

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 13-T3N-R66W

Brotemarkle 4C-13HZ

Plan A Rev 0

Plan: Plan A Rev 0 Permit

Sperry Drilling Services

Proposal Report

26 September, 2012

Well Coordinates: 1,323,477.82 N, 3,215,084.96 E (40° 13' 07.61" N, 104° 43' 47.21" W)

Ground Level: 5,025.00 ft

Local Coordinate Origin:

Centered on Well Brotemarkle 4C-13HZ

Viewing Datum:

RKB=16 @ 5041.00ft (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. 13-T3N-R66W
Well: Brotemarkle 4C-13HZ
Wellbore: Plan A Rev 0
Design: Plan A Rev 0 Permit

Anadarko Petroleum Corp.

HALLIBURTON
Sperry Drilling

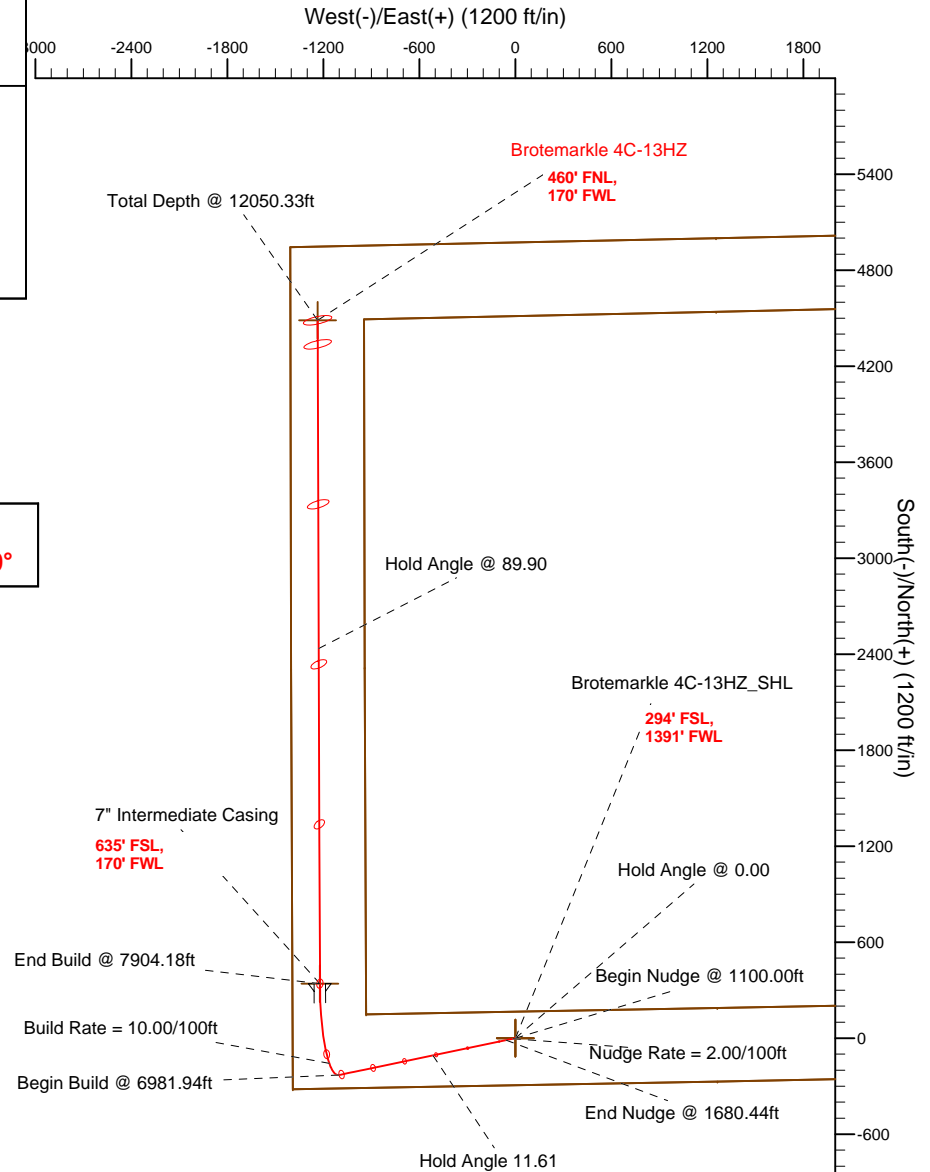
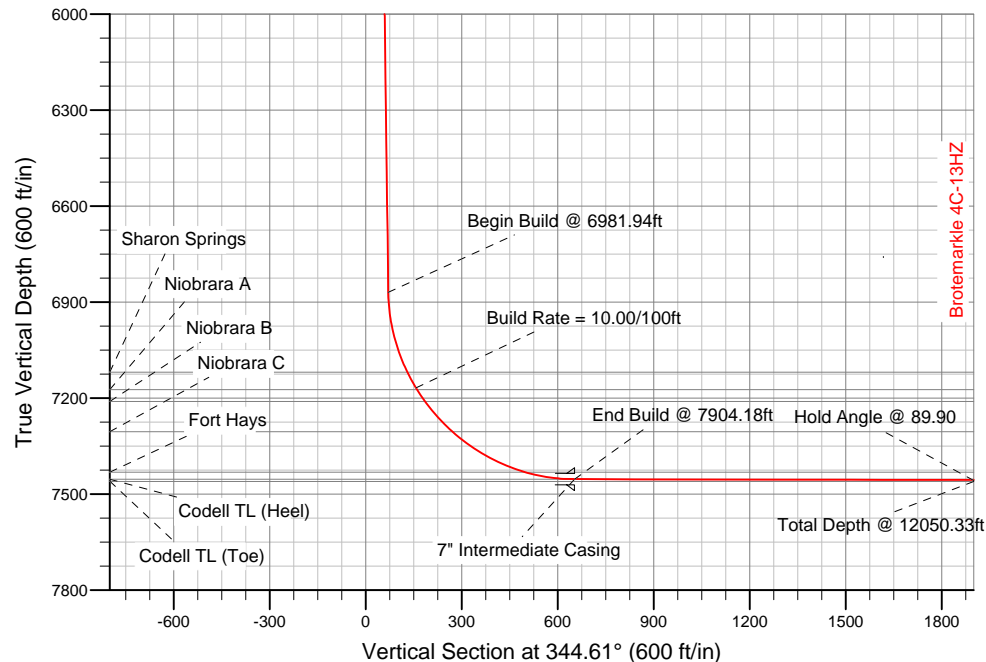
SECTION DETAILS

| 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 | 1680.44 | 11.61 | 258.20 | 1676.47 | -11.98 | -57.36 | 2.00 | 258.20 | 3.67 | |
| 4 | 6981.94 | 11.61 | 258.20 | 6869.53 | -230.13 | -1101.62 | 0.00 | 0.00 | 70.51 | |
| 5 | 7904.18 | 89.90 | 359.80 | 7454.00 | 341.00 | -1221.00 | 10.00 | 101.39 | 652.84 | Brotemarkle 4C-13HZ_Casing Point |
| 6 | 12050.33 | 89.90 | 359.80 | 7461.00 | 4487.12 | -1235.25 | 0.00 | 0.00 | 4654.04 | Brotemarkle 4C-13HZ_BHL |

WELLBORE TARGET DETAILS (LAT/LONG)

| Name | TVD | +N/-S | +E/-W | Latitude | Longitude | Shape |
|----------------------------------|---------|---------|----------|-----------|-------------|---------|
| Brotemarkle 4C-13HZ_Section Line | 0.00 | 0.00 | 0.00 | 40.218780 | -104.729780 | Polygon |
| Brotemarkle 4C-13HZ_Setback Line | 0.00 | 0.00 | 0.00 | 40.218780 | -104.729780 | Polygon |
| Brotemarkle 4C-13HZ_SHL | 0.00 | 0.00 | 0.00 | 40.218780 | -104.729780 | Point |
| Brotemarkle 4C-13HZ_Casing Point | 7454.00 | 341.00 | -1221.00 | 40.219716 | -104.734152 | Point |
| Brotemarkle 4C-13HZ_BHL | 7461.00 | 4487.12 | -1235.25 | 40.231097 | -104.734204 | Point |

Target Line:
7452.88' TVDkb @ 0° VS Drilling 89.90°



WELL DETAILS: Brotemarkle 4C-13HZ

Ground Level 5025.00 RKB=16 @ 5041.00ft (Drilling Rig)

Plan: Plan A Rev 0 Permit (Brotemarkle 4C-13HZ/Plan A Rev 0)

Created By: Fred Hartmann Date: 09/26/2012
Reviewed: Date:

Plan Report for Brotemarkle 4C-13HZ - 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 |
| Brotemarkle 4C-13HZ_SHL - Brotemarkle 4C-13HZ_Section Line - Brotemarkle 4C-13HZ_Setback Line | | | | | | | | | | |
| 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 |
| Hold Angle @ 0.00 | | | | | | | | | | |
| 700.00 | 0.00 | 0.00 | 700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 725.00 | 0.00 | 0.00 | 725.00 | 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 |
| 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 | 258.20 | 1,199.98 | -0.36 | -1.71 | 0.11 | 2.00 | 2.00 | 0.00 | 258.20 |
| 1,300.00 | 4.00 | 258.20 | 1,299.84 | -1.43 | -6.83 | 0.44 | 2.00 | 2.00 | 0.00 | 0.00 |
| 1,400.00 | 6.00 | 258.20 | 1,399.45 | -3.21 | -15.36 | 0.98 | 2.00 | 2.00 | 0.00 | 0.00 |
| Nudge Rate = 2.00/100ft | | | | | | | | | | |
| 1,500.00 | 8.00 | 258.20 | 1,498.70 | -5.70 | -27.29 | 1.75 | 2.00 | 2.00 | 0.00 | 0.00 |
| 1,600.00 | 10.00 | 258.20 | 1,597.47 | -8.90 | -42.60 | 2.73 | 2.00 | 2.00 | 0.00 | 0.00 |
| 1,680.44 | 11.61 | 258.20 | 1,676.48 | -11.98 | -57.36 | 3.67 | 2.00 | 2.00 | 0.00 | 0.00 |
| End Nudge @ 1680.44ft | | | | | | | | | | |
| 1,700.00 | 11.61 | 258.20 | 1,695.64 | -12.79 | -61.22 | 3.92 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,800.00 | 11.61 | 258.20 | 1,793.59 | -16.90 | -80.91 | 5.18 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,900.00 | 11.61 | 258.20 | 1,891.55 | -21.02 | -100.61 | 6.44 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,000.00 | 11.61 | 258.20 | 1,989.50 | -25.13 | -120.31 | 7.70 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,100.00 | 11.61 | 258.20 | 2,087.45 | -29.25 | -140.01 | 8.96 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,200.00 | 11.61 | 258.20 | 2,185.41 | -33.36 | -159.70 | 10.22 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,300.00 | 11.61 | 258.20 | 2,283.36 | -37.48 | -179.40 | 11.48 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,400.00 | 11.61 | 258.20 | 2,381.32 | -41.59 | -199.10 | 12.74 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,500.00 | 11.61 | 258.20 | 2,479.27 | -45.71 | -218.80 | 14.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,600.00 | 11.61 | 258.20 | 2,577.23 | -49.82 | -238.49 | 15.26 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,700.00 | 11.61 | 258.20 | 2,675.18 | -53.94 | -258.19 | 16.53 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,800.00 | 11.61 | 258.20 | 2,773.14 | -58.05 | -277.89 | 17.79 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,900.00 | 11.61 | 258.20 | 2,871.09 | -62.17 | -297.59 | 19.05 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,000.00 | 11.61 | 258.20 | 2,969.04 | -66.28 | -317.28 | 20.31 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,100.00 | 11.61 | 258.20 | 3,067.00 | -70.40 | -336.98 | 21.57 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,200.00 | 11.61 | 258.20 | 3,164.95 | -74.51 | -356.68 | 22.83 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,300.00 | 11.61 | 258.20 | 3,262.91 | -78.63 | -376.38 | 24.09 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,400.00 | 11.61 | 258.20 | 3,360.86 | -82.74 | -396.07 | 25.35 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,500.00 | 11.61 | 258.20 | 3,458.82 | -86.86 | -415.77 | 26.61 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,600.00 | 11.61 | 258.20 | 3,556.77 | -90.97 | -435.47 | 27.87 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,700.00 | 11.61 | 258.20 | 3,654.73 | -95.09 | -455.17 | 29.13 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,800.00 | 11.61 | 258.20 | 3,752.68 | -99.20 | -474.86 | 30.39 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,900.00 | 11.61 | 258.20 | 3,850.63 | -103.32 | -494.56 | 31.65 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,000.00 | 11.61 | 258.20 | 3,948.59 | -107.43 | -514.26 | 32.91 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hold Angle 11.61 | | | | | | | | | | |
| 4,100.00 | 11.61 | 258.20 | 4,046.54 | -111.55 | -533.96 | 34.18 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,104.55 | 11.61 | 258.20 | 4,051.00 | -111.73 | -534.85 | 34.23 | 0.00 | 0.00 | 0.00 | 0.00 |
| Parkman | | | | | | | | | | |
| 4,200.00 | 11.61 | 258.20 | 4,144.50 | -115.66 | -553.65 | 35.44 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,300.00 | 11.61 | 258.20 | 4,242.45 | -119.77 | -573.35 | 36.70 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,400.00 | 11.61 | 258.20 | 4,340.41 | -123.89 | -593.05 | 37.96 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,500.00 | 11.61 | 258.20 | 4,438.36 | -128.00 | -612.75 | 39.22 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,600.00 | 11.61 | 258.20 | 4,536.32 | -132.12 | -632.44 | 40.48 | 0.00 | 0.00 | 0.00 | 0.00 |

Plan Report for Brotemarkle 4C-13HZ - 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 (°) |
|---|-----------------|-------------|---------------------|-----------|-----------|-----------------------|-----------------------|----------------------|---------------------|----------------------|
| 4,600.70 | 11.61 | 258.20 | 4,537.00 | -132.15 | -632.58 | 40.49 | 0.00 | 0.00 | 0.00 | 0.00 |
| Sussex | | | | | | | | | | |
| 4,700.00 | 11.61 | 258.20 | 4,634.27 | -136.23 | -652.14 | 41.74 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,800.00 | 11.61 | 258.20 | 4,732.23 | -140.35 | -671.84 | 43.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,900.00 | 11.61 | 258.20 | 4,830.18 | -144.46 | -691.54 | 44.26 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,000.00 | 11.61 | 258.20 | 4,928.13 | -148.58 | -711.23 | 45.52 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,100.00 | 11.61 | 258.20 | 5,026.09 | -152.69 | -730.93 | 46.78 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,200.00 | 11.61 | 258.20 | 5,124.04 | -156.81 | -750.63 | 48.04 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,300.00 | 11.61 | 258.20 | 5,222.00 | -160.92 | -770.33 | 49.30 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,400.00 | 11.61 | 258.20 | 5,319.95 | -165.04 | -790.02 | 50.56 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,500.00 | 11.61 | 258.20 | 5,417.91 | -169.15 | -809.72 | 51.83 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,600.00 | 11.61 | 258.20 | 5,515.86 | -173.27 | -829.42 | 53.09 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,700.00 | 11.61 | 258.20 | 5,613.82 | -177.38 | -849.12 | 54.35 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,800.00 | 11.61 | 258.20 | 5,711.77 | -181.50 | -868.81 | 55.61 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,900.00 | 11.61 | 258.20 | 5,809.72 | -185.61 | -888.51 | 56.87 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,000.00 | 11.61 | 258.20 | 5,907.68 | -189.73 | -908.21 | 58.13 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,100.00 | 11.61 | 258.20 | 6,005.63 | -193.84 | -927.91 | 59.39 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,200.00 | 11.61 | 258.20 | 6,103.59 | -197.96 | -947.60 | 60.65 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,300.00 | 11.61 | 258.20 | 6,201.54 | -202.07 | -967.30 | 61.91 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,400.00 | 11.61 | 258.20 | 6,299.50 | -206.19 | -987.00 | 63.17 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,500.00 | 11.61 | 258.20 | 6,397.45 | -210.30 | -1,006.70 | 64.43 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,600.00 | 11.61 | 258.20 | 6,495.41 | -214.42 | -1,026.39 | 65.69 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,700.00 | 11.61 | 258.20 | 6,593.36 | -218.53 | -1,046.09 | 66.95 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,800.00 | 11.61 | 258.20 | 6,691.31 | -222.65 | -1,065.79 | 68.22 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,900.00 | 11.61 | 258.20 | 6,789.27 | -226.76 | -1,085.49 | 69.48 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,981.94 | 11.61 | 258.20 | 6,869.53 | -230.13 | -1,101.63 | 70.51 | 0.00 | 0.00 | 0.00 | 0.00 |
| Begin Build @ 6981.94ft | | | | | | | | | | |
| 7,000.00 | 11.39 | 267.20 | 6,887.23 | -230.59 | -1,105.19 | 71.01 | 10.00 | -1.22 | 49.85 | 101.39 |
| 7,100.00 | 14.77 | 310.08 | 6,984.84 | -222.85 | -1,124.85 | 83.70 | 10.00 | 3.38 | 42.88 | 92.57 |
| 7,200.00 | 22.45 | 330.68 | 7,079.64 | -197.93 | -1,144.00 | 112.81 | 10.00 | 7.68 | 20.60 | 50.69 |
| 7,243.20 | 26.24 | 335.73 | 7,119.00 | -182.02 | -1,151.97 | 130.26 | 10.00 | 8.77 | 11.69 | 31.10 |
| Sharon Springs | | | | | | | | | | |
| 7,300.00 | 31.42 | 340.59 | 7,168.75 | -156.59 | -1,162.06 | 157.45 | 10.00 | 9.12 | 8.56 | 26.50 |
| Build Rate = 10.00/100ft | | | | | | | | | | |
| 7,306.17 | 31.99 | 341.03 | 7,174.00 | -153.53 | -1,163.13 | 160.69 | 10.00 | 9.27 | 7.14 | 22.24 |
| Niobrara A | | | | | | | | | | |
| 7,350.85 | 36.17 | 343.85 | 7,211.00 | -129.66 | -1,170.65 | 185.69 | 10.00 | 9.36 | 6.31 | 21.86 |
| Niobrara B | | | | | | | | | | |
| 7,400.00 | 40.83 | 346.36 | 7,249.46 | -100.10 | -1,178.48 | 216.27 | 10.00 | 9.48 | 5.11 | 19.53 |
| 7,478.02 | 48.32 | 349.50 | 7,305.00 | -46.59 | -1,189.82 | 270.88 | 10.00 | 9.59 | 4.03 | 17.56 |
| Niobrara C | | | | | | | | | | |
| 7,500.00 | 50.44 | 350.25 | 7,319.31 | -30.16 | -1,192.75 | 287.49 | 10.00 | 9.66 | 3.43 | 15.32 |
| 7,600.00 | 60.14 | 353.19 | 7,376.19 | 51.09 | -1,204.45 | 368.94 | 10.00 | 9.71 | 2.94 | 14.83 |
| 7,700.00 | 69.90 | 355.60 | 7,418.37 | 141.20 | -1,213.21 | 458.14 | 10.00 | 9.76 | 2.41 | 13.15 |
| 7,744.28 | 74.24 | 356.57 | 7,432.00 | 183.22 | -1,216.08 | 499.41 | 10.00 | 9.78 | 2.18 | 12.13 |
| Fort Hays | | | | | | | | | | |
| 7,800.00 | 79.69 | 357.73 | 7,444.56 | 237.41 | -1,218.78 | 552.38 | 10.00 | 9.79 | 2.08 | 11.83 |
| 7,900.00 | 89.49 | 359.72 | 7,453.98 | 336.82 | -1,220.98 | 648.80 | 10.00 | 9.80 | 2.00 | 11.57 |
| 7,904.18 | 89.90 | 359.80 | 7,454.00 | 341.00 | -1,221.00 | 652.84 | 9.99 | 9.79 | 1.97 | 11.38 |
| End Build @ 7904.18ft - Codell TL (Heel) - 7" Intermediate Casing - Brotemarkle 4C-13HZ_Casing Point | | | | | | | | | | |
| 8,000.00 | 89.90 | 359.80 | 7,454.16 | 436.81 | -1,221.33 | 745.31 | 0.00 | 0.00 | 0.00 | 11.38 |
| 8,100.00 | 89.90 | 359.80 | 7,454.33 | 536.81 | -1,221.67 | 841.81 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8,200.00 | 89.90 | 359.80 | 7,454.50 | 636.81 | -1,222.02 | 938.32 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8,300.00 | 89.90 | 359.80 | 7,454.67 | 736.81 | -1,222.36 | 1,034.82 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8,400.00 | 89.90 | 359.80 | 7,454.84 | 836.81 | -1,222.70 | 1,131.32 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8,500.00 | 89.90 | 359.80 | 7,455.01 | 936.81 | -1,223.05 | 1,227.83 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8,600.00 | 89.90 | 359.80 | 7,455.17 | 1,036.81 | -1,223.39 | 1,324.33 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8,700.00 | 89.90 | 359.80 | 7,455.34 | 1,136.81 | -1,223.74 | 1,420.83 | 0.00 | 0.00 | 0.00 | 0.00 |

Plan Report for Brotemarkle 4C-13HZ - 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 (°) |
|---|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|----------------------|
| 8,800.00 | 89.90 | 359.80 | 7,455.51 | 1,236.81 | -1,224.08 | 1,517.34 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8,900.00 | 89.90 | 359.80 | 7,455.68 | 1,336.81 | -1,224.42 | 1,613.84 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9,000.00 | 89.90 | 359.80 | 7,455.85 | 1,436.81 | -1,224.77 | 1,710.35 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9,100.00 | 89.90 | 359.80 | 7,456.02 | 1,536.81 | -1,225.11 | 1,806.85 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9,200.00 | 89.90 | 359.80 | 7,456.19 | 1,636.81 | -1,225.45 | 1,903.35 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9,300.00 | 89.90 | 359.80 | 7,456.36 | 1,736.81 | -1,225.80 | 1,999.86 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9,400.00 | 89.90 | 359.80 | 7,456.53 | 1,836.80 | -1,226.14 | 2,096.36 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9,500.00 | 89.90 | 359.80 | 7,456.69 | 1,936.80 | -1,226.49 | 2,192.87 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9,600.00 | 89.90 | 359.80 | 7,456.86 | 2,036.80 | -1,226.83 | 2,289.37 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9,700.00 | 89.90 | 359.80 | 7,457.03 | 2,136.80 | -1,227.17 | 2,385.87 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9,800.00 | 89.90 | 359.80 | 7,457.20 | 2,236.80 | -1,227.52 | 2,482.38 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9,900.00 | 89.90 | 359.80 | 7,457.37 | 2,336.80 | -1,227.86 | 2,578.88 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10,000.00 | 89.90 | 359.80 | 7,457.54 | 2,436.80 | -1,228.20 | 2,675.39 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hold Angle @ 89.90 | | | | | | | | | | |
| 10,100.00 | 89.90 | 359.80 | 7,457.71 | 2,536.80 | -1,228.55 | 2,771.89 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10,200.00 | 89.90 | 359.80 | 7,457.88 | 2,636.80 | -1,228.89 | 2,868.39 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10,300.00 | 89.90 | 359.80 | 7,458.04 | 2,736.80 | -1,229.24 | 2,964.90 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10,400.00 | 89.90 | 359.80 | 7,458.21 | 2,836.80 | -1,229.58 | 3,061.40 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10,500.00 | 89.90 | 359.80 | 7,458.38 | 2,936.80 | -1,229.92 | 3,157.91 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10,600.00 | 89.90 | 359.80 | 7,458.55 | 3,036.80 | -1,230.27 | 3,254.41 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10,700.00 | 89.90 | 359.80 | 7,458.72 | 3,136.79 | -1,230.61 | 3,350.91 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10,800.00 | 89.90 | 359.80 | 7,458.89 | 3,236.79 | -1,230.95 | 3,447.42 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10,900.00 | 89.90 | 359.80 | 7,459.06 | 3,336.79 | -1,231.30 | 3,543.92 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11,000.00 | 89.90 | 359.80 | 7,459.23 | 3,436.79 | -1,231.64 | 3,640.43 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11,100.00 | 89.90 | 359.80 | 7,459.40 | 3,536.79 | -1,231.99 | 3,736.93 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11,200.00 | 89.90 | 359.80 | 7,459.56 | 3,636.79 | -1,232.33 | 3,833.43 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11,300.00 | 89.90 | 359.80 | 7,459.73 | 3,736.79 | -1,232.67 | 3,929.94 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11,400.00 | 89.90 | 359.80 | 7,459.90 | 3,836.79 | -1,233.02 | 4,026.44 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11,500.00 | 89.90 | 359.80 | 7,460.07 | 3,936.79 | -1,233.36 | 4,122.95 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11,600.00 | 89.90 | 359.80 | 7,460.24 | 4,036.79 | -1,233.70 | 4,219.45 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11,700.00 | 89.90 | 359.80 | 7,460.41 | 4,136.79 | -1,234.05 | 4,315.95 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11,800.00 | 89.90 | 359.80 | 7,460.58 | 4,236.79 | -1,234.39 | 4,412.46 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11,900.00 | 89.90 | 359.80 | 7,460.75 | 4,336.79 | -1,234.74 | 4,508.96 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12,000.00 | 89.90 | 359.80 | 7,460.92 | 4,436.79 | -1,235.08 | 4,605.47 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12,050.32 | 89.90 | 359.80 | 7,461.00 | 4,487.10 | -1,235.25 | 4,654.03 | 0.00 | 0.00 | 0.00 | 0.00 |
| Codell TL (Toe) | | | | | | | | | | |
| 12,050.33 | 89.90 | 359.80 | 7,461.00 | 4,487.11 | -1,235.25 | 4,654.04 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total Depth @ 12050.33ft - Brotemarkle 4C-13HZ_BHL | | | | | | | | | | |

Plan Annotations

| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates | | Comment |
|---------------------|---------------------|-------------------|------------|--------------------------|
| | | +N/-S (ft) | +E/-W (ft) | |
| 600.00 | 600.00 | 0.00 | 0.00 | Hold Angle @ 0.00 |
| 1,100.00 | 1,100.00 | 0.00 | 0.00 | Begin Nudge @ 1100.00ft |
| 1,400.00 | 1,399.45 | -3.21 | -15.36 | Nudge Rate = 2.00/100ft |
| 1,680.44 | 1,676.48 | -11.98 | -57.36 | End Nudge @ 1680.44ft |
| 4,000.00 | 3,948.59 | -107.43 | -514.26 | Hold Angle 11.61 |
| 6,981.94 | 6,869.53 | -230.13 | -1,101.63 | Begin Build @ 6981.94ft |
| 7,300.00 | 7,168.75 | -156.59 | -1,162.06 | Build Rate = 10.00/100ft |
| 7,904.18 | 7,454.00 | 341.00 | -1,221.00 | End Build @ 7904.18ft |
| 10,000.00 | 7,457.54 | 2,436.80 | -1,228.20 | Hold Angle @ 89.90 |
| 12,050.33 | 7,461.00 | 4,487.11 | -1,235.25 | Total Depth @ 12050.33ft |

Plan Report for Brotemarkle 4C-13HZ - Plan A Rev 0 Permit

Vertical Section Information

| Angle Type | Target | Azimuth (°) | Origin Type | Origin +N/_S (ft) | Origin +E/-W (ft) | Start TVD (ft) |
|---------------|-------------------------|----------------|----------------|-------------------------|-------------------------|----------------------|
| Target | Brotemarkle 4C-13HZ_BHL | 344.61 | Slot | 0.00 | 0.00 | 0.00 |

Survey tool program

| From (ft) | To (ft) | Survey/Plan | Survey Tool |
|--------------|------------|---------------------|-------------|
| 0.00 | 12,050.33 | Plan A Rev 0 Permit | MWD |

Casing Details

| Measured Depth (ft) | Vertical Depth (ft) | Name | Casing Diameter (") | Hole Diameter (") |
|---------------------------|---------------------------|------------------------|---------------------------|-------------------------|
| 7,904.18 | 7,454.00 | 7" Intermediate Casing | 7 | 8-3/4 |

Formation Details

| Measured Depth (ft) | Vertical Depth (ft) | Name | Lithology | Dip (°) | Dip Direction (°) |
|---------------------------|---------------------------|------------------|-----------|------------|-------------------------|
| 725.00 | 725.00 | Fox Hills | | 0.00 | |
| 4,104.55 | 4,051.00 | Parkman | | 0.00 | |
| 4,600.70 | 4,537.00 | Sussex | | 0.00 | |
| 7,243.20 | 7,119.00 | Sharon Springs | | 0.00 | |
| 7,306.17 | 7,174.00 | Niobrara A | | 0.00 | |
| 7,350.85 | 7,211.00 | Niobrara B | | 0.00 | |
| 7,478.02 | 7,305.00 | Niobrara C | | 0.00 | |
| 7,744.28 | 7,432.00 | Fort Hays | | 0.00 | |
| 7,904.18 | 7,454.00 | Codell TL (Heel) | | 0.00 | |
| 12,050.32 | 7,461.00 | Codell TL (Toe) | | 0.00 | |

Targets associated with this wellbore

| Target Name | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Shape |
|----------------------------------|-------------|---------------|---------------|---------|
| Brotemarkle 4C-13HZ_Casing Point | 7,454.00 | 341.00 | -1,221.00 | Point |
| Brotemarkle 4C-13HZ_BHL | 7,461.00 | 4,487.12 | -1,235.25 | Point |
| Brotemarkle 4C-13HZ_SHL | 0.00 | 0.00 | 0.00 | Point |
| Brotemarkle 4C-13HZ_Section Line | 0.00 | 0.00 | 0.00 | Polygon |
| Brotemarkle 4C-13HZ_Setback Line | 0.00 | 0.00 | 0.00 | Polygon |

North Reference Sheet for Sec. 13-T3N-R66W - Brotemarkle 4C-13HZ - 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=16 @ 5041.00ft (Drilling Rig). Northing and Easting are relative to Brotemarkle 4C-13HZ
 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: 0.99995700
 Grid Coordinates of Well: 1,323,477.82 ft N, 3,215,084.96 ft E
 Geographical Coordinates of Well: 40° 13' 07.61" N, 104° 43' 47.21" W
 Grid Convergence at Surface is: 0.50°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,050.33ft
 the Bottom Hole Displacement is 4,654.04ft in the Direction of 344.61° (True).
 Magnetic Convergence at surface is: -8.21° (26 September 2012, , BGGM2012)

