

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 8-T2N-R66W

Kunzman Federal 30N-5HZR

Plan A

Plan: Rev A0

Sperry Drilling Services

Proposal Report

01 October, 2013

Well Coordinates: 1,301,806.89 N, 3,194,447.30 E (40° 09' 35.14" N, 104° 48' 15.44" W)

Ground Level: 4,858.00 usft

Local Coordinate Origin:

Centered on Well Kunzman Federal 30N-5HZR

Viewing Datum:

RKB = 13' @ 4871.00usft (Ensign 132)

TVDs to System:

N

North Reference:

True

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

HALLIBURTON

Project: Weld County, CO (NAD 83)
Site: Sec. 8-T2N-R66W
Well: Kunzman Federal 30N-5HZR
Wellbore: Plan A
Design: Rev A0



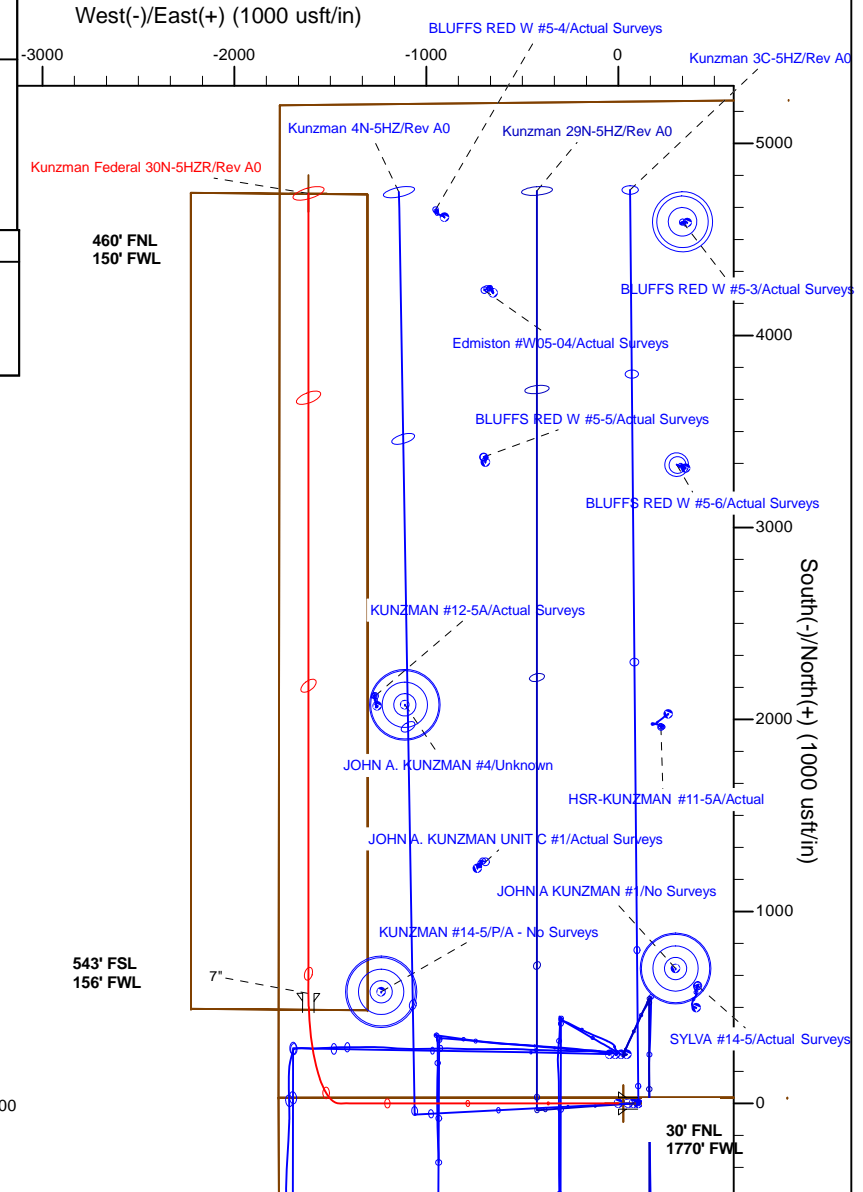
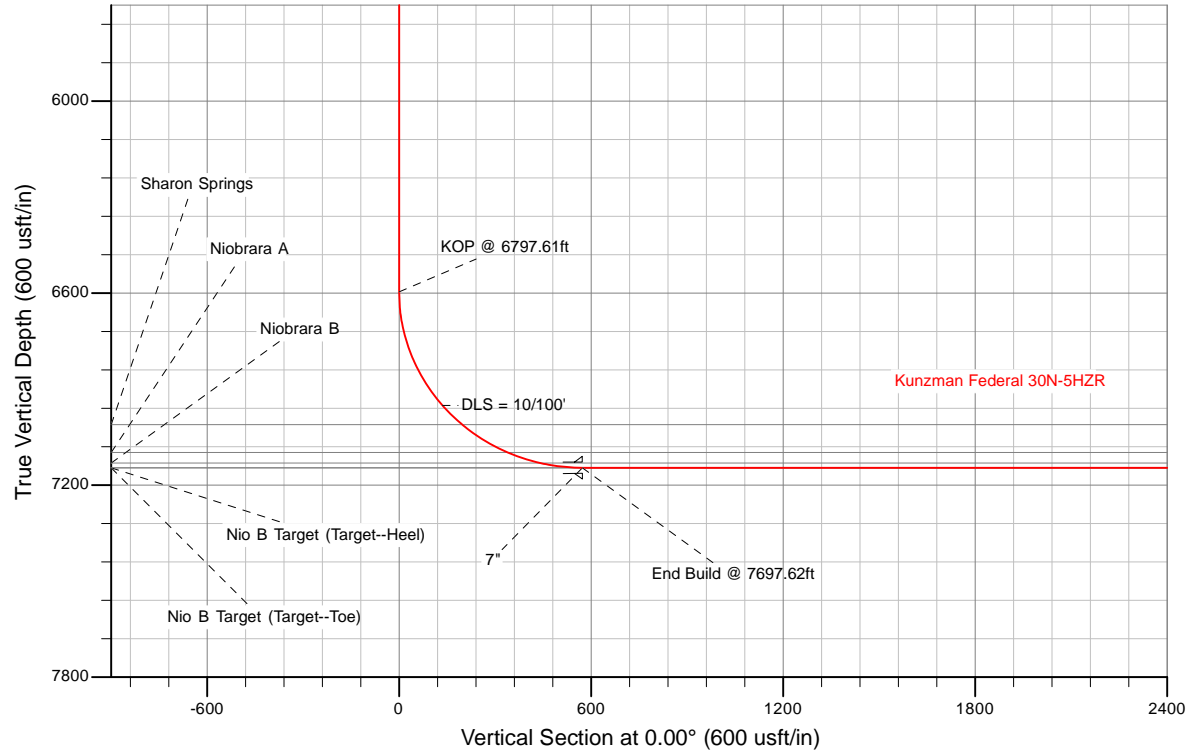
HALLIBURTON
Sperry Drilling

SECTION DETAILS

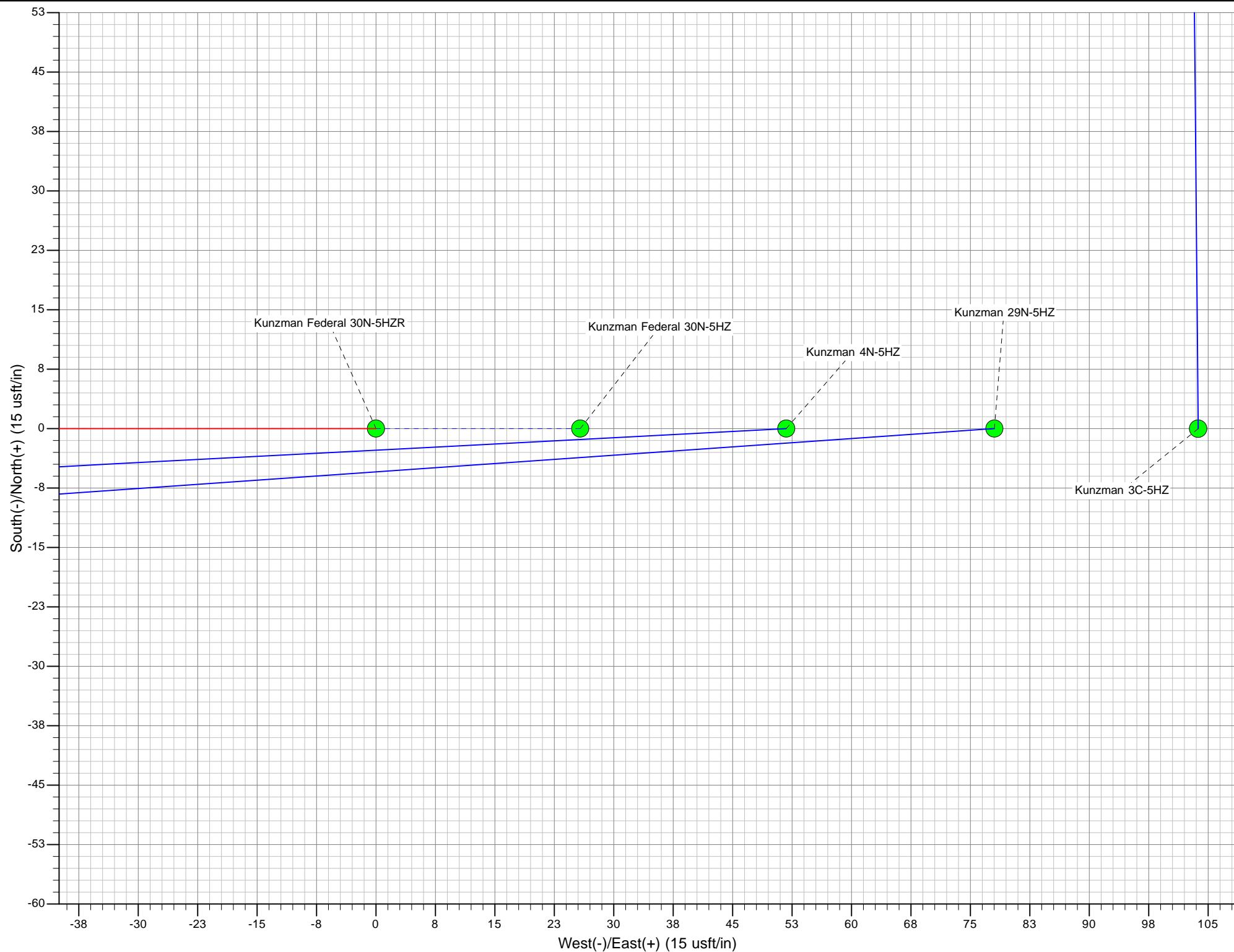
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1188.61	0.00	0.00	1188.61	0.00	0.00	0.00	0.00	0.00	
3	1999.61	16.22	270.00	1988.82	0.00	-114.03	2.00	270.00	0.00	
4	6797.61	16.22	270.00	6595.84	0.00	-1454.24	0.00	0.00	0.00	
5	7697.62	90.00	0.00	7146.00	572.96	-1614.26	10.00	90.00	572.96	
6	11864.58	90.00	0.00	7146.00	4739.93	-1614.09	0.00	0.00	4739.93	Kunzman Federal 30N-5HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Kunzman Federal 30N-5HZ_LD	0.00	0.00	25.76	40.159761	-104.804197	Polygon
Kunzman Federal 30N-5HZ_SEC	0.00	0.00	25.76	40.159761	-104.804197	Polygon
Kunzman Federal 30N-5HZR_SHL	0.00	0.00	0.00	40.159761	-104.804289	Point
Kunzman Federal 30N-5HZ_BHL	7146.00	4739.93	-1614.09	40.172772	-104.810065	Point



WELL DETAILS: Kunzman Federal 30N-5HZR			Ground Level: 4858.00	
RKB = 13' @ 4871.00usft (Ensign 132)			Plan: Rev A0 (Kunzman Federal 30N-5HZR/Plan A)	
Created By: Clint Eshelman			Date: 10/1/2013	
TVD	MD			
6595.84	6797.61	KOP @ 6797.61ft		



Plan Report for Kunzman Federal 30N-5HZR - Rev A0

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
Kunzman Federal 30N-5HZR_SHL - Kunzman Federal 30N-5HZ_SEC - Kunzman Federal 30N-5HZ_LD										
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
703.00	0.00	0.00	703.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills										
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
1,188.61	0.00	0.00	1,188.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 1188.61ft										
1,200.00	0.23	270.00	1,200.00	0.00	-0.02	0.00	2.00	2.00	0.00	270.00
1,300.00	2.23	270.00	1,299.97	0.00	-2.17	0.00	2.00	2.00	0.00	0.00
1,400.00	4.23	270.00	1,399.81	0.00	-7.80	0.00	2.00	2.00	0.00	0.00
1,500.00	6.23	270.00	1,499.39	0.00	-16.91	0.00	2.00	2.00	0.00	0.00
1,600.00	8.23	270.00	1,598.59	0.00	-29.49	0.00	2.00	2.00	0.00	0.00
1,700.00	10.23	270.00	1,697.29	0.00	-45.52	0.00	2.00	2.00	0.00	0.00
1,800.00	12.23	270.00	1,795.37	0.00	-64.99	0.00	2.00	2.00	0.00	0.00
1,900.00	14.23	270.00	1,892.71	0.00	-87.87	0.00	2.00	2.00	0.00	0.00
1,999.61	16.22	270.00	1,988.82	0.00	-114.03	0.00	2.00	2.00	0.00	0.00
End Nudge @ 1999.61ft										
2,000.00	16.22	270.00	1,989.20	0.00	-114.14	0.00	0.00	0.00	0.00	0.00
2,100.00	16.22	270.00	2,085.21	0.00	-142.07	0.00	0.00	0.00	0.00	0.00
2,200.00	16.22	270.00	2,181.23	0.00	-170.00	0.00	0.00	0.00	0.00	0.00
2,300.00	16.22	270.00	2,277.25	0.00	-197.94	0.00	0.00	0.00	0.00	0.00
2,400.00	16.22	270.00	2,373.27	0.00	-225.87	0.00	0.00	0.00	0.00	0.00
2,500.00	16.22	270.00	2,469.29	0.00	-253.80	0.00	0.00	0.00	0.00	0.00
2,600.00	16.22	270.00	2,565.31	0.00	-281.73	0.00	0.00	0.00	0.00	0.00
2,700.00	16.22	270.00	2,661.33	0.00	-309.67	0.00	0.00	0.00	0.00	0.00
2,800.00	16.22	270.00	2,757.35	0.00	-337.60	0.00	0.00	0.00	0.00	0.00
2,900.00	16.22	270.00	2,853.37	0.00	-365.53	0.00	0.00	0.00	0.00	0.00
3,000.00	16.22	270.00	2,949.39	0.00	-393.46	0.00	0.00	0.00	0.00	0.00
3,100.00	16.22	270.00	3,045.41	0.00	-421.40	0.00	0.00	0.00	0.00	0.00
3,200.00	16.22	270.00	3,141.43	0.00	-449.33	0.00	0.00	0.00	0.00	0.00
3,300.00	16.22	270.00	3,237.45	0.00	-477.26	0.00	0.00	0.00	0.00	0.00
3,400.00	16.22	270.00	3,333.47	0.00	-505.20	0.00	0.00	0.00	0.00	0.00
3,500.00	16.22	270.00	3,429.49	0.00	-533.13	0.00	0.00	0.00	0.00	0.00
3,600.00	16.22	270.00	3,525.51	0.00	-561.06	0.00	0.00	0.00	0.00	0.00
3,700.00	16.22	270.00	3,621.53	0.00	-588.99	0.00	0.00	0.00	0.00	0.00
3,800.00	16.22	270.00	3,717.55	0.00	-616.93	0.00	0.00	0.00	0.00	0.00
3,900.00	16.22	270.00	3,813.57	0.00	-644.86	0.00	0.00	0.00	0.00	0.00
4,000.00	16.22	270.00	3,909.59	0.00	-672.79	0.00	0.00	0.00	0.00	0.00
4,010.84	16.22	270.00	3,920.00	0.00	-675.82	0.00	0.00	0.00	0.00	0.00
Parkman										
4,100.00	16.22	270.00	4,005.61	0.00	-700.72	0.00	0.00	0.00	0.00	0.00
4,200.00	16.22	270.00	4,101.63	0.00	-728.66	0.00	0.00	0.00	0.00	0.00
4,300.00	16.22	270.00	4,197.65	0.00	-756.59	0.00	0.00	0.00	0.00	0.00
4,400.00	16.22	270.00	4,293.67	0.00	-784.52	0.00	0.00	0.00	0.00	0.00
4,427.43	16.22	270.00	4,320.00	0.00	-792.18	0.00	0.00	0.00	0.00	0.00
Sussex										

Plan Report for Kunzman Federal 30N-5HZR - Rev A0

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 (°)
4,500.00	16.22	270.00	4,389.69	0.00	-812.45	0.00	0.00	0.00	0.00	0.00
4,600.00	16.22	270.00	4,485.71	0.00	-840.39	0.00	0.00	0.00	0.00	0.00
4,700.00	16.22	270.00	4,581.73	0.00	-868.32	0.00	0.00	0.00	0.00	0.00
4,800.00	16.22	270.00	4,677.74	0.00	-896.25	0.00	0.00	0.00	0.00	0.00
4,900.00	16.22	270.00	4,773.76	0.00	-924.18	0.00	0.00	0.00	0.00	0.00
5,000.00	16.22	270.00	4,869.78	0.00	-952.12	0.00	0.00	0.00	0.00	0.00
5,100.00	16.22	270.00	4,965.80	0.00	-980.05	0.00	0.00	0.00	0.00	0.00
5,200.00	16.22	270.00	5,061.82	0.00	-1,007.98	0.00	0.00	0.00	0.00	0.00
5,300.00	16.22	270.00	5,157.84	0.00	-1,035.92	0.00	0.00	0.00	0.00	0.00
5,400.00	16.22	270.00	5,253.86	0.00	-1,063.85	0.00	0.00	0.00	0.00	0.00
5,500.00	16.22	270.00	5,349.88	0.00	-1,091.78	0.00	0.00	0.00	0.00	0.00
5,600.00	16.22	270.00	5,445.90	0.00	-1,119.71	0.00	0.00	0.00	0.00	0.00
5,700.00	16.22	270.00	5,541.92	0.00	-1,147.65	0.00	0.00	0.00	0.00	0.00
5,800.00	16.22	270.00	5,637.94	0.00	-1,175.58	0.00	0.00	0.00	0.00	0.00
5,900.00	16.22	270.00	5,733.96	0.00	-1,203.51	0.00	0.00	0.00	0.00	0.00
6,000.00	16.22	270.00	5,829.98	0.00	-1,231.44	0.00	0.00	0.00	0.00	0.00
6,100.00	16.22	270.00	5,926.00	0.00	-1,259.38	0.00	0.00	0.00	0.00	0.00
6,200.00	16.22	270.00	6,022.02	0.00	-1,287.31	0.00	0.00	0.00	0.00	0.00
6,300.00	16.22	270.00	6,118.04	0.00	-1,315.24	0.00	0.00	0.00	0.00	0.00
6,400.00	16.22	270.00	6,214.06	0.00	-1,343.17	0.00	0.00	0.00	0.00	0.00
6,500.00	16.22	270.00	6,310.08	0.00	-1,371.11	0.00	0.00	0.00	0.00	0.00
6,600.00	16.22	270.00	6,406.10	0.00	-1,399.04	0.00	0.00	0.00	0.00	0.00
6,700.00	16.22	270.00	6,502.12	0.00	-1,426.97	0.00	0.00	0.00	0.00	0.00
6,797.61	16.22	270.00	6,595.84	0.00	-1,454.24	0.00	0.00	0.00	0.00	0.00
KOP @ 6797.61ft										
6,800.00	16.22	270.86	6,598.14	0.00	-1,454.90	0.00	10.00	0.07	35.80	90.00
6,900.00	19.11	302.89	6,693.63	9.12	-1,482.68	9.12	10.00	2.89	32.03	89.18
7,000.00	25.72	322.85	6,786.16	35.38	-1,509.60	35.38	10.00	6.61	19.96	58.58
7,100.00	33.95	334.40	6,872.90	77.96	-1,534.83	77.96	10.00	8.23	11.54	40.06
7,200.00	42.86	341.73	6,951.23	135.59	-1,557.62	135.59	10.00	8.92	7.34	30.01
DLS = 10/100'										
7,287.53	50.95	346.35	7,011.00	197.00	-1,575.00	197.00	10.00	9.23	5.27	24.24
Sharon Springs										
7,300.00	52.11	346.92	7,018.76	206.50	-1,577.26	206.50	10.00	9.34	4.56	21.08
7,400.00	61.53	350.93	7,073.43	288.55	-1,593.16	288.55	10.00	9.42	4.01	20.73
7,456.50	66.90	352.88	7,098.00	338.90	-1,600.30	338.90	10.00	9.51	3.45	18.53
Niobrara A										
7,500.00	71.06	354.27	7,113.60	379.24	-1,604.84	379.24	10.00	9.54	3.21	17.68
7,563.51	77.13	356.19	7,131.00	440.08	-1,609.90	440.08	10.00	9.57	3.02	17.18
Niobrara B										
7,600.00	80.63	357.25	7,138.04	475.82	-1,611.94	475.82	10.00	9.59	2.90	16.65
7,697.62	90.00	0.00	7,146.00	572.97	-1,614.26	572.97	10.00	9.60	2.82	16.45
End Build @ 7697.62ft - Nio B Target (Target--Heel) - 7"										
7,700.00	90.00	0.00	7,146.00	575.35	-1,614.26	575.35	0.00	0.00	0.00	0.00
7,800.00	90.00	0.00	7,146.00	675.35	-1,614.25	675.35	0.00	0.00	0.00	0.00
7,900.00	90.00	0.00	7,146.00	775.35	-1,614.25	775.35	0.00	0.00	0.00	0.00
8,000.00	90.00	0.00	7,146.00	875.35	-1,614.25	875.35	0.00	0.00	0.00	0.00
8,100.00	90.00	0.00	7,146.00	975.35	-1,614.24	975.35	0.00	0.00	0.00	0.00
8,200.00	90.00	0.00	7,146.00	1,075.35	-1,614.24	1,075.35	0.00	0.00	0.00	0.00
8,300.00	90.00	0.00	7,146.00	1,175.35	-1,614.23	1,175.35	0.00	0.00	0.00	0.00
8,400.00	90.00	0.00	7,146.00	1,275.35	-1,614.23	1,275.35	0.00	0.00	0.00	0.00
8,500.00	90.00	0.00	7,146.00	1,375.35	-1,614.23	1,375.35	0.00	0.00	0.00	0.00
8,600.00	90.00	0.00	7,146.00	1,475.35	-1,614.22	1,475.35	0.00	0.00	0.00	0.00
8,700.00	90.00	0.00	7,146.00	1,575.35	-1,614.22	1,575.35	0.00	0.00	0.00	0.00
8,800.00	90.00	0.00	7,146.00	1,675.35	-1,614.21	1,675.35	0.00	0.00	0.00	0.00
8,900.00	90.00	0.00	7,146.00	1,775.35	-1,614.21	1,775.35	0.00	0.00	0.00	0.00
9,000.00	90.00	0.00	7,146.00	1,875.35	-1,614.20	1,875.35	0.00	0.00	0.00	0.00
9,100.00	90.00	0.00	7,146.00	1,975.35	-1,614.20	1,975.35	0.00	0.00	0.00	0.00
9,200.00	90.00	0.00	7,146.00	2,075.35	-1,614.20	2,075.35	0.00	0.00	0.00	0.00

Plan Report for Kunzman Federal 30N-5HZR - Rev A0

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 (°)
9,300.00	90.00	0.00	7,146.00	2,175.35	-1,614.19	2,175.35	0.00	0.00	0.00	0.00
9,400.00	90.00	0.00	7,146.00	2,275.35	-1,614.19	2,275.35	0.00	0.00	0.00	0.00
9,500.00	90.00	0.00	7,146.00	2,375.35	-1,614.18	2,375.35	0.00	0.00	0.00	0.00
9,600.00	90.00	0.00	7,146.00	2,475.35	-1,614.18	2,475.35	0.00	0.00	0.00	0.00
9,700.00	90.00	0.00	7,146.00	2,575.35	-1,614.18	2,575.35	0.00	0.00	0.00	0.00
9,800.00	90.00	0.00	7,146.00	2,675.35	-1,614.17	2,675.35	0.00	0.00	0.00	0.00
9,900.00	90.00	0.00	7,146.00	2,775.35	-1,614.17	2,775.35	0.00	0.00	0.00	0.00
10,000.00	90.00	0.00	7,146.00	2,875.35	-1,614.16	2,875.35	0.00	0.00	0.00	0.00
10,100.00	90.00	0.00	7,146.00	2,975.35	-1,614.16	2,975.35	0.00	0.00	0.00	0.00
10,200.00	90.00	0.00	7,146.00	3,075.35	-1,614.16	3,075.35	0.00	0.00	0.00	0.00
10,300.00	90.00	0.00	7,146.00	3,175.35	-1,614.15	3,175.35	0.00	0.00	0.00	0.00
10,400.00	90.00	0.00	7,146.00	3,275.35	-1,614.15	3,275.35	0.00	0.00	0.00	0.00
10,500.00	90.00	0.00	7,146.00	3,375.35	-1,614.14	3,375.35	0.00	0.00	0.00	0.00
10,600.00	90.00	0.00	7,146.00	3,475.35	-1,614.14	3,475.35	0.00	0.00	0.00	0.00
10,700.00	90.00	0.00	7,146.00	3,575.35	-1,614.14	3,575.35	0.00	0.00	0.00	0.00
10,800.00	90.00	0.00	7,146.00	3,675.35	-1,614.13	3,675.35	0.00	0.00	0.00	0.00
10,900.00	90.00	0.00	7,146.00	3,775.35	-1,614.13	3,775.35	0.00	0.00	0.00	0.00
11,000.00	90.00	0.00	7,146.00	3,875.35	-1,614.12	3,875.35	0.00	0.00	0.00	0.00
11,100.00	90.00	0.00	7,146.00	3,975.35	-1,614.12	3,975.35	0.00	0.00	0.00	0.00
11,200.00	90.00	0.00	7,146.00	4,075.35	-1,614.12	4,075.35	0.00	0.00	0.00	0.00
11,300.00	90.00	0.00	7,146.00	4,175.35	-1,614.11	4,175.35	0.00	0.00	0.00	0.00
11,400.00	90.00	0.00	7,146.00	4,275.35	-1,614.11	4,275.35	0.00	0.00	0.00	0.00
11,500.00	90.00	0.00	7,146.00	4,375.35	-1,614.10	4,375.35	0.00	0.00	0.00	0.00
11,600.00	90.00	0.00	7,146.00	4,475.35	-1,614.10	4,475.35	0.00	0.00	0.00	0.00
11,700.00	90.00	0.00	7,146.00	4,575.35	-1,614.10	4,575.35	0.00	0.00	0.00	0.00
11,800.00	90.00	0.00	7,146.00	4,675.35	-1,614.09	4,675.35	0.00	0.00	0.00	0.00
11,864.57	90.00	0.00	7,146.00	4,739.92	-1,614.09	4,739.92	0.00	0.00	0.00	0.00
Nio B Target (Target--Toe)										
11,864.58	90.00	0.00	7,146.00	4,739.93	-1,614.09	4,739.93	0.00	0.00	0.00	0.00
TD Well @ 11864.58ft - Kunzman Federal 30N-5HZ_BHL										

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,188.61	1,188.61	0.00	0.00	Begin Nudge @ 1188.61ft
1,999.61	1,988.82	0.00	-114.03	End Nudge @ 1999.61ft
6,797.61	6,595.84	0.00	-1,454.24	KOP @ 6797.61ft
7,200.00	6,951.23	135.59	-1,557.62	DLS = 10/100'
7,697.62	7,146.00	572.97	-1,614.26	End Build @ 7697.62ft
11,864.58	7,146.00	4,739.93	-1,614.09	TD Well @ 11864.58ft

Vertical Section Information

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

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	800.00	Rev A0	MWD+SC
800.00	7,697.62	Rev A0	MWD+SC
7,697.62	11,864.58	Rev A0	MWD+SC

Plan Report for Kunzman Federal 30N-5HZR - Rev A0**Casing Details**

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
800.00	800.00	9 5/8"	9-5/8	13-1/2
7,697.62	7,146.00	7"	7	8-3/4

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
703.00	703.00	Fox Hills		0.00	
4,010.84	3,920.00	Parkman		0.00	
4,427.43	4,320.00	Sussex		0.00	
7,287.53	7,011.00	Sharon Springs		0.00	
7,456.50	7,098.00	Niobrara A		0.00	
7,563.51	7,131.00	Niobrara B		0.00	
7,697.62	7,146.00	Nio B Target (Target--Heel)		0.00	
11,864.57	7,146.00	Nio B Target (Target--Toe)		0.00	

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
Kunzman Federal 30N-5HZR_SHL	0.00	0.00	0.00	Point
Kunzman Federal 30N-5HZ_BHL	7,146.00	4,739.93	-1,614.09	Point
Kunzman Federal 30N-5HZ_SEC	0.00	0.00	25.76	Polygon
Kunzman Federal 30N-5HZ_LD	0.00	0.00	25.76	Polygon

North Reference Sheet for Sec. 8-T2N-R66W - Kunzman Federal 30N-5HZR - 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 = 13' @ 4871.00usft (Ensign 132). Northing and Easting are relative to Kunzman Federal 30N-5HZR
 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: 0.99995810

Grid Coordinates of Well: 1,301,806.89 usft N, 3,194,447.30 usft E
 Geographical Coordinates of Well: 40° 09' 35.14" N, 104° 48' 15.44" W
 Grid Convergence at Surface is: 0.45°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,864.58usft
 the Bottom Hole Displacement is 5,007.21usft in the Direction of 341.19° (True).
 Magnetic Convergence at surface is: -8.14° (1 October 2013, , BGGM2013)

