

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

2N-65W-16 Cook #1 Pad

COOK 2G-16HZ

Plan A

Plan: Permit Rev-1

Sperry Drilling Services Proposal Report

27 April, 2015

Well Coordinates: 14,575,273.96 N, 1,733,653.26 E (40° 07' 58.15" N, 104° 39' 59.13" W)

Ground Level: 4,884.00 usft

Local Coordinate Origin:

Centered on Well COOK 2G-16HZ

Viewing Datum:

RKB = 17' @ 4901.00usft (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-16 Cook #1 Pad

Well: COOK 2G-16HZ

Wellbore: Plan A

Design: Permit Rev-1

US ROCKIES WATTENBERG PLANNING

HALLIBURTON

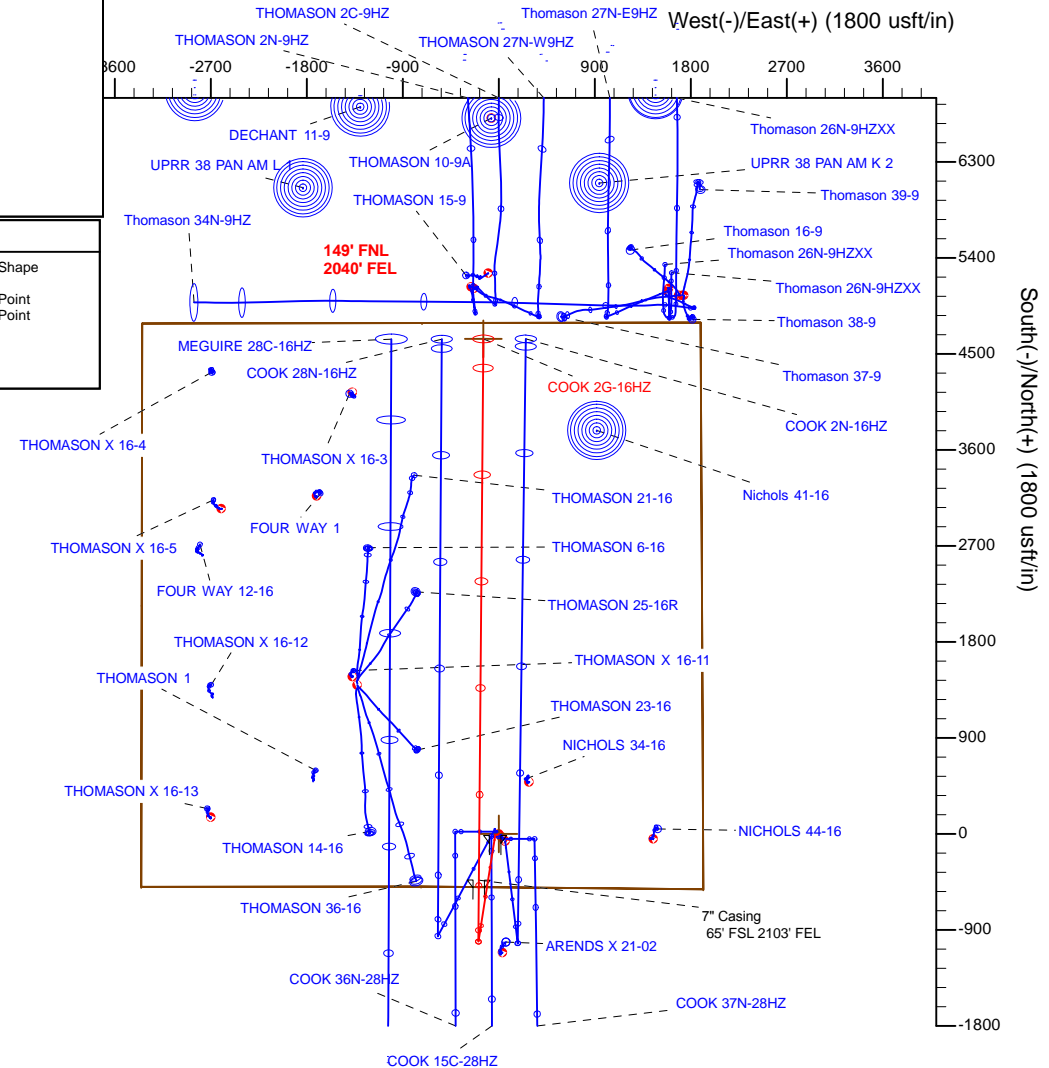
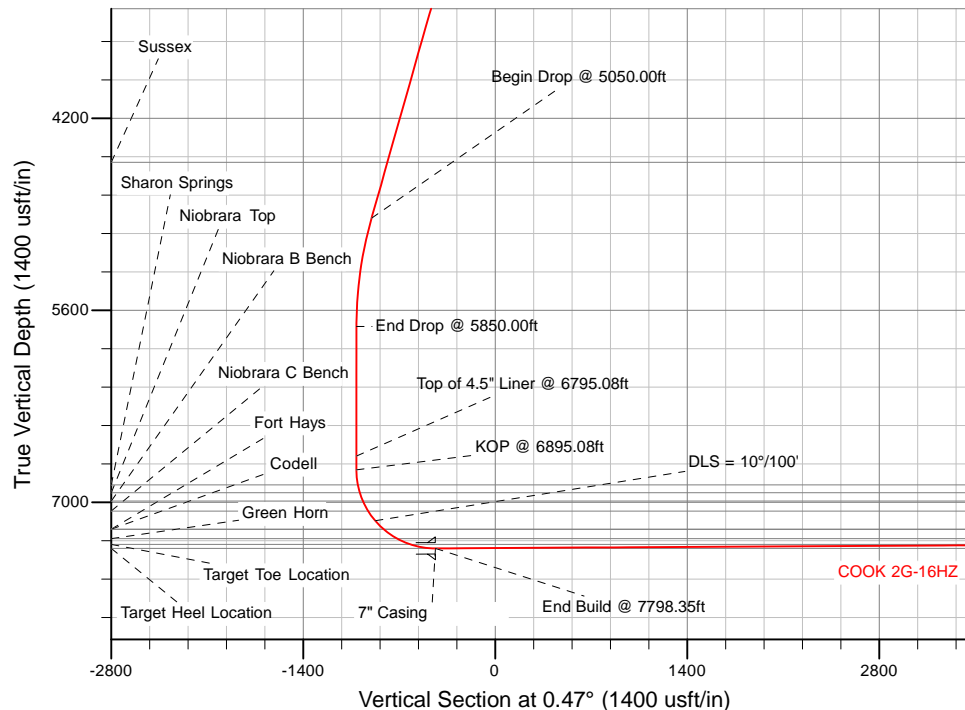
Sperry Drilling

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	300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	
3	500.00	3.00	248.00	499.91	-1.96	-4.85	1.50	248.00	-2.00	
4	1050.00	3.00	248.00	1049.15	-12.74	-31.54	0.00	0.00	-13.00	
5	1200.00	0.00	0.00	1199.09	-14.21	-35.18	2.00	180.00	-14.50	
6	1400.00	0.00	0.00	1399.09	-14.21	-35.18	0.00	0.00	-14.50	
7	2200.00	16.00	189.00	2188.73	-123.83	-52.54	2.00	189.00	-124.25	
8	5050.00	16.00	189.00	4928.33	-899.72	-175.43	0.00	0.00	-901.13	
9	5850.00	0.00	0.00	5717.97	-1009.33	-192.79	2.00	180.00	-1010.88	
10	6895.08	0.00	0.00	6763.05	-1009.33	-192.79	0.00	0.00	-1010.88	
11	7798.35	90.33	0.47	7336.00	-433.12	-188.02	10.00	0.47	-434.65	
12	12873.20	90.33	0.47	7307.00	4641.47	-145.98	0.00	0.00	4640.12	COOK 2G-16HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
COOK 2G-16HZ_SHL	0.00	0.00	0.00	40.132820	-104.666426	Point
COOK 2G-16HZ_BHL	7307.00	4641.47	-145.98	40.145566	-104.666948	Point



WELL DETAILS: COOK 2G-16HZ

Ground Level: 4884.00

RKB = 17' @ 4901.00usft (D Rig)

Plan: Permit Rev-1 (COOK 2G-16HZ/Plan A)

Created By: Clint Eshelman

Date: 3/6/2015

Reviewed:

Date:

Plan Report for COOK 2G-16HZ - 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. 16_Section Lines - COOK 2G-16HZ_SHL										
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
Begin Nudge @ 300.00ft										
400.00	1.50	248.00	399.99	-0.49	-1.21	-0.50	1.50	1.50	0.00	248.00
500.00	3.00	248.00	499.91	-1.96	-4.85	-2.00	1.50	1.50	0.00	0.00
End Nudge @ 500.00ft										
600.00	3.00	248.00	599.77	-3.92	-9.71	-4.00	0.00	0.00	0.00	0.00
700.00	3.00	248.00	699.63	-5.88	-14.56	-6.00	0.00	0.00	0.00	0.00
800.00	3.00	248.00	799.50	-7.84	-19.41	-8.00	0.00	0.00	0.00	0.00
900.00	3.00	248.00	899.36	-9.80	-24.26	-10.00	0.00	0.00	0.00	0.00
1,000.00	3.00	248.00	999.22	-11.76	-29.12	-12.00	0.00	0.00	0.00	0.00
1,050.00	3.00	248.00	1,049.15	-12.74	-31.54	-13.00	0.00	0.00	0.00	0.00
Begin Drop @ 1050.00ft										
1,100.00	2.00	248.00	1,099.11	-13.56	-33.56	-13.84	2.00	-2.00	0.00	180.00
1,200.00	0.00	0.00	1,199.09	-14.21	-35.18	-14.50	2.00	-2.00	112.00	180.00
End Drop @ 1200.00ft										
1,300.00	0.00	0.00	1,299.09	-14.21	-35.18	-14.50	0.00	0.00	0.00	180.00
1,350.00	0.00	0.00	1,349.09	-14.21	-35.18	-14.50	0.00	0.00	0.00	0.00
9 5/8"										
1,400.00	0.00	0.00	1,399.09	-14.21	-35.18	-14.50	0.00	0.00	0.00	0.00
Begin Nudge @ 1400.00ft										
1,500.00	2.00	189.00	1,499.07	-15.94	-35.46	-16.23	2.00	2.00	0.00	189.00
1,600.00	4.00	189.00	1,598.92	-21.11	-36.27	-21.40	2.00	2.00	0.00	0.00
1,700.00	6.00	189.00	1,698.54	-29.72	-37.64	-30.02	2.00	2.00	0.00	0.00
1,800.00	8.00	189.00	1,797.79	-41.75	-39.54	-42.07	2.00	2.00	0.00	0.00
1,900.00	10.00	189.00	1,896.55	-57.20	-41.99	-57.54	2.00	2.00	0.00	0.00
2,000.00	12.00	189.00	1,994.71	-76.05	-44.98	-76.41	2.00	2.00	0.00	0.00
2,100.00	14.00	189.00	2,092.14	-98.26	-48.49	-98.66	2.00	2.00	0.00	0.00
2,200.00	16.00	189.00	2,188.73	-123.83	-52.54	-124.25	2.00	2.00	0.00	0.00
End Nudge @ 2200.00ft										
2,300.00	16.00	189.00	2,284.86	-151.05	-56.86	-151.51	0.00	0.00	0.00	0.00
2,400.00	16.00	189.00	2,380.98	-178.27	-61.17	-178.77	0.00	0.00	0.00	0.00
2,500.00	16.00	189.00	2,477.11	-205.50	-65.48	-206.03	0.00	0.00	0.00	0.00
2,600.00	16.00	189.00	2,573.23	-232.72	-69.79	-233.29	0.00	0.00	0.00	0.00
2,700.00	16.00	189.00	2,669.36	-259.95	-74.10	-260.55	0.00	0.00	0.00	0.00
2,800.00	16.00	189.00	2,765.49	-287.17	-78.41	-287.81	0.00	0.00	0.00	0.00
2,900.00	16.00	189.00	2,861.61	-314.40	-82.73	-315.06	0.00	0.00	0.00	0.00
3,000.00	16.00	189.00	2,957.74	-341.62	-87.04	-342.32	0.00	0.00	0.00	0.00
3,100.00	16.00	189.00	3,053.86	-368.84	-91.35	-369.58	0.00	0.00	0.00	0.00
3,200.00	16.00	189.00	3,149.99	-396.07	-95.66	-396.84	0.00	0.00	0.00	0.00
3,300.00	16.00	189.00	3,246.12	-423.29	-99.97	-424.10	0.00	0.00	0.00	0.00
3,400.00	16.00	189.00	3,342.24	-450.52	-104.29	-451.36	0.00	0.00	0.00	0.00
3,500.00	16.00	189.00	3,438.37	-477.74	-108.60	-478.62	0.00	0.00	0.00	0.00
3,600.00	16.00	189.00	3,534.50	-504.97	-112.91	-505.88	0.00	0.00	0.00	0.00
3,700.00	16.00	189.00	3,630.62	-532.19	-117.22	-533.13	0.00	0.00	0.00	0.00
3,800.00	16.00	189.00	3,726.75	-559.42	-121.53	-560.39	0.00	0.00	0.00	0.00
3,900.00	16.00	189.00	3,822.87	-586.64	-125.85	-587.65	0.00	0.00	0.00	0.00
4,000.00	16.00	189.00	3,919.00	-613.86	-130.16	-614.91	0.00	0.00	0.00	0.00
4,100.00	16.00	189.00	4,015.13	-641.09	-134.47	-642.17	0.00	0.00	0.00	0.00
4,200.00	16.00	189.00	4,111.25	-668.31	-138.78	-669.43	0.00	0.00	0.00	0.00
4,300.00	16.00	189.00	4,207.38	-695.54	-143.09	-696.69	0.00	0.00	0.00	0.00
4,400.00	16.00	189.00	4,303.50	-722.76	-147.41	-723.95	0.00	0.00	0.00	0.00
4,500.00	16.00	189.00	4,399.63	-749.99	-151.72	-751.21	0.00	0.00	0.00	0.00
4,600.00	16.00	189.00	4,495.76	-777.21	-156.03	-778.46	0.00	0.00	0.00	0.00
4,626.26	16.00	189.00	4,521.00	-784.36	-157.16	-785.62	0.00	0.00	0.00	0.00

Plan Report for COOK 2G-16HZ - 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 (°)
Sussex										
4,700.00	16.00	189.00	4,591.88	-804.43	-160.34	-805.72	0.00	0.00	0.00	0.00
4,800.00	16.00	189.00	4,688.01	-831.66	-164.65	-832.98	0.00	0.00	0.00	0.00
4,900.00	16.00	189.00	4,784.14	-858.88	-168.97	-860.24	0.00	0.00	0.00	0.00
5,000.00	16.00	189.00	4,880.26	-886.11	-173.28	-887.50	0.00	0.00	0.00	0.00
5,050.00	16.00	189.00	4,928.33	-899.72	-175.43	-901.13	0.00	0.00	0.00	0.00
Begin Drop @ 5050.00ft										
5,100.00	15.00	189.00	4,976.51	-912.92	-177.52	-914.34	2.00	-2.00	0.00	180.00
5,200.00	13.00	189.00	5,073.53	-936.81	-181.31	-938.27	2.00	-2.00	0.00	180.00
5,300.00	11.00	189.00	5,171.34	-957.34	-184.56	-958.83	2.00	-2.00	0.00	180.00
5,400.00	9.00	189.00	5,269.82	-974.49	-187.28	-976.00	2.00	-2.00	0.00	180.00
5,500.00	7.00	189.00	5,368.84	-988.24	-189.45	-989.76	2.00	-2.00	0.00	180.00
5,600.00	5.00	189.00	5,468.29	-998.56	-191.09	-1,000.10	2.00	-2.00	0.00	180.00
5,700.00	3.00	189.00	5,568.04	-1,005.45	-192.18	-1,007.00	2.00	-2.00	0.00	180.00
5,800.00	1.00	189.00	5,667.97	-1,008.90	-192.73	-1,010.45	2.00	-2.00	0.00	180.00
5,850.00	0.00	0.00	5,717.97	-1,009.33	-192.79	-1,010.88	2.00	-2.00	0.00	180.00
End Drop @ 5850.00ft										
5,900.00	0.00	0.00	5,767.97	-1,009.33	-192.79	-1,010.88	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	5,867.97	-1,009.33	-192.79	-1,010.88	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	5,967.97	-1,009.33	-192.79	-1,010.88	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,067.97	-1,009.33	-192.79	-1,010.88	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,167.97	-1,009.33	-192.79	-1,010.88	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,267.97	-1,009.33	-192.79	-1,010.88	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,367.97	-1,009.33	-192.79	-1,010.88	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,467.97	-1,009.33	-192.79	-1,010.88	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,567.97	-1,009.33	-192.79	-1,010.88	0.00	0.00	0.00	0.00
6,795.08	0.00	0.00	6,663.05	-1,009.33	-192.79	-1,010.88	0.00	0.00	0.00	0.00
Top of 4.5" Liner @ 6795.08ft										
6,800.00	0.00	0.00	6,667.97	-1,009.33	-192.79	-1,010.88	0.00	0.00	0.00	0.00
6,895.08	0.00	0.00	6,763.05	-1,009.33	-192.79	-1,010.88	0.00	0.00	0.00	0.00
KOP @ 6895.08ft										
6,900.00	0.49	0.47	6,767.97	-1,009.31	-192.79	-1,010.86	10.00	10.00	0.00	0.47
7,000.00	10.49	0.47	6,867.38	-999.75	-192.71	-1,001.30	10.00	10.00	0.00	0.00
7,004.75	10.97	0.47	6,872.05	-998.87	-192.71	-1,000.41	10.00	10.00	0.00	0.00
Sharon Springs										
7,064.54	16.95	0.47	6,930.05	-984.45	-192.59	-986.00	10.00	10.00	0.00	0.00
Niobrara Top										
7,100.00	20.49	0.47	6,963.63	-973.08	-192.49	-974.62	10.00	10.00	0.00	0.00
7,129.29	23.42	0.47	6,990.79	-962.13	-192.40	-963.67	10.00	10.00	0.00	0.00
Niobrara B Bench										
7,200.00	30.49	0.47	7,053.78	-930.09	-192.14	-931.64	10.00	10.00	0.00	0.00
7,211.99	31.69	0.47	7,064.04	-923.90	-192.09	-925.45	10.00	10.00	0.00	0.00
Niobrara C Bench										
7,300.00	40.49	0.47	7,135.09	-872.11	-191.66	-873.65	10.00	10.00	0.00	0.00
DLS = 10°/100'										
7,386.62	49.15	0.47	7,196.47	-811.11	-191.15	-812.65	10.00	10.00	0.00	0.00
Codell										
7,387.49	49.24	0.47	7,197.04	-810.45	-191.15	-811.99	10.00	10.00	0.00	0.00
Fort Hays										
7,400.00	50.49	0.47	7,205.11	-800.89	-191.07	-802.43	10.00	10.00	0.00	0.00
7,500.00	60.49	0.47	7,261.69	-718.59	-190.38	-720.13	10.00	10.00	0.00	0.00
7,505.55	61.05	0.47	7,264.39	-713.75	-190.34	-715.29	10.00	10.00	0.00	0.00
Green Horn										
7,600.00	70.49	0.47	7,303.12	-627.72	-189.63	-629.25	10.00	10.00	0.00	0.00
7,700.00	80.49	0.47	7,328.13	-531.03	-188.83	-532.57	10.00	10.00	0.00	0.00
7,798.35	90.33	0.47	7,336.00	-433.12	-188.02	-434.65	10.00	10.00	0.00	0.00
End Build @ 7798.35ft - Target Heel Location - 7"										
7,800.00	90.33	0.47	7,335.99	-431.47	-188.01	-433.00	0.02	0.02	0.00	0.00

Plan Report for COOK 2G-16HZ - 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 (°)
7,900.00	90.33	0.47	7,335.42	-331.48	-187.18	-333.00	0.00	0.00	0.00	0.00
8,000.00	90.33	0.47	7,334.84	-231.48	-186.35	-233.00	0.00	0.00	0.00	0.00
8,100.00	90.33	0.47	7,334.27	-131.49	-185.52	-133.01	0.00	0.00	0.00	0.00
8,200.00	90.33	0.47	7,333.70	-31.49	-184.69	-33.01	0.00	0.00	0.00	0.00
8,300.00	90.33	0.47	7,333.13	68.50	-183.86	66.99	0.00	0.00	0.00	0.00
8,400.00	90.33	0.47	7,332.56	168.50	-183.04	166.99	0.00	0.00	0.00	0.00
8,500.00	90.33	0.47	7,331.99	268.49	-182.21	266.99	0.00	0.00	0.00	0.00
8,600.00	90.33	0.47	7,331.42	368.49	-181.38	366.99	0.00	0.00	0.00	0.00
8,700.00	90.33	0.47	7,330.84	468.48	-180.55	466.98	0.00	0.00	0.00	0.00
8,800.00	90.33	0.47	7,330.27	568.48	-179.72	566.98	0.00	0.00	0.00	0.00
8,900.00	90.33	0.47	7,329.70	668.47	-178.89	666.98	0.00	0.00	0.00	0.00
9,000.00	90.33	0.47	7,329.13	768.47	-178.07	766.98	0.00	0.00	0.00	0.00
9,100.00	90.33	0.47	7,328.56	868.46	-177.24	866.98	0.00	0.00	0.00	0.00
9,200.00	90.33	0.47	7,327.99	968.46	-176.41	966.98	0.00	0.00	0.00	0.00
9,300.00	90.33	0.47	7,327.42	1,068.45	-175.58	1,066.97	0.00	0.00	0.00	0.00
9,400.00	90.33	0.47	7,326.84	1,168.45	-174.75	1,166.97	0.00	0.00	0.00	0.00
9,500.00	90.33	0.47	7,326.27	1,268.44	-173.92	1,266.97	0.00	0.00	0.00	0.00
9,600.00	90.33	0.47	7,325.70	1,368.44	-173.09	1,366.97	0.00	0.00	0.00	0.00
9,700.00	90.33	0.47	7,325.13	1,468.43	-172.27	1,466.97	0.00	0.00	0.00	0.00
9,800.00	90.33	0.47	7,324.56	1,568.43	-171.44	1,566.97	0.00	0.00	0.00	0.00
9,900.00	90.33	0.47	7,323.99	1,668.42	-170.61	1,666.96	0.00	0.00	0.00	0.00
10,000.00	90.33	0.47	7,323.42	1,768.42	-169.78	1,766.96	0.00	0.00	0.00	0.00
10,100.00	90.33	0.47	7,322.85	1,868.41	-168.95	1,866.96	0.00	0.00	0.00	0.00
10,200.00	90.33	0.47	7,322.27	1,968.41	-168.12	1,966.96	0.00	0.00	0.00	0.00
10,300.00	90.33	0.47	7,321.70	2,068.40	-167.30	2,066.96	0.00	0.00	0.00	0.00
10,400.00	90.33	0.47	7,321.13	2,168.40	-166.47	2,166.96	0.00	0.00	0.00	0.00
10,500.00	90.33	0.47	7,320.56	2,268.39	-165.64	2,266.96	0.00	0.00	0.00	0.00
10,600.00	90.33	0.47	7,319.99	2,368.39	-164.81	2,366.95	0.00	0.00	0.00	0.00
10,700.00	90.33	0.47	7,319.42	2,468.38	-163.98	2,466.95	0.00	0.00	0.00	0.00
10,800.00	90.33	0.47	7,318.85	2,568.37	-163.15	2,566.95	0.00	0.00	0.00	0.00
10,900.00	90.33	0.47	7,318.27	2,668.37	-162.33	2,666.95	0.00	0.00	0.00	0.00
11,000.00	90.33	0.47	7,317.70	2,768.36	-161.50	2,766.95	0.00	0.00	0.00	0.00
11,100.00	90.33	0.47	7,317.13	2,868.36	-160.67	2,866.95	0.00	0.00	0.00	0.00
11,200.00	90.33	0.47	7,316.56	2,968.35	-159.84	2,966.94	0.00	0.00	0.00	0.00
11,300.00	90.33	0.47	7,315.99	3,068.35	-159.01	3,066.94	0.00	0.00	0.00	0.00
11,400.00	90.33	0.47	7,315.42	3,168.34	-158.18	3,166.94	0.00	0.00	0.00	0.00
11,500.00	90.33	0.47	7,314.85	3,268.34	-157.35	3,266.94	0.00	0.00	0.00	0.00
11,600.00	90.33	0.47	7,314.27	3,368.33	-156.53	3,366.94	0.00	0.00	0.00	0.00
11,700.00	90.33	0.47	7,313.70	3,468.33	-155.70	3,466.94	0.00	0.00	0.00	0.00
11,800.00	90.33	0.47	7,313.13	3,568.32	-154.87	3,566.93	0.00	0.00	0.00	0.00
11,900.00	90.33	0.47	7,312.56	3,668.32	-154.04	3,666.93	0.00	0.00	0.00	0.00
12,000.00	90.33	0.47	7,311.99	3,768.31	-153.21	3,766.93	0.00	0.00	0.00	0.00
12,100.00	90.33	0.47	7,311.42	3,868.31	-152.38	3,866.93	0.00	0.00	0.00	0.00
12,200.00	90.33	0.47	7,310.85	3,968.30	-151.56	3,966.93	0.00	0.00	0.00	0.00
12,300.00	90.33	0.47	7,310.28	4,068.30	-150.73	4,066.93	0.00	0.00	0.00	0.00
12,400.00	90.33	0.47	7,309.70	4,168.29	-149.90	4,166.92	0.00	0.00	0.00	0.00
12,500.00	90.33	0.47	7,309.13	4,268.29	-149.07	4,266.92	0.00	0.00	0.00	0.00
12,600.00	90.33	0.47	7,308.56	4,368.28	-148.24	4,366.92	0.00	0.00	0.00	0.00
12,700.00	90.33	0.47	7,307.99	4,468.28	-147.41	4,466.92	0.00	0.00	0.00	0.00
12,800.00	90.33	0.47	7,307.42	4,568.27	-146.59	4,566.92	0.00	0.00	0.00	0.00
12,873.20	90.33	0.47	7,307.00	4,641.47	-145.98	4,640.12	0.00	0.00	0.00	0.00

TD Well @ 12873.20ft - Target Toe Location - COOK 2G-16HZ_BHL

Plan Report for COOK 2G-16HZ - Permit Rev-1

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
300.00	300.00	0.00	0.00	Begin Nudge @ 300.00ft
500.00	499.91	-1.96	-4.85	End Nudge @ 500.00ft
1,050.00	1,049.15	-12.74	-31.54	Begin Drop @ 1050.00ft
1,200.00	1,199.09	-14.21	-35.18	End Drop @ 1200.00ft
1,400.00	1,399.09	-14.21	-35.18	Begin Nudge @ 1400.00ft
2,200.00	2,188.73	-123.83	-52.54	End Nudge @ 2200.00ft
5,050.00	4,928.33	-899.72	-175.43	Begin Drop @ 5050.00ft
5,850.00	5,717.97	-1,009.33	-192.79	End Drop @ 5850.00ft
6,795.08	6,663.05	-1,009.33	-192.79	Top of 4.5" Liner @ 6795.08ft
6,895.08	6,763.05	-1,009.33	-192.79	KOP @ 6895.08ft
7,300.00	7,135.09	-872.11	-191.66	DLS = 10°/100'
7,798.35	7,336.00	-433.12	-188.02	End Build @ 7798.35ft
12,873.20	7,307.00	4,641.47	-145.98	TD Well @ 12873.20ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/-S (usft)	+E/-W (usft)	
User	No Target (Freehand)	0.47	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,798.35	Permit Rev-1	APC_ISCWSA REV 2 MWD+IFR1
7,798.35	12,873.20	Permit Rev-1	APC_ISCWSA REV 2 MWD+IFR1

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,350.00	1,349.09	9 5/8"	9-5/8	13-1/2
7,798.35	7,336.00	7"	7	8-3/4

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,626.26	4,521.00	Sussex		0.00	
7,004.75	6,872.05	Sharon Springs		0.00	
7,064.54	6,930.05	Niobrara Top		0.00	
7,129.29	6,990.79	Niobrara B Bench		0.00	
7,211.99	7,064.04	Niobrara C Bench		0.00	
7,386.62	7,196.47	Codell		0.00	
7,387.49	7,197.04	Fort Hays		0.00	
7,505.55	7,264.39	Green Horn		0.00	
7,798.35	7,336.00	Target Heel Location		0.00	
12,873.20	7,307.00	Target Toe Location		0.00	

Plan Report for COOK 2G-16HZ - Permit Rev-1

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
2N-R65W-Sec. 16_Section Lines	-12.00	-2,894.31	-3,019.10	Polygon
COOK 2G-16HZ_SHL	0.00	0.00	0.00	Point
COOK 2G-16HZ_BHL	7,307.00	4,641.47	-145.98	Point

North Reference Sheet for 2N-65W-16 Cook #1 Pad - COOK 2G-16HZ - 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' @ 4901.00usft (D Rig). Northing and Easting are relative to COOK 2G-16HZ

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: 0.99960994

Grid Coordinates of Well: 14,575,273.96 usft N, 1,733,653.26 usft E

Geographical Coordinates of Well: 40° 07' 58.15" N, 104° 39' 59.13" W

Grid Convergence at Surface is: 0.22°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,873.20usft the Bottom Hole Displacement is 4,643.76usft in the Direction of 358.20° (True).

Magnetic Convergence at surface is: -8.08° (23 February 2015, , IGRF2010)

