

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 7-T2N-R65W

Thomsen 13N-18HZ

Plan A Rev 0

Plan: Plan A Rev 0 Permit

Sperry Drilling Services

Proposal Report

04 January, 2013

Well Coordinates: 1,299,781.20 N, 3,219,667.72 E (40° 09' 13.04" N, 104° 42' 50.84" W)

Ground Level: 4,947.00 ft

Local Coordinate Origin:

Centered on Well Thomsen 13N-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 13N-18HZ
Wellbore: Plan A Rev 0
Design: Plan A Rev 0 Permit

Anadarko Petroleum Corp.

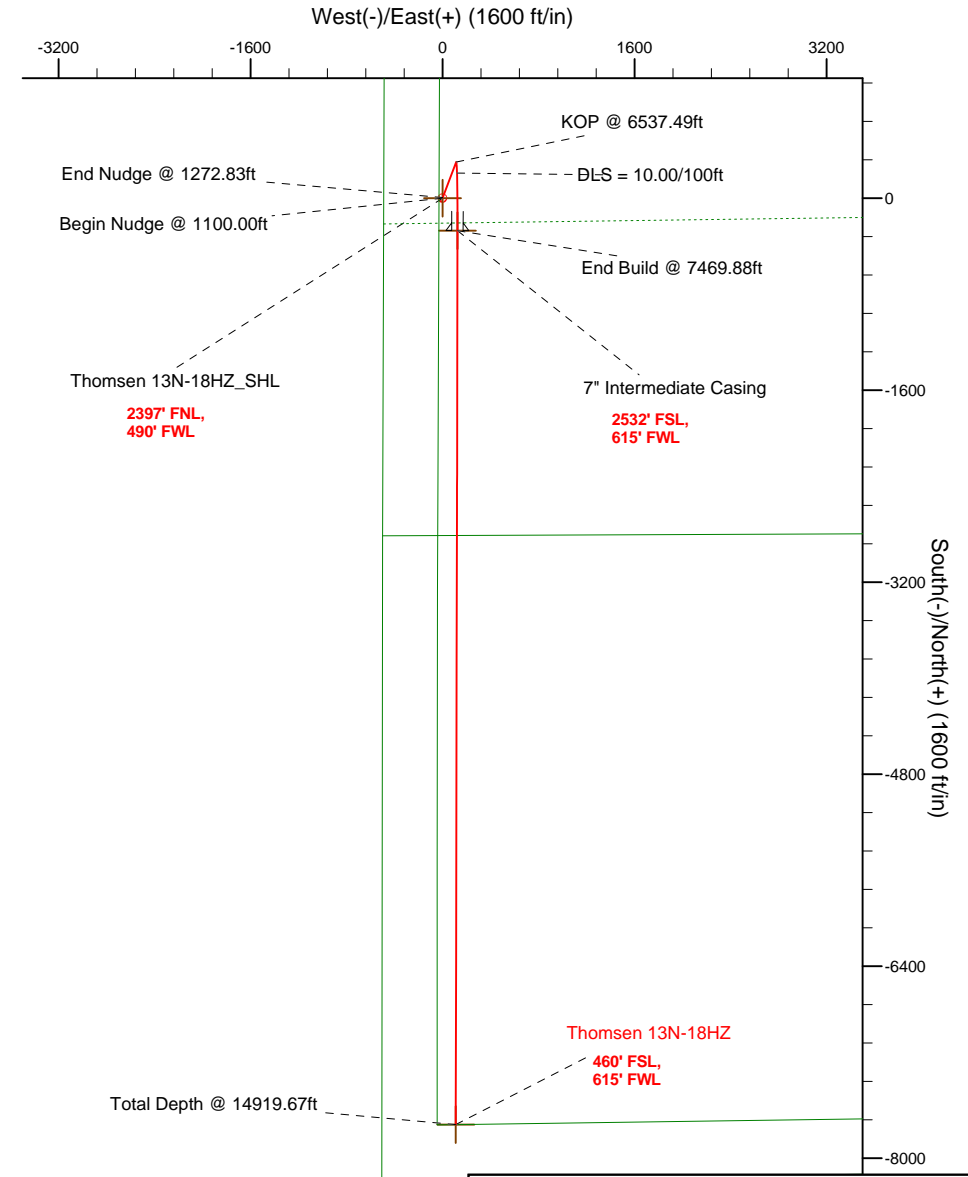
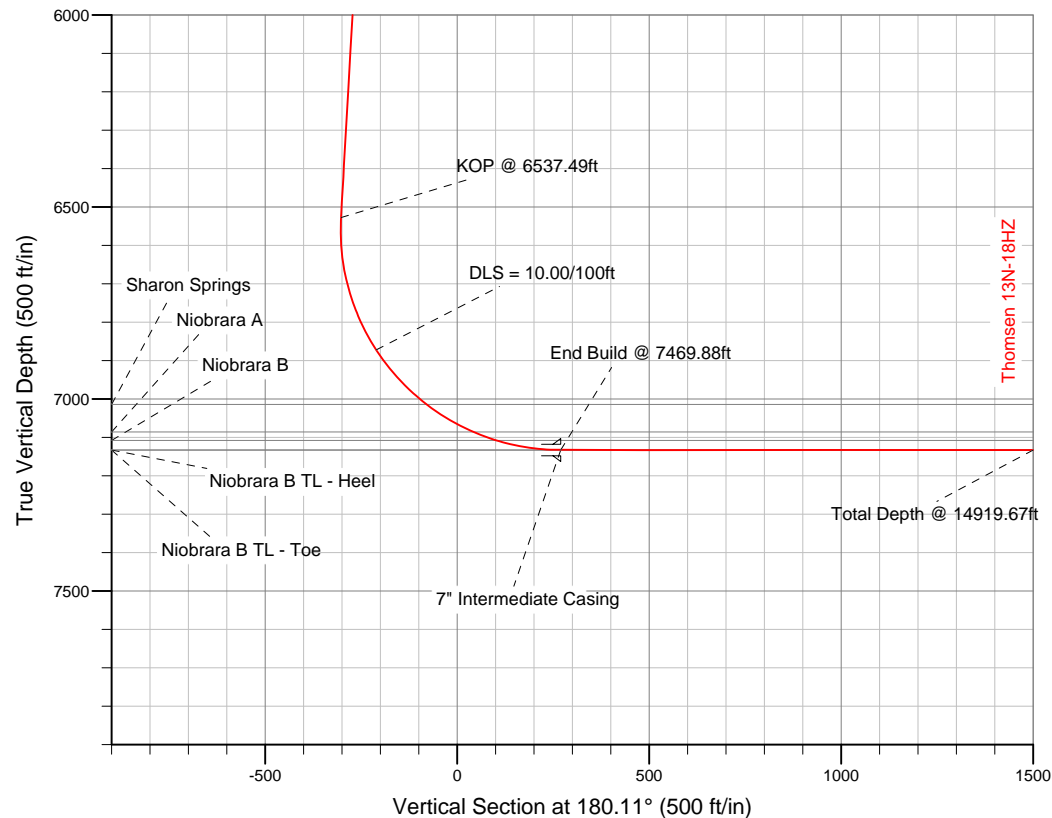
HALLIBURTON
Sperry Drilling

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	1272.83	3.46	20.57	1272.73	4.88	1.83	2.00	20.57	-4.88	
4	6537.49	3.46	20.57	6527.81	302.07	113.36	0.00	0.00	-302.28	
5	7469.88	90.00	180.11	7133.00	-270.00	125.00	10.00	159.51	269.76	Thomsen 13N-18HZ_CP
6	14919.67	90.00	180.11	7133.00	-7719.78	110.17	0.00	0.00	7719.56	Thomsen 13N-18HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Thomsen 13N-18HZ_SHL	0.00	0.00	0.00	40.153622	-104.714122	Point
Thomsen 13N-18HZ_BHL	7133.00	-7719.78	110.17	40.132431	-104.713728	Point
Thomsen 13N-18HZ_CP	7133.00	-270.00	125.00	40.152881	-104.713675	Point



*Footages are calculated from SHL and assume section lines parallel N/S and E/W.

WELL DETAILS: Thomsen 13N-18HZ

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

Plan: Plan A Rev 0 Permit (Thomsen 13N-18HZ/Plan A Rev 0)

Created By: Fred Hartmann Date: 01/08/2013
Reviewed: Date:

Plan Report for Thomsen 13N-18HZ - Plan A 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
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										
1,200.00	2.00	20.57	1,199.98	1.63	0.61	-1.64	2.00	2.00	0.00	20.57
1,272.83	3.46	20.57	1,272.73	4.88	1.83	-4.88	2.00	2.00	0.00	0.00
End Nudge @ 1272.83ft										
1,300.00	3.46	20.57	1,299.85	6.41	2.41	-6.42	0.00	0.00	0.00	0.00
1,400.00	3.46	20.57	1,399.66	12.06	4.53	-12.07	0.00	0.00	0.00	0.00
1,500.00	3.46	20.57	1,499.48	17.70	6.64	-17.72	0.00	0.00	0.00	0.00
1,600.00	3.46	20.57	1,599.30	23.35	8.76	-23.36	0.00	0.00	0.00	0.00
1,700.00	3.46	20.57	1,699.12	28.99	10.88	-29.01	0.00	0.00	0.00	0.00
1,800.00	3.46	20.57	1,798.94	34.64	13.00	-34.66	0.00	0.00	0.00	0.00
1,900.00	3.46	20.57	1,898.75	40.28	15.12	-40.31	0.00	0.00	0.00	0.00
2,000.00	3.46	20.57	1,998.57	45.93	17.24	-45.96	0.00	0.00	0.00	0.00
2,100.00	3.46	20.57	2,098.39	51.57	19.35	-51.61	0.00	0.00	0.00	0.00
2,200.00	3.46	20.57	2,198.21	57.22	21.47	-57.26	0.00	0.00	0.00	0.00
2,300.00	3.46	20.57	2,298.03	62.86	23.59	-62.91	0.00	0.00	0.00	0.00
2,400.00	3.46	20.57	2,397.84	68.51	25.71	-68.56	0.00	0.00	0.00	0.00
2,500.00	3.46	20.57	2,497.66	74.15	27.83	-74.21	0.00	0.00	0.00	0.00
2,600.00	3.46	20.57	2,597.48	79.80	29.95	-79.85	0.00	0.00	0.00	0.00
2,700.00	3.46	20.57	2,697.30	85.44	32.07	-85.50	0.00	0.00	0.00	0.00
2,800.00	3.46	20.57	2,797.12	91.09	34.18	-91.15	0.00	0.00	0.00	0.00
2,900.00	3.46	20.57	2,896.93	96.73	36.30	-96.80	0.00	0.00	0.00	0.00
3,000.00	3.46	20.57	2,996.75	102.38	38.42	-102.45	0.00	0.00	0.00	0.00
3,100.00	3.46	20.57	3,096.57	108.02	40.54	-108.10	0.00	0.00	0.00	0.00
3,200.00	3.46	20.57	3,196.39	113.67	42.66	-113.75	0.00	0.00	0.00	0.00
3,300.00	3.46	20.57	3,296.21	119.31	44.78	-119.40	0.00	0.00	0.00	0.00
3,400.00	3.46	20.57	3,396.03	124.96	46.90	-125.05	0.00	0.00	0.00	0.00
3,500.00	3.46	20.57	3,495.84	130.60	49.01	-130.70	0.00	0.00	0.00	0.00
3,600.00	3.46	20.57	3,595.66	136.25	51.13	-136.34	0.00	0.00	0.00	0.00
3,700.00	3.46	20.57	3,695.48	141.89	53.25	-141.99	0.00	0.00	0.00	0.00
3,800.00	3.46	20.57	3,795.30	147.54	55.37	-147.64	0.00	0.00	0.00	0.00
3,900.00	3.46	20.57	3,895.12	153.18	57.49	-153.29	0.00	0.00	0.00	0.00
4,000.00	3.46	20.57	3,994.93	158.83	59.61	-158.94	0.00	0.00	0.00	0.00
4,100.00	3.46	20.57	4,094.75	164.47	61.72	-164.59	0.00	0.00	0.00	0.00
4,200.00	3.46	20.57	4,194.57	170.12	63.84	-170.24	0.00	0.00	0.00	0.00
4,300.00	3.46	20.57	4,294.39	175.76	65.96	-175.89	0.00	0.00	0.00	0.00
4,400.00	3.46	20.57	4,394.21	181.41	68.08	-181.54	0.00	0.00	0.00	0.00
4,500.00	3.46	20.57	4,494.02	187.05	70.20	-187.19	0.00	0.00	0.00	0.00
4,600.00	3.46	20.57	4,593.84	192.70	72.32	-192.84	0.00	0.00	0.00	0.00
4,632.22	3.46	20.57	4,626.00	194.52	73.00	-194.65	0.00	0.00	0.00	0.00
Sussex										
4,700.00	3.46	20.57	4,693.66	198.34	74.44	-198.48	0.00	0.00	0.00	0.00
4,800.00	3.46	20.57	4,793.48	203.99	76.55	-204.13	0.00	0.00	0.00	0.00
4,900.00	3.46	20.57	4,893.30	209.63	78.67	-209.78	0.00	0.00	0.00	0.00
5,000.00	3.46	20.57	4,993.11	215.28	80.79	-215.43	0.00	0.00	0.00	0.00
5,100.00	3.46	20.57	5,092.93	220.92	82.91	-221.08	0.00	0.00	0.00	0.00
5,200.00	3.46	20.57	5,192.75	226.57	85.03	-226.73	0.00	0.00	0.00	0.00

Plan Report for Thomsen 13N-18HZ - Plan A 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 (°)
5,300.00	3.46	20.57	5,292.57	232.21	87.15	-232.38	0.00	0.00	0.00	0.00
5,400.00	3.46	20.57	5,392.39	237.86	89.26	-238.03	0.00	0.00	0.00	0.00
5,500.00	3.46	20.57	5,492.20	243.50	91.38	-243.68	0.00	0.00	0.00	0.00
5,600.00	3.46	20.57	5,592.02	249.15	93.50	-249.33	0.00	0.00	0.00	0.00
5,700.00	3.46	20.57	5,691.84	254.79	95.62	-254.97	0.00	0.00	0.00	0.00
5,800.00	3.46	20.57	5,791.66	260.44	97.74	-260.62	0.00	0.00	0.00	0.00
5,900.00	3.46	20.57	5,891.48	266.08	99.86	-266.27	0.00	0.00	0.00	0.00
6,000.00	3.46	20.57	5,991.29	271.73	101.98	-271.92	0.00	0.00	0.00	0.00
6,100.00	3.46	20.57	6,091.11	277.37	104.09	-277.57	0.00	0.00	0.00	0.00
6,200.00	3.46	20.57	6,190.93	283.02	106.21	-283.22	0.00	0.00	0.00	0.00
6,300.00	3.46	20.57	6,290.75	288.66	108.33	-288.87	0.00	0.00	0.00	0.00
6,400.00	3.46	20.57	6,390.57	294.31	110.45	-294.52	0.00	0.00	0.00	0.00
6,500.00	3.46	20.57	6,490.39	299.95	112.57	-300.17	0.00	0.00	0.00	0.00
6,537.49	3.46	20.57	6,527.81	302.07	113.36	-302.28	0.00	0.00	0.00	0.00
KOP @ 6537.49ft										
6,600.00	3.25	158.26	6,590.27	302.19	114.68	-302.41	10.00	-0.34	220.27	159.51
6,700.00	13.07	174.90	6,689.15	288.26	116.74	-288.49	10.00	9.82	16.64	21.89
6,800.00	23.04	177.27	6,784.11	257.38	118.68	-257.60	10.00	9.97	2.37	5.36
6,900.00	33.03	178.25	6,872.26	210.47	120.45	-210.70	10.00	9.99	0.98	3.09
DLS = 10.00/100ft										
7,000.00	43.03	178.82	6,950.93	148.96	121.99	-149.19	10.00	9.99	0.56	2.22
7,093.85	52.41	179.18	7,014.00	79.61	123.18	-79.85	10.00	10.00	0.39	1.77
Sharon Springs										
7,100.00	53.02	179.20	7,017.73	74.72	123.25	-74.96	10.00	10.00	0.33	1.53
7,200.00	63.02	179.50	7,070.62	-9.99	124.20	9.75	10.00	10.00	0.29	1.51
7,236.16	66.63	179.59	7,086.00	-42.71	124.46	42.47	10.00	10.00	0.26	1.36
Niobrara A										
7,299.98	73.01	179.74	7,108.00	-102.58	124.81	102.34	10.00	10.00	0.24	1.32
Niobrara B										
7,300.00	73.02	179.74	7,108.01	-102.60	124.81	102.36	10.00	10.00	0.23	1.26
7,400.00	83.01	179.97	7,128.75	-200.30	125.05	200.06	10.00	10.00	0.22	1.26
7,469.88	90.00	180.11	7,133.00	-270.00	125.00	269.76	10.00	10.00	0.21	1.22
End Build @ 7469.88ft - Niobrara B TL - Heel - 7" Intermediate Casing - Thomsen 13N-18HZ_CP										
7,500.00	90.00	180.11	7,133.00	-300.12	124.94	299.88	0.00	0.00	0.00	1.21
7,600.00	90.00	180.11	7,133.00	-400.12	124.74	399.88	0.00	0.00	0.00	0.00
7,700.00	90.00	180.11	7,133.00	-500.12	124.54	499.88	0.00	0.00	0.00	0.00
7,800.00	90.00	180.11	7,133.00	-600.12	124.34	599.88	0.00	0.00	0.00	0.00
7,900.00	90.00	180.11	7,133.00	-700.12	124.14	699.88	0.00	0.00	0.00	0.00
8,000.00	90.00	180.11	7,133.00	-800.12	123.94	799.88	0.00	0.00	0.00	0.00
8,100.00	90.00	180.11	7,133.00	-900.12	123.75	899.88	0.00	0.00	0.00	0.00
8,200.00	90.00	180.11	7,133.00	-1,000.12	123.55	999.88	0.00	0.00	0.00	0.00
8,300.00	90.00	180.11	7,133.00	-1,100.12	123.35	1,099.88	0.00	0.00	0.00	0.00
8,400.00	90.00	180.11	7,133.00	-1,200.12	123.15	1,199.88	0.00	0.00	0.00	0.00
8,500.00	90.00	180.11	7,133.00	-1,300.12	122.95	1,299.88	0.00	0.00	0.00	0.00
8,600.00	90.00	180.11	7,133.00	-1,400.12	122.75	1,399.88	0.00	0.00	0.00	0.00
8,700.00	90.00	180.11	7,133.00	-1,500.12	122.55	1,499.88	0.00	0.00	0.00	0.00
8,800.00	90.00	180.11	7,133.00	-1,600.12	122.35	1,599.88	0.00	0.00	0.00	0.00
8,900.00	90.00	180.11	7,133.00	-1,700.12	122.15	1,699.88	0.00	0.00	0.00	0.00
9,000.00	90.00	180.11	7,133.00	-1,800.12	121.95	1,799.88	0.00	0.00	0.00	0.00
9,100.00	90.00	180.11	7,133.00	-1,900.12	121.76	1,899.88	0.00	0.00	0.00	0.00
9,200.00	90.00	180.11	7,133.00	-2,000.12	121.56	1,999.88	0.00	0.00	0.00	0.00
9,300.00	90.00	180.11	7,133.00	-2,100.12	121.36	2,099.88	0.00	0.00	0.00	0.00
9,400.00	90.00	180.11	7,133.00	-2,200.12	121.16	2,199.88	0.00	0.00	0.00	0.00
9,500.00	90.00	180.11	7,133.00	-2,300.12	120.96	2,299.88	0.00	0.00	0.00	0.00
9,600.00	90.00	180.11	7,133.00	-2,400.12	120.76	2,399.88	0.00	0.00	0.00	0.00
9,700.00	90.00	180.11	7,133.00	-2,500.12	120.56	2,499.88	0.00	0.00	0.00	0.00
9,800.00	90.00	180.11	7,133.00	-2,600.12	120.36	2,599.88	0.00	0.00	0.00	0.00
9,900.00	90.00	180.11	7,133.00	-2,700.12	120.16	2,699.88	0.00	0.00	0.00	0.00
10,000.00	90.00	180.11	7,133.00	-2,800.12	119.96	2,799.88	0.00	0.00	0.00	0.00

Plan Report for Thomsen 13N-18HZ - Plan A 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 (°)
10,100.00	90.00	180.11	7,133.00	-2,900.12	119.76	2,899.88	0.00	0.00	0.00	0.00
10,200.00	90.00	180.11	7,133.00	-3,000.12	119.57	2,999.88	0.00	0.00	0.00	0.00
10,300.00	90.00	180.11	7,133.00	-3,100.12	119.37	3,099.88	0.00	0.00	0.00	0.00
10,400.00	90.00	180.11	7,133.00	-3,200.12	119.17	3,199.88	0.00	0.00	0.00	0.00
10,500.00	90.00	180.11	7,133.00	-3,300.12	118.97	3,299.88	0.00	0.00	0.00	0.00
10,600.00	90.00	180.11	7,133.00	-3,400.12	118.77	3,399.88	0.00	0.00	0.00	0.00
10,700.00	90.00	180.11	7,133.00	-3,500.12	118.57	3,499.88	0.00	0.00	0.00	0.00
10,800.00	90.00	180.11	7,133.00	-3,600.12	118.37	3,599.88	0.00	0.00	0.00	0.00
10,900.00	90.00	180.11	7,133.00	-3,700.12	118.17	3,699.88	0.00	0.00	0.00	0.00
11,000.00	90.00	180.11	7,133.00	-3,800.12	117.97	3,799.88	0.00	0.00	0.00	0.00
11,100.00	90.00	180.11	7,133.00	-3,900.12	117.77	3,899.88	0.00	0.00	0.00	0.00
11,200.00	90.00	180.11	7,133.00	-4,000.12	117.57	3,999.88	0.00	0.00	0.00	0.00
11,300.00	90.00	180.11	7,133.00	-4,100.12	117.38	4,099.88	0.00	0.00	0.00	0.00
11,400.00	90.00	180.11	7,133.00	-4,200.11	117.18	4,199.88	0.00	0.00	0.00	0.00
11,500.00	90.00	180.11	7,133.00	-4,300.11	116.98	4,299.88	0.00	0.00	0.00	0.00
11,600.00	90.00	180.11	7,133.00	-4,400.11	116.78	4,399.88	0.00	0.00	0.00	0.00
11,700.00	90.00	180.11	7,133.00	-4,500.11	116.58	4,499.88	0.00	0.00	0.00	0.00
11,800.00	90.00	180.11	7,133.00	-4,600.11	116.38	4,599.88	0.00	0.00	0.00	0.00
11,900.00	90.00	180.11	7,133.00	-4,700.11	116.18	4,699.88	0.00	0.00	0.00	0.00
12,000.00	90.00	180.11	7,133.00	-4,800.11	115.98	4,799.88	0.00	0.00	0.00	0.00
12,100.00	90.00	180.11	7,133.00	-4,900.11	115.78	4,899.88	0.00	0.00	0.00	0.00
12,200.00	90.00	180.11	7,133.00	-5,000.11	115.58	4,999.88	0.00	0.00	0.00	0.00
12,300.00	90.00	180.11	7,133.00	-5,100.11	115.39	5,099.88	0.00	0.00	0.00	0.00
12,400.00	90.00	180.11	7,133.00	-5,200.11	115.19	5,199.88	0.00	0.00	0.00	0.00
12,500.00	90.00	180.11	7,133.00	-5,300.11	114.99	5,299.88	0.00	0.00	0.00	0.00
12,600.00	90.00	180.11	7,133.00	-5,400.11	114.79	5,399.88	0.00	0.00	0.00	0.00
12,700.00	90.00	180.11	7,133.00	-5,500.11	114.59	5,499.88	0.00	0.00	0.00	0.00
12,800.00	90.00	180.11	7,133.00	-5,600.11	114.39	5,599.88	0.00	0.00	0.00	0.00
12,900.00	90.00	180.11	7,133.00	-5,700.11	114.19	5,699.88	0.00	0.00	0.00	0.00
13,000.00	90.00	180.11	7,133.00	-5,800.11	113.99	5,799.88	0.00	0.00	0.00	0.00
13,100.00	90.00	180.11	7,133.00	-5,900.11	113.79	5,899.88	0.00	0.00	0.00	0.00
13,200.00	90.00	180.11	7,133.00	-6,000.11	113.59	5,999.88	0.00	0.00	0.00	0.00
13,300.00	90.00	180.11	7,133.00	-6,100.11	113.39	6,099.88	0.00	0.00	0.00	0.00
13,400.00	90.00	180.11	7,133.00	-6,200.11	113.20	6,199.88	0.00	0.00	0.00	0.00
13,500.00	90.00	180.11	7,133.00	-6,300.11	113.00	6,299.88	0.00	0.00	0.00	0.00
13,600.00	90.00	180.11	7,133.00	-6,400.11	112.80	6,399.88	0.00	0.00	0.00	0.00
13,700.00	90.00	180.11	7,133.00	-6,500.11	112.60	6,499.88	0.00	0.00	0.00	0.00
13,800.00	90.00	180.11	7,133.00	-6,600.11	112.40	6,599.88	0.00	0.00	0.00	0.00
13,900.00	90.00	180.11	7,133.00	-6,700.11	112.20	6,699.88	0.00	0.00	0.00	0.00
14,000.00	90.00	180.11	7,133.00	-6,800.11	112.00	6,799.88	0.00	0.00	0.00	0.00
14,100.00	90.00	180.11	7,133.00	-6,900.11	111.80	6,899.88	0.00	0.00	0.00	0.00
14,200.00	90.00	180.11	7,133.00	-7,000.11	111.60	6,999.88	0.00	0.00	0.00	0.00
14,300.00	90.00	180.11	7,133.00	-7,100.11	111.40	7,099.88	0.00	0.00	0.00	0.00
14,400.00	90.00	180.11	7,133.00	-7,200.11	111.21	7,199.88	0.00	0.00	0.00	0.00
14,500.00	90.00	180.11	7,133.00	-7,300.11	111.01	7,299.88	0.00	0.00	0.00	0.00
14,600.00	90.00	180.11	7,133.00	-7,400.11	110.81	7,399.88	0.00	0.00	0.00	0.00
14,700.00	90.00	180.11	7,133.00	-7,500.11	110.61	7,499.88	0.00	0.00	0.00	0.00
14,800.00	90.00	180.11	7,133.00	-7,600.11	110.41	7,599.88	0.00	0.00	0.00	0.00
14,900.00	90.00	180.11	7,133.00	-7,700.11	110.21	7,699.88	0.00	0.00	0.00	0.00
14,919.66	90.00	180.11	7,133.00	-7,719.77	110.17	7,719.54	0.00	0.00	0.00	0.00
Niobrara B TL - Toe										
14,919.67	90.00	180.11	7,133.00	-7,719.78	110.17	7,719.55	0.00	0.00	0.00	0.00
Total Depth @ 14919.67ft - Thomsen 13N-18HZ_BHL										

Plan Report for Thomsen 13N-18HZ - Plan A 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
1,272.83	1,272.73	4.88	1.83	End Nudge @ 1272.83ft
6,537.49	6,527.81	302.07	113.36	KOP @ 6537.49ft
6,900.00	6,872.26	210.47	120.45	DLS = 10.00/100ft
7,469.88	7,133.00	-270.00	125.00	End Build @ 7469.88ft
14,919.67	7,133.00	-7,719.78	110.17	Total Depth @ 14919.67ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
User	No Target (Freehand)	180.11	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	14,919.67	Plan A Rev 0 Permit	MWD

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,469.88	7,133.00	7" Intermediate Casing	7	8-3/4

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,632.22	4,626.00	Sussex		0.00	
7,093.85	7,014.00	Sharon Springs		0.00	
7,236.16	7,086.00	Niobrara A		0.00	
7,299.98	7,108.00	Niobrara B		0.00	
7,469.88	7,133.00	Niobrara B TL - Heel		0.00	
14,919.66	7,133.00	Niobrara B TL - Toe		0.00	

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Thomsen 13N-18HZ_CP	7,133.00	-270.00	125.00	Point
Thomsen 13N-18HZ_BHL	7,133.00	-7,719.78	110.17	Point
Thomsen 13N-18HZ_SHL	0.00	0.00	0.00	Point

North Reference Sheet for Sec. 7-T2N-R65W - Thomsen 13N-18HZ - Plan A 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 13N-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: 1,299,781.20 ft N, 3,219,667.72 ft E

Geographical Coordinates of Well: 40° 09' 13.04" N, 104° 42' 50.84" W

Grid Convergence at Surface is: 0.51°

Based upon Minimum Curvature type calculations, at a Measured Depth of 14,919.67ft
the Bottom Hole Displacement is 7,720.56ft in the Direction of 179.18° (True).

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

