

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

2N-65W-22 Powers 2-22

POWERS 2C-27HZ

Plan A

Plan: Permit Rev-1

Sperry Drilling Services Proposal Report

11 March, 2015

Well Coordinates: 14,574,462.95 N, 1,739,532.94 E (40° 07' 49.91" N, 104° 38' 43.45" W)

Ground Level: 4,894.00 usft

Local Coordinate Origin:

Centered on Well POWERS 2C-27HZ

Viewing Datum:

RKB = 17' @ 4911.00usft (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-22 Powers 2-22

Well: POWERS 2C-27HZ

Wellbore: Plan A

Design: Permit Rev-1

US ROCKIES WATTENBERG PLANNING

HALLIBURTON

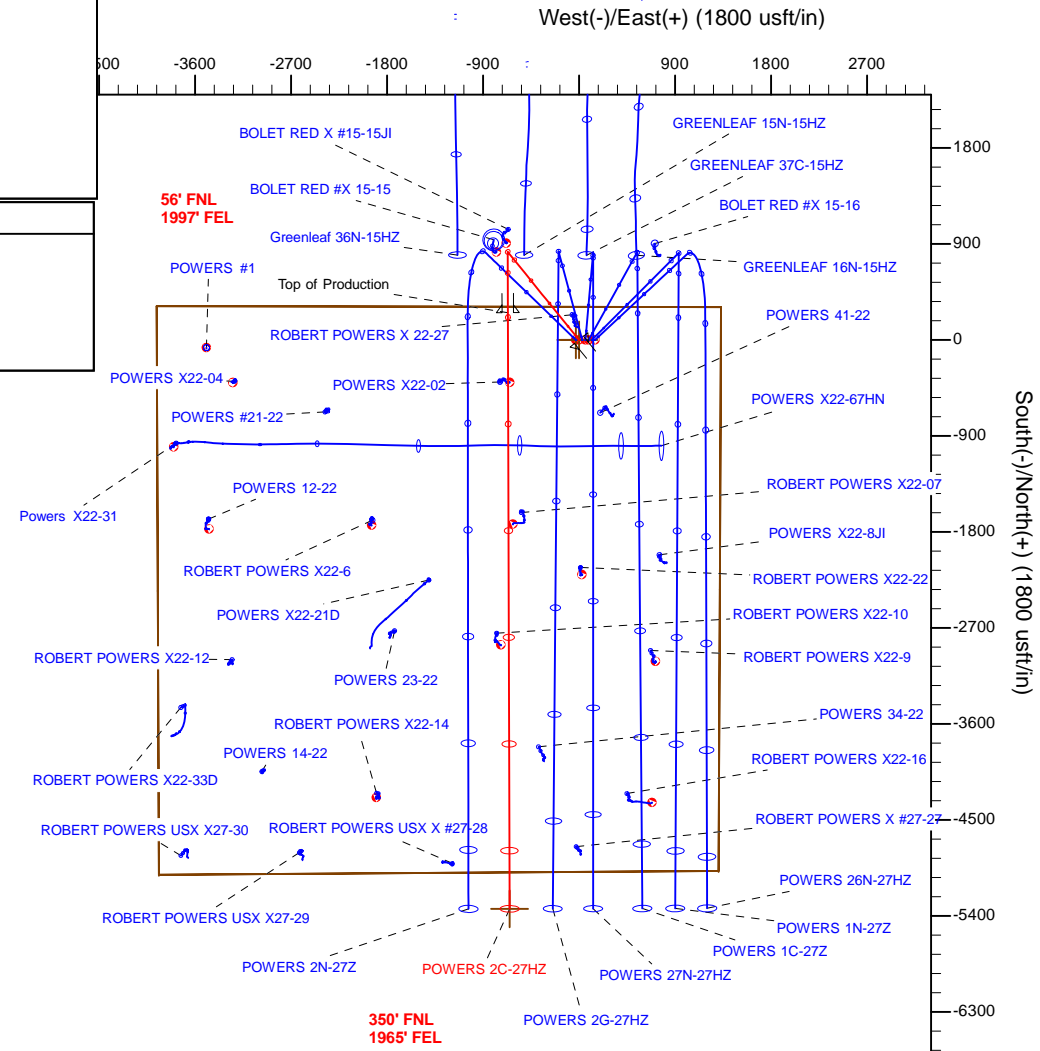
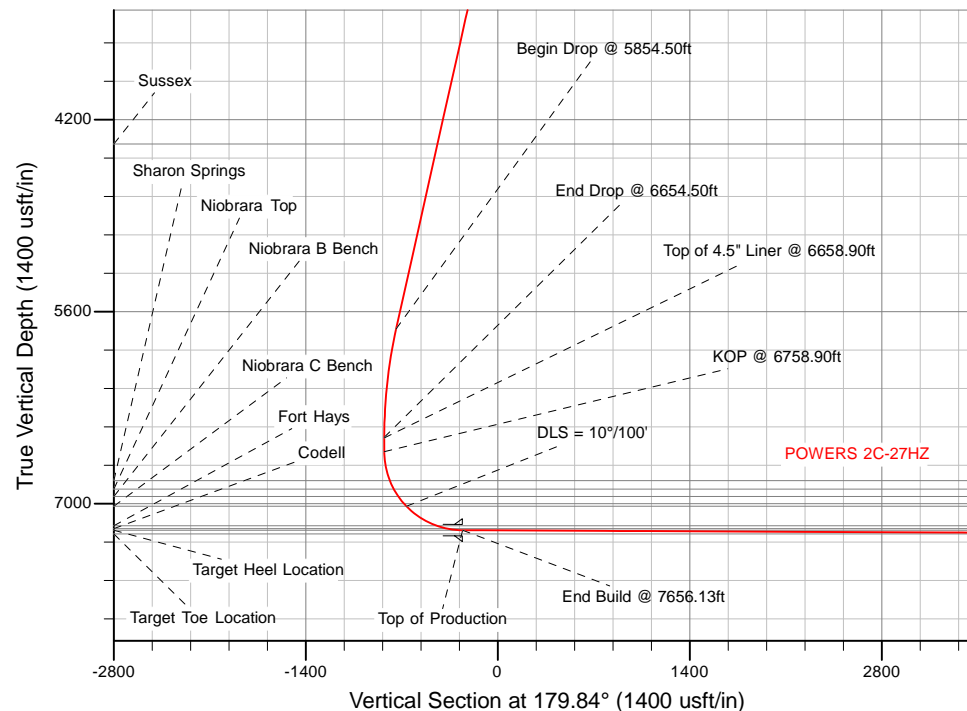
Sperry Drilling

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	2005.00	0.00	0.00	2005.00	0.00	0.00	0.00	0.00	0.00	
3	2805.00	16.00	321.00	2794.64	86.25	-69.84	2.00	321.00	-86.44	
4	5854.50	16.00	321.00	5726.01	739.48	-598.82	0.00	0.00	-741.15	
5	6654.50	0.00	0.00	6515.65	825.73	-668.66	2.00	180.00	-827.59	
6	6758.90	0.00	0.00	6620.05	825.73	-668.66	0.00	0.00	-827.59	
7	7656.13	89.72	179.84	7193.00	255.54	-667.07	10.00	179.84	-257.40	
8	13245.28	89.72	179.84	7220.00	-5333.52	-651.46	0.00	0.00	5331.68	POWERS 2C-27HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
2N-R65W-Sec. 22_Section Lines	0.00	0.00	-29.91	40.130530	-104.645509
POWERS 2C-27HZ_SHL	0.00	0.00	0.00	40.130530	-104.645402
POWERS 2C-27HZ_BHL	7220.00	-5333.52	-651.46	40.115884	-104.647732



WELL DETAILS: POWERS 2C-27HZ

Ground Level: 4894.00

RKB = 17' @ 4911.00usft (D Rig)

Plan: Permit Rev-1 (POWERS 2C-27HZ/Plan A)

Created By: Clint Eshelman

Date: 3/11/2015

Reviewed:

Date:

Plan Report for POWERS 2C-27HZ - 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. 22_Section Lines - POWERS 2C-27HZ_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
1,362.00	0.00	0.00	1,362.00	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
2,005.00	0.00	0.00	2,005.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 2005.00ft										
2,100.00	1.90	321.00	2,099.98	1.22	-0.99	-1.23	2.00	2.00	0.00	321.00
2,200.00	3.90	321.00	2,199.85	5.16	-4.17	-5.17	2.00	2.00	0.00	0.00
2,300.00	5.90	321.00	2,299.48	11.79	-9.55	-11.82	2.00	2.00	0.00	0.00
2,400.00	7.90	321.00	2,398.75	21.13	-17.11	-21.18	2.00	2.00	0.00	0.00
2,500.00	9.90	321.00	2,497.54	33.15	-26.85	-33.23	2.00	2.00	0.00	0.00
2,600.00	11.90	321.00	2,595.73	47.85	-38.75	-47.95	2.00	2.00	0.00	0.00
2,700.00	13.90	321.00	2,693.20	65.20	-52.79	-65.34	2.00	2.00	0.00	0.00
2,800.00	15.90	321.00	2,789.84	85.18	-68.98	-85.37	2.00	2.00	0.00	0.00
2,805.00	16.00	321.00	2,794.64	86.25	-69.84	-86.44	2.00	2.00	0.00	0.00
End Nudge @ 2805.00ft										
2,900.00	16.00	321.00	2,885.96	106.60	-86.32	-106.84	0.00	0.00	0.00	0.00
3,000.00	16.00	321.00	2,982.09	128.02	-103.67	-128.31	0.00	0.00	0.00	0.00
3,100.00	16.00	321.00	3,078.22	149.44	-121.01	-149.77	0.00	0.00	0.00	0.00
3,200.00	16.00	321.00	3,174.34	170.86	-138.36	-171.24	0.00	0.00	0.00	0.00
3,300.00	16.00	321.00	3,270.47	192.28	-155.70	-192.71	0.00	0.00	0.00	0.00
3,400.00	16.00	321.00	3,366.59	213.70	-173.05	-214.18	0.00	0.00	0.00	0.00
3,500.00	16.00	321.00	3,462.72	235.12	-190.40	-235.65	0.00	0.00	0.00	0.00
3,600.00	16.00	321.00	3,558.85	256.54	-207.74	-257.12	0.00	0.00	0.00	0.00
3,700.00	16.00	321.00	3,654.97	277.96	-225.09	-278.59	0.00	0.00	0.00	0.00
3,800.00	16.00	321.00	3,751.10	299.38	-242.44	-300.06	0.00	0.00	0.00	0.00
3,900.00	16.00	321.00	3,847.22	320.81	-259.78	-321.53	0.00	0.00	0.00	0.00
4,000.00	16.00	321.00	3,943.35	342.23	-277.13	-343.00	0.00	0.00	0.00	0.00
4,100.00	16.00	321.00	4,039.48	363.65	-294.48	-364.47	0.00	0.00	0.00	0.00
4,200.00	16.00	321.00	4,135.60	385.07	-311.82	-385.94	0.00	0.00	0.00	0.00
4,300.00	16.00	321.00	4,231.73	406.49	-329.17	-407.41	0.00	0.00	0.00	0.00
4,400.00	16.00	321.00	4,327.86	427.91	-346.52	-428.88	0.00	0.00	0.00	0.00
4,450.08	16.00	321.00	4,376.00	438.64	-355.20	-439.63	0.00	0.00	0.00	0.00
Sussex										
4,500.00	16.00	321.00	4,423.98	449.33	-363.86	-450.35	0.00	0.00	0.00	0.00
4,600.00	16.00	321.00	4,520.11	470.75	-381.21	-471.82	0.00	0.00	0.00	0.00
4,700.00	16.00	321.00	4,616.23	492.17	-398.55	-493.29	0.00	0.00	0.00	0.00
4,800.00	16.00	321.00	4,712.36	513.60	-415.90	-514.75	0.00	0.00	0.00	0.00

Plan Report for POWERS 2C-27HZ - 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	16.00	321.00	4,808.49	535.02	-433.25	-536.22	0.00	0.00	0.00	0.00
5,000.00	16.00	321.00	4,904.61	556.44	-450.59	-557.69	0.00	0.00	0.00	0.00
5,100.00	16.00	321.00	5,000.74	577.86	-467.94	-579.16	0.00	0.00	0.00	0.00
5,200.00	16.00	321.00	5,096.86	599.28	-485.29	-600.63	0.00	0.00	0.00	0.00
5,300.00	16.00	321.00	5,192.99	620.70	-502.63	-622.10	0.00	0.00	0.00	0.00
5,400.00	16.00	321.00	5,289.12	642.12	-519.98	-643.57	0.00	0.00	0.00	0.00
5,500.00	16.00	321.00	5,385.24	663.54	-537.33	-665.04	0.00	0.00	0.00	0.00
5,600.00	16.00	321.00	5,481.37	684.96	-554.67	-686.51	0.00	0.00	0.00	0.00
5,700.00	16.00	321.00	5,577.50	706.38	-572.02	-707.98	0.00	0.00	0.00	0.00
5,800.00	16.00	321.00	5,673.62	727.81	-589.37	-729.45	0.00	0.00	0.00	0.00
5,854.50	16.00	321.00	5,726.01	739.48	-598.82	-741.15	0.00	0.00	0.00	0.00
Begin Drop @ 5854.50ft										
5,900.00	15.09	321.00	5,769.85	748.96	-606.49	-750.65	2.00	-2.00	0.00	180.00
6,000.00	13.09	321.00	5,866.83	767.87	-621.81	-769.61	2.00	-2.00	0.00	180.00
6,100.00	11.09	321.00	5,964.61	784.15	-634.99	-785.92	2.00	-2.00	0.00	180.00
6,200.00	9.09	321.00	6,063.06	797.77	-646.02	-799.57	2.00	-2.00	0.00	180.00
6,300.00	7.09	321.00	6,162.06	808.70	-654.87	-810.53	2.00	-2.00	0.00	180.00
6,400.00	5.09	321.00	6,261.49	816.95	-661.55	-818.79	2.00	-2.00	0.00	180.00
6,500.00	3.09	321.00	6,361.23	822.49	-666.04	-824.35	2.00	-2.00	0.00	180.00
6,600.00	1.09	321.00	6,461.16	825.32	-668.33	-827.19	2.00	-2.00	0.00	180.00
6,654.50	0.00	0.00	6,515.65	825.73	-668.66	-827.59	2.00	-2.00	71.56	180.00
End Drop @ 6654.50ft										
6,658.90	0.00	0.00	6,520.05	825.73	-668.66	-827.59	0.00	0.00	0.00	180.00
Top of 4.5" Liner @ 6658.90ft										
6,700.00	0.00	0.00	6,561.15	825.73	-668.66	-827.59	0.00	0.00	0.00	0.00
6,758.90	0.00	0.00	6,620.05	825.73	-668.66	-827.59	0.00	0.00	0.00	0.00
KOP @ 6758.90ft										
6,800.00	4.11	179.84	6,661.12	824.25	-668.66	-826.12	10.00	10.00	0.00	179.84
6,900.00	14.11	179.84	6,759.73	808.44	-668.61	-810.30	10.00	10.00	0.00	0.00
6,976.34	21.74	179.84	6,832.31	784.96	-668.55	-786.82	10.00	10.00	0.00	0.00
Sharon Springs										
7,000.00	24.11	179.84	6,854.10	775.74	-668.52	-777.61	10.00	10.00	0.00	0.00
7,043.75	28.48	179.84	6,893.31	756.37	-668.47	-758.23	10.00	10.00	0.00	0.00
Niobrara Top										
7,100.00	34.11	179.84	6,941.36	727.16	-668.38	-729.02	10.00	10.00	0.00	0.00
7,105.89	34.70	179.84	6,946.22	723.83	-668.37	-725.69	10.00	10.00	0.00	0.00
Niobrara B Bench										
7,199.83	44.09	179.84	7,018.73	664.27	-668.21	-666.14	10.00	10.00	0.00	0.00
Niobrara C Bench										
7,200.00	44.11	179.84	7,018.85	664.15	-668.21	-666.02	10.00	10.00	0.00	0.00
DLS = 10°/100'										
7,300.00	54.11	179.84	7,084.23	588.65	-668.00	-590.52	10.00	10.00	0.00	0.00
7,400.00	64.11	179.84	7,135.51	502.95	-667.76	-504.81	10.00	10.00	0.00	0.00
7,465.17	70.63	179.84	7,160.57	442.82	-667.59	-444.69	10.00	10.00	0.00	0.00
Fort Hays										
7,500.00	74.11	179.84	7,171.12	409.64	-667.50	-411.50	10.00	10.00	0.00	0.00
7,549.36	79.05	179.84	7,182.57	361.65	-667.36	-363.51	10.00	10.00	0.00	0.00
Codell										
7,600.00	84.11	179.84	7,189.99	311.57	-667.22	-313.43	10.00	10.00	0.00	0.00
7,656.13	89.72	179.84	7,193.00	255.54	-667.07	-257.40	10.00	10.00	0.00	0.00
End Build @ 7656.13ft - Target Heel Location - Top of Production										
7,700.00	89.72	179.84	7,193.22	211.67	-666.94	-213.53	0.00	0.00	0.00	0.00
7,800.00	89.72	179.84	7,193.70	111.67	-666.67	-113.53	0.00	0.00	0.00	0.00
7,900.00	89.72	179.84	7,194.18	11.67	-666.39	-13.53	0.00	0.00	0.00	0.00
8,000.00	89.72	179.84	7,194.67	-88.32	-666.11	86.46	0.00	0.00	0.00	0.00
8,100.00	89.72	179.84	7,195.15	-188.32	-665.83	186.46	0.00	0.00	0.00	0.00
8,200.00	89.72	179.84	7,195.63	-288.32	-665.55	286.46	0.00	0.00	0.00	0.00
8,300.00	89.72	179.84	7,196.11	-388.32	-665.27	386.46	0.00	0.00	0.00	0.00

Plan Report for POWERS 2C-27HZ - 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 (°)
8,400.00	89.72	179.84	7,196.60	-488.32	-664.99	486.46	0.00	0.00	0.00	0.00
8,500.00	89.72	179.84	7,197.08	-588.32	-664.71	586.46	0.00	0.00	0.00	0.00
8,600.00	89.72	179.84	7,197.56	-688.32	-664.43	686.46	0.00	0.00	0.00	0.00
8,700.00	89.72	179.84	7,198.05	-788.31	-664.15	786.46	0.00	0.00	0.00	0.00
8,800.00	89.72	179.84	7,198.53	-888.31	-663.87	886.45	0.00	0.00	0.00	0.00
8,900.00	89.72	179.84	7,199.01	-988.31	-663.59	986.45	0.00	0.00	0.00	0.00
9,000.00	89.72	179.84	7,199.50	-1,088.31	-663.31	1,086.45	0.00	0.00	0.00	0.00
9,100.00	89.72	179.84	7,199.98	-1,188.31	-663.04	1,186.45	0.00	0.00	0.00	0.00
9,200.00	89.72	179.84	7,200.46	-1,288.31	-662.76	1,286.45	0.00	0.00	0.00	0.00
9,300.00	89.72	179.84	7,200.94	-1,388.30	-662.48	1,386.45	0.00	0.00	0.00	0.00
9,400.00	89.72	179.84	7,201.43	-1,488.30	-662.20	1,486.45	0.00	0.00	0.00	0.00
9,500.00	89.72	179.84	7,201.91	-1,588.30	-661.92	1,586.45	0.00	0.00	0.00	0.00
9,600.00	89.72	179.84	7,202.39	-1,688.30	-661.64	1,686.45	0.00	0.00	0.00	0.00
9,700.00	89.72	179.84	7,202.88	-1,788.30	-661.36	1,786.44	0.00	0.00	0.00	0.00
9,800.00	89.72	179.84	7,203.36	-1,888.30	-661.08	1,886.44	0.00	0.00	0.00	0.00
9,900.00	89.72	179.84	7,203.84	-1,988.30	-660.80	1,986.44	0.00	0.00	0.00	0.00
10,000.00	89.72	179.84	7,204.33	-2,088.29	-660.52	2,086.44	0.00	0.00	0.00	0.00
10,100.00	89.72	179.84	7,204.81	-2,188.29	-660.24	2,186.44	0.00	0.00	0.00	0.00
10,200.00	89.72	179.84	7,205.29	-2,288.29	-659.96	2,286.44	0.00	0.00	0.00	0.00
10,300.00	89.72	179.84	7,205.77	-2,388.29	-659.68	2,386.44	0.00	0.00	0.00	0.00
10,400.00	89.72	179.84	7,206.26	-2,488.29	-659.41	2,486.44	0.00	0.00	0.00	0.00
10,500.00	89.72	179.84	7,206.74	-2,588.29	-659.13	2,586.44	0.00	0.00	0.00	0.00
10,600.00	89.72	179.84	7,207.22	-2,688.28	-658.85	2,686.43	0.00	0.00	0.00	0.00
10,700.00	89.72	179.84	7,207.71	-2,788.28	-658.57	2,786.43	0.00	0.00	0.00	0.00
10,800.00	89.72	179.84	7,208.19	-2,888.28	-658.29	2,886.43	0.00	0.00	0.00	0.00
10,900.00	89.72	179.84	7,208.67	-2,988.28	-658.01	2,986.43	0.00	0.00	0.00	0.00
11,000.00	89.72	179.84	7,209.16	-3,088.28	-657.73	3,086.43	0.00	0.00	0.00	0.00
11,100.00	89.72	179.84	7,209.64	-3,188.28	-657.45	3,186.43	0.00	0.00	0.00	0.00
11,200.00	89.72	179.84	7,210.12	-3,288.27	-657.17	3,286.43	0.00	0.00	0.00	0.00
11,300.00	89.72	179.84	7,210.60	-3,388.27	-656.89	3,386.43	0.00	0.00	0.00	0.00
11,400.00	89.72	179.84	7,211.09	-3,488.27	-656.61	3,486.42	0.00	0.00	0.00	0.00
11,500.00	89.72	179.84	7,211.57	-3,588.27	-656.33	3,586.42	0.00	0.00	0.00	0.00
11,600.00	89.72	179.84	7,212.05	-3,688.27	-656.05	3,686.42	0.00	0.00	0.00	0.00
11,700.00	89.72	179.84	7,212.54	-3,788.27	-655.78	3,786.42	0.00	0.00	0.00	0.00
11,800.00	89.72	179.84	7,213.02	-3,888.27	-655.50	3,886.42	0.00	0.00	0.00	0.00
11,900.00	89.72	179.84	7,213.50	-3,988.26	-655.22	3,986.42	0.00	0.00	0.00	0.00
12,000.00	89.72	179.84	7,213.99	-4,088.26	-654.94	4,086.42	0.00	0.00	0.00	0.00
12,100.00	89.72	179.84	7,214.47	-4,188.26	-654.66	4,186.42	0.00	0.00	0.00	0.00
12,200.00	89.72	179.84	7,214.95	-4,288.26	-654.38	4,286.42	0.00	0.00	0.00	0.00
12,300.00	89.72	179.84	7,215.43	-4,388.26	-654.10	4,386.41	0.00	0.00	0.00	0.00
12,400.00	89.72	179.84	7,215.92	-4,488.26	-653.82	4,486.41	0.00	0.00	0.00	0.00
12,500.00	89.72	179.84	7,216.40	-4,588.25	-653.54	4,586.41	0.00	0.00	0.00	0.00
12,600.00	89.72	179.84	7,216.88	-4,688.25	-653.26	4,686.41	0.00	0.00	0.00	0.00
12,700.00	89.72	179.84	7,217.37	-4,788.25	-652.98	4,786.41	0.00	0.00	0.00	0.00
12,800.00	89.72	179.84	7,217.85	-4,888.25	-652.70	4,886.41	0.00	0.00	0.00	0.00
12,900.00	89.72	179.84	7,218.33	-4,988.25	-652.42	4,986.41	0.00	0.00	0.00	0.00
13,000.00	89.72	179.84	7,218.82	-5,088.25	-652.14	5,086.41	0.00	0.00	0.00	0.00
13,100.00	89.72	179.84	7,219.30	-5,188.25	-651.87	5,186.40	0.00	0.00	0.00	0.00
13,200.00	89.72	179.84	7,219.78	-5,288.24	-651.59	5,286.40	0.00	0.00	0.00	0.00
13,245.27	89.72	179.84	7,220.00	-5,333.51	-651.46	5,331.67	0.00	0.00	0.00	0.00

Target Toe Location

13,245.28	89.72	179.84	7,220.00	-5,333.52	-651.46	5,331.68	0.00	0.00	0.00	0.00
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TD Well @ 13245.28ft - POWERS 2C-27HZ_BHL

Plan Report for POWERS 2C-27HZ - Permit Rev-1

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,005.00	2,005.00	0.00	0.00	Begin Nudge @ 2005.00ft
2,805.00	2,794.64	86.25	-69.84	End Nudge @ 2805.00ft
5,854.50	5,726.01	739.48	-598.82	Begin Drop @ 5854.50ft
6,654.50	6,515.65	825.73	-668.66	End Drop @ 6654.50ft
6,658.90	6,520.05	825.73	-668.66	Top of 4.5" Liner @ 6658.90ft
6,758.90	6,620.05	825.73	-668.66	KOP @ 6758.90ft
7,200.00	7,018.85	664.15	-668.21	DLS = 10°/100'
7,656.13	7,193.00	255.54	-667.07	End Build @ 7656.13ft
13,245.28	7,220.00	-5,333.52	-651.46	TD Well @ 13245.28ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	179.84	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,656.13	Permit Rev-1	APC_ISCWSA REV 2 MWD+IFR1
7,656.13	13,245.28	Permit Rev-1	APC_ISCWSA REV 2 MWD+IFR1

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,362.00	1,362.00	9 5/8"	9-5/8	13-1/2
7,656.13	7,193.00	Top of Production	5-1/2	7-7/8

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,450.08	4,376.00	Sussex		0.00	
6,976.34	6,832.31	Sharon Springs		0.00	
7,043.75	6,893.31	Niobrara Top		0.00	
7,105.89	6,946.22	Niobrara B Bench		0.00	
7,199.83	7,018.73	Niobrara C Bench		0.00	
7,465.17	7,160.57	Fort Hays		0.00	
7,549.36	7,182.57	Codell		0.00	
7,656.13	7,193.00	Target Heel Location		0.00	
13,245.27	7,220.00	Target Toe Location		0.00	

Plan Report for POWERS 2C-27HZ - Permit Rev-1

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
POWERS 2C-27HZ_BHL	7,220.00	-5,333.52	-651.46	Point
2N-R65W-Sec. 22_Section Lines	0.00	0.00	-29.91	Polygon
POWERS 2C-27HZ_SHL	0.00	0.00	0.00	Point

North Reference Sheet for 2N-65W-22 Powers 22-2 - POWERS 2C-27HZ - 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' @ 4911.00usft (D Rig). Northing and Easting are relative to POWERS 2C-27HZ

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: 0.99961124

Grid Coordinates of Well: 14,574,462.95 usft N, 1,739,532.94 usft E

Geographical Coordinates of Well: 40° 07' 49.91" N, 104° 38' 43.45" W

Grid Convergence at Surface is: 0.23°

Based upon Minimum Curvature type calculations, at a Measured Depth of 13,245.28usft
the Bottom Hole Displacement is 5,373.16usft in the Direction of 186.96° (True).

Magnetic Convergence at surface is: -8.07° (12 January 2015, , IGRF2010)

