

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

2N-65W-16 Cook #1 Pad

COOK 36N-28HZ

Plan A

Plan: Permit Rev-1

Sperry Drilling Services Proposal Report

19 March, 2015

Well Coordinates: 14,575,296.56 N, 1,733,633.62 E (40° 07' 58.37" N, 104° 39' 59.39" W)

Ground Level: 4,884.00 usft

Local Coordinate Origin:

Centered on Well COOK 36N-28HZ

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 36N-28HZ

Wellbore: Plan A

Design: Permit Rev-1

US ROCKIES WATTENBERG PLANNING

HALLIBURTON

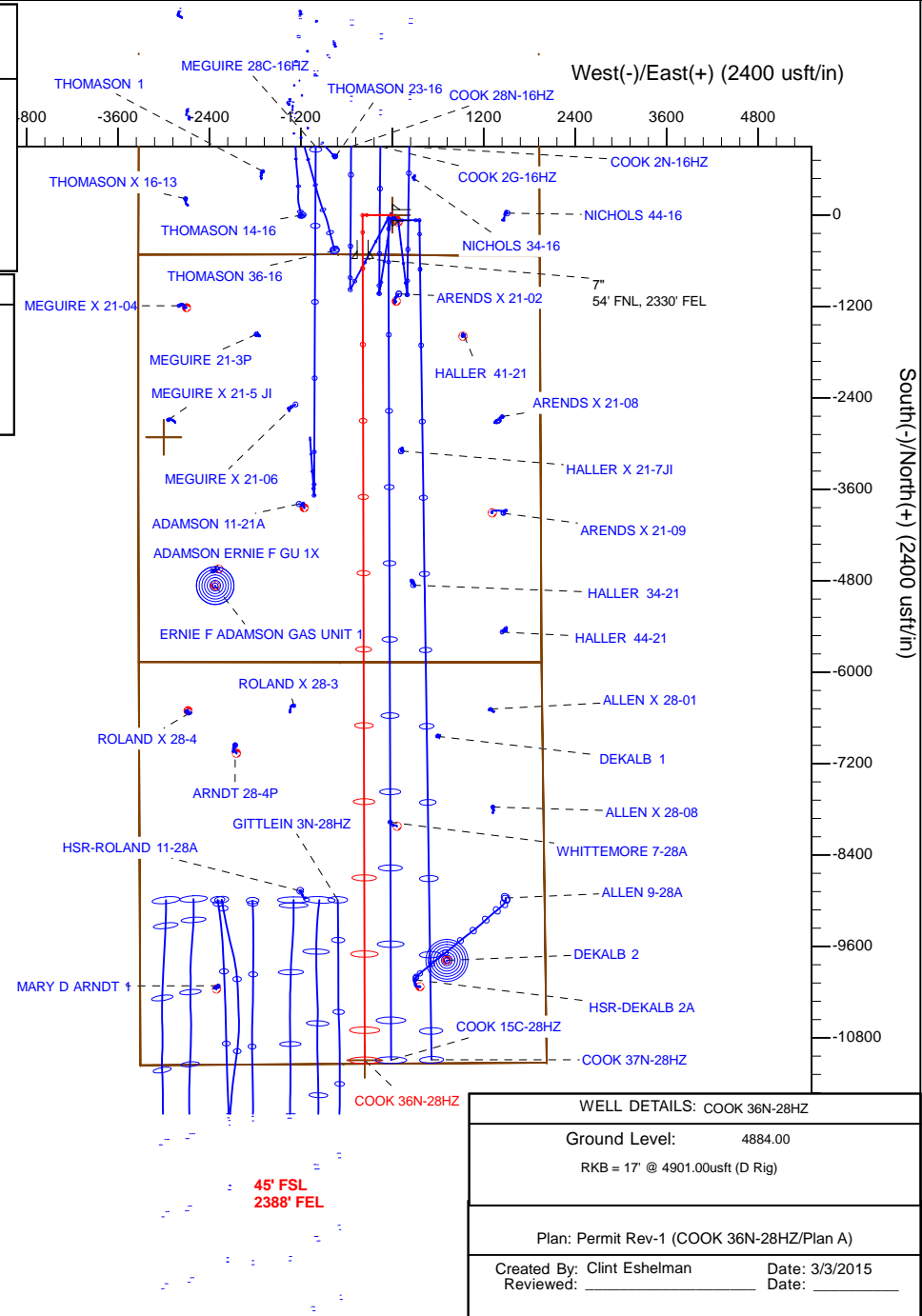
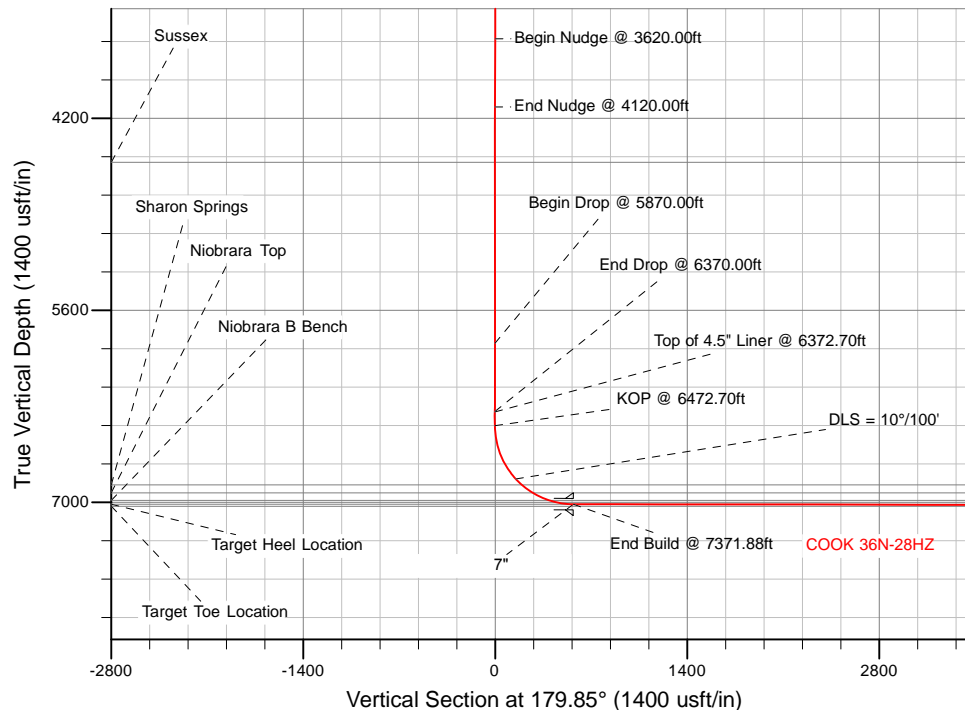
Sperry Drilling

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	3620.00	0.00	0.00	3620.00	0.00	0.00	0.00	0.00	0.00	
3	4120.00	10.00	270.00	4117.47	0.00	-43.52	2.00	270.00	-0.11	
4	5870.00	10.00	270.00	5840.88	0.00	-347.41	0.00	0.00	-0.91	
5	6370.00	0.00	0.00	6338.34	0.00	-390.93	2.00	180.00	-1.02	
6	6472.70	0.00	0.00	6441.04	0.00	-390.93	0.00	0.00	-1.02	
7	7371.88	89.92	179.85	7014.00	-572.14	-389.45	10.00	179.85	571.12	
8	17896.21	89.92	179.85	7029.00	-11096.42	-362.24	0.00	0.00	1095.43	COOK 36N-28HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
COOK 36N-28HZ_SHL	0.00	0.00	0.00	40.132882	-104.666496
COOK 36N-28HZ_BHL	7029.00	-11096.42	-362.24	40.102410	-104.667791



Plan Report for COOK 36N-28HZ - 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. 28_Section Lines - 2N-R65W-Sec. 16_Section Lines - 2N-R65W-Sec. 21_Section Lines - COOK 36N-28HZ_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
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
1,350.00	0.00	0.00	1,350.00	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
3,620.00	0.00	0.00	3,620.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 3620.00ft										
3,700.00	1.60	270.00	3,699.99	0.00	-1.12	0.00	2.00	2.00	0.00	270.00
3,800.00	3.60	270.00	3,799.88	0.00	-5.65	-0.01	2.00	2.00	0.00	0.00
3,900.00	5.60	270.00	3,899.55	0.00	-13.67	-0.04	2.00	2.00	0.00	0.00
4,000.00	7.60	270.00	3,998.89	0.00	-25.17	-0.07	2.00	2.00	0.00	0.00
4,100.00	9.60	270.00	4,097.76	0.00	-40.12	-0.11	2.00	2.00	0.00	0.00
4,120.00	10.00	270.00	4,117.47	0.00	-43.52	-0.11	2.00	2.00	0.00	0.00
End Nudge @ 4120.00ft										
4,200.00	10.00	270.00	4,196.25	0.00	-57.41	-0.15	0.00	0.00	0.00	0.00
4,300.00	10.00	270.00	4,294.73	0.00	-74.78	-0.20	0.00	0.00	0.00	0.00
4,400.00	10.00	270.00	4,393.21	0.00	-92.14	-0.24	0.00	0.00	0.00	0.00
4,500.00	10.00	270.00	4,491.69	0.00	-109.51	-0.29	0.00	0.00	0.00	0.00
4,529.76	10.00	270.00	4,521.00	0.00	-114.68	-0.30	0.00	0.00	0.00	0.00
Sussex										
4,600.00	10.00	270.00	4,590.17	0.00	-126.87	-0.33	0.00	0.00	0.00	0.00
4,700.00	10.00	270.00	4,688.65	0.00	-144.24	-0.38	0.00	0.00	0.00	0.00
4,800.00	10.00	270.00	4,787.13	0.00	-161.60	-0.42	0.00	0.00	0.00	0.00

Plan Report for COOK 36N-28HZ - 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	10.00	270.00	4,885.62	0.00	-178.97	-0.47	0.00	0.00	0.00	0.00
5,000.00	10.00	270.00	4,984.10	0.00	-196.33	-0.51	0.00	0.00	0.00	0.00
5,100.00	10.00	270.00	5,082.58	0.00	-213.70	-0.56	0.00	0.00	0.00	0.00
5,200.00	10.00	270.00	5,181.06	0.00	-231.06	-0.60	0.00	0.00	0.00	0.00
5,300.00	10.00	270.00	5,279.54	0.00	-248.43	-0.65	0.00	0.00	0.00	0.00
5,400.00	10.00	270.00	5,378.02	0.00	-265.79	-0.70	0.00	0.00	0.00	0.00
5,500.00	10.00	270.00	5,476.50	0.00	-283.16	-0.74	0.00	0.00	0.00	0.00
5,600.00	10.00	270.00	5,574.98	0.00	-300.52	-0.79	0.00	0.00	0.00	0.00
5,700.00	10.00	270.00	5,673.46	0.00	-317.89	-0.83	0.00	0.00	0.00	0.00
5,800.00	10.00	270.00	5,771.94	0.00	-335.25	-0.88	0.00	0.00	0.00	0.00
5,870.00	10.00	270.00	5,840.88	0.00	-347.41	-0.91	0.00	0.00	0.00	0.00
Begin Drop @ 5870.00ft										
5,900.00	9.40	270.00	5,870.45	0.00	-352.46	-0.92	2.00	-2.00	0.00	180.00
6,000.00	7.40	270.00	5,969.37	0.00	-367.07	-0.96	2.00	-2.00	0.00	180.00
6,100.00	5.40	270.00	6,068.74	0.00	-378.22	-0.99	2.00	-2.00	0.00	180.00
6,200.00	3.40	270.00	6,168.44	0.00	-385.89	-1.01	2.00	-2.00	0.00	180.00
6,300.00	1.40	270.00	6,268.35	0.00	-390.07	-1.02	2.00	-2.00	0.00	180.00
6,370.00	0.00	0.00	6,338.34	0.00	-390.93	-1.02	2.00	-2.00	128.57	180.00
End Drop @ 6370.00ft										
6,372.70	0.00	0.00	6,341.04	0.00	-390.93	-1.02	0.00	0.00	0.00	180.00
Top of 4.5" Liner @ 6372.70ft										
6,400.00	0.00	0.00	6,368.34	0.00	-390.93	-1.02	0.00	0.00	0.00	0.00
6,472.70	0.00	0.00	6,441.04	0.00	-390.93	-1.02	0.00	0.00	0.00	0.00
KOP @ 6472.70ft										
6,500.00	2.73	179.85	6,468.33	-0.65	-390.93	-0.37	10.00	10.00	0.00	179.85
6,600.00	12.73	179.85	6,567.30	-14.08	-390.89	13.06	10.00	10.00	0.00	0.00
6,700.00	22.73	179.85	6,662.43	-44.50	-390.81	43.47	10.00	10.00	0.00	0.00
6,800.00	32.73	179.85	6,750.83	-90.97	-390.69	89.95	10.00	10.00	0.00	0.00
6,900.00	42.73	179.85	6,829.82	-152.09	-390.54	151.06	10.00	10.00	0.00	0.00
DLS = 10°/100'										
6,962.40	48.97	179.85	6,873.26	-196.83	-390.42	195.81	10.00	10.00	0.00	0.00
Sharon Springs										
7,000.00	52.73	179.85	6,897.00	-225.99	-390.35	224.97	10.00	10.00	0.00	0.00
7,060.95	58.83	179.85	6,931.26	-276.36	-390.21	275.34	10.00	10.00	0.00	0.00
Niobrara Top										
7,100.00	62.73	179.85	6,950.32	-310.44	-390.13	309.41	10.00	10.00	0.00	0.00
7,193.59	72.09	179.85	6,986.23	-396.75	-389.90	395.72	10.00	10.00	0.00	0.00
Niobrara B Bench										
7,200.00	72.73	179.85	6,988.17	-402.86	-389.89	401.84	10.00	10.00	0.00	0.00
7,300.00	82.73	179.85	7,009.40	-500.45	-389.64	499.43	10.00	10.00	0.00	0.00
7,371.88	89.92	179.85	7,014.00	-572.14	-389.45	571.11	10.00	10.00	0.00	0.00
End Build @ 7371.88ft - Target Heel Location - 7"										
7,400.00	89.92	179.85	7,014.04	-600.26	-389.38	599.23	0.00	0.00	0.00	0.00
7,500.00	89.92	179.85	7,014.18	-700.26	-389.12	699.23	0.00	0.00	0.00	0.00
7,600.00	89.92	179.85	7,014.33	-800.25	-388.86	799.23	0.00	0.00	0.00	0.00
7,700.00	89.92	179.85	7,014.47	-900.25	-388.60	899.23	0.00	0.00	0.00	0.00
7,800.00	89.92	179.85	7,014.61	-1,000.25	-388.34	999.23	0.00	0.00	0.00	0.00
7,900.00	89.92	179.85	7,014.75	-1,100.25	-388.08	1,099.23	0.00	0.00	0.00	0.00
8,000.00	89.92	179.85	7,014.90	-1,200.25	-387.83	1,199.23	0.00	0.00	0.00	0.00
8,100.00	89.92	179.85	7,015.04	-1,300.25	-387.57	1,299.23	0.00	0.00	0.00	0.00
8,200.00	89.92	179.85	7,015.18	-1,400.25	-387.31	1,399.23	0.00	0.00	0.00	0.00
8,300.00	89.92	179.85	7,015.32	-1,500.25	-387.05	1,499.23	0.00	0.00	0.00	0.00
8,400.00	89.92	179.85	7,015.47	-1,600.25	-386.79	1,599.23	0.00	0.00	0.00	0.00
8,500.00	89.92	179.85	7,015.61	-1,700.25	-386.53	1,699.23	0.00	0.00	0.00	0.00
8,600.00	89.92	179.85	7,015.75	-1,800.25	-386.27	1,799.23	0.00	0.00	0.00	0.00
8,700.00	89.92	179.85	7,015.89	-1,900.25	-386.02	1,899.23	0.00	0.00	0.00	0.00
8,800.00	89.92	179.85	7,016.04	-2,000.25	-385.76	1,999.23	0.00	0.00	0.00	0.00
8,900.00	89.92	179.85	7,016.18	-2,100.25	-385.50	2,099.23	0.00	0.00	0.00	0.00

Plan Report for COOK 36N-28HZ - 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	89.92	179.85	7,016.32	-2,200.25	-385.24	2,199.23	0.00	0.00	0.00	0.00
9,100.00	89.92	179.85	7,016.46	-2,300.25	-384.98	2,299.23	0.00	0.00	0.00	0.00
9,200.00	89.92	179.85	7,016.61	-2,400.25	-384.72	2,399.23	0.00	0.00	0.00	0.00
9,300.00	89.92	179.85	7,016.75	-2,500.25	-384.47	2,499.23	0.00	0.00	0.00	0.00
9,400.00	89.92	179.85	7,016.89	-2,600.25	-384.21	2,599.23	0.00	0.00	0.00	0.00
9,500.00	89.92	179.85	7,017.03	-2,700.25	-383.95	2,699.23	0.00	0.00	0.00	0.00
9,600.00	89.92	179.85	7,017.18	-2,800.25	-383.69	2,799.23	0.00	0.00	0.00	0.00
9,700.00	89.92	179.85	7,017.32	-2,900.25	-383.43	2,899.23	0.00	0.00	0.00	0.00
9,800.00	89.92	179.85	7,017.46	-3,000.25	-383.17	2,999.23	0.00	0.00	0.00	0.00
9,900.00	89.92	179.85	7,017.60	-3,100.24	-382.91	3,099.23	0.00	0.00	0.00	0.00
10,000.00	89.92	179.85	7,017.75	-3,200.24	-382.66	3,199.23	0.00	0.00	0.00	0.00
10,100.00	89.92	179.85	7,017.89	-3,300.24	-382.40	3,299.23	0.00	0.00	0.00	0.00
10,200.00	89.92	179.85	7,018.03	-3,400.24	-382.14	3,399.23	0.00	0.00	0.00	0.00
10,300.00	89.92	179.85	7,018.17	-3,500.24	-381.88	3,499.23	0.00	0.00	0.00	0.00
10,400.00	89.92	179.85	7,018.32	-3,600.24	-381.62	3,599.23	0.00	0.00	0.00	0.00
10,500.00	89.92	179.85	7,018.46	-3,700.24	-381.36	3,699.23	0.00	0.00	0.00	0.00
10,600.00	89.92	179.85	7,018.60	-3,800.24	-381.10	3,799.23	0.00	0.00	0.00	0.00
10,700.00	89.92	179.85	7,018.74	-3,900.24	-380.85	3,899.23	0.00	0.00	0.00	0.00
10,800.00	89.92	179.85	7,018.89	-4,000.24	-380.59	3,999.23	0.00	0.00	0.00	0.00
10,900.00	89.92	179.85	7,019.03	-4,100.24	-380.33	4,099.23	0.00	0.00	0.00	0.00
11,000.00	89.92	179.85	7,019.17	-4,200.24	-380.07	4,199.23	0.00	0.00	0.00	0.00
11,100.00	89.92	179.85	7,019.31	-4,300.24	-379.81	4,299.23	0.00	0.00	0.00	0.00
11,200.00	89.92	179.85	7,019.46	-4,400.24	-379.55	4,399.23	0.00	0.00	0.00	0.00
11,300.00	89.92	179.85	7,019.60	-4,500.24	-379.29	4,499.23	0.00	0.00	0.00	0.00
11,400.00	89.92	179.85	7,019.74	-4,600.24	-379.04	4,599.23	0.00	0.00	0.00	0.00
11,500.00	89.92	179.85	7,019.88	-4,700.24	-378.78	4,699.23	0.00	0.00	0.00	0.00
11,600.00	89.92	179.85	7,020.03	-4,800.24	-378.52	4,799.23	0.00	0.00	0.00	0.00
11,700.00	89.92	179.85	7,020.17	-4,900.24	-378.26	4,899.23	0.00	0.00	0.00	0.00
11,800.00	89.92	179.85	7,020.31	-5,000.24	-378.00	4,999.23	0.00	0.00	0.00	0.00
11,900.00	89.92	179.85	7,020.45	-5,100.24	-377.74	5,099.23	0.00	0.00	0.00	0.00
12,000.00	89.92	179.85	7,020.60	-5,200.24	-377.48	5,199.23	0.00	0.00	0.00	0.00
12,100.00	89.92	179.85	7,020.74	-5,300.24	-377.23	5,299.23	0.00	0.00	0.00	0.00
12,200.00	89.92	179.85	7,020.88	-5,400.23	-376.97	5,399.23	0.00	0.00	0.00	0.00
12,300.00	89.92	179.85	7,021.02	-5,500.23	-376.71	5,499.23	0.00	0.00	0.00	0.00
12,400.00	89.92	179.85	7,021.17	-5,600.23	-376.45	5,599.23	0.00	0.00	0.00	0.00
12,500.00	89.92	179.85	7,021.31	-5,700.23	-376.19	5,699.23	0.00	0.00	0.00	0.00
12,600.00	89.92	179.85	7,021.45	-5,800.23	-375.93	5,799.23	0.00	0.00	0.00	0.00
12,700.00	89.92	179.85	7,021.59	-5,900.23	-375.67	5,899.23	0.00	0.00	0.00	0.00
12,800.00	89.92	179.85	7,021.74	-6,000.23	-375.42	5,999.23	0.00	0.00	0.00	0.00
12,900.00	89.92	179.85	7,021.88	-6,100.23	-375.16	6,099.23	0.00	0.00	0.00	0.00
13,000.00	89.92	179.85	7,022.02	-6,200.23	-374.90	6,199.23	0.00	0.00	0.00	0.00
13,100.00	89.92	179.85	7,022.16	-6,300.23	-374.64	6,299.23	0.00	0.00	0.00	0.00
13,200.00	89.92	179.85	7,022.31	-6,400.23	-374.38	6,399.23	0.00	0.00	0.00	0.00
13,300.00	89.92	179.85	7,022.45	-6,500.23	-374.12	6,499.23	0.00	0.00	0.00	0.00
13,400.00	89.92	179.85	7,022.59	-6,600.23	-373.86	6,599.23	0.00	0.00	0.00	0.00
13,500.00	89.92	179.85	7,022.73	-6,700.23	-373.61	6,699.23	0.00	0.00	0.00	0.00
13,600.00	89.92	179.85	7,022.88	-6,800.23	-373.35	6,799.23	0.00	0.00	0.00	0.00
13,700.00	89.92	179.85	7,023.02	-6,900.23	-373.09	6,899.23	0.00	0.00	0.00	0.00
13,800.00	89.92	179.85	7,023.16	-7,000.23	-372.83	6,999.23	0.00	0.00	0.00	0.00
13,900.00	89.92	179.85	7,023.30	-7,100.23	-372.57	7,099.23	0.00	0.00	0.00	0.00
14,000.00	89.92	179.85	7,023.45	-7,200.23	-372.31	7,199.23	0.00	0.00	0.00	0.00
14,100.00	89.92	179.85	7,023.59	-7,300.23	-372.05	7,299.23	0.00	0.00	0.00	0.00
14,200.00	89.92	179.85	7,023.73	-7,400.23	-371.80	7,399.23	0.00	0.00	0.00	0.00
14,300.00	89.92	179.85	7,023.87	-7,500.23	-371.54	7,499.23	0.00	0.00	0.00	0.00
14,400.00	89.92	179.85	7,024.02	-7,600.23	-371.28	7,599.23	0.00	0.00	0.00	0.00
14,500.00	89.92	179.85	7,024.16	-7,700.22	-371.02	7,699.23	0.00	0.00	0.00	0.00
14,600.00	89.92	179.85	7,024.30	-7,800.22	-370.76	7,799.23	0.00	0.00	0.00	0.00
14,700.00	89.92	179.85	7,024.45	-7,900.22	-370.50	7,899.23	0.00	0.00	0.00	0.00
14,800.00	89.92	179.85	7,024.59	-8,000.22	-370.25	7,999.23	0.00	0.00	0.00	0.00
14,900.00	89.92	179.85	7,024.73	-8,100.22	-369.99	8,099.23	0.00	0.00	0.00	0.00

Plan Report for COOK 36N-28HZ - 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 (°)
15,000.00	89.92	179.85	7,024.87	-8,200.22	-369.73	8,199.23	0.00	0.00	0.00	0.00
15,100.00	89.92	179.85	7,025.02	-8,300.22	-369.47	8,299.23	0.00	0.00	0.00	0.00
15,200.00	89.92	179.85	7,025.16	-8,400.22	-369.21	8,399.23	0.00	0.00	0.00	0.00
15,300.00	89.92	179.85	7,025.30	-8,500.22	-368.95	8,499.23	0.00	0.00	0.00	0.00
15,400.00	89.92	179.85	7,025.44	-8,600.22	-368.69	8,599.23	0.00	0.00	0.00	0.00
15,500.00	89.92	179.85	7,025.59	-8,700.22	-368.44	8,699.23	0.00	0.00	0.00	0.00
15,600.00	89.92	179.85	7,025.73	-8,800.22	-368.18	8,799.23	0.00	0.00	0.00	0.00
15,700.00	89.92	179.85	7,025.87	-8,900.22	-367.92	8,899.23	0.00	0.00	0.00	0.00
15,800.00	89.92	179.85	7,026.01	-9,000.22	-367.66	8,999.23	0.00	0.00	0.00	0.00
15,900.00	89.92	179.85	7,026.16	-9,100.22	-367.40	9,099.23	0.00	0.00	0.00	0.00
16,000.00	89.92	179.85	7,026.30	-9,200.22	-367.14	9,199.23	0.00	0.00	0.00	0.00
16,100.00	89.92	179.85	7,026.44	-9,300.22	-366.88	9,299.23	0.00	0.00	0.00	0.00
16,200.00	89.92	179.85	7,026.58	-9,400.22	-366.63	9,399.23	0.00	0.00	0.00	0.00
16,300.00	89.92	179.85	7,026.73	-9,500.22	-366.37	9,499.23	0.00	0.00	0.00	0.00
16,400.00	89.92	179.85	7,026.87	-9,600.22	-366.11	9,599.23	0.00	0.00	0.00	0.00
16,500.00	89.92	179.85	7,027.01	-9,700.22	-365.85	9,699.23	0.00	0.00	0.00	0.00
16,600.00	89.92	179.85	7,027.15	-9,800.22	-365.59	9,799.22	0.00	0.00	0.00	0.00
16,700.00	89.92	179.85	7,027.30	-9,900.22	-365.33	9,899.22	0.00	0.00	0.00	0.00
16,800.00	89.92	179.85	7,027.44	-10,000.21	-365.07	9,999.22	0.00	0.00	0.00	0.00
16,900.00	89.92	179.85	7,027.58	-10,100.21	-364.82	10,099.22	0.00	0.00	0.00	0.00
17,000.00	89.92	179.85	7,027.72	-10,200.21	-364.56	10,199.22	0.00	0.00	0.00	0.00
17,100.00	89.92	179.85	7,027.87	-10,300.21	-364.30	10,299.22	0.00	0.00	0.00	0.00
17,200.00	89.92	179.85	7,028.01	-10,400.21	-364.04	10,399.22	0.00	0.00	0.00	0.00
17,300.00	89.92	179.85	7,028.15	-10,500.21	-363.78	10,499.22	0.00	0.00	0.00	0.00
17,400.00	89.92	179.85	7,028.29	-10,600.21	-363.52	10,599.22	0.00	0.00	0.00	0.00
17,500.00	89.92	179.85	7,028.44	-10,700.21	-363.26	10,699.22	0.00	0.00	0.00	0.00
17,600.00	89.92	179.85	7,028.58	-10,800.21	-363.01	10,799.22	0.00	0.00	0.00	0.00
17,700.00	89.92	179.85	7,028.72	-10,900.21	-362.75	10,899.22	0.00	0.00	0.00	0.00
17,800.00	89.92	179.85	7,028.86	-11,000.21	-362.49	10,999.22	0.00	0.00	0.00	0.00
17,896.21	89.92	179.85	7,029.00	-11,096.42	-362.24	11,095.43	0.00	0.00	0.00	0.00

TD Well @ 17896.21ft - Target Toe Location - COOK 36N-28HZ_BHL

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
3,620.00	3,620.00	0.00	0.00	Begin Nudge @ 3620.00ft
4,120.00	4,117.47	0.00	-43.52	End Nudge @ 4120.00ft
5,870.00	5,840.88	0.00	-347.41	Begin Drop @ 5870.00ft
6,370.00	6,338.34	0.00	-390.93	End Drop @ 6370.00ft
6,372.70	6,341.04	0.00	-390.93	Top of 4.5" Liner @ 6372.70ft
6,472.70	6,441.04	0.00	-390.93	KOP @ 6472.70ft
6,900.00	6,829.82	-152.09	-390.54	DLS = 10°/100'
7,371.88	7,014.00	-572.14	-389.45	End Build @ 7371.88ft
17,896.21	7,029.00	-11,096.42	-362.24	TD Well @ 17896.21ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	179.85	Slot	0.00	0.00	0.00

Plan Report for COOK 36N-28HZ - Permit Rev-1**Survey tool program**

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,371.88	Permit Rev-1	APC_ISCWSA REV 2 MWD+IFR1
7,371.88	17,896.21	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	1,350.00	9 5/8"	9-5/8	13-1/2
7,371.88	7,014.00	7"	7	8-3/4

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,529.76	4,521.00	Sussex		0.00	
6,962.40	6,873.26	Sharon Springs		0.00	
7,060.95	6,931.26	Niobrara Top		0.00	
7,193.59	6,986.23	Niobrara B Bench		0.00	
7,371.88	7,014.00	Target Heel Location		0.00	
17,896.21	7,029.00	Target Toe Location		0.00	

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
2N-R65W-Sec. 28_Section Lines	0.00	0.00	0.00	Polygon
2N-R65W-Sec. 16_Section Lines	-12.00	-2,916.99	-2,999.54	Polygon
2N-R65W-Sec. 21_Section Lines	-12.00	-2,916.99	-2,999.54	Polygon
COOK 36N-28HZ_SHL	0.00	0.00	0.00	Point
COOK 36N-28HZ_BHL	7,029.00	-11,096.42	-362.24	Point

North Reference Sheet for 2N-65W-16 Cook #1 Pad - COOK 36N-28HZ - 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 36N-28HZ

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: 14,575,296.56 usft N, 1,733,633.62 usft E

Geographical Coordinates of Well: 40° 07' 58.37" N, 104° 39' 59.39" W

Grid Convergence at Surface is: 0.21°

Based upon Minimum Curvature type calculations, at a Measured Depth of 17,896.21usft the Bottom Hole Displacement is 11,102.33usft in the Direction of 181.87° (True).

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

