

# US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N  
2N-65W-08 Sunflower Pad  
SUNFLOWER 40C-17HZ

Plan A

Plan: Permit Rev-1

## Sperry Drilling Services Proposal Report

18 March, 2015

Well Coordinates: 14,582,858.97 N, 1,729,044.11 E (40° 09' 13.30" N, 104° 40' 58.15" W)  
Ground Level: 4,901.00 usft

Local Coordinate Origin:	Centered on Well SUNFLOWER 40C-17HZ
Viewing Datum:	RKB = 17' @ 4918.00usft (D Rig)
TVDs to System:	N
North Reference:	True
Unit System:	Dec-Deg - API - US Survey Feet - Custom

Version: 5000.1 Build: 70

**HALLIBURTON**

Project: WELD-NAD83-UTMFT13N  
Site: 2N-65W-08 Sunflower Pad  
Well: SUNFLOWER 40C-17HZ  
Wellbore: Plan A  
Design: Permit Rev-1

# US ROCKIES WATTENBERG PLANNING

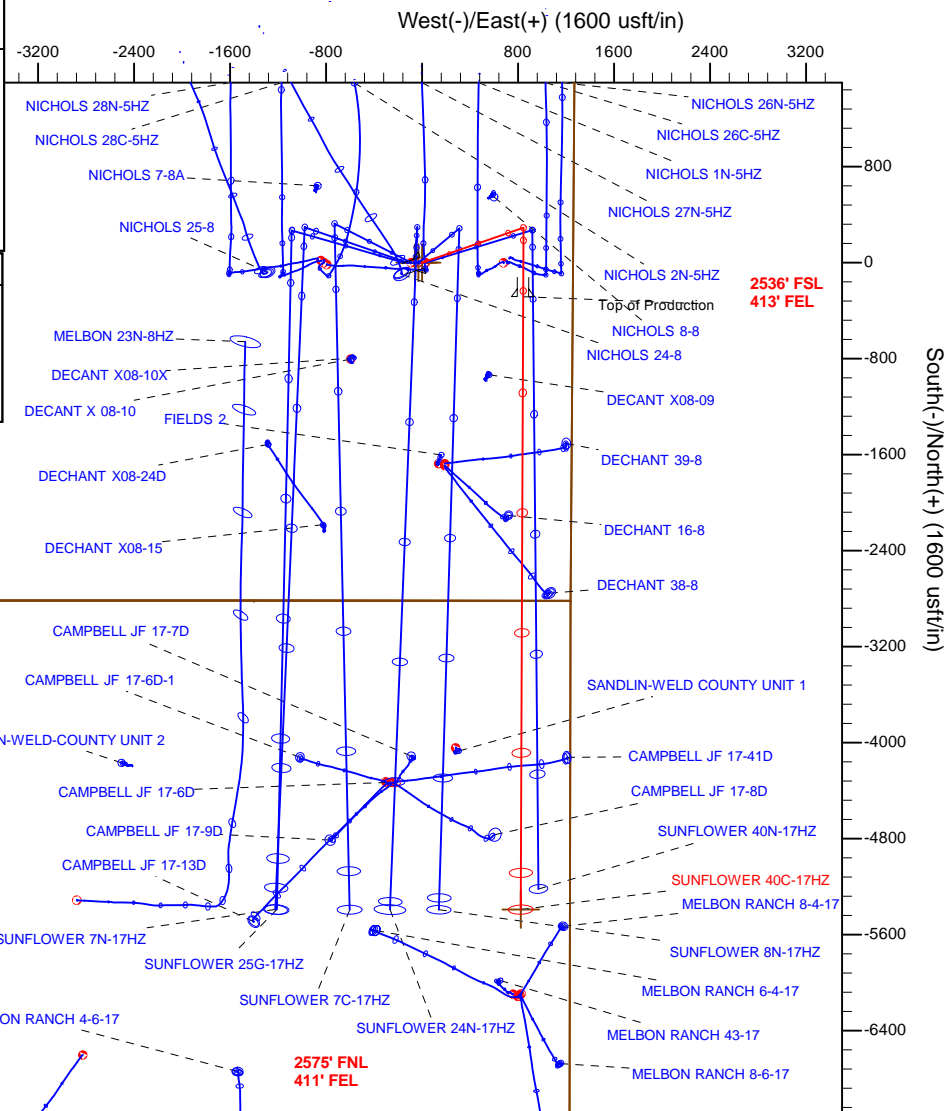
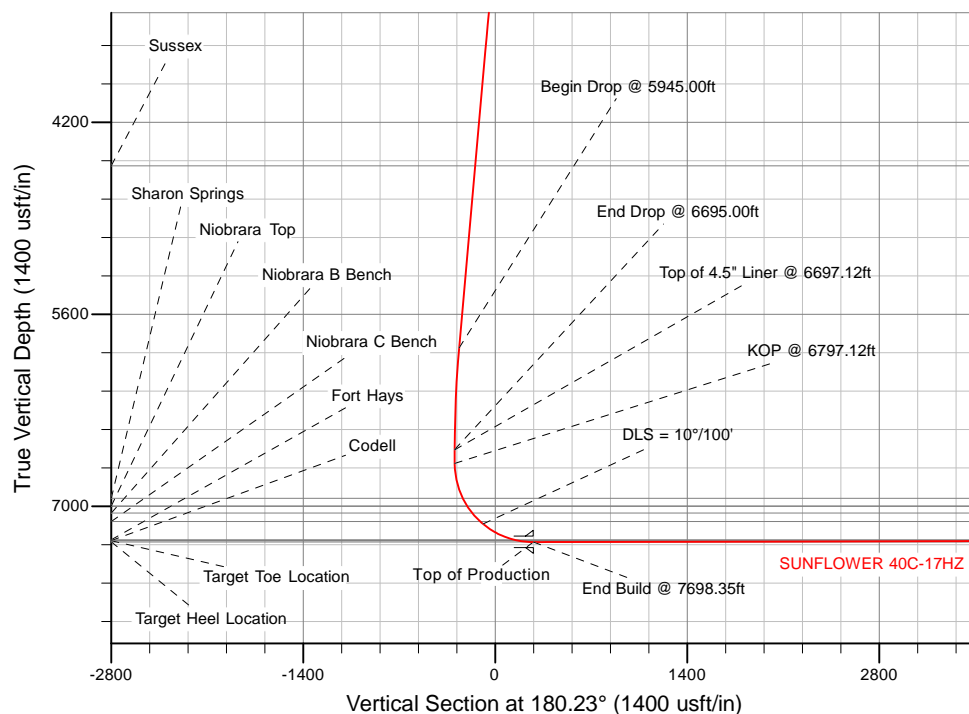
**HALLIBURTON**  
Sperry Drilling

## 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	2495.00	0.00	0.00	2495.00	0.00	0.00	0.00	0.00	0.00	
3	3245.00	15.00	71.00	3236.46	31.78	92.30	2.00	71.00	-32.15	
4	5945.00	15.00	71.00	5844.46	259.29	753.04	0.00	0.00	-262.31	
5	6695.00	0.00	0.00	6585.92	291.07	845.33	2.00	180.00	-294.46	
6	6797.12	0.00	0.00	6688.04	291.07	845.33	0.00	0.00	-294.46	
7	7698.35	90.12	180.23	7261.00	-283.12	843.03	10.00	180.23	279.73	
8	12806.20	90.12	180.23	7250.00	-5390.91	822.52	0.00	0.00	5387.56	SUNFLOWER 40C-17HZ_BHL

## WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
SUNFLOWER 40C-17HZ_SHL	0.00	0.00	0.00	40.153695	-104.682819	Point
SUNFLOWER 40C-17HZ_BHL	7250.00	-5390.91	822.52	40.138891	-104.679876	Point



TVD MD  
6688.04 6797.12 KOP @ 6797.12ft

## WELL DETAILS: SUNFLOWER 40C-17HZ

Ground Level: 4901.00

RKB = 17' @ 4918.00usft (D Rig)

Plan: Permit Rev-1 (SUNFLOWER 40C-17HZ/Plan A)

Created By: Clint Eshelman

Date: 2/25/2015

Reviewed:

Date:

## Plan Report for SUNFLOWER 40C-17HZ - Permit Rev-1

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
<b>SUNFLOWER 40C-17HZ_SHL - 2N-R65W-Sec. 17_Section lines - 2N-R65W-Sec. 8_Section lines</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
1,315.00	0.00	0.00	1,315.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>9 5/8"</b>										
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,495.00	0.00	0.00	2,495.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Begin Nudge @ 2495.00ft</b>										
2,500.00	0.10	71.00	2,500.00	0.00	0.00	0.00	2.00	2.00	0.00	71.00
2,600.00	2.10	71.00	2,599.98	0.63	1.82	-0.63	2.00	2.00	0.00	0.00
2,700.00	4.10	71.00	2,699.83	2.39	6.93	-2.41	2.00	2.00	0.00	0.00
2,800.00	6.10	71.00	2,799.42	5.28	15.34	-5.34	2.00	2.00	0.00	0.00
2,900.00	8.10	71.00	2,898.65	9.30	27.02	-9.41	2.00	2.00	0.00	0.00
3,000.00	10.10	71.00	2,997.39	14.45	41.98	-14.62	2.00	2.00	0.00	0.00
3,100.00	12.10	71.00	3,095.51	20.72	60.18	-20.96	2.00	2.00	0.00	0.00
3,200.00	14.10	71.00	3,192.91	28.10	81.61	-28.43	2.00	2.00	0.00	0.00
3,245.00	15.00	71.00	3,236.46	31.78	92.30	-32.15	2.00	2.00	0.00	0.00
<b>End Nudge @ 3245.00ft</b>										
3,300.00	15.00	71.00	3,289.59	36.41	105.76	-36.84	0.00	0.00	0.00	0.00
3,400.00	15.00	71.00	3,386.18	44.84	130.23	-45.36	0.00	0.00	0.00	0.00
3,500.00	15.00	71.00	3,482.77	53.27	154.70	-53.89	0.00	0.00	0.00	0.00
3,600.00	15.00	71.00	3,579.37	61.69	179.17	-62.41	0.00	0.00	0.00	0.00
3,700.00	15.00	71.00	3,675.96	70.12	203.64	-70.94	0.00	0.00	0.00	0.00
3,800.00	15.00	71.00	3,772.55	78.55	228.12	-79.46	0.00	0.00	0.00	0.00
3,900.00	15.00	71.00	3,869.14	86.97	252.59	-87.99	0.00	0.00	0.00	0.00
4,000.00	15.00	71.00	3,965.74	95.40	277.06	-96.51	0.00	0.00	0.00	0.00
4,100.00	15.00	71.00	4,062.33	103.83	301.53	-105.04	0.00	0.00	0.00	0.00
4,200.00	15.00	71.00	4,158.92	112.25	326.00	-113.56	0.00	0.00	0.00	0.00
4,300.00	15.00	71.00	4,255.51	120.68	350.47	-122.08	0.00	0.00	0.00	0.00
4,400.00	15.00	71.00	4,352.11	129.10	374.95	-130.61	0.00	0.00	0.00	0.00
4,500.00	15.00	71.00	4,448.70	137.53	399.42	-139.13	0.00	0.00	0.00	0.00
4,571.75	15.00	71.00	4,518.00	143.58	416.98	-145.25	0.00	0.00	0.00	0.00
<b>Sussex</b>										
4,600.00	15.00	71.00	4,545.29	145.96	423.89	-147.66	0.00	0.00	0.00	0.00
4,700.00	15.00	71.00	4,641.88	154.38	448.36	-156.18	0.00	0.00	0.00	0.00
4,800.00	15.00	71.00	4,738.48	162.81	472.83	-164.71	0.00	0.00	0.00	0.00

## Plan Report for SUNFLOWER 40C-17HZ - Permit Rev-1

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 (°)
4,900.00	15.00	71.00	4,835.07	171.24	497.31	-173.23	0.00	0.00	0.00	0.00
5,000.00	15.00	71.00	4,931.66	179.66	521.78	-181.76	0.00	0.00	0.00	0.00
5,100.00	15.00	71.00	5,028.25	188.09	546.25	-190.28	0.00	0.00	0.00	0.00
5,200.00	15.00	71.00	5,124.85	196.52	570.72	-198.80	0.00	0.00	0.00	0.00
5,300.00	15.00	71.00	5,221.44	204.94	595.19	-207.33	0.00	0.00	0.00	0.00
5,400.00	15.00	71.00	5,318.03	213.37	619.66	-215.85	0.00	0.00	0.00	0.00
5,500.00	15.00	71.00	5,414.62	221.79	644.14	-224.38	0.00	0.00	0.00	0.00
5,600.00	15.00	71.00	5,511.22	230.22	668.61	-232.90	0.00	0.00	0.00	0.00
5,700.00	15.00	71.00	5,607.81	238.65	693.08	-241.43	0.00	0.00	0.00	0.00
5,800.00	15.00	71.00	5,704.40	247.07	717.55	-249.95	0.00	0.00	0.00	0.00
5,900.00	15.00	71.00	5,801.00	255.50	742.02	-258.48	0.00	0.00	0.00	0.00
5,945.00	15.00	71.00	5,844.46	259.29	753.04	-262.31	0.00	0.00	0.00	0.00
<b>Begin Drop @ 5945.00ft</b>										
6,000.00	13.90	71.00	5,897.72	263.76	766.01	-266.83	2.00	-2.00	0.00	180.00
6,100.00	11.90	71.00	5,995.19	271.03	787.12	-274.18	2.00	-2.00	0.00	180.00
6,200.00	9.90	71.00	6,093.38	277.18	805.00	-280.41	2.00	-2.00	0.00	180.00
6,300.00	7.90	71.00	6,192.17	282.22	819.63	-285.51	2.00	-2.00	0.00	180.00
6,400.00	5.90	71.00	6,291.44	286.13	830.98	-289.46	2.00	-2.00	0.00	180.00
6,500.00	3.90	71.00	6,391.07	288.91	839.06	-292.28	2.00	-2.00	0.00	180.00
6,600.00	1.90	71.00	6,490.94	290.56	843.84	-293.94	2.00	-2.00	0.00	180.00
6,695.00	0.00	0.00	6,585.92	291.07	845.33	-294.46	2.00	-2.00	0.00	-180.00
<b>End Drop @ 6695.00ft</b>										
6,697.12	0.00	0.00	6,588.04	291.07	845.33	-294.46	0.00	0.00	0.00	0.00
<b>Top of 4.5" Liner @ 6697.12ft</b>										
6,700.00	0.00	0.00	6,590.92	291.07	845.33	-294.46	0.00	0.00	0.00	0.00
6,797.12	0.00	0.00	6,688.04	291.07	845.33	-294.46	0.00	0.00	0.00	0.00
<b>KOP @ 6797.12ft</b>										
6,800.00	0.29	180.23	6,690.92	291.06	845.33	-294.46	10.00	10.00	0.00	180.23
6,900.00	10.29	180.23	6,790.37	281.86	845.30	-285.25	10.00	10.00	0.00	0.00
7,000.00	20.29	180.23	6,886.71	255.53	845.19	-258.92	10.00	10.00	0.00	0.00
7,060.16	26.30	180.23	6,941.94	231.75	845.10	-235.14	10.00	10.00	0.00	0.00
<b>Sharon Springs</b>										
7,100.00	30.29	180.23	6,977.01	212.86	845.02	-216.25	10.00	10.00	0.00	0.00
7,123.36	32.62	180.23	6,996.94	200.67	844.97	-204.06	10.00	10.00	0.00	0.00
<b>Niobrara Top</b>										
7,187.90	39.08	180.23	7,049.22	162.90	844.82	-166.29	10.00	10.00	0.00	0.00
<b>Niobrara B Bench</b>										
7,200.00	40.29	180.23	7,058.54	155.17	844.79	-158.56	10.00	10.00	0.00	0.00
7,271.63	47.45	180.23	7,110.14	105.56	844.59	-108.95	10.00	10.00	0.00	0.00
<b>Niobrara C Bench</b>										
7,300.00	50.29	180.23	7,128.80	84.19	844.50	-87.58	10.00	10.00	0.00	0.00
<b>DLS = 10°/100'</b>										
7,400.00	60.29	180.23	7,185.67	2.10	844.17	-5.49	10.00	10.00	0.00	0.00
7,500.00	70.29	180.23	7,227.43	-88.63	843.81	85.24	10.00	10.00	0.00	0.00
7,553.68	75.66	180.23	7,243.14	-139.94	843.60	136.55	10.00	10.00	0.00	0.00
<b>Fort Hays</b>										
7,580.83	78.37	180.23	7,249.24	-166.39	843.50	163.00	10.00	10.00	0.00	0.00
<b>Codell</b>										
7,600.00	80.29	180.23	7,252.79	-185.23	843.42	181.84	10.00	10.00	0.00	0.00
7,698.35	90.12	180.23	7,261.00	-283.11	843.03	279.73	10.00	10.00	0.00	0.00
<b>End Build @ 7698.35ft - Target Heel Location - Top of Production</b>										
7,700.00	90.12	180.23	7,261.00	-284.76	843.02	281.38	0.02	0.02	0.00	0.00
7,800.00	90.12	180.23	7,260.78	-384.76	842.62	381.37	0.00	0.00	0.00	0.00
7,900.00	90.12	180.23	7,260.57	-484.76	842.22	481.37	0.00	0.00	0.00	0.00
8,000.00	90.12	180.23	7,260.35	-584.76	841.82	581.37	0.00	0.00	0.00	0.00
8,100.00	90.12	180.23	7,260.14	-684.76	841.42	681.37	0.00	0.00	0.00	0.00
8,200.00	90.12	180.23	7,259.92	-784.76	841.01	781.37	0.00	0.00	0.00	0.00
8,300.00	90.12	180.23	7,259.70	-884.76	840.61	881.37	0.00	0.00	0.00	0.00

## Plan Report for SUNFLOWER 40C-17HZ - Permit Rev-1

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 (°)
8,400.00	90.12	180.23	7,259.49	-984.75	840.21	981.37	0.00	0.00	0.00	0.00
8,500.00	90.12	180.23	7,259.27	-1,084.75	839.81	1,081.37	0.00	0.00	0.00	0.00
8,600.00	90.12	180.23	7,259.06	-1,184.75	839.41	1,181.37	0.00	0.00	0.00	0.00
8,700.00	90.12	180.23	7,258.84	-1,284.75	839.01	1,281.37	0.00	0.00	0.00	0.00
8,800.00	90.12	180.23	7,258.63	-1,384.75	838.61	1,381.37	0.00	0.00	0.00	0.00
8,900.00	90.12	180.23	7,258.41	-1,484.75	838.20	1,481.37	0.00	0.00	0.00	0.00
9,000.00	90.12	180.23	7,258.20	-1,584.75	837.80	1,581.37	0.00	0.00	0.00	0.00
9,100.00	90.12	180.23	7,257.98	-1,684.75	837.40	1,681.37	0.00	0.00	0.00	0.00
9,200.00	90.12	180.23	7,257.77	-1,784.75	837.00	1,781.37	0.00	0.00	0.00	0.00
9,300.00	90.12	180.23	7,257.55	-1,884.74	836.60	1,881.37	0.00	0.00	0.00	0.00
9,400.00	90.12	180.23	7,257.34	-1,984.74	836.20	1,981.37	0.00	0.00	0.00	0.00
9,500.00	90.12	180.23	7,257.12	-2,084.74	835.79	2,081.37	0.00	0.00	0.00	0.00
9,600.00	90.12	180.23	7,256.90	-2,184.74	835.39	2,181.37	0.00	0.00	0.00	0.00
9,700.00	90.12	180.23	7,256.69	-2,284.74	834.99	2,281.37	0.00	0.00	0.00	0.00
9,800.00	90.12	180.23	7,256.47	-2,384.74	834.59	2,381.37	0.00	0.00	0.00	0.00
9,900.00	90.12	180.23	7,256.26	-2,484.74	834.19	2,481.37	0.00	0.00	0.00	0.00
10,000.00	90.12	180.23	7,256.04	-2,584.74	833.79	2,581.37	0.00	0.00	0.00	0.00
10,100.00	90.12	180.23	7,255.83	-2,684.74	833.39	2,681.37	0.00	0.00	0.00	0.00
10,200.00	90.12	180.23	7,255.61	-2,784.74	832.98	2,781.37	0.00	0.00	0.00	0.00
10,300.00	90.12	180.23	7,255.40	-2,884.73	832.58	2,881.37	0.00	0.00	0.00	0.00
10,400.00	90.12	180.23	7,255.18	-2,984.73	832.18	2,981.37	0.00	0.00	0.00	0.00
10,500.00	90.12	180.23	7,254.97	-3,084.73	831.78	3,081.37	0.00	0.00	0.00	0.00
10,600.00	90.12	180.23	7,254.75	-3,184.73	831.38	3,181.37	0.00	0.00	0.00	0.00
10,700.00	90.12	180.23	7,254.54	-3,284.73	830.98	3,281.37	0.00	0.00	0.00	0.00
10,800.00	90.12	180.23	7,254.32	-3,384.73	830.58	3,381.37	0.00	0.00	0.00	0.00
10,900.00	90.12	180.23	7,254.11	-3,484.73	830.17	3,481.37	0.00	0.00	0.00	0.00
11,000.00	90.12	180.23	7,253.89	-3,584.73	829.77	3,581.37	0.00	0.00	0.00	0.00
11,100.00	90.12	180.23	7,253.67	-3,684.73	829.37	3,681.37	0.00	0.00	0.00	0.00
11,200.00	90.12	180.23	7,253.46	-3,784.73	828.97	3,781.37	0.00	0.00	0.00	0.00
11,300.00	90.12	180.23	7,253.24	-3,884.72	828.57	3,881.37	0.00	0.00	0.00	0.00
11,400.00	90.12	180.23	7,253.03	-3,984.72	828.17	3,981.37	0.00	0.00	0.00	0.00
11,500.00	90.12	180.23	7,252.81	-4,084.72	827.77	4,081.37	0.00	0.00	0.00	0.00
11,600.00	90.12	180.23	7,252.60	-4,184.72	827.36	4,181.37	0.00	0.00	0.00	0.00
11,700.00	90.12	180.23	7,252.38	-4,284.72	826.96	4,281.37	0.00	0.00	0.00	0.00
11,800.00	90.12	180.23	7,252.17	-4,384.72	826.56	4,381.37	0.00	0.00	0.00	0.00
11,900.00	90.12	180.23	7,251.95	-4,484.72	826.16	4,481.37	0.00	0.00	0.00	0.00
12,000.00	90.12	180.23	7,251.74	-4,584.72	825.76	4,581.37	0.00	0.00	0.00	0.00
12,100.00	90.12	180.23	7,251.52	-4,684.72	825.36	4,681.36	0.00	0.00	0.00	0.00
12,200.00	90.12	180.23	7,251.31	-4,784.71	824.95	4,781.36	0.00	0.00	0.00	0.00
12,300.00	90.12	180.23	7,251.09	-4,884.71	824.55	4,881.36	0.00	0.00	0.00	0.00
12,400.00	90.12	180.23	7,250.87	-4,984.71	824.15	4,981.36	0.00	0.00	0.00	0.00
12,500.00	90.12	180.23	7,250.66	-5,084.71	823.75	5,081.36	0.00	0.00	0.00	0.00
12,600.00	90.12	180.23	7,250.44	-5,184.71	823.35	5,181.36	0.00	0.00	0.00	0.00
12,700.00	90.12	180.23	7,250.23	-5,284.71	822.95	5,281.36	0.00	0.00	0.00	0.00
12,800.00	90.12	180.23	7,250.01	-5,384.71	822.55	5,381.36	0.00	0.00	0.00	0.00
12,806.19	90.12	180.23	7,250.00	-5,390.90	822.52	5,387.55	0.00	0.00	0.00	0.00

## Target Toe Location

12,806.20	90.12	180.23	7,250.00	-5,390.91	822.52	5,387.56	0.00	0.00	0.00	0.00
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## TD Well @ 12806.20ft - SUNFLOWER 40C-17HZ\_BHL

## Plan Report for SUNFLOWER 40C-17HZ - Permit Rev-1

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,495.00	2,495.00	0.00	0.00	Begin Nudge @ 2495.00ft
3,245.00	3,236.46	31.78	92.30	End Nudge @ 3245.00ft
5,945.00	5,844.46	259.29	753.04	Begin Drop @ 5945.00ft
6,695.00	6,585.92	291.07	845.33	End Drop @ 6695.00ft
6,697.12	6,588.04	291.07	845.33	Top of 4.5" Liner @ 6697.12ft
6,797.12	6,688.04	291.07	845.33	KOP @ 6797.12ft
7,300.00	7,128.80	84.19	844.50	DLS = 10°/100'
7,698.35	7,261.00	-283.11	843.03	End Build @ 7698.35ft
12,806.20	7,250.00	-5,390.91	822.52	TD Well @ 12806.20ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	180.23	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,698.35	Permit Rev-1	APC_ISCWSA REV 2 MWD+IFR1
7,698.35	12,806.20	Permit Rev-1	APC_ISCWSA REV 2 MWD+IFR1

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,315.00	1,315.00	9 5/8"	9-5/8	13-1/2
7,698.35	7,261.00	Top of Production	5-1/2	7-7/8

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,571.75	4,518.00	Sussex		0.00	
7,060.16	6,941.94	Sharon Springs		0.00	
7,123.36	6,996.94	Niobrara Top		0.00	
7,187.90	7,049.22	Niobrara B Bench		0.00	
7,271.63	7,110.14	Niobrara C Bench		0.00	
7,553.68	7,243.14	Fort Hays		0.00	
7,580.83	7,249.24	Codell		0.00	
7,698.35	7,261.00	Target Heel Location		0.00	
12,806.19	7,250.00	Target Toe Location		0.00	

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Plan Report for SUNFLOWER 40C-17HZ - Permit Rev-1

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*Targets associated with this wellbore*

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
SUNFLOWER 40C-17HZ_SHL	0.00	0.00	0.00	Point
2N-R65W-Sec. 17_Section lines	0.00	0.00	-29.90	Polygon
SUNFLOWER 40C-17HZ_BHL	7,250.00	-5,390.91	822.52	Point
2N-R65W-Sec. 8_Section lines	0.00	0.00	-60.08	Polygon

## North Reference Sheet for 2N-65W-08 Sunflower Pad - SUNFLOWER 40C-17HZ - 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' @ 4918.00usft (D Rig). Northing and Easting are relative to SUNFLOWER 40C-17HZ

Coordinate System is Universal Transverse Mercator (US Survey Feet), Zone 13N (108 W to 102 W) using datum North American Datum 1983, ellipsoid

Projection method is Transverse Mercator (Gauss-Kruger)

Central Meridian is -105.00°, Longitude Origin:0.000000°, Latitude Origin:0.000000°

False Easting: 1,640,416.67usft, False Northing: 0.00usft, Scale Reduction: 0.99960898

Grid Coordinates of Well: 14,582,858.97 usft N, 1,729,044.11 usft E

Geographical Coordinates of Well: 40° 09' 13.30" N, 104° 40' 58.15" W

Grid Convergence at Surface is: 0.20°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,806.20usft the Bottom Hole Displacement is 5,453.29usft in the Direction of 171.32° (True).

Magnetic Convergence at surface is: -8.10° (17 February 2015, , IGRF2010)

