05	-303.21	0.00	0.00	0.00	0.00
6,000.00	3.70	3.41	5,990.04	309.80	18.44	-309.65	0.00	0.00	0.00	0.00
6,100.00	3.70	3.41	6,089.83	316.24	18.82	-316.09	0.00	0.00	0.00	0.00
6,200.00	3.70	3.41	6,189.62	322.68	19.20	-322.53	0.00	0.00	0.00	0.00
6,300.00	3.70	3.41	6,289.41	329.13	19.59	-328.98	0.00	0.00	0.00	0.00
6,400.00	3.70	3.41	6,389.20	335.57	19.97	-335.42	0.00	0.00	0.00	0.00
6,500.00	3.70	3.41	6,488.99	342.02	20.35	-341.86	0.00	0.00	0.00	0.00
6,600.00	3.70	3.41	6,588.79	348.46	20.74	-348.30	0.00	0.00	0.00	0.00
6,700.00	3.70	3.41	6,688.58	354.90	21.12	-354.74	0.00	0.00	0.00	0.00
6,800.00	3.70	3.41	6,788.37	361.35	21.50	-361.18	0.00	0.00	0.00	0.00
6,900.00	3.70	3.41	6,888.16	367.79	21.89	-367.62	0.00	0.00	0.00	0.00
7,000.00	3.70	3.41	6,987.95	374.24	22.27	-374.06	0.00	0.00	0.00	0.00
7,100.00	3.70	3.41	7,087.74	380.68	22.66	-380.50	0.00	0.00	0.00	0.00
7,173.55	3.70	3.41	7,161.14	385.42	22.94	-385.24	0.00	0.00	0.00	0.00
Begin Build @ 7173.55ft										
7,200.00	1.07	12.46	7,187.56	386.51	23.04	-386.34	10.00	-9.93	34.24	176.33
7,300.00	8.95	178.24	7,287.20	379.63	23.48	-379.45	10.00	7.88	165.78	167.28
7,396.70	18.62	179.04	7,381.00	356.62	23.97	-356.43	10.00	10.00	0.83	1.52
Sharon Springs										
7,400.00	18.95	179.06	7,384.12	355.56	23.99	-355.37	10.00	10.00	0.40	0.74
7,427.60	21.71	179.15	7,410.00	345.97	24.14	-345.78	10.00	10.00	0.34	0.73
Niobrara A										
7,500.00	28.95	179.32	7,475.40	315.01	24.55	-314.83	10.00	10.00	0.23	0.64
Build Rate = 10.00/100ft										
7,534.42	32.39	179.37	7,505.00	297.46	24.75	-297.27	10.00	10.00	0.16	0.49
Niobrara B										
7,600.00	38.95	179.45	7,558.24	259.24	25.14	-259.05	10.00	10.00	0.12	0.44
7,665.90	45.54	179.51	7,607.00	214.95	25.54	-214.76	10.00	10.00	0.09	0.38
Niobrara C										
7,700.00	48.95	179.54	7,630.14	189.92	25.75	-189.73	10.00	10.00	0.08	0.33
7,800.00	58.95	179.60	7,688.91	109.17	26.35	-108.98	10.00	10.00	0.06	0.31
7,900.00	68.95	179.65	7,732.77	19.45	26.93	-19.25	10.00	10.00	0.05	0.28
7,906.29	69.58	179.66	7,735.00	13.56	26.97	-13.37	10.00	10.00	0.05	0.25
Fort Hays										
8,000.00	78.95	179.70	7,760.38	-76.53	27.47	76.73	10.00	10.00	0.04	0.25
8,003.27	79.28	179.70	7,761.00	-79.75	27.49	79.94	10.00	10.00	0.04	0.24
Codell										
8,100.00	88.95	179.74	7,770.91	-175.85	27.96	176.05	10.00	10.00	0.04	0.24
8,109.15	89.87	179.74	7,771.00	-185.00	28.00	185.20	10.00	10.00	0.04	0.24
End Build @ 8109.15ft - Codell TL - Heel - 7" Intermediate Casing - Griffiths 14C-20HZ_CP										
8,200.00	89.87	179.74	7,771.21	-275.85	28.41	276.05	0.00	0.00	0.00	0.24
8,300.00	89.87	179.74	7,771.44	-375.84	28.85	376.04	0.00	0.00	0.00	0.00
8,400.00	89.87	179.74	7,771.68	-475.84	29.30	476.04	0.00	0.00	0.00	0.00
8,500.00	89.87	179.74	7,771.91	-575.84	29.75	576.04	0.00	0.00	0.00	0.00
8,600.00	89.87	179.74	7,772.14	-675.84	30.19	676.04	0.00	0.00	0.00	0.00
8,700.00	89.87	179.74	7,772.37	-775.84	30.64	776.04	0.00	0.00	0.00	0.00
8,800.00	89.87	179.74	7,772.61	-875.84	31.09	876.04	0.00	0.00	0.00	0.00
8,900.00	89.87	179.74	7,772.84	-975.84	31.53	976.04	0.00	0.00	0.00	0.00
9,000.00	89.87	179.74	7,773.07	-1,075.84	31.98	1,076.04	0.00	0.00	0.00	0.00
9,100.00	89.87	179.74	7,773.30	-1,175.83	32.43	1,176.04	0.00	0.00	0.00	0.00

Plan Report for Griffiths 14C-20HZ - Plan B 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 (°)
9,200.00	89.87	179.74	7,773.54	-1,275.83	32.87	1,276.04	0.00	0.00	0.00	0.00
9,300.00	89.87	179.74	7,773.77	-1,375.83	33.32	1,376.04	0.00	0.00	0.00	0.00
9,400.00	89.87	179.74	7,774.00	-1,475.83	33.77	1,476.04	0.00	0.00	0.00	0.00
9,500.00	89.87	179.74	7,774.23	-1,575.83	34.22	1,576.04	0.00	0.00	0.00	0.00
9,600.00	89.87	179.74	7,774.47	-1,675.83	34.66	1,676.04	0.00	0.00	0.00	0.00
9,700.00	89.87	179.74	7,774.70	-1,775.83	35.11	1,776.04	0.00	0.00	0.00	0.00
9,800.00	89.87	179.74	7,774.93	-1,875.83	35.56	1,876.03	0.00	0.00	0.00	0.00
9,900.00	89.87	179.74	7,775.16	-1,975.82	36.00	1,976.03	0.00	0.00	0.00	0.00
10,000.00	89.87	179.74	7,775.40	-2,075.82	36.45	2,076.03	0.00	0.00	0.00	0.00
10,100.00	89.87	179.74	7,775.63	-2,175.82	36.90	2,176.03	0.00	0.00	0.00	0.00
10,200.00	89.87	179.74	7,775.86	-2,275.82	37.34	2,276.03	0.00	0.00	0.00	0.00
10,300.00	89.87	179.74	7,776.09	-2,375.82	37.79	2,376.03	0.00	0.00	0.00	0.00
10,400.00	89.87	179.74	7,776.33	-2,475.82	38.24	2,476.03	0.00	0.00	0.00	0.00
10,500.00	89.87	179.74	7,776.56	-2,575.82	38.68	2,576.03	0.00	0.00	0.00	0.00
10,600.00	89.87	179.74	7,776.79	-2,675.82	39.13	2,676.03	0.00	0.00	0.00	0.00
10,700.00	89.87	179.74	7,777.02	-2,775.81	39.58	2,776.03	0.00	0.00	0.00	0.00
10,800.00	89.87	179.74	7,777.26	-2,875.81	40.02	2,876.03	0.00	0.00	0.00	0.00
10,900.00	89.87	179.74	7,777.49	-2,975.81	40.47	2,976.03	0.00	0.00	0.00	0.00
11,000.00	89.87	179.74	7,777.72	-3,075.81	40.92	3,076.03	0.00	0.00	0.00	0.00
11,100.00	89.87	179.74	7,777.95	-3,175.81	41.36	3,176.03	0.00	0.00	0.00	0.00
11,200.00	89.87	179.74	7,778.19	-3,275.81	41.81	3,276.03	0.00	0.00	0.00	0.00
11,300.00	89.87	179.74	7,778.42	-3,375.81	42.26	3,376.02	0.00	0.00	0.00	0.00
11,400.00	89.87	179.74	7,778.65	-3,475.80	42.71	3,476.02	0.00	0.00	0.00	0.00
11,500.00	89.87	179.74	7,778.88	-3,575.80	43.15	3,576.02	0.00	0.00	0.00	0.00
11,600.00	89.87	179.74	7,779.12	-3,675.80	43.60	3,676.02	0.00	0.00	0.00	0.00
11,700.00	89.87	179.74	7,779.35	-3,775.80	44.05	3,776.02	0.00	0.00	0.00	0.00
11,800.00	89.87	179.74	7,779.58	-3,875.80	44.49	3,876.02	0.00	0.00	0.00	0.00
11,900.00	89.87	179.74	7,779.81	-3,975.80	44.94	3,976.02	0.00	0.00	0.00	0.00
12,000.00	89.87	179.74	7,780.04	-4,075.80	45.39	4,076.02	0.00	0.00	0.00	0.00
12,100.00	89.87	179.74	7,780.28	-4,175.80	45.83	4,176.02	0.00	0.00	0.00	0.00
12,200.00	89.87	179.74	7,780.51	-4,275.79	46.28	4,276.02	0.00	0.00	0.00	0.00
12,300.00	89.87	179.74	7,780.74	-4,375.79	46.73	4,376.02	0.00	0.00	0.00	0.00
12,400.00	89.87	179.74	7,780.97	-4,475.79	47.17	4,476.02	0.00	0.00	0.00	0.00
12,500.00	89.87	179.74	7,781.21	-4,575.79	47.62	4,576.02	0.00	0.00	0.00	0.00
12,600.00	89.87	179.74	7,781.44	-4,675.79	48.07	4,676.02	0.00	0.00	0.00	0.00
12,700.00	89.87	179.74	7,781.67	-4,775.79	48.51	4,776.02	0.00	0.00	0.00	0.00
12,800.00	89.87	179.74	7,781.90	-4,875.79	48.96	4,876.01	0.00	0.00	0.00	0.00
12,900.00	89.87	179.74	7,782.14	-4,975.79	49.41	4,976.01	0.00	0.00	0.00	0.00
13,000.00	89.87	179.74	7,782.37	-5,075.78	49.86	5,076.01	0.00	0.00	0.00	0.00
13,100.00	89.87	179.74	7,782.60	-5,175.78	50.30	5,176.01	0.00	0.00	0.00	0.00
13,200.00	89.87	179.74	7,782.83	-5,275.78	50.75	5,276.01	0.00	0.00	0.00	0.00
13,300.00	89.87	179.74	7,783.07	-5,375.78	51.20	5,376.01	0.00	0.00	0.00	0.00
13,400.00	89.87	179.74	7,783.30	-5,475.78	51.64	5,476.01	0.00	0.00	0.00	0.00
13,500.00	89.87	179.74	7,783.53	-5,575.78	52.09	5,576.01	0.00	0.00	0.00	0.00
13,600.00	89.87	179.74	7,783.76	-5,675.78	52.54	5,676.01	0.00	0.00	0.00	0.00
13,700.00	89.87	179.74	7,784.00	-5,775.78	52.98	5,776.01	0.00	0.00	0.00	0.00
13,800.00	89.87	179.74	7,784.23	-5,875.77	53.43	5,876.01	0.00	0.00	0.00	0.00
13,900.00	89.87	179.74	7,784.46	-5,975.77	53.88	5,976.01	0.00	0.00	0.00	0.00
14,000.00	89.87	179.74	7,784.69	-6,075.77	54.32	6,076.01	0.00	0.00	0.00	0.00
14,100.00	89.87	179.74	7,784.93	-6,175.77	54.77	6,176.01	0.00	0.00	0.00	0.00
14,200.00	89.87	179.74	7,785.16	-6,275.77	55.22	6,276.01	0.00	0.00	0.00	0.00
14,300.00	89.87	179.74	7,785.39	-6,375.77	55.66	6,376.00	0.00	0.00	0.00	0.00
14,400.00	89.87	179.74	7,785.62	-6,475.77	56.11	6,476.00	0.00	0.00	0.00	0.00
14,500.00	89.87	179.74	7,785.86	-6,575.77	56.56	6,576.00	0.00	0.00	0.00	0.00
14,600.00	89.87	179.74	7,786.09	-6,675.76	57.01	6,676.00	0.00	0.00	0.00	0.00
14,700.00	89.87	179.74	7,786.32	-6,775.76	57.45	6,776.00	0.00	0.00	0.00	0.00
14,800.00	89.87	179.74	7,786.55	-6,875.76	57.90	6,876.00	0.00	0.00	0.00	0.00
14,900.00	89.87	179.74	7,786.79	-6,975.76	58.35	6,976.00	0.00	0.00	0.00	0.00
15,000.00	89.87	179.74	7,787.02	-7,075.76	58.79	7,076.00	0.00	0.00	0.00	0.00
15,100.00	89.87	179.74	7,787.25	-7,175.76	59.24	7,176.00	0.00	0.00	0.00	0.00

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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 (°)
15,200.00	89.87	179.74	7,787.48	-7,275.76	59.69	7,276.00	0.00	0.00	0.00	0.00
15,300.00	89.87	179.74	7,787.72	-7,375.76	60.13	7,376.00	0.00	0.00	0.00	0.00
15,400.00	89.87	179.74	7,787.95	-7,475.75	60.58	7,476.00	0.00	0.00	0.00	0.00
15,500.00	89.87	179.74	7,788.18	-7,575.75	61.03	7,576.00	0.00	0.00	0.00	0.00
15,600.00	89.87	179.74	7,788.41	-7,675.75	61.47	7,676.00	0.00	0.00	0.00	0.00
15,700.00	89.87	179.74	7,788.65	-7,775.75	61.92	7,776.00	0.00	0.00	0.00	0.00
15,800.00	89.87	179.74	7,788.88	-7,875.75	62.37	7,875.99	0.00	0.00	0.00	0.00
15,900.00	89.87	179.74	7,789.11	-7,975.75	62.81	7,975.99	0.00	0.00	0.00	0.00
16,000.00	89.87	179.74	7,789.34	-8,075.75	63.26	8,075.99	0.00	0.00	0.00	0.00
16,100.00	89.87	179.74	7,789.58	-8,175.75	63.71	8,175.99	0.00	0.00	0.00	0.00
16,200.00	89.87	179.74	7,789.81	-8,275.74	64.15	8,275.99	0.00	0.00	0.00	0.00
16,300.00	89.87	179.74	7,790.04	-8,375.74	64.60	8,375.99	0.00	0.00	0.00	0.00
16,400.00	89.87	179.74	7,790.27	-8,475.74	65.05	8,475.99	0.00	0.00	0.00	0.00
16,500.00	89.87	179.74	7,790.51	-8,575.74	65.50	8,575.99	0.00	0.00	0.00	0.00
16,600.00	89.87	179.74	7,790.74	-8,675.74	65.94	8,675.99	0.00	0.00	0.00	0.00
16,700.00	89.87	179.74	7,790.97	-8,775.74	66.39	8,775.99	0.00	0.00	0.00	0.00
16,800.00	89.87	179.74	7,791.20	-8,875.74	66.84	8,875.99	0.00	0.00	0.00	0.00
16,900.00	89.87	179.74	7,791.44	-8,975.74	67.28	8,975.99	0.00	0.00	0.00	0.00
17,000.00	89.87	179.74	7,791.67	-9,075.73	67.73	9,075.99	0.00	0.00	0.00	0.00
17,100.00	89.87	179.74	7,791.90	-9,175.73	68.18	9,175.99	0.00	0.00	0.00	0.00
17,200.00	89.87	179.74	7,792.13	-9,275.73	68.62	9,275.99	0.00	0.00	0.00	0.00
17,300.00	89.87	179.74	7,792.37	-9,375.73	69.07	9,375.98	0.00	0.00	0.00	0.00
17,400.00	89.87	179.74	7,792.60	-9,475.73	69.52	9,475.98	0.00	0.00	0.00	0.00
17,500.00	89.87	179.74	7,792.83	-9,575.73	69.96	9,575.98	0.00	0.00	0.00	0.00
17,572.84	89.87	179.74	7,793.00	-9,648.57	70.29	9,648.82	0.00	0.00	0.00	0.00

Total Depth @ 17572.84ft - Griffiths 14C-20HZ_newBHL**Plan Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	+E/-W (ft)	Comment
1,100.00	1,100.00	0.00	0.00	Begin Nudge @ 1100.00ft
1,285.06	1,284.93	5.96	0.35	End Nudge @ 1285.06ft
7,173.55	7,161.14	385.42	22.94	Begin Build @ 7173.55ft
7,500.00	7,475.40	315.01	24.55	Build Rate = 10.00/100ft
8,109.15	7,771.00	-185.00	28.00	End Build @ 8109.15ft
17,572.84	7,793.00	-9,648.57	70.29	Total Depth @ 17572.84ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (ft)	+E/-W (ft)	Start TVD (ft)
Target	Griffiths 14C-20HZ_newBHL	179.58	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	17,572.84	Plan B Rev 0 Permit	MWD

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Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
8,109.15	7,771.00	7" Intermediate Casing	7	8-3/4

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,561.96	4,555.00	Sussex		0.00	
5,154.20	5,146.00	Shannon		0.00	
7,396.70	7,381.00	Sharon Springs		0.00	
7,427.60	7,410.00	Niobrara A		0.00	
7,534.42	7,505.00	Niobrara B		0.00	
7,665.90	7,607.00	Niobrara C		0.00	
7,906.29	7,735.00	Fort Hays		0.00	
8,003.27	7,761.00	Codell		0.00	
8,109.15	7,771.00	Codell TL - Heel		0.00	
17,572.84	7,793.00	Codell TL - Toe		0.00	

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Griffiths 14C-20HZ_SHL	0.00	0.00	0.00	Point
Griffiths 14C-20HZ_Setback Line	0.00	0.00	0.00	Polygon
Griffiths 14C-20HZ_newBHL	7,793.00	-9,648.57	70.29	Point
Griffiths 14C-20HZ_Sec 17/20 Line	0.00	0.00	0.00	Point
Griffiths 14C-20HZ_CP	7,771.00	-185.00	28.00	Point
Griffiths 14C-20HZ_Section Line	0.00	0.00	0.00	Polygon

North Reference Sheet for Sec. 17-T1N-R67W - Griffiths 14C-20HZ - Plan B 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 @ 5073.00ft (Drilling Rig). Northing and Easting are relative to Griffiths 14C-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: 1,264,173.77 ft N, 3,163,058.44 ft E

Geographical Coordinates of Well: 40° 03' 25.47" N, 104° 55' 02.91" W

Grid Convergence at Surface is: 0.38°

Based upon Minimum Curvature type calculations, at a Measured Depth of 17,572.84ft
the Bottom Hole Displacement is 9,648.82ft in the Direction of 179.58° (True).

Magnetic Convergence at surface is: -8.39° (12 December 2012, , BGGM2012)

