

# US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N  
2N-65W-08 Sunflower Pad  
SUNFLOWER 7N-17HZ

Plan A

Plan: Permit Rev-3

## Sperry Drilling Services Proposal Report

08 April, 2015

Well Coordinates: 14,582,858.54 N, 1,728,924.24 E (40° 09' 13.30" N, 104° 40' 59.69" W)  
Ground Level: 4,901.00 usft

Local Coordinate Origin:	Centered on Well SUNFLOWER 7N-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 7N-17HZ  
Wellbore: Plan A  
Design: Permit Rev-3

# US ROCKIES WATTENBERG PLANNING

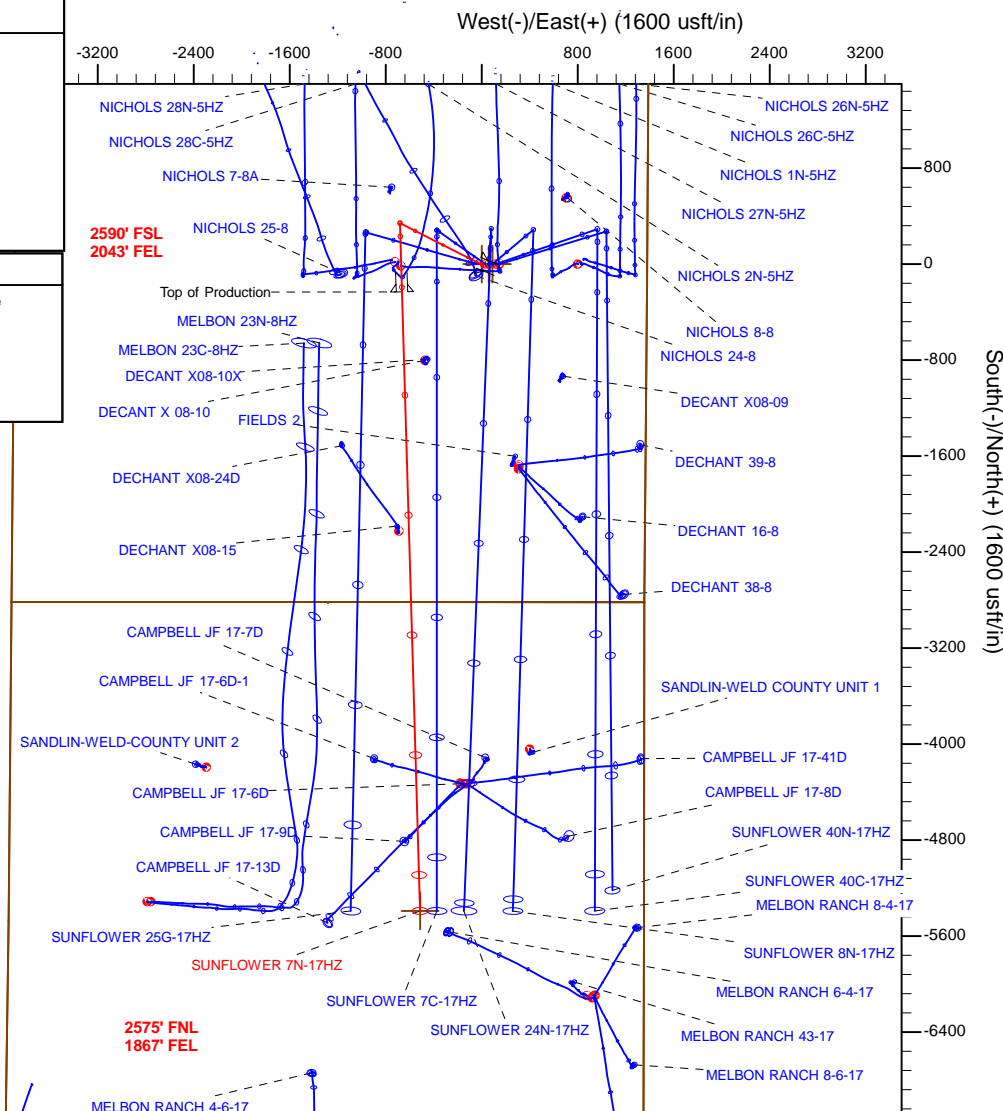
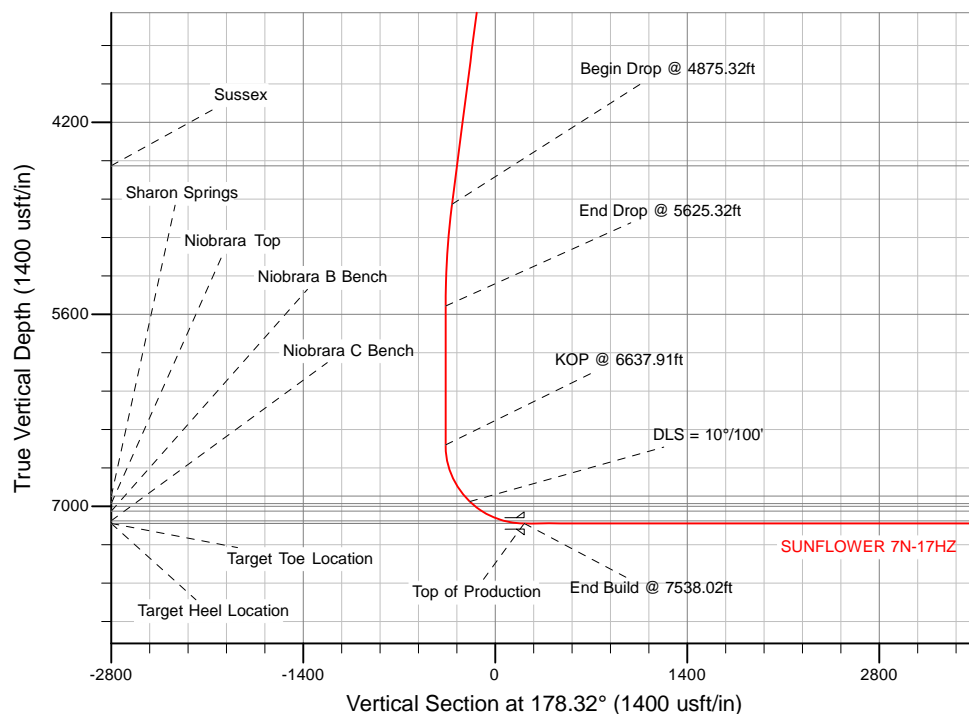
**HALLIBURTON**  
Sperry Drilling

## 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	250.00	0.00	0.00	250.00	0.00	0.00	0.00	0.00	0.00	
3	350.00	1.50	292.00	349.99	0.49	-1.21	1.50	292.00	-0.53	
4	2200.00	1.50	292.00	2199.35	18.63	-46.11	0.00	0.00	-19.98	
5	2875.32	15.00	297.00	2866.14	61.82	-132.58	2.00	5.54	-65.68	
6	4875.32	15.00	297.00	4797.99	296.82	-593.80	0.00	0.00	-314.10	
7	5625.32	0.00	0.00	5539.45	341.14	-680.77	2.00	180.00	-360.95	
8	6637.91	0.00	0.00	6552.04	341.14	-680.77	0.00	0.00	-360.95	
9	7538.02	90.01	178.32	7125.00	-231.69	-663.98	10.00	178.32	212.12	
10	12699.45	90.01	178.32	7124.00	-5390.90	-512.74	0.00	0.00	5373.55	SUNFLOWER 7N-17HZ_BHL

## WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
SUNFLOWER 7N-17HZ_SHL	0.00	-0.00	0.00	40.153695	-104.683248	Point
SUNFLOWER 7N-17HZ_BHL	7124.00	-5390.90	-512.74	40.138891	-104.685083	Point



## WELL DETAILS: SUNFLOWER 7N-17HZ

Ground Level: 4901.00

RKB = 17' @ 4918.00usft (D Rig)

Plan: Permit Rev-3 (SUNFLOWER 7N-17HZ/Plan A)

Created By: Clint Eshelman

Date: 4/08/2015

Reviewed:

Date:

## Plan Report for SUNFLOWER 7N-17HZ - Permit Rev-3

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>2N-R65W-Sec. 17_Section lines - SUNFLOWER 7N-17HZ_SHL - 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
250.00	0.00	0.00	250.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Begin Nudge @ 250.00ft</b>										
300.00	0.75	292.00	300.00	0.12	-0.30	-0.13	1.50	1.50	0.00	292.00
350.00	1.50	292.00	349.99	0.49	-1.21	-0.53	1.50	1.50	0.00	0.00
<b>End Nudge @ 350.00ft</b>										
400.00	1.50	292.00	399.97	0.98	-2.43	-1.05	0.00	0.00	0.00	0.00
500.00	1.50	292.00	499.94	1.96	-4.85	-2.10	0.00	0.00	0.00	0.00
600.00	1.50	292.00	599.90	2.94	-7.28	-3.15	0.00	0.00	0.00	0.00
700.00	1.50	292.00	699.87	3.92	-9.71	-4.21	0.00	0.00	0.00	0.00
800.00	1.50	292.00	799.83	4.90	-12.14	-5.26	0.00	0.00	0.00	0.00
900.00	1.50	292.00	899.80	5.88	-14.56	-6.31	0.00	0.00	0.00	0.00
1,000.00	1.50	292.00	999.77	6.86	-16.99	-7.36	0.00	0.00	0.00	0.00
1,100.00	1.50	292.00	1,099.73	7.84	-19.42	-8.41	0.00	0.00	0.00	0.00
1,200.00	1.50	292.00	1,199.70	8.83	-21.84	-9.46	0.00	0.00	0.00	0.00
1,300.00	1.50	292.00	1,299.66	9.81	-24.27	-10.51	0.00	0.00	0.00	0.00
1,315.00	1.50	292.00	1,314.66	9.95	-24.63	-10.67	0.00	0.00	0.00	0.00
<b>9 5/8"</b>										
1,400.00	1.50	292.00	1,399.63	10.79	-26.70	-11.56	0.00	0.00	0.00	0.00
1,500.00	1.50	292.00	1,499.59	11.77	-29.13	-12.62	0.00	0.00	0.00	0.00
1,600.00	1.50	292.00	1,599.56	12.75	-31.55	-13.67	0.00	0.00	0.00	0.00
1,700.00	1.50	292.00	1,699.53	13.73	-33.98	-14.72	0.00	0.00	0.00	0.00
1,800.00	1.50	292.00	1,799.49	14.71	-36.41	-15.77	0.00	0.00	0.00	0.00
1,900.00	1.50	292.00	1,899.46	15.69	-38.83	-16.82	0.00	0.00	0.00	0.00
2,000.00	1.50	292.00	1,999.42	16.67	-41.26	-17.87	0.00	0.00	0.00	0.00
2,100.00	1.50	292.00	2,099.39	17.65	-43.69	-18.92	0.00	0.00	0.00	0.00
2,200.00	1.50	292.00	2,199.35	18.63	-46.11	-19.98	0.00	0.00	0.00	0.00
<b>Begin Nudge @ 2200.00ft</b>										
2,300.00	3.50	295.17	2,299.25	20.42	-50.09	-21.88	2.00	2.00	3.17	5.54
2,400.00	5.49	296.03	2,398.94	23.82	-57.15	-25.48	2.00	2.00	0.87	2.38
2,500.00	7.49	296.44	2,498.30	28.82	-67.29	-30.78	2.00	2.00	0.40	1.51
2,600.00	9.49	296.67	2,597.19	35.43	-80.50	-37.77	2.00	2.00	0.23	1.11
2,700.00	11.49	296.83	2,695.52	43.63	-96.76	-46.45	2.00	2.00	0.15	0.88
2,800.00	13.49	296.94	2,793.14	53.41	-116.06	-56.79	2.00	2.00	0.11	0.73
2,875.32	15.00	297.00	2,866.14	61.82	-132.58	-65.68	2.00	2.00	0.08	0.62
<b>End Nudge @ 2875.32ft</b>										
2,900.00	15.00	297.00	2,889.98	64.72	-138.27	-68.74	0.00	0.00	0.00	0.00
3,000.00	15.00	297.00	2,986.58	76.47	-161.33	-81.17	0.00	0.00	0.00	0.00
3,100.00	15.00	297.00	3,083.17	88.22	-184.39	-93.59	0.00	0.00	0.00	0.00
3,200.00	15.00	297.00	3,179.76	99.97	-207.45	-106.01	0.00	0.00	0.00	0.00
3,300.00	15.00	297.00	3,276.35	111.72	-230.51	-118.43	0.00	0.00	0.00	0.00
3,400.00	15.00	297.00	3,372.95	123.47	-253.57	-130.85	0.00	0.00	0.00	0.00
3,500.00	15.00	297.00	3,469.54	135.22	-276.64	-143.27	0.00	0.00	0.00	0.00
3,600.00	15.00	297.00	3,566.13	146.97	-299.70	-155.69	0.00	0.00	0.00	0.00
3,700.00	15.00	297.00	3,662.72	158.72	-322.76	-168.11	0.00	0.00	0.00	0.00
3,800.00	15.00	297.00	3,759.32	170.47	-345.82	-180.53	0.00	0.00	0.00	0.00
3,900.00	15.00	297.00	3,855.91	182.22	-368.88	-192.96	0.00	0.00	0.00	0.00
4,000.00	15.00	297.00	3,952.50	193.97	-391.94	-205.38	0.00	0.00	0.00	0.00
4,100.00	15.00	297.00	4,049.09	205.72	-415.00	-217.80	0.00	0.00	0.00	0.00
4,200.00	15.00	297.00	4,145.69	217.47	-438.06	-230.22	0.00	0.00	0.00	0.00
4,300.00	15.00	297.00	4,242.28	229.22	-461.12	-242.64	0.00	0.00	0.00	0.00
4,400.00	15.00	297.00	4,338.87	240.97	-484.18	-255.06	0.00	0.00	0.00	0.00
4,500.00	15.00	297.00	4,435.46	252.72	-507.25	-267.48	0.00	0.00	0.00	0.00
4,585.45	15.00	297.00	4,518.00	262.76	-526.95	-278.10	0.00	0.00	0.00	0.00

## Plan Report for SUNFLOWER 7N-17HZ - Permit Rev-3

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 (°)
<b>Sussex</b>										
4,600.00	15.00	297.00	4,532.06	264.47	-530.31	-279.90	0.00	0.00	0.00	0.00
4,700.00	15.00	297.00	4,628.65	276.22	-553.37	-292.33	0.00	0.00	0.00	0.00
4,800.00	15.00	297.00	4,725.24	287.97	-576.43	-304.75	0.00	0.00	0.00	0.00
4,875.32	15.00	297.00	4,798.00	296.82	-593.80	-314.10	0.00	0.00	0.00	0.00
<b>Begin Drop @ 4875.32ft</b>										
4,900.00	14.51	297.00	4,821.86	299.67	-599.40	-317.12	2.00	-2.00	0.00	180.00
5,000.00	12.51	297.00	4,919.09	310.28	-620.21	-328.33	2.00	-2.00	0.00	180.00
5,100.00	10.51	297.00	5,017.08	319.33	-637.98	-337.90	2.00	-2.00	0.00	180.00
5,200.00	8.51	297.00	5,115.70	326.83	-652.69	-345.82	2.00	-2.00	0.00	180.00
5,300.00	6.51	297.00	5,214.84	332.76	-664.33	-352.09	2.00	-2.00	0.00	180.00
5,400.00	4.51	297.00	5,314.37	337.12	-672.88	-356.70	2.00	-2.00	0.00	180.00
5,500.00	2.51	297.00	5,414.18	339.89	-678.33	-359.63	2.00	-2.00	0.00	180.00
5,600.00	0.51	297.00	5,514.14	341.09	-680.67	-360.90	2.00	-2.00	0.00	180.00
5,625.32	0.00	0.00	5,539.46	341.14	-680.77	-360.95	2.00	-2.00	0.00	180.00
<b>End Drop @ 5625.32ft</b>										
5,700.00	0.00	0.00	5,614.14	341.14	-680.77	-360.95	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,714.14	341.14	-680.77	-360.95	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,814.14	341.14	-680.77	-360.95	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	5,914.14	341.14	-680.77	-360.95	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,014.14	341.14	-680.77	-360.95	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,114.14	341.14	-680.77	-360.95	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,214.14	341.14	-680.77	-360.95	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,314.14	341.14	-680.77	-360.95	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,414.14	341.14	-680.77	-360.95	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,514.14	341.14	-680.77	-360.95	0.00	0.00	0.00	0.00
6,637.91	0.00	0.00	6,552.05	341.14	-680.77	-360.95	0.00	0.00	0.00	0.00
<b>KOP @ 6637.91ft</b>										
6,700.00	6.21	178.32	6,614.02	337.78	-680.67	-357.59	10.00	10.00	0.00	178.32
6,800.00	16.21	178.32	6,711.98	318.37	-680.11	-338.17	10.00	10.00	0.00	0.00
6,900.00	26.21	178.32	6,805.09	282.25	-679.05	-302.04	10.00	10.00	0.00	0.00
7,000.00	36.21	178.32	6,890.51	230.53	-677.53	-250.29	10.00	10.00	0.00	0.00
7,044.41	40.65	178.32	6,925.29	202.94	-676.72	-222.70	10.00	10.00	0.00	0.00
<b>Sharon Springs</b>										
7,100.00	46.21	178.32	6,965.65	164.76	-675.60	-184.49	10.00	10.00	0.00	0.00
<b>DLS = 10°/100'</b>										
7,121.59	48.37	178.32	6,980.29	148.90	-675.14	-168.63	10.00	10.00	0.00	0.00
<b>Niobrara Top</b>										
7,200.00	56.21	178.32	7,028.22	86.94	-673.32	-106.65	10.00	10.00	0.00	0.00
7,213.11	57.52	178.32	7,035.38	75.97	-673.00	-95.67	10.00	10.00	0.00	0.00
<b>Niobrara B Bench</b>										
7,300.00	66.21	178.32	7,076.32	-0.54	-670.76	-19.12	10.00	10.00	0.00	0.00
7,394.51	75.66	178.32	7,107.15	-89.73	-668.14	70.10	10.00	10.00	0.00	0.00
<b>Niobrara C Bench</b>										
7,400.00	76.21	178.32	7,108.49	-95.05	-667.99	75.43	10.00	10.00	0.00	0.00
7,500.00	86.21	178.32	7,123.75	-193.71	-665.09	174.13	10.00	10.00	0.00	0.00
7,538.02	90.01	178.32	7,125.00	-231.69	-663.98	212.12	10.00	10.00	0.00	0.00
<b>End Build @ 7538.02ft - Target Heel Location - Top of Production</b>										
7,600.00	90.01	178.32	7,124.99	-293.64	-662.16	274.10	0.00	0.00	0.00	0.00
7,700.00	90.01	178.32	7,124.97	-393.60	-659.23	374.10	0.00	0.00	0.00	0.00
7,800.00	90.01	178.32	7,124.95	-493.56	-656.30	474.10	0.00	0.00	0.00	0.00
7,900.00	90.01	178.32	7,124.93	-593.51	-653.37	574.10	0.00	0.00	0.00	0.00
8,000.00	90.01	178.32	7,124.91	-693.47	-650.44	674.10	0.00	0.00	0.00	0.00
8,100.00	90.01	178.32	7,124.89	-793.43	-647.51	774.10	0.00	0.00	0.00	0.00
8,200.00	90.01	178.32	7,124.87	-893.38	-644.58	874.10	0.00	0.00	0.00	0.00
8,300.00	90.01	178.32	7,124.85	-993.34	-641.65	974.10	0.00	0.00	0.00	0.00
8,400.00	90.01	178.32	7,124.83	-1,093.30	-638.72	1,074.10	0.00	0.00	0.00	0.00
8,500.00	90.01	178.32	7,124.82	-1,193.25	-635.79	1,174.10	0.00	0.00	0.00	0.00
8,600.00	90.01	178.32	7,124.80	-1,293.21	-632.86	1,274.10	0.00	0.00	0.00	0.00

## Plan Report for SUNFLOWER 7N-17HZ - Permit Rev-3

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 (°)
8,700.00	90.01	178.32	7,124.78	-1,393.17	-629.93	1,374.10	0.00	0.00	0.00	0.00
8,800.00	90.01	178.32	7,124.76	-1,493.13	-627.00	1,474.10	0.00	0.00	0.00	0.00
8,900.00	90.01	178.32	7,124.74	-1,593.08	-624.07	1,574.10	0.00	0.00	0.00	0.00
9,000.00	90.01	178.32	7,124.72	-1,693.04	-621.14	1,674.10	0.00	0.00	0.00	0.00
9,100.00	90.01	178.32	7,124.70	-1,793.00	-618.21	1,774.10	0.00	0.00	0.00	0.00
9,200.00	90.01	178.32	7,124.68	-1,892.95	-615.28	1,874.10	0.00	0.00	0.00	0.00
9,300.00	90.01	178.32	7,124.66	-1,992.91	-612.35	1,974.10	0.00	0.00	0.00	0.00
9,400.00	90.01	178.32	7,124.64	-2,092.87	-609.42	2,074.10	0.00	0.00	0.00	0.00
9,500.00	90.01	178.32	7,124.62	-2,192.83	-606.49	2,174.10	0.00	0.00	0.00	0.00
9,600.00	90.01	178.32	7,124.60	-2,292.78	-603.56	2,274.10	0.00	0.00	0.00	0.00
9,700.00	90.01	178.32	7,124.58	-2,392.74	-600.63	2,374.10	0.00	0.00	0.00	0.00
9,800.00	90.01	178.32	7,124.56	-2,492.70	-597.70	2,474.10	0.00	0.00	0.00	0.00
9,900.00	90.01	178.32	7,124.54	-2,592.65	-594.77	2,574.10	0.00	0.00	0.00	0.00
10,000.00	90.01	178.32	7,124.52	-2,692.61	-591.84	2,674.10	0.00	0.00	0.00	0.00
10,100.00	90.01	178.32	7,124.50	-2,792.57	-588.91	2,774.10	0.00	0.00	0.00	0.00
10,200.00	90.01	178.32	7,124.49	-2,892.52	-585.98	2,874.10	0.00	0.00	0.00	0.00
10,300.00	90.01	178.32	7,124.47	-2,992.48	-583.05	2,974.10	0.00	0.00	0.00	0.00
10,400.00	90.01	178.32	7,124.45	-3,092.44	-580.12	3,074.10	0.00	0.00	0.00	0.00
10,500.00	90.01	178.32	7,124.43	-3,192.40	-577.19	3,174.10	0.00	0.00	0.00	0.00
10,600.00	90.01	178.32	7,124.41	-3,292.35	-574.26	3,274.10	0.00	0.00	0.00	0.00
10,700.00	90.01	178.32	7,124.39	-3,392.31	-571.33	3,374.10	0.00	0.00	0.00	0.00
10,800.00	90.01	178.32	7,124.37	-3,492.27	-568.40	3,474.10	0.00	0.00	0.00	0.00
10,900.00	90.01	178.32	7,124.35	-3,592.22	-565.47	3,574.10	0.00	0.00	0.00	0.00
11,000.00	90.01	178.32	7,124.33	-3,692.18	-562.54	3,674.10	0.00	0.00	0.00	0.00
11,100.00	90.01	178.32	7,124.31	-3,792.14	-559.61	3,774.10	0.00	0.00	0.00	0.00
11,200.00	90.01	178.32	7,124.29	-3,892.10	-556.68	3,874.10	0.00	0.00	0.00	0.00
11,300.00	90.01	178.32	7,124.27	-3,992.05	-553.75	3,974.10	0.00	0.00	0.00	0.00
11,400.00	90.01	178.32	7,124.25	-4,092.01	-550.82	4,074.10	0.00	0.00	0.00	0.00
11,500.00	90.01	178.32	7,124.23	-4,191.97	-547.89	4,174.10	0.00	0.00	0.00	0.00
11,600.00	90.01	178.32	7,124.21	-4,291.92	-544.96	4,274.10	0.00	0.00	0.00	0.00
11,700.00	90.01	178.32	7,124.19	-4,391.88	-542.03	4,374.10	0.00	0.00	0.00	0.00
11,800.00	90.01	178.32	7,124.17	-4,491.84	-539.10	4,474.10	0.00	0.00	0.00	0.00
11,900.00	90.01	178.32	7,124.16	-4,591.79	-536.17	4,574.10	0.00	0.00	0.00	0.00
12,000.00	90.01	178.32	7,124.14	-4,691.75	-533.24	4,674.10	0.00	0.00	0.00	0.00
12,100.00	90.01	178.32	7,124.12	-4,791.71	-530.31	4,774.10	0.00	0.00	0.00	0.00
12,200.00	90.01	178.32	7,124.10	-4,891.67	-527.37	4,874.10	0.00	0.00	0.00	0.00
12,300.00	90.01	178.32	7,124.08	-4,991.62	-524.44	4,974.10	0.00	0.00	0.00	0.00
12,400.00	90.01	178.32	7,124.06	-5,091.58	-521.51	5,074.10	0.00	0.00	0.00	0.00
12,500.00	90.01	178.32	7,124.04	-5,191.54	-518.58	5,174.10	0.00	0.00	0.00	0.00
12,600.00	90.01	178.32	7,124.02	-5,291.49	-515.65	5,274.10	0.00	0.00	0.00	0.00
12,699.44	90.01	178.32	7,124.00	-5,390.89	-512.74	5,373.54	0.00	0.00	0.00	0.00
Target Toe Location										
12,699.45	90.01	178.32	7,124.00	-5,390.90	-512.74	5,373.55	0.01	0.00	0.00	0.00
TD Well @ 12699.45ft - SUNFLOWER 7N-17HZ_BHL										

## Plan Report for SUNFLOWER 7N-17HZ - Permit Rev-3

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
250.00	250.00	0.00	0.00	Begin Nudge @ 250.00ft
350.00	349.99	0.49	-1.21	End Nudge @ 350.00ft
2,200.00	2,199.35	18.63	-46.11	Begin Nudge @ 2200.00ft
2,875.32	2,866.14	61.82	-132.58	End Nudge @ 2875.32ft
4,875.32	4,798.00	296.82	-593.80	Begin Drop @ 4875.32ft
5,625.32	5,539.46	341.14	-680.77	End Drop @ 5625.32ft
6,637.91	6,552.05	341.14	-680.77	KOP @ 6637.91ft
7,100.00	6,965.65	164.76	-675.60	DLS = 10°/100'
7,538.02	7,125.00	-231.69	-663.98	End Build @ 7538.02ft
12,699.45	7,124.00	-5,390.90	-512.74	TD Well @ 12699.45ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	178.32	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,538.02	Permit Rev-3	APC_ISCWSA REV 2 MWD+IFR1+MSA
7,538.02	12,699.45	Permit Rev-3	APC_ISCWSA REV 2 MWD+IFR1+MSA

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,315.00	1,314.66	9 5/8"	9-5/8	13-1/2
7,538.02	7,125.00	Top of Production	5-1/2	7-7/8

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,585.45	4,518.00	Sussex		0.00	
7,044.41	6,925.29	Sharon Springs		0.00	
7,121.59	6,980.29	Niobrara Top		0.00	
7,213.11	7,035.38	Niobrara B Bench		0.00	
7,394.51	7,107.15	Niobrara C Bench		0.00	
7,538.02	7,125.00	Target Heel Location		0.00	
12,699.44	7,124.00	Target Toe Location		0.00	

**Plan Report for SUNFLOWER 7N-17HZ - Permit Rev-3**

*Targets associated with this wellbore*

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
SUNFLOWER 7N-17HZ_BHL	7,124.00	-5,390.90	-512.74	Point
2N-R65W-Sec. 17_Section lines	0.00	0.00	89.97	Polygon
SUNFLOWER 7N-17HZ_SHL	0.00	0.00	0.00	Point
2N-R65W-Sec. 8_Section lines	0.00	0.00	59.80	Polygon

## North Reference Sheet for 2N-65W-08 Sunflower Pad - SUNFLOWER 7N-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 7N-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: 0.99960896

Grid Coordinates of Well: 14,582,858.54 usft N, 1,728,924.24 usft E

Geographical Coordinates of Well: 40° 09' 13.30" N, 104° 40' 59.69" W

Grid Convergence at Surface is: 0.20°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,699.45usft  
the Bottom Hole Displacement is 5,415.23usft in the Direction of 185.43° (True).

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

