

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 8-T2N-R66W

Kunzman 3C-5HZ

Plan D 0

Plan: Plan D 0-Permit

Sperry Drilling Services

Proposal Report

05 June, 2013

Well Coordinates: 1,301,807.68 N, 3,194,551.04 E (40° 09' 35.14" N, 104° 48' 14.10" W)

Ground Level: 4,858.00 ft

Local Coordinate Origin:

Centered on Well Kunzman 3C-5HZ

Viewing Datum:

RKB @ 17' @ 4875.00ft (Drilling Rig)

TVDs to System:

N

North Reference:

True

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 431

HALLIBURTON

Project: Weld County, CO (NAD 83)
 Site: Sec. 8-T2N-R66W
 Well: Kunzman 3C-5HZ
 Wellbore: Plan D 0
 Design: Plan D 0-Permit



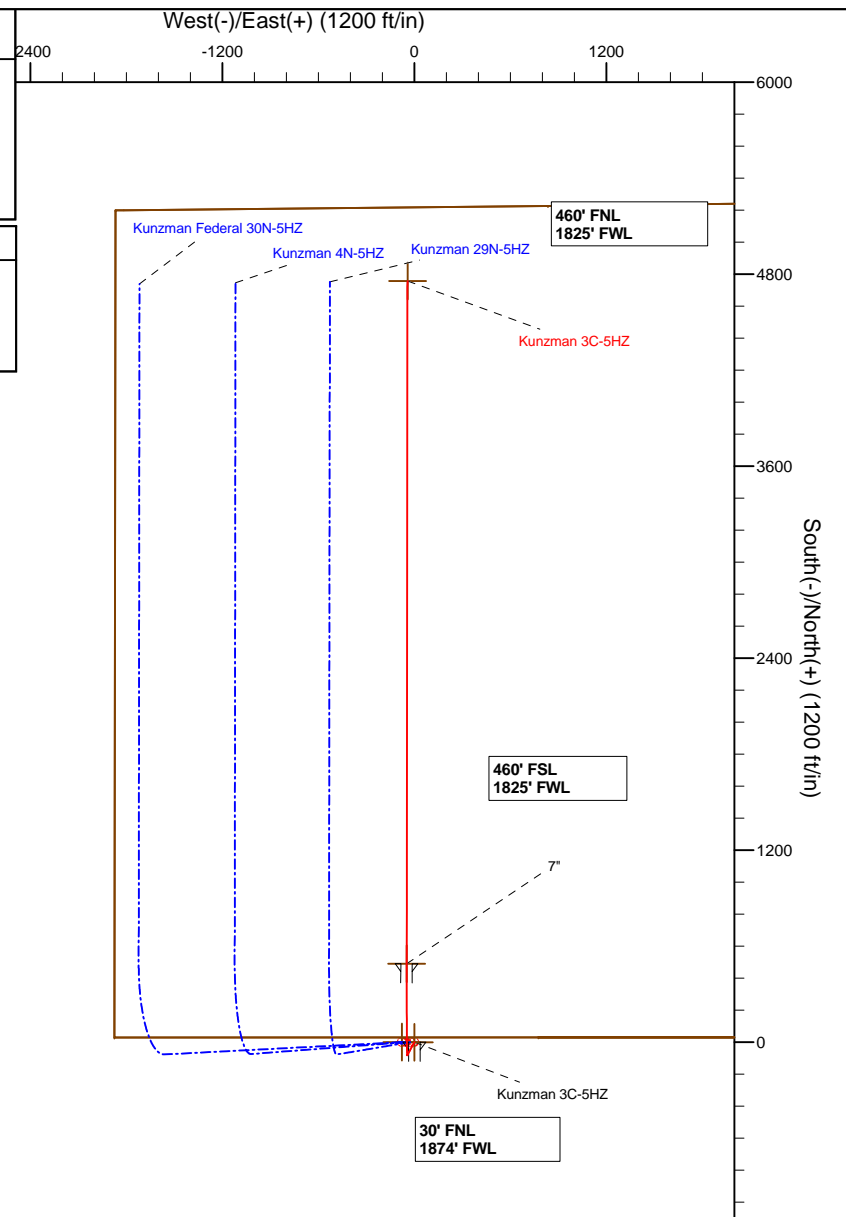
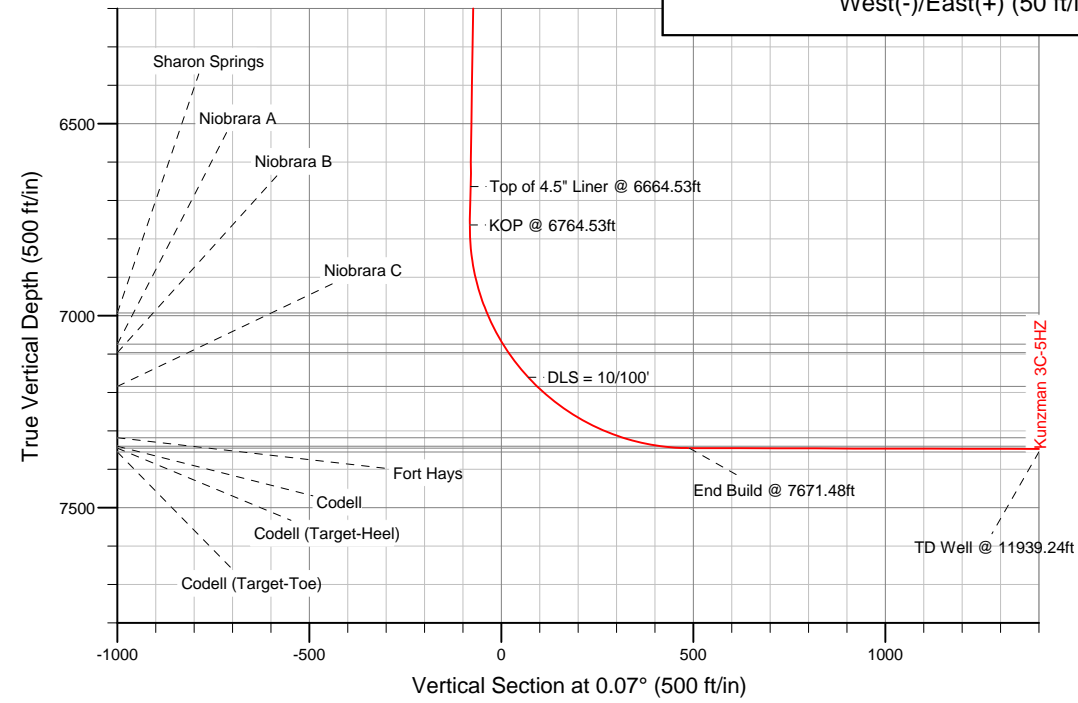
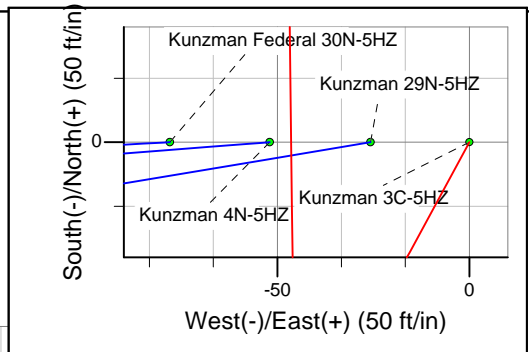
SECTION DETAILS

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	1147.11	0.94	208.44	1147.11	-0.34	-0.18	2.00	208.44	-0.34	
4	6764.53	0.94	208.44	6763.77	-81.56	-44.17	0.00	0.00	-81.61	
5	7671.48	89.87	0.07	7345.00	490.00	-48.00	10.00	151.63	489.94	Kunzman 3C-5HZ_CP
6	11939.24	89.87	0.07	7355.00	4757.75	-42.76	0.00	0.00	4757.69	Kunzman 3C-5HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Kunzman 3C-5HZ_SHL	0.00	0.00	0.00	40.159761	-104.803918	Point
Kunzman_SEC	0.00	0.03	-77.98	40.159761	-104.804197	Polygon
Kunzman 3C-5HZ_CP	7345.00	490.00	-48.00	40.161106	-104.804090	Point
Kunzman 3C-5HZ_BHL	7355.00	4757.75	-42.76	40.172821	-104.804071	Point

MD	TVD	
6664.53	6663.78	Top of 4.5" Liner @ 6664.53ft
6764.53	6763.77	KOP @ 6764.53ft



WELL DETAILS: Kunzman 3C-5HZ	
Ground Level:	4858.00
RKB @ 17' @ 4875.00ft (Drilling Rig)	
Plan: Plan D 0-Permit (Kunzman 3C-5HZ/Plan D 0)	
Created By: Fred Hartmann Date: 06/05/2013	

Plan Report for Kunzman 3C-5HZ - Plan D 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
9 5/8"										
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										
1,147.11	0.94	208.44	1,147.11	-0.34	-0.18	-0.34	2.00	2.00	0.00	208.44
End Nudge @ 1147.11ft										
1,200.00	0.94	208.44	1,199.99	-1.11	-0.60	-1.11	0.00	0.00	0.00	0.00
1,300.00	0.94	208.44	1,299.98	-2.55	-1.38	-2.55	0.00	0.00	0.00	0.00
1,400.00	0.94	208.44	1,399.96	-4.00	-2.16	-4.00	0.00	0.00	0.00	0.00
1,500.00	0.94	208.44	1,499.95	-5.44	-2.95	-5.45	0.00	0.00	0.00	0.00
1,600.00	0.94	208.44	1,599.94	-6.89	-3.73	-6.89	0.00	0.00	0.00	0.00
1,700.00	0.94	208.44	1,699.92	-8.33	-4.51	-8.34	0.00	0.00	0.00	0.00
1,800.00	0.94	208.44	1,799.91	-9.78	-5.30	-9.79	0.00	0.00	0.00	0.00
1,900.00	0.94	208.44	1,899.90	-11.23	-6.08	-11.23	0.00	0.00	0.00	0.00
2,000.00	0.94	208.44	1,999.88	-12.67	-6.86	-12.68	0.00	0.00	0.00	0.00
2,100.00	0.94	208.44	2,099.87	-14.12	-7.65	-14.13	0.00	0.00	0.00	0.00
2,200.00	0.94	208.44	2,199.86	-15.56	-8.43	-15.57	0.00	0.00	0.00	0.00
2,300.00	0.94	208.44	2,299.84	-17.01	-9.21	-17.02	0.00	0.00	0.00	0.00
2,400.00	0.94	208.44	2,399.83	-18.46	-10.00	-18.47	0.00	0.00	0.00	0.00
2,500.00	0.94	208.44	2,499.81	-19.90	-10.78	-19.91	0.00	0.00	0.00	0.00
2,600.00	0.94	208.44	2,599.80	-21.35	-11.56	-21.36	0.00	0.00	0.00	0.00
2,700.00	0.94	208.44	2,699.79	-22.79	-12.34	-22.81	0.00	0.00	0.00	0.00
2,800.00	0.94	208.44	2,799.77	-24.24	-13.13	-24.26	0.00	0.00	0.00	0.00
2,900.00	0.94	208.44	2,899.76	-25.68	-13.91	-25.70	0.00	0.00	0.00	0.00
3,000.00	0.94	208.44	2,999.75	-27.13	-14.69	-27.15	0.00	0.00	0.00	0.00
3,100.00	0.94	208.44	3,099.73	-28.58	-15.48	-28.60	0.00	0.00	0.00	0.00
3,200.00	0.94	208.44	3,199.72	-30.02	-16.26	-30.04	0.00	0.00	0.00	0.00
3,300.00	0.94	208.44	3,299.71	-31.47	-17.04	-31.49	0.00	0.00	0.00	0.00
3,400.00	0.94	208.44	3,399.69	-32.91	-17.83	-32.94	0.00	0.00	0.00	0.00
3,500.00	0.94	208.44	3,499.68	-34.36	-18.61	-34.38	0.00	0.00	0.00	0.00
3,600.00	0.94	208.44	3,599.67	-35.81	-19.39	-35.83	0.00	0.00	0.00	0.00
3,700.00	0.94	208.44	3,699.65	-37.25	-20.17	-37.28	0.00	0.00	0.00	0.00
3,800.00	0.94	208.44	3,799.64	-38.70	-20.96	-38.72	0.00	0.00	0.00	0.00
3,900.00	0.94	208.44	3,899.63	-40.14	-21.74	-40.17	0.00	0.00	0.00	0.00
3,922.38	0.94	208.44	3,922.00	-40.47	-21.92	-40.49	0.00	0.00	0.00	0.00
Parkman										
4,000.00	0.94	208.44	3,999.61	-41.59	-22.52	-41.62	0.00	0.00	0.00	0.00
4,100.00	0.94	208.44	4,099.60	-43.04	-23.31	-43.06	0.00	0.00	0.00	0.00
4,200.00	0.94	208.44	4,199.59	-44.48	-24.09	-44.51	0.00	0.00	0.00	0.00
4,300.00	0.94	208.44	4,299.57	-45.93	-24.87	-45.96	0.00	0.00	0.00	0.00
4,322.43	0.94	208.44	4,322.00	-46.25	-25.05	-46.28	0.00	0.00	0.00	0.00
Sussex										
4,400.00	0.94	208.44	4,399.56	-47.37	-25.66	-47.40	0.00	0.00	0.00	0.00
4,500.00	0.94	208.44	4,499.54	-48.82	-26.44	-48.85	0.00	0.00	0.00	0.00
4,600.00	0.94	208.44	4,599.53	-50.26	-27.22	-50.30	0.00	0.00	0.00	0.00
4,700.00	0.94	208.44	4,699.52	-51.71	-28.01	-51.74	0.00	0.00	0.00	0.00
4,800.00	0.94	208.44	4,799.50	-53.16	-28.79	-53.19	0.00	0.00	0.00	0.00
4,900.00	0.94	208.44	4,899.49	-54.60	-29.57	-54.64	0.00	0.00	0.00	0.00

Plan Report for Kunzman 3C-5HZ - Plan D 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 (°)
5,000.00	0.94	208.44	4,999.48	-56.05	-30.35	-56.08	0.00	0.00	0.00	0.00
5,100.00	0.94	208.44	5,099.46	-57.49	-31.14	-57.53	0.00	0.00	0.00	0.00
5,200.00	0.94	208.44	5,199.45	-58.94	-31.92	-58.98	0.00	0.00	0.00	0.00
5,300.00	0.94	208.44	5,299.44	-60.39	-32.70	-60.43	0.00	0.00	0.00	0.00
5,400.00	0.94	208.44	5,399.42	-61.83	-33.49	-61.87	0.00	0.00	0.00	0.00
5,500.00	0.94	208.44	5,499.41	-63.28	-34.27	-63.32	0.00	0.00	0.00	0.00
5,600.00	0.94	208.44	5,599.40	-64.72	-35.05	-64.77	0.00	0.00	0.00	0.00
5,700.00	0.94	208.44	5,699.38	-66.17	-35.84	-66.21	0.00	0.00	0.00	0.00
5,800.00	0.94	208.44	5,799.37	-67.61	-36.62	-67.66	0.00	0.00	0.00	0.00
5,900.00	0.94	208.44	5,899.36	-69.06	-37.40	-69.11	0.00	0.00	0.00	0.00
6,000.00	0.94	208.44	5,999.34	-70.51	-38.18	-70.55	0.00	0.00	0.00	0.00
6,100.00	0.94	208.44	6,099.33	-71.95	-38.97	-72.00	0.00	0.00	0.00	0.00
6,200.00	0.94	208.44	6,199.31	-73.40	-39.75	-73.45	0.00	0.00	0.00	0.00
6,300.00	0.94	208.44	6,299.30	-74.84	-40.53	-74.89	0.00	0.00	0.00	0.00
6,400.00	0.94	208.44	6,399.29	-76.29	-41.32	-76.34	0.00	0.00	0.00	0.00
6,500.00	0.94	208.44	6,499.27	-77.74	-42.10	-77.79	0.00	0.00	0.00	0.00
6,600.00	0.94	208.44	6,599.26	-79.18	-42.88	-79.23	0.00	0.00	0.00	0.00
6,664.53	0.94	208.44	6,663.78	-80.11	-43.39	-80.17	0.00	0.00	0.00	0.00
Top of 4.5" Liner @ 6664.53ft										
6,700.00	0.94	208.44	6,699.25	-80.63	-43.67	-80.68	0.00	0.00	0.00	0.00
6,764.53	0.94	208.44	6,763.77	-81.56	-44.17	-81.61	0.00	0.00	0.00	0.00
KOP @ 6764.53ft										
6,800.00	2.75	350.72	6,799.23	-80.98	-44.45	-81.03	10.00	5.11	401.14	151.63
6,900.00	12.73	358.09	6,898.19	-67.56	-45.20	-67.62	10.00	9.97	7.36	9.36
6,999.65	22.69	359.00	6,993.00	-37.30	-45.91	-37.36	10.00	10.00	0.92	2.03
Sharon Springs										
7,000.00	22.72	359.00	6,993.33	-37.17	-45.91	-37.22	10.00	10.00	0.52	1.16
7,090.85	31.81	359.35	7,074.00	4.40	-46.49	4.35	10.00	10.00	0.38	1.16
Niobrara A										
7,100.00	32.72	359.37	7,081.74	9.29	-46.54	9.23	10.00	10.00	0.27	0.85
7,117.12	34.43	359.42	7,096.00	18.75	-46.64	18.70	10.00	10.00	0.26	0.83
Niobrara B										
7,200.00	42.72	359.59	7,160.74	70.39	-47.08	70.33	10.00	10.00	0.20	0.79
DLS = 10/100'										
7,232.54	45.97	359.64	7,184.00	93.12	-47.24	93.07	10.00	10.00	0.16	0.66
Niobrara C										
7,300.00	52.72	359.73	7,227.93	144.28	-47.52	144.22	10.00	10.00	0.14	0.62
7,400.00	62.72	359.84	7,281.27	228.71	-47.83	228.65	10.00	10.00	0.11	0.56
7,496.22	72.34	359.93	7,318.00	317.52	-48.00	317.46	10.00	10.00	0.09	0.50
Fort Hays										
7,500.00	72.72	359.93	7,319.13	321.13	-48.01	321.07	10.00	10.00	0.09	0.47
7,597.06	82.42	0.01	7,340.00	415.80	-48.05	415.74	10.00	10.00	0.08	0.47
Codell										
7,600.00	82.72	0.01	7,340.38	418.72	-48.05	418.66	10.00	10.00	0.08	0.45
7,671.48	89.87	0.07	7,345.00	490.00	-48.00	489.94	10.00	10.00	0.08	0.45
End Build @ 7671.48ft - Codell (Target-Heel) - 7" - Kunzman 3C-5HZ_CP										
7,700.00	89.87	0.07	7,345.07	518.52	-47.96	518.46	0.00	0.00	0.00	0.00
7,800.00	89.87	0.07	7,345.30	618.52	-47.84	618.46	0.00	0.00	0.00	0.00
7,900.00	89.87	0.07	7,345.54	718.52	-47.72	718.46	0.00	0.00	0.00	0.00
8,000.00	89.87	0.07	7,345.77	818.52	-47.60	818.46	0.00	0.00	0.00	0.00
8,100.00	89.87	0.07	7,346.00	918.52	-47.47	918.46	0.00	0.00	0.00	0.00
8,200.00	89.87	0.07	7,346.24	1,018.52	-47.35	1,018.46	0.00	0.00	0.00	0.00
8,300.00	89.87	0.07	7,346.47	1,118.52	-47.23	1,118.46	0.00	0.00	0.00	0.00
8,400.00	89.87	0.07	7,346.71	1,218.52	-47.10	1,218.46	0.00	0.00	0.00	0.00
8,500.00	89.87	0.07	7,346.94	1,318.52	-46.98	1,318.46	0.00	0.00	0.00	0.00
8,600.00	89.87	0.07	7,347.18	1,418.52	-46.86	1,418.46	0.00	0.00	0.00	0.00
8,700.00	89.87	0.07	7,347.41	1,518.52	-46.74	1,518.46	0.00	0.00	0.00	0.00
8,800.00	89.87	0.07	7,347.64	1,618.52	-46.61	1,618.46	0.00	0.00	0.00	0.00

Plan Report for Kunzman 3C-5HZ - Plan D 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 (°)
8,900.00	89.87	0.07	7,347.88	1,718.51	-46.49	1,718.46	0.00	0.00	0.00	0.00
9,000.00	89.87	0.07	7,348.11	1,818.51	-46.37	1,818.46	0.00	0.00	0.00	0.00
9,100.00	89.87	0.07	7,348.35	1,918.51	-46.24	1,918.46	0.00	0.00	0.00	0.00
9,200.00	89.87	0.07	7,348.58	2,018.51	-46.12	2,018.46	0.00	0.00	0.00	0.00
9,300.00	89.87	0.07	7,348.82	2,118.51	-46.00	2,118.46	0.00	0.00	0.00	0.00
9,400.00	89.87	0.07	7,349.05	2,218.51	-45.88	2,218.46	0.00	0.00	0.00	0.00
9,500.00	89.87	0.07	7,349.28	2,318.51	-45.75	2,318.46	0.00	0.00	0.00	0.00
9,600.00	89.87	0.07	7,349.52	2,418.51	-45.63	2,418.45	0.00	0.00	0.00	0.00
9,700.00	89.87	0.07	7,349.75	2,518.51	-45.51	2,518.45	0.00	0.00	0.00	0.00
9,800.00	89.87	0.07	7,349.99	2,618.51	-45.38	2,618.45	0.00	0.00	0.00	0.00
9,900.00	89.87	0.07	7,350.22	2,718.51	-45.26	2,718.45	0.00	0.00	0.00	0.00
10,000.00	89.87	0.07	7,350.46	2,818.51	-45.14	2,818.45	0.00	0.00	0.00	0.00
10,100.00	89.87	0.07	7,350.69	2,918.51	-45.02	2,918.45	0.00	0.00	0.00	0.00
10,200.00	89.87	0.07	7,350.92	3,018.51	-44.89	3,018.45	0.00	0.00	0.00	0.00
10,300.00	89.87	0.07	7,351.16	3,118.51	-44.77	3,118.45	0.00	0.00	0.00	0.00
10,400.00	89.87	0.07	7,351.39	3,218.51	-44.65	3,218.45	0.00	0.00	0.00	0.00
10,500.00	89.87	0.07	7,351.63	3,318.51	-44.52	3,318.45	0.00	0.00	0.00	0.00
10,600.00	89.87	0.07	7,351.86	3,418.51	-44.40	3,418.45	0.00	0.00	0.00	0.00
10,700.00	89.87	0.07	7,352.10	3,518.51	-44.28	3,518.45	0.00	0.00	0.00	0.00
10,800.00	89.87	0.07	7,352.33	3,618.51	-44.16	3,618.45	0.00	0.00	0.00	0.00
10,900.00	89.87	0.07	7,352.56	3,718.51	-44.03	3,718.45	0.00	0.00	0.00	0.00
11,000.00	89.87	0.07	7,352.80	3,818.51	-43.91	3,818.45	0.00	0.00	0.00	0.00
11,100.00	89.87	0.07	7,353.03	3,918.51	-43.79	3,918.45	0.00	0.00	0.00	0.00
11,200.00	89.87	0.07	7,353.27	4,018.51	-43.66	4,018.45	0.00	0.00	0.00	0.00
11,300.00	89.87	0.07	7,353.50	4,118.51	-43.54	4,118.45	0.00	0.00	0.00	0.00
11,400.00	89.87	0.07	7,353.74	4,218.51	-43.42	4,218.45	0.00	0.00	0.00	0.00
11,500.00	89.87	0.07	7,353.97	4,318.51	-43.30	4,318.45	0.00	0.00	0.00	0.00
11,600.00	89.87	0.07	7,354.21	4,418.51	-43.17	4,418.45	0.00	0.00	0.00	0.00
11,700.00	89.87	0.07	7,354.44	4,518.51	-43.05	4,518.45	0.00	0.00	0.00	0.00
11,800.00	89.87	0.07	7,354.67	4,618.50	-42.93	4,618.45	0.00	0.00	0.00	0.00
11,900.00	89.87	0.07	7,354.91	4,718.50	-42.80	4,718.45	0.00	0.00	0.00	0.00
11,939.24	89.87	0.07	7,355.00	4,757.74	-42.76	4,757.69	0.00	0.00	0.00	0.00

TD Well @ 11939.24ft - Kunzman 3C-5HZ_BHL

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	+E/-W (ft)	Comment
1,100.00	1,100.00	0.00	0.00	Begin Nudge @ 1100.00ft
1,147.11	1,147.11	-0.34	-0.18	End Nudge @ 1147.11ft
6,664.53	6,663.78	-80.11	-43.39	Top of 4.5" Liner @ 6664.53ft
6,764.53	6,763.77	-81.56	-44.17	KOP @ 6764.53ft
7,200.00	7,160.74	70.39	-47.08	DLS = 10/100'
7,671.48	7,345.00	490.00	-48.00	End Build @ 7671.48ft
11,939.24	7,355.00	4,757.74	-42.76	TD Well @ 11939.24ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (ft)	Origin +E/-W (ft)	Start TVD (ft)
User	No Target (Freehand)	0.07	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	11,939.24	Plan D 0-Permit	MWD

Plan Report for Kunzman 3C-5HZ - Plan D 0-Permit**Casing Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
800.00	800.00	9 5/8"	9-5/8	13-1/2
7,671.48	7,345.00	7"	7	8-3/4

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,922.38	3,922.00	Parkman		0.00	
4,322.43	4,322.00	Sussex		0.00	
6,999.65	6,993.00	Sharon Springs		0.00	
7,090.85	7,074.00	Niobrara A		0.00	
7,117.12	7,096.00	Niobrara B		0.00	
7,232.54	7,184.00	Niobrara C		0.00	
7,496.22	7,318.00	Fort Hays		0.00	
7,597.06	7,340.00	Codell		0.00	
7,671.48	7,345.00	Codell (Target-Heel)		0.00	
11,939.24	7,355.00	Codell (Target-Toe)		0.00	

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Kunzman 3C-5HZ_SHL	0.00	0.00	0.00	Point
Kunzman 3C-5HZ_CP	7,345.00	490.00	-48.00	Point
Kunzman_SEC	0.00	0.03	-77.98	Polygon
Kunzman 3C-5HZ_BHL	7,355.00	4,757.75	-42.76	Point

North Reference Sheet for Sec. 8-T2N-R66W - Kunzman 3C-5HZ - Plan D 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' @ 4875.00ft (Drilling Rig). Northing and Easting are relative to Kunzman 3C-5HZ

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: 0.99995810

Grid Coordinates of Well: 1,301,807.68 ft N, 3,194,551.04 ft E

Geographical Coordinates of Well: 40° 09' 35.14" N, 104° 48' 14.10" W

Grid Convergence at Surface is: 0.45°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,939.24ft
the Bottom Hole Displacement is 4,757.94ft in the Direction of 359.49° (True).

Magnetic Convergence at surface is: -8.18° (4 June 2013, , BGGM2013)

