



Project: COLORADO NORTHERN ZONE - 83
Site: SPOTTED 35-23HZ
Well: SPOTTED 4C-23HZ
Wellbore: OH
Design: PLAN #1 PRELIMINARY



WELL DETAILS: SPOTTED 4C-23HZ

GL 4966 & KB 17 @ 4983.00ft (ASSUMED)

| +N/-S | +E/-W | Northing | Easting | Latitude | Longitude |
|-------|-------|------------|------------|------------|--------------|
| 0.00 | 0.00 | 1286160.58 | 3177745.06 | 40.1171550 | -104.8644470 |

SECTION DETAILS

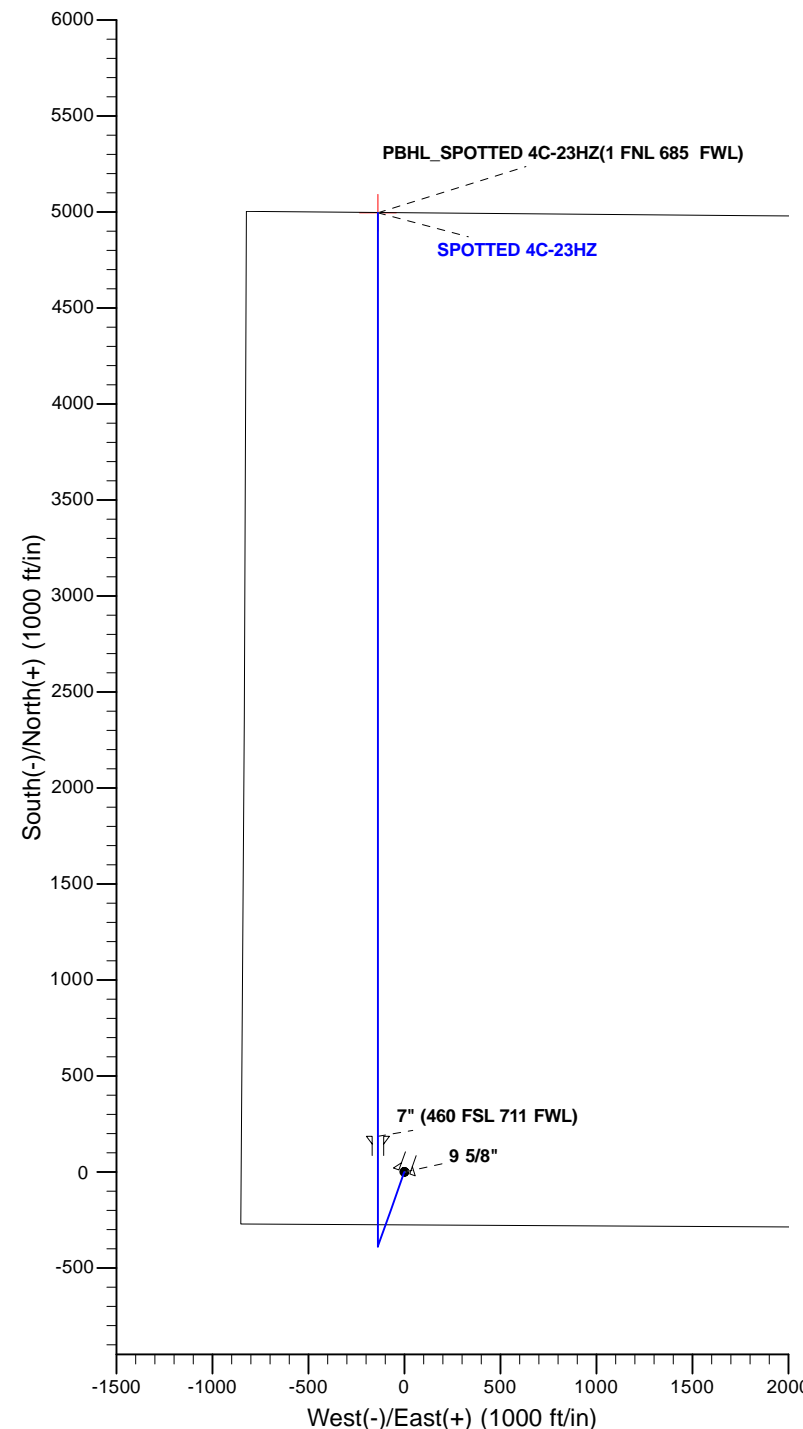
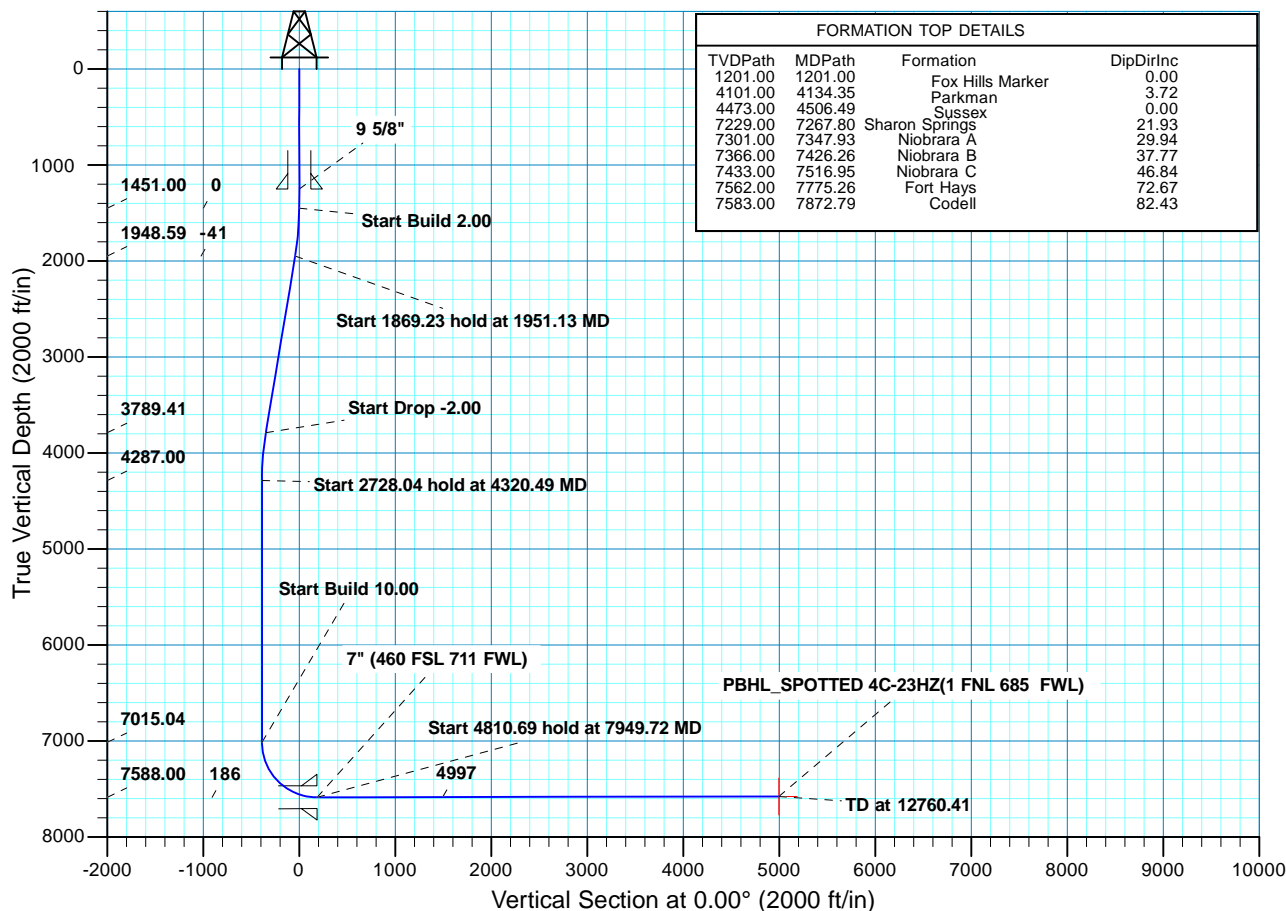
| MD | Inc | Azi | TVD | +N/-S | +E/-W | Dleg | TFace | VFace | Target |
|----------|-------|--------|---------|---------|---------|-------|--------|---------|-------------------------------------|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1451.00 | 0.00 | 0.00 | 1451.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1951.13 | 10.00 | 199.56 | 1948.59 | -41.03 | -14.58 | 2.00 | 199.56 | -41.03 | |
| 3820.36 | 10.00 | 199.56 | 3789.41 | -346.97 | -123.27 | 0.00 | 0.00 | -346.97 | |
| 4320.49 | 0.00 | 0.00 | 4287.00 | -388.00 | -137.85 | 2.00 | 180.00 | -388.00 | |
| 7048.53 | 0.00 | 0.00 | 7015.04 | -388.00 | -137.85 | 0.00 | 0.00 | -388.00 | |
| 7949.72 | 90.12 | 0.00 | 7588.00 | 186.15 | -137.85 | 10.00 | 0.00 | 186.15 | |
| 12760.41 | 90.12 | 0.00 | 7578.00 | 4996.83 | -137.85 | 0.00 | 0.00 | 4996.83 | PBHL_SPOTTED 4C-23HZ(1 FNL 685 FWL) |

CASING DETAILS

| TVD | MD | Name | Size |
|---------|---------|--------|-------|
| 1251.00 | 1251.00 | 9 5/8" | 9.625 |
| 7588.00 | 7949.72 | 7" | 7.000 |

FORMATION TOP DETAILS

| TVDPPath | MDPath | Formation | DipDirInc |
|----------|---------|------------------|-----------|
| 1201.00 | 1201.00 | Fox Hills Marker | 0.00 |
| 4101.00 | 4134.35 | Parkman | 3.72 |
| 4473.00 | 4506.49 | Sussex | 0.00 |
| 7229.00 | 7267.80 | Sharon Springs | 21.93 |
| 7301.00 | 7347.93 | Niobrara A | 29.94 |
| 7366.00 | 7426.26 | Niobrara B | 37.77 |
| 7433.00 | 7516.95 | Niobrara C | 46.84 |
| 7562.00 | 7775.26 | Fort Hays | 72.67 |
| 7583.00 | 7872.79 | Codell | 82.43 |



Plan: PLAN #1 PRELIMINARY (SPOTTED 4C-23HZ/OH)

Created By: RobertScott Date: 8:04, February 18 2014



Scientific Drilling

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

SPOTTED 35-23HZ

SPOTTED 4C-23HZ

OH

Plan: PLAN #1 PRELIMINARY

Standard Planning Report

18 February, 2014

| | | | |
|------------------|-----------------------------|-------------------------------------|---------------------------------------|
| Database: | EDM 5000.1 Single User Db | Local Co-ordinate Reference: | Well SPOTTED 4C-23HZ |
| Company: | US ROCKIES REGION PLANNING | TVD Reference: | GL 4966 & KB 17 @ 4983.00ft (ASSUMED) |
| Project: | COLORADO NORTHERN ZONE - 83 | MD Reference: | GL 4966 & KB 17 @ 4983.00ft (ASSUMED) |
| Site: | SPOTTED 35-23HZ | North Reference: | True |
| Well: | SPOTTED 4C-23HZ | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | OH | | |
| Design: | PLAN #1 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 | SPOTTED 35-23HZ, SECTION 23 T2N R67W | | | |
| Site Position: | | Northing: | 1,286,160.58 usft | Latitude: 40.1171550 |
| From: | Lat/Long | Easting: | 3,177,745.06 usft | Longitude: -104.8644470 |
| Position Uncertainty: | 0.00 ft | Slot Radius: | 13.200 in | Grid Convergence: 0.41 ° |

| | | | | |
|-----------------------------|----------------------------------|---------|----------------------------|-------------------|
| Well | SPOTTED 4C-23HZ, 275 FSL 850 FWL | | | |
| Well Position | +N/-S | 0.00 ft | Northing: | 1,286,160.58 usft |
| | +E/-W | 0.00 ft | Easting: | 3,177,745.06 usft |
| Position Uncertainty | | 0.00 ft | Wellhead Elevation: | 0.00 ft |
| | | | Ground Level: | 4,966.00 ft |

| | | | | | |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| Wellbore | OH | | | | |
| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
| | BGGM2013 | 02/13/14 | 8.58 | 66.70 | 52,611 |

| | | | | |
|--------------------------|------------------------------|-------------------|----------------------|----------------------|
| Design | PLAN #1 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 | 0.00 |

| Plan Sections | | | | | | | | | | |
|----------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|----------------------|---------------------|---------|-----------------|
| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) | TFO (°) | Target |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1,451.00 | 0.00 | 0.00 | 1,451.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1,951.13 | 10.00 | 199.56 | 1,948.59 | -41.03 | -14.58 | 2.00 | 2.00 | 0.00 | 199.56 | |
| 3,820.36 | 10.00 | 199.56 | 3,789.41 | -346.97 | -123.27 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 4,320.49 | 0.00 | 0.00 | 4,287.00 | -388.00 | -137.85 | 2.00 | -2.00 | 0.00 | 180.00 | |
| 7,048.53 | 0.00 | 0.00 | 7,015.04 | -388.00 | -137.85 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7,949.72 | 90.12 | 0.00 | 7,588.00 | 186.15 | -137.85 | 10.00 | 10.00 | 0.00 | 0.00 | |
| 12,760.41 | 90.12 | 0.00 | 7,578.00 | 4,996.83 | -137.85 | 0.00 | 0.00 | 0.00 | 0.00 | PBHL_SPOTTED 4C |

| | | | |
|------------------|-----------------------------|-------------------------------------|---------------------------------------|
| Database: | EDM 5000.1 Single User Db | Local Co-ordinate Reference: | Well SPOTTED 4C-23HZ |
| Company: | US ROCKIES REGION PLANNING | TVD Reference: | GL 4966 & KB 17 @ 4983.00ft (ASSUMED) |
| Project: | COLORADO NORTHERN ZONE - 83 | MD Reference: | GL 4966 & KB 17 @ 4983.00ft (ASSUMED) |
| Site: | SPOTTED 35-23HZ | North Reference: | True |
| Well: | SPOTTED 4C-23HZ | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | OH | | |
| Design: | PLAN #1 PRELIMINARY | | |

| Planned Survey | | | | | | | | | |
|---|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| 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) |
| 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 |
| 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 |
| 1,201.00 | 0.00 | 0.00 | 1,201.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fox Hills Marker | | | | | | | | | |
| 1,251.00 | 0.00 | 0.00 | 1,251.00 | 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 |
| 1,451.00 | 0.00 | 0.00 | 1,451.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Start Build 2.00 | | | | | | | | | |
| 1,500.00 | 0.98 | 199.56 | 1,500.00 | -0.39 | -0.14 | -0.39 | 2.00 | 2.00 | 0.00 |
| 1,600.00 | 2.98 | 199.56 | 1,599.93 | -3.65 | -1.30 | -3.65 | 2.00 | 2.00 | 0.00 |
| 1,700.00 | 4.98 | 199.56 | 1,699.69 | -10.19 | -3.62 | -10.19 | 2.00 | 2.00 | 0.00 |
| 1,800.00 | 6.98 | 199.56 | 1,799.14 | -20.01 | -7.11 | -20.01 | 2.00 | 2.00 | 0.00 |
| 1,900.00 | 8.98 | 199.56 | 1,898.16 | -33.09 | -11.76 | -33.09 | 2.00 | 2.00 | 0.00 |
| 1,951.13 | 10.00 | 199.56 | 1,948.59 | -41.03 | -14.58 | -41.03 | 2.00 | 2.00 | 0.00 |
| Start 1869.23 hold at 1951.13 MD | | | | | | | | | |
| 2,000.00 | 10.00 | 199.56 | 1,996.72 | -49.03 | -17.42 | -49.03 | 0.00 | 0.00 | 0.00 |
| 2,100.00 | 10.00 | 199.56 | 2,095.20 | -65.40 | -23.23 | -65.40 | 0.00 | 0.00 | 0.00 |
| 2,200.00 | 10.00 | 199.56 | 2,193.68 | -81.76 | -29.05 | -81.76 | 0.00 | 0.00 | 0.00 |
| 2,300.00 | 10.00 | 199.56 | 2,292.16 | -98.13 | -34.86 | -98.13 | 0.00 | 0.00 | 0.00 |
| 2,400.00 | 10.00 | 199.56 | 2,390.64 | -114.50 | -40.68 | -114.50 | 0.00 | 0.00 | 0.00 |
| 2,500.00 | 10.00 | 199.56 | 2,489.12 | -130.87 | -46.49 | -130.87 | 0.00 | 0.00 | 0.00 |
| 2,600.00 | 10.00 | 199.56 | 2,587.60 | -147.23 | -52.31 | -147.23 | 0.00 | 0.00 | 0.00 |
| 2,700.00 | 10.00 | 199.56 | 2,686.08 | -163.60 | -58.12 | -163.60 | 0.00 | 0.00 | 0.00 |
| 2,800.00 | 10.00 | 199.56 | 2,784.56 | -179.97 | -63.94 | -179.97 | 0.00 | 0.00 | 0.00 |
| 2,900.00 | 10.00 | 199.56 | 2,883.04 | -196.33 | -69.75 | -196.33 | 0.00 | 0.00 | 0.00 |
| 3,000.00 | 10.00 | 199.56 | 2,981.52 | -212.70 | -75.57 | -212.70 | 0.00 | 0.00 | 0.00 |
| 3,100.00 | 10.00 | 199.56 | 3,080.00 | -229.07 | -81.38 | -229.07 | 0.00 | 0.00 | 0.00 |
| 3,200.00 | 10.00 | 199.56 | 3,178.48 | -245.43 | -87.20 | -245.43 | 0.00 | 0.00 | 0.00 |
| 3,300.00 | 10.00 | 199.56 | 3,276.96 | -261.80 | -93.01 | -261.80 | 0.00 | 0.00 | 0.00 |
| 3,400.00 | 10.00 | 199.56 | 3,375.44 | -278.17 | -98.83 | -278.17 | 0.00 | 0.00 | 0.00 |
| 3,500.00 | 10.00 | 199.56 | 3,473.92 | -294.54 | -104.64 | -294.54 | 0.00 | 0.00 | 0.00 |
| 3,600.00 | 10.00 | 199.56 | 3,572.40 | -310.90 | -110.46 | -310.90 | 0.00 | 0.00 | 0.00 |
| 3,700.00 | 10.00 | 199.56 | 3,670.88 | -327.27 | -116.27 | -327.27 | 0.00 | 0.00 | 0.00 |
| 3,800.00 | 10.00 | 199.56 | 3,769.36 | -343.64 | -122.09 | -343.64 | 0.00 | 0.00 | 0.00 |
| 3,820.36 | 10.00 | 199.56 | 3,789.41 | -346.97 | -123.27 | -346.97 | 0.00 | 0.00 | 0.00 |
| Start Drop -2.00 | | | | | | | | | |
| 3,900.00 | 8.41 | 199.56 | 3,868.02 | -358.97 | -127.54 | -358.97 | 2.00 | -2.00 | 0.00 |
| 4,000.00 | 6.41 | 199.56 | 3,967.18 | -371.13 | -131.86 | -371.13 | 2.00 | -2.00 | 0.00 |
| 4,100.00 | 4.41 | 199.56 | 4,066.73 | -380.01 | -135.01 | -380.01 | 2.00 | -2.00 | 0.00 |
| 4,134.35 | 3.72 | 199.56 | 4,101.00 | -382.30 | -135.83 | -382.30 | 2.00 | -2.00 | 0.00 |

| | | | |
|------------------|-----------------------------|-------------------------------------|---------------------------------------|
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| Project: | COLORADO NORTHERN ZONE - 83 | MD Reference: | GL 4966 & KB 17 @ 4983.00ft (ASSUMED) |
| Site: | SPOTTED 35-23HZ | North Reference: | True |
| Well: | SPOTTED 4C-23HZ | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | OH | | |
| Design: | PLAN #1 PRELIMINARY | | |

| Planned Survey | | | | | | | | | |
|---|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| 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) |
| Parkman | | | | | | | | | |
| 4,200.00 | 2.41 | 199.56 | 4,166.55 | -385.61 | -137.00 | -385.61 | 2.00 | -2.00 | 0.00 |
| 4,300.00 | 0.41 | 199.56 | 4,266.51 | -387.93 | -137.83 | -387.93 | 2.00 | -2.00 | 0.00 |
| 4,320.49 | 0.00 | 0.00 | 4,287.00 | -388.00 | -137.85 | -388.00 | 2.00 | -2.00 | 0.00 |
| Start 2728.04 hold at 4320.49 MD | | | | | | | | | |
| 4,400.00 | 0.00 | 0.00 | 4,366.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 4,500.00 | 0.00 | 0.00 | 4,466.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 4,506.49 | 0.00 | 0.00 | 4,473.00 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| Sussex | | | | | | | | | |
| 4,600.00 | 0.00 | 0.00 | 4,566.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 4,700.00 | 0.00 | 0.00 | 4,666.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 4,800.00 | 0.00 | 0.00 | 4,766.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 4,900.00 | 0.00 | 0.00 | 4,866.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 5,000.00 | 0.00 | 0.00 | 4,966.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 5,100.00 | 0.00 | 0.00 | 5,066.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 5,200.00 | 0.00 | 0.00 | 5,166.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 5,300.00 | 0.00 | 0.00 | 5,266.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 5,400.00 | 0.00 | 0.00 | 5,366.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 5,500.00 | 0.00 | 0.00 | 5,466.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 5,600.00 | 0.00 | 0.00 | 5,566.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 5,700.00 | 0.00 | 0.00 | 5,666.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 5,800.00 | 0.00 | 0.00 | 5,766.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 5,900.00 | 0.00 | 0.00 | 5,866.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 6,000.00 | 0.00 | 0.00 | 5,966.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 6,100.00 | 0.00 | 0.00 | 6,066.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 6,200.00 | 0.00 | 0.00 | 6,166.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 6,300.00 | 0.00 | 0.00 | 6,266.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 6,400.00 | 0.00 | 0.00 | 6,366.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 6,500.00 | 0.00 | 0.00 | 6,466.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 6,600.00 | 0.00 | 0.00 | 6,566.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 6,700.00 | 0.00 | 0.00 | 6,666.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 6,800.00 | 0.00 | 0.00 | 6,766.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 6,900.00 | 0.00 | 0.00 | 6,866.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 7,000.00 | 0.00 | 0.00 | 6,966.51 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| 7,048.53 | 0.00 | 0.00 | 7,015.04 | -388.00 | -137.85 | -388.00 | 0.00 | 0.00 | 0.00 |
| Start Build 10.00 | | | | | | | | | |
| 7,100.00 | 5.15 | 0.00 | 7,066.45 | -385.69 | -137.85 | -385.69 | 10.00 | 10.00 | 0.00 |
| 7,200.00 | 15.15 | 0.00 | 7,164.76 | -368.09 | -137.85 | -368.09 | 10.00 | 10.00 | 0.00 |
| 7,267.80 | 21.93 | 0.00 | 7,229.00 | -346.55 | -137.85 | -346.55 | 10.00 | 10.00 | 0.00 |
| Sharon Springs | | | | | | | | | |
| 7,300.00 | 25.15 | 0.00 | 7,258.52 | -333.69 | -137.85 | -333.69 | 10.00 | 10.00 | 0.00 |
| 7,347.93 | 29.94 | 0.00 | 7,301.00 | -311.54 | -137.85 | -311.54 | 10.00 | 10.00 | 0.00 |
| Niobrara A | | | | | | | | | |
| 7,400.00 | 35.15 | 0.00 | 7,344.88 | -283.53 | -137.85 | -283.53 | 10.00 | 10.00 | 0.00 |
| 7,426.26 | 37.77 | 0.00 | 7,366.00 | -267.93 | -137.85 | -267.93 | 10.00 | 10.00 | 0.00 |
| Niobrara B | | | | | | | | | |
| 7,500.00 | 45.15 | 0.00 | 7,421.22 | -219.14 | -137.85 | -219.14 | 10.00 | 10.00 | 0.00 |
| 7,516.95 | 46.84 | 0.00 | 7,433.00 | -206.95 | -137.85 | -206.95 | 10.00 | 10.00 | 0.00 |
| Niobrara C | | | | | | | | | |
| 7,600.00 | 55.15 | 0.00 | 7,485.22 | -142.47 | -137.85 | -142.47 | 10.00 | 10.00 | 0.00 |
| 7,700.00 | 65.15 | 0.00 | 7,534.94 | -55.85 | -137.85 | -55.85 | 10.00 | 10.00 | 0.00 |
| 7,775.26 | 72.67 | 0.00 | 7,562.00 | 14.33 | -137.85 | 14.33 | 10.00 | 10.00 | 0.00 |
| Fort Hays | | | | | | | | | |

| | | | |
|------------------|-----------------------------|-------------------------------------|---------------------------------------|
| Database: | EDM 5000.1 Single User Db | Local Co-ordinate Reference: | Well SPOTTED 4C-23HZ |
| Company: | US ROCKIES REGION PLANNING | TVD Reference: | GL 4966 & KB 17 @ 4983.00ft (ASSUMED) |
| Project: | COLORADO NORTHERN ZONE - 83 | MD Reference: | GL 4966 & KB 17 @ 4983.00ft (ASSUMED) |
| Site: | SPOTTED 35-23HZ | North Reference: | True |
| Well: | SPOTTED 4C-23HZ | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | OH | | |
| Design: | PLAN #1 PRELIMINARY | | |

| Planned Survey | | | | | | | | | |
|--|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| 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) |
| 7,800.00 | 75.15 | 0.00 | 7,568.85 | 38.09 | -137.85 | 38.09 | 10.00 | 10.00 | 0.00 |
| 7,872.79 | 82.43 | 0.00 | 7,583.00 | 109.45 | -137.85 | 109.45 | 10.00 | 10.00 | 0.00 |
| Codell | | | | | | | | | |
| 7,900.00 | 85.15 | 0.00 | 7,585.94 | 136.49 | -137.85 | 136.49 | 10.00 | 10.00 | 0.00 |
| 7,949.72 | 90.12 | 0.00 | 7,588.00 | 186.15 | -137.85 | 186.15 | 10.00 | 10.00 | 0.00 |
| Start 4810.69 hold at 7949.72 MD - 7" (460 FSL 711 FWL) | | | | | | | | | |
| 8,000.00 | 90.12 | 0.00 | 7,587.89 | 236.43 | -137.85 | 236.43 | 0.00 | 0.00 | 0.00 |
| 8,100.00 | 90.12 | 0.00 | 7,587.68 | 336.43 | -137.85 | 336.43 | 0.00 | 0.00 | 0.00 |
| 8,200.00 | 90.12 | 0.00 | 7,587.48 | 436.43 | -137.85 | 436.43 | 0.00 | 0.00 | 0.00 |
| 8,300.00 | 90.12 | 0.00 | 7,587.27 | 536.43 | -137.85 | 536.43 | 0.00 | 0.00 | 0.00 |
| 8,400.00 | 90.12 | 0.00 | 7,587.06 | 636.43 | -137.85 | 636.43 | 0.00 | 0.00 | 0.00 |
| 8,500.00 | 90.12 | 0.00 | 7,586.85 | 736.43 | -137.85 | 736.43 | 0.00 | 0.00 | 0.00 |
| 8,600.00 | 90.12 | 0.00 | 7,586.65 | 836.43 | -137.85 | 836.43 | 0.00 | 0.00 | 0.00 |
| 8,700.00 | 90.12 | 0.00 | 7,586.44 | 936.43 | -137.85 | 936.43 | 0.00 | 0.00 | 0.00 |
| 8,800.00 | 90.12 | 0.00 | 7,586.23 | 1,036.43 | -137.85 | 1,036.43 | 0.00 | 0.00 | 0.00 |
| 8,900.00 | 90.12 | 0.00 | 7,586.02 | 1,136.43 | -137.85 | 1,136.43 | 0.00 | 0.00 | 0.00 |
| 9,000.00 | 90.12 | 0.00 | 7,585.81 | 1,236.43 | -137.85 | 1,236.43 | 0.00 | 0.00 | 0.00 |
| 9,100.00 | 90.12 | 0.00 | 7,585.61 | 1,336.43 | -137.85 | 1,336.43 | 0.00 | 0.00 | 0.00 |
| 9,200.00 | 90.12 | 0.00 | 7,585.40 | 1,436.43 | -137.85 | 1,436.43 | 0.00 | 0.00 | 0.00 |
| 9,300.00 | 90.12 | 0.00 | 7,585.19 | 1,536.43 | -137.85 | 1,536.43 | 0.00 | 0.00 | 0.00 |
| 9,400.00 | 90.12 | 0.00 | 7,584.98 | 1,636.43 | -137.85 | 1,636.43 | 0.00 | 0.00 | 0.00 |
| 9,500.00 | 90.12 | 0.00 | 7,584.78 | 1,736.43 | -137.85 | 1,736.43 | 0.00 | 0.00 | 0.00 |
| 9,600.00 | 90.12 | 0.00 | 7,584.57 | 1,836.43 | -137.85 | 1,836.43 | 0.00 | 0.00 | 0.00 |
| 9,700.00 | 90.12 | 0.00 | 7,584.36 | 1,936.43 | -137.85 | 1,936.43 | 0.00 | 0.00 | 0.00 |
| 9,800.00 | 90.12 | 0.00 | 7,584.15 | 2,036.43 | -137.85 | 2,036.43 | 0.00 | 0.00 | 0.00 |
| 9,900.00 | 90.12 | 0.00 | 7,583.94 | 2,136.43 | -137.85 | 2,136.43 | 0.00 | 0.00 | 0.00 |
| 10,000.00 | 90.12 | 0.00 | 7,583.74 | 2,236.43 | -137.85 | 2,236.43 | 0.00 | 0.00 | 0.00 |
| 10,100.00 | 90.12 | 0.00 | 7,583.53 | 2,336.43 | -137.85 | 2,336.43 | 0.00 | 0.00 | 0.00 |
| 10,200.00 | 90.12 | 0.00 | 7,583.32 | 2,436.43 | -137.85 | 2,436.43 | 0.00 | 0.00 | 0.00 |
| 10,300.00 | 90.12 | 0.00 | 7,583.11 | 2,536.43 | -137.85 | 2,536.43 | 0.00 | 0.00 | 0.00 |
| 10,400.00 | 90.12 | 0.00 | 7,582.91 | 2,636.43 | -137.85 | 2,636.43 | 0.00 | 0.00 | 0.00 |
| 10,500.00 | 90.12 | 0.00 | 7,582.70 | 2,736.43 | -137.85 | 2,736.43 | 0.00 | 0.00 | 0.00 |
| 10,600.00 | 90.12 | 0.00 | 7,582.49 | 2,836.43 | -137.85 | 2,836.43 | 0.00 | 0.00 | 0.00 |
| 10,700.00 | 90.12 | 0.00 | 7,582.28 | 2,936.43 | -137.85 | 2,936.43 | 0.00 | 0.00 | 0.00 |
| 10,800.00 | 90.12 | 0.00 | 7,582.07 | 3,036.43 | -137.85 | 3,036.43 | 0.00 | 0.00 | 0.00 |
| 10,900.00 | 90.12 | 0.00 | 7,581.87 | 3,136.43 | -137.85 | 3,136.43 | 0.00 | 0.00 | 0.00 |
| 11,000.00 | 90.12 | 0.00 | 7,581.66 | 3,236.43 | -137.85 | 3,236.43 | 0.00 | 0.00 | 0.00 |
| 11,100.00 | 90.12 | 0.00 | 7,581.45 | 3,336.43 | -137.85 | 3,336.43 | 0.00 | 0.00 | 0.00 |
| 11,200.00 | 90.12 | 0.00 | 7,581.24 | 3,436.43 | -137.85 | 3,436.43 | 0.00 | 0.00 | 0.00 |
| 11,300.00 | 90.12 | 0.00 | 7,581.03 | 3,536.43 | -137.85 | 3,536.43 | 0.00 | 0.00 | 0.00 |
| 11,400.00 | 90.12 | 0.00 | 7,580.83 | 3,636.42 | -137.85 | 3,636.42 | 0.00 | 0.00 | 0.00 |
| 11,500.00 | 90.12 | 0.00 | 7,580.62 | 3,736.42 | -137.85 | 3,736.42 | 0.00 | 0.00 | 0.00 |
| 11,600.00 | 90.12 | 0.00 | 7,580.41 | 3,836.42 | -137.85 | 3,836.42 | 0.00 | 0.00 | 0.00 |
| 11,700.00 | 90.12 | 0.00 | 7,580.20 | 3,936.42 | -137.85 | 3,936.42 | 0.00 | 0.00 | 0.00 |
| 11,800.00 | 90.12 | 0.00 | 7,580.00 | 4,036.42 | -137.85 | 4,036.42 | 0.00 | 0.00 | 0.00 |
| 11,900.00 | 90.12 | 0.00 | 7,579.79 | 4,136.42 | -137.85 | 4,136.42 | 0.00 | 0.00 | 0.00 |
| 12,000.00 | 90.12 | 0.00 | 7,579.58 | 4,236.42 | -137.85 | 4,236.42 | 0.00 | 0.00 | 0.00 |
| 12,100.00 | 90.12 | 0.00 | 7,579.37 | 4,336.42 | -137.85 | 4,336.42 | 0.00 | 0.00 | 0.00 |
| 12,200.00 | 90.12 | 0.00 | 7,579.16 | 4,436.42 | -137.85 | 4,436.42 | 0.00 | 0.00 | 0.00 |
| 12,300.00 | 90.12 | 0.00 | 7,578.96 | 4,536.42 | -137.85 | 4,536.42 | 0.00 | 0.00 | 0.00 |
| 12,400.00 | 90.12 | 0.00 | 7,578.75 | 4,636.42 | -137.85 | 4,636.42 | 0.00 | 0.00 | 0.00 |
| 12,500.00 | 90.12 | 0.00 | 7,578.54 | 4,736.42 | -137.85 | 4,736.42 | 0.00 | 0.00 | 0.00 |
| 12,600.00 | 90.12 | 0.00 | 7,578.33 | 4,836.42 | -137.85 | 4,836.42 | 0.00 | 0.00 | 0.00 |
| 12,700.00 | 90.12 | 0.00 | 7,578.13 | 4,936.42 | -137.85 | 4,936.42 | 0.00 | 0.00 | 0.00 |

| | | | |
|------------------|-----------------------------|-------------------------------------|---------------------------------------|
| Database: | EDM 5000.1 Single User Db | Local Co-ordinate Reference: | Well SPOTTED 4C-23HZ |
| Company: | US ROCKIES REGION PLANNING | TVD Reference: | GL 4966 & KB 17 @ 4983.00ft (ASSUMED) |
| Project: | COLORADO NORTHERN ZONE - 83 | MD Reference: | GL 4966 & KB 17 @ 4983.00ft (ASSUMED) |
| Site: | SPOTTED 35-23HZ | North Reference: | True |
| Well: | SPOTTED 4C-23HZ | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | OH | | |
| Design: | PLAN #1 PRELIMINARY | | |

| Planned Survey | | | | | | | | | |
|--|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| 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) |
| 12,760.41 | 90.12 | 0.00 | 7,578.00 | 4,996.83 | -137.85 | 4,996.83 | 0.00 | 0.00 | 0.00 |
| TD at 12760.41 - PBHL_SPOTTED 4C-23HZ(1 FNL 685 FWL) | | | | | | | | | |

| Design Targets | | | | | | | | | |
|--|---------------|--------------|----------|------------|------------|-----------------|----------------|------------|--------------|
| Target Name - hit/miss target - Shape | Dip Angle (°) | Dip Dir. (°) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (usft) | Easting (usft) | Latitude | Longitude |
| PBHL_SPOTTED 4C-23 - plan hits target center - Point | 0.00 | 0.00 | 7,578.00 | 4,996.83 | -137.85 | 1,291,156.28 | 3,177,571.40 | 40.1308720 | -104.8649400 |

| Casing Points | | | | | |
|---------------------|---------------------|----------------------|----------------------|--------------------|--|
| Measured Depth (ft) | Vertical Depth (ft) | Name | Casing Diameter (in) | Hole Diameter (in) | |
| 1,251.00 | 1,251.00 | 9 5/8" | 9.625 | 12.250 | |
| 7,949.72 | 7,588.00 | 7" (460 FSL 711 FWL) | 7.000 | 7.500 | |

| Formations | | | | | | |
|---------------------|---------------------|------------------|-----------|---------|-------------------|--|
| Measured Depth (ft) | Vertical Depth (ft) | Name | Lithology | Dip (°) | Dip Direction (°) | |
| 1,201.00 | 1,201.00 | Fox Hills Marker | | | | |
| 4,134.35 | 4,101.00 | Parkman | | | | |
| 4,506.49 | 4,473.00 | Sussex | | | | |
| 7,267.80 | 7,229.00 | Sharon Springs | | | | |
| 7,347.93 | 7,301.00 | Niobrara A | | | | |
| 7,426.26 | 7,366.00 | Niobrara B | | | | |
| 7,516.95 | 7,433.00 | Niobrara C | | | | |
| 7,775.26 | 7,562.00 | Fort Hays | | | | |
| 7,872.79 | 7,583.00 | Codell | | | | |

| Plan Annotations | | | | | |
|---------------------|---------------------|-------------------|------------|----------------------------------|--|
| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates | | | |
| | | +N/-S (ft) | +E/-W (ft) | Comment | |
| 1,451.00 | 1,451.00 | 0.00 | 0.00 | Start Build 2.00 | |
| 1,951.13 | 1,948.59 | -41.03 | -14.58 | Start 1869.23 hold at 1951.13 MD | |
| 3,820.36 | 3,789.41 | -346.97 | -123.27 | Start Drop -2.00 | |
| 4,320.49 | 4,287.00 | -388.00 | -137.85 | Start 2728.04 hold at 4320.49 MD | |
| 7,048.53 | 7,015.04 | -388.00 | -137.85 | Start Build 10.00 | |
| 7,949.72 | 7,588.00 | 186.15 | -137.85 | Start 4810.69 hold at 7949.72 MD | |
| 12,760.41 | 7,578.00 | 4,996.83 | -137.85 | TD at 12760.41 | |