

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 22-T2N-R67W

Black Tiger 15C-27HZ

Plan A

Plan: Rev A0 Permit

Sperry Drilling Services

Proposal Report

10 February, 2014

Well Coordinates: 1,286,181.56 N, 3,175,423.01 E (40° 07' 02.13" N, 104° 52' 21.90" W)

Ground Level: 4,980.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

Centered on Well Black Tiger 15C-27HZ

RKB=17' @ 4997.00usft (Drilling Rig)

N

True

Dec-Deg - API - US Survey Feet - Custom

HALLIBURTON

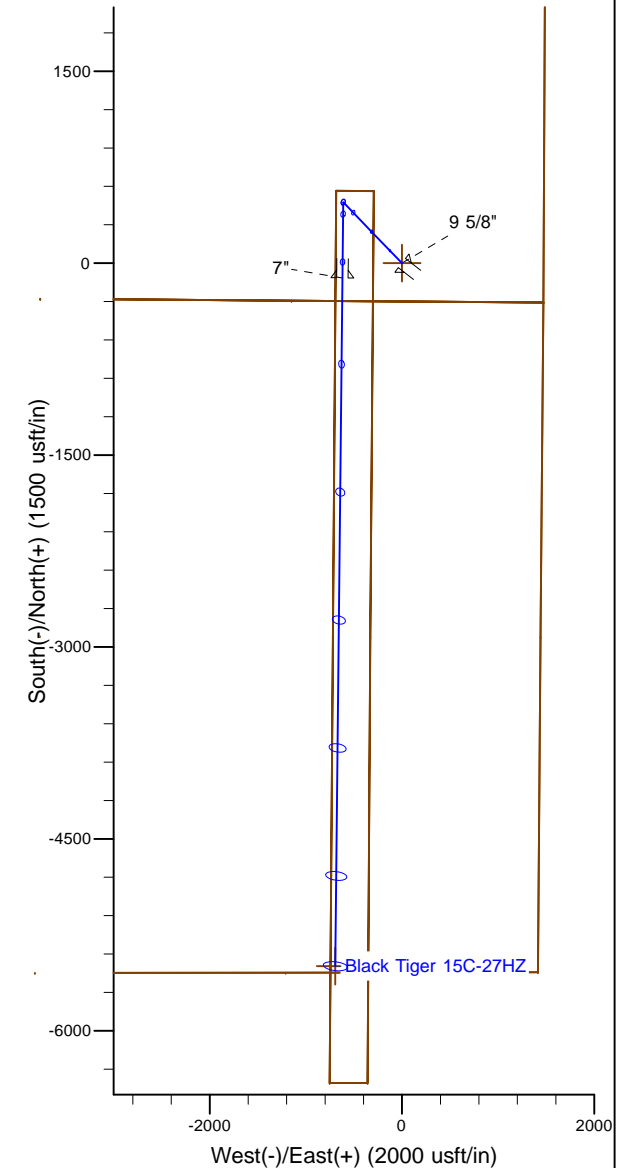
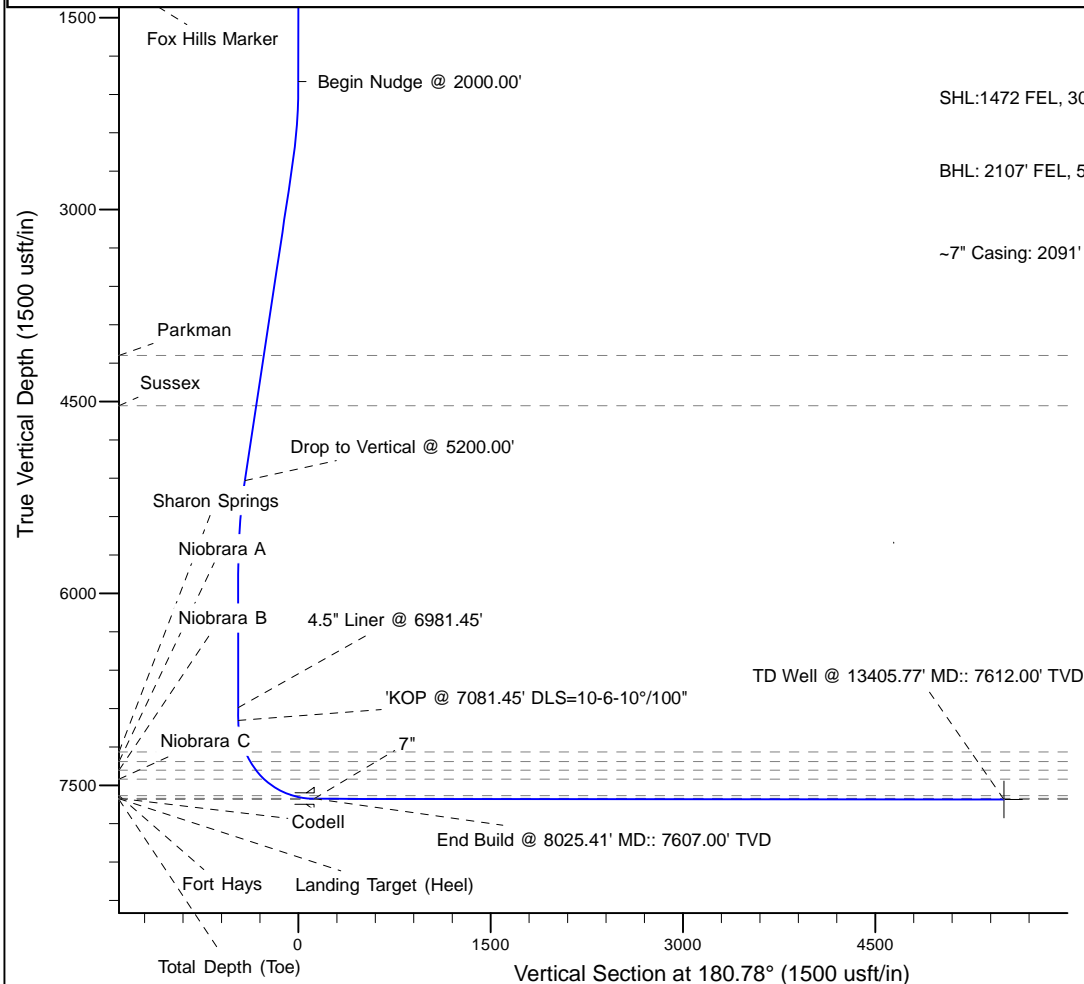
Project: Weld County, CO (NAD 83)
 Site: Sec. 22-T2N-R67W
 Well: Black Tiger 15C-27HZ
 Wellbore: Plan A
 Design: Rev A0 Permit

Anadarko Petroleum Corp.



Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Black Tiger 15C-27HZ LD	0.00	4352.40	-2891.70	1290513.22	3172500.72	40.129205	-104.883090
Black Tiger 15C-27HZ SHL	0.00	0.00	0.00	1286181.56	3175423.01	40.117258	-104.872749
Black Tiger 15C-27HZ Pad_Sec.line	0.00	4352.40	-2891.70	1290513.22	3172500.72	40.129205	-104.883090
Black Tiger 15C-27HZ BHL	7612.00	-5494.62	-692.37	1280682.41	3174769.55	40.102175	-104.875224

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSec
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2000.00	0.00	0.00	2000.00	0.00	0.00	0.00	0.00
2700.00	14.00	308.00	2693.06	52.39	-67.06	2.00	-51.47
5200.00	14.00	308.00	5118.79	424.75	-543.65	0.00	-417.31
5900.00	0.00	0.00	5811.85	477.14	-610.71	2.00	-468.78
7081.45	0.00	0.00	6993.30	477.14	-610.71	0.00	-468.78
7309.09	22.76	180.78	7215.00	432.51	-611.31	10.00	-424.15
7420.52	29.45	180.78	7315.00	383.51	-611.98	6.00	-375.14
8025.41	89.94	180.78	7606.26	-114.76	-618.79	10.00	123.17
13405.77	89.94	180.78	7612.00	-5494.62	-692.37	0.00	5503.53



WELL DETAILS: Black Tiger 15C-27HZ	
Ground Level:	4980.00
RKB=17' @ 4997.00usft (Drilling Rig)	
Plan: Rev A0 Permit (Black Tiger 15C-27HZ/Plan A)	
Created By: Pari Amanlou	Date: 2-6-2014

Plan Report for Black Tiger 15C-27HZ - Rev A0 Permit

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
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
1,228.00	0.00	0.00	1,228.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills Marker										
1,278.00	0.00	0.00	1,278.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"										
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	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
Begin Nudge @ 2000.00'										
2,100.00	2.00	308.00	2,099.98	1.07	-1.38	-1.06	2.00	2.00	0.00	308.00
2,200.00	4.00	308.00	2,199.84	4.30	-5.50	-4.22	2.00	2.00	0.00	0.00
2,300.00	6.00	308.00	2,299.45	9.66	-12.37	-9.49	2.00	2.00	0.00	0.00
2,400.00	8.00	308.00	2,398.70	17.16	-21.97	-16.86	2.00	2.00	0.00	0.00
2,500.00	10.00	308.00	2,497.47	26.80	-34.30	-26.33	2.00	2.00	0.00	0.00
2,600.00	12.00	308.00	2,595.62	38.54	-49.33	-37.87	2.00	2.00	0.00	0.00
2,700.00	14.00	308.00	2,693.06	52.39	-67.06	-51.47	2.00	2.00	0.00	0.00
2,800.00	14.00	308.00	2,790.08	67.28	-86.12	-66.11	0.00	0.00	0.00	0.00
2,900.00	14.00	308.00	2,887.11	82.18	-105.18	-80.74	0.00	0.00	0.00	0.00
3,000.00	14.00	308.00	2,984.14	97.07	-124.25	-95.37	0.00	0.00	0.00	0.00
3,100.00	14.00	308.00	3,081.17	111.97	-143.31	-110.01	0.00	0.00	0.00	0.00
3,200.00	14.00	308.00	3,178.20	126.86	-162.38	-124.64	0.00	0.00	0.00	0.00
3,300.00	14.00	308.00	3,275.23	141.76	-181.44	-139.27	0.00	0.00	0.00	0.00
3,400.00	14.00	308.00	3,372.26	156.65	-200.50	-153.91	0.00	0.00	0.00	0.00
3,500.00	14.00	308.00	3,469.29	171.54	-219.57	-168.54	0.00	0.00	0.00	0.00
3,600.00	14.00	308.00	3,566.32	186.44	-238.63	-183.17	0.00	0.00	0.00	0.00
3,700.00	14.00	308.00	3,663.35	201.33	-257.69	-197.81	0.00	0.00	0.00	0.00
3,800.00	14.00	308.00	3,760.38	216.23	-276.76	-212.44	0.00	0.00	0.00	0.00
3,900.00	14.00	308.00	3,857.41	231.12	-295.82	-227.07	0.00	0.00	0.00	0.00
4,000.00	14.00	308.00	3,954.44	246.02	-314.89	-241.71	0.00	0.00	0.00	0.00
4,100.00	14.00	308.00	4,051.47	260.91	-333.95	-256.34	0.00	0.00	0.00	0.00
4,192.27	14.00	308.00	4,141.00	274.65	-351.54	-269.84	0.00	0.00	0.00	0.00
Parkman										
4,200.00	14.00	308.00	4,148.50	275.80	-353.01	-270.97	0.00	0.00	0.00	0.00
4,300.00	14.00	308.00	4,245.53	290.70	-372.08	-285.61	0.00	0.00	0.00	0.00
4,400.00	14.00	308.00	4,342.56	305.59	-391.14	-300.24	0.00	0.00	0.00	0.00
4,500.00	14.00	308.00	4,439.59	320.49	-410.20	-314.87	0.00	0.00	0.00	0.00
4,596.27	14.00	308.00	4,533.00	334.83	-428.56	-328.96	0.00	0.00	0.00	0.00
Sussex										
4,600.00	14.00	308.00	4,536.62	335.38	-429.27	-329.51	0.00	0.00	0.00	0.00
4,700.00	14.00	308.00	4,633.65	350.27	-448.33	-344.14	0.00	0.00	0.00	0.00
4,800.00	14.00	308.00	4,730.68	365.17	-467.39	-358.77	0.00	0.00	0.00	0.00

Plan Report for Black Tiger 15C-27HZ - Rev A0 Permit

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	14.00	308.00	4,827.71	380.06	-486.46	-373.41	0.00	0.00	0.00	0.00
5,000.00	14.00	308.00	4,924.74	394.96	-505.52	-388.04	0.00	0.00	0.00	0.00
5,100.00	14.00	308.00	5,021.76	409.85	-524.59	-402.67	0.00	0.00	0.00	0.00
5,200.00	14.00	308.00	5,118.79	424.75	-543.65	-417.31	0.00	0.00	0.00	0.00
Drop to Vertical @ 5200.00'										
5,300.00	12.00	308.00	5,216.23	438.59	-561.38	-430.91	2.00	-2.00	0.00	180.00
5,400.00	10.00	308.00	5,314.38	450.34	-576.41	-442.45	2.00	-2.00	0.00	180.00
5,500.00	8.00	308.00	5,413.15	459.97	-588.74	-451.91	2.00	-2.00	0.00	180.00
5,600.00	6.00	308.00	5,512.40	467.47	-598.34	-459.29	2.00	-2.00	0.00	180.00
5,700.00	4.00	308.00	5,612.01	472.84	-605.21	-464.56	2.00	-2.00	0.00	180.00
5,800.00	2.00	308.00	5,711.87	476.06	-609.33	-467.72	2.00	-2.00	0.00	180.00
5,900.00	0.00	0.00	5,811.85	477.14	-610.71	-468.78	2.00	-2.00	0.00	180.00
6,000.00	0.00	0.00	5,911.85	477.14	-610.71	-468.78	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,011.85	477.14	-610.71	-468.78	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,111.85	477.14	-610.71	-468.78	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,211.85	477.14	-610.71	-468.78	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,311.85	477.14	-610.71	-468.78	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,411.85	477.14	-610.71	-468.78	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,511.85	477.14	-610.71	-468.78	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,611.85	477.14	-610.71	-468.78	0.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,711.85	477.14	-610.71	-468.78	0.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,811.85	477.14	-610.71	-468.78	0.00	0.00	0.00	0.00
6,981.45	0.00	0.00	6,893.30	477.14	-610.71	-468.78	0.00	0.00	0.00	0.00
4.5" Liner @ 6981.45'										
7,000.00	0.00	0.00	6,911.85	477.14	-610.71	-468.78	0.00	0.00	0.00	0.00
7,081.45	0.00	0.00	6,993.30	477.14	-610.71	-468.78	0.00	0.00	0.00	0.00
'KOP @ 7081.45' DLS=10-6-10°/100"										
7,100.00	1.85	180.78	7,011.85	476.84	-610.71	-468.48	10.00	10.00	0.00	180.78
7,200.00	11.85	180.78	7,111.01	464.92	-610.87	-456.56	10.00	10.00	0.00	0.00
7,300.00	21.85	180.78	7,206.59	435.96	-611.27	-427.60	10.00	10.00	0.00	0.00
7,309.09	22.76	180.78	7,215.00	432.51	-611.31	-424.15	10.00	10.00	0.00	0.00
7,336.37	24.40	180.78	7,240.00	421.60	-611.46	-413.23	6.00	6.00	0.00	0.00
Sharon Springs										
7,400.00	28.22	180.78	7,297.03	393.40	-611.85	-385.04	6.00	6.00	0.00	0.00
7,420.52	29.45	180.78	7,315.00	383.51	-611.98	-375.14	6.00	6.00	0.00	0.00
Niobrara A										
7,500.00	37.40	180.78	7,381.28	339.77	-612.58	-331.40	10.00	10.00	0.00	0.00
7,500.90	37.49	180.78	7,382.00	339.22	-612.58	-330.85	10.00	10.00	0.00	0.00
Niobrara B										
7,597.00	47.10	180.78	7,453.00	274.64	-613.47	-266.26	10.00	10.00	0.00	0.00
Niobrara C										
7,600.00	47.40	180.78	7,455.04	272.43	-613.50	-264.06	10.00	10.00	0.00	0.00
7,700.00	57.40	180.78	7,515.98	193.31	-614.58	-184.93	10.00	10.00	0.00	0.00
7,800.00	67.40	180.78	7,562.25	104.81	-615.78	-96.42	10.00	10.00	0.00	0.00
7,858.70	73.27	180.78	7,582.00	49.57	-616.54	-41.17	10.00	10.00	0.00	0.00
Fort Hays										
7,900.00	77.40	180.78	7,592.45	9.63	-617.09	-1.23	10.00	10.00	0.00	0.00
7,956.13	83.01	180.78	7,602.00	-45.65	-617.84	54.06	10.00	10.00	0.00	0.00
Codell										
8,000.00	87.40	180.78	7,605.67	-89.36	-618.44	97.77	10.00	10.00	0.00	0.00
8,025.41	89.94	180.78	7,606.26	-114.76	-618.79	123.17	10.00	10.00	0.00	0.00
End Build @ 8025.41' MD:: 7607.00' TVD - Landing Target (Heel) - 7"										
8,100.00	89.94	180.78	7,606.34	-189.34	-619.81	197.76	0.00	0.00	0.00	0.00
8,200.00	89.94	180.78	7,606.44	-289.33	-621.17	297.76	0.00	0.00	0.00	0.00
8,300.00	89.94	180.78	7,606.55	-389.32	-622.54	397.76	0.00	0.00	0.00	0.00
8,400.00	89.94	180.78	7,606.66	-489.31	-623.91	497.76	0.00	0.00	0.00	0.00
8,500.00	89.94	180.78	7,606.76	-589.30	-625.28	597.76	0.00	0.00	0.00	0.00
8,600.00	89.94	180.78	7,606.87	-689.29	-626.64	697.76	0.00	0.00	0.00	0.00

Plan Report for Black Tiger 15C-27HZ - Rev A0 Permit

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	89.94	180.78	7,606.98	-789.28	-628.01	797.76	0.00	0.00	0.00	0.00
8,800.00	89.94	180.78	7,607.08	-889.28	-629.38	897.76	0.00	0.00	0.00	0.00
8,900.00	89.94	180.78	7,607.19	-989.27	-630.75	997.76	0.00	0.00	0.00	0.00
9,000.00	89.94	180.78	7,607.30	-1,089.26	-632.11	1,097.76	0.00	0.00	0.00	0.00
9,100.00	89.94	180.78	7,607.40	-1,189.25	-633.48	1,197.76	0.00	0.00	0.00	0.00
9,200.00	89.94	180.78	7,607.51	-1,289.24	-634.85	1,297.76	0.00	0.00	0.00	0.00
9,300.00	89.94	180.78	7,607.62	-1,389.23	-636.22	1,397.76	0.00	0.00	0.00	0.00
9,400.00	89.94	180.78	7,607.72	-1,489.22	-637.59	1,497.76	0.00	0.00	0.00	0.00
9,500.00	89.94	180.78	7,607.83	-1,589.21	-638.95	1,597.76	0.00	0.00	0.00	0.00
9,600.00	89.94	180.78	7,607.94	-1,689.20	-640.32	1,697.76	0.00	0.00	0.00	0.00
9,700.00	89.94	180.78	7,608.04	-1,789.19	-641.69	1,797.76	0.00	0.00	0.00	0.00
9,800.00	89.94	180.78	7,608.15	-1,889.18	-643.06	1,897.76	0.00	0.00	0.00	0.00
9,900.00	89.94	180.78	7,608.26	-1,989.17	-644.42	1,997.76	0.00	0.00	0.00	0.00
10,000.00	89.94	180.78	7,608.36	-2,089.16	-645.79	2,097.76	0.00	0.00	0.00	0.00
10,100.00	89.94	180.78	7,608.47	-2,189.15	-647.16	2,197.76	0.00	0.00	0.00	0.00
10,200.00	89.94	180.78	7,608.58	-2,289.14	-648.53	2,297.76	0.00	0.00	0.00	0.00
10,300.00	89.94	180.78	7,608.69	-2,389.13	-649.89	2,397.76	0.00	0.00	0.00	0.00
10,400.00	89.94	180.78	7,608.79	-2,489.12	-651.26	2,497.76	0.00	0.00	0.00	0.00
10,500.00	89.94	180.78	7,608.90	-2,589.12	-652.63	2,597.76	0.00	0.00	0.00	0.00
10,600.00	89.94	180.78	7,609.01	-2,689.11	-654.00	2,697.76	0.00	0.00	0.00	0.00
10,700.00	89.94	180.78	7,609.11	-2,789.10	-655.36	2,797.76	0.00	0.00	0.00	0.00
10,800.00	89.94	180.78	7,609.22	-2,889.09	-656.73	2,897.76	0.00	0.00	0.00	0.00
10,900.00	89.94	180.78	7,609.33	-2,989.08	-658.10	2,997.76	0.00	0.00	0.00	0.00
11,000.00	89.94	180.78	7,609.43	-3,089.07	-659.47	3,097.76	0.00	0.00	0.00	0.00
11,100.00	89.94	180.78	7,609.54	-3,189.06	-660.83	3,197.76	0.00	0.00	0.00	0.00
11,200.00	89.94	180.78	7,609.65	-3,289.05	-662.20	3,297.76	0.00	0.00	0.00	0.00
11,300.00	89.94	180.78	7,609.75	-3,389.04	-663.57	3,397.76	0.00	0.00	0.00	0.00
11,400.00	89.94	180.78	7,609.86	-3,489.03	-664.94	3,497.76	0.00	0.00	0.00	0.00
11,500.00	89.94	180.78	7,609.97	-3,589.02	-666.31	3,597.76	0.00	0.00	0.00	0.00
11,600.00	89.94	180.78	7,610.07	-3,689.01	-667.67	3,697.76	0.00	0.00	0.00	0.00
11,700.00	89.94	180.78	7,610.18	-3,789.00	-669.04	3,797.76	0.00	0.00	0.00	0.00
11,800.00	89.94	180.78	7,610.29	-3,888.99	-670.41	3,897.76	0.00	0.00	0.00	0.00
11,900.00	89.94	180.78	7,610.39	-3,988.98	-671.78	3,997.76	0.00	0.00	0.00	0.00
12,000.00	89.94	180.78	7,610.50	-4,088.97	-673.14	4,097.76	0.00	0.00	0.00	0.00
12,100.00	89.94	180.78	7,610.61	-4,188.96	-674.51	4,197.76	0.00	0.00	0.00	0.00
12,200.00	89.94	180.78	7,610.71	-4,288.96	-675.88	4,297.76	0.00	0.00	0.00	0.00
12,300.00	89.94	180.78	7,610.82	-4,388.95	-677.25	4,397.76	0.00	0.00	0.00	0.00
12,400.00	89.94	180.78	7,610.93	-4,488.94	-678.61	4,497.76	0.00	0.00	0.00	0.00
12,500.00	89.94	180.78	7,611.03	-4,588.93	-679.98	4,597.76	0.00	0.00	0.00	0.00
12,600.00	89.94	180.78	7,611.14	-4,688.92	-681.35	4,697.76	0.00	0.00	0.00	0.00
12,700.00	89.94	180.78	7,611.25	-4,788.91	-682.72	4,797.76	0.00	0.00	0.00	0.00
12,800.00	89.94	180.78	7,611.35	-4,888.90	-684.08	4,897.76	0.00	0.00	0.00	0.00
12,900.00	89.94	180.78	7,611.46	-4,988.89	-685.45	4,997.76	0.00	0.00	0.00	0.00
13,000.00	89.94	180.78	7,611.57	-5,088.88	-686.82	5,097.76	0.00	0.00	0.00	0.00
13,100.00	89.94	180.78	7,611.67	-5,188.87	-688.19	5,197.76	0.00	0.00	0.00	0.00
13,200.00	89.94	180.78	7,611.78	-5,288.86	-689.56	5,297.76	0.00	0.00	0.00	0.00
13,300.00	89.94	180.78	7,611.89	-5,388.85	-690.92	5,397.76	0.00	0.00	0.00	0.00
13,400.00	89.94	180.78	7,611.99	-5,488.84	-692.29	5,497.76	0.00	0.00	0.00	0.00
13,405.77	89.94	180.78	7,612.00	-5,494.61	-692.37	5,503.53	0.00	0.00	0.00	0.00

TD Well @ 13405.77' MD:: 7612.00' TVD

Plan Report for Black Tiger 15C-27HZ - Rev A0 Permit**Plan Annotations**

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,000.00	2,000.00	0.00	0.00	Begin Nudge @ 2000.00'
5,200.00	5,118.79	424.75	-543.65	Drop to Vertical @ 5200.00'
6,981.45	6,893.30	477.14	-610.71	4.5" Liner @ 6981.45'
7,081.45	6,993.30	477.14	-610.71	'KOP @ 7081.45' DLS=10-6-10"/100"
8,025.41	7,606.26	-114.76	-618.79	End Build @ 8025.41' MD:: 7607.00' TVD
13,405.77	7,612.00	-5,494.61	-692.37	TD Well @ 13405.77' MD:: 7612.00' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	180.78	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	1,278.00	Rev A0 Permit	MWD
1,278.00	8,025.41	Rev A0 Permit	MWD
8,025.41	13,405.77	Rev A0 Permit	MWD

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,278.00	1,278.00	9 5/8"	9-5/8	12-3/4
8,025.41	7,606.26	7"	7	8-3/4

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,228.00	1,228.00	Fox Hills Marker		0.00	
4,192.27	4,141.00	Parkman		0.00	
4,596.27	4,533.00	Sussex		0.00	
7,336.37	7,240.00	Sharon Springs		0.00	
7,420.52	7,315.00	Niobrara A		0.00	
7,500.90	7,382.00	Niobrara B		0.00	
7,597.00	7,453.00	Niobrara C		0.00	
7,858.70	7,582.00	Fort Hays		0.00	
7,956.13	7,602.00	Codell		0.00	
8,025.41	7,606.26	Landing Target (Heel)		0.00	
13,405.77	7,612.00	Total Depth (Toe)		0.00	

Plan Report for Black Tiger 15C-27HZ - Rev A0 Permit

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
BLack Tiger 15C-27HZ SHL	0.00	0.00	0.00	Point
Black Tiger15C-27HZ Pad_Sec.line	0.00	4,352.40	-2,891.70	Polygon
Black Tiger 15C-27HZ LD	0.00	4,352.40	-2,891.70	Polygon
Black Tiger 15C-27HZ BHL	7,612.00	-5,494.62	-692.37	Point

Directional Difficulty Index

Average Dogleg over Survey:	0.88 °/100usft	Maximum Dogleg over Survey:	10.00 °/100usft at 7,309.09 usft
Net Tortousity applicable to Plans:	0.88 °/100usft	Directional Difficulty Index:	6.314

Audit Info

North Reference Sheet for Sec. 22-T2N-R67W - Black Tiger 15C-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' @ 4997.00usft (Drilling Rig). Northing and Easting are relative to Black Tiger 15C-27HZ
Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980
Projection method is Lambert Conformal Conic (2 parallel)
Central Meridian is -105.50°, Longitude Origin:0.000000°, Latitude Origin:40.783333°
False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99995955

Grid Coordinates of Well: 1,286,181.56 usft N, 3,175,423.01 usft E
Geographical Coordinates of Well: 40° 07' 02.13" N, 104° 52' 21.90" W
Grid Convergence at Surface is: 0.41°

Based upon Minimum Curvature type calculations, at a Measured Depth of 13,405.77usft
the Bottom Hole Displacement is 5,538.06usft in the Direction of 187.18° (True).
Magnetic Convergence at surface is: -8.18° (10 February 2014, , BGGM2013)

