

# Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 7-T2N-R65W

Thomsen 35N-18HZ

Plan B Rev 0

Plan: Plan B Rev 0 Permit

## Sperry Drilling Services

### Proposal Report

08 February, 2013

Well Coordinates: 1,299,782.46 N, 3,219,727.53 E (40° 09' 13.05" N, 104° 42' 50.07" W)

Ground Level: 4,947.00 ft

Local Coordinate Origin:

Centered on Well Thomsen 35N-18HZ

Viewing Datum:

RKB=16 @ 4963.00ft (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. 7-T2N-R65W  
Well: Thomsen 35N-18HZ  
Wellbore: Plan B Rev 0  
Design: Plan B Rev 0 Permit

# Anadarko Petroleum Corp.

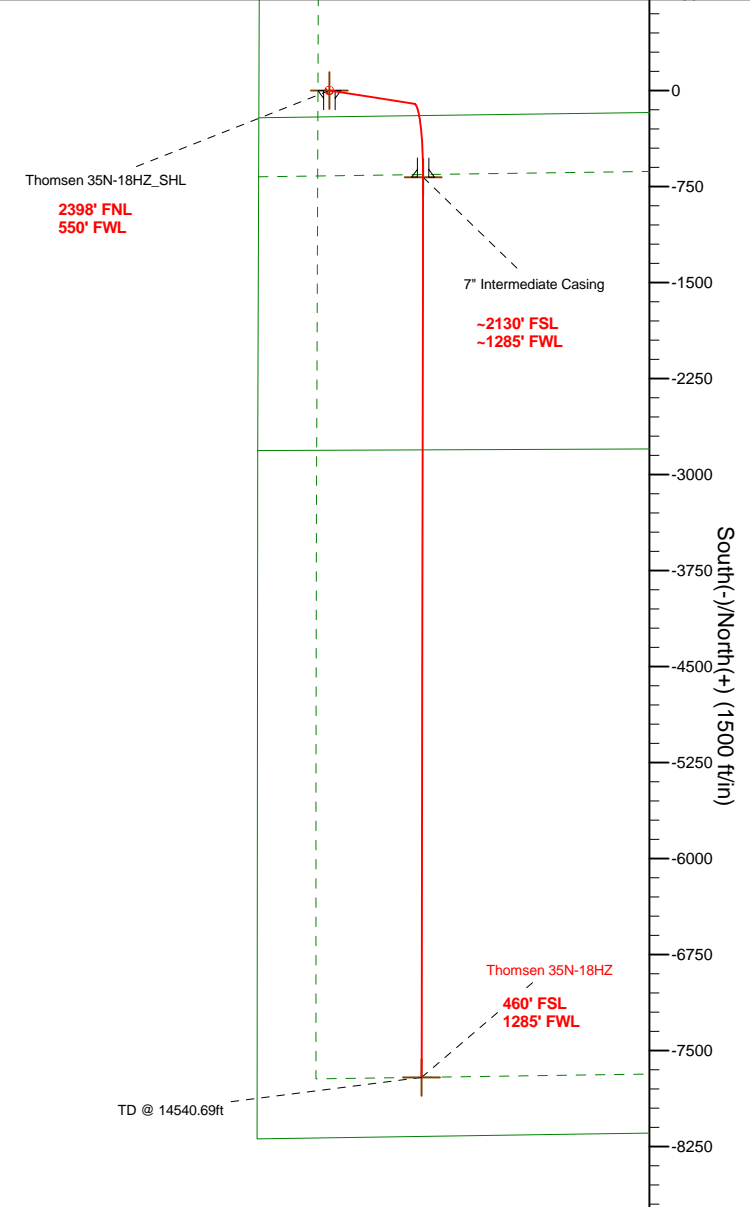
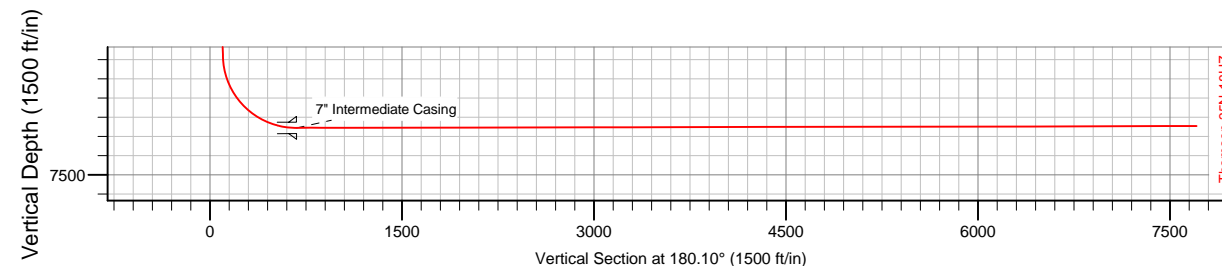
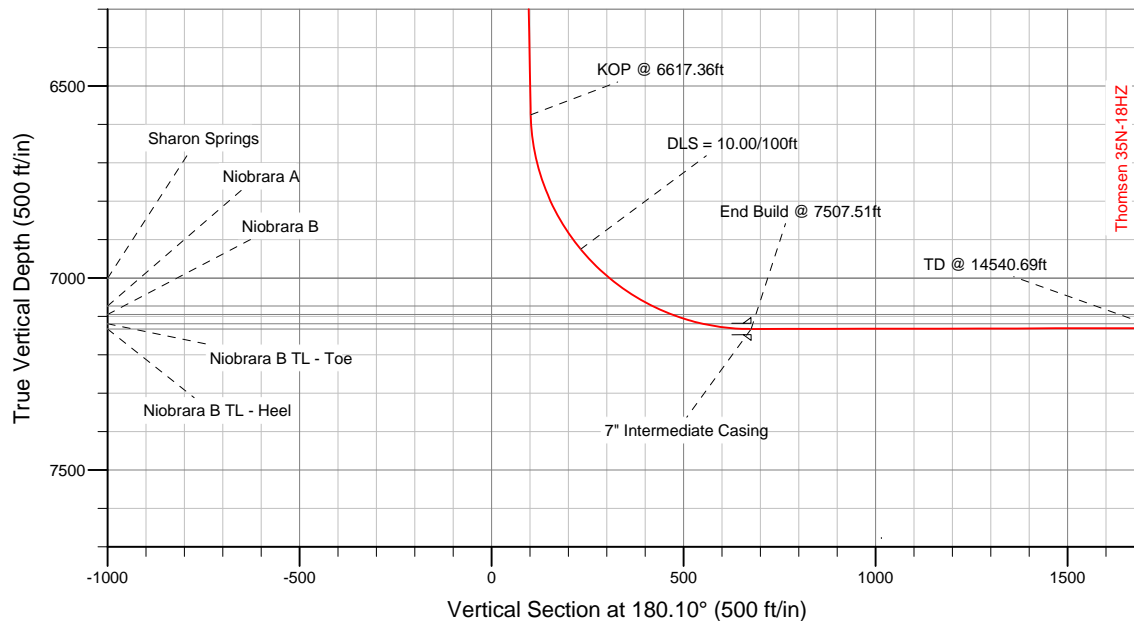
**HALLIBURTON**  
Sperry Drilling

## 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	1100.00	0.00	0.00	1100.00	0.00	0.00	0.00	0.00	0.00	
3	1461.50	7.23	98.86	1460.55	-3.51	22.51	2.00	98.86	3.47	
4	6617.36	7.23	98.86	6575.40	-103.40	663.66	0.00	0.00	102.24	
5	7507.51	90.11	180.10	7133.00	-677.51	732.70	10.00	81.30	676.23	Thomsen 35N-18HZ_CP
6	14540.69	90.11	180.10	7119.00	-7710.66	720.30	0.00	0.00	7709.39	Thomsen 35N-18HZ_BHL

## WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Thomsen 35N-18HZ_SHL	0.00	0.00	0.00	40.153624	-104.713908	Point
Thomsen 35N-18HZ_BHL	7119.00	-7710.66	720.30	40.132458	-104.711332	Point
Thomsen 35N-18HZ_CP	7133.00	-677.51	732.70	40.151764	-104.711287	Point



## WELL DETAILS: Thomsen 35N-18HZ

Ground Level: 4947.00  
RKB=16 @ 4963.00ft (Drilling Rig)

Plan: Plan B Rev 0 Permit (Thomsen 35N-18HZ/Plan B Rev 0)

Created By: Fred Hartmann Date: 02/07/2013  
Reviewed: \_\_\_\_\_ Date: \_\_\_\_\_

**Plan Report for Thomsen 35N-18HZ - Plan B 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
<b>9 5/8" Surface Casing</b>										
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
<b>Begin Nudge @ 1100.00ft</b>										
1,200.00	2.00	98.86	1,199.98	-0.27	1.72	0.27	2.00	2.00	0.00	98.86
1,300.00	4.00	98.86	1,299.84	-1.07	6.90	1.06	2.00	2.00	0.00	0.00
1,400.00	6.00	98.86	1,399.45	-2.42	15.51	2.39	2.00	2.00	0.00	0.00
1,461.50	7.23	98.86	1,460.54	-3.51	22.51	3.47	2.00	2.00	0.00	0.00
<b>End Nudge @ 1461.50ft</b>										
1,500.00	7.23	98.86	1,498.74	-4.25	27.29	4.21	0.00	0.00	0.00	0.00
1,600.00	7.23	98.86	1,597.94	-6.19	39.73	6.12	0.00	0.00	0.00	0.00
1,700.00	7.23	98.86	1,697.15	-8.13	52.16	8.04	0.00	0.00	0.00	0.00
1,800.00	7.23	98.86	1,796.35	-10.07	64.60	9.95	0.00	0.00	0.00	0.00
1,900.00	7.23	98.86	1,895.55	-12.00	77.04	11.87	0.00	0.00	0.00	0.00
2,000.00	7.23	98.86	1,994.76	-13.94	89.47	13.78	0.00	0.00	0.00	0.00
2,100.00	7.23	98.86	2,093.96	-15.88	101.91	15.70	0.00	0.00	0.00	0.00
2,200.00	7.23	98.86	2,193.17	-17.82	114.34	17.62	0.00	0.00	0.00	0.00
2,300.00	7.23	98.86	2,292.37	-19.75	126.78	19.53	0.00	0.00	0.00	0.00
2,400.00	7.23	98.86	2,391.58	-21.69	139.21	21.45	0.00	0.00	0.00	0.00
2,500.00	7.23	98.86	2,490.78	-23.63	151.65	23.36	0.00	0.00	0.00	0.00
2,600.00	7.23	98.86	2,589.99	-25.57	164.08	25.28	0.00	0.00	0.00	0.00
2,700.00	7.23	98.86	2,689.19	-27.50	176.52	27.19	0.00	0.00	0.00	0.00
2,800.00	7.23	98.86	2,788.40	-29.44	188.95	29.11	0.00	0.00	0.00	0.00
2,900.00	7.23	98.86	2,887.60	-31.38	201.39	31.03	0.00	0.00	0.00	0.00
3,000.00	7.23	98.86	2,986.81	-33.32	213.82	32.94	0.00	0.00	0.00	0.00
3,100.00	7.23	98.86	3,086.01	-35.25	226.26	34.86	0.00	0.00	0.00	0.00
3,200.00	7.23	98.86	3,185.22	-37.19	238.70	36.77	0.00	0.00	0.00	0.00
3,300.00	7.23	98.86	3,284.42	-39.13	251.13	38.69	0.00	0.00	0.00	0.00
3,400.00	7.23	98.86	3,383.63	-41.07	263.57	40.61	0.00	0.00	0.00	0.00
3,500.00	7.23	98.86	3,482.83	-43.00	276.00	42.52	0.00	0.00	0.00	0.00
3,600.00	7.23	98.86	3,582.04	-44.94	288.44	44.44	0.00	0.00	0.00	0.00
3,700.00	7.23	98.86	3,681.24	-46.88	300.87	46.35	0.00	0.00	0.00	0.00
3,800.00	7.23	98.86	3,780.45	-48.82	313.31	48.27	0.00	0.00	0.00	0.00
3,900.00	7.23	98.86	3,879.65	-50.75	325.74	50.18	0.00	0.00	0.00	0.00
4,000.00	7.23	98.86	3,978.86	-52.69	338.18	52.10	0.00	0.00	0.00	0.00
4,100.00	7.23	98.86	4,078.06	-54.63	350.61	54.02	0.00	0.00	0.00	0.00
4,200.00	7.23	98.86	4,177.27	-56.57	363.05	55.93	0.00	0.00	0.00	0.00
4,300.00	7.23	98.86	4,276.47	-58.50	375.48	57.85	0.00	0.00	0.00	0.00
4,400.00	7.23	98.86	4,375.68	-60.44	387.92	59.76	0.00	0.00	0.00	0.00
4,500.00	7.23	98.86	4,474.88	-62.38	400.36	61.68	0.00	0.00	0.00	0.00
4,600.00	7.23	98.86	4,574.09	-64.32	412.79	63.60	0.00	0.00	0.00	0.00
4,637.21	7.23	98.86	4,611.00	-65.04	417.42	64.31	0.00	0.00	0.00	0.00
<b>Sussex</b>										
4,700.00	7.23	98.86	4,673.29	-66.25	425.23	65.51	0.00	0.00	0.00	0.00
4,800.00	7.23	98.86	4,772.50	-68.19	437.66	67.43	0.00	0.00	0.00	0.00
4,900.00	7.23	98.86	4,871.70	-70.13	450.10	69.34	0.00	0.00	0.00	0.00
5,000.00	7.23	98.86	4,970.91	-72.07	462.53	71.26	0.00	0.00	0.00	0.00
5,100.00	7.23	98.86	5,070.11	-74.00	474.97	73.17	0.00	0.00	0.00	0.00

**Plan Report for Thomsen 35N-18HZ - Plan B 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 (°)
5,200.00	7.23	98.86	5,169.32	-75.94	487.40	75.09	0.00	0.00	0.00	0.00
5,300.00	7.23	98.86	5,268.52	-77.88	499.84	77.01	0.00	0.00	0.00	0.00
5,400.00	7.23	98.86	5,367.73	-79.82	512.27	78.92	0.00	0.00	0.00	0.00
5,500.00	7.23	98.86	5,466.93	-81.75	524.71	80.84	0.00	0.00	0.00	0.00
5,600.00	7.23	98.86	5,566.14	-83.69	537.14	82.75	0.00	0.00	0.00	0.00
5,700.00	7.23	98.86	5,665.34	-85.63	549.58	84.67	0.00	0.00	0.00	0.00
5,800.00	7.23	98.86	5,764.54	-87.57	562.02	86.59	0.00	0.00	0.00	0.00
5,900.00	7.23	98.86	5,863.75	-89.50	574.45	88.50	0.00	0.00	0.00	0.00
6,000.00	7.23	98.86	5,962.95	-91.44	586.89	90.42	0.00	0.00	0.00	0.00
6,100.00	7.23	98.86	6,062.16	-93.38	599.32	92.33	0.00	0.00	0.00	0.00
6,200.00	7.23	98.86	6,161.36	-95.32	611.76	94.25	0.00	0.00	0.00	0.00
6,300.00	7.23	98.86	6,260.57	-97.25	624.19	96.16	0.00	0.00	0.00	0.00
6,400.00	7.23	98.86	6,359.77	-99.19	636.63	98.08	0.00	0.00	0.00	0.00
6,500.00	7.23	98.86	6,458.98	-101.13	649.06	100.00	0.00	0.00	0.00	0.00
6,600.00	7.23	98.86	6,558.18	-103.07	661.50	101.91	0.00	0.00	0.00	0.00
6,617.36	7.23	98.86	6,575.41	-103.40	663.66	102.24	0.00	0.00	0.00	0.00
<b>KOP @ 6617.36ft</b>										
6,700.00	11.76	143.05	6,656.99	-110.95	673.88	109.77	10.00	5.48	53.48	81.30
6,800.00	20.59	160.59	6,752.99	-135.74	685.87	134.54	10.00	8.83	17.54	37.62
6,900.00	30.15	167.62	6,843.26	-176.96	697.13	175.74	10.00	9.55	7.02	20.71
7,000.00	39.90	171.46	6,925.07	-233.35	707.30	232.11	10.00	9.76	3.84	14.34
<b>DLS = 10.00/100ft</b>										
7,100.00	49.74	173.99	6,995.91	-303.19	716.08	301.94	10.00	9.84	2.53	11.18
7,107.94	50.53	174.16	7,001.00	-309.26	716.71	308.00	10.00	9.87	2.11	9.38
<b>Sharon Springs</b>										
7,200.00	59.63	175.87	7,053.65	-384.37	723.19	383.11	10.00	9.88	1.86	9.27
7,240.75	63.66	176.53	7,073.00	-420.15	725.57	418.88	10.00	9.90	1.61	8.29
<b>Niobrara A</b>										
7,295.69	69.10	177.34	7,095.00	-470.39	728.25	469.12	10.00	9.91	1.48	7.98
<b>Niobrara B</b>										
7,300.00	69.53	177.40	7,096.52	-474.42	728.43	473.15	10.00	9.91	1.42	7.65
7,400.00	79.45	178.75	7,123.23	-570.61	731.64	569.33	10.00	9.92	1.34	7.63
7,500.00	89.37	180.01	7,132.97	-670.00	732.71	668.72	10.00	9.92	1.26	7.27
7,507.51	90.11	180.10	7,133.00	-677.51	732.70	676.23	10.00	9.92	1.24	7.15
<b>End Build @ 7507.51ft - Niobrara B TL - Heel - 7" Intermediate Casing - Thomsen 35N-18HZ_CP</b>										
7,600.00	90.11	180.10	7,132.82	-770.00	732.54	768.72	0.00	0.00	0.00	7.15
7,700.00	90.11	180.10	7,132.62	-870.00	732.36	868.72	0.00	0.00	0.00	0.00
7,800.00	90.11	180.10	7,132.42	-970.00	732.18	968.72	0.00	0.00	0.00	0.00
7,900.00	90.11	180.10	7,132.22	-1,070.00	732.01	1,068.72	0.00	0.00	0.00	0.00
8,000.00	90.11	180.10	7,132.02	-1,170.00	731.83	1,168.72	0.00	0.00	0.00	0.00
8,100.00	90.11	180.10	7,131.82	-1,270.00	731.66	1,268.72	0.00	0.00	0.00	0.00
8,200.00	90.11	180.10	7,131.62	-1,370.00	731.48	1,368.72	0.00	0.00	0.00	0.00
8,300.00	90.11	180.10	7,131.42	-1,470.00	731.30	1,468.72	0.00	0.00	0.00	0.00
8,400.00	90.11	180.10	7,131.22	-1,569.99	731.13	1,568.72	0.00	0.00	0.00	0.00
8,500.00	90.11	180.10	7,131.02	-1,669.99	730.95	1,668.72	0.00	0.00	0.00	0.00
8,600.00	90.11	180.10	7,130.83	-1,769.99	730.77	1,768.72	0.00	0.00	0.00	0.00
8,700.00	90.11	180.10	7,130.63	-1,869.99	730.60	1,868.72	0.00	0.00	0.00	0.00
8,800.00	90.11	180.10	7,130.43	-1,969.99	730.42	1,968.72	0.00	0.00	0.00	0.00
8,900.00	90.11	180.10	7,130.23	-2,069.99	730.25	2,068.72	0.00	0.00	0.00	0.00
9,000.00	90.11	180.10	7,130.03	-2,169.99	730.07	2,168.72	0.00	0.00	0.00	0.00
9,100.00	90.11	180.10	7,129.83	-2,269.99	729.89	2,268.72	0.00	0.00	0.00	0.00
9,200.00	90.11	180.10	7,129.63	-2,369.99	729.72	2,368.71	0.00	0.00	0.00	0.00
9,300.00	90.11	180.10	7,129.43	-2,469.99	729.54	2,468.71	0.00	0.00	0.00	0.00
9,400.00	90.11	180.10	7,129.23	-2,569.99	729.36	2,568.71	0.00	0.00	0.00	0.00
9,500.00	90.11	180.10	7,129.03	-2,669.99	729.19	2,668.71	0.00	0.00	0.00	0.00
9,600.00	90.11	180.10	7,128.83	-2,769.99	729.01	2,768.71	0.00	0.00	0.00	0.00
9,700.00	90.11	180.10	7,128.64	-2,869.99	728.84	2,868.71	0.00	0.00	0.00	0.00
9,800.00	90.11	180.10	7,128.44	-2,969.99	728.66	2,968.71	0.00	0.00	0.00	0.00
9,900.00	90.11	180.10	7,128.24	-3,069.99	728.48	3,068.71	0.00	0.00	0.00	0.00

**Plan Report for Thomsen 35N-18HZ - Plan B 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 (°)
10,000.00	90.11	180.10	7,128.04	-3,169.99	728.31	3,168.71	0.00	0.00	0.00	0.00
10,100.00	90.11	180.10	7,127.84	-3,269.99	728.13	3,268.71	0.00	0.00	0.00	0.00
10,200.00	90.11	180.10	7,127.64	-3,369.99	727.95	3,368.71	0.00	0.00	0.00	0.00
10,300.00	90.11	180.10	7,127.44	-3,469.99	727.78	3,468.71	0.00	0.00	0.00	0.00
10,400.00	90.11	180.10	7,127.24	-3,569.99	727.60	3,568.71	0.00	0.00	0.00	0.00
10,500.00	90.11	180.10	7,127.04	-3,669.99	727.43	3,668.71	0.00	0.00	0.00	0.00
10,600.00	90.11	180.10	7,126.84	-3,769.99	727.25	3,768.71	0.00	0.00	0.00	0.00
10,700.00	90.11	180.10	7,126.65	-3,869.99	727.07	3,868.71	0.00	0.00	0.00	0.00
10,800.00	90.11	180.10	7,126.45	-3,969.99	726.90	3,968.71	0.00	0.00	0.00	0.00
10,900.00	90.11	180.10	7,126.25	-4,069.99	726.72	4,068.71	0.00	0.00	0.00	0.00
11,000.00	90.11	180.10	7,126.05	-4,169.99	726.54	4,168.71	0.00	0.00	0.00	0.00
11,100.00	90.11	180.10	7,125.85	-4,269.99	726.37	4,268.71	0.00	0.00	0.00	0.00
11,200.00	90.11	180.10	7,125.65	-4,369.99	726.19	4,368.71	0.00	0.00	0.00	0.00
11,300.00	90.11	180.10	7,125.45	-4,469.98	726.02	4,468.71	0.00	0.00	0.00	0.00
11,400.00	90.11	180.10	7,125.25	-4,569.98	725.84	4,568.71	0.00	0.00	0.00	0.00
11,500.00	90.11	180.10	7,125.05	-4,669.98	725.66	4,668.71	0.00	0.00	0.00	0.00
11,600.00	90.11	180.10	7,124.85	-4,769.98	725.49	4,768.71	0.00	0.00	0.00	0.00
11,700.00	90.11	180.10	7,124.65	-4,869.98	725.31	4,868.71	0.00	0.00	0.00	0.00
11,800.00	90.11	180.10	7,124.46	-4,969.98	725.13	4,968.71	0.00	0.00	0.00	0.00
11,900.00	90.11	180.10	7,124.26	-5,069.98	724.96	5,068.71	0.00	0.00	0.00	0.00
12,000.00	90.11	180.10	7,124.06	-5,169.98	724.78	5,168.71	0.00	0.00	0.00	0.00
12,100.00	90.11	180.10	7,123.86	-5,269.98	724.61	5,268.71	0.00	0.00	0.00	0.00
12,200.00	90.11	180.10	7,123.66	-5,369.98	724.43	5,368.71	0.00	0.00	0.00	0.00
12,300.00	90.11	180.10	7,123.46	-5,469.98	724.25	5,468.71	0.00	0.00	0.00	0.00
12,400.00	90.11	180.10	7,123.26	-5,569.98	724.08	5,568.71	0.00	0.00	0.00	0.00
12,500.00	90.11	180.10	7,123.06	-5,669.98	723.90	5,668.71	0.00	0.00	0.00	0.00
12,600.00	90.11	180.10	7,122.86	-5,769.98	723.72	5,768.71	0.00	0.00	0.00	0.00
12,700.00	90.11	180.10	7,122.66	-5,869.98	723.55	5,868.71	0.00	0.00	0.00	0.00
12,800.00	90.11	180.10	7,122.46	-5,969.98	723.37	5,968.71	0.00	0.00	0.00	0.00
12,900.00	90.11	180.10	7,122.27	-6,069.98	723.20	6,068.71	0.00	0.00	0.00	0.00
13,000.00	90.11	180.10	7,122.07	-6,169.98	723.02	6,168.71	0.00	0.00	0.00	0.00
13,100.00	90.11	180.10	7,121.87	-6,269.98	722.84	6,268.71	0.00	0.00	0.00	0.00
13,200.00	90.11	180.10	7,121.67	-6,369.98	722.67	6,368.71	0.00	0.00	0.00	0.00
13,300.00	90.11	180.10	7,121.47	-6,469.98	722.49	6,468.71	0.00	0.00	0.00	0.00
13,400.00	90.11	180.10	7,121.27	-6,569.98	722.31	6,568.71	0.00	0.00	0.00	0.00
13,500.00	90.11	180.10	7,121.07	-6,669.98	722.14	6,668.71	0.00	0.00	0.00	0.00
13,600.00	90.11	180.10	7,120.87	-6,769.98	721.96	6,768.71	0.00	0.00	0.00	0.00
13,700.00	90.11	180.10	7,120.67	-6,869.98	721.79	6,868.71	0.00	0.00	0.00	0.00
13,800.00	90.11	180.10	7,120.47	-6,969.98	721.61	6,968.71	0.00	0.00	0.00	0.00
13,900.00	90.11	180.10	7,120.28	-7,069.98	721.43	7,068.71	0.00	0.00	0.00	0.00
14,000.00	90.11	180.10	7,120.08	-7,169.98	721.26	7,168.71	0.00	0.00	0.00	0.00
14,100.00	90.11	180.10	7,119.88	-7,269.97	721.08	7,268.71	0.00	0.00	0.00	0.00
14,200.00	90.11	180.10	7,119.68	-7,369.97	720.90	7,368.71	0.00	0.00	0.00	0.00
14,300.00	90.11	180.10	7,119.48	-7,469.97	720.73	7,468.70	0.00	0.00	0.00	0.00
14,400.00	90.11	180.10	7,119.28	-7,569.97	720.55	7,568.70	0.00	0.00	0.00	0.00
14,500.00	90.11	180.10	7,119.08	-7,669.97	720.38	7,668.70	0.00	0.00	0.00	0.00
14,540.68	90.11	180.10	7,119.00	-7,710.65	720.30	7,709.38	0.00	0.00	0.00	0.00
<b>Niobrara B TL - Toe</b>										
14,540.69	90.11	180.10	7,119.00	-7,710.66	720.30	7,709.39	0.00	0.00	0.00	0.00
<b>Thomsen 35N-18HZ_BHL</b>										

## Plan Report for Thomsen 35N-18HZ - Plan B Rev 0 Permit

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
1,461.50	1,460.54	-3.51	22.51	End Nudge @ 1461.50ft
6,617.36	6,575.41	-103.40	663.66	KOP @ 6617.36ft
7,000.00	6,925.07	-233.35	707.30	DLS = 10.00/100ft
7,507.51	7,133.00	-677.51	732.70	End Build @ 7507.51ft
14,540.69	7,119.00	-7,710.66	720.30	TD @ 14540.69ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
User	No Target (Freehand)	180.10	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	14,540.69	Plan B Rev 0 Permit	MWD

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
900.00	900.00	9 5/8" Surface Casing	9-5/8	13-1/2
7,507.51	7,133.00	7" Intermediate Casing	7	8-3/4

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,637.21	4,611.00	Sussex		0.00	
7,107.94	7,001.00	Sharon Springs		0.00	
7,240.75	7,073.00	Niobrara A		0.00	
7,295.69	7,095.00	Niobrara B		0.00	
7,507.51	7,133.00	Niobrara B TL - Heel		0.00	
14,540.68	7,119.00	Niobrara B TL - Toe		0.00	

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Thomsen 35N-18HZ_CP	7,133.00	-677.51	732.70	Point
Thomsen 35N-18HZ_SHL	0.00	0.00	0.00	Point
Thomsen 35N-18HZ_BHL	7,119.00	-7,710.66	720.30	Point

## North Reference Sheet for Sec. 7-T2N-R65W - Thomsen 35N-18HZ - Plan B 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=16 @ 4963.00ft (Drilling Rig). Northing and Easting are relative to Thomsen 35N-18HZ

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: 0.99995828

Grid Coordinates of Well: 1,299,782.46 ft N, 3,219,727.53 ft E

Geographical Coordinates of Well: 40° 09' 13.05" N, 104° 42' 50.07" W

Grid Convergence at Surface is: 0.51°

Based upon Minimum Curvature type calculations, at a Measured Depth of 14,540.69ft  
the Bottom Hole Displacement is 7,744.23ft in the Direction of 174.66° (True).

Magnetic Convergence at surface is: -8.15° ( 4 January 2013, , BGGM2012)

