

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 6-T1N-R65W

THOMASON 12C-31HZ

Plan B

Plan: Plan B0 Permit

Sperry Drilling Services

Proposal Report

26 September, 2013

Well Coordinates: 1,270,781.08 N, 3,220,752.00 E (40° 04' 26.36" N, 104° 42' 40.20" W)

Ground Level: 5,001.00 usft

Local Coordinate Origin:	Centered on Well THOMASON 12C-31HZ
Viewing Datum:	RKB =17' @ 5018.00usft (Drilling Rig)
TVDs to System:	N
North Reference:	True
Unit System:	Custom API-US-Survy Feet

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

HALLIBURTON

Project: Weld County, CO (NAD 83)
 Site: Sec. 6-T1N-R65W
 Well: THOMASON 12C-31HZ
 Wellbore: Plan B
 Design: Plan B0 Permit

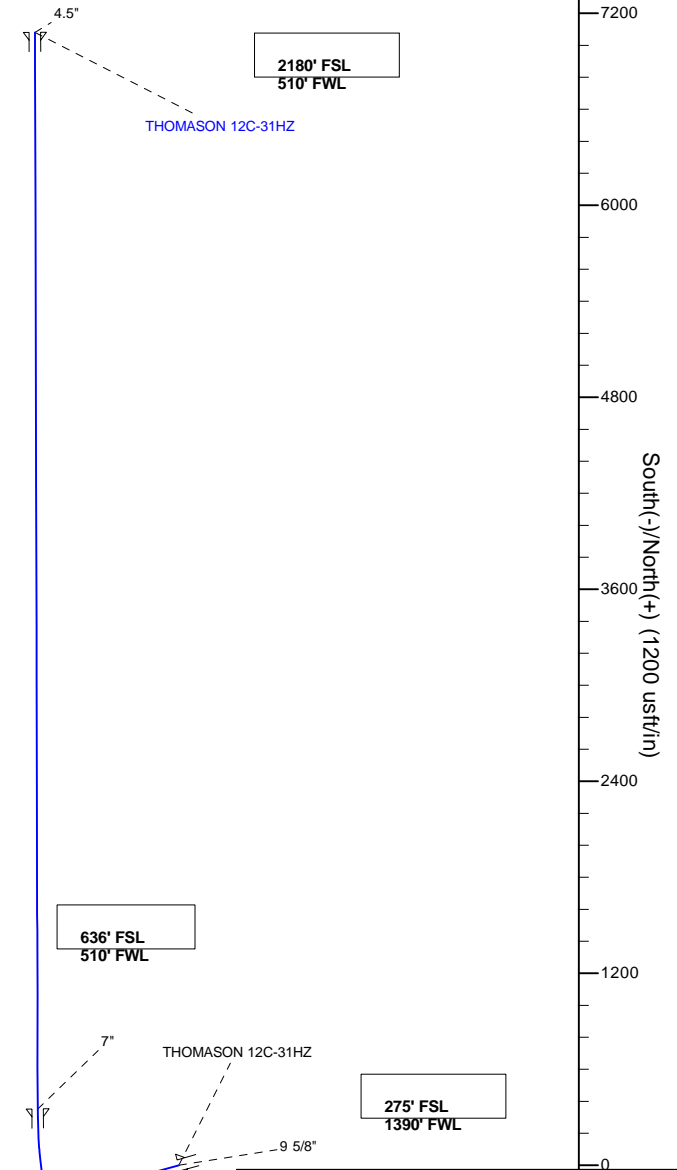
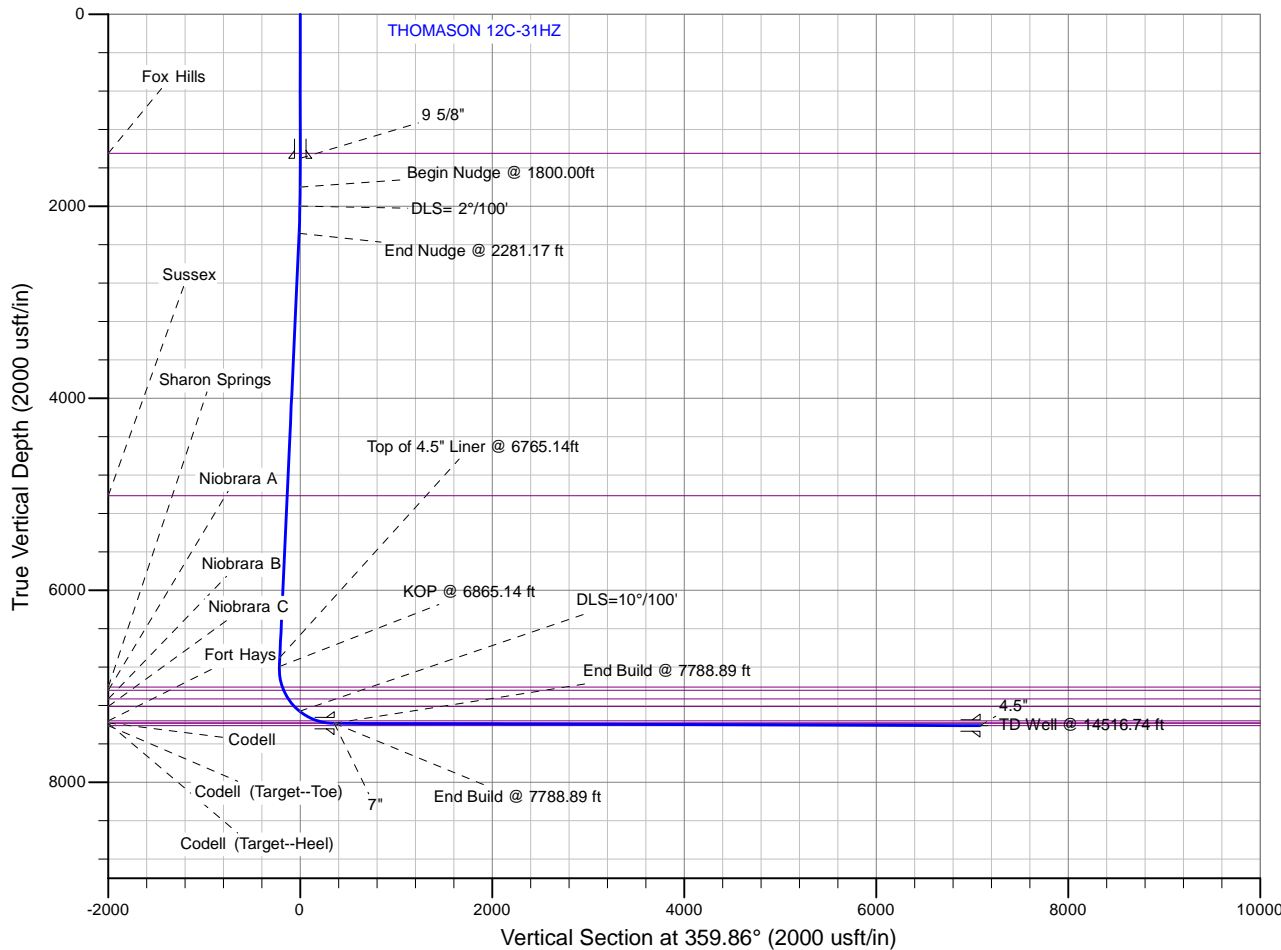


SECTION DETAILS

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	1800.00	0.00	0.00	1800.00	0.00	0.00	0.00	0.00	0.00	
3	2285.22	9.70	254.44	2282.90	-10.99	-39.49	2.00	254.44	-10.90	
4	6865.14	9.70	254.44	6797.29	-218.03	-783.22	0.00	0.00	-216.12	
5	7788.89	89.80	359.86	7388.00	352.18	-881.67	10.00	105.24	354.32	Thomason 12C-31HZ_Heel
6	14516.74	89.80	359.86	7411.00	7079.96	-898.16	0.00	0.00	7082.13	Thomason 12C-31HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Thomason 12C-31HZ_Section Lines	-4.00	-5.95	-464.53	40.073984	-104.712826	Polygon
Thomason 12C-31HZ_SHL	0.00	0.01	0.00	40.073989	-104.711166	Point
Thomason 12C-31HZ_Heel	7388.00	352.18	-881.67	40.074977	-104.714305	Point
Thomason 12C-31HZ_BHL	7411.00	7079.96	-898.16	40.093445	-104.714151	Point



WELL DETAILS: THOMASON 12C-31HZ	
Ground Level:	5001.00
RKB =17' @ 5018.00usft (Drilling Rig)	
Plan: Plan B0 Permit (THOMASON 12C-31HZ/Plan B)	
Created By: Pari Amanlou	Date: 09/26/2013

Plan Report for THOMASON 12C-31HZ - Plan B0 Permit

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
Thomason 12C-31HZ_Section Lines - Thomason 12C-31HZ_SHL										
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
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,449.00	0.00	0.00	1,449.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills										
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"										
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 1800.00ft										
1,900.00	2.00	254.95	1,899.98	-0.45	-1.69	-0.46	2.00	2.00	0.00	254.95
2,000.00	4.00	254.95	1,999.84	-1.81	-6.74	-1.86	2.00	2.00	0.00	0.00
DLS= 2°/100'										
2,100.00	6.00	254.95	2,099.45	-4.07	-15.16	-4.17	2.00	2.00	0.00	0.00
2,200.00	8.00	254.95	2,198.70	-7.24	-26.92	-7.41	2.00	2.00	0.00	0.00
2,285.22	9.70	254.95	2,282.90	-10.64	-39.59	-10.90	2.00	2.00	0.00	0.00
End Nudge @ 2281.17 ft										
2,300.00	9.70	254.95	2,297.47	-11.29	-41.99	-11.56	0.00	0.00	0.00	0.00
2,400.00	9.70	254.95	2,396.04	-15.66	-58.27	-16.04	0.00	0.00	0.00	0.00
2,500.00	9.70	254.95	2,494.61	-20.04	-74.55	-20.52	0.00	0.00	0.00	0.00
2,600.00	9.70	254.95	2,593.18	-24.42	-90.83	-25.00	0.00	0.00	0.00	0.00
2,700.00	9.70	254.95	2,691.75	-28.79	-107.11	-29.48	0.00	0.00	0.00	0.00
2,800.00	9.70	254.95	2,790.32	-33.17	-123.39	-33.96	0.00	0.00	0.00	0.00
2,900.00	9.70	254.95	2,888.89	-37.54	-139.67	-38.45	0.00	0.00	0.00	0.00
3,000.00	9.70	254.95	2,987.46	-41.92	-155.94	-42.93	0.00	0.00	0.00	0.00
3,100.00	9.70	254.95	3,086.02	-46.30	-172.22	-47.41	0.00	0.00	0.00	0.00
3,200.00	9.70	254.95	3,184.59	-50.67	-188.50	-51.89	0.00	0.00	0.00	0.00
3,300.00	9.70	254.95	3,283.16	-55.05	-204.78	-56.37	0.00	0.00	0.00	0.00
3,400.00	9.70	254.95	3,381.73	-59.42	-221.06	-60.85	0.00	0.00	0.00	0.00
3,500.00	9.70	254.95	3,480.30	-63.80	-237.34	-65.33	0.00	0.00	0.00	0.00
3,600.00	9.70	254.95	3,578.87	-68.18	-253.61	-69.81	0.00	0.00	0.00	0.00
3,700.00	9.70	254.95	3,677.44	-72.55	-269.89	-74.29	0.00	0.00	0.00	0.00
3,800.00	9.70	254.95	3,776.01	-76.93	-286.17	-78.78	0.00	0.00	0.00	0.00
3,900.00	9.70	254.95	3,874.58	-81.30	-302.45	-83.26	0.00	0.00	0.00	0.00
4,000.00	9.70	254.95	3,973.15	-85.68	-318.73	-87.74	0.00	0.00	0.00	0.00
4,100.00	9.70	254.95	4,071.72	-90.06	-335.01	-92.22	0.00	0.00	0.00	0.00
4,200.00	9.70	254.95	4,170.28	-94.43	-351.29	-96.70	0.00	0.00	0.00	0.00
4,300.00	9.70	254.95	4,268.85	-98.81	-367.56	-101.18	0.00	0.00	0.00	0.00
4,400.00	9.70	254.95	4,367.42	-103.18	-383.84	-105.66	0.00	0.00	0.00	0.00
4,500.00	9.70	254.95	4,465.99	-107.56	-400.12	-110.14	0.00	0.00	0.00	0.00
4,600.00	9.70	254.95	4,564.56	-111.94	-416.40	-114.62	0.00	0.00	0.00	0.00
4,700.00	9.70	254.95	4,663.13	-116.31	-432.68	-119.10	0.00	0.00	0.00	0.00
4,800.00	9.70	254.95	4,761.70	-120.69	-448.96	-123.59	0.00	0.00	0.00	0.00
4,900.00	9.70	254.95	4,860.27	-125.06	-465.24	-128.07	0.00	0.00	0.00	0.00

Plan Report for THOMASON 12C-31HZ - Plan B0 Permit

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 (°)
5,000.00	9.70	254.95	4,958.84	-129.44	-481.51	-132.55	0.00	0.00	0.00	0.00
5,057.99	9.70	254.95	5,016.00	-131.98	-490.95	-135.15	0.00	0.00	0.00	0.00
Sussex										
5,100.00	9.70	254.95	5,057.41	-133.82	-497.79	-137.03	0.00	0.00	0.00	0.00
5,200.00	9.70	254.95	5,155.97	-138.19	-514.07	-141.51	0.00	0.00	0.00	0.00
5,300.00	9.70	254.95	5,254.54	-142.57	-530.35	-145.99	0.00	0.00	0.00	0.00
5,400.00	9.70	254.95	5,353.11	-146.94	-546.63	-150.47	0.00	0.00	0.00	0.00
5,500.00	9.70	254.95	5,451.68	-151.32	-562.91	-154.95	0.00	0.00	0.00	0.00
5,600.00	9.70	254.95	5,550.25	-155.70	-579.18	-159.43	0.00	0.00	0.00	0.00
5,700.00	9.70	254.95	5,648.82	-160.07	-595.46	-163.91	0.00	0.00	0.00	0.00
5,800.00	9.70	254.95	5,747.39	-164.45	-611.74	-168.40	0.00	0.00	0.00	0.00
5,900.00	9.70	254.95	5,845.96	-168.82	-628.02	-172.88	0.00	0.00	0.00	0.00
6,000.00	9.70	254.95	5,944.53	-173.20	-644.30	-177.36	0.00	0.00	0.00	0.00
6,100.00	9.70	254.95	6,043.10	-177.58	-660.58	-181.84	0.00	0.00	0.00	0.00
6,200.00	9.70	254.95	6,141.67	-181.95	-676.86	-186.32	0.00	0.00	0.00	0.00
6,300.00	9.70	254.95	6,240.23	-186.33	-693.13	-190.80	0.00	0.00	0.00	0.00
6,400.00	9.70	254.95	6,338.80	-190.70	-709.41	-195.28	0.00	0.00	0.00	0.00
6,500.00	9.70	254.95	6,437.37	-195.08	-725.69	-199.76	0.00	0.00	0.00	0.00
6,600.00	9.70	254.95	6,535.94	-199.46	-741.97	-204.24	0.00	0.00	0.00	0.00
6,700.00	9.70	254.95	6,634.51	-203.83	-758.25	-208.72	0.00	0.00	0.00	0.00
6,765.14	9.70	254.95	6,698.72	-206.68	-768.85	-211.64	0.00	0.00	0.00	0.00
Top of 4.5" Liner @ 6765.14ft										
6,800.00	9.70	254.95	6,733.08	-208.21	-774.53	-213.21	0.00	0.00	0.00	0.00
6,865.14	9.70	254.95	6,797.29	-211.06	-785.13	-216.12	0.00	0.00	0.00	0.00
KOP @ 6865.14 ft										
6,900.00	9.40	275.99	6,831.67	-211.52	-790.80	-216.63	10.00	-0.86	60.35	105.24
7,000.00	14.34	320.25	6,929.69	-201.12	-806.89	-206.33	10.00	4.94	44.26	84.48
7,082.24	21.23	335.29	7,008.00	-179.73	-819.64	-185.02	10.00	8.37	18.29	41.05
Sharon Springs										
7,100.00	22.83	337.35	7,024.46	-173.63	-822.32	-178.94	10.00	9.01	11.58	26.69
7,119.15	24.58	339.28	7,042.00	-166.48	-825.16	-171.80	10.00	9.14	10.08	24.79
Niobrara A										
7,200.00	32.16	345.21	7,113.10	-129.89	-836.62	-135.29	10.00	9.38	7.33	23.02
7,222.60	34.32	346.43	7,132.00	-117.88	-839.65	-123.30	10.00	9.55	5.42	17.79
Niobrara B										
7,300.00	41.78	349.77	7,192.91	-71.22	-849.36	-76.70	10.00	9.64	4.32	16.77
7,323.34	44.05	350.59	7,210.00	-55.56	-852.07	-61.06	10.00	9.71	3.51	14.13
Niobrara C										
7,400.00	51.53	352.88	7,261.47	0.60	-860.16	-4.96	10.00	9.75	2.98	13.53
DLS=10°/100'										
7,500.00	61.34	355.23	7,316.70	83.37	-868.69	77.76	10.00	9.81	2.36	11.99
7,600.00	71.18	357.18	7,356.92	174.59	-874.68	168.94	10.00	9.84	1.95	10.68
7,609.78	72.14	357.36	7,360.00	183.87	-875.12	178.21	10.00	9.85	1.81	9.89
Fort Hays										
7,700.00	81.03	358.91	7,380.91	271.49	-877.95	265.81	10.00	9.86	1.72	9.84
7,707.30	81.75	359.03	7,382.00	278.71	-878.08	273.03	10.00	9.86	1.66	9.48
Codell										
7,788.89	89.80	0.37	7,388.00	360.00	-878.50	354.32	10.00	9.87	1.64	9.46
End Build @ 7788.89 ft - Codell (Target--Heel) - 7" - Thomason 12C-31HZ_Heel										
7,800.00	89.80	0.37	7,388.04	371.11	-878.43	365.43	0.00	0.00	0.00	9.36
7,900.00	89.80	0.37	7,388.38	471.11	-877.78	465.43	0.00	0.00	0.00	0.00
8,000.00	89.80	0.37	7,388.72	571.11	-877.14	565.43	0.00	0.00	0.00	0.00
8,100.00	89.80	0.37	7,389.06	671.10	-876.50	665.43	0.00	0.00	0.00	0.00
8,200.00	89.80	0.37	7,389.41	771.10	-875.85	765.43	0.00	0.00	0.00	0.00
8,300.00	89.80	0.37	7,389.75	871.10	-875.21	865.43	0.00	0.00	0.00	0.00
8,400.00	89.80	0.37	7,390.09	971.10	-874.56	965.43	0.00	0.00	0.00	0.00
8,500.00	89.80	0.37	7,390.43	1,071.09	-873.92	1,065.43	0.00	0.00	0.00	0.00
8,600.00	89.80	0.37	7,390.77	1,171.09	-873.27	1,165.43	0.00	0.00	0.00	0.00

Plan Report for THOMASON 12C-31HZ - Plan B0 Permit

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 (°)
8,700.00	89.80	0.37	7,391.11	1,271.09	-872.63	1,265.43	0.00	0.00	0.00	0.00
8,800.00	89.80	0.37	7,391.46	1,371.08	-871.98	1,365.43	0.00	0.00	0.00	0.00
8,900.00	89.80	0.37	7,391.80	1,471.08	-871.34	1,465.42	0.00	0.00	0.00	0.00
9,000.00	89.80	0.37	7,392.14	1,571.08	-870.70	1,565.42	0.00	0.00	0.00	0.00
9,100.00	89.80	0.37	7,392.48	1,671.08	-870.05	1,665.42	0.00	0.00	0.00	0.00
9,200.00	89.80	0.37	7,392.82	1,771.07	-869.41	1,765.42	0.00	0.00	0.00	0.00
9,300.00	89.80	0.37	7,393.17	1,871.07	-868.76	1,865.42	0.00	0.00	0.00	0.00
9,400.00	89.80	0.37	7,393.51	1,971.07	-868.12	1,965.42	0.00	0.00	0.00	0.00
9,500.00	89.80	0.37	7,393.85	2,071.07	-867.47	2,065.42	0.00	0.00	0.00	0.00
9,600.00	89.80	0.37	7,394.19	2,171.06	-866.83	2,165.42	0.00	0.00	0.00	0.00
9,700.00	89.80	0.37	7,394.53	2,271.06	-866.18	2,265.42	0.00	0.00	0.00	0.00
9,800.00	89.80	0.37	7,394.88	2,371.06	-865.54	2,365.42	0.00	0.00	0.00	0.00
9,900.00	89.80	0.37	7,395.22	2,471.06	-864.90	2,465.42	0.00	0.00	0.00	0.00
10,000.00	89.80	0.37	7,395.56	2,571.05	-864.25	2,565.42	0.00	0.00	0.00	0.00
10,100.00	89.80	0.37	7,395.90	2,671.05	-863.61	2,665.42	0.00	0.00	0.00	0.00
10,200.00	89.80	0.37	7,396.24	2,771.05	-862.96	2,765.42	0.00	0.00	0.00	0.00
10,300.00	89.80	0.37	7,396.58	2,871.05	-862.32	2,865.42	0.00	0.00	0.00	0.00
10,400.00	89.80	0.37	7,396.93	2,971.04	-861.67	2,965.42	0.00	0.00	0.00	0.00
10,500.00	89.80	0.37	7,397.27	3,071.04	-861.03	3,065.42	0.00	0.00	0.00	0.00
10,600.00	89.80	0.37	7,397.61	3,171.04	-860.38	3,165.41	0.00	0.00	0.00	0.00
10,700.00	89.80	0.37	7,397.95	3,271.03	-859.74	3,265.41	0.00	0.00	0.00	0.00
10,800.00	89.80	0.37	7,398.29	3,371.03	-859.10	3,365.41	0.00	0.00	0.00	0.00
10,900.00	89.80	0.37	7,398.64	3,471.03	-858.45	3,465.41	0.00	0.00	0.00	0.00
11,000.00	89.80	0.37	7,398.98	3,571.03	-857.81	3,565.41	0.00	0.00	0.00	0.00
11,100.00	89.80	0.37	7,399.32	3,671.02	-857.16	3,665.41	0.00	0.00	0.00	0.00
11,200.00	89.80	0.37	7,399.66	3,771.02	-856.52	3,765.41	0.00	0.00	0.00	0.00
11,300.00	89.80	0.37	7,400.00	3,871.02	-855.87	3,865.41	0.00	0.00	0.00	0.00
11,400.00	89.80	0.37	7,400.35	3,971.02	-855.23	3,965.41	0.00	0.00	0.00	0.00
11,500.00	89.80	0.37	7,400.69	4,071.01	-854.59	4,065.41	0.00	0.00	0.00	0.00
11,600.00	89.80	0.37	7,401.03	4,171.01	-853.94	4,165.41	0.00	0.00	0.00	0.00
11,700.00	89.80	0.37	7,401.37	4,271.01	-853.30	4,265.41	0.00	0.00	0.00	0.00
11,800.00	89.80	0.37	7,401.71	4,371.01	-852.65	4,365.41	0.00	0.00	0.00	0.00
11,900.00	89.80	0.37	7,402.05	4,471.00	-852.01	4,465.41	0.00	0.00	0.00	0.00
12,000.00	89.80	0.37	7,402.40	4,571.00	-851.36	4,565.41	0.00	0.00	0.00	0.00
12,100.00	89.80	0.37	7,402.74	4,671.00	-850.72	4,665.41	0.00	0.00	0.00	0.00
12,200.00	89.80	0.37	7,403.08	4,770.99	-850.07	4,765.41	0.00	0.00	0.00	0.00
12,300.00	89.80	0.37	7,403.42	4,870.99	-849.43	4,865.40	0.00	0.00	0.00	0.00
12,400.00	89.80	0.37	7,403.76	4,970.99	-848.79	4,965.40	0.00	0.00	0.00	0.00
12,500.00	89.80	0.37	7,404.11	5,070.99	-848.14	5,065.40	0.00	0.00	0.00	0.00
12,600.00	89.80	0.37	7,404.45	5,170.98	-847.50	5,165.40	0.00	0.00	0.00	0.00
12,700.00	89.80	0.37	7,404.79	5,270.98	-846.85	5,265.40	0.00	0.00	0.00	0.00
12,800.00	89.80	0.37	7,405.13	5,370.98	-846.21	5,365.40	0.00	0.00	0.00	0.00
12,900.00	89.80	0.37	7,405.47	5,470.98	-845.56	5,465.40	0.00	0.00	0.00	0.00
13,000.00	89.80	0.37	7,405.81	5,570.97	-844.92	5,565.40	0.00	0.00	0.00	0.00
13,100.00	89.80	0.37	7,406.16	5,670.97	-844.27	5,665.40	0.00	0.00	0.00	0.00
13,200.00	89.80	0.37	7,406.50	5,770.97	-843.63	5,765.40	0.00	0.00	0.00	0.00
13,300.00	89.80	0.37	7,406.84	5,870.97	-842.99	5,865.40	0.00	0.00	0.00	0.00
13,400.00	89.80	0.37	7,407.18	5,970.96	-842.34	5,965.40	0.00	0.00	0.00	0.00
13,500.00	89.80	0.37	7,407.52	6,070.96	-841.70	6,065.40	0.00	0.00	0.00	0.00
13,600.00	89.80	0.37	7,407.87	6,170.96	-841.05	6,165.40	0.00	0.00	0.00	0.00
13,700.00	89.80	0.37	7,408.21	6,270.95	-840.41	6,265.40	0.00	0.00	0.00	0.00
13,800.00	89.80	0.37	7,408.55	6,370.95	-839.76	6,365.40	0.00	0.00	0.00	0.00
13,900.00	89.80	0.37	7,408.89	6,470.95	-839.12	6,465.40	0.00	0.00	0.00	0.00
14,000.00	89.80	0.37	7,409.23	6,570.95	-838.47	6,565.39	0.00	0.00	0.00	0.00
14,100.00	89.80	0.37	7,409.58	6,670.94	-837.83	6,665.39	0.00	0.00	0.00	0.00
14,200.00	89.80	0.37	7,409.92	6,770.94	-837.19	6,765.39	0.00	0.00	0.00	0.00
14,300.00	89.80	0.37	7,410.26	6,870.94	-836.54	6,865.39	0.00	0.00	0.00	0.00
14,400.00	89.80	0.37	7,410.60	6,970.94	-835.90	6,965.39	0.00	0.00	0.00	0.00
14,500.00	89.80	0.37	7,410.94	7,070.93	-835.25	7,065.39	0.00	0.00	0.00	0.00
14,516.74	89.80	0.37	7,411.00	7,087.67	-835.14	7,082.13	0.00	0.00	0.00	0.00

Plan Report for THOMASON 12C-31HZ - Plan B0 Permit

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 (°)
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TD Well @ 14516.74 ft - Thomason 12C-31HZ_BHL

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,800.00	1,800.00	0.00	0.00	Begin Nudge @ 1800.00ft
2,000.00	1,999.84	-1.81	-6.74	DLS= 2°/100'
2,285.22	2,282.90	-10.64	-39.59	End Nudge @ 2281.17 ft
6,765.14	6,698.72	-206.68	-768.85	Top of 4.5" Liner @ 6765.14ft
6,865.14	6,797.29	-211.06	-785.13	KOP @ 6865.14 ft
7,400.00	7,261.47	0.60	-860.16	DLS=10°/100'
7,788.89	7,388.00	360.00	-878.50	End Build @ 7788.89 ft
14,516.74	7,411.00	7,087.67	-835.14	TD Well @ 14516.74 ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	0.37	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	1,500.00	Plan B0 Permit	MWD
1,500.00	7,788.89	Plan B0 Permit	MWD
7,788.89	14,516.74	Plan B0 Permit	MWD

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,500.00	1,500.00	9 5/8"	9-5/8	13-1/2
7,788.89	7,388.00	7"	7	8-3/4
14,516.74	7,411.00	4.5"	4-1/2	6-1/8

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,449.00	1,449.00	Fox Hills		0.00	
5,057.99	5,016.00	Sussex		0.00	
7,082.24	7,008.00	Sharon Springs		0.00	
7,119.15	7,042.00	Niobrara A		0.00	
7,222.60	7,132.00	Niobrara B		0.00	
7,323.34	7,210.00	Niobrara C		0.00	
7,609.78	7,360.00	Fort Hays		0.00	
7,707.30	7,382.00	Codell		0.00	
7,788.89	7,388.00	Codell (Target--Heel)		0.00	

Plan Report for THOMASON 12C-31HZ - Plan B0 Permit

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
Thomason 12C-31HZ_Heel	7,388.00	360.00	-878.50	Point
Thomason 12C-31HZ_Section Lines	-4.00	-1.82	-464.57	Polygon
Thomason 12C-31HZ_SHL	0.00	0.01	0.00	Point
Thomason 12C-31HZ_BHL	7,411.00	7,087.67	-835.14	Point

North Reference Sheet for Sec. 6-T1N-R65W - THOMASON 12C-31HZ - 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' @ 5018.00usft (Drilling Rig). Northing and Easting are relative to THOMASON 12C-31HZ
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: 0.99996158

Grid Coordinates of Well: 1,270,781.08 usft N, 3,220,752.00 usft E
Geographical Coordinates of Well: 40° 04' 26.36" N, 104° 42' 40.20" W
Grid Convergence at Surface is: 0.51°

Based upon Minimum Curvature type calculations, at a Measured Depth of 14,516.74usft
the Bottom Hole Displacement is 7,136.71usft in the Direction of 353.28° (True).

Magnetic Convergence at surface is: -8.03° (4 September 2013, , BGGM2013)

