

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 7-T2N-R65W

Thomsen 13C-18HZ

Plan B Rev 0

Plan: Plan B Rev 0 Permit

Sperry Drilling Services

Proposal Report

07 February, 2013

Well Coordinates: 1,299,840.67 N, 3,220,948.57 E (40° 09' 13.51" N, 104° 42' 34.34" W)

Ground Level: 4,952.00 ft

Local Coordinate Origin:	Centered on Well Thomsen 13C-18HZ
Viewing Datum:	RKB=16 @ 4968.00ft (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 13C-18HZ
 Wellbore: Plan B Rev 0
 Design: Plan B Rev 0 Permit

Anadarko Petroleum Corp.

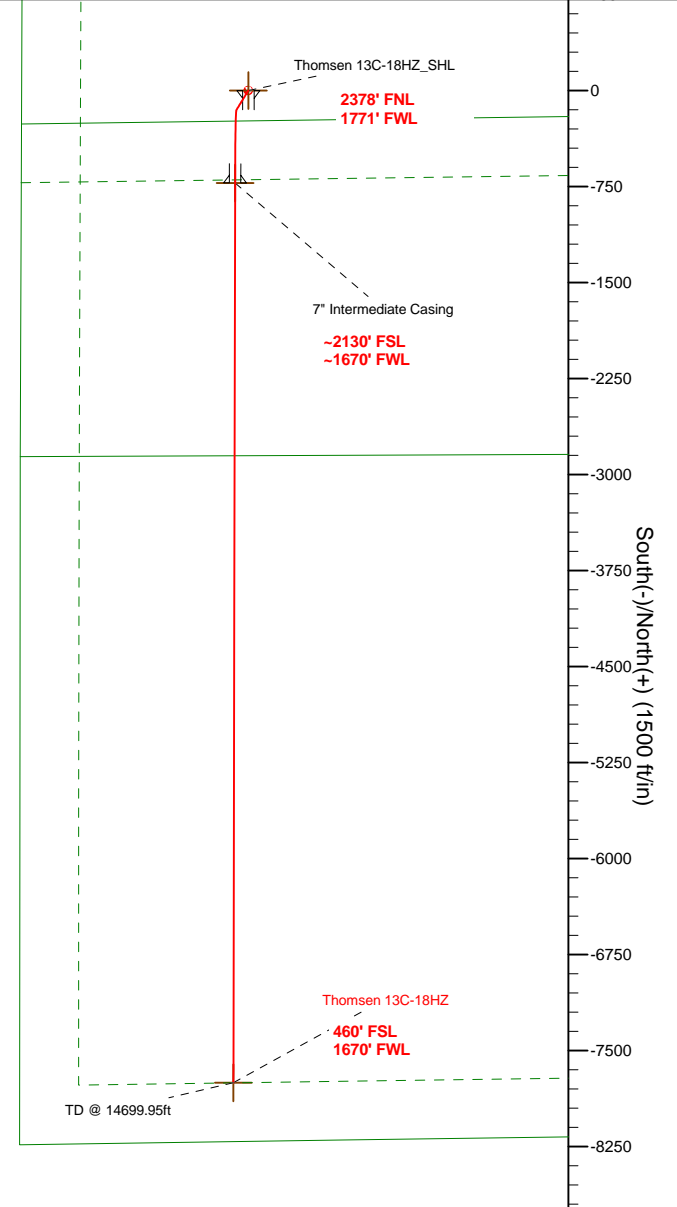
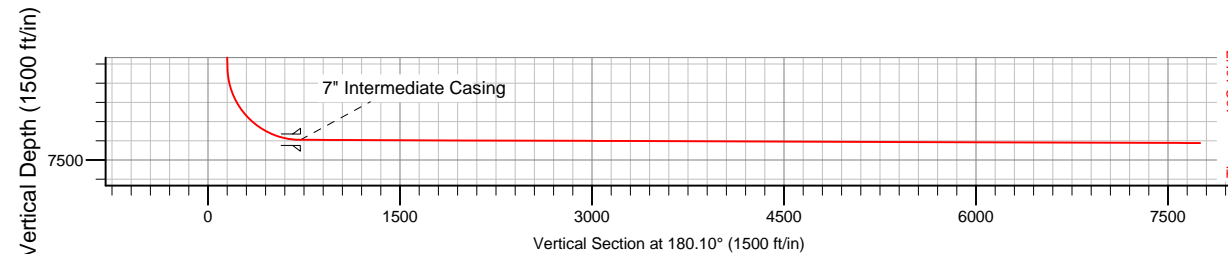
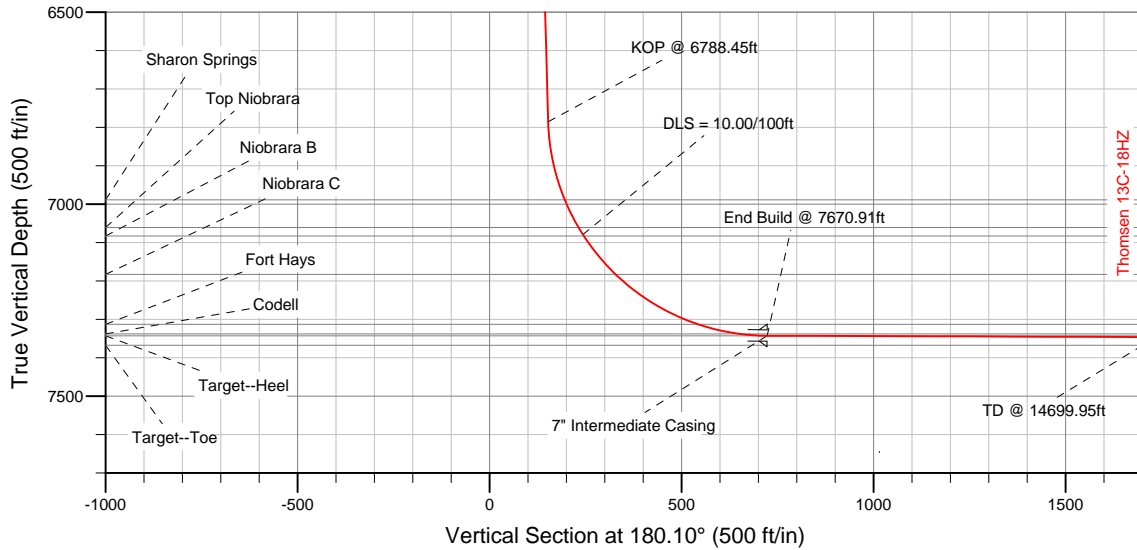


SECTION DETAILS

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	1190.85	1.82	211.52	1190.83	-1.23	-0.75	2.00	211.52	1.23	
4	6788.45	1.82	211.52	6785.63	-152.53	-93.52	0.00	0.00	152.69	
5	7670.91	89.80	180.10	7343.00	-723.22	-103.75	10.00	-31.43	723.40	Thomsen 13C-18HZ_CP2
6	14699.95	89.80	180.10	7368.00	-7752.20	-116.60	0.00	0.00	7752.39	Thomsen 13C-18HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Thomsen 13C-18HZ_SHL	0.00	0.00	0.00	40.153754	-104.709538	Point
Thomsen 13C-18HZ_CP2	7343.00	-723.22	-103.75	40.151769	-104.709909	Point
Thomsen 13C-18HZ_BHL	7368.00	-7752.20	-116.60	40.132474	-104.709955	Point



WELL DETAILS: Thomsen 13C-18HZ	
Ground Level:	4952.00
RKB=16 @ 4968.00ft (Drilling Rig)	
Plan: Plan B Rev 0 Permit (Thomsen 13C-18HZ/Plan B Rev 0)	
Created By: Fred Hartmann	Date: 02/07/2013
Reviewed: _____	Date: _____

Plan Report for Thomsen 13C-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
9 5/8" Surface Casing										
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										
1,190.85	1.82	211.52	1,190.83	-1.23	-0.75	1.23	2.00	2.00	0.00	211.52
End Nudge @ 1190.85ft										
1,200.00	1.82	211.52	1,199.98	-1.48	-0.90	1.48	0.00	0.00	0.00	0.00
1,300.00	1.82	211.52	1,299.93	-4.18	-2.56	4.18	0.00	0.00	0.00	0.00
1,400.00	1.82	211.52	1,399.88	-6.88	-4.22	6.89	0.00	0.00	0.00	0.00
1,500.00	1.82	211.52	1,499.83	-9.58	-5.88	9.59	0.00	0.00	0.00	0.00
1,600.00	1.82	211.52	1,599.78	-12.29	-7.53	12.30	0.00	0.00	0.00	0.00
1,700.00	1.82	211.52	1,699.73	-14.99	-9.19	15.01	0.00	0.00	0.00	0.00
1,800.00	1.82	211.52	1,799.68	-17.69	-10.85	17.71	0.00	0.00	0.00	0.00
1,900.00	1.82	211.52	1,899.63	-20.40	-12.51	20.42	0.00	0.00	0.00	0.00
2,000.00	1.82	211.52	1,999.58	-23.10	-14.16	23.12	0.00	0.00	0.00	0.00
2,100.00	1.82	211.52	2,099.53	-25.80	-15.82	25.83	0.00	0.00	0.00	0.00
2,200.00	1.82	211.52	2,199.48	-28.50	-17.48	28.54	0.00	0.00	0.00	0.00
2,300.00	1.82	211.52	2,299.43	-31.21	-19.14	31.24	0.00	0.00	0.00	0.00
2,400.00	1.82	211.52	2,399.38	-33.91	-20.79	33.95	0.00	0.00	0.00	0.00
2,500.00	1.82	211.52	2,499.33	-36.61	-22.45	36.65	0.00	0.00	0.00	0.00
2,600.00	1.82	211.52	2,599.28	-39.32	-24.11	39.36	0.00	0.00	0.00	0.00
2,700.00	1.82	211.52	2,699.23	-42.02	-25.76	42.06	0.00	0.00	0.00	0.00
2,800.00	1.82	211.52	2,799.18	-44.72	-27.42	44.77	0.00	0.00	0.00	0.00
2,900.00	1.82	211.52	2,899.13	-47.43	-29.08	47.48	0.00	0.00	0.00	0.00
3,000.00	1.82	211.52	2,999.08	-50.13	-30.74	50.18	0.00	0.00	0.00	0.00
3,100.00	1.82	211.52	3,099.02	-52.83	-32.39	52.89	0.00	0.00	0.00	0.00
3,200.00	1.82	211.52	3,198.97	-55.53	-34.05	55.59	0.00	0.00	0.00	0.00
3,300.00	1.82	211.52	3,298.92	-58.24	-35.71	58.30	0.00	0.00	0.00	0.00
3,400.00	1.82	211.52	3,398.87	-60.94	-37.37	61.00	0.00	0.00	0.00	0.00
3,500.00	1.82	211.52	3,498.82	-63.64	-39.02	63.71	0.00	0.00	0.00	0.00
3,600.00	1.82	211.52	3,598.77	-66.35	-40.68	66.42	0.00	0.00	0.00	0.00
3,700.00	1.82	211.52	3,698.72	-69.05	-42.34	69.12	0.00	0.00	0.00	0.00
3,800.00	1.82	211.52	3,798.67	-71.75	-44.00	71.83	0.00	0.00	0.00	0.00
3,900.00	1.82	211.52	3,898.62	-74.45	-45.65	74.53	0.00	0.00	0.00	0.00
4,000.00	1.82	211.52	3,998.57	-77.16	-47.31	77.24	0.00	0.00	0.00	0.00
4,100.00	1.82	211.52	4,098.52	-79.86	-48.97	79.95	0.00	0.00	0.00	0.00
4,200.00	1.82	211.52	4,198.47	-82.56	-50.62	82.65	0.00	0.00	0.00	0.00
4,300.00	1.82	211.52	4,298.42	-85.27	-52.28	85.36	0.00	0.00	0.00	0.00
4,400.00	1.82	211.52	4,398.37	-87.97	-53.94	88.06	0.00	0.00	0.00	0.00
4,500.00	1.82	211.52	4,498.32	-90.67	-55.60	90.77	0.00	0.00	0.00	0.00
4,600.00	1.82	211.52	4,598.27	-93.37	-57.25	93.47	0.00	0.00	0.00	0.00
4,602.73	1.82	211.52	4,601.00	-93.45	-57.30	93.55	0.00	0.00	0.00	0.00
Sussex										
4,700.00	1.82	211.52	4,698.22	-96.08	-58.91	96.18	0.00	0.00	0.00	0.00
4,800.00	1.82	211.52	4,798.17	-98.78	-60.57	98.89	0.00	0.00	0.00	0.00
4,900.00	1.82	211.52	4,898.12	-101.48	-62.23	101.59	0.00	0.00	0.00	0.00
5,000.00	1.82	211.52	4,998.07	-104.19	-63.88	104.30	0.00	0.00	0.00	0.00
5,100.00	1.82	211.52	5,098.02	-106.89	-65.54	107.00	0.00	0.00	0.00	0.00

Plan Report for Thomsen 13C-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	1.82	211.52	5,197.97	-109.59	-67.20	109.71	0.00	0.00	0.00	0.00
5,300.00	1.82	211.52	5,297.92	-112.30	-68.86	112.42	0.00	0.00	0.00	0.00
5,400.00	1.82	211.52	5,397.87	-115.00	-70.51	115.12	0.00	0.00	0.00	0.00
5,500.00	1.82	211.52	5,497.82	-117.70	-72.17	117.83	0.00	0.00	0.00	0.00
5,600.00	1.82	211.52	5,597.77	-120.40	-73.83	120.53	0.00	0.00	0.00	0.00
5,700.00	1.82	211.52	5,697.72	-123.11	-75.49	123.24	0.00	0.00	0.00	0.00
5,800.00	1.82	211.52	5,797.67	-125.81	-77.14	125.94	0.00	0.00	0.00	0.00
5,900.00	1.82	211.52	5,897.62	-128.51	-78.80	128.65	0.00	0.00	0.00	0.00
6,000.00	1.82	211.52	5,997.57	-131.22	-80.46	131.36	0.00	0.00	0.00	0.00
6,100.00	1.82	211.52	6,097.52	-133.92	-82.11	134.06	0.00	0.00	0.00	0.00
6,200.00	1.82	211.52	6,197.47	-136.62	-83.77	136.77	0.00	0.00	0.00	0.00
6,300.00	1.82	211.52	6,297.42	-139.32	-85.43	139.47	0.00	0.00	0.00	0.00
6,400.00	1.82	211.52	6,397.37	-142.03	-87.09	142.18	0.00	0.00	0.00	0.00
6,500.00	1.82	211.52	6,497.32	-144.73	-88.74	144.89	0.00	0.00	0.00	0.00
6,600.00	1.82	211.52	6,597.27	-147.43	-90.40	147.59	0.00	0.00	0.00	0.00
6,700.00	1.82	211.52	6,697.22	-150.14	-92.06	150.30	0.00	0.00	0.00	0.00
6,788.45	1.82	211.52	6,785.62	-152.53	-93.52	152.69	0.00	0.00	0.00	0.00
KOP @ 6788.45ft										
6,800.00	2.87	199.39	6,797.16	-152.96	-93.72	153.12	10.00	9.08	-105.01	-31.43
6,900.00	12.74	184.30	6,896.12	-166.34	-95.38	166.51	10.00	9.87	-15.09	-19.31
6,997.56	22.48	182.39	6,989.00	-195.78	-96.96	195.95	10.00	9.98	-1.95	-4.30
Sharon Springs										
7,000.00	22.72	182.36	6,991.25	-196.71	-97.00	196.88	10.00	9.99	-1.12	-2.48
7,078.09	30.53	181.71	7,061.00	-231.66	-98.22	231.83	10.00	9.99	-0.84	-2.45
Top Niobrara										
7,100.00	32.72	181.58	7,079.66	-243.14	-98.55	243.32	10.00	10.00	-0.60	-1.87
DLS = 10.00/100ft										
7,103.98	33.12	181.55	7,083.00	-245.31	-98.61	245.48	10.00	10.00	-0.56	-1.75
Niobrara B										
7,200.00	42.71	181.13	7,158.66	-304.22	-99.96	304.40	10.00	10.00	-0.44	-1.73
7,234.07	46.12	181.01	7,183.00	-328.06	-100.41	328.24	10.00	10.00	-0.34	-1.40
Niobrara C										
7,300.00	52.71	180.82	7,225.87	-378.10	-101.20	378.27	10.00	10.00	-0.29	-1.31
7,400.00	62.71	180.59	7,279.22	-462.52	-102.23	462.70	10.00	10.00	-0.23	-1.19
7,486.70	71.38	180.42	7,313.00	-542.27	-102.93	542.45	10.00	10.00	-0.20	-1.07
Fort Hays										
7,500.00	72.71	180.40	7,317.10	-554.92	-103.02	555.10	10.00	10.00	-0.18	-1.00
7,597.17	82.42	180.23	7,338.00	-649.70	-103.54	649.88	10.00	10.00	-0.17	-0.99
Codell										
7,600.00	82.71	180.22	7,338.37	-652.51	-103.55	652.69	10.00	10.00	-0.17	-0.96
7,670.91	89.80	180.10	7,343.00	-723.22	-103.75	723.40	10.00	10.00	-0.17	-0.95
End Build @ 7670.91ft - Target--Heel - 7" Intermediate Casing - Thomsen 13C-18HZ_CP2										
7,700.00	89.80	180.10	7,343.10	-752.31	-103.80	752.49	0.00	0.00	0.00	-0.95
7,800.00	89.80	180.10	7,343.46	-852.31	-103.99	852.49	0.00	0.00	0.00	0.00
7,900.00	89.80	180.10	7,343.81	-952.31	-104.17	952.49	0.00	0.00	0.00	0.00
8,000.00	89.80	180.10	7,344.17	-1,052.31	-104.35	1,052.49	0.00	0.00	0.00	0.00
8,100.00	89.80	180.10	7,344.53	-1,152.31	-104.53	1,152.49	0.00	0.00	0.00	0.00
8,200.00	89.80	180.10	7,344.88	-1,252.30	-104.72	1,252.49	0.00	0.00	0.00	0.00
8,300.00	89.80	180.10	7,345.24	-1,352.30	-104.90	1,352.48	0.00	0.00	0.00	0.00
8,400.00	89.80	180.10	7,345.59	-1,452.30	-105.08	1,452.48	0.00	0.00	0.00	0.00
8,500.00	89.80	180.10	7,345.95	-1,552.30	-105.27	1,552.48	0.00	0.00	0.00	0.00
8,600.00	89.80	180.10	7,346.30	-1,652.30	-105.45	1,652.48	0.00	0.00	0.00	0.00
8,700.00	89.80	180.10	7,346.66	-1,752.30	-105.63	1,752.48	0.00	0.00	0.00	0.00
8,800.00	89.80	180.10	7,347.02	-1,852.30	-105.81	1,852.48	0.00	0.00	0.00	0.00
8,900.00	89.80	180.10	7,347.37	-1,952.30	-106.00	1,952.48	0.00	0.00	0.00	0.00
9,000.00	89.80	180.10	7,347.73	-2,052.30	-106.18	2,052.48	0.00	0.00	0.00	0.00
9,100.00	89.80	180.10	7,348.08	-2,152.30	-106.36	2,152.48	0.00	0.00	0.00	0.00
9,200.00	89.80	180.10	7,348.44	-2,252.30	-106.55	2,252.48	0.00	0.00	0.00	0.00

Plan Report for Thomsen 13C-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 (°)
9,300.00	89.80	180.10	7,348.79	-2,352.30	-106.73	2,352.48	0.00	0.00	0.00	0.00
9,400.00	89.80	180.10	7,349.15	-2,452.29	-106.91	2,452.48	0.00	0.00	0.00	0.00
9,500.00	89.80	180.10	7,349.51	-2,552.29	-107.09	2,552.48	0.00	0.00	0.00	0.00
9,600.00	89.80	180.10	7,349.86	-2,652.29	-107.28	2,652.48	0.00	0.00	0.00	0.00
9,700.00	89.80	180.10	7,350.22	-2,752.29	-107.46	2,752.48	0.00	0.00	0.00	0.00
9,800.00	89.80	180.10	7,350.57	-2,852.29	-107.64	2,852.48	0.00	0.00	0.00	0.00
9,900.00	89.80	180.10	7,350.93	-2,952.29	-107.83	2,952.47	0.00	0.00	0.00	0.00
10,000.00	89.80	180.10	7,351.28	-3,052.29	-108.01	3,052.47	0.00	0.00	0.00	0.00
10,100.00	89.80	180.10	7,351.64	-3,152.29	-108.19	3,152.47	0.00	0.00	0.00	0.00
10,200.00	89.80	180.10	7,352.00	-3,252.29	-108.37	3,252.47	0.00	0.00	0.00	0.00
10,300.00	89.80	180.10	7,352.35	-3,352.29	-108.56	3,352.47	0.00	0.00	0.00	0.00
10,400.00	89.80	180.10	7,352.71	-3,452.29	-108.74	3,452.47	0.00	0.00	0.00	0.00
10,500.00	89.80	180.10	7,353.06	-3,552.29	-108.92	3,552.47	0.00	0.00	0.00	0.00
10,600.00	89.80	180.10	7,353.42	-3,652.29	-109.11	3,652.47	0.00	0.00	0.00	0.00
10,700.00	89.80	180.10	7,353.77	-3,752.28	-109.29	3,752.47	0.00	0.00	0.00	0.00
10,800.00	89.80	180.10	7,354.13	-3,852.28	-109.47	3,852.47	0.00	0.00	0.00	0.00
10,900.00	89.80	180.10	7,354.48	-3,952.28	-109.65	3,952.47	0.00	0.00	0.00	0.00
11,000.00	89.80	180.10	7,354.84	-4,052.28	-109.84	4,052.47	0.00	0.00	0.00	0.00
11,100.00	89.80	180.10	7,355.20	-4,152.28	-110.02	4,152.47	0.00	0.00	0.00	0.00
11,200.00	89.80	180.10	7,355.55	-4,252.28	-110.20	4,252.47	0.00	0.00	0.00	0.00
11,300.00	89.80	180.10	7,355.91	-4,352.28	-110.39	4,352.47	0.00	0.00	0.00	0.00
11,400.00	89.80	180.10	7,356.26	-4,452.28	-110.57	4,452.46	0.00	0.00	0.00	0.00
11,500.00	89.80	180.10	7,356.62	-4,552.28	-110.75	4,552.46	0.00	0.00	0.00	0.00
11,600.00	89.80	180.10	7,356.97	-4,652.28	-110.93	4,652.46	0.00	0.00	0.00	0.00
11,700.00	89.80	180.10	7,357.33	-4,752.28	-111.12	4,752.46	0.00	0.00	0.00	0.00
11,800.00	89.80	180.10	7,357.69	-4,852.28	-111.30	4,852.46	0.00	0.00	0.00	0.00
11,900.00	89.80	180.10	7,358.04	-4,952.27	-111.48	4,952.46	0.00	0.00	0.00	0.00
12,000.00	89.80	180.10	7,358.40	-5,052.27	-111.67	5,052.46	0.00	0.00	0.00	0.00
12,100.00	89.80	180.10	7,358.75	-5,152.27	-111.85	5,152.46	0.00	0.00	0.00	0.00
12,200.00	89.80	180.10	7,359.11	-5,252.27	-112.03	5,252.46	0.00	0.00	0.00	0.00
12,300.00	89.80	180.10	7,359.46	-5,352.27	-112.21	5,352.46	0.00	0.00	0.00	0.00
12,400.00	89.80	180.10	7,359.82	-5,452.27	-112.40	5,452.46	0.00	0.00	0.00	0.00
12,500.00	89.80	180.10	7,360.18	-5,552.27	-112.58	5,552.46	0.00	0.00	0.00	0.00
12,600.00	89.80	180.10	7,360.53	-5,652.27	-112.76	5,652.46	0.00	0.00	0.00	0.00
12,700.00	89.80	180.10	7,360.89	-5,752.27	-112.95	5,752.46	0.00	0.00	0.00	0.00
12,800.00	89.80	180.10	7,361.24	-5,852.27	-113.13	5,852.46	0.00	0.00	0.00	0.00
12,900.00	89.80	180.10	7,361.60	-5,952.27	-113.31	5,952.46	0.00	0.00	0.00	0.00
13,000.00	89.80	180.10	7,361.95	-6,052.27	-113.49	6,052.45	0.00	0.00	0.00	0.00
13,100.00	89.80	180.10	7,362.31	-6,152.27	-113.68	6,152.45	0.00	0.00	0.00	0.00
13,200.00	89.80	180.10	7,362.67	-6,252.26	-113.86	6,252.45	0.00	0.00	0.00	0.00
13,300.00	89.80	180.10	7,363.02	-6,352.26	-114.04	6,352.45	0.00	0.00	0.00	0.00
13,400.00	89.80	180.10	7,363.38	-6,452.26	-114.23	6,452.45	0.00	0.00	0.00	0.00
13,500.00	89.80	180.10	7,363.73	-6,552.26	-114.41	6,552.45	0.00	0.00	0.00	0.00
13,600.00	89.80	180.10	7,364.09	-6,652.26	-114.59	6,652.45	0.00	0.00	0.00	0.00
13,700.00	89.80	180.10	7,364.44	-6,752.26	-114.77	6,752.45	0.00	0.00	0.00	0.00
13,800.00	89.80	180.10	7,364.80	-6,852.26	-114.96	6,852.45	0.00	0.00	0.00	0.00
13,900.00	89.80	180.10	7,365.15	-6,952.26	-115.14	6,952.45	0.00	0.00	0.00	0.00
14,000.00	89.80	180.10	7,365.51	-7,052.26	-115.32	7,052.45	0.00	0.00	0.00	0.00
14,100.00	89.80	180.10	7,365.87	-7,152.26	-115.51	7,152.45	0.00	0.00	0.00	0.00
14,200.00	89.80	180.10	7,366.22	-7,252.26	-115.69	7,252.45	0.00	0.00	0.00	0.00
14,300.00	89.80	180.10	7,366.58	-7,352.26	-115.87	7,352.45	0.00	0.00	0.00	0.00
14,400.00	89.80	180.10	7,366.93	-7,452.25	-116.05	7,452.45	0.00	0.00	0.00	0.00
14,500.00	89.80	180.10	7,367.29	-7,552.25	-116.24	7,552.45	0.00	0.00	0.00	0.00
14,600.00	89.80	180.10	7,367.64	-7,652.25	-116.42	7,652.44	0.00	0.00	0.00	0.00
14,699.94	89.80	180.10	7,368.00	-7,752.19	-116.60	7,752.38	0.00	0.00	0.00	0.00
Target--Toe										
14,699.95	89.80	180.10	7,368.00	-7,752.20	-116.60	7,752.39	0.00	0.00	0.00	0.00
Thomsen 13C-18HZ_BHL										

Plan Report for Thomsen 13C-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
1,190.85	1,190.83	-1.23	-0.75	End Nudge @ 1190.85ft
6,788.45	6,785.62	-152.53	-93.52	KOP @ 6788.45ft
7,100.00	7,079.66	-243.14	-98.55	DLS = 10.00/100ft
7,670.91	7,343.00	-723.22	-103.75	End Build @ 7670.91ft
14,699.95	7,368.00	-7,752.20	-116.60	TD @ 14699.95ft

Vertical Section Information

User	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	14,699.95	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
7,670.91	7,343.00	7" Intermediate Casing	7	8-3/4

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,602.73	4,601.00	Sussex		0.00	
6,997.56	6,989.00	Sharon Springs		0.00	
7,078.09	7,061.00	Top Niobrara		0.00	
7,103.98	7,083.00	Niobrara B		0.00	
7,234.07	7,183.00	Niobrara C		0.00	
7,486.70	7,313.00	Fort Hays		0.00	
7,597.17	7,338.00	Codell		0.00	
7,670.91	7,343.00	Target--Heel		0.00	
14,699.94	7,368.00	Target--Toe		0.00	

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Thomsen 13C-18HZ_7/2	0.00	0.00	0.00	Polygon
Thomsen 13C-18HZ_Sec	0.00	0.00	0.00	Polygon
Thomsen 13C-18HZ_7-18	0.00	0.00	0.00	Polygon
Thomsen 13C-18HZ_CP2	7,343.00	-723.22	-103.75	Point
Thomsen 13C-18HZ_7-460	0.00	0.00	0.00	Polygon
Thomsen 13C-18HZ_SHL	0.00	0.00	0.00	Point
Thomsen 13C-18HZ_BHL	7,368.00	-7,752.20	-116.60	Point

North Reference Sheet for Sec. 7-T2N-R65W - Thomsen 13C-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 @ 4968.00ft (Drilling Rig). Northing and Easting are relative to Thomsen 13C-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: 0.99995827

Grid Coordinates of Well: 1,299,840.67 ft N, 3,220,948.57 ft E
 Geographical Coordinates of Well: 40° 09' 13.51" N, 104° 42' 34.34" W
 Grid Convergence at Surface is: 0.51°

Based upon Minimum Curvature type calculations, at a Measured Depth of 14,699.95ft
 the Bottom Hole Displacement is 7,753.08ft in the Direction of 180.86° (True).

Magnetic Convergence at surface is: -8.13° (6 February 2013, , BGGM2012)

