



Project: COLORADO NORTHERN ZONE - 83
Site: BUFFALO & BADGER 4C-15HZ PAD
Well: BADGER 22N-3HZ
Wellbore: OH
Design: PLAN #2 PRELIMINARY

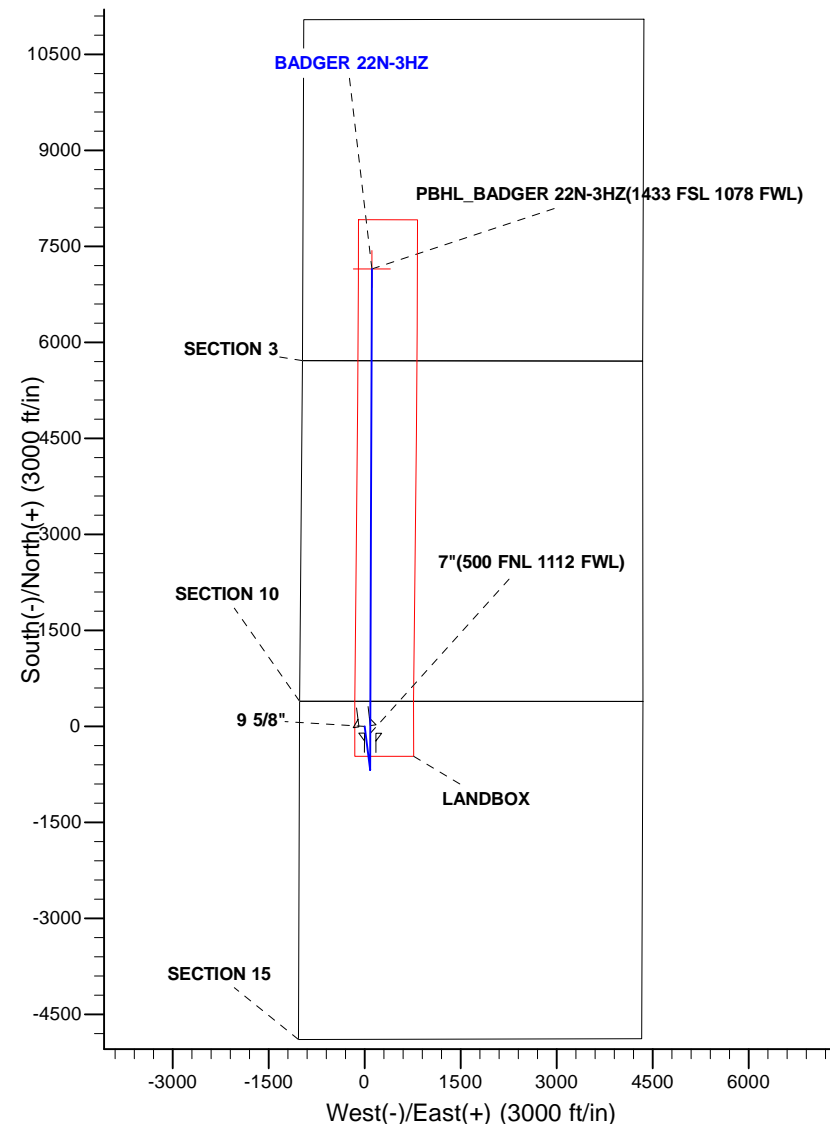
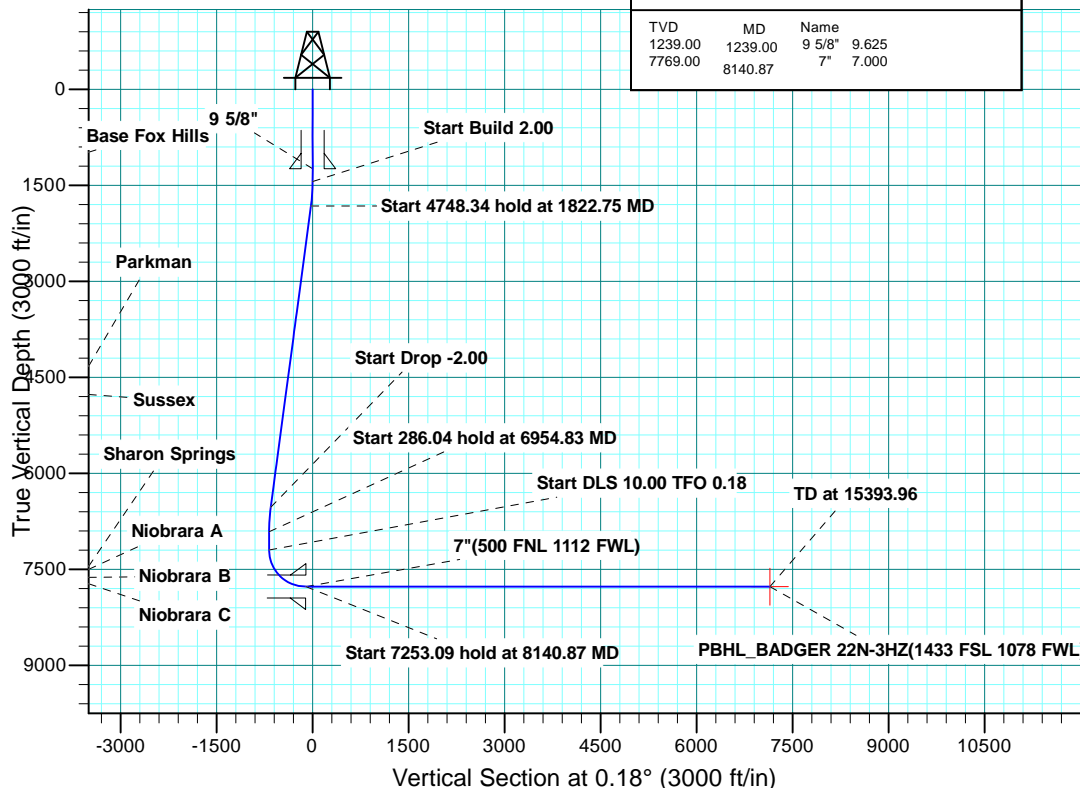


| WELL DETAILS: BADGER 22N-3HZ | | | | | | | | | |
|--|---------|--------|------------|------------|------------|--------------|--------------|---------|--|
| GL 5138 & KB 21 @ 5159.00ft (UNIT 403) | | | | | | | | | |
| | | +N-S | +E-W | Northing | Easting | Latitude | Longitude | | |
| | | 0.00 | 0.00 | 1264137.16 | 3141220.68 | 40.0573429 | -104.9954900 | | |
| SECTION DETAILS | | | | | | | | | |
| MD | Inc | Azi | TVD | +N/-S | +E/-W | Dleg | TFace | VSect | |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1439.00 | 0.00 | 0.00 | 1439.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1822.75 | 7.67 | 172.75 | 1821.60 | -25.46 | 3.24 | 2.00 | 172.75 | -25.45 | |
| 6571.08 | 7.67 | 172.75 | 6527.40 | -654.54 | 83.27 | 0.00 | 0.00 | -654.28 | |
| 6954.83 | 0.00 | 0.00 | 6910.00 | -680.00 | 86.51 | 2.00 | 180.00 | -679.72 | |
| 7240.87 | 0.00 | 0.00 | 7196.04 | -680.00 | 86.51 | 0.00 | 0.00 | -679.72 | |
| 8140.87 | 90.00 | 0.18 | 7769.00 | -107.04 | 88.34 | 10.00 | 0.18 | -106.77 | |
| 15393.96 | 90.00 | 0.18 | 7769.00 | 7146.00 | 111.51 | 0.00 | 0.00 | 7146.32 | PBHL_BADGER 22N-3HZ(1433 FSL 1078 FWL) |
| DESIGN TARGET DETAILS | | | | | | | | | |
| Name | TVD | +N/-S | +E/-W | Northing | Easting | Latitude | Longitude | Shape | |
| PBHL 7769.00 | 7146.00 | 111.51 | 1271283.67 | 3141291.53 | 40.0769599 | -104.9950915 | | Point | |
| - plan hits target center | | | | | | | | | |

| PROJECT DETAILS: COLORADO NORTHERN ZONE - 83 | |
|--|--|
| Geodetic System: US State Plane 1983 | |
| Datum: North American Datum 1983 | |
| Ellipsoid: GRS 1980 | |
| Zone: Colorado Northern Zone | |
| Location: SECTION 15 T1N R68W | |
| System Datum: Mean Sea Level | |

| FORMATION TOP DETAILS | | | |
|-----------------------|---------|----------------|-------|
| TVDPath | MDPath | Formation | Inc |
| 979.00 | 979.00 | Base Fox Hills | 0.00 |
| 4321.00 | 4344.74 | Parkman | 7.67 |
| 4767.00 | 4794.77 | Sussex | 7.67 |
| 7452.00 | 7506.21 | Sharon Springs | 26.53 |
| 7498.00 | 7558.91 | Niobrara A | 31.80 |
| 7623.00 | 7722.62 | Niobrara B | 48.17 |
| 7725.00 | 7914.87 | Niobrara C | 67.40 |

| CASING DETAILS | | | |
|----------------|---------|--------|-------|
| TVD | MD | Name | |
| 1239.00 | 1239.00 | 9 5/8" | 9.625 |
| 7769.00 | 8140.87 | 7" | 7.000 |





Scientific Drilling

US ROCKIES REGION PLANNING

**COLORADO NORTHERN ZONE - 83
BUFFALO & BADGER 4C-15HZ PAD
BADGER 22N-3HZ**

OH

Plan: PLAN #2 PRELIMINARY

Standard Planning Report

03 October, 2014

| | | | |
|------------------|------------------------------|-------------------------------------|--|
| Database: | Denver Sales | Local Co-ordinate Reference: | Well BADGER 22N-3HZ |
| Company: | US ROCKIES REGION PLANNING | TVD Reference: | GL 5138 & KB 21 @ 5159.00ft (UNIT 403) |
| Project: | COLORADO NORTHERN ZONE - 83 | MD Reference: | GL 5138 & KB 21 @ 5159.00ft (UNIT 403) |
| Site: | BUFFALO & BADGER 4C-15HZ PAD | North Reference: | True |
| Well: | BADGER 22N-3HZ | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | OH | | |
| Design: | PLAN #2 PRELIMINARY | | |

| | | | |
|--------------------|--|----------------------|----------------|
| Project | COLORADO NORTHERN ZONE - 83, KERR MCGEE OIL & GAS ONSHORE LP | | |
| Map System: | US State Plane 1983 | System Datum: | Mean Sea Level |
| Geo Datum: | North American Datum 1983 | | |
| Map Zone: | Colorado Northern Zone | | |

| | | | | |
|------------------------------|---|---------------------|-------------------|---------------------------------|
| Site | BUFFALO & BADGER 4C-15HZ PAD, SECTION 15 T1N R68W | | | |
| Site Position: | | Northing: | 1,264,136.65 usft | Latitude: 40.0573420 |
| From: | Lat/Long | Easting: | 3,141,190.73 usft | Longitude: -104.9955970 |
| Position Uncertainty: | 0.00 ft | Slot Radius: | 13.200 in | Grid Convergence: 0.33 ° |

| | | | | |
|-----------------------------|------------------------------------|----------|----------------------------|-------------------|
| Well | BADGER 22N-3HZ, 392' FNL 1170' FWL | | | |
| Well Position | +N/-S | 0.34 ft | Northing: | 1,264,137.16 usft |
| | +E/-W | 29.95 ft | Easting: | 3,141,220.68 usft |
| Position Uncertainty | | 0.00 ft | Wellhead Elevation: | 0.00 ft |
| | | | Ground Level: | 5,138.00 ft |

| | | | | | |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| Wellbore | OH | | | | |
| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
| | BGGM2013 | 6/5/2014 | 8.61 | 66.62 | 52,525 |

| | | | | |
|--------------------------|------------------------------|-------------------|----------------------|----------------------|
| Design | PLAN #2 PRELIMINARY | | | |
| Audit Notes: | | | | |
| Version: | Phase: | PLAN | Tie On Depth: | 0.00 |
| Vertical Section: | Depth From (TVD) (ft) | +N/-S (ft) | +E/-W (ft) | Direction (°) |
| | 0.00 | 0.00 | 0.00 | 0.18 |

| Plan Sections | | | | | | | | | | |
|----------------------|-----------------|-------------|---------------------|------------|------------|-------------------------|------------------------|-----------------------|---------|-----------------|
| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) | TFO (°) | Target |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1,439.00 | 0.00 | 0.00 | 1,439.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1,822.75 | 7.67 | 172.75 | 1,821.60 | -25.46 | 3.24 | 2.00 | 2.00 | 0.00 | 172.75 | |
| 6,571.08 | 7.67 | 172.75 | 6,527.40 | -654.54 | 83.27 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 6,954.83 | 0.00 | 0.00 | 6,910.00 | -680.00 | 86.51 | 2.00 | -2.00 | 0.00 | 180.00 | |
| 7,240.87 | 0.00 | 0.00 | 7,196.04 | -680.00 | 86.51 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 8,140.87 | 90.00 | 0.18 | 7,769.00 | -107.04 | 88.34 | 10.00 | 10.00 | 0.02 | 0.18 | |
| 15,393.96 | 90.00 | 0.18 | 7,769.00 | 7,146.00 | 111.51 | 0.00 | 0.00 | 0.00 | 0.00 | PBHL_BADGER 22N |

| | | | |
|------------------|------------------------------|-------------------------------------|--|
| Database: | Denver Sales | Local Co-ordinate Reference: | Well BADGER 22N-3HZ |
| Company: | US ROCKIES REGION PLANNING | TVD Reference: | GL 5138 & KB 21 @ 5159.00ft (UNIT 403) |
| Project: | COLORADO NORTHERN ZONE - 83 | MD Reference: | GL 5138 & KB 21 @ 5159.00ft (UNIT 403) |
| Site: | BUFFALO & BADGER 4C-15HZ PAD | North Reference: | True |
| Well: | BADGER 22N-3HZ | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | OH | | |
| Design: | PLAN #2 PRELIMINARY | | |

| Planned Survey | | | | | | | | | |
|---|-----------------|-------------|---------------------|------------|------------|-----------------------|-------------------------|------------------------|-----------------------|
| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| 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 |
| 200.00 | 0.00 | 0.00 | 200.00 | 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 |
| 400.00 | 0.00 | 0.00 | 400.00 | 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 |
| 600.00 | 0.00 | 0.00 | 600.00 | 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 |
| 800.00 | 0.00 | 0.00 | 800.00 | 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 |
| 979.00 | 0.00 | 0.00 | 979.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Base Fox Hills | | | | | | | | | |
| 1,000.00 | 0.00 | 0.00 | 1,000.00 | 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 |
| 1,200.00 | 0.00 | 0.00 | 1,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,239.00 | 0.00 | 0.00 | 1,239.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 5/8" | | | | | | | | | |
| 1,300.00 | 0.00 | 0.00 | 1,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,400.00 | 0.00 | 0.00 | 1,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,439.00 | 0.00 | 0.00 | 1,439.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Start Build 2.00 | | | | | | | | | |
| 1,500.00 | 1.22 | 172.75 | 1,500.00 | -0.64 | 0.08 | -0.64 | 2.00 | 2.00 | 0.00 |
| 1,600.00 | 3.22 | 172.75 | 1,599.92 | -4.49 | 0.57 | -4.48 | 2.00 | 2.00 | 0.00 |
| 1,700.00 | 5.22 | 172.75 | 1,699.64 | -11.79 | 1.50 | -11.78 | 2.00 | 2.00 | 0.00 |
| 1,800.00 | 7.22 | 172.75 | 1,799.05 | -22.53 | 2.87 | -22.52 | 2.00 | 2.00 | 0.00 |
| 1,822.75 | 7.67 | 172.75 | 1,821.60 | -25.46 | 3.24 | -25.45 | 2.00 | 2.00 | 0.00 |
| Start 4748.34 hold at 1822.75 MD | | | | | | | | | |
| 1,900.00 | 7.67 | 172.75 | 1,898.16 | -35.69 | 4.54 | -35.68 | 0.00 | 0.00 | 0.00 |
| 2,000.00 | 7.67 | 172.75 | 1,997.27 | -48.94 | 6.23 | -48.92 | 0.00 | 0.00 | 0.00 |
| 2,100.00 | 7.67 | 172.75 | 2,096.37 | -62.19 | 7.91 | -62.17 | 0.00 | 0.00 | 0.00 |
| 2,200.00 | 7.67 | 172.75 | 2,195.47 | -75.44 | 9.60 | -75.41 | 0.00 | 0.00 | 0.00 |
| 2,300.00 | 7.67 | 172.75 | 2,294.58 | -88.69 | 11.28 | -88.65 | 0.00 | 0.00 | 0.00 |
| 2,400.00 | 7.67 | 172.75 | 2,393.68 | -101.94 | 12.97 | -101.89 | 0.00 | 0.00 | 0.00 |
| 2,500.00 | 7.67 | 172.75 | 2,492.79 | -115.18 | 14.65 | -115.14 | 0.00 | 0.00 | 0.00 |
| 2,600.00 | 7.67 | 172.75 | 2,591.89 | -128.43 | 16.34 | -128.38 | 0.00 | 0.00 | 0.00 |
| 2,700.00 | 7.67 | 172.75 | 2,690.99 | -141.68 | 18.02 | -141.62 | 0.00 | 0.00 | 0.00 |
| 2,800.00 | 7.67 | 172.75 | 2,790.10 | -154.93 | 19.71 | -154.87 | 0.00 | 0.00 | 0.00 |
| 2,900.00 | 7.67 | 172.75 | 2,889.20 | -168.18 | 21.40 | -168.11 | 0.00 | 0.00 | 0.00 |
| 3,000.00 | 7.67 | 172.75 | 2,988.31 | -181.43 | 23.08 | -181.35 | 0.00 | 0.00 | 0.00 |
| 3,100.00 | 7.67 | 172.75 | 3,087.41 | -194.68 | 24.77 | -194.60 | 0.00 | 0.00 | 0.00 |
| 3,200.00 | 7.67 | 172.75 | 3,186.52 | -207.92 | 26.45 | -207.84 | 0.00 | 0.00 | 0.00 |
| 3,300.00 | 7.67 | 172.75 | 3,285.62 | -221.17 | 28.14 | -221.08 | 0.00 | 0.00 | 0.00 |
| 3,400.00 | 7.67 | 172.75 | 3,384.72 | -234.42 | 29.82 | -234.33 | 0.00 | 0.00 | 0.00 |
| 3,500.00 | 7.67 | 172.75 | 3,483.83 | -247.67 | 31.51 | -247.57 | 0.00 | 0.00 | 0.00 |
| 3,600.00 | 7.67 | 172.75 | 3,582.93 | -260.92 | 33.19 | -260.81 | 0.00 | 0.00 | 0.00 |
| 3,700.00 | 7.67 | 172.75 | 3,682.04 | -274.17 | 34.88 | -274.06 | 0.00 | 0.00 | 0.00 |
| 3,800.00 | 7.67 | 172.75 | 3,781.14 | -287.41 | 36.57 | -287.30 | 0.00 | 0.00 | 0.00 |
| 3,900.00 | 7.67 | 172.75 | 3,880.24 | -300.66 | 38.25 | -300.54 | 0.00 | 0.00 | 0.00 |
| 4,000.00 | 7.67 | 172.75 | 3,979.35 | -313.91 | 39.94 | -313.78 | 0.00 | 0.00 | 0.00 |
| 4,100.00 | 7.67 | 172.75 | 4,078.45 | -327.16 | 41.62 | -327.03 | 0.00 | 0.00 | 0.00 |
| 4,200.00 | 7.67 | 172.75 | 4,177.56 | -340.41 | 43.31 | -340.27 | 0.00 | 0.00 | 0.00 |
| 4,300.00 | 7.67 | 172.75 | 4,276.66 | -353.66 | 44.99 | -353.51 | 0.00 | 0.00 | 0.00 |
| 4,344.74 | 7.67 | 172.75 | 4,321.00 | -359.58 | 45.75 | -359.44 | 0.00 | 0.00 | 0.00 |
| Parkman | | | | | | | | | |

| | | | |
|------------------|------------------------------|-------------------------------------|--|
| Database: | Denver Sales | Local Co-ordinate Reference: | Well BADGER 22N-3HZ |
| Company: | US ROCKIES REGION PLANNING | TVD Reference: | GL 5138 & KB 21 @ 5159.00ft (UNIT 403) |
| Project: | COLORADO NORTHERN ZONE - 83 | MD Reference: | GL 5138 & KB 21 @ 5159.00ft (UNIT 403) |
| Site: | BUFFALO & BADGER 4C-15HZ PAD | North Reference: | True |
| Well: | BADGER 22N-3HZ | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | OH | | |
| Design: | PLAN #2 PRELIMINARY | | |

| Planned Survey | | | | | | | | | |
|--|-----------------|-------------|---------------------|------------|------------|-----------------------|-------------------------|------------------------|-----------------------|
| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| 4,400.00 | 7.67 | 172.75 | 4,375.77 | -366.91 | 46.68 | -366.76 | 0.00 | 0.00 | 0.00 |
| 4,500.00 | 7.67 | 172.75 | 4,474.87 | -380.15 | 48.36 | -380.00 | 0.00 | 0.00 | 0.00 |
| 4,600.00 | 7.67 | 172.75 | 4,573.97 | -393.40 | 50.05 | -393.24 | 0.00 | 0.00 | 0.00 |
| 4,700.00 | 7.67 | 172.75 | 4,673.08 | -406.65 | 51.73 | -406.49 | 0.00 | 0.00 | 0.00 |
| 4,794.77 | 7.67 | 172.75 | 4,767.00 | -419.21 | 53.33 | -419.04 | 0.00 | 0.00 | 0.00 |
| Sussex | | | | | | | | | |
| 4,800.00 | 7.67 | 172.75 | 4,772.18 | -419.90 | 53.42 | -419.73 | 0.00 | 0.00 | 0.00 |
| 4,900.00 | 7.67 | 172.75 | 4,871.29 | -433.15 | 55.11 | -432.97 | 0.00 | 0.00 | 0.00 |
| 5,000.00 | 7.67 | 172.75 | 4,970.39 | -446.40 | 56.79 | -446.22 | 0.00 | 0.00 | 0.00 |
| 5,100.00 | 7.67 | 172.75 | 5,069.49 | -459.65 | 58.48 | -459.46 | 0.00 | 0.00 | 0.00 |
| 5,200.00 | 7.67 | 172.75 | 5,168.60 | -472.89 | 60.16 | -472.70 | 0.00 | 0.00 | 0.00 |
| 5,300.00 | 7.67 | 172.75 | 5,267.70 | -486.14 | 61.85 | -485.95 | 0.00 | 0.00 | 0.00 |
| 5,400.00 | 7.67 | 172.75 | 5,366.81 | -499.39 | 63.53 | -499.19 | 0.00 | 0.00 | 0.00 |
| 5,500.00 | 7.67 | 172.75 | 5,465.91 | -512.64 | 65.22 | -512.43 | 0.00 | 0.00 | 0.00 |
| 5,600.00 | 7.67 | 172.75 | 5,565.02 | -525.89 | 66.90 | -525.67 | 0.00 | 0.00 | 0.00 |
| 5,700.00 | 7.67 | 172.75 | 5,664.12 | -539.14 | 68.59 | -538.92 | 0.00 | 0.00 | 0.00 |
| 5,800.00 | 7.67 | 172.75 | 5,763.22 | -552.38 | 70.27 | -552.16 | 0.00 | 0.00 | 0.00 |
| 5,900.00 | 7.67 | 172.75 | 5,862.33 | -565.63 | 71.96 | -565.40 | 0.00 | 0.00 | 0.00 |
| 6,000.00 | 7.67 | 172.75 | 5,961.43 | -578.88 | 73.65 | -578.65 | 0.00 | 0.00 | 0.00 |
| 6,100.00 | 7.67 | 172.75 | 6,060.54 | -592.13 | 75.33 | -591.89 | 0.00 | 0.00 | 0.00 |
| 6,200.00 | 7.67 | 172.75 | 6,159.64 | -605.38 | 77.02 | -605.13 | 0.00 | 0.00 | 0.00 |
| 6,300.00 | 7.67 | 172.75 | 6,258.74 | -618.63 | 78.70 | -618.38 | 0.00 | 0.00 | 0.00 |
| 6,400.00 | 7.67 | 172.75 | 6,357.85 | -631.88 | 80.39 | -631.62 | 0.00 | 0.00 | 0.00 |
| 6,500.00 | 7.67 | 172.75 | 6,456.95 | -645.12 | 82.07 | -644.86 | 0.00 | 0.00 | 0.00 |
| 6,571.08 | 7.67 | 172.75 | 6,527.40 | -654.54 | 83.27 | -654.28 | 0.00 | 0.00 | 0.00 |
| Start Drop -2.00 | | | | | | | | | |
| 6,600.00 | 7.10 | 172.75 | 6,556.08 | -658.23 | 83.74 | -657.96 | 2.00 | -2.00 | 0.00 |
| 6,700.00 | 5.10 | 172.75 | 6,655.51 | -668.76 | 85.08 | -668.49 | 2.00 | -2.00 | 0.00 |
| 6,800.00 | 3.10 | 172.75 | 6,755.25 | -675.85 | 85.98 | -675.58 | 2.00 | -2.00 | 0.00 |
| 6,900.00 | 1.10 | 172.75 | 6,855.17 | -679.48 | 86.44 | -679.20 | 2.00 | -2.00 | 0.00 |
| 6,954.83 | 0.00 | 0.00 | 6,910.00 | -680.00 | 86.51 | -679.72 | 2.00 | -2.00 | 0.00 |
| Start 286.04 hold at 6954.83 MD | | | | | | | | | |
| 7,000.00 | 0.00 | 0.00 | 6,955.17 | -680.00 | 86.51 | -679.72 | 0.00 | 0.00 | 0.00 |
| 7,100.00 | 0.00 | 0.00 | 7,055.17 | -680.00 | 86.51 | -679.72 | 0.00 | 0.00 | 0.00 |
| 7,200.00 | 0.00 | 0.00 | 7,155.17 | -680.00 | 86.51 | -679.72 | 0.00 | 0.00 | 0.00 |
| 7,240.87 | 0.00 | 0.00 | 7,196.04 | -680.00 | 86.51 | -679.72 | 0.00 | 0.00 | 0.00 |
| Start DLS 10.00 TFO 0.18 | | | | | | | | | |
| 7,300.00 | 5.91 | 0.18 | 7,255.06 | -676.95 | 86.52 | -676.68 | 10.00 | 10.00 | 0.00 |
| 7,400.00 | 15.91 | 0.18 | 7,353.13 | -658.04 | 86.58 | -657.77 | 10.00 | 10.00 | 0.00 |
| 7,500.00 | 25.91 | 0.18 | 7,446.43 | -622.39 | 86.69 | -622.12 | 10.00 | 10.00 | 0.00 |
| 7,506.21 | 26.53 | 0.18 | 7,452.00 | -619.65 | 86.70 | -619.37 | 10.00 | 10.00 | 0.00 |
| Sharon Springs | | | | | | | | | |
| 7,558.91 | 31.80 | 0.18 | 7,498.00 | -593.97 | 86.78 | -593.70 | 10.00 | 10.00 | 0.00 |
| Niobrara A | | | | | | | | | |
| 7,600.00 | 35.91 | 0.18 | 7,532.11 | -571.09 | 86.86 | -570.81 | 10.00 | 10.00 | 0.00 |
| 7,700.00 | 45.91 | 0.18 | 7,607.59 | -505.68 | 87.07 | -505.40 | 10.00 | 10.00 | 0.00 |
| 7,722.62 | 48.17 | 0.18 | 7,623.00 | -489.12 | 87.12 | -488.85 | 10.00 | 10.00 | 0.00 |
| Niobrara B | | | | | | | | | |
| 7,800.00 | 55.91 | 0.18 | 7,670.56 | -428.16 | 87.31 | -427.88 | 10.00 | 10.00 | 0.00 |
| 7,900.00 | 65.91 | 0.18 | 7,719.11 | -340.88 | 87.59 | -340.61 | 10.00 | 10.00 | 0.00 |
| 7,914.87 | 67.40 | 0.18 | 7,725.00 | -327.23 | 87.64 | -326.96 | 10.00 | 10.00 | 0.00 |
| Niobrara C | | | | | | | | | |
| 8,000.00 | 75.91 | 0.18 | 7,751.77 | -246.50 | 87.89 | -246.22 | 10.00 | 10.00 | 0.00 |

| | | | |
|------------------|------------------------------|-------------------------------------|--|
| Database: | Denver Sales | Local Co-ordinate Reference: | Well BADGER 22N-3HZ |
| Company: | US ROCKIES REGION PLANNING | TVD Reference: | GL 5138 & KB 21 @ 5159.00ft (UNIT 403) |
| Project: | COLORADO NORTHERN ZONE - 83 | MD Reference: | GL 5138 & KB 21 @ 5159.00ft (UNIT 403) |
| Site: | BUFFALO & BADGER 4C-15HZ PAD | North Reference: | True |
| Well: | BADGER 22N-3HZ | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | OH | | |
| Design: | PLAN #2 PRELIMINARY | | |

| Planned Survey | | | | | | | | | | |
|---|-----------------|-------------|---------------------|------------|------------|-----------------------|-------------------------|------------------------|-----------------------|--|
| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) | |
| 8,100.00 | 85.91 | 0.18 | 7,767.54 | -147.88 | 88.21 | -147.60 | 10.00 | 10.00 | 0.00 | |
| 8,140.87 | 90.00 | 0.18 | 7,769.00 | -107.05 | 88.34 | -106.77 | 10.00 | 10.00 | 0.00 | |
| Start 7253.09 hold at 8140.87 MD - 7"(500 FNL 1112 FWL) | | | | | | | | | | |
| 8,200.00 | 90.00 | 0.18 | 7,769.00 | -47.92 | 88.53 | -47.64 | 0.00 | 0.00 | 0.00 | |
| 8,300.00 | 90.00 | 0.18 | 7,769.00 | 52.08 | 88.85 | 52.36 | 0.00 | 0.00 | 0.00 | |
| 8,400.00 | 90.00 | 0.18 | 7,769.00 | 152.08 | 89.17 | 152.36 | 0.00 | 0.00 | 0.00 | |
| 8,500.00 | 90.00 | 0.18 | 7,769.00 | 252.08 | 89.49 | 252.36 | 0.00 | 0.00 | 0.00 | |
| 8,600.00 | 90.00 | 0.18 | 7,769.00 | 352.08 | 89.81 | 352.36 | 0.00 | 0.00 | 0.00 | |
| 8,700.00 | 90.00 | 0.18 | 7,769.00 | 452.08 | 90.13 | 452.36 | 0.00 | 0.00 | 0.00 | |
| 8,800.00 | 90.00 | 0.18 | 7,769.00 | 552.08 | 90.45 | 552.36 | 0.00 | 0.00 | 0.00 | |
| 8,900.00 | 90.00 | 0.18 | 7,769.00 | 652.08 | 90.77 | 652.36 | 0.00 | 0.00 | 0.00 | |
| 9,000.00 | 90.00 | 0.18 | 7,769.00 | 752.08 | 91.08 | 752.36 | 0.00 | 0.00 | 0.00 | |
| 9,100.00 | 90.00 | 0.18 | 7,769.00 | 852.08 | 91.40 | 852.36 | 0.00 | 0.00 | 0.00 | |
| 9,200.00 | 90.00 | 0.18 | 7,769.00 | 952.08 | 91.72 | 952.36 | 0.00 | 0.00 | 0.00 | |
| 9,300.00 | 90.00 | 0.18 | 7,769.00 | 1,052.08 | 92.04 | 1,052.36 | 0.00 | 0.00 | 0.00 | |
| 9,400.00 | 90.00 | 0.18 | 7,769.00 | 1,152.08 | 92.36 | 1,152.36 | 0.00 | 0.00 | 0.00 | |
| 9,500.00 | 90.00 | 0.18 | 7,769.00 | 1,252.08 | 92.68 | 1,252.36 | 0.00 | 0.00 | 0.00 | |
| 9,600.00 | 90.00 | 0.18 | 7,769.00 | 1,352.08 | 93.00 | 1,352.36 | 0.00 | 0.00 | 0.00 | |
| 9,700.00 | 90.00 | 0.18 | 7,769.00 | 1,452.08 | 93.32 | 1,452.36 | 0.00 | 0.00 | 0.00 | |
| 9,800.00 | 90.00 | 0.18 | 7,769.00 | 1,552.08 | 93.64 | 1,552.36 | 0.00 | 0.00 | 0.00 | |
| 9,900.00 | 90.00 | 0.18 | 7,769.00 | 1,652.08 | 93.96 | 1,652.36 | 0.00 | 0.00 | 0.00 | |
| 10,000.00 | 90.00 | 0.18 | 7,769.00 | 1,752.07 | 94.28 | 1,752.36 | 0.00 | 0.00 | 0.00 | |
| 10,100.00 | 90.00 | 0.18 | 7,769.00 | 1,852.07 | 94.60 | 1,852.36 | 0.00 | 0.00 | 0.00 | |
| 10,200.00 | 90.00 | 0.18 | 7,769.00 | 1,952.07 | 94.92 | 1,952.36 | 0.00 | 0.00 | 0.00 | |
| 10,300.00 | 90.00 | 0.18 | 7,769.00 | 2,052.07 | 95.24 | 2,052.36 | 0.00 | 0.00 | 0.00 | |
| 10,400.00 | 90.00 | 0.18 | 7,769.00 | 2,152.07 | 95.56 | 2,152.36 | 0.00 | 0.00 | 0.00 | |
| 10,500.00 | 90.00 | 0.18 | 7,769.00 | 2,252.07 | 95.88 | 2,252.36 | 0.00 | 0.00 | 0.00 | |
| 10,600.00 | 90.00 | 0.18 | 7,769.00 | 2,352.07 | 96.20 | 2,352.36 | 0.00 | 0.00 | 0.00 | |
| 10,700.00 | 90.00 | 0.18 | 7,769.00 | 2,452.07 | 96.52 | 2,452.36 | 0.00 | 0.00 | 0.00 | |
| 10,800.00 | 90.00 | 0.18 | 7,769.00 | 2,552.07 | 96.83 | 2,552.36 | 0.00 | 0.00 | 0.00 | |
| 10,900.00 | 90.00 | 0.18 | 7,769.00 | 2,652.07 | 97.15 | 2,652.36 | 0.00 | 0.00 | 0.00 | |
| 11,000.00 | 90.00 | 0.18 | 7,769.00 | 2,752.07 | 97.47 | 2,752.36 | 0.00 | 0.00 | 0.00 | |
| 11,100.00 | 90.00 | 0.18 | 7,769.00 | 2,852.07 | 97.79 | 2,852.36 | 0.00 | 0.00 | 0.00 | |
| 11,200.00 | 90.00 | 0.18 | 7,769.00 | 2,952.07 | 98.11 | 2,952.36 | 0.00 | 0.00 | 0.00 | |
| 11,300.00 | 90.00 | 0.18 | 7,769.00 | 3,052.07 | 98.43 | 3,052.36 | 0.00 | 0.00 | 0.00 | |
| 11,400.00 | 90.00 | 0.18 | 7,769.00 | 3,152.07 | 98.75 | 3,152.36 | 0.00 | 0.00 | 0.00 | |
| 11,500.00 | 90.00 | 0.18 | 7,769.00 | 3,252.07 | 99.07 | 3,252.36 | 0.00 | 0.00 | 0.00 | |
| 11,600.00 | 90.00 | 0.18 | 7,769.00 | 3,352.07 | 99.39 | 3,352.36 | 0.00 | 0.00 | 0.00 | |
| 11,700.00 | 90.00 | 0.18 | 7,769.00 | 3,452.07 | 99.71 | 3,452.36 | 0.00 | 0.00 | 0.00 | |
| 11,800.00 | 90.00 | 0.18 | 7,769.00 | 3,552.07 | 100.03 | 3,552.36 | 0.00 | 0.00 | 0.00 | |
| 11,900.00 | 90.00 | 0.18 | 7,769.00 | 3,652.06 | 100.35 | 3,652.36 | 0.00 | 0.00 | 0.00 | |
| 12,000.00 | 90.00 | 0.18 | 7,769.00 | 3,752.06 | 100.67 | 3,752.36 | 0.00 | 0.00 | 0.00 | |
| 12,100.00 | 90.00 | 0.18 | 7,769.00 | 3,852.06 | 100.99 | 3,852.36 | 0.00 | 0.00 | 0.00 | |
| 12,200.00 | 90.00 | 0.18 | 7,769.00 | 3,952.06 | 101.31 | 3,952.36 | 0.00 | 0.00 | 0.00 | |
| 12,300.00 | 90.00 | 0.18 | 7,769.00 | 4,052.06 | 101.63 | 4,052.36 | 0.00 | 0.00 | 0.00 | |
| 12,400.00 | 90.00 | 0.18 | 7,769.00 | 4,152.06 | 101.95 | 4,152.36 | 0.00 | 0.00 | 0.00 | |
| 12,500.00 | 90.00 | 0.18 | 7,769.00 | 4,252.06 | 102.27 | 4,252.36 | 0.00 | 0.00 | 0.00 | |
| 12,600.00 | 90.00 | 0.18 | 7,769.00 | 4,352.06 | 102.58 | 4,352.36 | 0.00 | 0.00 | 0.00 | |
| 12,700.00 | 90.00 | 0.18 | 7,769.00 | 4,452.06 | 102.90 | 4,452.36 | 0.00 | 0.00 | 0.00 | |
| 12,800.00 | 90.00 | 0.18 | 7,769.00 | 4,552.06 | 103.22 | 4,552.36 | 0.00 | 0.00 | 0.00 | |
| 12,900.00 | 90.00 | 0.18 | 7,769.00 | 4,652.06 | 103.54 | 4,652.36 | 0.00 | 0.00 | 0.00 | |
| 13,000.00 | 90.00 | 0.18 | 7,769.00 | 4,752.06 | 103.86 | 4,752.36 | 0.00 | 0.00 | 0.00 | |
| 13,100.00 | 90.00 | 0.18 | 7,769.00 | 4,852.06 | 104.18 | 4,852.36 | 0.00 | 0.00 | 0.00 | |

| | | | |
|------------------|------------------------------|-------------------------------------|--|
| Database: | Denver Sales | Local Co-ordinate Reference: | Well BADGER 22N-3HZ |
| Company: | US ROCKIES REGION PLANNING | TVD Reference: | GL 5138 & KB 21 @ 5159.00ft (UNIT 403) |
| Project: | COLORADO NORTHERN ZONE - 83 | MD Reference: | GL 5138 & KB 21 @ 5159.00ft (UNIT 403) |
| Site: | BUFFALO & BADGER 4C-15HZ PAD | North Reference: | True |
| Well: | BADGER 22N-3HZ | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | OH | | |
| Design: | PLAN #2 PRELIMINARY | | |

| Planned Survey | | | | | | | | | |
|---|-----------------|-------------|---------------------|------------|------------|-----------------------|-------------------------|------------------------|-----------------------|
| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| 13,200.00 | 90.00 | 0.18 | 7,769.00 | 4,952.06 | 104.50 | 4,952.36 | 0.00 | 0.00 | 0.00 |
| 13,300.00 | 90.00 | 0.18 | 7,769.00 | 5,052.06 | 104.82 | 5,052.36 | 0.00 | 0.00 | 0.00 |
| 13,400.00 | 90.00 | 0.18 | 7,769.00 | 5,152.06 | 105.14 | 5,152.36 | 0.00 | 0.00 | 0.00 |
| 13,500.00 | 90.00 | 0.18 | 7,769.00 | 5,252.06 | 105.46 | 5,252.36 | 0.00 | 0.00 | 0.00 |
| 13,600.00 | 90.00 | 0.18 | 7,769.00 | 5,352.06 | 105.78 | 5,352.36 | 0.00 | 0.00 | 0.00 |
| 13,700.00 | 90.00 | 0.18 | 7,769.00 | 5,452.06 | 106.10 | 5,452.36 | 0.00 | 0.00 | 0.00 |
| 13,800.00 | 90.00 | 0.18 | 7,769.00 | 5,552.06 | 106.42 | 5,552.36 | 0.00 | 0.00 | 0.00 |
| 13,900.00 | 90.00 | 0.18 | 7,769.00 | 5,652.05 | 106.74 | 5,652.36 | 0.00 | 0.00 | 0.00 |
| 14,000.00 | 90.00 | 0.18 | 7,769.00 | 5,752.05 | 107.06 | 5,752.36 | 0.00 | 0.00 | 0.00 |
| 14,100.00 | 90.00 | 0.18 | 7,769.00 | 5,852.05 | 107.38 | 5,852.36 | 0.00 | 0.00 | 0.00 |
| 14,200.00 | 90.00 | 0.18 | 7,769.00 | 5,952.05 | 107.70 | 5,952.36 | 0.00 | 0.00 | 0.00 |
| 14,300.00 | 90.00 | 0.18 | 7,769.00 | 6,052.05 | 108.02 | 6,052.36 | 0.00 | 0.00 | 0.00 |
| 14,400.00 | 90.00 | 0.18 | 7,769.00 | 6,152.05 | 108.33 | 6,152.36 | 0.00 | 0.00 | 0.00 |
| 14,500.00 | 90.00 | 0.18 | 7,769.00 | 6,252.05 | 108.65 | 6,252.36 | 0.00 | 0.00 | 0.00 |
| 14,600.00 | 90.00 | 0.18 | 7,769.00 | 6,352.05 | 108.97 | 6,352.36 | 0.00 | 0.00 | 0.00 |
| 14,700.00 | 90.00 | 0.18 | 7,769.00 | 6,452.05 | 109.29 | 6,452.36 | 0.00 | 0.00 | 0.00 |
| 14,800.00 | 90.00 | 0.18 | 7,769.00 | 6,552.05 | 109.61 | 6,552.36 | 0.00 | 0.00 | 0.00 |
| 14,900.00 | 90.00 | 0.18 | 7,769.00 | 6,652.05 | 109.93 | 6,652.36 | 0.00 | 0.00 | 0.00 |
| 15,000.00 | 90.00 | 0.18 | 7,769.00 | 6,752.05 | 110.25 | 6,752.36 | 0.00 | 0.00 | 0.00 |
| 15,100.00 | 90.00 | 0.18 | 7,769.00 | 6,852.05 | 110.57 | 6,852.36 | 0.00 | 0.00 | 0.00 |
| 15,200.00 | 90.00 | 0.18 | 7,769.00 | 6,952.05 | 110.89 | 6,952.36 | 0.00 | 0.00 | 0.00 |
| 15,300.00 | 90.00 | 0.18 | 7,769.00 | 7,052.05 | 111.21 | 7,052.36 | 0.00 | 0.00 | 0.00 |
| 15,393.96 | 90.00 | 0.18 | 7,769.00 | 7,146.00 | 111.51 | 7,146.32 | 0.00 | 0.00 | 0.00 |
| TD at 15393.96 - PBHL_BADGER 22N-3HZ(1433 FSL 1078 FWL) | | | | | | | | | |

| Design Targets | | | | | | | | | |
|---------------------------|---------------|--------------|----------|------------|------------|-----------------|----------------|------------|--------------|
| Target Name | Dip Angle (°) | Dip Dir. (°) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (usft) | Easting (usft) | Latitude | Longitude |
| - hit/miss target | | | | | | | | | |
| - Shape | | | | | | | | | |
| PBHL_BADGER 22N-3H | 0.00 | 0.00 | 7,769.00 | 7,146.00 | 111.51 | 1,271,283.67 | 3,141,291.53 | 40.0769599 | -104.9950915 |
| - plan hits target center | | | | | | | | | |
| - Point | | | | | | | | | |

| Casing Points | | | | | |
|---------------------|---------------------|----------------------|----------------------|--------------------|--|
| Measured Depth (ft) | Vertical Depth (ft) | Name | Casing Diameter (in) | Hole Diameter (in) | |
| 1,239.00 | 1,239.00 | 9 5/8" | 9.625 | 12.250 | |
| 8,140.87 | 7,769.00 | 7"(500 FNL 1112 FWL) | 7.000 | 8.750 | |

| | | | |
|------------------|------------------------------|-------------------------------------|--|
| Database: | Denver Sales | Local Co-ordinate Reference: | Well BADGER 22N-3HZ |
| Company: | US ROCKIES REGION PLANNING | TVD Reference: | GL 5138 & KB 21 @ 5159.00ft (UNIT 403) |
| Project: | COLORADO NORTHERN ZONE - 83 | MD Reference: | GL 5138 & KB 21 @ 5159.00ft (UNIT 403) |
| Site: | BUFFALO & BADGER 4C-15HZ PAD | North Reference: | True |
| Well: | BADGER 22N-3HZ | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | OH | | |
| Design: | PLAN #2 PRELIMINARY | | |

| Formations | | | | | |
|---------------------|---------------------|----------------|-----------|---------|-------------------|
| Measured Depth (ft) | Vertical Depth (ft) | Name | Lithology | Dip (°) | Dip Direction (°) |
| 979.00 | 979.00 | Base Fox Hills | | | |
| 4,344.74 | 4,321.00 | Parkman | | | |
| 4,794.77 | 4,767.00 | Sussex | | | |
| 7,506.21 | 7,452.00 | Sharon Springs | | | |
| 7,558.91 | 7,498.00 | Niobrara A | | | |
| 7,722.62 | 7,623.00 | Niobrara B | | | |
| 7,914.87 | 7,725.00 | Niobrara C | | | |

| Plan Annotations | | | | | |
|---------------------|---------------------|-------------------|------------|----------------------------------|--|
| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates | | | |
| | | +N/-S (ft) | +E/-W (ft) | Comment | |
| 1,439.00 | 1,439.00 | 0.00 | 0.00 | Start Build 2.00 | |
| 1,822.75 | 1,821.60 | -25.46 | 3.24 | Start 4748.34 hold at 1822.75 MD | |
| 6,571.08 | 6,527.40 | -654.54 | 83.27 | Start Drop -2.00 | |
| 6,954.83 | 6,910.00 | -680.00 | 86.51 | Start 286.04 hold at 6954.83 MD | |
| 7,240.87 | 7,196.04 | -680.00 | 86.51 | Start DLS 10.00 TFO 0.18 | |
| 8,140.87 | 7,769.00 | -107.04 | 88.34 | Start 7253.09 hold at 8140.87 MD | |
| 15,393.96 | 7,769.00 | 7,146.00 | 111.51 | TD at 15393.96 | |