

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 21-T1N-R67W

Howard 30N-21HZ

Plan C 0

Plan: Plan C 0 - PERMIT

Sperry Drilling Services

Proposal Report

16 May, 2013

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 30N-21HZ

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

Project: Weld County, CO (NAD 83)
 Site: Sec. 21-T1N-R67W
 Well: Howard 30N-21HZ
 Wellbore: Plan C 0
 Design: Plan C 0 - PERMIT

Anadarko Petroleum Corp.

HALLIBURTON
 Sperry Drilling

SECTION DETAILS

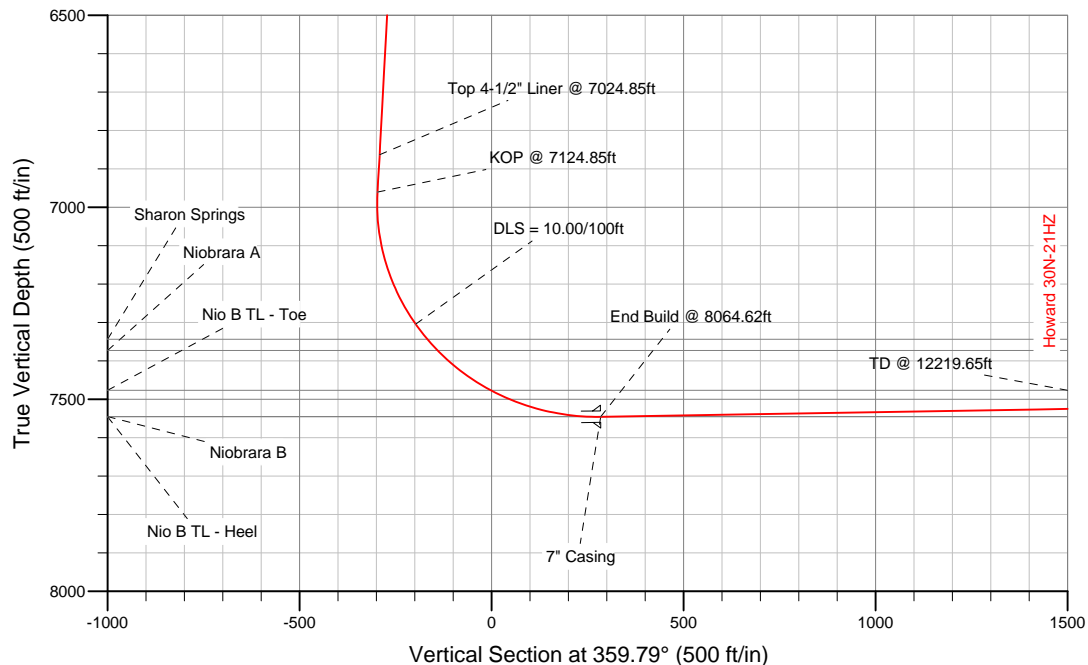
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1200.00	0.00	0.00	1200.00	0.00	0.00	0.00	0.00	0.00	
3	1904.92	14.10	257.16	1897.83	-19.18	-84.13	2.00	257.16	-18.87	
4	7124.85	14.10	257.16	6960.52	-301.83	-1323.83	0.00	0.00	-296.98	
5	8064.62	90.95	359.79	7546.00	279.00	-1472.00	10.00	102.03	284.39	Howard 30N-21HZ_CP
6	12219.65	90.95	359.79	7477.00	4433.43	-1487.58	0.00	0.00	4438.86	Howard 30N-21HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

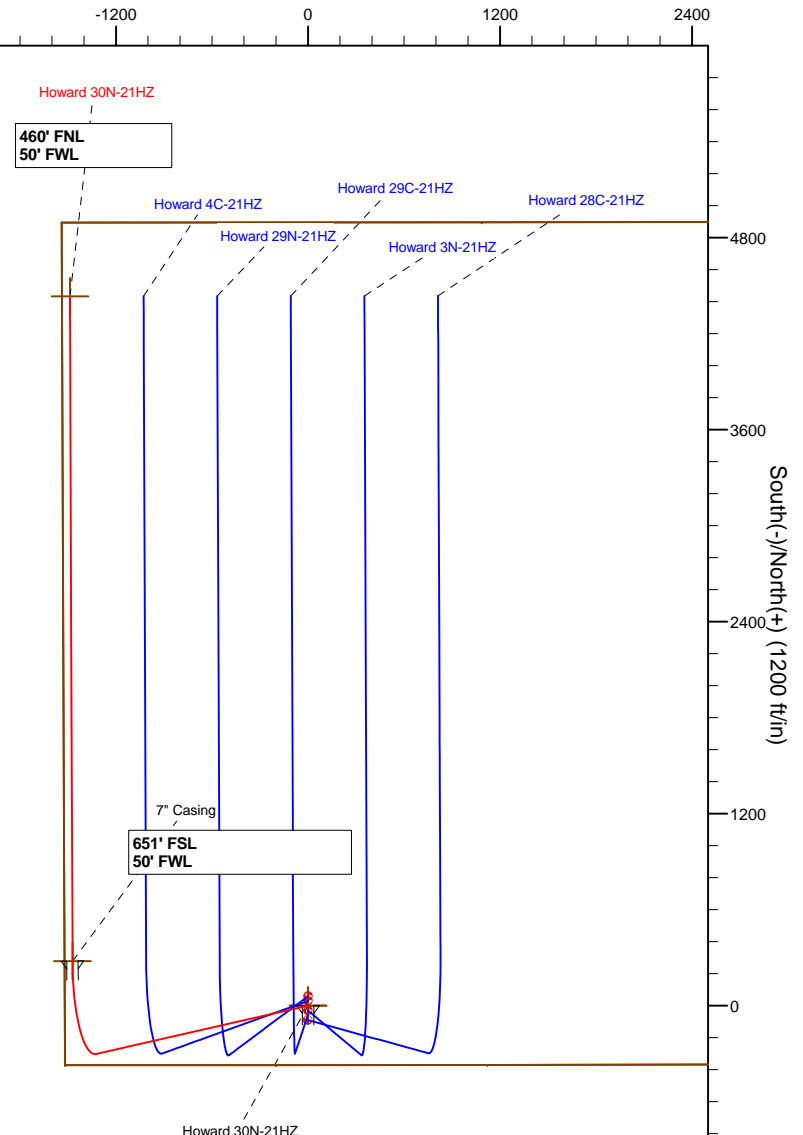
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Howard 30N-21HZ_Sec	0.00	0.00	0.00	40.030339	-104.899553	Polygon
Howard 30N-21HZ_SHL	0.00	0.00	0.00	40.030339	-104.899553	Point
Howard 30N-21HZ_BHL	7477.00	4433.43	-1487.58	40.042509	-104.904866	Point
Howard 30N-21HZ_CP	7546.00	279.00	-1472.00	40.031105	-104.904809	Point

MD TVD Annotation

7024.85 6863.54 Top 4-1/2" Liner @ 7024.85ft
 7124.85 6960.53 KOP @ 7124.85ft



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



WELL DETAILS: Howard 30N-21HZ

Ground Level: 5025.00
 RKB=17 @ 5042.00ft (Drilling Rig)

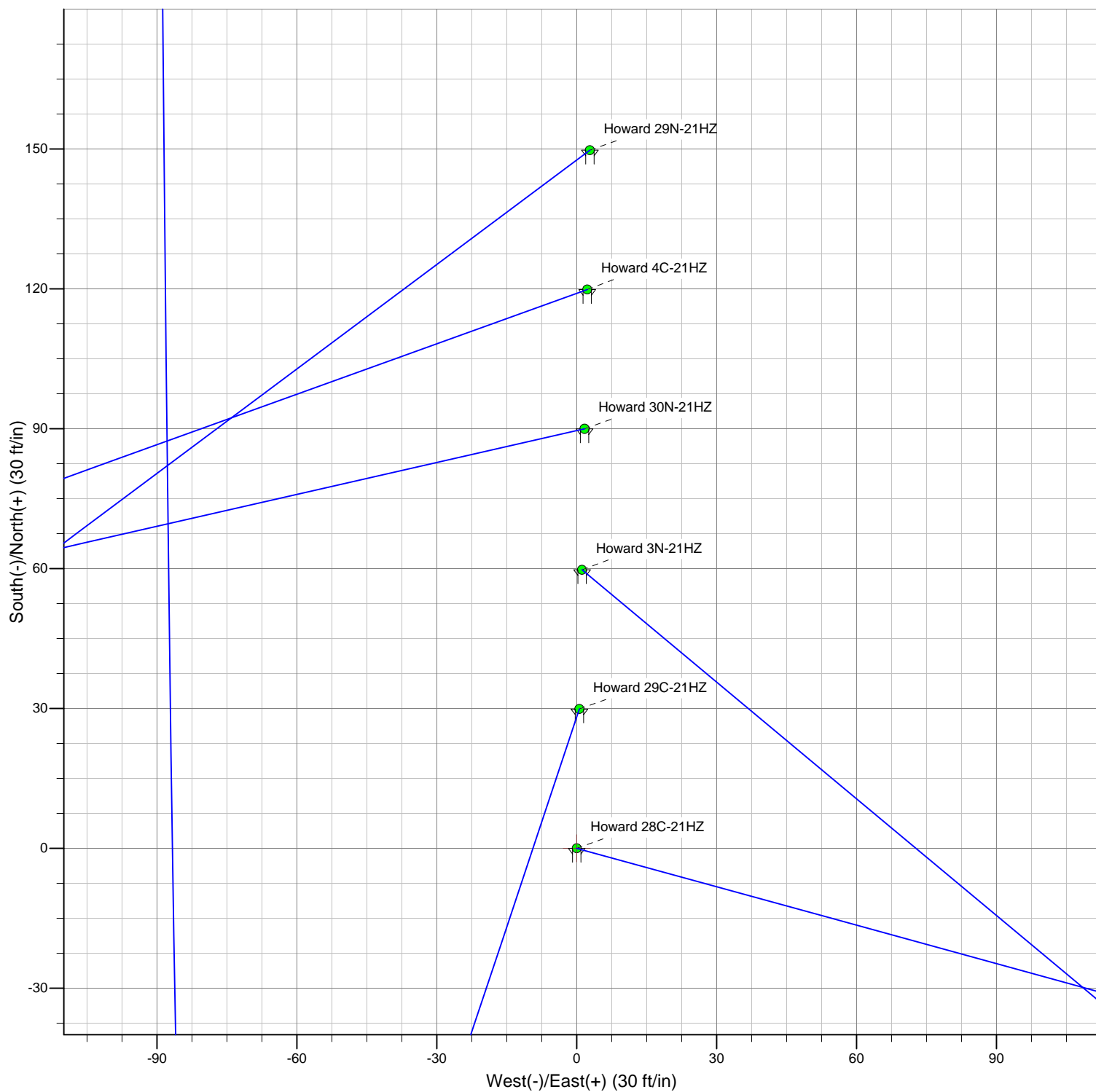
Plan: Plan C 0 - PERMIT (Howard 30N-21HZ/Plan C 0)

Created By: Fred Hartmann Date: 05/16/2013
 Reviewed: _____ Date: _____

Project: Weld County, CO (NAD 83)
Site: Sec. 21-T1N-R67W
Pad: Howard 14-21HZ

Anadarko Petroleum Corp.

HALLIBURTON
Sperry Drilling



Azimuths to True North
Magnetic North: 8.70°

Magnetic Field
Strength: 52619.5snT
Dip Angle: 66.64°
Date: 05-16-2013
Model: BGGM2012

Plan Report for Howard 30N-21HZ - Plan C 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
803.00	0.00	0.00	803.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8" Casing										
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
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 1200.00ft										
1,300.00	2.00	257.16	1,299.98	-0.39	-1.70	-0.38	2.00	2.00	0.00	257.16
1,400.00	4.00	257.16	1,399.84	-1.55	-6.80	-1.53	2.00	2.00	0.00	0.00
1,500.00	6.00	257.16	1,499.45	-3.49	-15.30	-3.43	2.00	2.00	0.00	0.00
1,600.00	8.00	257.16	1,598.70	-6.20	-27.18	-6.10	2.00	2.00	0.00	0.00
1,700.00	10.00	257.16	1,697.47	-9.67	-42.43	-9.52	2.00	2.00	0.00	0.00
1,800.00	12.00	257.16	1,795.62	-13.92	-61.04	-13.69	2.00	2.00	0.00	0.00
1,900.00	14.00	257.16	1,893.06	-18.92	-82.97	-18.61	2.00	2.00	0.00	0.00
1,904.92	14.10	257.16	1,897.83	-19.18	-84.13	-18.87	2.00	2.00	0.00	0.00
End Nudge @ 1904.92ft										
2,000.00	14.10	257.16	1,990.04	-24.33	-106.71	-23.94	0.00	0.00	0.00	0.00
2,100.00	14.10	257.16	2,087.03	-29.74	-130.46	-29.27	0.00	0.00	0.00	0.00
2,200.00	14.10	257.16	2,184.02	-35.16	-154.21	-34.59	0.00	0.00	0.00	0.00
2,300.00	14.10	257.16	2,281.01	-40.57	-177.96	-39.92	0.00	0.00	0.00	0.00
2,400.00	14.10	257.16	2,378.00	-45.99	-201.71	-45.25	0.00	0.00	0.00	0.00
2,500.00	14.10	257.16	2,474.98	-51.40	-225.46	-50.58	0.00	0.00	0.00	0.00
2,600.00	14.10	257.16	2,571.97	-56.82	-249.21	-55.91	0.00	0.00	0.00	0.00
2,700.00	14.10	257.16	2,668.96	-62.23	-272.96	-61.23	0.00	0.00	0.00	0.00
2,800.00	14.10	257.16	2,765.95	-67.65	-296.71	-66.56	0.00	0.00	0.00	0.00
2,900.00	14.10	257.16	2,862.93	-73.06	-320.46	-71.89	0.00	0.00	0.00	0.00
3,000.00	14.10	257.16	2,959.92	-78.48	-344.21	-77.22	0.00	0.00	0.00	0.00
3,100.00	14.10	257.16	3,056.91	-83.89	-367.96	-82.54	0.00	0.00	0.00	0.00
3,200.00	14.10	257.16	3,153.90	-89.31	-391.71	-87.87	0.00	0.00	0.00	0.00
3,300.00	14.10	257.16	3,250.89	-94.72	-415.46	-93.20	0.00	0.00	0.00	0.00
3,400.00	14.10	257.16	3,347.87	-100.14	-439.20	-98.53	0.00	0.00	0.00	0.00
3,500.00	14.10	257.16	3,444.86	-105.55	-462.95	-103.85	0.00	0.00	0.00	0.00
3,600.00	14.10	257.16	3,541.85	-110.97	-486.70	-109.18	0.00	0.00	0.00	0.00
3,700.00	14.10	257.16	3,638.84	-116.38	-510.45	-114.51	0.00	0.00	0.00	0.00
3,800.00	14.10	257.16	3,735.83	-121.80	-534.20	-119.84	0.00	0.00	0.00	0.00
3,900.00	14.10	257.16	3,832.81	-127.21	-557.95	-125.17	0.00	0.00	0.00	0.00
4,000.00	14.10	257.16	3,929.80	-132.63	-581.70	-130.49	0.00	0.00	0.00	0.00
4,065.16	14.10	257.16	3,993.00	-136.15	-597.18	-133.96	0.00	0.00	0.00	0.00
Parkman										
4,100.00	14.10	257.16	4,026.79	-138.04	-605.45	-135.82	0.00	0.00	0.00	0.00
4,200.00	14.10	257.16	4,123.78	-143.46	-629.20	-141.15	0.00	0.00	0.00	0.00
4,300.00	14.10	257.16	4,220.76	-148.87	-652.95	-146.48	0.00	0.00	0.00	0.00
4,400.00	14.10	257.16	4,317.75	-154.28	-676.70	-151.80	0.00	0.00	0.00	0.00
4,500.00	14.10	257.16	4,414.74	-159.70	-700.45	-157.13	0.00	0.00	0.00	0.00
4,600.00	14.10	257.16	4,511.73	-165.11	-724.20	-162.46	0.00	0.00	0.00	0.00
4,700.00	14.10	257.16	4,608.72	-170.53	-747.95	-167.79	0.00	0.00	0.00	0.00
4,800.00	14.10	257.16	4,705.70	-175.94	-771.70	-173.11	0.00	0.00	0.00	0.00
4,837.42	14.10	257.16	4,742.00	-177.97	-780.58	-175.11	0.00	0.00	0.00	0.00
Sussex										

Plan Report for Howard 30N-21HZ - Plan C 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 (°)
4,900.00	14.10	257.16	4,802.69	-181.36	-795.45	-178.44	0.00	0.00	0.00	0.00
5,000.00	14.10	257.16	4,899.68	-186.77	-819.20	-183.77	0.00	0.00	0.00	0.00
5,100.00	14.10	257.16	4,996.67	-192.19	-842.94	-189.10	0.00	0.00	0.00	0.00
5,200.00	14.10	257.16	5,093.66	-197.60	-866.69	-194.43	0.00	0.00	0.00	0.00
5,300.00	14.10	257.16	5,190.64	-203.02	-890.44	-199.75	0.00	0.00	0.00	0.00
5,400.00	14.10	257.16	5,287.63	-208.43	-914.19	-205.08	0.00	0.00	0.00	0.00
5,500.00	14.10	257.16	5,384.62	-213.85	-937.94	-210.41	0.00	0.00	0.00	0.00
5,600.00	14.10	257.16	5,481.61	-219.26	-961.69	-215.74	0.00	0.00	0.00	0.00
5,700.00	14.10	257.16	5,578.60	-224.68	-985.44	-221.06	0.00	0.00	0.00	0.00
5,800.00	14.10	257.16	5,675.58	-230.09	-1,009.19	-226.39	0.00	0.00	0.00	0.00
5,900.00	14.10	257.16	5,772.57	-235.51	-1,032.94	-231.72	0.00	0.00	0.00	0.00
6,000.00	14.10	257.16	5,869.56	-240.92	-1,056.69	-237.05	0.00	0.00	0.00	0.00
6,100.00	14.10	257.16	5,966.55	-246.34	-1,080.44	-242.37	0.00	0.00	0.00	0.00
6,200.00	14.10	257.16	6,063.53	-251.75	-1,104.19	-247.70	0.00	0.00	0.00	0.00
6,300.00	14.10	257.16	6,160.52	-257.17	-1,127.94	-253.03	0.00	0.00	0.00	0.00
6,400.00	14.10	257.16	6,257.51	-262.58	-1,151.69	-258.36	0.00	0.00	0.00	0.00
6,500.00	14.10	257.16	6,354.50	-268.00	-1,175.44	-263.69	0.00	0.00	0.00	0.00
6,600.00	14.10	257.16	6,451.49	-273.41	-1,199.19	-269.01	0.00	0.00	0.00	0.00
6,700.00	14.10	257.16	6,548.47	-278.82	-1,222.94	-274.34	0.00	0.00	0.00	0.00
6,800.00	14.10	257.16	6,645.46	-284.24	-1,246.68	-279.67	0.00	0.00	0.00	0.00
6,900.00	14.10	257.16	6,742.45	-289.65	-1,270.43	-285.00	0.00	0.00	0.00	0.00
7,000.00	14.10	257.16	6,839.44	-295.07	-1,294.18	-290.32	0.00	0.00	0.00	0.00
7,024.85	14.10	257.16	6,863.54	-296.41	-1,300.09	-291.65	0.00	0.00	0.00	0.00
Top 4-1/2" Liner @ 7024.85ft										
7,100.00	14.10	257.16	6,936.43	-300.48	-1,317.93	-295.65	0.00	0.00	0.00	0.00
7,124.85	14.10	257.16	6,960.53	-301.83	-1,323.83	-296.98	0.00	0.00	0.00	0.00
KOP @ 7124.85ft										
7,200.00	14.49	287.90	7,033.45	-300.97	-1,341.73	-296.05	10.00	0.52	40.91	102.03
7,300.00	19.92	316.94	7,129.12	-284.64	-1,365.33	-279.64	10.00	5.43	29.04	72.20
7,400.00	27.92	331.97	7,220.54	-251.45	-1,388.01	-246.36	10.00	8.00	15.03	44.38
7,500.00	36.85	340.45	7,304.95	-202.41	-1,409.10	-197.24	10.00	8.93	8.47	30.59
DLS = 10.00/100ft										
7,550.39	41.51	343.46	7,344.00	-172.14	-1,418.92	-166.94	10.00	9.26	5.99	23.41
Sharon Springs										
7,590.30	45.26	345.48	7,373.00	-145.73	-1,426.24	-140.50	10.00	9.38	5.06	21.07
Niobrara A										
7,600.00	46.17	345.93	7,379.77	-139.00	-1,427.95	-133.77	10.00	9.43	4.65	19.60
7,700.00	55.69	349.91	7,442.75	-63.16	-1,443.99	-57.87	10.00	9.51	3.98	19.28
7,800.00	65.30	353.07	7,491.95	22.81	-1,456.74	28.15	10.00	9.62	3.16	16.76
7,900.00	74.97	355.78	7,525.89	116.30	-1,465.79	121.68	10.00	9.67	2.70	15.20
8,000.00	84.68	358.24	7,543.54	214.47	-1,470.89	219.86	10.00	9.70	2.47	14.28
8,019.10	86.53	358.70	7,545.00	233.50	-1,471.40	238.90	10.00	9.71	2.40	13.84
Niobrara B										
8,064.62	90.95	359.79	7,546.00	279.00	-1,472.00	284.39	10.00	9.71	2.38	13.81
End Build @ 8064.62ft - Nio B TL - Heel - 7" Casing - Howard 30N-21HZ_CP										
8,100.00	90.95	359.79	7,545.41	314.38	-1,472.13	319.77	0.00	0.00	0.00	13.78
8,200.00	90.95	359.79	7,543.75	414.36	-1,472.51	419.76	0.00	0.00	0.00	0.00
8,300.00	90.95	359.79	7,542.09	514.35	-1,472.88	519.74	0.00	0.00	0.00	0.00
8,400.00	90.95	359.79	7,540.43	614.33	-1,473.26	619.73	0.00	0.00	0.00	0.00
8,500.00	90.95	359.79	7,538.77	714.32	-1,473.63	719.72	0.00	0.00	0.00	0.00
8,600.00	90.95	359.79	7,537.11	814.30	-1,474.01	819.70	0.00	0.00	0.00	0.00
8,700.00	90.95	359.79	7,535.45	914.29	-1,474.38	919.69	0.00	0.00	0.00	0.00
8,800.00	90.95	359.79	7,533.79	1,014.28	-1,474.76	1,019.67	0.00	0.00	0.00	0.00
8,900.00	90.95	359.79	7,532.13	1,114.26	-1,475.13	1,119.66	0.00	0.00	0.00	0.00
9,000.00	90.95	359.79	7,530.47	1,214.25	-1,475.51	1,219.65	0.00	0.00	0.00	0.00
9,100.00	90.95	359.79	7,528.81	1,314.23	-1,475.88	1,319.63	0.00	0.00	0.00	0.00
9,200.00	90.95	359.79	7,527.15	1,414.22	-1,476.26	1,419.62	0.00	0.00	0.00	0.00
9,300.00	90.95	359.79	7,525.48	1,514.20	-1,476.63	1,519.61	0.00	0.00	0.00	0.00
9,400.00	90.95	359.79	7,523.82	1,614.19	-1,477.01	1,619.59	0.00	0.00	0.00	0.00

Plan Report for Howard 30N-21HZ - Plan C 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	90.95	359.79	7,522.16	1,714.17	-1,477.38	1,719.58	0.00	0.00	0.00	0.00
9,600.00	90.95	359.79	7,520.50	1,814.16	-1,477.76	1,819.56	0.00	0.00	0.00	0.00
9,700.00	90.95	359.79	7,518.84	1,914.15	-1,478.13	1,919.55	0.00	0.00	0.00	0.00
9,800.00	90.95	359.79	7,517.18	2,014.13	-1,478.51	2,019.54	0.00	0.00	0.00	0.00
9,900.00	90.95	359.79	7,515.52	2,114.12	-1,478.88	2,119.52	0.00	0.00	0.00	0.00
10,000.00	90.95	359.79	7,513.86	2,214.10	-1,479.26	2,219.51	0.00	0.00	0.00	0.00
10,100.00	90.95	359.79	7,512.20	2,314.09	-1,479.63	2,319.50	0.00	0.00	0.00	0.00
10,200.00	90.95	359.79	7,510.54	2,414.07	-1,480.01	2,419.48	0.00	0.00	0.00	0.00
10,300.00	90.95	359.79	7,508.88	2,514.06	-1,480.38	2,519.47	0.00	0.00	0.00	0.00
10,400.00	90.95	359.79	7,507.22	2,614.04	-1,480.76	2,619.45	0.00	0.00	0.00	0.00
10,500.00	90.95	359.79	7,505.56	2,714.03	-1,481.13	2,719.44	0.00	0.00	0.00	0.00
10,600.00	90.95	359.79	7,503.90	2,814.01	-1,481.51	2,819.43	0.00	0.00	0.00	0.00
10,700.00	90.95	359.79	7,502.24	2,914.00	-1,481.88	2,919.41	0.00	0.00	0.00	0.00
10,800.00	90.95	359.79	7,500.58	3,013.99	-1,482.26	3,019.40	0.00	0.00	0.00	0.00
10,900.00	90.95	359.79	7,498.91	3,113.97	-1,482.63	3,119.38	0.00	0.00	0.00	0.00
11,000.00	90.95	359.79	7,497.25	3,213.96	-1,483.01	3,219.37	0.00	0.00	0.00	0.00
11,100.00	90.95	359.79	7,495.59	3,313.94	-1,483.38	3,319.36	0.00	0.00	0.00	0.00
11,200.00	90.95	359.79	7,493.93	3,413.93	-1,483.76	3,419.34	0.00	0.00	0.00	0.00
11,300.00	90.95	359.79	7,492.27	3,513.91	-1,484.13	3,519.33	0.00	0.00	0.00	0.00
11,400.00	90.95	359.79	7,490.61	3,613.90	-1,484.51	3,619.32	0.00	0.00	0.00	0.00
11,500.00	90.95	359.79	7,488.95	3,713.88	-1,484.88	3,719.30	0.00	0.00	0.00	0.00
11,600.00	90.95	359.79	7,487.29	3,813.87	-1,485.26	3,819.29	0.00	0.00	0.00	0.00
11,700.00	90.95	359.79	7,485.63	3,913.86	-1,485.63	3,919.27	0.00	0.00	0.00	0.00
11,800.00	90.95	359.79	7,483.97	4,013.84	-1,486.01	4,019.26	0.00	0.00	0.00	0.00
11,900.00	90.95	359.79	7,482.31	4,113.83	-1,486.38	4,119.25	0.00	0.00	0.00	0.00
12,000.00	90.95	359.79	7,480.65	4,213.81	-1,486.76	4,219.23	0.00	0.00	0.00	0.00
12,100.00	90.95	359.79	7,478.99	4,313.80	-1,487.13	4,319.22	0.00	0.00	0.00	0.00
12,200.00	90.95	359.79	7,477.33	4,413.78	-1,487.51	4,419.21	0.00	0.00	0.00	0.00
12,219.64	90.95	359.79	7,477.00	4,433.42	-1,487.58	4,438.84	0.00	0.00	0.00	0.00
Nio B TL - Toe										
12,219.65	90.95	359.79	7,477.00	4,433.43	-1,487.58	4,438.85	0.00	0.00	0.00	0.00
TD @ 12219.65ft - Howard 30N-21HZ_BHL										

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
1,200.00	1,200.00	0.00	0.00	Begin Nudge @ 1200.00ft
1,904.92	1,897.83	-19.18	-84.13	End Nudge @ 1904.92ft
7,024.85	6,863.54	-296.41	-1,300.09	Top 4-1/2" Liner @ 7024.85ft
7,124.85	6,960.53	-301.83	-1,323.83	KOP @ 7124.85ft
7,500.00	7,304.95	-202.41	-1,409.10	DLS = 10.00/100ft
8,064.62	7,546.00	279.00	-1,472.00	End Build @ 8064.62ft
12,219.65	7,477.00	4,433.43	-1,487.58	TD @ 12219.65ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	+N/-S (ft)	+E/-W (ft)	Start TVD (ft)
User	No Target (Freehand)	359.79	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	12,219.65	Plan C 0 - PERMIT	MWD

Plan Report for Howard 30N-21HZ - Plan C 0 - PERMIT

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
803.00	803.00	9 5/8" Casing	9-5/8	13-1/2
8,064.62	7,546.00	7" Casing	7	8-3/4

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,065.16	3,993.00	Parkman		0.00	
4,837.42	4,742.00	Sussex		0.00	
7,550.39	7,344.00	Sharon Springs		0.00	
7,590.30	7,373.00	Niobrara A		0.00	
8,019.10	7,545.00	Niobrara B		0.00	
8,064.62	7,546.00	Nio B TL - Heel		0.00	
12,219.64	7,477.00	Nio B TL - Toe		0.00	

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Howard 30N-21HZ_BHL	7,477.00	4,433.43	-1,487.58	Point
Howard 30N-21HZ_Sec	0.00	0.00	0.00	Polygon
Howard 30N-21HZ_SHL	0.00	0.00	0.00	Point
Howard 30N-21HZ_CP	7,546.00	279.00	-1,472.00	Point

North Reference Sheet for Sec. 21-T1N-R67W - Howard 30N-21HZ - Plan C 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 30N-21HZ
 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 12,219.65ft
 the Bottom Hole Displacement is 4,676.34ft in the Direction of 341.45° (True).

Magnetic Convergence at surface is: -8.31° (16 May 2013, , BGGM2012)

