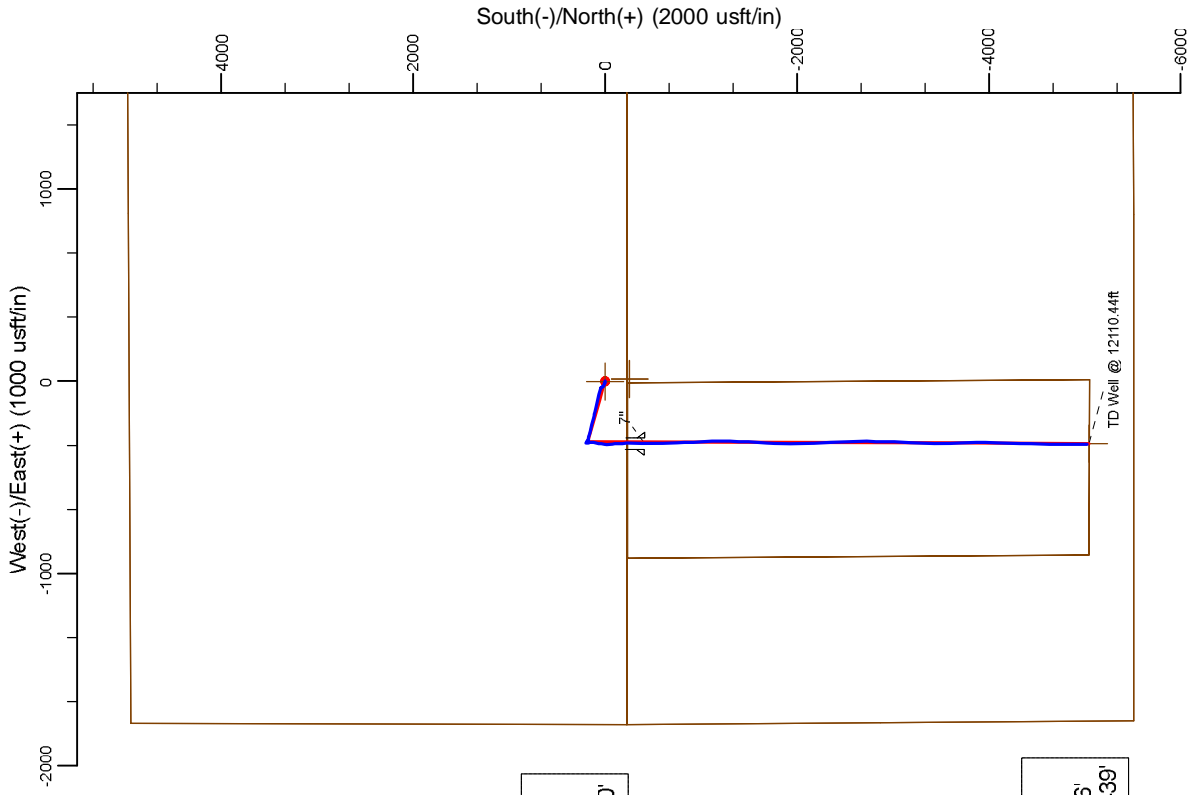
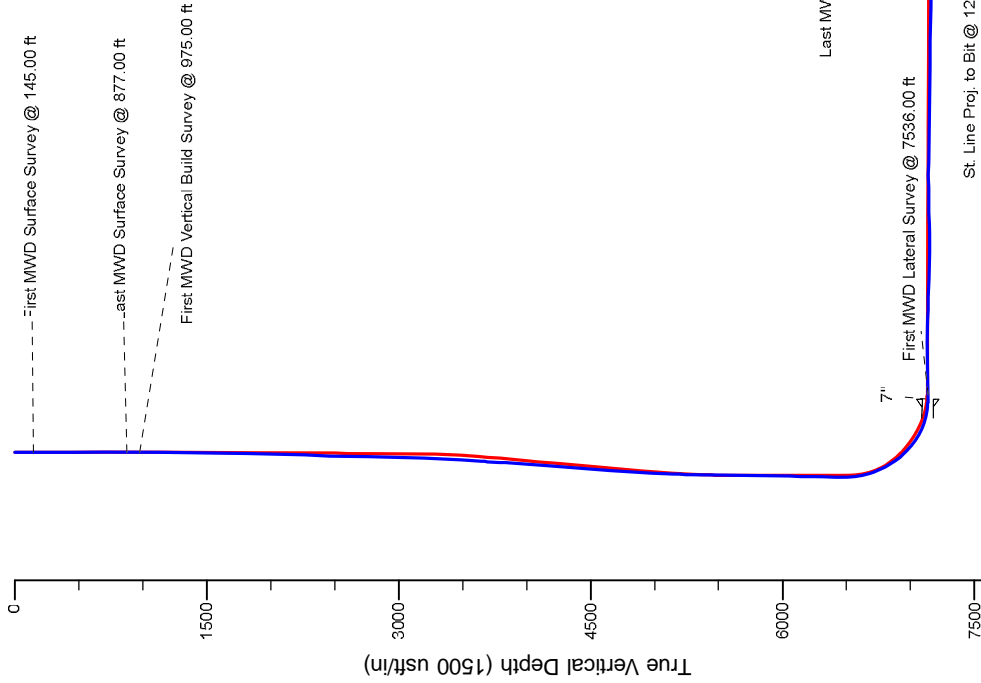




Project: Weld County, CO (NAD 83)
 Site: Sec. 5-T2N-R66W
 Well: KUNZMAN FEDERAL 35N-8HZ
 Wellbore: Plan B
 Design: Actual Surveys

LEGEND

- ✖ KUNZMAN FEDERAL 35N-8HZ, Plan B, Plan B0 Proposal VO
- ▣ Actual Surveys



7" Casing
 FNL: 185'
 FWL: 1460'

BHL: 486'
 FSL: 486'
 FWL: 1439'

| 7" Casing | Longitude | Northing | Easting |
|-----------|-----------|--------------|--------------|
| BHL: | 40.159334 | 1,301,648.90 | 3,194,138.63 |
| | 40.146683 | 1,297,040.50 | 3,194,169.42 |

St. Line Proj. to Bit @ 12110MD :: 7145.03' TVD

| | |
|---|-----------------------|
| WELL DETAILS: KUNZMAN FEDERAL 35N-8HZ | |
| RKB = 13' @ 4871.00usft (Ensign 132) | Ground Level: 4859.00 |
| Design: Actual Surveys (KUNZMAN FEDERAL 35N-8HZ/Plan B) | |
| Created By: Pari Amanlou | Date: 10/11/2013 |

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 5-T2N-R66W

KUNZMAN FEDERAL 35N-8HZ

Plan B

Design: Actual Surveys

Sperry Drilling Services

Proposal Report

30 October, 2013

Well Coordinates: 1,302,062.71 N, 3,194,459.31 E (40° 09' 37.67" N, 104° 48' 15.26" W)

Ground Level: 4,858.00 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 KUNZMAN FEDERAL 35N-8HZ

RKB = 13' @ 4871.00usft (Ensign 132)

N

True

Dec-Deg - API - US Survey Feet - Custom

HALLIBURTON

Design Report for KUNZMAN FEDERAL 35N-8HZ - Actual Surveys

| 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 35N-8HZ_SHL - Kunzman 30N-5HZ_SEC - Kunzman Federal 35N-8HZ_LD | | | | | | | | | | |
| 100.00 | 0.15 | 269.65 | 100.00 | 0.00 | -0.13 | 0.00 | 0.15 | 0.15 | 0.00 | 269.65 |
| 145.00 | 0.22 | 269.65 | 145.00 | 0.00 | -0.28 | 0.00 | 0.15 | 0.15 | 0.00 | 0.00 |
| First MWD Surface Survey @ 145.00 ft | | | | | | | | | | |
| 200.00 | 0.19 | 252.86 | 200.00 | -0.03 | -0.47 | 0.03 | 0.12 | -0.06 | -30.53 | -125.34 |
| 300.00 | 0.33 | 249.68 | 300.00 | -0.19 | -0.83 | 0.19 | 0.14 | 0.14 | -3.17 | -7.42 |
| 400.00 | 0.28 | 259.45 | 400.00 | -0.36 | -1.43 | 0.37 | 0.07 | -0.05 | 9.76 | 136.15 |
| 500.00 | 0.24 | 266.56 | 500.00 | -0.39 | -1.82 | 0.39 | 0.06 | -0.05 | 7.11 | 148.45 |
| 600.00 | 0.34 | 291.83 | 599.99 | -0.37 | -2.32 | 0.37 | 0.16 | 0.11 | 25.27 | 63.38 |
| 700.00 | 0.36 | 293.61 | 699.99 | -0.02 | -2.90 | 0.03 | 0.02 | 0.02 | 1.78 | 36.89 |
| 800.00 | 0.53 | 297.71 | 799.99 | 0.23 | -3.55 | -0.22 | 0.17 | 0.17 | 4.10 | 12.72 |
| 877.00 | 0.62 | 301.72 | 876.99 | 0.64 | -4.24 | -0.63 | 0.13 | 0.12 | 5.20 | 25.84 |
| Last MWD Surface Survey @ 877.00 ft | | | | | | | | | | |
| 900.00 | 0.68 | 301.05 | 899.98 | 0.78 | -4.47 | -0.77 | 0.27 | 0.26 | -2.93 | -7.49 |
| 975.00 | 0.88 | 299.50 | 974.98 | 1.29 | -5.35 | -1.28 | 0.27 | 0.27 | -2.06 | -6.81 |
| First MWD Vertical Build Survey @ 975.00 ft | | | | | | | | | | |
| 1,000.00 | 0.92 | 302.66 | 999.97 | 1.49 | -5.69 | -1.48 | 0.26 | 0.17 | 12.65 | 50.37 |
| 1,100.00 | 1.02 | 309.29 | 1,099.96 | 2.56 | -7.07 | -2.55 | 0.15 | 0.09 | 6.63 | 53.68 |
| 1,200.00 | 1.01 | 310.07 | 1,199.94 | 3.65 | -8.41 | -3.63 | 0.01 | 0.00 | 0.78 | 102.03 |
| 1,300.00 | 1.14 | 313.02 | 1,299.93 | 4.90 | -9.82 | -4.88 | 0.14 | 0.13 | 2.95 | 24.56 |
| 1,400.00 | 1.43 | 306.75 | 1,399.90 | 6.34 | -11.46 | -6.32 | 0.32 | 0.29 | -6.27 | -29.38 |
| 1,500.00 | 1.55 | 303.72 | 1,499.87 | 7.85 | -13.68 | -7.83 | 0.14 | 0.12 | -3.03 | -35.33 |
| 1,600.00 | 1.58 | 313.58 | 1,599.83 | 9.50 | -15.83 | -9.47 | 0.27 | 0.04 | 9.86 | 87.40 |
| 1,700.00 | 1.56 | 315.65 | 1,699.79 | 11.47 | -17.77 | -11.44 | 0.06 | -0.02 | 2.07 | 110.40 |
| 1,800.00 | 1.96 | 310.70 | 1,799.74 | 13.55 | -19.98 | -13.51 | 0.42 | 0.40 | -4.95 | -23.49 |
| 1,900.00 | 1.67 | 307.57 | 1,899.69 | 15.52 | -22.45 | -15.48 | 0.30 | -0.29 | -3.13 | -162.33 |
| 2,000.00 | 1.57 | 318.88 | 1,999.66 | 17.41 | -24.51 | -17.37 | 0.34 | -0.11 | 11.31 | 114.36 |
| 2,100.00 | 1.76 | 333.99 | 2,099.61 | 19.85 | -26.05 | -19.80 | 0.48 | 0.20 | 15.11 | 73.34 |
| 2,200.00 | 1.87 | 337.31 | 2,199.56 | 22.81 | -27.35 | -22.77 | 0.15 | 0.10 | 3.32 | 47.70 |
| 2,300.00 | 1.69 | 336.08 | 2,299.51 | 25.62 | -28.59 | -25.57 | 0.18 | -0.17 | -1.23 | -168.16 |
| 2,400.00 | 1.71 | 337.68 | 2,399.47 | 28.34 | -29.72 | -28.29 | 0.05 | 0.01 | 1.60 | 74.37 |
| 2,500.00 | 1.60 | 333.78 | 2,499.43 | 31.08 | -30.92 | -31.03 | 0.16 | -0.11 | -3.90 | -135.42 |
| 2,600.00 | 1.17 | 330.13 | 2,599.40 | 33.20 | -32.11 | -33.14 | 0.43 | -0.43 | -3.65 | -170.10 |
| 2,700.00 | 1.06 | 333.32 | 2,699.38 | 34.79 | -32.95 | -34.73 | 0.13 | -0.11 | 3.18 | 152.91 |
| 2,800.00 | 1.10 | 340.27 | 2,799.36 | 36.58 | -33.77 | -36.52 | 0.14 | 0.04 | 6.95 | 76.19 |
| 2,900.00 | 1.16 | 357.18 | 2,899.34 | 38.44 | -34.16 | -38.38 | 0.34 | 0.06 | 16.91 | 88.08 |
| 3,000.00 | 1.18 | 2.76 | 2,999.32 | 40.56 | -34.09 | -40.50 | 0.11 | 0.01 | 5.58 | 85.52 |
| 3,100.00 | 1.05 | 1.62 | 3,099.30 | 42.50 | -34.01 | -42.44 | 0.13 | -0.13 | -1.13 | -171.06 |
| 3,200.00 | 3.05 | 318.20 | 3,199.25 | 45.06 | -35.26 | -45.00 | 2.40 | 2.01 | -43.42 | -60.83 |
| 3,300.00 | 5.18 | 311.71 | 3,298.97 | 50.17 | -40.62 | -50.10 | 2.18 | 2.13 | -6.49 | -15.58 |
| 3,400.00 | 6.79 | 303.93 | 3,398.42 | 56.58 | -48.86 | -56.50 | 1.79 | 1.60 | -7.78 | -30.74 |
| 3,500.00 | 7.92 | 295.53 | 3,497.59 | 62.91 | -60.01 | -62.81 | 1.56 | 1.13 | -8.40 | -47.77 |
| 3,600.00 | 7.07 | 297.63 | 3,596.72 | 68.71 | -71.85 | -68.59 | 0.89 | -0.85 | 2.10 | 163.17 |
| 3,700.00 | 9.98 | 293.73 | 3,695.61 | 75.04 | -85.16 | -74.90 | 2.97 | 2.91 | -3.90 | -13.16 |
| 3,800.00 | 9.40 | 293.51 | 3,794.20 | 81.77 | -100.50 | -81.60 | 0.59 | -0.58 | -0.21 | -176.57 |
| 3,900.00 | 10.42 | 291.47 | 3,892.69 | 88.33 | -116.51 | -88.12 | 1.08 | 1.02 | -2.05 | -20.07 |
| 4,000.00 | 10.44 | 292.85 | 3,991.04 | 95.14 | -133.26 | -94.91 | 0.25 | 0.02 | 1.38 | 85.84 |
| 4,100.00 | 10.61 | 294.06 | 4,089.36 | 102.46 | -150.00 | -102.20 | 0.28 | 0.17 | 1.21 | 52.33 |
| 4,200.00 | 10.39 | 294.12 | 4,187.64 | 109.95 | -166.86 | -109.66 | 0.22 | -0.22 | 0.06 | 177.45 |
| 4,300.00 | 9.18 | 294.93 | 4,286.18 | 117.04 | -182.32 | -116.72 | 1.22 | -1.21 | 0.81 | 173.92 |
| 4,400.00 | 8.99 | 295.91 | 4,385.02 | 123.50 | -196.07 | -123.15 | 0.24 | -0.19 | 0.98 | 141.00 |
| 4,500.00 | 9.80 | 296.84 | 4,483.60 | 131.05 | -211.08 | -130.68 | 0.82 | 0.81 | 0.93 | 11.13 |
| 4,600.00 | 9.44 | 296.36 | 4,582.21 | 138.47 | -225.94 | -138.07 | 0.37 | -0.36 | -0.48 | -167.50 |
| 4,700.00 | 9.13 | 296.30 | 4,680.88 | 145.66 | -240.49 | -145.24 | 0.31 | -0.31 | -0.06 | -178.27 |
| 4,800.00 | 8.54 | 295.52 | 4,779.69 | 152.43 | -254.30 | -151.98 | 0.60 | -0.59 | -0.78 | -168.89 |
| 4,900.00 | 7.63 | 295.26 | 4,878.68 | 158.44 | -267.13 | -157.98 | 0.91 | -0.91 | -0.25 | -177.90 |
| 5,000.00 | 7.04 | 295.56 | 4,977.88 | 163.87 | -278.52 | -163.39 | 0.59 | -0.59 | 0.30 | 176.46 |

Design Report for KUNZMAN FEDERAL 35N-8HZ - Actual Surveys

| 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 (°) |
|--|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|----------------------|
| 5,100.00 | 6.54 | 294.99 | 5,077.17 | 168.96 | -289.25 | -168.46 | 0.50 | -0.50 | -0.57 | -172.59 |
| 5,200.00 | 5.04 | 296.18 | 5,176.64 | 173.35 | -298.56 | -172.83 | 1.51 | -1.50 | 1.19 | 176.01 |
| 5,300.00 | 3.10 | 299.94 | 5,276.38 | 176.66 | -304.87 | -176.12 | 1.95 | -1.94 | 3.76 | 174.02 |
| 5,400.00 | 1.55 | 310.89 | 5,376.30 | 178.87 | -308.20 | -178.33 | 1.60 | -1.55 | 10.95 | 169.39 |
| 5,500.00 | 0.84 | 352.85 | 5,476.28 | 180.46 | -309.28 | -179.92 | 1.09 | -0.71 | 41.96 | 148.68 |
| 5,600.00 | 0.72 | 352.52 | 5,576.27 | 181.81 | -309.40 | -181.27 | 0.12 | -0.12 | -0.33 | -178.08 |
| 5,700.00 | 0.81 | 345.19 | 5,676.26 | 183.12 | -309.66 | -182.58 | 0.13 | 0.09 | -7.33 | -51.97 |
| 5,800.00 | 0.92 | 339.78 | 5,776.25 | 184.54 | -310.12 | -184.00 | 0.14 | 0.11 | -5.41 | -39.07 |
| 5,900.00 | 1.18 | 337.14 | 5,876.23 | 186.25 | -310.75 | -185.70 | 0.26 | 0.26 | -2.64 | -11.87 |
| 6,000.00 | 1.49 | 324.22 | 5,976.20 | 188.31 | -311.98 | -187.76 | 0.43 | 0.31 | -12.92 | -50.41 |
| 6,100.00 | 1.41 | 317.56 | 6,076.17 | 190.22 | -313.52 | -189.68 | 0.19 | -0.08 | -6.66 | -118.74 |
| 6,200.00 | 1.59 | 310.52 | 6,176.13 | 192.10 | -315.48 | -191.55 | 0.26 | 0.18 | -7.04 | -49.41 |
| 6,300.00 | 1.46 | 307.90 | 6,276.10 | 193.71 | -317.55 | -193.15 | 0.14 | -0.13 | -2.62 | -152.51 |
| 6,400.00 | 1.46 | 313.49 | 6,376.07 | 195.39 | -319.49 | -194.83 | 0.14 | -0.01 | 5.59 | 95.02 |
| 6,500.00 | 1.31 | 308.58 | 6,476.04 | 197.09 | -321.27 | -196.53 | 0.19 | -0.15 | -4.92 | -143.48 |
| 6,600.00 | 7.88 | 176.20 | 6,575.78 | 191.55 | -321.73 | -190.98 | 8.82 | 6.57 | -132.38 | -138.64 |
| 6,700.00 | 16.46 | 176.99 | 6,673.21 | 169.49 | -320.48 | -168.93 | 8.58 | 8.58 | 0.79 | 1.50 |
| 6,800.00 | 23.99 | 180.06 | 6,767.09 | 135.28 | -319.44 | -134.72 | 7.60 | 7.53 | 3.07 | 9.49 |
| 6,900.00 | 32.24 | 185.02 | 6,855.10 | 88.04 | -321.62 | -87.47 | 8.57 | 8.25 | 4.96 | 18.03 |
| 7,000.00 | 41.58 | 184.89 | 6,935.10 | 28.53 | -327.57 | -27.95 | 9.35 | 9.35 | -0.13 | -0.53 |
| 7,100.00 | 50.07 | 178.13 | 7,004.39 | -43.38 | -329.41 | 43.95 | 9.77 | 8.49 | -6.76 | -32.15 |
| 7,200.00 | 60.28 | 177.11 | 7,062.20 | -124.69 | -325.15 | 125.26 | 10.24 | 10.20 | -1.02 | -4.97 |
| 7,300.00 | 69.76 | 179.58 | 7,103.62 | -215.54 | -322.80 | 216.11 | 9.74 | 9.48 | 2.47 | 13.83 |
| 7,400.00 | 79.87 | 180.64 | 7,129.43 | -312.00 | -323.33 | 312.56 | 10.16 | 10.11 | 1.05 | 5.87 |
| 7,462.00 | 86.64 | 180.10 | 7,136.82 | -373.52 | -323.75 | 374.08 | 10.95 | 10.92 | -0.86 | -4.52 |
| Last MWD Vertical Build Survey @ 7462.00 ft | | | | | | | | | | |
| 7,499.80 | 89.33 | 180.46 | 7,138.15 | -411.29 | -323.93 | 411.86 | 7.18 | 7.12 | 0.95 | 7.57 |
| 7" | | | | | | | | | | |
| 7,500.00 | 89.35 | 180.46 | 7,138.15 | -411.49 | -323.94 | 412.06 | 7.18 | 7.12 | 0.95 | 7.56 |
| 7,536.00 | 91.91 | 180.80 | 7,137.76 | -447.48 | -324.33 | 448.05 | 7.18 | 7.12 | 0.95 | 7.56 |
| First MWD Lateral Survey @ 7536.00 ft | | | | | | | | | | |
| 7,600.00 | 92.14 | 179.74 | 7,135.50 | -511.44 | -324.63 | 512.01 | 1.70 | 0.36 | -1.66 | -77.67 |
| 7,700.00 | 91.18 | 179.10 | 7,132.25 | -611.38 | -323.35 | 611.94 | 1.15 | -0.96 | -0.64 | -146.40 |
| 7,800.00 | 89.90 | 178.96 | 7,131.36 | -711.36 | -321.64 | 711.92 | 1.29 | -1.28 | -0.14 | -173.56 |
| 7,900.00 | 89.01 | 178.89 | 7,132.37 | -811.33 | -319.75 | 811.89 | 0.89 | -0.89 | -0.07 | -175.66 |
| 8,000.00 | 88.92 | 178.45 | 7,134.27 | -911.29 | -317.48 | 911.84 | 0.44 | -0.10 | -0.43 | -102.39 |
| 8,100.00 | 89.18 | 178.31 | 7,135.95 | -1,011.24 | -314.62 | 1,011.78 | 0.30 | 0.27 | -0.15 | -29.22 |
| 8,200.00 | 88.74 | 178.96 | 7,137.72 | -1,111.19 | -312.20 | 1,111.73 | 0.79 | -0.44 | 0.66 | 123.68 |
| 8,300.00 | 88.35 | 180.05 | 7,140.25 | -1,211.15 | -311.35 | 1,211.69 | 1.16 | -0.40 | 1.09 | 109.98 |
| 8,400.00 | 87.87 | 180.79 | 7,143.59 | -1,311.09 | -312.16 | 1,311.63 | 0.88 | -0.48 | 0.74 | 123.10 |
| 8,500.00 | 88.11 | 180.79 | 7,147.30 | -1,411.02 | -313.40 | 1,411.56 | 0.24 | 0.24 | 0.00 | -0.87 |
| 8,600.00 | 89.59 | 181.78 | 7,149.01 | -1,510.97 | -315.74 | 1,511.52 | 1.78 | 1.48 | 0.99 | 33.74 |
| 8,700.00 | 89.66 | 181.79 | 7,149.97 | -1,610.91 | -319.08 | 1,611.46 | 0.07 | 0.07 | 0.02 | 13.14 |
| 8,800.00 | 90.78 | 181.06 | 7,149.34 | -1,710.88 | -321.38 | 1,711.43 | 1.34 | 1.12 | -0.74 | -33.28 |
| 8,900.00 | 91.05 | 181.09 | 7,147.83 | -1,810.85 | -323.23 | 1,811.41 | 0.28 | 0.27 | 0.04 | 7.51 |
| 9,000.00 | 91.33 | 180.69 | 7,145.61 | -1,910.81 | -325.07 | 1,911.37 | 0.49 | 0.28 | -0.40 | -54.73 |
| 9,100.00 | 91.19 | 179.47 | 7,143.41 | -2,010.78 | -325.20 | 2,011.34 | 1.23 | -0.15 | -1.23 | -96.81 |
| 9,200.00 | 90.61 | 178.81 | 7,141.65 | -2,110.75 | -323.45 | 2,111.31 | 0.87 | -0.58 | -0.65 | -131.48 |
| 9,300.00 | 89.67 | 178.80 | 7,141.45 | -2,210.72 | -321.36 | 2,211.28 | 0.94 | -0.94 | -0.01 | -179.27 |
| 9,400.00 | 88.81 | 178.81 | 7,142.78 | -2,310.69 | -319.27 | 2,311.25 | 0.86 | -0.86 | 0.01 | 179.65 |
| 9,500.00 | 88.53 | 178.77 | 7,145.29 | -2,410.64 | -317.18 | 2,411.19 | 0.28 | -0.28 | -0.03 | -172.96 |
| 9,600.00 | 88.59 | 178.72 | 7,147.80 | -2,510.58 | -314.99 | 2,511.13 | 0.09 | 0.06 | -0.06 | -42.50 |
| 9,700.00 | 89.22 | 179.21 | 7,149.85 | -2,610.54 | -313.04 | 2,611.08 | 0.80 | 0.63 | 0.49 | 38.08 |
| 9,800.00 | 90.07 | 179.91 | 7,150.47 | -2,710.54 | -312.28 | 2,711.08 | 1.10 | 0.85 | 0.71 | 39.77 |
| 9,900.00 | 89.29 | 180.76 | 7,150.78 | -2,810.53 | -312.84 | 2,811.07 | 1.15 | -0.78 | 0.84 | 132.76 |
| 10,000.00 | 89.51 | 180.84 | 7,151.99 | -2,910.51 | -314.32 | 2,911.06 | 0.23 | 0.22 | 0.09 | 21.51 |
| 10,100.00 | 89.93 | 180.81 | 7,152.48 | -3,010.50 | -315.77 | 3,011.05 | 0.42 | 0.42 | -0.03 | -4.29 |
| 10,200.00 | 89.28 | 181.03 | 7,153.14 | -3,110.49 | -317.37 | 3,111.03 | 0.68 | -0.65 | 0.22 | 161.04 |
| 10,300.00 | 88.64 | 181.24 | 7,154.99 | -3,210.45 | -319.37 | 3,211.00 | 0.67 | -0.64 | 0.21 | 161.86 |

Design Report for KUNZMAN FEDERAL 35N-8HZ - Actual Surveys

| 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 (°) |
|--|--------------------|----------------|-----------------------------|-----------------|-----------------|-------------------------------|-------------------------------|------------------------------|-----------------------------|----------------------------|
| 10,400.00 | 88.62 | 181.13 | 7,157.38 | -3,310.40 | -321.44 | 3,310.95 | 0.11 | -0.02 | -0.11 | -98.13 |
| 10,500.00 | 88.80 | 180.82 | 7,159.77 | -3,410.35 | -323.30 | 3,410.91 | 0.36 | 0.18 | -0.31 | -60.05 |
| 10,600.00 | 89.72 | 179.71 | 7,160.86 | -3,510.34 | -323.59 | 3,510.90 | 1.44 | 0.92 | -1.11 | -50.34 |
| 10,700.00 | 89.60 | 179.53 | 7,161.46 | -3,610.34 | -322.93 | 3,610.90 | 0.22 | -0.13 | -0.18 | -124.44 |
| 10,800.00 | 89.44 | 179.34 | 7,162.28 | -3,710.33 | -321.94 | 3,710.89 | 0.24 | -0.15 | -0.19 | -128.63 |
| 10,900.00 | 89.23 | 179.13 | 7,163.43 | -3,810.31 | -320.60 | 3,810.87 | 0.29 | -0.21 | -0.21 | -135.73 |
| 11,000.00 | 89.46 | 179.51 | 7,164.80 | -3,910.29 | -319.11 | 3,910.84 | 0.44 | 0.22 | 0.38 | 59.50 |
| 11,100.00 | 90.78 | 180.64 | 7,164.82 | -4,010.29 | -319.28 | 4,010.84 | 1.75 | 1.33 | 1.14 | 40.61 |
| 11,200.00 | 91.70 | 181.14 | 7,162.22 | -4,110.24 | -321.08 | 4,110.79 | 1.05 | 0.92 | 0.50 | 28.34 |
| 11,300.00 | 91.65 | 181.08 | 7,159.30 | -4,210.18 | -323.02 | 4,210.73 | 0.08 | -0.05 | -0.06 | -132.29 |
| 11,400.00 | 91.60 | 180.88 | 7,156.46 | -4,310.12 | -324.78 | 4,310.68 | 0.21 | -0.05 | -0.21 | -103.48 |
| 11,500.00 | 91.55 | 180.57 | 7,153.71 | -4,410.07 | -326.04 | 4,410.64 | 0.31 | -0.05 | -0.31 | -98.82 |
| 11,600.00 | 91.15 | 180.45 | 7,151.25 | -4,510.04 | -326.89 | 4,510.60 | 0.42 | -0.40 | -0.12 | -163.21 |
| 11,700.00 | 90.60 | 180.41 | 7,149.72 | -4,610.03 | -327.64 | 4,610.59 | 0.55 | -0.55 | -0.04 | -175.64 |
| 11,800.00 | 90.50 | 180.28 | 7,148.84 | -4,710.02 | -328.25 | 4,710.59 | 0.16 | -0.10 | -0.13 | -126.87 |
| 11,900.00 | 90.52 | 180.13 | 7,147.95 | -4,810.01 | -328.60 | 4,810.58 | 0.15 | 0.02 | -0.15 | -84.09 |
| 12,000.00 | 90.79 | 180.19 | 7,146.82 | -4,910.01 | -328.86 | 4,910.57 | 0.28 | 0.28 | 0.07 | 13.54 |
| 12,064.00 | 90.99 | 180.25 | 7,145.83 | -4,974.00 | -329.11 | 4,974.57 | 0.32 | 0.31 | 0.09 | 16.59 |
| Last MWD Lateral Survey @ 12064.00 ft | | | | | | | | | | |
| 12,100.00 | 90.99 | 180.25 | 7,145.20 | -5,009.99 | -329.26 | 5,010.56 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12,110.00 | 90.99 | 180.25 | 7,145.03 | -5,019.99 | -329.31 | 5,020.56 | 0.00 | 0.00 | 0.00 | 0.00 |
| St. Line Proj. to Bit @ 12110'MD :: 7145. 03' TVD - Kunzman Federal 35N-8HZ_BHL | | | | | | | | | | |

Design Annotations

| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates | | Comment |
|-----------------------------|-----------------------------|-------------------|-----------------|---|
| | | +N/-S (usft) | +E/-W (usft) | |
| 145.00 | 145.00 | 0.00 | -0.28 | First MWD Surface Survey @ 145.00 ft |
| 877.00 | 876.99 | 0.64 | -4.24 | Last MWD Surface Survey @ 877.00 ft |
| 975.00 | 974.98 | 1.29 | -5.35 | First MWD Vertical Build Survey @ 975.00 ft |
| 7,462.00 | 7,136.82 | -373.52 | -323.75 | Last MWD Vertical Build Survey @ 7462.00 ft |
| 7,536.00 | 7,137.76 | -447.48 | -324.33 | First MWD Lateral Survey @ 7536.00 ft |
| 12,064.00 | 7,145.83 | -4,974.00 | -329.11 | Last MWD Lateral Survey @ 12064.00 ft |
| 12,110.00 | 7,145.03 | -5,019.99 | -329.31 | St. Line Proj. to Bit @ 12110'MD :: 7145. 03' TVD |

Vertical Section Information

| Angle Type | Target | Azimuth (°) | Origin Type | Origin +N/_S (usft) | Origin +E/-W (usft) | Start TVD (usft) |
|---------------|----------------------|----------------|----------------|---------------------------|---------------------------|------------------------|
| User | No Target (Freehand) | 180.10 | Slot | 0.00 | 0.00 | 0.00 |

Survey tool program

| From (usft) | To (usft) | Survey/Plan | Survey Tool |
|----------------|--------------|----------------------------|-------------|
| 145.00 | 877.00 | MWD Surface Surveys | MWD+SC |
| 975.00 | 7,462.00 | MWD Vertical/Build Surveys | MWD+IFR1+SC |
| 7,536.00 | 12,064.00 | MWD Lateral Surveys | MWD+IFR1+SC |

Design Report for KUNZMAN FEDERAL 35N-8HZ - Actual Surveys

Casing Details

| Measured Depth (usft) | Vertical Depth (usft) | Name | Casing Diameter (") | Hole Diameter (") |
|-----------------------|-----------------------|------|---------------------|-------------------|
| 7,499.80 | 7,138.15 | 7" | 7 | 8-3/4 |

Targets associated with this wellbore

| Target Name | TVD (usft) | +N/-S (usft) | +E/-W (usft) | Shape |
|-----------------------------|------------|--------------|--------------|---------|
| Kunzman Federal 35N-8HZ_SHL | 0.00 | 0.01 | 0.00 | Point |
| Kunzman 30N-5HZ_SEC | 0.00 | -255.72 | 11.74 | Polygon |
| Kunzman Federal 35N-8HZ_LD | 0.00 | -255.72 | 11.74 | Polygon |
| Kunzman Federal 35N-8HZ_BHL | 7,147.00 | -5,045.84 | -323.45 | Point |

Directional Difficulty Index

| | | | |
|------------------------------------|----------------|-------------------------------|----------------------------------|
| Average Dogleg over Survey: | 1.39 °/100usft | Maximum Dogleg over Survey: | 12.64 °/100usft at 7,218.00 usft |
| Net Tortosity applicable to Plans: | 0.47 °/100usft | Directional Difficulty Index: | 6.202 |

Audit Info

North Reference Sheet for Sec. 5-T2N-R66W - KUNZMAN FEDERAL 35N-8HZ - Plan B

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 35N-8HZ

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: 0.99995808

Grid Coordinates of Well: 1,302,062.71 usft N, 3,194,459.31 usft E

Geographical Coordinates of Well: 40° 09' 37.67" N, 104° 48' 15.26" W

Grid Convergence at Surface is: 0.45°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,110.00usft the Bottom Hole Displacement is 5,030.78usft in the Direction of 183.75° (True).

Magnetic Convergence at surface is: -8.15° (16 August 2013, , BGGM2013)

Magnetic Model: BGGM2013
 Date: 16-Aug-13
 Declination: 8.60°
 Inclination/Dip: 66.77°
 Field Strength: 52703

Grid North is 0.45° East of True North (Grid Convergence)
 Magnetic North is 8.60° East of True North (Magnetic Declination)
 Magnetic North is 8.15° East of Grid North (Magnetic Convergence)

To convert a True Direction to a Grid Direction, Subtract 0.45°
 To convert a Magnetic Direction to a True Direction, Add 8.60° East
 To convert a Magnetic Direction to a Grid Direction, Add 8.15°