

US ROCKIES WATTENBERG PLANNING

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

Plan A

Plan: Permit Rev-2

Sperry Drilling Services Proposal Report

24 April, 2015

Well Coordinates: 14,582,858.65 N, 1,728,954.14 E (40° 09' 13.30" N, 104° 40' 59.31" W)

Ground Level: 4,901.00 usft

Local Coordinate Origin:

Centered on Well SUNFLOWER 7C-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 7C-17HZ
Wellbore: Plan A
Design: Permit Rev-2

US ROCKIES WATTENBERG PLANNING

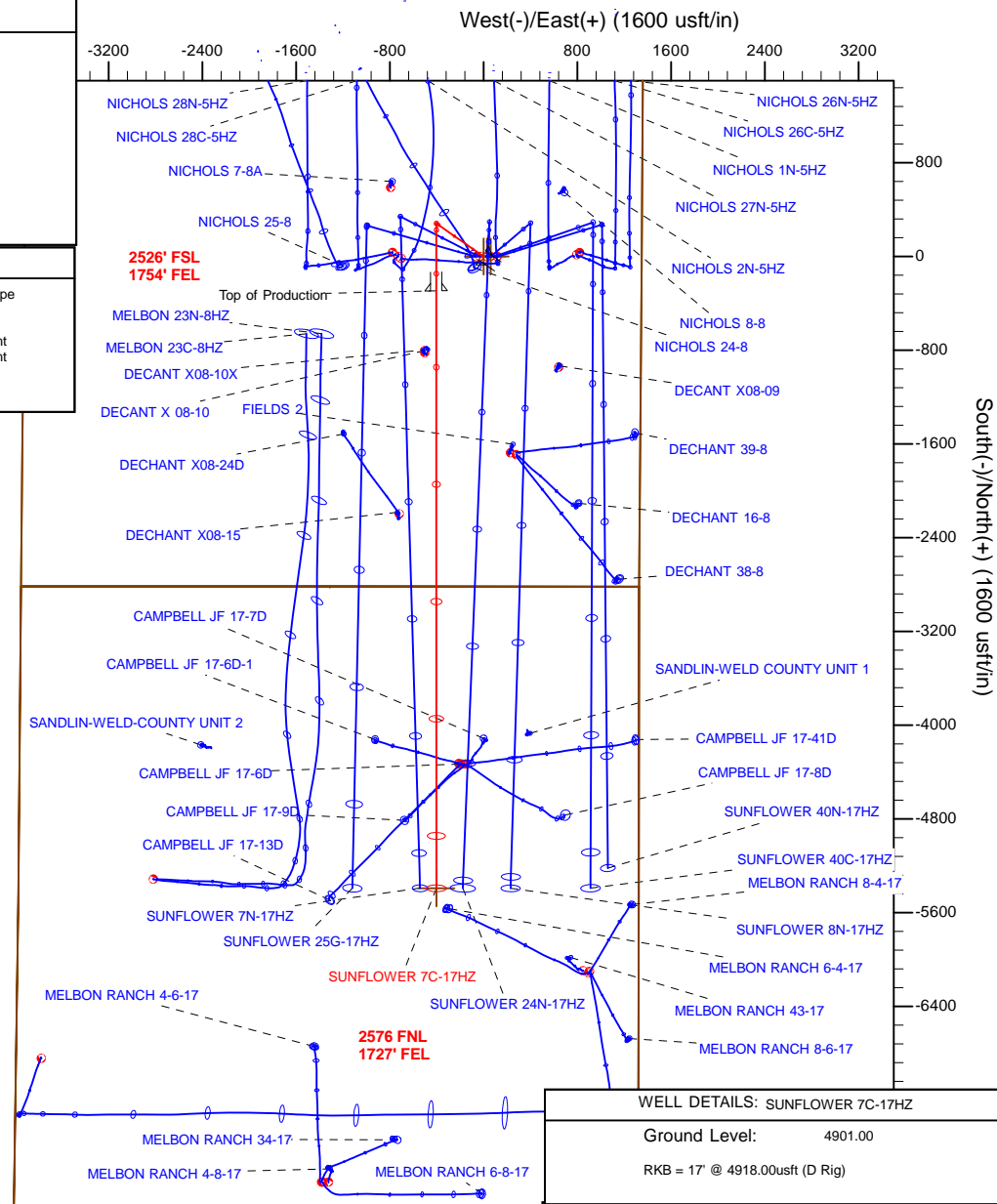
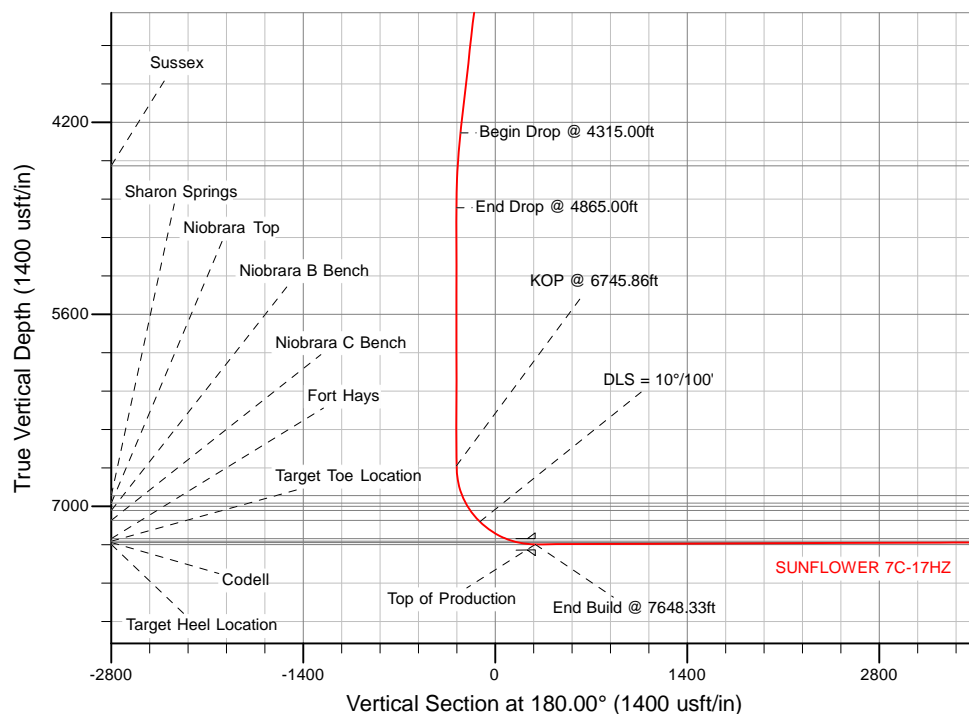
HALLIBURTON
Sperry Drilling

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	850.00	0.00	0.00	850.00	0.00	0.00	0.00	0.00	0.00	
3	950.00	1.50	305.00	949.99	0.75	-1.07	1.50	305.00	-0.75	
4	1950.00	1.50	305.00	1949.65	15.77	-22.52	0.00	0.00	-15.77	
5	2425.00	11.00	305.00	2421.28	45.39	-64.83	2.00	0.00	-45.39	
6	4315.00	11.00	305.00	4276.56	252.24	-360.24	0.00	0.00	-252.24	
7	4865.00	0.00	0.00	4823.18	282.43	-403.35	2.00	180.00	-282.43	
8	6745.86	0.00	0.00	6704.04	282.43	-403.35	0.00	0.00	-282.43	
9	7648.33	90.25	180.00	7277.00	-293.00	-403.33	10.00	180.00	293.00	
10	12747.02	90.25	180.00	7255.00	-5391.64	-403.14	0.00	0.00	5391.64	SUNFLOWER 7C-17HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
SUNFLOWER 7C-17HZ_SHL	0.00	-0.00	0.00	40.153695	-104.683141	Point
SUNFLOWER 7C-17HZ_BHL	7255.00	-5391.64	-403.14	40.138889	-104.684583	Point



WELL DETAILS: SUNFLOWER 7C-17HZ

Ground Level: 4901.00

RKB = 17' @ 4918.00usft (D Rig)

Plan: Permit Rev-2 (SUNFLOWER 7C-17HZ/Plan A)

Created By: Clint Eshelman

Date: 4/24/2015

Reviewed:

Date:

Plan Report for SUNFLOWER 7C-17HZ - Permit Rev-2

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 7C-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
850.00	0.00	0.00	850.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 850.00ft										
900.00	0.75	305.00	900.00	0.19	-0.27	-0.19	1.50	1.50	0.00	305.00
950.00	1.50	305.00	949.99	0.75	-1.07	-0.75	1.50	1.50	0.00	0.00
End Nudge @ 950.00ft										
1,000.00	1.50	305.00	999.97	1.50	-2.14	-1.50	0.00	0.00	0.00	0.00
1,100.00	1.50	305.00	1,099.94	3.00	-4.29	-3.00	0.00	0.00	0.00	0.00
1,200.00	1.50	305.00	1,199.90	4.50	-6.43	-4.50	0.00	0.00	0.00	0.00
1,300.00	1.50	305.00	1,299.87	6.01	-8.58	-6.01	0.00	0.00	0.00	0.00
1,315.00	1.50	305.00	1,314.86	6.23	-8.90	-6.23	0.00	0.00	0.00	0.00
9 5/8"										
1,400.00	1.50	305.00	1,399.83	7.51	-10.72	-7.51	0.00	0.00	0.00	0.00
1,500.00	1.50	305.00	1,499.80	9.01	-12.87	-9.01	0.00	0.00	0.00	0.00
1,600.00	1.50	305.00	1,599.77	10.51	-15.01	-10.51	0.00	0.00	0.00	0.00
1,700.00	1.50	305.00	1,699.73	12.01	-17.15	-12.01	0.00	0.00	0.00	0.00
1,800.00	1.50	305.00	1,799.70	13.51	-19.30	-13.51	0.00	0.00	0.00	0.00
1,900.00	1.50	305.00	1,899.66	15.01	-21.44	-15.01	0.00	0.00	0.00	0.00
1,950.00	1.50	305.00	1,949.65	15.77	-22.52	-15.77	0.00	0.00	0.00	0.00
Begin Nudge @ 1950.00ft										
2,000.00	2.50	305.00	1,999.61	16.77	-23.94	-16.77	2.00	2.00	0.00	0.00
2,100.00	4.50	305.00	2,099.42	20.27	-28.95	-20.27	2.00	2.00	0.00	0.00
2,200.00	6.50	305.00	2,198.96	25.76	-36.80	-25.76	2.00	2.00	0.00	0.00
2,300.00	8.50	305.00	2,298.10	33.25	-47.49	-33.25	2.00	2.00	0.00	0.00
2,400.00	10.50	305.00	2,396.72	42.72	-61.01	-42.72	2.00	2.00	0.00	0.00
2,425.00	11.00	305.00	2,421.28	45.39	-64.83	-45.39	2.00	2.00	0.00	0.00
End Nudge @ 2425.00ft										
2,500.00	11.00	305.00	2,494.90	53.60	-76.55	-53.60	0.00	0.00	0.00	0.00
2,600.00	11.00	305.00	2,593.07	64.54	-92.18	-64.54	0.00	0.00	0.00	0.00
2,700.00	11.00	305.00	2,691.23	75.49	-107.81	-75.49	0.00	0.00	0.00	0.00
2,800.00	11.00	305.00	2,789.39	86.43	-123.44	-86.43	0.00	0.00	0.00	0.00
2,900.00	11.00	305.00	2,887.55	97.38	-139.07	-97.38	0.00	0.00	0.00	0.00
3,000.00	11.00	305.00	2,985.72	108.32	-154.70	-108.32	0.00	0.00	0.00	0.00
3,100.00	11.00	305.00	3,083.88	119.27	-170.33	-119.27	0.00	0.00	0.00	0.00
3,200.00	11.00	305.00	3,182.04	130.21	-185.96	-130.21	0.00	0.00	0.00	0.00
3,300.00	11.00	305.00	3,280.21	141.16	-201.59	-141.16	0.00	0.00	0.00	0.00
3,400.00	11.00	305.00	3,378.37	152.10	-217.22	-152.10	0.00	0.00	0.00	0.00
3,500.00	11.00	305.00	3,476.53	163.04	-232.85	-163.04	0.00	0.00	0.00	0.00
3,600.00	11.00	305.00	3,574.69	173.99	-248.48	-173.99	0.00	0.00	0.00	0.00
3,700.00	11.00	305.00	3,672.86	184.93	-264.11	-184.93	0.00	0.00	0.00	0.00
3,800.00	11.00	305.00	3,771.02	195.88	-279.74	-195.88	0.00	0.00	0.00	0.00
3,900.00	11.00	305.00	3,869.18	206.82	-295.37	-206.82	0.00	0.00	0.00	0.00
4,000.00	11.00	305.00	3,967.34	217.77	-311.00	-217.77	0.00	0.00	0.00	0.00
4,100.00	11.00	305.00	4,065.51	228.71	-326.63	-228.71	0.00	0.00	0.00	0.00
4,200.00	11.00	305.00	4,163.67	239.65	-342.26	-239.65	0.00	0.00	0.00	0.00
4,300.00	11.00	305.00	4,261.83	250.60	-357.89	-250.60	0.00	0.00	0.00	0.00
4,315.00	11.00	305.00	4,276.56	252.24	-360.24	-252.24	0.00	0.00	0.00	0.00
Begin Drop @ 4315.00ft										

Plan Report for SUNFLOWER 7C-17HZ - Permit Rev-2

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 (°)
4,400.00	9.30	305.00	4,360.22	260.83	-372.51	-260.83	2.00	-2.00	0.00	180.00
4,500.00	7.30	305.00	4,459.17	269.11	-384.33	-269.11	2.00	-2.00	0.00	180.00
4,559.23	6.12	305.00	4,518.00	273.08	-390.00	-273.08	2.00	-2.00	0.00	180.00
Sussex										
4,600.00	5.30	305.00	4,558.56	275.40	-393.32	-275.40	2.00	-2.00	0.00	180.00
4,700.00	3.30	305.00	4,658.28	279.71	-399.46	-279.71	2.00	-2.00	0.00	180.00
4,800.00	1.30	305.00	4,758.19	282.01	-402.75	-282.01	2.00	-2.00	0.00	180.00
4,865.00	0.00	0.00	4,823.18	282.43	-403.35	-282.43	2.00	-2.00	0.00	180.00
End Drop @ 4865.00ft										
4,900.00	0.00	0.00	4,858.18	282.43	-403.35	-282.43	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	4,958.18	282.43	-403.35	-282.43	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,058.18	282.43	-403.35	-282.43	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,158.18	282.43	-403.35	-282.43	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,258.18	282.43	-403.35	-282.43	0.00	0.00	0.00	0.00
5,400.00	0.00	0.00	5,358.18	282.43	-403.35	-282.43	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,458.18	282.43	-403.35	-282.43	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,558.18	282.43	-403.35	-282.43	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,658.18	282.43	-403.35	-282.43	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,758.18	282.43	-403.35	-282.43	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,858.18	282.43	-403.35	-282.43	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	5,958.18	282.43	-403.35	-282.43	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,058.18	282.43	-403.35	-282.43	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,158.18	282.43	-403.35	-282.43	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,258.18	282.43	-403.35	-282.43	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,358.18	282.43	-403.35	-282.43	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,458.18	282.43	-403.35	-282.43	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,558.18	282.43	-403.35	-282.43	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,658.18	282.43	-403.35	-282.43	0.00	0.00	0.00	0.00
6,745.86	0.00	0.00	6,704.04	282.43	-403.35	-282.43	0.00	0.00	0.00	0.00
KOP @ 6745.86ft										
6,800.00	5.41	180.00	6,758.10	279.87	-403.35	-279.87	10.00	10.00	332.47	180.00
6,900.00	15.41	180.00	6,856.33	261.82	-403.35	-261.82	10.00	10.00	0.00	0.00
6,968.97	22.31	180.00	6,921.56	239.54	-403.35	-239.54	10.00	10.00	0.00	0.00
Sharon Springs										
7,000.00	25.41	180.00	6,949.93	226.99	-403.35	-226.99	10.00	10.00	0.00	0.00
7,029.86	28.40	180.00	6,976.56	213.47	-403.35	-213.47	10.00	10.00	0.00	0.00
Niobrara Top										
7,094.23	34.84	180.00	7,031.34	179.75	-403.35	-179.75	10.00	10.00	0.00	0.00
Niobrara B Bench										
7,100.00	35.41	180.00	7,036.06	176.42	-403.35	-176.42	10.00	10.00	0.00	0.00
7,186.31	44.05	180.00	7,102.38	121.31	-403.35	-121.31	10.00	10.00	0.00	0.00
Niobrara C Bench										
7,200.00	45.41	180.00	7,112.10	111.68	-403.35	-111.68	10.00	10.00	0.00	0.00
DLS = 10°/100'										
7,300.00	55.41	180.00	7,175.75	34.71	-403.34	-34.71	10.00	10.00	0.00	0.00
7,400.00	65.41	180.00	7,225.06	-52.14	-403.34	52.14	10.00	10.00	0.00	0.00
7,426.12	68.03	180.00	7,235.38	-76.14	-403.34	76.14	10.00	10.00	0.00	0.00
Fort Hays										
7,500.00	75.41	180.00	7,258.54	-146.24	-403.34	146.24	10.00	10.00	0.00	0.00
7,520.90	77.50	180.00	7,263.43	-166.56	-403.34	166.56	10.00	10.00	0.00	0.00
Codell										
7,600.00	85.41	180.00	7,275.17	-244.72	-403.33	244.72	10.00	10.00	0.00	0.00
7,648.33	90.25	180.00	7,277.00	-293.00	-403.33	293.00	10.00	10.00	0.00	0.00
End Build @ 7648.33ft - Target Heel Location - Top of Production										
7,700.00	90.25	180.00	7,276.77	-344.67	-403.33	344.67	0.00	0.00	0.00	0.00
7,800.00	90.25	180.00	7,276.34	-444.67	-403.32	444.67	0.00	0.00	0.00	0.00
7,900.00	90.25	180.00	7,275.91	-544.67	-403.32	544.67	0.00	0.00	0.00	0.00
8,000.00	90.25	180.00	7,275.48	-644.66	-403.32	644.66	0.00	0.00	0.00	0.00

Plan Report for SUNFLOWER 7C-17HZ - Permit Rev-2

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 (°)
8,100.00	90.25	180.00	7,275.05	-744.66	-403.31	744.66	0.00	0.00	0.00	0.00
8,200.00	90.25	180.00	7,274.62	-844.66	-403.31	844.66	0.00	0.00	0.00	0.00
8,300.00	90.25	180.00	7,274.19	-944.66	-403.31	944.66	0.00	0.00	0.00	0.00
8,400.00	90.25	180.00	7,273.75	-1,044.66	-403.30	1,044.66	0.00	0.00	0.00	0.00
8,500.00	90.25	180.00	7,273.32	-1,144.66	-403.30	1,144.66	0.00	0.00	0.00	0.00
8,600.00	90.25	180.00	7,272.89	-1,244.66	-403.29	1,244.66	0.00	0.00	0.00	0.00
8,700.00	90.25	180.00	7,272.46	-1,344.66	-403.29	1,344.66	0.00	0.00	0.00	0.00
8,800.00	90.25	180.00	7,272.03	-1,444.66	-403.29	1,444.66	0.00	0.00	0.00	0.00
8,900.00	90.25	180.00	7,271.60	-1,544.66	-403.28	1,544.66	0.00	0.00	0.00	0.00
9,000.00	90.25	180.00	7,271.17	-1,644.66	-403.28	1,644.66	0.00	0.00	0.00	0.00
9,100.00	90.25	180.00	7,270.73	-1,744.65	-403.28	1,744.65	0.00	0.00	0.00	0.00
9,200.00	90.25	180.00	7,270.30	-1,844.65	-403.27	1,844.65	0.00	0.00	0.00	0.00
9,300.00	90.25	180.00	7,269.87	-1,944.65	-403.27	1,944.65	0.00	0.00	0.00	0.00
9,400.00	90.25	180.00	7,269.44	-2,044.65	-403.26	2,044.65	0.00	0.00	0.00	0.00
9,500.00	90.25	180.00	7,269.01	-2,144.65	-403.26	2,144.65	0.00	0.00	0.00	0.00
9,600.00	90.25	180.00	7,268.58	-2,244.65	-403.26	2,244.65	0.00	0.00	0.00	0.00
9,700.00	90.25	180.00	7,268.15	-2,344.65	-403.25	2,344.65	0.00	0.00	0.00	0.00
9,800.00	90.25	180.00	7,267.71	-2,444.65	-403.25	2,444.65	0.00	0.00	0.00	0.00
9,900.00	90.25	180.00	7,267.28	-2,544.65	-403.25	2,544.65	0.00	0.00	0.00	0.00
10,000.00	90.25	180.00	7,266.85	-2,644.65	-403.24	2,644.65	0.00	0.00	0.00	0.00
10,100.00	90.25	180.00	7,266.42	-2,744.64	-403.24	2,744.64	0.00	0.00	0.00	0.00
10,200.00	90.25	180.00	7,265.99	-2,844.64	-403.24	2,844.64	0.00	0.00	0.00	0.00
10,300.00	90.25	180.00	7,265.56	-2,944.64	-403.23	2,944.64	0.00	0.00	0.00	0.00
10,400.00	90.25	180.00	7,265.13	-3,044.64	-403.23	3,044.64	0.00	0.00	0.00	0.00
10,500.00	90.25	180.00	7,264.69	-3,144.64	-403.22	3,144.64	0.00	0.00	0.00	0.00
10,600.00	90.25	180.00	7,264.26	-3,244.64	-403.22	3,244.64	0.00	0.00	0.00	0.00
10,700.00	90.25	180.00	7,263.83	-3,344.64	-403.22	3,344.64	0.00	0.00	0.00	0.00
10,800.00	90.25	180.00	7,263.40	-3,444.64	-403.21	3,444.64	0.00	0.00	0.00	0.00
10,900.00	90.25	180.00	7,262.97	-3,544.64	-403.21	3,544.64	0.00	0.00	0.00	0.00
11,000.00	90.25	180.00	7,262.54	-3,644.64	-403.21	3,644.64	0.00	0.00	0.00	0.00
11,100.00	90.25	180.00	7,262.11	-3,744.64	-403.20	3,744.64	0.00	0.00	0.00	0.00
11,200.00	90.25	180.00	7,261.67	-3,844.63	-403.20	3,844.63	0.00	0.00	0.00	0.00
11,300.00	90.25	180.00	7,261.24	-3,944.63	-403.19	3,944.63	0.00	0.00	0.00	0.00
11,400.00	90.25	180.00	7,260.81	-4,044.63	-403.19	4,044.63	0.00	0.00	0.00	0.00
11,500.00	90.25	180.00	7,260.38	-4,144.63	-403.19	4,144.63	0.00	0.00	0.00	0.00
11,600.00	90.25	180.00	7,259.95	-4,244.63	-403.18	4,244.63	0.00	0.00	0.00	0.00
11,700.00	90.25	180.00	7,259.52	-4,344.63	-403.18	4,344.63	0.00	0.00	0.00	0.00
11,800.00	90.25	180.00	7,259.09	-4,444.63	-403.18	4,444.63	0.00	0.00	0.00	0.00
11,900.00	90.25	180.00	7,258.65	-4,544.63	-403.17	4,544.63	0.00	0.00	0.00	0.00
12,000.00	90.25	180.00	7,258.22	-4,644.63	-403.17	4,644.63	0.00	0.00	0.00	0.00
12,100.00	90.25	180.00	7,257.79	-4,744.63	-403.16	4,744.63	0.00	0.00	0.00	0.00
12,200.00	90.25	180.00	7,257.36	-4,844.63	-403.16	4,844.63	0.00	0.00	0.00	0.00
12,300.00	90.25	180.00	7,256.93	-4,944.62	-403.16	4,944.62	0.00	0.00	0.00	0.00
12,400.00	90.25	180.00	7,256.50	-5,044.62	-403.15	5,044.62	0.00	0.00	0.00	0.00
12,500.00	90.25	180.00	7,256.07	-5,144.62	-403.15	5,144.62	0.00	0.00	0.00	0.00
12,600.00	90.25	180.00	7,255.63	-5,244.62	-403.15	5,244.62	0.00	0.00	0.00	0.00
12,700.00	90.25	180.00	7,255.20	-5,344.62	-403.14	5,344.62	0.00	0.00	0.00	0.00
12,747.01	90.25	180.00	7,255.00	-5,391.63	-403.14	5,391.63	0.00	0.00	0.00	0.00

Target Toe Location

12,747.02	90.25	180.00	7,255.00	-5,391.64	-403.14	5,391.64	0.00	0.00	0.00	0.00
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TD Well @ 12747.02ft - SUNFLOWER 7C-17HZ_BHL

Plan Report for SUNFLOWER 7C-17HZ - Permit Rev-2

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
850.00	850.00	0.00	0.00	Begin Nudge @ 850.00ft
950.00	949.99	0.75	-1.07	End Nudge @ 950.00ft
1,950.00	1,949.65	15.77	-22.52	Begin Nudge @ 1950.00ft
2,425.00	2,421.28	45.39	-64.83	End Nudge @ 2425.00ft
4,315.00	4,276.56	252.24	-360.24	Begin Drop @ 4315.00ft
4,865.00	4,823.18	282.43	-403.35	End Drop @ 4865.00ft
6,745.86	6,704.04	282.43	-403.35	KOP @ 6745.86ft
7,200.00	7,112.10	111.68	-403.35	DLS = 10°/100'
7,648.33	7,277.00	-293.00	-403.33	End Build @ 7648.33ft
12,747.02	7,255.00	-5,391.64	-403.14	TD Well @ 12747.02ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	180.00	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,648.33	Permit Rev-2	APC_ISCWSA REV 2 MWD+IFR1
7,648.33	12,747.02	Permit Rev-2	APC_ISCWSA REV 2 MWD+IFR1

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,315.00	1,314.86	9 5/8"	9-5/8	13-1/2
7,648.33	7,277.00	Top of Production	5-1/2	7-7/8

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,559.23	4,518.00	Sussex		0.00	
6,968.97	6,921.56	Sharon Springs		0.00	
7,029.86	6,976.56	Niobrara Top		0.00	
7,094.23	7,031.34	Niobrara B Bench		0.00	
7,186.31	7,102.38	Niobrara C Bench		0.00	
7,426.12	7,235.38	Fort Hays		0.00	
7,520.90	7,263.43	Codell		0.00	
7,648.33	7,277.00	Target Heel Location		0.00	
12,747.01	7,255.00	Target Toe Location		0.00	

Plan Report for SUNFLOWER 7C-17HZ - Permit Rev-2

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	60.08	Polygon
SUNFLOWER 7C-17HZ_BHL	7,255.00	-5,391.64	-403.14	Point
SUNFLOWER 7C-17HZ_SHL	0.00	0.00	0.00	Point
2N-R65W-Sec. 8_Section lines	0.00	0.00	29.90	Polygon

North Reference Sheet for 2N-65W-08 Sunflower Pad - SUNFLOWER 7C-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 7C-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: 14,582,858.65 usft N, 1,728,954.14 usft E

Geographical Coordinates of Well: 40° 09' 13.30" N, 104° 40' 59.31" W

Grid Convergence at Surface is: 0.20°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,747.02usft
the Bottom Hole Displacement is 5,406.69usft in the Direction of 184.28° (True).

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

