

# Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 6-T1N-R65W

THOMASON 11N-31HZ

Plan A

Plan: Plan A0 Permit

## Sperry Drilling Services

# Proposal Report

04 September, 2013

Well Coordinates: 1,270,782.24 N, 3,220,842.11 E (40° 04' 26.36" N, 104° 42' 39.04" W)

Ground Level: 5,001.00 ft

Local Coordinate Origin: Centered on Well THOMASON 11N-31HZ

Viewing Datum: RKB = 17' @ 5018.00ft (Drilling Rig)

TVDs to System: N

North Reference: True

Unit System: API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 431

**HALLIBURTON**

Project: Weld County, CO (NAD 83)  
 Site: Sec. 6-T1N-R65W  
 Well: THOMASON 11N-31HZ  
 Wellbore: Plan A  
 Design: Plan A0 Permit

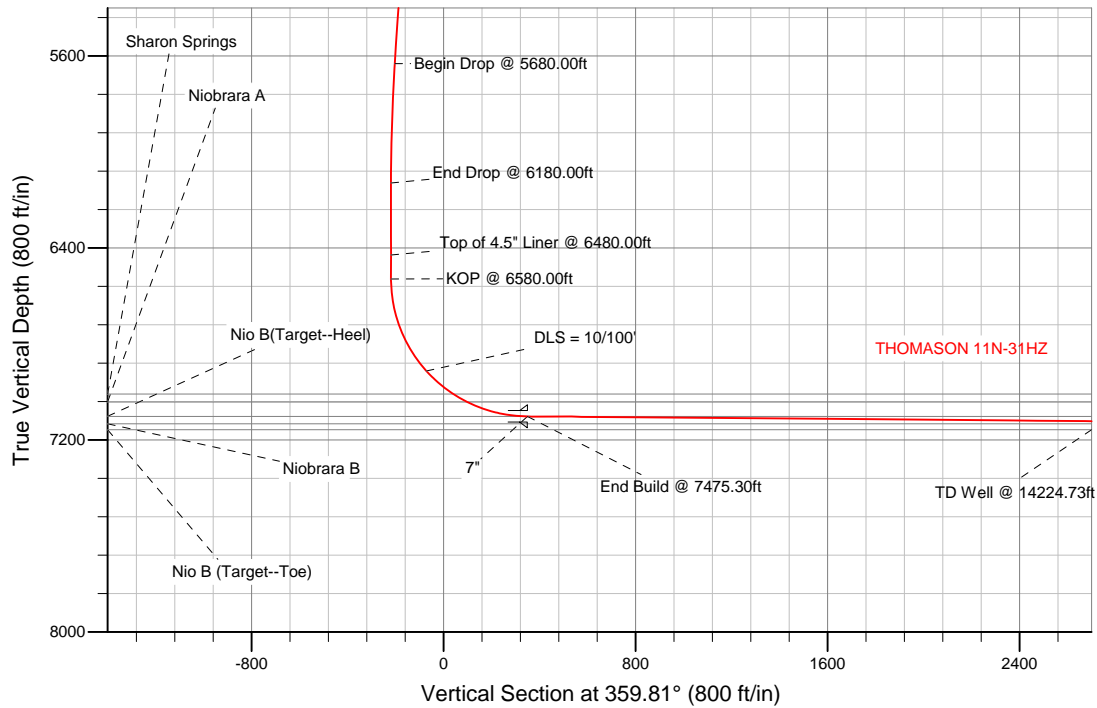


SECTION DETAILS

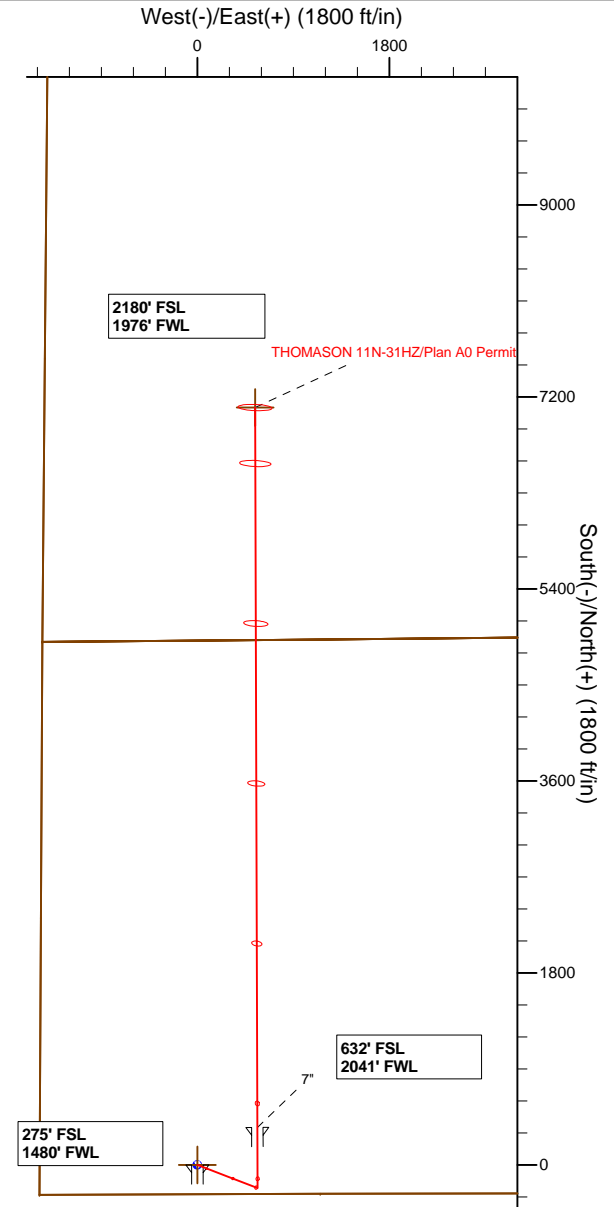
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	2200.00	0.00	0.00	2200.00	0.00	0.00	0.00	0.00	0.00	
3	2700.00	10.00	111.00	2697.47	-15.60	40.63	2.00	111.00	-15.73	
4	5680.00	10.00	111.00	5632.19	-201.04	523.73	0.00	0.00	-202.78	
5	6180.00	0.00	0.00	6129.66	-216.64	564.36	2.00	180.00	-218.51	
6	6580.00	0.00	0.00	6529.66	-216.64	564.36	0.00	0.00	-218.51	
7	7475.30	89.53	359.81	7102.60	351.61	562.51	10.00	359.81	349.74	
8	14224.73	89.53	359.81	7158.00	7100.78	540.54	0.00	0.00	7098.95	Thomason 11N-31HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

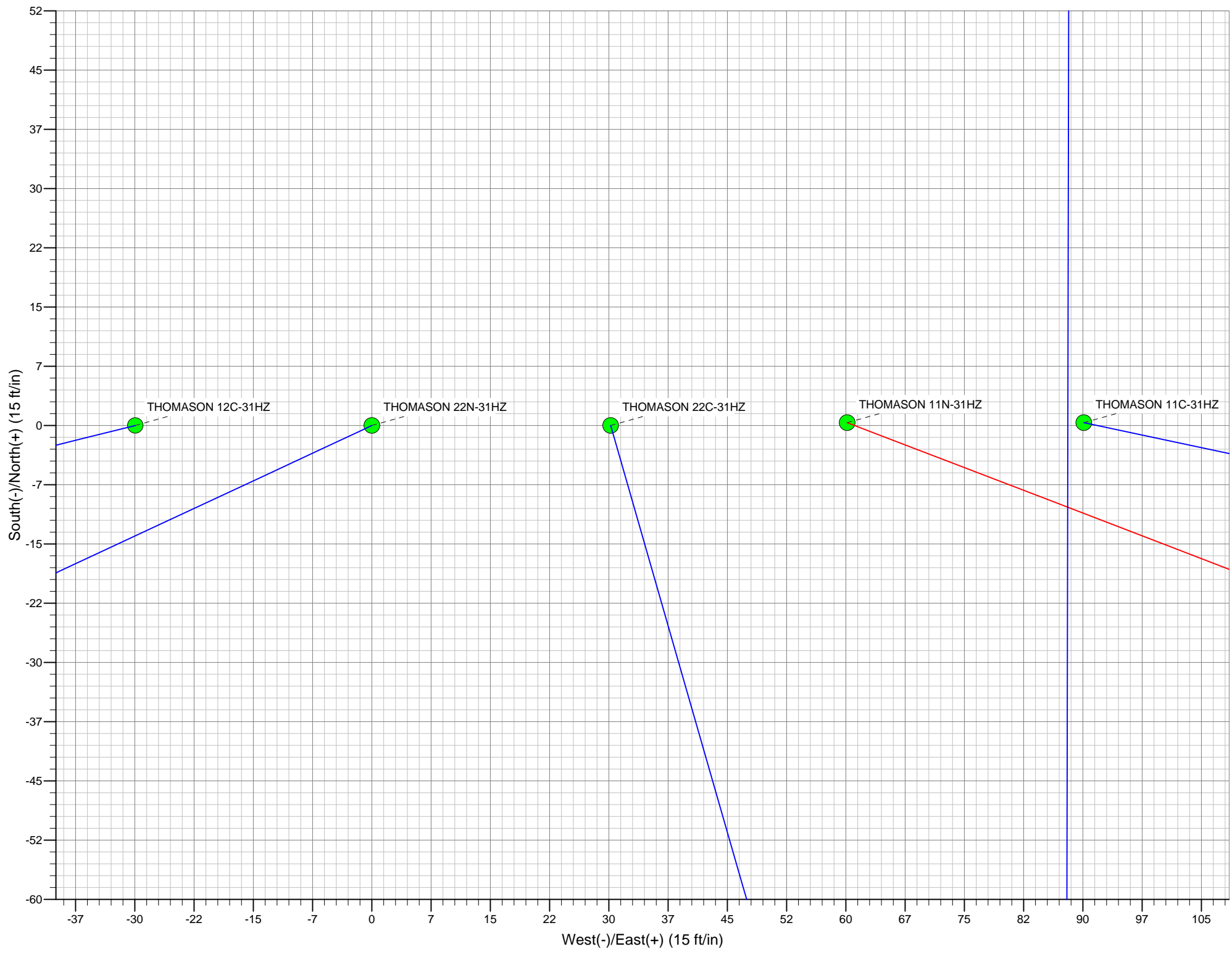
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Thomason 11N-31HZ_SHL	0.00	0.00	0.00	40.073990	-104.710844	Point
Thomason_Section	0.00	154.70	3474.72	40.074414	-104.698428	Polygon
Thomason 11N-31HZ_BHL	7158.00	7100.78	540.54	40.093482	-104.708912	Point



TVD	MD	Description
6429.66	6480.00	Top of 4.5" Liner @ 6480.00ft
6529.66	6580.00	KOP @ 6580.00ft



WELL DETAILS: THOMASON 11N-31HZ	
Ground Level: 5001.00 RKB = 17' @ 5018.00ft (Drilling Rig)	
Plan: Plan A0 Permit (THOMASON 11N-31HZ/Plan A)	
Created By: Clint Eshelman	Date: 09/03/2013



**Plan Report for THOMASON 11N-31HZ - Plan A0 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)	Tooface Azimuth (°)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Thomason 11N-31HZ_SHL - Thomason_Section</b>										
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
1,450.00	0.00	0.00	1,450.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Fox Hills</b>										
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>9 5/8"</b>										
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
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Begin Nudge @ 2200.00ft</b>										
2,300.00	2.00	111.00	2,299.98	-0.63	1.63	-0.63	2.00	2.00	0.00	111.00
2,400.00	4.00	111.00	2,399.84	-2.50	6.51	-2.52	2.00	2.00	0.00	0.00
2,500.00	6.00	111.00	2,499.45	-5.62	14.65	-5.67	2.00	2.00	0.00	0.00
2,600.00	8.00	111.00	2,598.70	-9.99	26.03	-10.08	2.00	2.00	0.00	0.00
2,700.00	10.00	111.00	2,697.47	-15.60	40.63	-15.73	2.00	2.00	0.00	0.00
<b>End Nudge @ 2700.00ft</b>										
2,800.00	10.00	111.00	2,795.95	-21.82	56.84	-22.01	0.00	0.00	0.00	0.00
2,900.00	10.00	111.00	2,894.43	-28.04	73.05	-28.29	0.00	0.00	0.00	0.00
3,000.00	10.00	111.00	2,992.91	-34.27	89.27	-34.56	0.00	0.00	0.00	0.00
3,100.00	10.00	111.00	3,091.39	-40.49	105.48	-40.84	0.00	0.00	0.00	0.00
3,200.00	10.00	111.00	3,189.87	-46.71	121.69	-47.12	0.00	0.00	0.00	0.00
3,300.00	10.00	111.00	3,288.35	-52.94	137.90	-53.39	0.00	0.00	0.00	0.00
3,400.00	10.00	111.00	3,386.83	-59.16	154.11	-59.67	0.00	0.00	0.00	0.00
3,500.00	10.00	111.00	3,485.31	-65.38	170.32	-65.95	0.00	0.00	0.00	0.00
3,600.00	10.00	111.00	3,583.79	-71.60	186.53	-72.22	0.00	0.00	0.00	0.00
3,700.00	10.00	111.00	3,682.27	-77.83	202.75	-78.50	0.00	0.00	0.00	0.00
3,800.00	10.00	111.00	3,780.75	-84.05	218.96	-84.78	0.00	0.00	0.00	0.00
3,900.00	10.00	111.00	3,879.23	-90.27	235.17	-91.05	0.00	0.00	0.00	0.00
4,000.00	10.00	111.00	3,977.72	-96.50	251.38	-97.33	0.00	0.00	0.00	0.00
4,100.00	10.00	111.00	4,076.20	-102.72	267.59	-103.61	0.00	0.00	0.00	0.00
4,200.00	10.00	111.00	4,174.68	-108.94	283.80	-109.88	0.00	0.00	0.00	0.00
4,300.00	10.00	111.00	4,273.16	-115.17	300.02	-116.16	0.00	0.00	0.00	0.00
4,400.00	10.00	111.00	4,371.64	-121.39	316.23	-122.44	0.00	0.00	0.00	0.00
4,500.00	10.00	111.00	4,470.12	-127.61	332.44	-128.71	0.00	0.00	0.00	0.00
4,600.00	10.00	111.00	4,568.60	-133.83	348.65	-134.99	0.00	0.00	0.00	0.00
4,700.00	10.00	111.00	4,667.08	-140.06	364.86	-141.27	0.00	0.00	0.00	0.00
4,800.00	10.00	111.00	4,765.56	-146.28	381.07	-147.54	0.00	0.00	0.00	0.00
4,900.00	10.00	111.00	4,864.04	-152.50	397.28	-153.82	0.00	0.00	0.00	0.00
5,000.00	10.00	111.00	4,962.52	-158.73	413.50	-160.10	0.00	0.00	0.00	0.00
5,055.32	10.00	111.00	5,017.00	-162.17	422.46	-163.57	0.00	0.00	0.00	0.00

**Plan Report for THOMASON 11N-31HZ - Plan A0 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>Sussex</b>										
5,100.00	10.00	111.00	5,061.00	-164.95	429.71	-166.37	0.00	0.00	0.00	0.00
5,200.00	10.00	111.00	5,159.48	-171.17	445.92	-172.65	0.00	0.00	0.00	0.00
5,300.00	10.00	111.00	5,257.97	-177.39	462.13	-178.93	0.00	0.00	0.00	0.00
5,400.00	10.00	111.00	5,356.45	-183.62	478.34	-185.20	0.00	0.00	0.00	0.00
5,500.00	10.00	111.00	5,454.93	-189.84	494.55	-191.48	0.00	0.00	0.00	0.00
5,600.00	10.00	111.00	5,553.41	-196.06	510.76	-197.76	0.00	0.00	0.00	0.00
5,680.00	10.00	111.00	5,632.19	-201.04	523.73	-202.78	0.00	0.00	0.00	0.00
<b>Begin Drop @ 5680.00ft</b>										
5,700.00	9.60	111.00	5,651.90	-202.26	526.91	-204.01	2.00	-2.00	0.00	180.00
5,800.00	7.60	111.00	5,750.77	-207.62	540.87	-209.41	2.00	-2.00	0.00	180.00
5,900.00	5.60	111.00	5,850.10	-211.74	551.60	-213.57	2.00	-2.00	0.00	180.00
6,000.00	3.60	111.00	5,949.78	-214.61	559.09	-216.47	2.00	-2.00	0.00	180.00
6,100.00	1.60	111.00	6,049.67	-216.24	563.32	-218.11	2.00	-2.00	0.00	180.00
6,180.00	0.00	0.00	6,129.66	-216.64	564.36	-218.51	2.00	-2.00	0.00	-180.00
<b>End Drop @ 6180.00ft</b>										
6,200.00	0.00	0.00	6,149.66	-216.64	564.36	-218.51	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,249.66	-216.64	564.36	-218.51	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,349.66	-216.64	564.36	-218.51	0.00	0.00	0.00	0.00
6,480.00	0.00	0.00	6,429.66	-216.64	564.36	-218.51	0.00	0.00	0.00	0.00
<b>Top of 4.5" Liner @ 6480.00ft</b>										
6,500.00	0.00	0.00	6,449.66	-216.64	564.36	-218.51	0.00	0.00	0.00	0.00
6,580.00	0.00	0.00	6,529.66	-216.64	564.36	-218.51	0.00	0.00	0.00	0.00
<b>KOP @ 6580.00ft</b>										
6,600.00	2.00	359.81	6,549.65	-216.29	564.36	-218.16	10.00	10.00	0.00	359.81
6,700.00	12.00	359.81	6,648.78	-204.12	564.32	-205.99	10.00	10.00	0.00	0.00
6,800.00	22.00	359.81	6,744.29	-174.92	564.23	-176.79	10.00	10.00	0.00	0.00
6,900.00	32.00	359.81	6,833.28	-129.58	564.08	-131.45	10.00	10.00	0.00	0.00
7,000.00	42.00	359.81	6,913.04	-69.47	563.89	-71.34	10.00	10.00	0.00	0.00
<b>DLS = 10/100'</b>										
7,100.00	52.00	359.81	6,981.15	3.57	563.65	1.70	10.00	10.00	0.00	0.00
7,147.84	56.78	359.81	7,009.00	42.45	563.52	40.58	10.00	10.00	0.00	0.00
<b>Sharon Springs</b>										
7,200.00	62.00	359.81	7,035.55	87.33	563.38	85.46	10.00	10.00	0.00	0.00
7,216.31	63.63	359.81	7,043.00	101.84	563.33	99.97	10.00	10.00	0.00	0.00
<b>Niobrara A</b>										
7,300.00	72.00	359.81	7,074.57	179.26	563.08	177.39	10.00	10.00	0.00	0.00
7,400.00	82.00	359.81	7,097.04	276.58	562.76	274.71	10.00	10.00	0.00	0.00
7,475.30	89.53	359.81	7,102.60	351.62	562.51	349.75	10.00	10.00	0.00	0.00
<b>End Build @ 7475.30ft - Nio B(Target--Heel) - 7"</b>										
7,500.00	89.53	359.81	7,102.80	376.31	562.43	374.45	0.00	0.00	0.00	0.00
7,600.00	89.53	359.81	7,103.62	476.31	562.11	474.44	0.00	0.00	0.00	0.00
7,700.00	89.53	359.81	7,104.44	576.31	561.78	574.44	0.00	0.00	0.00	0.00
7,800.00	89.53	359.81	7,105.26	676.30	561.46	674.44	0.00	0.00	0.00	0.00
7,900.00	89.53	359.81	7,106.08	776.30	561.13	774.43	0.00	0.00	0.00	0.00
8,000.00	89.53	359.81	7,106.90	876.29	560.81	874.43	0.00	0.00	0.00	0.00
8,100.00	89.53	359.81	7,107.72	976.29	560.48	974.43	0.00	0.00	0.00	0.00
8,200.00	89.53	359.81	7,108.55	1,076.29	560.15	1,074.42	0.00	0.00	0.00	0.00
8,300.00	89.53	359.81	7,109.37	1,176.28	559.83	1,174.42	0.00	0.00	0.00	0.00
8,400.00	89.53	359.81	7,110.19	1,276.28	559.50	1,274.42	0.00	0.00	0.00	0.00
8,500.00	89.53	359.81	7,111.01	1,376.28	559.18	1,374.41	0.00	0.00	0.00	0.00
8,600.00	89.53	359.81	7,111.83	1,476.27	558.85	1,474.41	0.00	0.00	0.00	0.00
8,700.00	89.53	359.81	7,112.65	1,576.27	558.53	1,574.41	0.00	0.00	0.00	0.00
8,800.00	89.53	359.81	7,113.47	1,676.26	558.20	1,674.40	0.00	0.00	0.00	0.00
8,900.00	89.53	359.81	7,114.29	1,776.26	557.88	1,774.40	0.00	0.00	0.00	0.00
9,000.00	89.53	359.81	7,115.11	1,876.26	557.55	1,874.40	0.00	0.00	0.00	0.00
9,100.00	89.53	359.81	7,115.93	1,976.25	557.22	1,974.39	0.00	0.00	0.00	0.00
9,200.00	89.53	359.81	7,116.75	2,076.25	556.90	2,074.39	0.00	0.00	0.00	0.00

**Plan Report for THOMASON 11N-31HZ - Plan A0 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 (°)
9,300.00	89.53	359.81	7,117.57	2,176.24	556.57	2,174.39	0.00	0.00	0.00	0.00
9,400.00	89.53	359.81	7,118.40	2,276.24	556.25	2,274.38	0.00	0.00	0.00	0.00
9,500.00	89.53	359.81	7,119.22	2,376.24	555.92	2,374.38	0.00	0.00	0.00	0.00
9,600.00	89.53	359.81	7,120.04	2,476.23	555.60	2,474.38	0.00	0.00	0.00	0.00
9,700.00	89.53	359.81	7,120.86	2,576.23	555.27	2,574.37	0.00	0.00	0.00	0.00
9,800.00	89.53	359.81	7,121.68	2,676.22	554.94	2,674.37	0.00	0.00	0.00	0.00
9,900.00	89.53	359.81	7,122.50	2,776.22	554.62	2,774.37	0.00	0.00	0.00	0.00
10,000.00	89.53	359.81	7,123.32	2,876.22	554.29	2,874.36	0.00	0.00	0.00	0.00
10,100.00	89.53	359.81	7,124.14	2,976.21	553.97	2,974.36	0.00	0.00	0.00	0.00
10,200.00	89.53	359.81	7,124.96	3,076.21	553.64	3,074.36	0.00	0.00	0.00	0.00
10,300.00	89.53	359.81	7,125.78	3,176.21	553.32	3,174.35	0.00	0.00	0.00	0.00
10,400.00	89.53	359.81	7,126.60	3,276.20	552.99	3,274.35	0.00	0.00	0.00	0.00
10,500.00	89.53	359.81	7,127.43	3,376.20	552.66	3,374.35	0.00	0.00	0.00	0.00
10,600.00	89.53	359.81	7,128.25	3,476.19	552.34	3,474.34	0.00	0.00	0.00	0.00
10,700.00	89.53	359.81	7,129.07	3,576.19	552.01	3,574.34	0.00	0.00	0.00	0.00
10,800.00	89.53	359.81	7,129.89	3,676.19	551.69	3,674.34	0.00	0.00	0.00	0.00
10,900.00	89.53	359.81	7,130.71	3,776.18	551.36	3,774.33	0.00	0.00	0.00	0.00
11,000.00	89.53	359.81	7,131.53	3,876.18	551.04	3,874.33	0.00	0.00	0.00	0.00
11,100.00	89.53	359.81	7,132.35	3,976.17	550.71	3,974.33	0.00	0.00	0.00	0.00
11,179.16	89.53	359.81	7,133.00	4,055.33	550.45	4,053.48	0.00	0.00	0.00	0.00
<b>Niobrara B</b>										
11,200.00	89.53	359.81	7,133.17	4,076.17	550.39	4,074.32	0.00	0.00	0.00	0.00
11,300.00	89.53	359.81	7,133.99	4,176.17	550.06	4,174.32	0.00	0.00	0.00	0.00
11,400.00	89.53	359.81	7,134.81	4,276.16	549.73	4,274.32	0.00	0.00	0.00	0.00
11,500.00	89.53	359.81	7,135.63	4,376.16	549.41	4,374.31	0.00	0.00	0.00	0.00
11,600.00	89.53	359.81	7,136.45	4,476.15	549.08	4,474.31	0.00	0.00	0.00	0.00
11,700.00	89.53	359.81	7,137.28	4,576.15	548.76	4,574.31	0.00	0.00	0.00	0.00
11,800.00	89.53	359.81	7,138.10	4,676.15	548.43	4,674.30	0.00	0.00	0.00	0.00
11,900.00	89.53	359.81	7,138.92	4,776.14	548.11	4,774.30	0.00	0.00	0.00	0.00
12,000.00	89.53	359.81	7,139.74	4,876.14	547.78	4,874.30	0.00	0.00	0.00	0.00
12,100.00	89.53	359.81	7,140.56	4,976.14	547.45	4,974.29	0.00	0.00	0.00	0.00
12,200.00	89.53	359.81	7,141.38	5,076.13	547.13	5,074.29	0.00	0.00	0.00	0.00
12,300.00	89.53	359.81	7,142.20	5,176.13	546.80	5,174.29	0.00	0.00	0.00	0.00
12,400.00	89.53	359.81	7,143.02	5,276.12	546.48	5,274.28	0.00	0.00	0.00	0.00
12,500.00	89.53	359.81	7,143.84	5,376.12	546.15	5,374.28	0.00	0.00	0.00	0.00
12,600.00	89.53	359.81	7,144.66	5,476.12	545.83	5,474.28	0.00	0.00	0.00	0.00
12,700.00	89.53	359.81	7,145.48	5,576.11	545.50	5,574.27	0.00	0.00	0.00	0.00
12,800.00	89.53	359.81	7,146.30	5,676.11	545.18	5,674.27	0.00	0.00	0.00	0.00
12,900.00	89.53	359.81	7,147.13	5,776.10	544.85	5,774.27	0.00	0.00	0.00	0.00
13,000.00	89.53	359.81	7,147.95	5,876.10	544.52	5,874.26	0.00	0.00	0.00	0.00
13,100.00	89.53	359.81	7,148.77	5,976.10	544.20	5,974.26	0.00	0.00	0.00	0.00
13,200.00	89.53	359.81	7,149.59	6,076.09	543.87	6,074.26	0.00	0.00	0.00	0.00
13,300.00	89.53	359.81	7,150.41	6,176.09	543.55	6,174.25	0.00	0.00	0.00	0.00
13,400.00	89.53	359.81	7,151.23	6,276.08	543.22	6,274.25	0.00	0.00	0.00	0.00
13,500.00	89.53	359.81	7,152.05	6,376.08	542.90	6,374.25	0.00	0.00	0.00	0.00
13,600.00	89.53	359.81	7,152.87	6,476.08	542.57	6,474.24	0.00	0.00	0.00	0.00
13,700.00	89.53	359.81	7,153.69	6,576.07	542.24	6,574.24	0.00	0.00	0.00	0.00
13,800.00	89.53	359.81	7,154.51	6,676.07	541.92	6,674.24	0.00	0.00	0.00	0.00
13,900.00	89.53	359.81	7,155.33	6,776.06	541.59	6,774.23	0.00	0.00	0.00	0.00
14,000.00	89.53	359.81	7,156.16	6,876.06	541.27	6,874.23	0.00	0.00	0.00	0.00
14,100.00	89.53	359.81	7,156.98	6,976.06	540.94	6,974.22	0.00	0.00	0.00	0.00
14,200.00	89.53	359.81	7,157.80	7,076.05	540.62	7,074.22	0.00	0.00	0.00	0.00
14,224.73	89.53	359.81	7,158.00	7,100.78	540.54	7,098.95	0.00	0.00	0.00	0.00

TD Well @ 14224.73ft - Nio B (Target--Toe) - Thomason 11N-31HZ\_BHL

**Plan Report for THOMASON 11N-31HZ - Plan A0 Permit****Plan Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
2,200.00	2,200.00	0.00	0.00	Begin Nudge @ 2200.00ft
2,700.00	2,697.47	-15.60	40.63	End Nudge @ 2700.00ft
5,680.00	5,632.19	-201.04	523.73	Begin Drop @ 5680.00ft
6,180.00	6,129.66	-216.64	564.36	End Drop @ 6180.00ft
6,480.00	6,429.66	-216.64	564.36	Top of 4.5" Liner @ 6480.00ft
6,580.00	6,529.66	-216.64	564.36	KOP @ 6580.00ft
7,000.00	6,913.04	-69.47	563.89	DLS = 10/100'
7,475.30	7,102.60	351.62	562.51	End Build @ 7475.30ft
14,224.73	7,158.00	7,100.78	540.54	TD Well @ 14224.73ft

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/_S (ft)	+E/-W (ft)	
User	No Target (Freehand)	359.81	Slot	0.00	0.00	0.00

**Survey tool program**

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	7,475.30	Plan A0 Permit	MWD
7,475.30	14,224.73	Plan A0 Permit	MWD

**Casing Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
1,500.00	1,500.00	9 5/8"	9-5/8	13-1/2
7,475.30	7,102.60	7"	7	8-3/4

**Formation Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,450.00	1,450.00	Fox Hills		0.00	
5,055.32	5,017.00	Sussex		0.00	
7,147.84	7,009.00	Sharon Springs		0.00	
7,216.31	7,043.00	Niobrara A		0.00	
7,475.30	7,102.60	Nio B(Target--Heel)		0.00	
11,179.16	7,133.00	Niobrara B		0.00	
14,224.73	7,158.00	Nio B (Target--Toe)		0.00	

**Targets associated with this wellbore**

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Thomason_Section	0.00	154.70	3,474.72	Polygon
Thomason 11N-31HZ_BHL	7,158.00	7,100.78	540.54	Point
Thomason 11N-31HZ_SHL	0.00	0.00	0.00	Point

**North Reference Sheet for Sec. 6-T1N-R65W - THOMASON 11N-31HZ - Plan A**

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' @ 5018.00ft (Drilling Rig). Northing and Easting are relative to THOMASON 11N-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: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99996158

Grid Coordinates of Well: 1,270,782.24 ft N, 3,220,842.11 ft E  
 Geographical Coordinates of Well: 40° 04' 26.36" N, 104° 42' 39.04" W  
 Grid Convergence at Surface is: 0.51°

Based upon Minimum Curvature type calculations, at a Measured Depth of 14,224.73ft  
 the Bottom Hole Displacement is 7,121.33ft in the Direction of 4.35° (True).

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

