

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 10-T2N-R66W

Cannon 13C-10HZ

Plan A Rev 0

Plan: Plan A Rev 0 Permit

Sperry Drilling Services

Proposal Report

14 December, 2012

Well Coordinates: 1,301,538.78 N, 3,204,451.43 E (40° 09' 31.69" N, 104° 46' 06.62" W)

Ground Level: 4,949.00 ft

Local Coordinate Origin:

Centered on Well Cannon 13C-10HZ

Viewing Datum:

RKB=17 @ 4966.00ft (Drilling Rig)

TVDs to System:

N

North Reference:

True

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 43I

HALLIBURTON

Project: Weld County, CO (NAD 83)
Site: Sec. 10-T2N-R66W
Well: Cannon 13C-10HZ
Wellbore: Plan A Rev 0
Design: Plan A Rev 0 Permit

Anadarko Petroleum Corp.

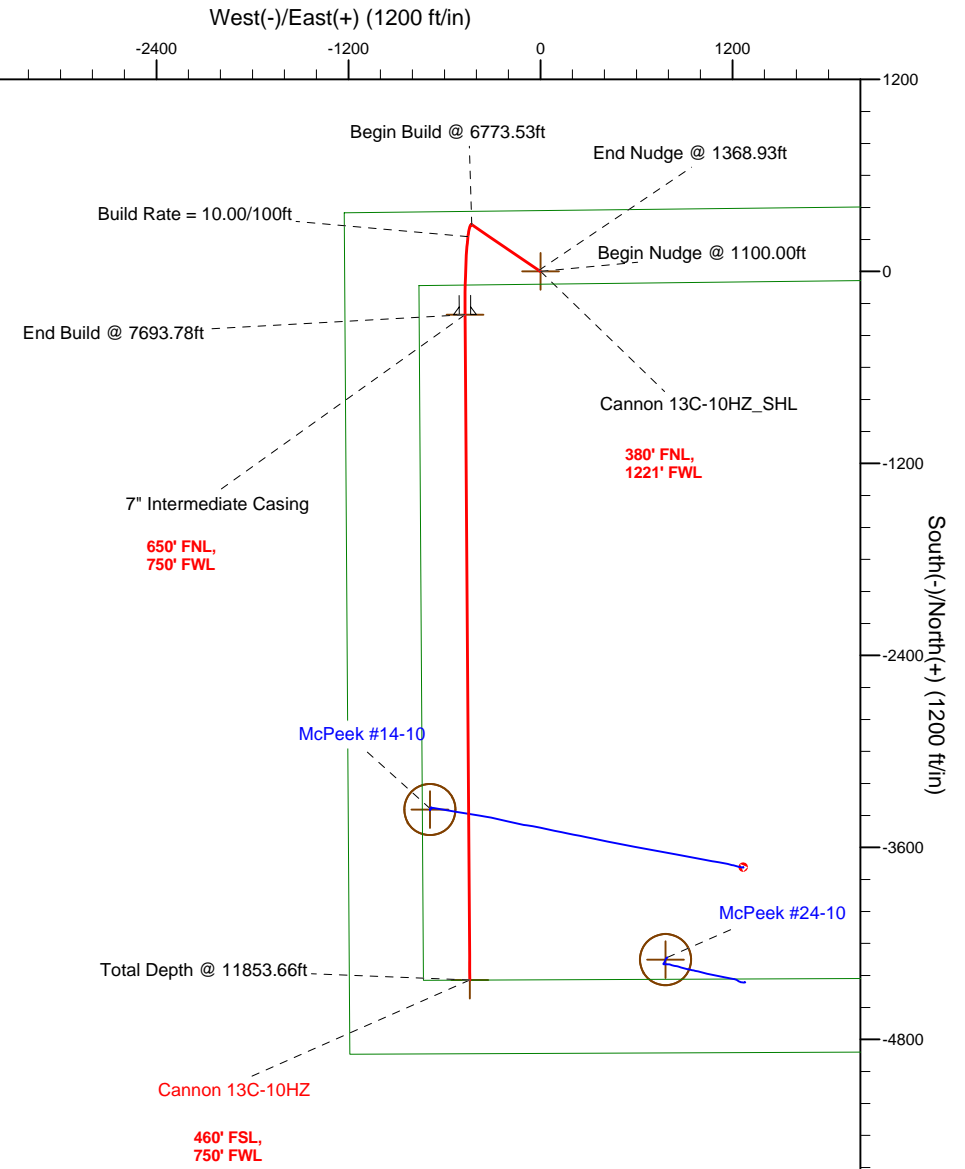
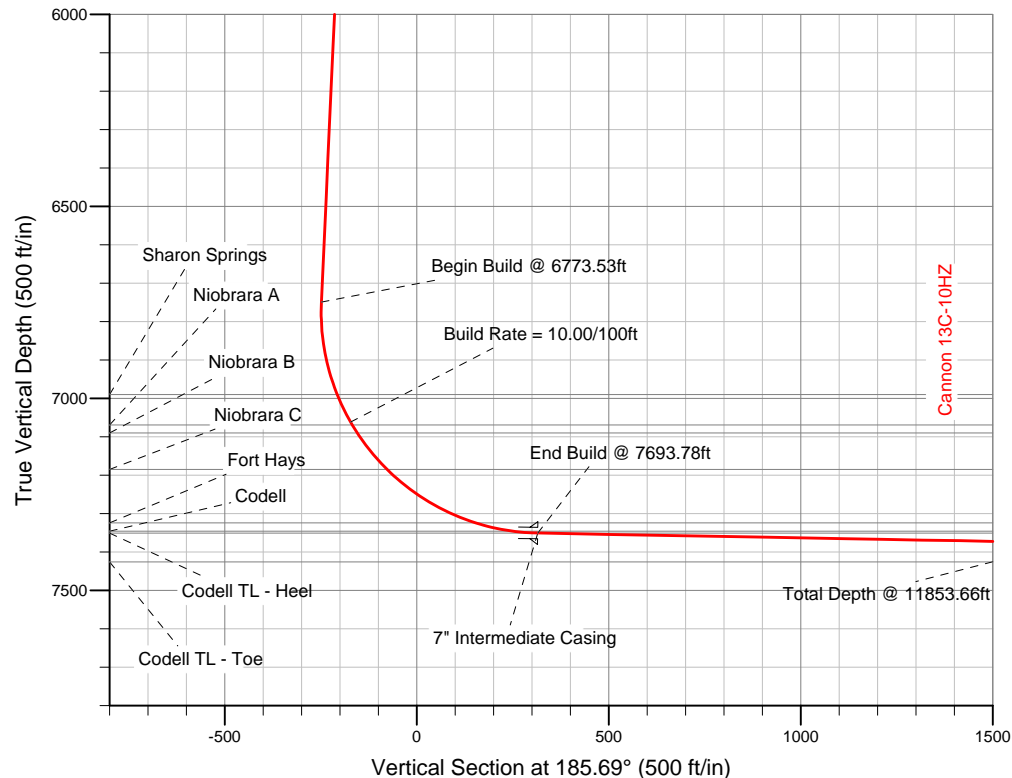
HALLIBURTON
Sperry Drilling

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	1100.00	0.00	0.00	1100.00	0.00	0.00	0.00	0.00	0.00	
3	1368.93	5.38	304.24	1368.53	7.10	-10.43	2.00	304.24	-6.03	
4	6773.53	5.38	304.24	6749.34	292.15	-429.22	0.00	0.00	-248.15	
5	7693.78	88.97	179.59	7351.00	-270.00	-471.00	10.00	-124.61	315.38	Cannon 13C-10HZ_CP
6	11853.66	88.97	179.59	7426.00	-4429.10	-441.43	0.00	0.00	4451.05	Cannon 13C-10HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Cannon 13C-10HZ_SHL	0.00	0.00	0.00	40.158804	-104.768505	Point
Cannon 13C-10HZ_CP	7351.00	-270.00	-471.00	40.158063	-104.770190	Point
-McPeck 14-10 - 160'	7406.73	-3363.17	-690.77	40.149572	-104.770976	Circle (Radius: 160.00)
-McPeck 24-10 - 160'	7423.83	-4300.86	781.93	40.146998	-104.765708	Circle (Radius: 160.00)
Cannon 13C-10HZ_BHL	7426.00	-4429.10	-441.43	40.146646	-104.770084	Point



WELL DETAILS: Cannon 13C-10HZ

Ground Level: 4949.00 RKB=17 @ 4966.00ft (Drilling Rig)

Plan: Plan A Rev 0 Permit (Cannon 13C-10HZ/Plan A Rev 0)

Created By: Fred Hartmann Date: 12/14/2012
Reviewed: _____ Date: _____

Plan Report for Cannon 13C-10HZ - Plan A Rev 0 Permit

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	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
Begin Nudge @ 1100.00ft										
1,200.00	2.00	304.24	1,199.98	0.98	-1.44	-0.83	2.00	2.00	0.00	304.24
1,300.00	4.00	304.24	1,299.84	3.93	-5.77	-3.34	2.00	2.00	0.00	0.00
1,368.93	5.38	304.24	1,368.54	7.10	-10.43	-6.03	2.00	2.00	0.00	0.00
End Nudge @ 1368.93ft										
1,400.00	5.38	304.24	1,399.47	8.74	-12.83	-7.42	0.00	0.00	0.00	0.00
1,500.00	5.38	304.24	1,499.03	14.01	-20.58	-11.90	0.00	0.00	0.00	0.00
1,600.00	5.38	304.24	1,598.59	19.28	-28.33	-16.38	0.00	0.00	0.00	0.00
1,700.00	5.38	304.24	1,698.15	24.56	-36.08	-20.86	0.00	0.00	0.00	0.00
1,800.00	5.38	304.24	1,797.71	29.83	-43.83	-25.34	0.00	0.00	0.00	0.00
1,900.00	5.38	304.24	1,897.27	35.11	-51.58	-29.82	0.00	0.00	0.00	0.00
2,000.00	5.38	304.24	1,996.83	40.38	-59.33	-34.30	0.00	0.00	0.00	0.00
2,100.00	5.38	304.24	2,096.39	45.66	-67.08	-38.78	0.00	0.00	0.00	0.00
2,200.00	5.38	304.24	2,195.95	50.93	-74.83	-43.26	0.00	0.00	0.00	0.00
2,300.00	5.38	304.24	2,295.51	56.21	-82.57	-47.74	0.00	0.00	0.00	0.00
2,400.00	5.38	304.24	2,395.07	61.48	-90.32	-52.22	0.00	0.00	0.00	0.00
2,500.00	5.38	304.24	2,494.63	66.75	-98.07	-56.70	0.00	0.00	0.00	0.00
2,600.00	5.38	304.24	2,594.18	72.03	-105.82	-61.18	0.00	0.00	0.00	0.00
2,700.00	5.38	304.24	2,693.74	77.30	-113.57	-65.66	0.00	0.00	0.00	0.00
2,800.00	5.38	304.24	2,793.30	82.58	-121.32	-70.14	0.00	0.00	0.00	0.00
2,900.00	5.38	304.24	2,892.86	87.85	-129.07	-74.62	0.00	0.00	0.00	0.00
3,000.00	5.38	304.24	2,992.42	93.13	-136.82	-79.10	0.00	0.00	0.00	0.00
3,100.00	5.38	304.24	3,091.98	98.40	-144.57	-83.58	0.00	0.00	0.00	0.00
3,200.00	5.38	304.24	3,191.54	103.67	-152.31	-88.06	0.00	0.00	0.00	0.00
3,300.00	5.38	304.24	3,291.10	108.95	-160.06	-92.54	0.00	0.00	0.00	0.00
3,400.00	5.38	304.24	3,390.66	114.22	-167.81	-97.02	0.00	0.00	0.00	0.00
3,500.00	5.38	304.24	3,490.22	119.50	-175.56	-101.50	0.00	0.00	0.00	0.00
3,600.00	5.38	304.24	3,589.78	124.77	-183.31	-105.98	0.00	0.00	0.00	0.00
3,700.00	5.38	304.24	3,689.34	130.05	-191.06	-110.46	0.00	0.00	0.00	0.00
3,800.00	5.38	304.24	3,788.90	135.32	-198.81	-114.94	0.00	0.00	0.00	0.00
3,900.00	5.38	304.24	3,888.46	140.59	-206.56	-119.42	0.00	0.00	0.00	0.00
3,968.84	5.38	304.24	3,957.00	144.23	-211.89	-122.50	0.00	0.00	0.00	0.00
Parkman										
4,000.00	5.38	304.24	3,988.02	145.87	-214.31	-123.90	0.00	0.00	0.00	0.00
4,100.00	5.38	304.24	4,087.58	151.14	-222.06	-128.38	0.00	0.00	0.00	0.00
4,200.00	5.38	304.24	4,187.14	156.42	-229.80	-132.86	0.00	0.00	0.00	0.00
4,300.00	5.38	304.24	4,286.70	161.69	-237.55	-137.34	0.00	0.00	0.00	0.00
4,377.64	5.38	304.24	4,364.00	165.79	-243.57	-140.81	0.00	0.00	0.00	0.00
Sussex										
4,400.00	5.38	304.24	4,386.26	166.97	-245.30	-141.82	0.00	0.00	0.00	0.00
4,500.00	5.38	304.24	4,485.82	172.24	-253.05	-146.30	0.00	0.00	0.00	0.00
4,600.00	5.38	304.24	4,585.38	177.52	-260.80	-150.78	0.00	0.00	0.00	0.00
4,700.00	5.38	304.24	4,684.94	182.79	-268.55	-155.26	0.00	0.00	0.00	0.00
4,800.00	5.38	304.24	4,784.50	188.06	-276.30	-159.74	0.00	0.00	0.00	0.00
4,900.00	5.38	304.24	4,884.06	193.34	-284.05	-164.22	0.00	0.00	0.00	0.00
5,000.00	5.38	304.24	4,983.62	198.61	-291.80	-168.70	0.00	0.00	0.00	0.00

Plan Report for Cannon 13C-10HZ - Plan A Rev 0 Permit

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Toolface Azimuth (°)
5,100.00	5.38	304.24	5,083.18	203.89	-299.54	-173.17	0.00	0.00	0.00	0.00
5,200.00	5.38	304.24	5,182.74	209.16	-307.29	-177.65	0.00	0.00	0.00	0.00
5,300.00	5.38	304.24	5,282.30	214.44	-315.04	-182.13	0.00	0.00	0.00	0.00
5,400.00	5.38	304.24	5,381.86	219.71	-322.79	-186.61	0.00	0.00	0.00	0.00
5,500.00	5.38	304.24	5,481.42	224.98	-330.54	-191.09	0.00	0.00	0.00	0.00
5,600.00	5.38	304.24	5,580.98	230.26	-338.29	-195.57	0.00	0.00	0.00	0.00
5,700.00	5.38	304.24	5,680.54	235.53	-346.04	-200.05	0.00	0.00	0.00	0.00
5,800.00	5.38	304.24	5,780.10	240.81	-353.79	-204.53	0.00	0.00	0.00	0.00
5,900.00	5.38	304.24	5,879.66	246.08	-361.54	-209.01	0.00	0.00	0.00	0.00
6,000.00	5.38	304.24	5,979.22	251.36	-369.28	-213.49	0.00	0.00	0.00	0.00
6,100.00	5.38	304.24	6,078.77	256.63	-377.03	-217.97	0.00	0.00	0.00	0.00
6,200.00	5.38	304.24	6,178.33	261.91	-384.78	-222.45	0.00	0.00	0.00	0.00
6,300.00	5.38	304.24	6,277.89	267.18	-392.53	-226.93	0.00	0.00	0.00	0.00
6,400.00	5.38	304.24	6,377.45	272.45	-400.28	-231.41	0.00	0.00	0.00	0.00
6,500.00	5.38	304.24	6,477.01	277.73	-408.03	-235.89	0.00	0.00	0.00	0.00
6,600.00	5.38	304.24	6,576.57	283.00	-415.78	-240.37	0.00	0.00	0.00	0.00
6,700.00	5.38	304.24	6,676.13	288.28	-423.53	-244.85	0.00	0.00	0.00	0.00
6,773.53	5.38	304.24	6,749.34	292.16	-429.22	-248.15	0.00	0.00	0.00	0.00
Begin Build @ 6773.53ft										
6,800.00	4.44	274.86	6,775.72	292.94	-431.27	-248.72	10.00	-3.53	-110.99	-124.61
6,900.00	10.55	204.06	6,874.97	284.89	-438.88	-239.96	10.00	6.11	-70.80	-95.33
7,000.00	20.06	191.75	6,971.34	259.68	-446.13	-214.15	10.00	9.51	-12.32	-24.92
7,019.99	22.01	190.55	6,990.00	252.63	-447.51	-207.01	10.00	9.77	-6.00	-13.00
Sharon Springs										
7,100.00	29.89	187.25	7,061.89	218.06	-452.78	-172.09	10.00	9.84	-4.12	-11.88
Build Rate = 10.00/100ft										
7,108.24	30.70	187.00	7,069.00	213.94	-453.29	-167.93	10.00	9.88	-3.03	-8.91
Niobrara A										
7,132.98	33.15	186.32	7,090.00	200.95	-454.81	-154.85	10.00	9.89	-2.76	-8.69
Niobrara B										
7,200.00	39.79	184.84	7,143.86	161.32	-458.64	-115.04	10.00	9.91	-2.20	-8.11
7,255.88	45.34	183.90	7,185.00	123.65	-461.50	-77.27	10.00	9.93	-1.69	-6.92
Niobrara C										
7,300.00	49.73	183.27	7,214.78	91.17	-463.53	-44.75	10.00	9.95	-1.42	-6.23
7,400.00	59.69	182.11	7,272.48	9.74	-467.30	36.66	10.00	9.95	-1.17	-5.80
7,500.00	69.65	181.16	7,315.22	-80.50	-469.84	126.70	10.00	9.96	-0.95	-5.13
7,526.97	72.34	180.92	7,324.00	-105.99	-470.31	152.11	10.00	9.97	-0.86	-4.72
Fort Hays										
7,600.00	79.62	180.33	7,341.68	-176.79	-471.07	222.64	10.00	9.97	-0.82	-4.64
7,627.57	82.37	180.11	7,346.00	-204.02	-471.17	249.74	10.00	9.97	-0.79	-4.50
Codell										
7,693.78	88.97	179.59	7,351.00	-270.00	-471.00	315.38	10.00	9.97	-0.78	-4.46
End Build @ 7693.78ft - Codell TL - Heel - 7" Intermediate Casing - Cannon 13C-10HZ_CP										
7,700.00	88.97	179.59	7,351.11	-276.22	-470.96	321.57	0.00	0.00	0.00	-4.43
7,800.00	88.97	179.59	7,352.92	-376.20	-470.24	420.98	0.00	0.00	0.00	0.00
7,900.00	88.97	179.59	7,354.72	-476.18	-469.53	520.40	0.00	0.00	0.00	0.00
8,000.00	88.97	179.59	7,356.52	-576.16	-468.82	619.82	0.00	0.00	0.00	0.00
8,100.00	88.97	179.59	7,358.32	-676.15	-468.11	719.24	0.00	0.00	0.00	0.00
8,200.00	88.97	179.59	7,360.13	-776.13	-467.40	818.65	0.00	0.00	0.00	0.00
8,300.00	88.97	179.59	7,361.93	-876.11	-466.69	918.07	0.00	0.00	0.00	0.00
8,400.00	88.97	179.59	7,363.73	-976.09	-465.98	1,017.49	0.00	0.00	0.00	0.00
8,500.00	88.97	179.59	7,365.54	-1,076.07	-465.27	1,116.91	0.00	0.00	0.00	0.00
8,600.00	88.97	179.59	7,367.34	-1,176.05	-464.56	1,216.33	0.00	0.00	0.00	0.00
8,700.00	88.97	179.59	7,369.14	-1,276.03	-463.85	1,315.74	0.00	0.00	0.00	0.00
8,800.00	88.97	179.59	7,370.94	-1,376.01	-463.14	1,415.16	0.00	0.00	0.00	0.00
8,900.00	88.97	179.59	7,372.75	-1,476.00	-462.43	1,514.58	0.00	0.00	0.00	0.00
9,000.00	88.97	179.59	7,374.55	-1,575.98	-461.71	1,614.00	0.00	0.00	0.00	0.00
9,100.00	88.97	179.59	7,376.35	-1,675.96	-461.00	1,713.42	0.00	0.00	0.00	0.00

Plan Report for Cannon 13C-10HZ - Plan A Rev 0 Permit

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Toolface Azimuth (°)
9,200.00	88.97	179.59	7,378.16	-1,775.94	-460.29	1,812.83	0.00	0.00	0.00	0.00
9,300.00	88.97	179.59	7,379.96	-1,875.92	-459.58	1,912.25	0.00	0.00	0.00	0.00
9,400.00	88.97	179.59	7,381.76	-1,975.90	-458.87	2,011.67	0.00	0.00	0.00	0.00
9,500.00	88.97	179.59	7,383.56	-2,075.88	-458.16	2,111.09	0.00	0.00	0.00	0.00
9,600.00	88.97	179.59	7,385.37	-2,175.86	-457.45	2,210.50	0.00	0.00	0.00	0.00
9,700.00	88.97	179.59	7,387.17	-2,275.84	-456.74	2,309.92	0.00	0.00	0.00	0.00
9,800.00	88.97	179.59	7,388.97	-2,375.83	-456.03	2,409.34	0.00	0.00	0.00	0.00
9,900.00	88.97	179.59	7,390.78	-2,475.81	-455.32	2,508.76	0.00	0.00	0.00	0.00
10,000.00	88.97	179.59	7,392.58	-2,575.79	-454.61	2,608.18	0.00	0.00	0.00	0.00
10,100.00	88.97	179.59	7,394.38	-2,675.77	-453.90	2,707.59	0.00	0.00	0.00	0.00
10,200.00	88.97	179.59	7,396.19	-2,775.75	-453.18	2,807.01	0.00	0.00	0.00	0.00
10,300.00	88.97	179.59	7,397.99	-2,875.73	-452.47	2,906.43	0.00	0.00	0.00	0.00
10,400.00	88.97	179.59	7,399.79	-2,975.71	-451.76	3,005.85	0.00	0.00	0.00	0.00
10,500.00	88.97	179.59	7,401.59	-3,075.69	-451.05	3,105.26	0.00	0.00	0.00	0.00
10,600.00	88.97	179.59	7,403.40	-3,175.68	-450.34	3,204.68	0.00	0.00	0.00	0.00
10,700.00	88.97	179.59	7,405.20	-3,275.66	-449.63	3,304.10	0.00	0.00	0.00	0.00
10,800.00	88.97	179.59	7,407.00	-3,375.64	-448.92	3,403.52	0.00	0.00	0.00	0.00
10,900.00	88.97	179.59	7,408.81	-3,475.62	-448.21	3,502.94	0.00	0.00	0.00	0.00
11,000.00	88.97	179.59	7,410.61	-3,575.60	-447.50	3,602.35	0.00	0.00	0.00	0.00
11,100.00	88.97	179.59	7,412.41	-3,675.58	-446.79	3,701.77	0.00	0.00	0.00	0.00
11,200.00	88.97	179.59	7,414.21	-3,775.56	-446.08	3,801.19	0.00	0.00	0.00	0.00
11,300.00	88.97	179.59	7,416.02	-3,875.54	-445.37	3,900.61	0.00	0.00	0.00	0.00
11,400.00	88.97	179.59	7,417.82	-3,975.53	-444.65	4,000.02	0.00	0.00	0.00	0.00
11,500.00	88.97	179.59	7,419.62	-4,075.51	-443.94	4,099.44	0.00	0.00	0.00	0.00
11,600.00	88.97	179.59	7,421.43	-4,175.49	-443.23	4,198.86	0.00	0.00	0.00	0.00
11,700.00	88.97	179.59	7,423.23	-4,275.47	-442.52	4,298.28	0.00	0.00	0.00	0.00
11,800.00	88.97	179.59	7,425.03	-4,375.45	-441.81	4,397.70	0.00	0.00	0.00	0.00
11,853.66	88.97	179.59	7,426.00	-4,429.10	-441.43	4,451.04	0.00	0.00	0.00	0.00
Total Depth @ 11853.66ft - Cannon 13C-10HZ_BHL										

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,100.00	1,100.00	0.00	0.00	Begin Nudge @ 1100.00ft
1,368.93	1,368.54	7.10	-10.43	End Nudge @ 1368.93ft
6,773.53	6,749.34	292.16	-429.22	Begin Build @ 6773.53ft
7,100.00	7,061.89	218.06	-452.78	Build Rate = 10.00/100ft
7,693.78	7,351.00	-270.00	-471.00	End Build @ 7693.78ft
11,853.66	7,426.00	-4,429.10	-441.43	Total Depth @ 11853.66ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Cannon 13C-10HZ_BHL	185.69	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	11,853.66	Plan A Rev 0 Permit	MWD

Plan Report for Cannon 13C-10HZ - Plan A Rev 0 Permit**Casing Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,693.78	7,351.00	7" Intermediate Casing	7	8-3/4

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,968.84	3,957.00	Parkman		0.00	
4,377.64	4,364.00	Sussex		0.00	
7,019.99	6,990.00	Sharon Springs		0.00	
7,108.24	7,069.00	Niobrara A		0.00	
7,132.98	7,090.00	Niobrara B		0.00	
7,255.88	7,185.00	Niobrara C		0.00	
7,526.97	7,324.00	Fort Hays		0.00	
7,627.57	7,346.00	Codell		0.00	
7,693.78	7,351.00	Codell TL - Heel		0.00	
11,853.66	7,426.00	Codell TL - Toe		0.00	

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
-McPeck 14-10 - 160'	7,406.73	-3,363.17	-690.77	Circle
-McPeck 24-10 - 160'	7,423.83	-4,300.86	781.93	Circle
Cannon 13C-10HZ_BHL	7,426.00	-4,429.10	-441.43	Point
Cannon 13C-10HZ_SHL	0.00	0.00	0.00	Point
Cannon 13C-10HZ_CP	7,351.00	-270.00	-471.00	Point

North Reference Sheet for Sec. 10-T2N-R66W - Cannon 13C-10HZ - Plan A Rev 0

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 @ 4966.00ft (Drilling Rig). Northing and Easting are relative to Cannon 13C-10HZ
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: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99995813

Grid Coordinates of Well: 1,301,538.78 ft N, 3,204,451.43 ft E
Geographical Coordinates of Well: 40° 09' 31.69" N, 104° 46' 06.62" W
Grid Convergence at Surface is: 0.47°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,853.66ft
the Bottom Hole Displacement is 4,451.04ft in the Direction of 185.69° (True).

Magnetic Convergence at surface is: -8.22° (13 December 2012, , BGGM2012)

