

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 21-T1N-R67W

Howard 30C-33HZ

Plan A Rev 0

Plan: Plan A Rev 0 Permit

Sperry Drilling Services

Proposal Report

28 December, 2012

Well Coordinates: 1,254,467.83 N, 3,168,141.26 E (40° 01' 49.22" N, 104° 53' 58.39" W)

Ground Level: 5,025.00 ft

Local Coordinate Origin:

Centered on Well Howard 30C-33HZ

Viewing Datum:

RKB=17 @ 5042.00ft (Drilling Rig)

TVDs to System:

N

North Reference:

True

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

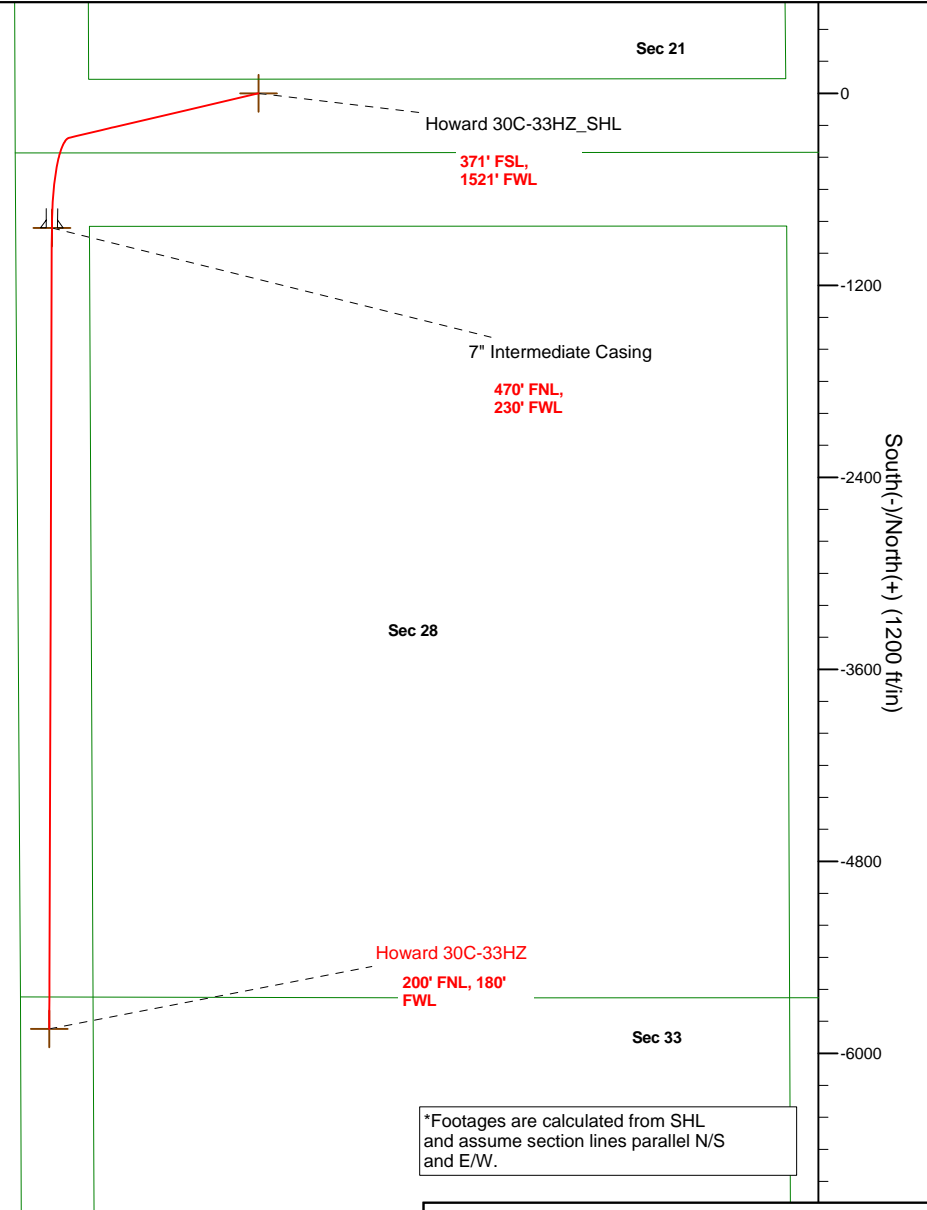
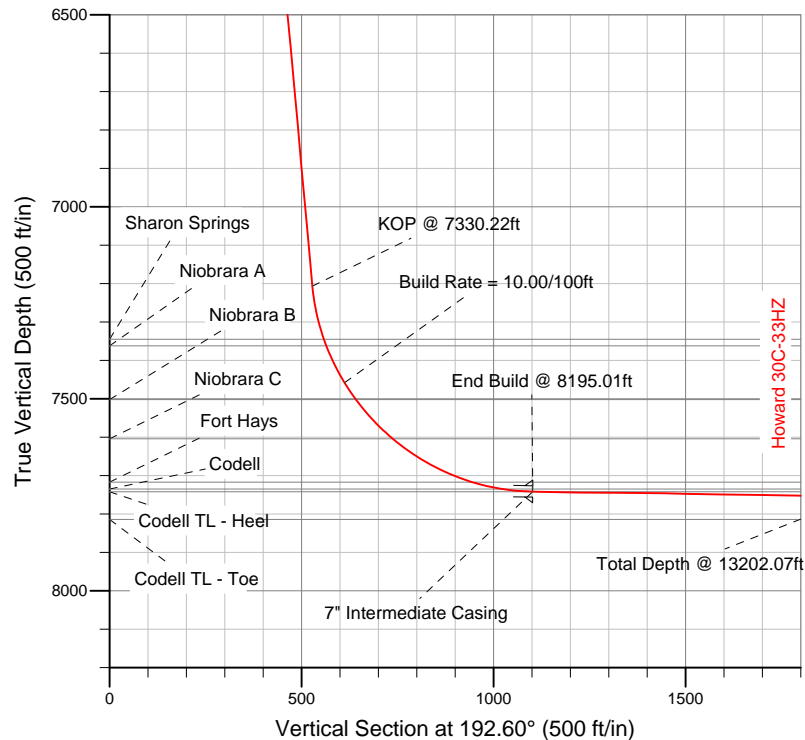
Version: 2003.16 Build: 43I

HALLIBURTON

Anadarko Petroleum Corp.

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	1690.04	11.80	256.81	1685.88	-13.82	-58.95	2.00	256.81	26.35	
4	7330.22	11.80	256.81	7206.84	-277.11	-1181.97	0.00	0.00	528.31	
5	8195.01	89.18	180.19	7742.00	-841.00	-1291.00	10.00	-77.06	1102.40	Howard 30C-33HZ_CP
6	13202.07	89.18	180.19	7814.00	-5847.51	-1307.25	0.00	0.00	5991.85	Howard 30C-33HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)						
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Howard 30C-33HZ_SHL	0.00	0.00	0.00	40.030339	-104.899553	Point
Howard 30C-33HZ_CP	7742.00	-841.00	-1291.00	40.028030	-104.904163	Point
Howard 30C-33HZ_BHL	7814.00	-5847.51	-1307.25	40.014287	-104.904220	Point



WELL DETAILS: Howard 30C-33HZ	
Ground Level: 5025.00	RKB=17 @ 5042.00ft (Drilling Rig)
Plan: Plan A Rev 0 Permit (Howard 30C-33HZ/Plan A Rev 0)	
Created By: Fred Hartmann	Date: 12/28/2012
Reviewed: _____	Date: _____

Plan Report for Howard 30C-33HZ - 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
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	256.81	1,199.98	-0.40	-1.70	0.76	2.00	2.00	0.00	256.81
1,300.00	4.00	256.81	1,299.84	-1.59	-6.79	3.04	2.00	2.00	0.00	0.00
1,400.00	6.00	256.81	1,399.45	-3.58	-15.28	6.83	2.00	2.00	0.00	0.00
1,500.00	8.00	256.81	1,498.70	-6.36	-27.14	12.13	2.00	2.00	0.00	0.00
1,600.00	10.00	256.81	1,597.47	-9.93	-42.37	18.94	2.00	2.00	0.00	0.00
1,690.04	11.80	256.81	1,685.88	-13.82	-58.95	26.35	2.00	2.00	0.00	0.00
End Nudge @ 1690.04ft										
1,700.00	11.80	256.81	1,695.63	-14.29	-60.93	27.24	0.00	0.00	0.00	0.00
1,800.00	11.80	256.81	1,793.51	-18.95	-80.84	36.14	0.00	0.00	0.00	0.00
1,900.00	11.80	256.81	1,891.40	-23.62	-100.76	45.03	0.00	0.00	0.00	0.00
2,000.00	11.80	256.81	1,989.29	-28.29	-120.67	53.93	0.00	0.00	0.00	0.00
2,100.00	11.80	256.81	2,087.17	-32.96	-140.58	62.83	0.00	0.00	0.00	0.00
2,200.00	11.80	256.81	2,185.06	-37.63	-160.49	71.73	0.00	0.00	0.00	0.00
2,300.00	11.80	256.81	2,282.95	-42.29	-180.40	80.63	0.00	0.00	0.00	0.00
2,400.00	11.80	256.81	2,380.83	-46.96	-200.31	89.53	0.00	0.00	0.00	0.00
2,500.00	11.80	256.81	2,478.72	-51.63	-220.22	98.43	0.00	0.00	0.00	0.00
2,600.00	11.80	256.81	2,576.60	-56.30	-240.13	107.33	0.00	0.00	0.00	0.00
2,700.00	11.80	256.81	2,674.49	-60.97	-260.04	116.23	0.00	0.00	0.00	0.00
2,800.00	11.80	256.81	2,772.38	-65.64	-279.96	125.13	0.00	0.00	0.00	0.00
2,900.00	11.80	256.81	2,870.26	-70.30	-299.87	134.03	0.00	0.00	0.00	0.00
3,000.00	11.80	256.81	2,968.15	-74.97	-319.78	142.93	0.00	0.00	0.00	0.00
3,100.00	11.80	256.81	3,066.04	-79.64	-339.69	151.83	0.00	0.00	0.00	0.00
3,200.00	11.80	256.81	3,163.92	-84.31	-359.60	160.73	0.00	0.00	0.00	0.00
3,300.00	11.80	256.81	3,261.81	-88.98	-379.51	169.63	0.00	0.00	0.00	0.00
3,400.00	11.80	256.81	3,359.70	-93.64	-399.42	178.53	0.00	0.00	0.00	0.00
3,500.00	11.80	256.81	3,457.58	-98.31	-419.33	187.43	0.00	0.00	0.00	0.00
3,600.00	11.80	256.81	3,555.47	-102.98	-439.24	196.33	0.00	0.00	0.00	0.00
3,700.00	11.80	256.81	3,653.36	-107.65	-459.16	205.23	0.00	0.00	0.00	0.00
3,800.00	11.80	256.81	3,751.24	-112.32	-479.07	214.13	0.00	0.00	0.00	0.00
3,900.00	11.80	256.81	3,849.13	-116.98	-498.98	223.03	0.00	0.00	0.00	0.00
4,000.00	11.80	256.81	3,947.01	-121.65	-518.89	231.93	0.00	0.00	0.00	0.00
4,100.00	11.80	256.81	4,044.90	-126.32	-538.80	240.83	0.00	0.00	0.00	0.00
4,200.00	11.80	256.81	4,142.79	-130.99	-558.71	249.73	0.00	0.00	0.00	0.00
4,300.00	11.80	256.81	4,240.67	-135.66	-578.62	258.63	0.00	0.00	0.00	0.00
4,400.00	11.80	256.81	4,338.56	-140.33	-598.53	267.53	0.00	0.00	0.00	0.00
4,500.00	11.80	256.81	4,436.45	-144.99	-618.44	276.43	0.00	0.00	0.00	0.00
4,600.00	11.80	256.81	4,534.33	-149.66	-638.36	285.33	0.00	0.00	0.00	0.00
4,700.00	11.80	256.81	4,632.22	-154.33	-658.27	294.23	0.00	0.00	0.00	0.00
4,800.00	11.80	256.81	4,730.11	-159.00	-678.18	303.13	0.00	0.00	0.00	0.00
4,893.88	11.80	256.81	4,822.00	-163.38	-696.87	311.48	0.00	0.00	0.00	0.00
Sussex										
4,900.00	11.80	256.81	4,827.99	-163.67	-698.09	312.03	0.00	0.00	0.00	0.00
5,000.00	11.80	256.81	4,925.88	-168.33	-718.00	320.93	0.00	0.00	0.00	0.00
5,100.00	11.80	256.81	5,023.77	-173.00	-737.91	329.83	0.00	0.00	0.00	0.00
5,200.00	11.80	256.81	5,121.65	-177.67	-757.82	338.72	0.00	0.00	0.00	0.00

Plan Report for Howard 30C-33HZ - 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 (°)
5,300.00	11.80	256.81	5,219.54	-182.34	-777.73	347.62	0.00	0.00	0.00	0.00
5,400.00	11.80	256.81	5,317.43	-187.01	-797.64	356.52	0.00	0.00	0.00	0.00
5,500.00	11.80	256.81	5,415.31	-191.67	-817.56	365.42	0.00	0.00	0.00	0.00
5,600.00	11.80	256.81	5,513.20	-196.34	-837.47	374.32	0.00	0.00	0.00	0.00
5,700.00	11.80	256.81	5,611.08	-201.01	-857.38	383.22	0.00	0.00	0.00	0.00
5,800.00	11.80	256.81	5,708.97	-205.68	-877.29	392.12	0.00	0.00	0.00	0.00
5,900.00	11.80	256.81	5,806.86	-210.35	-897.20	401.02	0.00	0.00	0.00	0.00
6,000.00	11.80	256.81	5,904.74	-215.02	-917.11	409.92	0.00	0.00	0.00	0.00
6,100.00	11.80	256.81	6,002.63	-219.68	-937.02	418.82	0.00	0.00	0.00	0.00
6,200.00	11.80	256.81	6,100.52	-224.35	-956.93	427.72	0.00	0.00	0.00	0.00
6,300.00	11.80	256.81	6,198.40	-229.02	-976.84	436.62	0.00	0.00	0.00	0.00
6,400.00	11.80	256.81	6,296.29	-233.69	-996.76	445.52	0.00	0.00	0.00	0.00
6,500.00	11.80	256.81	6,394.18	-238.36	-1,016.67	454.42	0.00	0.00	0.00	0.00
6,600.00	11.80	256.81	6,492.06	-243.02	-1,036.58	463.32	0.00	0.00	0.00	0.00
6,700.00	11.80	256.81	6,589.95	-247.69	-1,056.49	472.22	0.00	0.00	0.00	0.00
6,800.00	11.80	256.81	6,687.84	-252.36	-1,076.40	481.12	0.00	0.00	0.00	0.00
6,900.00	11.80	256.81	6,785.72	-257.03	-1,096.31	490.02	0.00	0.00	0.00	0.00
7,000.00	11.80	256.81	6,883.61	-261.70	-1,116.22	498.92	0.00	0.00	0.00	0.00
7,100.00	11.80	256.81	6,981.49	-266.36	-1,136.13	507.82	0.00	0.00	0.00	0.00
7,200.00	11.80	256.81	7,079.38	-271.03	-1,156.04	516.72	0.00	0.00	0.00	0.00
7,300.00	11.80	256.81	7,177.27	-275.70	-1,175.96	525.62	0.00	0.00	0.00	0.00
7,330.22	11.80	256.81	7,206.85	-277.11	-1,181.97	528.31	0.00	0.00	0.00	0.00
KOP @ 7330.22ft										
7,400.00	14.97	229.53	7,274.79	-284.60	-1,195.79	538.63	10.00	4.55	-39.09	-77.06
7,473.68	20.45	213.08	7,345.00	-301.59	-1,210.08	558.33	10.00	7.43	-22.33	-50.48
Sharon Springs										
7,491.92	21.97	210.30	7,362.00	-307.20	-1,213.54	564.56	10.00	8.34	-15.25	-34.79
Niobrara A										
7,500.00	22.66	209.18	7,369.48	-309.87	-1,215.06	567.49	10.00	8.51	-13.83	-32.19
7,600.00	31.62	199.31	7,458.42	-351.53	-1,233.16	612.10	10.00	8.96	-9.87	-31.16
Build Rate = 10.00/100ft										
7,652.63	36.53	195.95	7,502.00	-379.63	-1,242.04	641.46	10.00	9.34	-6.38	-22.35
Niobrara B										
7,700.00	41.02	193.54	7,538.92	-408.32	-1,249.56	671.10	10.00	9.48	-5.10	-19.56
7,792.89	49.94	189.87	7,604.00	-473.12	-1,262.81	737.24	10.00	9.60	-3.95	-17.68
Niobrara C										
7,800.00	50.63	189.63	7,608.54	-478.51	-1,263.74	742.70	10.00	9.66	-3.37	-15.09
7,900.00	60.33	186.67	7,665.15	-559.98	-1,275.28	824.71	10.00	9.70	-2.95	-14.94
8,000.00	70.08	184.24	7,707.04	-650.23	-1,283.83	914.67	10.00	9.76	-2.43	-13.26
8,031.59	73.17	183.55	7,717.00	-680.14	-1,285.86	944.30	10.00	9.78	-2.21	-12.24
Fort Hays										
8,100.00	79.87	182.10	7,732.94	-746.55	-1,289.13	1,009.81	10.00	9.79	-2.11	-12.02
8,112.46	81.09	181.85	7,735.00	-758.83	-1,289.55	1,021.89	10.00	9.79	-2.05	-11.68
Codell										
8,195.01	89.18	180.19	7,742.00	-841.00	-1,291.00	1,102.40	10.00	9.80	-2.01	-11.64
End Build @ 8195.01ft - Codell TL - Heel - 7" Intermediate Casing - Howard 30C-33HZ_CP										
8,200.00	89.18	180.19	7,742.07	-845.99	-1,291.02	1,107.27	0.01	0.01	0.00	-11.50
8,300.00	89.18	180.19	7,743.51	-945.97	-1,291.34	1,204.92	0.00	0.00	0.00	0.00
8,400.00	89.18	180.19	7,744.95	-1,045.96	-1,291.67	1,302.57	0.00	0.00	0.00	0.00
8,500.00	89.18	180.19	7,746.39	-1,145.95	-1,291.99	1,400.22	0.00	0.00	0.00	0.00
8,600.00	89.18	180.19	7,747.82	-1,245.94	-1,292.31	1,497.87	0.00	0.00	0.00	0.00
8,700.00	89.18	180.19	7,749.26	-1,345.93	-1,292.64	1,595.52	0.00	0.00	0.00	0.00
8,800.00	89.18	180.19	7,750.70	-1,445.92	-1,292.96	1,693.18	0.00	0.00	0.00	0.00
8,900.00	89.18	180.19	7,752.14	-1,545.91	-1,293.29	1,790.83	0.00	0.00	0.00	0.00
9,000.00	89.18	180.19	7,753.58	-1,645.90	-1,293.61	1,888.48	0.00	0.00	0.00	0.00
9,100.00	89.18	180.19	7,755.01	-1,745.89	-1,293.94	1,986.13	0.00	0.00	0.00	0.00
9,200.00	89.18	180.19	7,756.45	-1,845.88	-1,294.26	2,083.78	0.00	0.00	0.00	0.00
9,300.00	89.18	180.19	7,757.89	-1,945.87	-1,294.59	2,181.43	0.00	0.00	0.00	0.00
9,400.00	89.18	180.19	7,759.33	-2,045.85	-1,294.91	2,279.08	0.00	0.00	0.00	0.00

Plan Report for Howard 30C-33HZ - 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 (°)
9,500.00	89.18	180.19	7,760.77	-2,145.84	-1,295.24	2,376.73	0.00	0.00	0.00	0.00
9,600.00	89.18	180.19	7,762.20	-2,245.83	-1,295.56	2,474.39	0.00	0.00	0.00	0.00
9,700.00	89.18	180.19	7,763.64	-2,345.82	-1,295.88	2,572.04	0.00	0.00	0.00	0.00
9,800.00	89.18	180.19	7,765.08	-2,445.81	-1,296.21	2,669.69	0.00	0.00	0.00	0.00
9,900.00	89.18	180.19	7,766.52	-2,545.80	-1,296.53	2,767.34	0.00	0.00	0.00	0.00
10,000.00	89.18	180.19	7,767.96	-2,645.79	-1,296.86	2,864.99	0.00	0.00	0.00	0.00
10,100.00	89.18	180.19	7,769.39	-2,745.78	-1,297.18	2,962.64	0.00	0.00	0.00	0.00
10,200.00	89.18	180.19	7,770.83	-2,845.77	-1,297.51	3,060.29	0.00	0.00	0.00	0.00
10,300.00	89.18	180.19	7,772.27	-2,945.76	-1,297.83	3,157.94	0.00	0.00	0.00	0.00
10,400.00	89.18	180.19	7,773.71	-3,045.75	-1,298.16	3,255.60	0.00	0.00	0.00	0.00
10,500.00	89.18	180.19	7,775.15	-3,145.74	-1,298.48	3,353.25	0.00	0.00	0.00	0.00
10,600.00	89.18	180.19	7,776.58	-3,245.72	-1,298.81	3,450.90	0.00	0.00	0.00	0.00
10,700.00	89.18	180.19	7,778.02	-3,345.71	-1,299.13	3,548.55	0.00	0.00	0.00	0.00
10,800.00	89.18	180.19	7,779.46	-3,445.70	-1,299.45	3,646.20	0.00	0.00	0.00	0.00
10,900.00	89.18	180.19	7,780.90	-3,545.69	-1,299.78	3,743.85	0.00	0.00	0.00	0.00
11,000.00	89.18	180.19	7,782.33	-3,645.68	-1,300.10	3,841.50	0.00	0.00	0.00	0.00
11,100.00	89.18	180.19	7,783.77	-3,745.67	-1,300.43	3,939.15	0.00	0.00	0.00	0.00
11,200.00	89.18	180.19	7,785.21	-3,845.66	-1,300.75	4,036.81	0.00	0.00	0.00	0.00
11,300.00	89.18	180.19	7,786.65	-3,945.65	-1,301.08	4,134.46	0.00	0.00	0.00	0.00
11,400.00	89.18	180.19	7,788.09	-4,045.64	-1,301.40	4,232.11	0.00	0.00	0.00	0.00
11,500.00	89.18	180.19	7,789.52	-4,145.63	-1,301.73	4,329.76	0.00	0.00	0.00	0.00
11,600.00	89.18	180.19	7,790.96	-4,245.62	-1,302.05	4,427.41	0.00	0.00	0.00	0.00
11,700.00	89.18	180.19	7,792.40	-4,345.60	-1,302.37	4,525.06	0.00	0.00	0.00	0.00
11,800.00	89.18	180.19	7,793.84	-4,445.59	-1,302.70	4,622.71	0.00	0.00	0.00	0.00
11,900.00	89.18	180.19	7,795.28	-4,545.58	-1,303.02	4,720.36	0.00	0.00	0.00	0.00
12,000.00	89.18	180.19	7,796.71	-4,645.57	-1,303.35	4,818.02	0.00	0.00	0.00	0.00
12,100.00	89.18	180.19	7,798.15	-4,745.56	-1,303.67	4,915.67	0.00	0.00	0.00	0.00
12,200.00	89.18	180.19	7,799.59	-4,845.55	-1,304.00	5,013.32	0.00	0.00	0.00	0.00
12,300.00	89.18	180.19	7,801.03	-4,945.54	-1,304.32	5,110.97	0.00	0.00	0.00	0.00
12,400.00	89.18	180.19	7,802.47	-5,045.53	-1,304.65	5,208.62	0.00	0.00	0.00	0.00
12,500.00	89.18	180.19	7,803.90	-5,145.52	-1,304.97	5,306.27	0.00	0.00	0.00	0.00
12,600.00	89.18	180.19	7,805.34	-5,245.51	-1,305.30	5,403.92	0.00	0.00	0.00	0.00
12,700.00	89.18	180.19	7,806.78	-5,345.50	-1,305.62	5,501.57	0.00	0.00	0.00	0.00
12,800.00	89.18	180.19	7,808.22	-5,445.49	-1,305.94	5,599.23	0.00	0.00	0.00	0.00
12,900.00	89.18	180.19	7,809.66	-5,545.47	-1,306.27	5,696.88	0.00	0.00	0.00	0.00
13,000.00	89.18	180.19	7,811.09	-5,645.46	-1,306.59	5,794.53	0.00	0.00	0.00	0.00
13,100.00	89.18	180.19	7,812.53	-5,745.45	-1,306.92	5,892.18	0.00	0.00	0.00	0.00
13,200.00	89.18	180.19	7,813.97	-5,845.44	-1,307.24	5,989.83	0.00	0.00	0.00	0.00
13,202.07	89.18	180.19	7,814.00	-5,847.51	-1,307.25	5,991.85	0.00	0.00	0.00	0.00

Total Depth @ 13202.07ft - Howard 30C-33HZ_BHL**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
1,690.04	1,685.88	-13.82	-58.95	End Nudge @ 1690.04ft
7,330.22	7,206.85	-277.11	-1,181.97	KOP @ 7330.22ft
7,600.00	7,458.42	-351.53	-1,233.16	Build Rate = 10.00/100ft
8,195.01	7,742.00	-841.00	-1,291.00	End Build @ 8195.01ft
13,202.07	7,814.00	-5,847.51	-1,307.25	Total Depth @ 13202.07ft

Plan Report for Howard 30C-33HZ - Plan A Rev 0 Permit

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (ft)	Origin +E/-W (ft)	Start TVD (ft)
Target	Howard 30C-33HZ_BHL	192.60	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	8,195.01	Plan A Rev 0 Permit	MWD
8,195.01	13,202.07	Plan A Rev 0 Permit	MWD

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
8,195.01	7,742.00	7" Intermediate Casing	7	8-3/4

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,893.88	4,822.00	Sussex		0.00	
7,473.68	7,345.00	Sharon Springs		0.00	
7,491.92	7,362.00	Niobrara A		0.00	
7,652.63	7,502.00	Niobrara B		0.00	
7,792.89	7,604.00	Niobrara C		0.00	
8,031.59	7,717.00	Fort Hays		0.00	
8,112.46	7,735.00	Codell		0.00	
8,195.01	7,742.00	Codell TL - Heel		0.00	
13,202.07	7,814.00	Codell TL - Toe		0.00	

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Howard 30C-33HZ_CP	7,742.00	-841.00	-1,291.00	Point
Howard 30C-33HZ_BHL	7,814.00	-5,847.51	-1,307.25	Point
Howard 30C-33HZ_SHL	0.00	0.00	0.00	Point

North Reference Sheet for Sec. 21-T1N-R67W - Howard 30C-33HZ - 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 @ 5042.00ft (Drilling Rig). Northing and Easting are relative to Howard 30C-33HZ

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: 0.99996421

Grid Coordinates of Well: 1,254,467.83 ft N, 3,168,141.26 ft E

Geographical Coordinates of Well: 40° 01' 49.22" N, 104° 53' 58.39" W

Grid Convergence at Surface is: 0.39°

Based upon Minimum Curvature type calculations, at a Measured Depth of 13,202.07ft
the Bottom Hole Displacement is 5,991.85ft in the Direction of 192.60° (True).

Magnetic Convergence at surface is: -8.36° (27 December 2012, , BGGM2012)

