

# US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N  
2N-65W-08 Sunflower Pad  
SUNFLOWER 24N-17HZ

Plan A

Plan: Permit Rev-1

## Sperry Drilling Services Proposal Report

18 March, 2015

Well Coordinates: 14,582,858.75 N, 1,728,984.04 E (40° 09' 13.30" N, 104° 40' 58.92" W)  
Ground Level: 4,901.00 usft

Local Coordinate Origin:	Centered on Well SUNFLOWER 24N-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 24N-17HZ  
Wellbore: Plan A  
Design: Permit Rev-1

# US ROCKIES WATTENBERG PLANNING

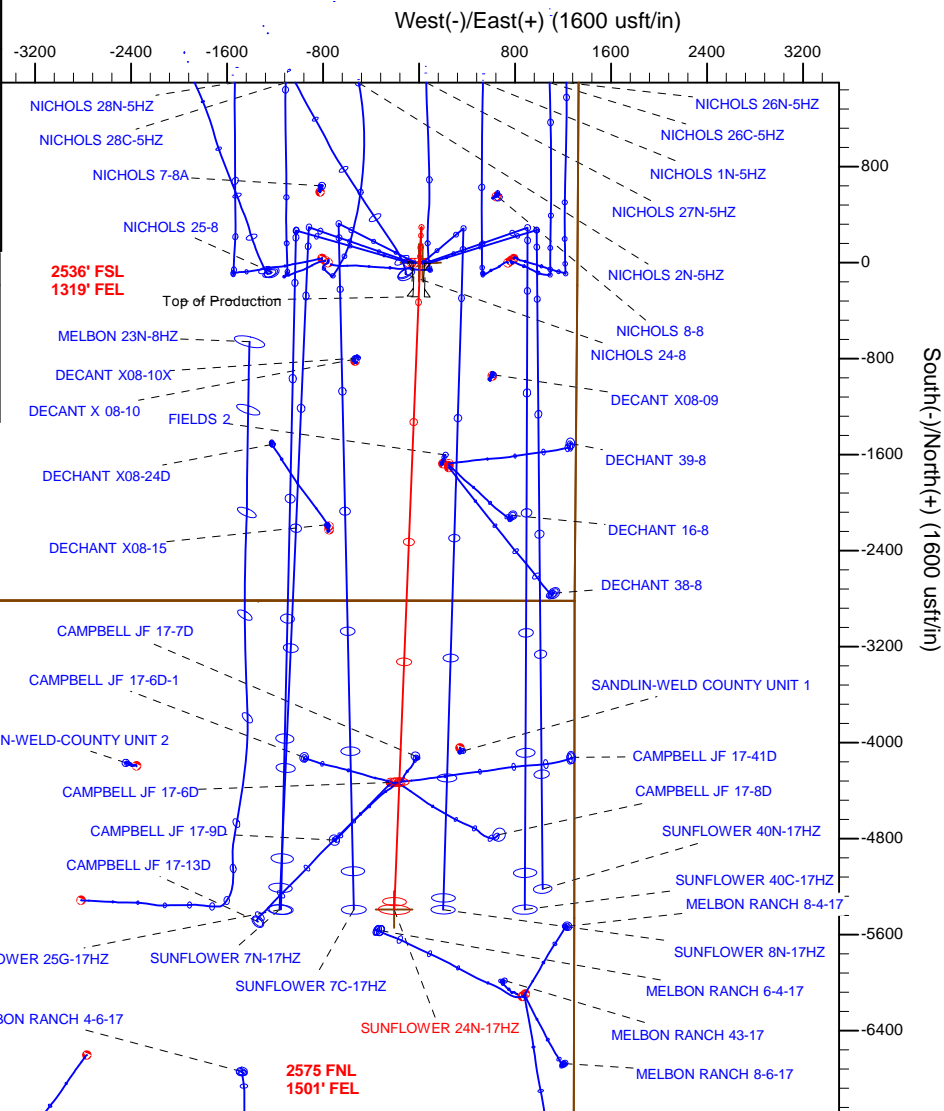
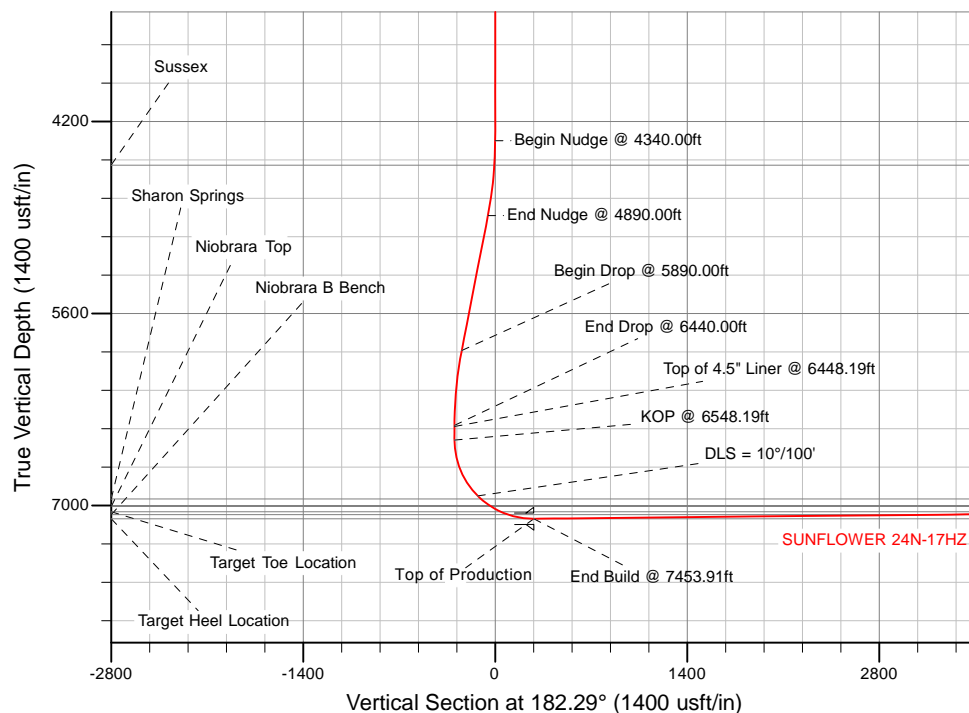
**HALLIBURTON**  
Sperry Drilling

## SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	4340.00	0.00	0.00	4340.00	0.00	0.00	0.00	0.00	0.00	
3	4890.00	11.00	4.00	4886.63	52.51	3.67	2.00	4.00	-52.61	
4	5890.00	11.00	4.00	5868.25	242.85	16.98	0.00	0.00	-243.33	
5	6440.00	0.00	0.00	6414.88	295.36	20.65	2.00	-180.00	-295.95	
6	6548.19	0.00	0.00	6523.07	295.36	20.65	0.00	0.00	-295.95	
7	7453.91	90.57	182.29	7096.00	-282.85	-2.50	10.00	182.29	282.73	
8	12566.32	90.57	182.29	7045.00	-5390.92	-207.05	0.00	0.00	5394.89	SUNFLOWER 24N-17HZ_BHL

## WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
SUNFLOWER 24N-17HZ_SHL	0.00	0.00	0.00	40.153695	-104.683034	Point
SUNFLOWER 24N-17HZ_BHL	7045.00	-5390.92	-207.05	40.138891	-104.683775	Point



TVD MD  
6523.07 6548.19 KOP @ 6548.19ft

## WELL DETAILS: SUNFLOWER 24N-17HZ

Ground Level: 4901.00

RKB = 17' @ 4918.00usft (D Rig)

Plan: Permit Rev-1 (SUNFLOWER 24N-17HZ/Plan A)

Created By: Clint Eshelman

Date: 2/25/2015

Reviewed:

Date:

## Plan Report for SUNFLOWER 24N-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
2N-R65W-Sec. 17_Section lines - SUNFLOWER 24N-17HZ_SHL - 2N-R65W-Sec. 8_Section lines										
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
9 5/8"										
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
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,340.00	0.00	0.00	4,340.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 4340.00ft										
4,400.00	1.20	4.00	4,400.00	0.63	0.04	-0.63	2.00	2.00	0.00	4.00
4,500.00	3.20	4.00	4,499.92	4.46	0.31	-4.46	2.00	2.00	0.00	0.00
4,518.11	3.56	4.00	4,518.00	5.52	0.39	-5.53	2.00	2.00	0.00	0.00
Sussex										
4,600.00	5.20	4.00	4,599.64	11.76	0.82	-11.79	2.00	2.00	0.00	0.00
4,700.00	7.20	4.00	4,699.05	22.53	1.58	-22.58	2.00	2.00	0.00	0.00
4,800.00	9.20	4.00	4,798.03	36.76	2.57	-36.84	2.00	2.00	0.00	0.00
4,890.00	11.00	4.00	4,886.63	52.51	3.67	-52.61	2.00	2.00	0.00	0.00
End Nudge @ 4890.00ft										

## Plan Report for SUNFLOWER 24N-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	11.00	4.00	4,896.44	54.41	3.80	-54.52	0.00	0.00	0.00	0.00
5,000.00	11.00	4.00	4,994.61	73.44	5.14	-73.59	0.00	0.00	0.00	0.00
5,100.00	11.00	4.00	5,092.77	92.48	6.47	-92.66	0.00	0.00	0.00	0.00
5,200.00	11.00	4.00	5,190.93	111.51	7.80	-111.74	0.00	0.00	0.00	0.00
5,300.00	11.00	4.00	5,289.09	130.55	9.13	-130.81	0.00	0.00	0.00	0.00
5,400.00	11.00	4.00	5,387.26	149.58	10.46	-149.88	0.00	0.00	0.00	0.00
5,500.00	11.00	4.00	5,485.42	168.62	11.79	-168.95	0.00	0.00	0.00	0.00
5,600.00	11.00	4.00	5,583.58	187.65	13.12	-188.02	0.00	0.00	0.00	0.00
5,700.00	11.00	4.00	5,681.75	206.68	14.45	-207.10	0.00	0.00	0.00	0.00
5,800.00	11.00	4.00	5,779.91	225.72	15.78	-226.17	0.00	0.00	0.00	0.00
5,890.00	11.00	4.00	5,868.25	242.85	16.98	-243.33	0.00	0.00	0.00	0.00
<b>Begin Drop @ 5890.00ft</b>										
5,900.00	10.80	4.00	5,878.07	244.74	17.11	-245.22	2.00	-2.00	0.00	-180.00
6,000.00	8.80	4.00	5,976.61	261.72	18.30	-262.24	2.00	-2.00	0.00	-180.00
6,100.00	6.80	4.00	6,075.68	275.25	19.25	-275.80	2.00	-2.00	0.00	-180.00
6,200.00	4.80	4.00	6,175.16	285.33	19.95	-285.90	2.00	-2.00	0.00	-180.00
6,300.00	2.80	4.00	6,274.94	291.94	20.41	-292.53	2.00	-2.00	0.00	-180.00
6,400.00	0.80	4.00	6,374.88	295.08	20.63	-295.67	2.00	-2.00	0.00	-180.00
6,440.00	0.00	0.00	6,414.88	295.36	20.65	-295.95	2.00	-2.00	-10.00	-180.00
<b>End Drop @ 6440.00ft</b>										
6,448.19	0.00	0.00	6,423.07	295.36	20.65	-295.95	0.00	0.00	0.00	0.00
<b>Top of 4.5" Liner @ 6448.19ft</b>										
6,500.00	0.00	0.00	6,474.88	295.36	20.65	-295.95	0.00	0.00	0.00	0.00
6,548.19	0.00	0.00	6,523.07	295.36	20.65	-295.95	0.00	0.00	0.00	0.00
<b>KOP @ 6548.19ft</b>										
6,600.00	5.18	182.29	6,574.81	293.02	20.56	-293.60	10.00	10.00	-343.00	-177.71
6,700.00	15.18	182.29	6,673.11	275.38	19.85	-275.95	10.00	10.00	0.00	0.00
6,800.00	25.18	182.29	6,766.85	240.95	18.47	-241.50	10.00	10.00	0.00	0.00
6,900.00	35.18	182.29	6,853.19	190.78	16.47	-191.29	10.00	10.00	0.00	0.00
7,000.00	45.18	182.29	6,929.49	126.39	13.89	-126.85	10.00	10.00	0.00	0.00
<b>DLS = 10°/100'</b>										
7,032.66	48.45	182.29	6,951.84	102.60	12.93	-103.04	10.00	10.00	0.00	0.00
<b>Sharon Springs</b>										
7,100.00	55.18	182.29	6,993.45	49.75	10.82	-50.14	10.00	10.00	0.00	0.00
7,124.20	57.60	182.29	7,006.84	29.61	10.01	-29.99	10.00	10.00	0.00	0.00
<b>Niobrara Top</b>										
7,200.00	65.18	182.29	7,043.11	-36.83	7.35	36.51	10.00	10.00	0.00	0.00
7,259.93	71.17	182.29	7,065.38	-92.40	5.13	92.13	10.00	10.00	0.00	0.00
<b>Niobrara B Bench</b>										
7,300.00	75.18	182.29	7,076.97	-130.72	3.59	130.47	10.00	10.00	0.00	0.00
7,400.00	85.18	182.29	7,094.00	-229.05	-0.35	228.88	10.00	10.00	0.00	0.00
7,453.91	90.57	182.29	7,096.00	-282.86	-2.50	282.73	10.00	10.00	0.00	0.00
<b>End Build @ 7453.91ft - Target Heel Location - Top of Production</b>										
7,500.00	90.57	182.29	7,095.54	-328.91	-4.34	328.82	0.00	0.00	0.00	0.00
7,600.00	90.57	182.29	7,094.54	-428.82	-8.35	428.81	0.00	0.00	0.00	0.00
7,700.00	90.57	182.29	7,093.55	-528.74	-12.35	528.81	0.00	0.00	0.00	0.00
7,800.00	90.57	182.29	7,092.55	-628.65	-16.35	628.80	0.00	0.00	0.00	0.00
7,900.00	90.57	182.29	7,091.55	-728.57	-20.35	728.80	0.00	0.00	0.00	0.00
8,000.00	90.57	182.29	7,090.55	-828.48	-24.35	828.79	0.00	0.00	0.00	0.00
8,100.00	90.57	182.29	7,089.56	-928.40	-28.35	928.79	0.00	0.00	0.00	0.00
8,200.00	90.57	182.29	7,088.56	-1,028.31	-32.35	1,028.78	0.00	0.00	0.00	0.00
8,300.00	90.57	182.29	7,087.56	-1,128.23	-36.35	1,128.78	0.00	0.00	0.00	0.00
8,400.00	90.57	182.29	7,086.56	-1,228.14	-40.35	1,228.77	0.00	0.00	0.00	0.00
8,500.00	90.57	182.29	7,085.57	-1,328.06	-44.36	1,328.77	0.00	0.00	0.00	0.00
8,600.00	90.57	182.29	7,084.57	-1,427.97	-48.36	1,428.77	0.00	0.00	0.00	0.00
8,700.00	90.57	182.29	7,083.57	-1,527.89	-52.36	1,528.76	0.00	0.00	0.00	0.00
8,800.00	90.57	182.29	7,082.57	-1,627.80	-56.36	1,628.76	0.00	0.00	0.00	0.00
8,900.00	90.57	182.29	7,081.58	-1,727.72	-60.36	1,728.75	0.00	0.00	0.00	0.00

## Plan Report for SUNFLOWER 24N-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 (°)
9,000.00	90.57	182.29	7,080.58	-1,827.63	-64.36	1,828.75	0.00	0.00	0.00	0.00
9,100.00	90.57	182.29	7,079.58	-1,927.55	-68.36	1,928.74	0.00	0.00	0.00	0.00
9,200.00	90.57	182.29	7,078.58	-2,027.46	-72.36	2,028.74	0.00	0.00	0.00	0.00
9,300.00	90.57	182.29	7,077.58	-2,127.38	-76.36	2,128.73	0.00	0.00	0.00	0.00
9,400.00	90.57	182.29	7,076.59	-2,227.29	-80.36	2,228.73	0.00	0.00	0.00	0.00
9,500.00	90.57	182.29	7,075.59	-2,327.21	-84.37	2,328.72	0.00	0.00	0.00	0.00
9,600.00	90.57	182.29	7,074.59	-2,427.12	-88.37	2,428.72	0.00	0.00	0.00	0.00
9,700.00	90.57	182.29	7,073.59	-2,527.04	-92.37	2,528.71	0.00	0.00	0.00	0.00
9,800.00	90.57	182.29	7,072.60	-2,626.95	-96.37	2,628.71	0.00	0.00	0.00	0.00
9,900.00	90.57	182.29	7,071.60	-2,726.87	-100.37	2,728.70	0.00	0.00	0.00	0.00
10,000.00	90.57	182.29	7,070.60	-2,826.78	-104.37	2,828.70	0.00	0.00	0.00	0.00
10,100.00	90.57	182.29	7,069.60	-2,926.70	-108.37	2,928.69	0.00	0.00	0.00	0.00
10,200.00	90.57	182.29	7,068.61	-3,026.61	-112.37	3,028.69	0.00	0.00	0.00	0.00
10,300.00	90.57	182.29	7,067.61	-3,126.53	-116.37	3,128.68	0.00	0.00	0.00	0.00
10,400.00	90.57	182.29	7,066.61	-3,226.44	-120.37	3,228.68	0.00	0.00	0.00	0.00
10,500.00	90.57	182.29	7,065.61	-3,326.36	-124.38	3,328.67	0.00	0.00	0.00	0.00
10,600.00	90.57	182.29	7,064.62	-3,426.27	-128.38	3,428.67	0.00	0.00	0.00	0.00
10,700.00	90.57	182.29	7,063.62	-3,526.19	-132.38	3,528.66	0.00	0.00	0.00	0.00
10,800.00	90.57	182.29	7,062.62	-3,626.10	-136.38	3,628.66	0.00	0.00	0.00	0.00
10,900.00	90.57	182.29	7,061.62	-3,726.02	-140.38	3,728.65	0.00	0.00	0.00	0.00
11,000.00	90.57	182.29	7,060.63	-3,825.93	-144.38	3,828.65	0.00	0.00	0.00	0.00
11,100.00	90.57	182.29	7,059.63	-3,925.85	-148.38	3,928.64	0.00	0.00	0.00	0.00
11,200.00	90.57	182.29	7,058.63	-4,025.76	-152.38	4,028.64	0.00	0.00	0.00	0.00
11,300.00	90.57	182.29	7,057.63	-4,125.68	-156.38	4,128.63	0.00	0.00	0.00	0.00
11,400.00	90.57	182.29	7,056.64	-4,225.59	-160.39	4,228.63	0.00	0.00	0.00	0.00
11,500.00	90.57	182.29	7,055.64	-4,325.51	-164.39	4,328.62	0.00	0.00	0.00	0.00
11,600.00	90.57	182.29	7,054.64	-4,425.42	-168.39	4,428.62	0.00	0.00	0.00	0.00
11,700.00	90.57	182.29	7,053.64	-4,525.34	-172.39	4,528.61	0.00	0.00	0.00	0.00
11,800.00	90.57	182.29	7,052.64	-4,625.25	-176.39	4,628.61	0.00	0.00	0.00	0.00
11,900.00	90.57	182.29	7,051.65	-4,725.17	-180.39	4,728.60	0.00	0.00	0.00	0.00
12,000.00	90.57	182.29	7,050.65	-4,825.08	-184.39	4,828.60	0.00	0.00	0.00	0.00
12,100.00	90.57	182.29	7,049.65	-4,925.00	-188.39	4,928.59	0.00	0.00	0.00	0.00
12,200.00	90.57	182.29	7,048.65	-5,024.91	-192.39	5,028.59	0.00	0.00	0.00	0.00
12,300.00	90.57	182.29	7,047.66	-5,124.83	-196.39	5,128.58	0.00	0.00	0.00	0.00
12,400.00	90.57	182.29	7,046.66	-5,224.74	-200.40	5,228.58	0.00	0.00	0.00	0.00
12,500.00	90.57	182.29	7,045.66	-5,324.66	-204.40	5,328.57	0.00	0.00	0.00	0.00
12,566.31	90.57	182.29	7,045.00	-5,390.91	-207.05	5,394.88	0.00	0.00	0.00	0.00
Target Toe Location										
12,566.32	90.57	182.29	7,045.00	-5,390.92	-207.05	5,394.89	0.01	0.00	0.00	0.00
TD Well @ 12566.32ft - SUNFLOWER 24N-17HZ_BHL										

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,340.00	4,340.00	0.00	0.00	Begin Nudge @ 4340.00ft
4,890.00	4,886.63	52.51	3.67	End Nudge @ 4890.00ft
5,890.00	5,868.25	242.85	16.98	Begin Drop @ 5890.00ft
6,440.00	6,414.88	295.36	20.65	End Drop @ 6440.00ft
6,448.19	6,423.07	295.36	20.65	Top of 4.5" Liner @ 6448.19ft
6,548.19	6,523.07	295.36	20.65	KOP @ 6548.19ft
7,000.00	6,929.49	126.39	13.89	DLS = 10°/100'
7,453.91	7,096.00	-282.86	-2.50	End Build @ 7453.91ft
12,566.32	7,045.00	-5,390.92	-207.05	TD Well @ 12566.32ft

## Plan Report for SUNFLOWER 24N-17HZ - Permit Rev-1

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	182.29	Slot	0.00	0.00	0.00

**Survey tool program**

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,453.91	Permit Rev-1	APC_ISCWSA REV 2 MWD+IFR1
7,453.91	12,565.34	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
7,453.91	7,096.00	Top of Production	5-1/2	7-7/8

**Formation Details**

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,518.11	4,518.00	Sussex		0.00	
7,032.66	6,951.84	Sharon Springs		0.00	
7,124.20	7,006.84	Niobrara Top		0.00	
7,259.93	7,065.38	Niobrara B Bench		0.00	
7,453.91	7,096.00	Target Heel Location		0.00	
12,566.31	7,045.00	Target Toe Location		0.00	

**Targets associated with this wellbore**

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
2N-R65W-Sec. 17_Section lines	0.00	0.00	30.18	Polygon
SUNFLOWER 24N-17HZ_BHL	7,045.00	-5,390.92	-207.05	Point
SUNFLOWER 24N-17HZ_SHL	0.00	0.00	0.00	Point
2N-R65W-Sec. 8_Section lines	0.00	0.00	0.00	Polygon

## North Reference Sheet for 2N-65W-08 Sunflower Pad - SUNFLOWER 24N-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 24N-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: 0.99960897

Grid Coordinates of Well: 14,582,858.75 usft N, 1,728,984.04 usft E

Geographical Coordinates of Well: 40° 09' 13.30" N, 104° 40' 58.92" W

Grid Convergence at Surface is: 0.20°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,566.32usft the Bottom Hole Displacement is 5,394.89usft in the Direction of 182.20° (True).

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

