

# Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 17-T1N-R67W

Griffiths 14N-20HZ

Plan B Rev 0

Plan: Plan B Rev 0 Permit

## Sperry Drilling Services

## Proposal Report

12 December, 2012

Well Coordinates: 1,263,672.81 N, 3,163,380.57 E (40° 03' 20.50" N, 104° 54' 58.81" W)

Ground Level: 5,061.00 ft

Local Coordinate Origin:

Centered on Well Griffiths 14N-20HZ

Viewing Datum:

RKB=17 @ 5078.00ft (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 14N-20HZ  
Wellbore: Plan B Rev 0  
Design: Plan B Rev 0 Permit

# Anadarko Petroleum Corp.

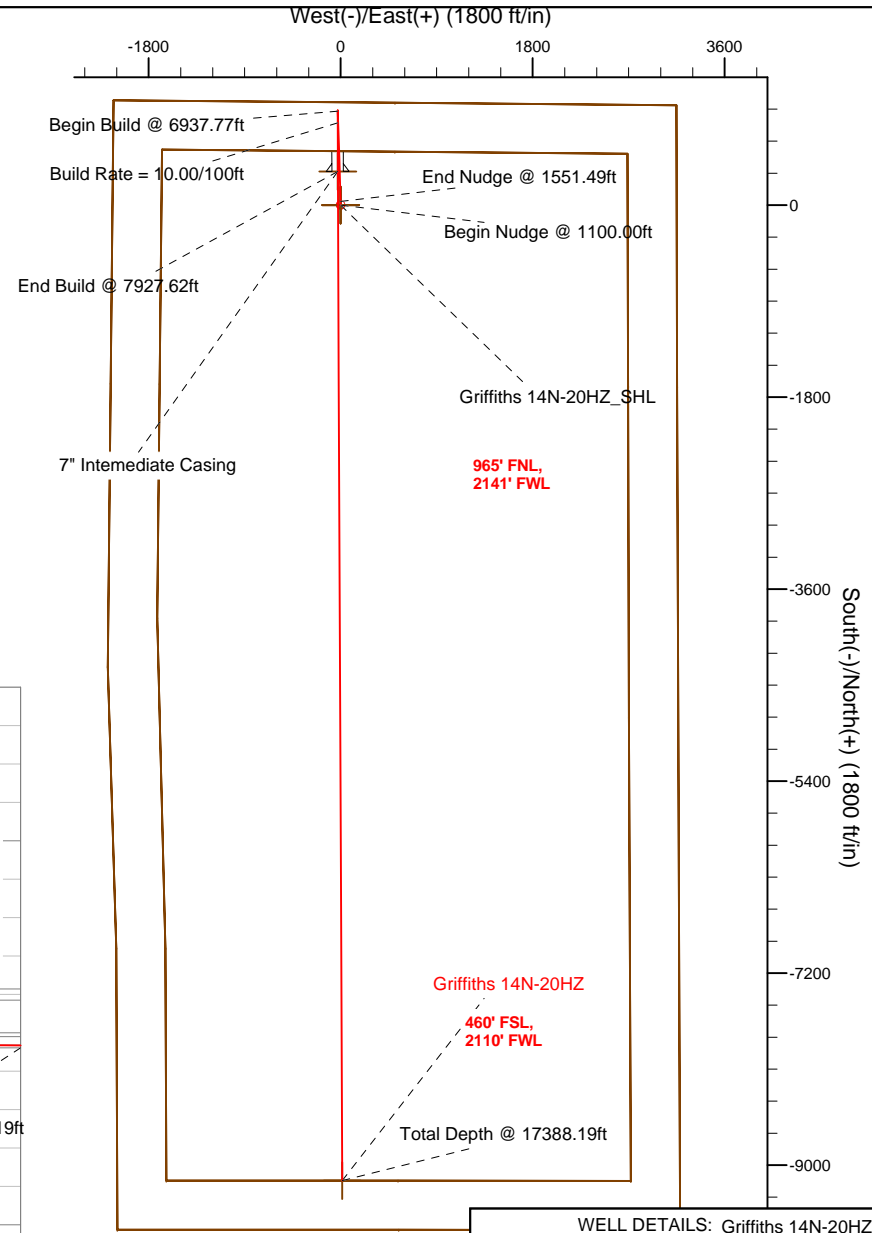
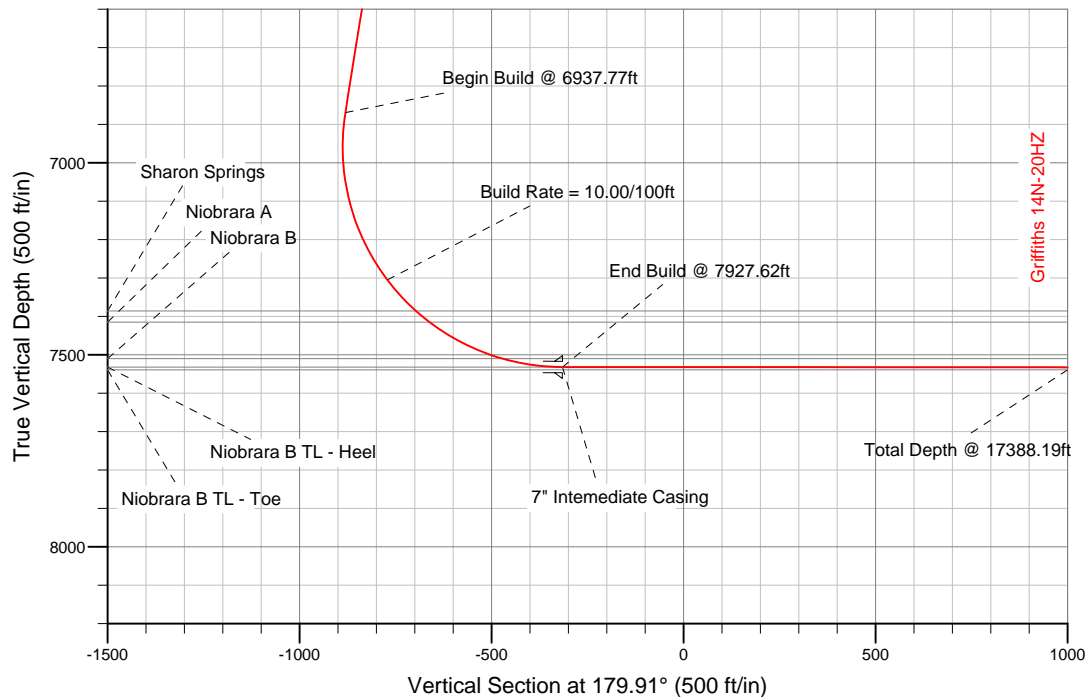
**HALLIBURTON**  
Sperry Drilling

## 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	1551.49	9.03	358.23	1549.62	35.49	-1.10	2.00	358.23	-35.49	
4	6937.77	9.03	358.23	6869.16	880.45	-27.21	0.00	0.00	-880.49	
5	7927.62	89.96	179.75	7532.00	315.00	-27.50	10.00	-178.46	-315.04	Griffiths 14N-20HZ_CP
6	17388.19	89.96	179.75	7539.00	-9145.47	14.28	0.00	0.00	9145.49	Griffiths 14N-20HZ_newBHL

## WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Griffiths 14N-20HZ_Section Lines	0.00	0.00	0.00	40.055695	-104.916337	Polygon
Griffiths 14N-20HZ_Setback Lines	0.00	0.00	0.00	40.055695	-104.916337	Polygon
Griffiths 14N-20HZ_Setback Lines - Sec 20.00	0.00	0.00	0.00	40.055695	-104.916337	Point
Griffiths 14N-20HZ_SHL	0.00	0.00	0.00	40.055695	-104.916337	Point
Griffiths 14N-20HZ_CP	7532.00	315.00	-27.50	40.056560	-104.916435	Point
Griffiths 14N-20HZ_newBHL	7539.00	-9145.47	14.28	40.030590	-104.916286	Point



## WELL DETAILS: Griffiths 14N-20HZ

Ground Level 5061.00 RKB=17 @ 5078.00ft (Drilling Rig)

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

Created By: Fred Hartmann Date: 12/03/2012  
Reviewed: \_\_\_\_\_ Date: \_\_\_\_\_

**Plan Report for Griffiths 14N-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
<b>Begin Nudge @ 1100.00ft</b>										
1,200.00	2.00	358.23	1,199.98	1.74	-0.05	-1.74	2.00	2.00	0.00	358.23
1,300.00	4.00	358.23	1,299.84	6.98	-0.22	-6.98	2.00	2.00	0.00	0.00
1,400.00	6.00	358.23	1,399.45	15.69	-0.48	-15.69	2.00	2.00	0.00	0.00
1,500.00	8.00	358.23	1,498.70	27.87	-0.86	-27.87	2.00	2.00	0.00	0.00
1,551.49	9.03	358.23	1,549.62	35.49	-1.10	-35.49	2.00	2.00	0.00	0.00
<b>End Nudge @ 1551.49ft</b>										
1,600.00	9.03	358.23	1,597.53	43.10	-1.33	-43.10	0.00	0.00	0.00	0.00
1,700.00	9.03	358.23	1,696.29	58.78	-1.82	-58.79	0.00	0.00	0.00	0.00
1,800.00	9.03	358.23	1,795.05	74.47	-2.30	-74.47	0.00	0.00	0.00	0.00
1,900.00	9.03	358.23	1,893.81	90.16	-2.79	-90.16	0.00	0.00	0.00	0.00
2,000.00	9.03	358.23	1,992.57	105.85	-3.27	-105.85	0.00	0.00	0.00	0.00
2,100.00	9.03	358.23	2,091.34	121.53	-3.76	-121.54	0.00	0.00	0.00	0.00
2,200.00	9.03	358.23	2,190.10	137.22	-4.24	-137.23	0.00	0.00	0.00	0.00
2,300.00	9.03	358.23	2,288.86	152.91	-4.73	-152.91	0.00	0.00	0.00	0.00
2,400.00	9.03	358.23	2,387.62	168.59	-5.21	-168.60	0.00	0.00	0.00	0.00
2,500.00	9.03	358.23	2,486.38	184.28	-5.70	-184.29	0.00	0.00	0.00	0.00
2,600.00	9.03	358.23	2,585.14	199.97	-6.18	-199.98	0.00	0.00	0.00	0.00
2,700.00	9.03	358.23	2,683.90	215.66	-6.66	-215.67	0.00	0.00	0.00	0.00
2,800.00	9.03	358.23	2,782.66	231.34	-7.15	-231.35	0.00	0.00	0.00	0.00
2,900.00	9.03	358.23	2,881.42	247.03	-7.63	-247.04	0.00	0.00	0.00	0.00
3,000.00	9.03	358.23	2,980.18	262.72	-8.12	-262.73	0.00	0.00	0.00	0.00
3,100.00	9.03	358.23	3,078.94	278.40	-8.60	-278.42	0.00	0.00	0.00	0.00
3,200.00	9.03	358.23	3,177.70	294.09	-9.09	-294.11	0.00	0.00	0.00	0.00
3,300.00	9.03	358.23	3,276.46	309.78	-9.57	-309.79	0.00	0.00	0.00	0.00
3,400.00	9.03	358.23	3,375.22	325.47	-10.06	-325.48	0.00	0.00	0.00	0.00
3,500.00	9.03	358.23	3,473.99	341.15	-10.54	-341.17	0.00	0.00	0.00	0.00
3,600.00	9.03	358.23	3,572.75	356.84	-11.03	-356.86	0.00	0.00	0.00	0.00
3,700.00	9.03	358.23	3,671.51	372.53	-11.51	-372.55	0.00	0.00	0.00	0.00
3,800.00	9.03	358.23	3,770.27	388.22	-12.00	-388.23	0.00	0.00	0.00	0.00
3,900.00	9.03	358.23	3,869.03	403.90	-12.48	-403.92	0.00	0.00	0.00	0.00
4,000.00	9.03	358.23	3,967.79	419.59	-12.97	-419.61	0.00	0.00	0.00	0.00
4,100.00	9.03	358.23	4,066.55	435.28	-13.45	-435.30	0.00	0.00	0.00	0.00
4,200.00	9.03	358.23	4,165.31	450.96	-13.94	-450.99	0.00	0.00	0.00	0.00
4,300.00	9.03	358.23	4,264.07	466.65	-14.42	-466.67	0.00	0.00	0.00	0.00
4,400.00	9.03	358.23	4,362.83	482.34	-14.91	-482.36	0.00	0.00	0.00	0.00
4,500.00	9.03	358.23	4,461.59	498.03	-15.39	-498.05	0.00	0.00	0.00	0.00
4,599.64	9.03	358.23	4,560.00	513.66	-15.87	-513.68	0.00	0.00	0.00	0.00
<b>Sussex</b>										
4,600.00	9.03	358.23	4,560.35	513.71	-15.88	-513.74	0.00	0.00	0.00	0.00
4,700.00	9.03	358.23	4,659.11	529.40	-16.36	-529.43	0.00	0.00	0.00	0.00
4,800.00	9.03	358.23	4,757.87	545.09	-16.85	-545.11	0.00	0.00	0.00	0.00
4,900.00	9.03	358.23	4,856.64	560.77	-17.33	-560.80	0.00	0.00	0.00	0.00
5,000.00	9.03	358.23	4,955.40	576.46	-17.82	-576.49	0.00	0.00	0.00	0.00
5,100.00	9.03	358.23	5,054.16	592.15	-18.30	-592.18	0.00	0.00	0.00	0.00
5,198.06	9.03	358.23	5,151.00	607.53	-18.78	-607.56	0.00	0.00	0.00	0.00

**Plan Report for Griffiths 14N-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 (°)
<b>Shannon</b>										
5,200.00	9.03	358.23	5,152.92	607.84	-18.79	-607.87	0.00	0.00	0.00	0.00
5,300.00	9.03	358.23	5,251.68	623.52	-19.27	-623.55	0.00	0.00	0.00	0.00
5,400.00	9.03	358.23	5,350.44	639.21	-19.76	-639.24	0.00	0.00	0.00	0.00
5,500.00	9.03	358.23	5,449.20	654.90	-20.24	-654.93	0.00	0.00	0.00	0.00
5,600.00	9.03	358.23	5,547.96	670.59	-20.72	-670.62	0.00	0.00	0.00	0.00
5,700.00	9.03	358.23	5,646.72	686.27	-21.21	-686.30	0.00	0.00	0.00	0.00
5,800.00	9.03	358.23	5,745.48	701.96	-21.69	-701.99	0.00	0.00	0.00	0.00
5,900.00	9.03	358.23	5,844.24	717.65	-22.18	-717.68	0.00	0.00	0.00	0.00
6,000.00	9.03	358.23	5,943.00	733.33	-22.66	-733.37	0.00	0.00	0.00	0.00
6,100.00	9.03	358.23	6,041.76	749.02	-23.15	-749.06	0.00	0.00	0.00	0.00
6,200.00	9.03	358.23	6,140.52	764.71	-23.63	-764.74	0.00	0.00	0.00	0.00
6,300.00	9.03	358.23	6,239.29	780.40	-24.12	-780.43	0.00	0.00	0.00	0.00
6,400.00	9.03	358.23	6,338.05	796.08	-24.60	-796.12	0.00	0.00	0.00	0.00
6,500.00	9.03	358.23	6,436.81	811.77	-25.09	-811.81	0.00	0.00	0.00	0.00
6,600.00	9.03	358.23	6,535.57	827.46	-25.57	-827.50	0.00	0.00	0.00	0.00
6,700.00	9.03	358.23	6,634.33	843.14	-26.06	-843.18	0.00	0.00	0.00	0.00
6,800.00	9.03	358.23	6,733.09	858.83	-26.54	-858.87	0.00	0.00	0.00	0.00
6,900.00	9.03	358.23	6,831.85	874.52	-27.03	-874.56	0.00	0.00	0.00	0.00
6,937.77	9.03	358.23	6,869.15	880.44	-27.21	-880.49	0.00	0.00	0.00	0.00
<b>Begin Build @ 6937.77ft</b>										
7,000.00	2.81	354.84	6,931.02	886.85	-27.50	-886.90	10.00	-9.99	-5.45	-178.46
7,100.00	7.20	181.66	7,030.82	883.02	-27.90	-883.07	10.00	4.39	-173.18	-175.08
7,200.00	17.20	180.53	7,128.44	861.92	-28.22	-861.97	10.00	10.00	-1.13	-1.92
7,300.00	27.20	180.22	7,220.91	824.19	-28.44	-824.24	10.00	10.00	-0.31	-0.82
7,400.00	37.20	180.06	7,305.42	770.98	-28.56	-771.02	10.00	10.00	-0.15	-0.53
<b>Build Rate = 10.00/100ft</b>										
7,500.00	47.20	179.97	7,379.41	703.90	-28.58	-703.94	10.00	10.00	-0.09	-0.40
7,509.79	48.17	179.96	7,386.00	696.66	-28.57	-696.70	10.00	10.00	-0.08	-0.33
<b>Sharon Springs</b>										
7,555.34	52.73	179.93	7,415.00	661.54	-28.54	-661.58	10.00	10.00	-0.07	-0.32
<b>Niobrara A</b>										
7,600.00	57.20	179.90	7,440.63	624.98	-28.49	-625.03	10.00	10.00	-0.06	-0.30
7,700.00	67.20	179.85	7,487.22	536.64	-28.29	-536.69	10.00	10.00	-0.05	-0.29
7,768.75	74.07	179.82	7,510.00	471.82	-28.10	-471.86	10.00	10.00	-0.05	-0.26
<b>Niobrara B</b>										
7,800.00	77.20	179.80	7,517.75	441.55	-28.00	-441.60	10.00	10.00	-0.04	-0.25
7,900.00	87.20	179.76	7,531.31	342.60	-27.62	-342.65	10.00	10.00	-0.04	-0.25
7,927.62	89.96	179.75	7,532.00	315.00	-27.50	-315.04	10.00	10.00	-0.04	-0.24
<b>End Build @ 7927.62ft - Niobrara B TL - Heel - 7" Intermediate Casing - Griffiths 14N-20HZ_CP</b>										
8,000.00	89.96	179.75	7,532.05	242.62	-27.18	-242.66	0.00	0.00	0.00	-0.24
8,100.00	89.96	179.75	7,532.13	142.62	-26.74	-142.66	0.00	0.00	0.00	0.00
8,200.00	89.96	179.75	7,532.20	42.62	-26.30	-42.66	0.00	0.00	0.00	0.00
8,300.00	89.96	179.75	7,532.28	-57.38	-25.86	57.34	0.00	0.00	0.00	0.00
8,400.00	89.96	179.75	7,532.35	-157.38	-25.41	157.34	0.00	0.00	0.00	0.00
8,500.00	89.96	179.75	7,532.42	-257.38	-24.97	257.34	0.00	0.00	0.00	0.00
8,600.00	89.96	179.75	7,532.50	-357.38	-24.53	357.34	0.00	0.00	0.00	0.00
8,700.00	89.96	179.75	7,532.57	-457.38	-24.09	457.34	0.00	0.00	0.00	0.00
8,800.00	89.96	179.75	7,532.65	-557.38	-23.65	557.34	0.00	0.00	0.00	0.00
8,900.00	89.96	179.75	7,532.72	-657.37	-23.21	657.34	0.00	0.00	0.00	0.00
9,000.00	89.96	179.75	7,532.79	-757.37	-22.76	757.34	0.00	0.00	0.00	0.00
9,100.00	89.96	179.75	7,532.87	-857.37	-22.32	857.34	0.00	0.00	0.00	0.00
9,200.00	89.96	179.75	7,532.94	-957.37	-21.88	957.34	0.00	0.00	0.00	0.00
9,300.00	89.96	179.75	7,533.02	-1,057.37	-21.44	1,057.34	0.00	0.00	0.00	0.00
9,400.00	89.96	179.75	7,533.09	-1,157.37	-21.00	1,157.33	0.00	0.00	0.00	0.00
9,500.00	89.96	179.75	7,533.16	-1,257.37	-20.56	1,257.33	0.00	0.00	0.00	0.00
9,600.00	89.96	179.75	7,533.24	-1,357.37	-20.11	1,357.33	0.00	0.00	0.00	0.00
9,700.00	89.96	179.75	7,533.31	-1,457.37	-19.67	1,457.33	0.00	0.00	0.00	0.00

**Plan Report for Griffiths 14N-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 (°)
9,800.00	89.96	179.75	7,533.39	-1,557.37	-19.23	1,557.33	0.00	0.00	0.00	0.00
9,900.00	89.96	179.75	7,533.46	-1,657.36	-18.79	1,657.33	0.00	0.00	0.00	0.00
10,000.00	89.96	179.75	7,533.53	-1,757.36	-18.35	1,757.33	0.00	0.00	0.00	0.00
10,100.00	89.96	179.75	7,533.61	-1,857.36	-17.91	1,857.33	0.00	0.00	0.00	0.00
10,200.00	89.96	179.75	7,533.68	-1,957.36	-17.46	1,957.33	0.00	0.00	0.00	0.00
10,300.00	89.96	179.75	7,533.76	-2,057.36	-17.02	2,057.33	0.00	0.00	0.00	0.00
10,400.00	89.96	179.75	7,533.83	-2,157.36	-16.58	2,157.33	0.00	0.00	0.00	0.00
10,500.00	89.96	179.75	7,533.90	-2,257.36	-16.14	2,257.33	0.00	0.00	0.00	0.00
10,600.00	89.96	179.75	7,533.98	-2,357.36	-15.70	2,357.33	0.00	0.00	0.00	0.00
10,700.00	89.96	179.75	7,534.05	-2,457.36	-15.26	2,457.33	0.00	0.00	0.00	0.00
10,800.00	89.96	179.75	7,534.13	-2,557.36	-14.81	2,557.33	0.00	0.00	0.00	0.00
10,900.00	89.96	179.75	7,534.20	-2,657.35	-14.37	2,657.33	0.00	0.00	0.00	0.00
11,000.00	89.96	179.75	7,534.27	-2,757.35	-13.93	2,757.33	0.00	0.00	0.00	0.00
11,100.00	89.96	179.75	7,534.35	-2,857.35	-13.49	2,857.33	0.00	0.00	0.00	0.00
11,200.00	89.96	179.75	7,534.42	-2,957.35	-13.05	2,957.33	0.00	0.00	0.00	0.00
11,300.00	89.96	179.75	7,534.50	-3,057.35	-12.61	3,057.33	0.00	0.00	0.00	0.00
11,400.00	89.96	179.75	7,534.57	-3,157.35	-12.16	3,157.33	0.00	0.00	0.00	0.00
11,500.00	89.96	179.75	7,534.64	-3,257.35	-11.72	3,257.33	0.00	0.00	0.00	0.00
11,600.00	89.96	179.75	7,534.72	-3,357.35	-11.28	3,357.33	0.00	0.00	0.00	0.00
11,700.00	89.96	179.75	7,534.79	-3,457.35	-10.84	3,457.32	0.00	0.00	0.00	0.00
11,800.00	89.96	179.75	7,534.87	-3,557.35	-10.40	3,557.32	0.00	0.00	0.00	0.00
11,900.00	89.96	179.75	7,534.94	-3,657.34	-9.96	3,657.32	0.00	0.00	0.00	0.00
12,000.00	89.96	179.75	7,535.01	-3,757.34	-9.51	3,757.32	0.00	0.00	0.00	0.00
12,100.00	89.96	179.75	7,535.09	-3,857.34	-9.07	3,857.32	0.00	0.00	0.00	0.00
12,200.00	89.96	179.75	7,535.16	-3,957.34	-8.63	3,957.32	0.00	0.00	0.00	0.00
12,300.00	89.96	179.75	7,535.24	-4,057.34	-8.19	4,057.32	0.00	0.00	0.00	0.00
12,400.00	89.96	179.75	7,535.31	-4,157.34	-7.75	4,157.32	0.00	0.00	0.00	0.00
12,500.00	89.96	179.75	7,535.38	-4,257.34	-7.31	4,257.32	0.00	0.00	0.00	0.00
12,600.00	89.96	179.75	7,535.46	-4,357.34	-6.86	4,357.32	0.00	0.00	0.00	0.00
12,700.00	89.96	179.75	7,535.53	-4,457.34	-6.42	4,457.32	0.00	0.00	0.00	0.00
12,800.00	89.96	179.75	7,535.61	-4,557.34	-5.98	4,557.32	0.00	0.00	0.00	0.00
12,900.00	89.96	179.75	7,535.68	-4,657.33	-5.54	4,657.32	0.00	0.00	0.00	0.00
13,000.00	89.96	179.75	7,535.75	-4,757.33	-5.10	4,757.32	0.00	0.00	0.00	0.00
13,100.00	89.96	179.75	7,535.83	-4,857.33	-4.66	4,857.32	0.00	0.00	0.00	0.00
13,200.00	89.96	179.75	7,535.90	-4,957.33	-4.21	4,957.32	0.00	0.00	0.00	0.00
13,300.00	89.96	179.75	7,535.98	-5,057.33	-3.77	5,057.32	0.00	0.00	0.00	0.00
13,400.00	89.96	179.75	7,536.05	-5,157.33	-3.33	5,157.32	0.00	0.00	0.00	0.00
13,500.00	89.96	179.75	7,536.12	-5,257.33	-2.89	5,257.32	0.00	0.00	0.00	0.00
13,600.00	89.96	179.75	7,536.20	-5,357.33	-2.45	5,357.32	0.00	0.00	0.00	0.00
13,700.00	89.96	179.75	7,536.27	-5,457.33	-2.01	5,457.32	0.00	0.00	0.00	0.00
13,800.00	89.96	179.75	7,536.35	-5,557.33	-1.57	5,557.32	0.00	0.00	0.00	0.00
13,900.00	89.96	179.75	7,536.42	-5,657.32	-1.12	5,657.32	0.00	0.00	0.00	0.00
14,000.00	89.96	179.75	7,536.49	-5,757.32	-0.68	5,757.31	0.00	0.00	0.00	0.00
14,100.00	89.96	179.75	7,536.57	-5,857.32	-0.24	5,857.31	0.00	0.00	0.00	0.00
14,200.00	89.96	179.75	7,536.64	-5,957.32	0.20	5,957.31	0.00	0.00	0.00	0.00
14,300.00	89.96	179.75	7,536.72	-6,057.32	0.64	6,057.31	0.00	0.00	0.00	0.00
14,400.00	89.96	179.75	7,536.79	-6,157.32	1.08	6,157.31	0.00	0.00	0.00	0.00
14,500.00	89.96	179.75	7,536.86	-6,257.32	1.53	6,257.31	0.00	0.00	0.00	0.00
14,600.00	89.96	179.75	7,536.94	-6,357.32	1.97	6,357.31	0.00	0.00	0.00	0.00
14,700.00	89.96	179.75	7,537.01	-6,457.32	2.41	6,457.31	0.00	0.00	0.00	0.00
14,800.00	89.96	179.75	7,537.08	-6,557.32	2.85	6,557.31	0.00	0.00	0.00	0.00
14,900.00	89.96	179.75	7,537.16	-6,657.31	3.29	6,657.31	0.00	0.00	0.00	0.00
15,000.00	89.96	179.75	7,537.23	-6,757.31	3.73	6,757.31	0.00	0.00	0.00	0.00
15,100.00	89.96	179.75	7,537.31	-6,857.31	4.18	6,857.31	0.00	0.00	0.00	0.00
15,200.00	89.96	179.75	7,537.38	-6,957.31	4.62	6,957.31	0.00	0.00	0.00	0.00
15,300.00	89.96	179.75	7,537.45	-7,057.31	5.06	7,057.31	0.00	0.00	0.00	0.00
15,400.00	89.96	179.75	7,537.53	-7,157.31	5.50	7,157.31	0.00	0.00	0.00	0.00
15,500.00	89.96	179.75	7,537.60	-7,257.31	5.94	7,257.31	0.00	0.00	0.00	0.00
15,600.00	89.96	179.75	7,537.68	-7,357.31	6.38	7,357.31	0.00	0.00	0.00	0.00
15,700.00	89.96	179.75	7,537.75	-7,457.31	6.83	7,457.31	0.00	0.00	0.00	0.00

**Plan Report for Griffiths 14N-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 (°)
15,800.00	89.96	179.75	7,537.82	-7,557.31	7.27	7,557.31	0.00	0.00	0.00	0.00
15,900.00	89.96	179.75	7,537.90	-7,657.30	7.71	7,657.31	0.00	0.00	0.00	0.00
16,000.00	89.96	179.75	7,537.97	-7,757.30	8.15	7,757.31	0.00	0.00	0.00	0.00
16,100.00	89.96	179.75	7,538.05	-7,857.30	8.59	7,857.31	0.00	0.00	0.00	0.00
16,200.00	89.96	179.75	7,538.12	-7,957.30	9.03	7,957.31	0.00	0.00	0.00	0.00
16,300.00	89.96	179.75	7,538.19	-8,057.30	9.48	8,057.30	0.00	0.00	0.00	0.00
16,400.00	89.96	179.75	7,538.27	-8,157.30	9.92	8,157.30	0.00	0.00	0.00	0.00
16,500.00	89.96	179.75	7,538.34	-8,257.30	10.36	8,257.30	0.00	0.00	0.00	0.00
16,600.00	89.96	179.75	7,538.42	-8,357.30	10.80	8,357.30	0.00	0.00	0.00	0.00
16,700.00	89.96	179.75	7,538.49	-8,457.30	11.24	8,457.30	0.00	0.00	0.00	0.00
16,800.00	89.96	179.75	7,538.56	-8,557.29	11.68	8,557.30	0.00	0.00	0.00	0.00
16,900.00	89.96	179.75	7,538.64	-8,657.29	12.13	8,657.30	0.00	0.00	0.00	0.00
17,000.00	89.96	179.75	7,538.71	-8,757.29	12.57	8,757.30	0.00	0.00	0.00	0.00
17,100.00	89.96	179.75	7,538.79	-8,857.29	13.01	8,857.30	0.00	0.00	0.00	0.00
17,200.00	89.96	179.75	7,538.86	-8,957.29	13.45	8,957.30	0.00	0.00	0.00	0.00
17,300.00	89.96	179.75	7,538.93	-9,057.29	13.89	9,057.30	0.00	0.00	0.00	0.00
17,388.19	89.96	179.75	7,539.00	-9,145.47	14.28	9,145.49	0.00	0.00	0.00	0.00

Niobrara B TL - Toe - Griffiths 14N-20HZ\_newBHL

**Plan Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,100.00	1,100.00	0.00	0.00	Begin Nudge @ 1100.00ft
1,551.49	1,549.62	35.49	-1.10	End Nudge @ 1551.49ft
6,937.77	6,869.15	880.44	-27.21	Begin Build @ 6937.77ft
7,400.00	7,305.42	770.98	-28.56	Build Rate = 10.00/100ft
7,927.62	7,532.00	315.00	-27.50	End Build @ 7927.62ft
17,388.19	7,539.00	-9,145.48	14.28	Total Depth @ 17388.19ft

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Griffiths 14N-20HZ_newBHL	179.91	Slot	0.00	0.00	0.00

**Survey tool program**

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	17,388.19	Plan B Rev 0 Permit	MWD

**Casing Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,927.62	7,532.00	7" Intermediate Casing	7	8-3/4

## Plan Report for Griffiths 14N-20HZ - Plan B Rev 0 Permit

### Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,599.64	4,560.00	Sussex		0.00	
5,198.06	5,151.00	Shannon		0.00	
7,509.79	7,386.00	Sharon Springs		0.00	
7,555.34	7,415.00	Niobrara A		0.00	
7,768.75	7,510.00	Niobrara B		0.00	
7,927.62	7,532.00	Niobrara B TL - Heel		0.00	
17,388.19	7,539.00	Niobrara B TL - Toe		0.00	

### *Targets associated with this wellbore*

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Griffiths 14N-20HZ_Section Lines	0.00	0.00	0.00	Polygon
Griffiths 14N-20HZ_Setback Lines - Sec 20	0.00	0.00	0.00	Point
Griffiths 14N-20HZ_newBHL	7,539.00	-9,145.47	14.28	Point
Griffiths 14N-20HZ_CP	7,532.00	315.00	-27.50	Point
Griffiths 14N-20HZ_SHL	0.00	0.00	0.00	Point
Griffiths 14N-20HZ_Setback Lines	0.00	0.00	0.00	Polygon

## North Reference Sheet for Sec. 17-T1N-R67W - Griffiths 14N-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 @ 5078.00ft (Drilling Rig). Northing and Easting are relative to Griffiths 14N-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: 0.99996261

Grid Coordinates of Well: 1,263,672.81 ft N, 3,163,380.57 ft E

Geographical Coordinates of Well: 40° 03' 20.50" N, 104° 54' 58.81" W

Grid Convergence at Surface is: 0.38°

Based upon Minimum Curvature type calculations, at a Measured Depth of 17,388.19ft  
the Bottom Hole Displacement is 9,145.49ft in the Direction of 179.91° (True).

Magnetic Convergence at surface is: -8.38° (12 December 2012, , BGGM2012)

