

Anadarko Petroleum Corporation

Weld County, CO (NAD 83)

Sec. 15-T3N-R68W

RMF 31N-15HZ

Plan B

Plan: Permit Rev-2

Sperry Drilling Services

Proposal Report

11 December, 2014

Well Coordinates: 1,327,557.81 N, 3,144,605.70 E (40° 13' 52.99" N, 104° 58' 55.47" W)

Ground Level: 4,970.00 usft

Local Coordinate Origin:

Centered on Well RMF 31N-15HZ

Viewing Datum:

RKB = 17' @ 4987.00usft (Drilling Rig)

TVDs to System:

N

North Reference:

True

Unit System:

Dec-Deg - API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

HALLIBURTON

Project: Weld County, CO (NAD 83)
Site: Sec. 15-T3N-R68W
Well: RMF 31N-15HZ
Wellbore: Plan B
Design: Permit Rev-2

Anadarko Petroleum Corporation

HALLIBURTON
Sperry Drilling

SECTION DETAILS

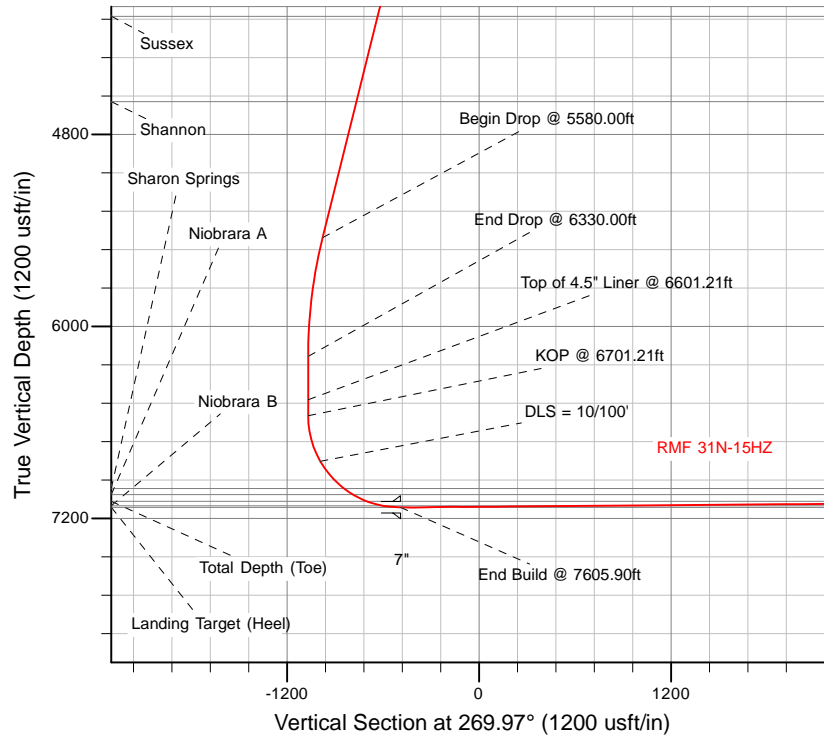
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1130.00	0.00	0.00	1130.00	0.00	0.00	0.00	0.00	0.00	
3	1880.00	15.00	112.00	1871.46	-36.57	90.51	2.00	112.00	-90.49	
4	5580.00	15.00	112.00	5445.39	-395.30	978.41	0.00	0.00	-978.20	
5	6330.00	0.00	0.00	6186.85	-431.87	1068.91	2.00	180.00	-1068.69	
6	6701.21	0.00	0.00	6558.06	-431.87	1068.91	0.00	0.00	-1068.69	
7	7605.90	90.47	269.97	7131.00	-432.21	491.27	10.00	269.97	-491.04	
8	12250.44	90.47	269.97	7093.00	-434.98	-4153.12	0.00	0.00	4153.35	RMF 31N-15HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

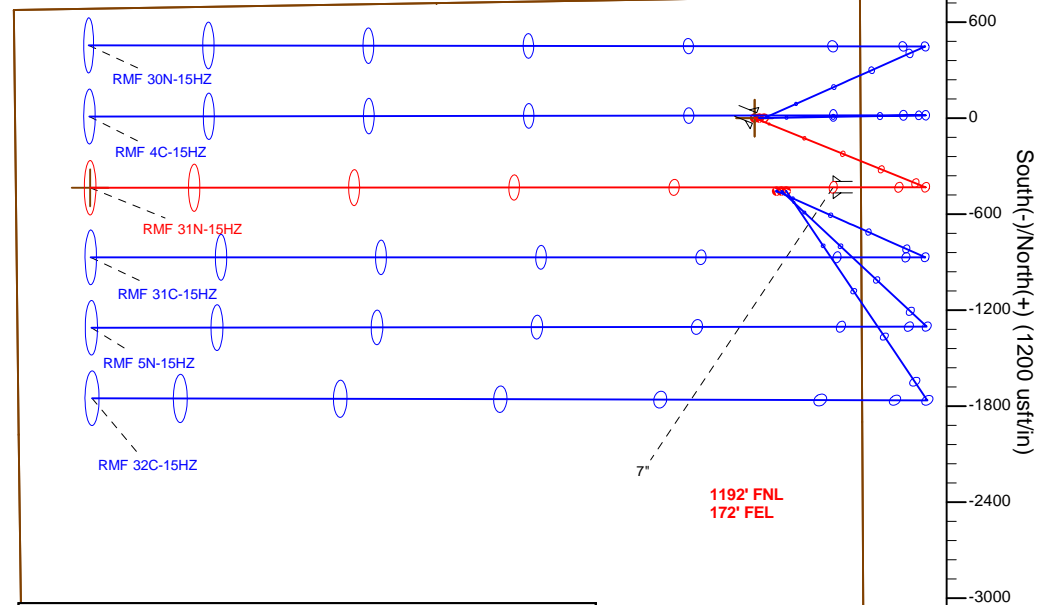
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Polygon
RMF 31N-15HZ_SEC	0.00	0.01	0.00	40.231385	-104.982074	
RMF 31N-15HZ_SHL	0.00	0.01	0.00	40.231385	-104.982074	
RMF 31N-15HZ_BHL	7093.00	-434.98	-4153.12	40.230190	-104.996948	

West(-)/East(+) (1200 usft/in)

-3600 -3000 -2400 -1800 -1200 -600 0 600



1115' FNL
460' FWL



TVD MD

6458.06 6601.21 Top of 4.5" Liner @ 6601.21ft
6558.06 6701.21 KOP @ 6701.21ft

WELL DETAILS: RMF 31N-15HZ

Ground Level: 4970.00

RKB = 17' @ 4987.00usft (Drilling Rig)

Plan: Permit Rev-2 (RMF 31N-15HZ/Plan B)

Created By: Clint Eshelman Date: 12/11/2014
Reviewed: Date:



Plan Report for RMF 31N-15HZ - Permit Rev-2

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RMF 31N-15HZ_SHL - RMF 31N-15HZ_SEC										
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
1,018.00	0.00	0.00	1,018.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills Base										
1,068.00	0.00	0.00	1,068.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"										
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,130.00	0.00	0.00	1,130.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 1130.00ft										
1,200.00	1.40	112.00	1,199.99	-0.32	0.79	-0.79	2.00	2.00	0.00	112.00
1,300.00	3.40	112.00	1,299.90	-1.89	4.68	-4.67	2.00	2.00	0.00	0.00
1,400.00	5.40	112.00	1,399.60	-4.76	11.79	-11.79	2.00	2.00	0.00	0.00
1,500.00	7.40	112.00	1,498.97	-8.94	22.12	-22.12	2.00	2.00	0.00	0.00
1,600.00	9.40	112.00	1,597.89	-14.41	35.67	-35.66	2.00	2.00	0.00	0.00
1,700.00	11.40	112.00	1,696.25	-21.17	52.40	-52.39	2.00	2.00	0.00	0.00
1,800.00	13.40	112.00	1,793.91	-29.22	72.31	-72.30	2.00	2.00	0.00	0.00
1,880.00	15.00	112.00	1,871.46	-36.57	90.51	-90.49	2.00	2.00	0.00	0.00
End Nudge @ 1880.00ft										
1,900.00	15.00	112.00	1,890.78	-38.51	95.31	-95.29	0.00	0.00	0.00	0.00
2,000.00	15.00	112.00	1,987.37	-48.20	119.30	-119.28	0.00	0.00	0.00	0.00
2,100.00	15.00	112.00	2,083.97	-57.90	143.30	-143.27	0.00	0.00	0.00	0.00
2,200.00	15.00	112.00	2,180.56	-67.59	167.30	-167.26	0.00	0.00	0.00	0.00
2,300.00	15.00	112.00	2,277.15	-77.29	191.30	-191.26	0.00	0.00	0.00	0.00
2,400.00	15.00	112.00	2,373.74	-86.98	215.29	-215.25	0.00	0.00	0.00	0.00
2,500.00	15.00	112.00	2,470.34	-96.68	239.29	-239.24	0.00	0.00	0.00	0.00
2,600.00	15.00	112.00	2,566.93	-106.38	263.29	-263.23	0.00	0.00	0.00	0.00
2,700.00	15.00	112.00	2,663.52	-116.07	287.29	-287.22	0.00	0.00	0.00	0.00
2,800.00	15.00	112.00	2,760.11	-125.77	311.28	-311.22	0.00	0.00	0.00	0.00
2,900.00	15.00	112.00	2,856.71	-135.46	335.28	-335.21	0.00	0.00	0.00	0.00
3,000.00	15.00	112.00	2,953.30	-145.16	359.28	-359.20	0.00	0.00	0.00	0.00
3,100.00	15.00	112.00	3,049.89	-154.85	383.27	-383.19	0.00	0.00	0.00	0.00
3,200.00	15.00	112.00	3,146.48	-164.55	407.27	-407.19	0.00	0.00	0.00	0.00
3,300.00	15.00	112.00	3,243.08	-174.24	431.27	-431.18	0.00	0.00	0.00	0.00
3,400.00	15.00	112.00	3,339.67	-183.94	455.27	-455.17	0.00	0.00	0.00	0.00
3,500.00	15.00	112.00	3,436.26	-193.63	479.26	-479.16	0.00	0.00	0.00	0.00
3,600.00	15.00	112.00	3,532.85	-203.33	503.26	-503.15	0.00	0.00	0.00	0.00
3,700.00	15.00	112.00	3,629.45	-213.03	527.26	-527.15	0.00	0.00	0.00	0.00
3,800.00	15.00	112.00	3,726.04	-222.72	551.26	-551.14	0.00	0.00	0.00	0.00
3,900.00	15.00	112.00	3,822.63	-232.42	575.25	-575.13	0.00	0.00	0.00	0.00
4,000.00	15.00	112.00	3,919.22	-242.11	599.25	-599.12	0.00	0.00	0.00	0.00
4,100.00	15.00	112.00	4,015.82	-251.81	623.25	-623.12	0.00	0.00	0.00	0.00
4,147.81	15.00	112.00	4,062.00	-256.44	634.72	-634.59	0.00	0.00	0.00	0.00
Sussex										
4,200.00	15.00	112.00	4,112.41	-261.50	647.24	-647.11	0.00	0.00	0.00	0.00
4,300.00	15.00	112.00	4,209.00	-271.20	671.24	-671.10	0.00	0.00	0.00	0.00
4,400.00	15.00	112.00	4,305.60	-280.89	695.24	-695.09	0.00	0.00	0.00	0.00
4,500.00	15.00	112.00	4,402.19	-290.59	719.24	-719.08	0.00	0.00	0.00	0.00
4,600.00	15.00	112.00	4,498.78	-300.29	743.23	-743.08	0.00	0.00	0.00	0.00

Plan Report for RMF 31N-15HZ - Permit Rev-2

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
4,698.58	15.00	112.00	4,594.00	-309.84	766.89	-766.73	0.00	0.00	0.00	0.00
Shannon										
4,700.00	15.00	112.00	4,595.37	-309.98	767.23	-767.07	0.00	0.00	0.00	0.00
4,800.00	15.00	112.00	4,691.97	-319.68	791.23	-791.06	0.00	0.00	0.00	0.00
4,900.00	15.00	112.00	4,788.56	-329.37	815.23	-815.05	0.00	0.00	0.00	0.00
5,000.00	15.00	112.00	4,885.15	-339.07	839.22	-839.04	0.00	0.00	0.00	0.00
5,100.00	15.00	112.00	4,981.74	-348.76	863.22	-863.04	0.00	0.00	0.00	0.00
5,200.00	15.00	112.00	5,078.34	-358.46	887.22	-887.03	0.00	0.00	0.00	0.00
5,300.00	15.00	112.00	5,174.93	-368.15	911.21	-911.02	0.00	0.00	0.00	0.00
5,400.00	15.00	112.00	5,271.52	-377.85	935.21	-935.01	0.00	0.00	0.00	0.00
5,500.00	15.00	112.00	5,368.11	-387.55	959.21	-959.01	0.00	0.00	0.00	0.00
5,580.00	15.00	112.00	5,445.39	-395.30	978.41	-978.20	0.00	0.00	0.00	0.00
Begin Drop @ 5580.00ft										
5,600.00	14.60	112.00	5,464.72	-397.22	983.14	-982.94	2.00	-2.00	0.00	180.00
5,700.00	12.60	112.00	5,561.92	-406.02	1,004.94	-1,004.73	2.00	-2.00	0.00	180.00
5,800.00	10.60	112.00	5,659.87	-413.56	1,023.59	-1,023.37	2.00	-2.00	0.00	180.00
5,900.00	8.60	112.00	5,758.46	-419.80	1,039.05	-1,038.83	2.00	-2.00	0.00	180.00
6,000.00	6.60	112.00	5,857.58	-424.76	1,051.31	-1,051.09	2.00	-2.00	0.00	180.00
6,100.00	4.60	112.00	5,957.10	-428.41	1,060.36	-1,060.13	2.00	-2.00	0.00	180.00
6,200.00	2.60	112.00	6,056.89	-430.76	1,066.18	-1,065.95	2.00	-2.00	0.00	180.00
6,300.00	0.60	112.00	6,156.85	-431.81	1,068.77	-1,068.54	2.00	-2.00	0.00	180.00
6,330.00	0.00	0.00	6,186.85	-431.87	1,068.91	-1,068.69	2.00	-2.00	0.00	-180.00
End Drop @ 6330.00ft										
6,400.00	0.00	0.00	6,256.85	-431.87	1,068.91	-1,068.69	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,356.85	-431.87	1,068.91	-1,068.69	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,456.85	-431.87	1,068.91	-1,068.69	0.00	0.00	0.00	0.00
6,601.21	0.00	0.00	6,458.06	-431.87	1,068.91	-1,068.69	0.00	0.00	0.00	0.00
Top of 4.5" Liner @ 6601.21ft										
6,700.00	0.00	0.00	6,556.85	-431.87	1,068.91	-1,068.69	0.00	0.00	0.00	0.00
6,701.21	0.00	0.00	6,558.06	-431.87	1,068.91	-1,068.69	0.00	0.00	0.00	0.00
KOP @ 6701.21ft										
6,800.00	9.88	269.97	6,656.36	-431.87	1,060.42	-1,060.19	10.00	10.00	0.00	269.97
6,900.00	19.88	269.97	6,752.89	-431.89	1,034.77	-1,034.55	10.00	10.00	0.00	0.00
7,000.00	29.88	269.97	6,843.49	-431.91	992.76	-992.53	10.00	10.00	0.00	0.00
DLS = 10/100'										
7,100.00	39.88	269.97	6,925.42	-431.95	935.64	-935.42	10.00	10.00	0.00	0.00
7,200.00	49.88	269.97	6,996.19	-431.99	865.17	-864.95	10.00	10.00	0.00	0.00
7,226.84	52.56	269.97	7,013.00	-432.00	844.25	-844.03	10.00	10.00	0.00	0.00
Sharon Springs										
7,294.76	59.36	269.97	7,051.00	-432.04	788.00	-787.78	10.00	10.00	0.00	0.00
Niobrara A										
7,300.00	59.88	269.97	7,053.65	-432.04	783.48	-783.26	10.00	10.00	0.00	0.00
7,400.00	69.88	269.97	7,096.05	-432.09	693.06	-692.83	10.00	10.00	0.00	0.00
7,488.67	78.75	269.97	7,120.00	-432.14	607.78	-607.55	10.00	10.00	0.00	0.00
Niobrara B										
7,500.00	79.88	269.97	7,122.10	-432.15	596.64	-596.41	10.00	10.00	0.00	0.00
7,600.00	89.88	269.97	7,131.02	-432.21	497.17	-496.94	10.00	10.00	0.00	0.00
7,605.90	90.47	269.97	7,131.00	-432.21	491.27	-491.04	10.00	10.00	0.00	0.00
End Build @ 7605.90ft - Landing Target (Heel) - 7"										
7,700.00	90.47	269.97	7,130.23	-432.27	397.17	-396.94	0.00	0.00	0.00	0.00
7,800.00	90.47	269.97	7,129.41	-432.33	297.17	-296.95	0.00	0.00	0.00	0.00
7,900.00	90.47	269.97	7,128.59	-432.39	197.18	-196.95	0.00	0.00	0.00	0.00
8,000.00	90.47	269.97	7,127.77	-432.45	97.18	-96.95	0.00	0.00	0.00	0.00
8,100.00	90.47	269.97	7,126.96	-432.51	-2.82	3.04	0.00	0.00	0.00	0.00
8,200.00	90.47	269.97	7,126.14	-432.57	-102.81	103.04	0.00	0.00	0.00	0.00
8,300.00	90.47	269.97	7,125.32	-432.63	-202.81	203.04	0.00	0.00	0.00	0.00
8,400.00	90.47	269.97	7,124.50	-432.69	-302.81	303.03	0.00	0.00	0.00	0.00
8,500.00	90.47	269.97	7,123.68	-432.75	-402.80	403.03	0.00	0.00	0.00	0.00

Plan Report for RMF 31N-15HZ - Permit Rev-2

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
8,600.00	90.47	269.97	7,122.87	-432.81	-502.80	503.03	0.00	0.00	0.00	0.00
8,700.00	90.47	269.97	7,122.05	-432.86	-602.80	603.02	0.00	0.00	0.00	0.00
8,800.00	90.47	269.97	7,121.23	-432.92	-702.79	703.02	0.00	0.00	0.00	0.00
8,900.00	90.47	269.97	7,120.41	-432.98	-802.79	803.02	0.00	0.00	0.00	0.00
9,000.00	90.47	269.97	7,119.59	-433.04	-902.79	903.01	0.00	0.00	0.00	0.00
9,100.00	90.47	269.97	7,118.77	-433.10	-1,002.78	1,003.01	0.00	0.00	0.00	0.00
9,200.00	90.47	269.97	7,117.96	-433.16	-1,102.78	1,103.01	0.00	0.00	0.00	0.00
9,300.00	90.47	269.97	7,117.14	-433.22	-1,202.78	1,203.00	0.00	0.00	0.00	0.00
9,400.00	90.47	269.97	7,116.32	-433.28	-1,302.77	1,303.00	0.00	0.00	0.00	0.00
9,500.00	90.47	269.97	7,115.50	-433.34	-1,402.77	1,403.00	0.00	0.00	0.00	0.00
9,600.00	90.47	269.97	7,114.68	-433.40	-1,502.77	1,502.99	0.00	0.00	0.00	0.00
9,700.00	90.47	269.97	7,113.87	-433.46	-1,602.76	1,602.99	0.00	0.00	0.00	0.00
9,800.00	90.47	269.97	7,113.05	-433.52	-1,702.76	1,702.99	0.00	0.00	0.00	0.00
9,900.00	90.47	269.97	7,112.23	-433.58	-1,802.76	1,802.98	0.00	0.00	0.00	0.00
10,000.00	90.47	269.97	7,111.41	-433.64	-1,902.75	1,902.98	0.00	0.00	0.00	0.00
10,100.00	90.47	269.97	7,110.59	-433.70	-2,002.75	2,002.98	0.00	0.00	0.00	0.00
10,200.00	90.47	269.97	7,109.78	-433.76	-2,102.75	2,102.97	0.00	0.00	0.00	0.00
10,300.00	90.47	269.97	7,108.96	-433.82	-2,202.74	2,202.97	0.00	0.00	0.00	0.00
10,400.00	90.47	269.97	7,108.14	-433.88	-2,302.74	2,302.97	0.00	0.00	0.00	0.00
10,500.00	90.47	269.97	7,107.32	-433.94	-2,402.74	2,402.96	0.00	0.00	0.00	0.00
10,600.00	90.47	269.97	7,106.50	-434.00	-2,502.73	2,502.96	0.00	0.00	0.00	0.00
10,700.00	90.47	269.97	7,105.68	-434.06	-2,602.73	2,602.96	0.00	0.00	0.00	0.00
10,800.00	90.47	269.97	7,104.87	-434.12	-2,702.73	2,702.95	0.00	0.00	0.00	0.00
10,900.00	90.47	269.97	7,104.05	-434.17	-2,802.72	2,802.95	0.00	0.00	0.00	0.00
11,000.00	90.47	269.97	7,103.23	-434.23	-2,902.72	2,902.95	0.00	0.00	0.00	0.00
11,100.00	90.47	269.97	7,102.41	-434.29	-3,002.72	3,002.94	0.00	0.00	0.00	0.00
11,200.00	90.47	269.97	7,101.59	-434.35	-3,102.71	3,102.94	0.00	0.00	0.00	0.00
11,300.00	90.47	269.97	7,100.78	-434.41	-3,202.71	3,202.94	0.00	0.00	0.00	0.00
11,400.00	90.47	269.97	7,099.96	-434.47	-3,302.71	3,302.93	0.00	0.00	0.00	0.00
11,500.00	90.47	269.97	7,099.14	-434.53	-3,402.70	3,402.93	0.00	0.00	0.00	0.00
11,600.00	90.47	269.97	7,098.32	-434.59	-3,502.70	3,502.93	0.00	0.00	0.00	0.00
11,700.00	90.47	269.97	7,097.50	-434.65	-3,602.70	3,602.92	0.00	0.00	0.00	0.00
11,800.00	90.47	269.97	7,096.69	-434.71	-3,702.69	3,702.92	0.00	0.00	0.00	0.00
11,900.00	90.47	269.97	7,095.87	-434.77	-3,802.69	3,802.92	0.00	0.00	0.00	0.00
12,000.00	90.47	269.97	7,095.05	-434.83	-3,902.69	3,902.91	0.00	0.00	0.00	0.00
12,100.00	90.47	269.97	7,094.23	-434.89	-4,002.68	4,002.91	0.00	0.00	0.00	0.00
12,200.00	90.47	269.97	7,093.41	-434.95	-4,102.68	4,102.91	0.00	0.00	0.00	0.00
12,250.44	90.47	269.97	7,093.00	-434.98	-4,153.12	4,153.34	0.00	0.00	0.00	0.00

TD Well @ 12250.44ft - Total Depth (Toe) - RMF 31N-15HZ_BHL

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,130.00	1,130.00	0.00	0.00	Begin Nudge @ 1130.00ft
1,880.00	1,871.46	-36.57	90.51	End Nudge @ 1880.00ft
5,580.00	5,445.39	-395.30	978.41	Begin Drop @ 5580.00ft
6,330.00	6,186.85	-431.87	1,068.91	End Drop @ 6330.00ft
6,601.21	6,458.06	-431.87	1,068.91	Top of 4.5" Liner @ 6601.21ft
6,701.21	6,558.06	-431.87	1,068.91	KOP @ 6701.21ft
7,000.00	6,843.49	-431.91	992.76	DLS = 10/100'
7,605.90	7,131.00	-432.21	491.27	End Build @ 7605.90ft
12,250.44	7,093.00	-434.98	-4,153.12	TD Well @ 12250.44ft

Plan Report for RMF 31N-15HZ - Permit Rev-2

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	269.97	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,605.90	Permit Rev-2	MWD+IFR1
7,605.90	12,250.44	Permit Rev-2	MWD+IFR1

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,068.00	1,068.00	9 5/8"	9-5/8	13-1/2
7,605.90	7,131.00	7"	7	8-3/4

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,018.00	1,018.00	Fox Hills Base		0.00	
4,147.81	4,062.00	Sussex		0.00	
4,698.58	4,594.00	Shannon		0.00	
7,226.84	7,013.00	Sharon Springs		0.00	
7,294.76	7,051.00	Niobrara A		0.00	
7,488.67	7,120.00	Niobrara B		0.00	
7,605.90	7,131.00	Landing Target (Heel)		0.00	
12,250.44	7,093.00	Total Depth (Toe)		0.00	

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
RMF 31N-15HZ_BHL	7,093.00	-434.98	-4,153.12	Point
RMF 31N-15HZ_SHL	0.00	0.01	0.00	Point
RMF 31N-15HZ_SEC	0.00	0.01	0.00	Polygon

North Reference Sheet for Sec. 15-T3N-R68W - RMF 31N-15HZ - Plan B

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' @ 4987.00usft (Drilling Rig). Northing and Easting are relative to RMF 31N-15HZ

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: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99995690

Grid Coordinates of Well: 1,327,557.81 usft N, 3,144,605.70 usft E

Geographical Coordinates of Well: 40° 13' 52.99" N, 104° 58' 55.47" W

Grid Convergence at Surface is: 0.33°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,250.44usft
the Bottom Hole Displacement is 4,175.83usft in the Direction of 264.02° (True).

Magnetic Convergence at surface is: -8.35° (3 October 2013, , BGGM2013)

