Schlumberger

# Final Survey - Cimarex Canyonlands 2 State Com 2H 0ft to 16218ft (Surcon Corrected) Final Survey Geodetic Report

**(Def Survey)**

CIMAREX

| | | | |
|---|---|---|---|
| **Report Date:** | September 05, 2018 - 02:21 PM | **Survey / DLS Computation:** | Minimum Curvature / Lubinski |
| **Client:** | Cimarex | **Vertical Section Azimuth:** | 359.297 ° (Grid North) |
| **Field:** | NM Lea County (NAD 83) | **Vertical Section Origin:** | 0.000 ft, 0.000 ft |
| **Structure / Slot:** | Cimarex Canyonlands 2 State Com 2H / Cimarex Canyonlands 2 State Com 2H | **TVD Reference Datum:** | RKB |
| **Well:** | Cimarex Canyonlands 2 State Com 2H | **TVD Reference Elevation:** | 3448.900 ft above MSL |
| **Borehole:** | Original Borehole | **Seabed / Ground Elevation:** | 3425.900 ft above MSL |
| **UWI / API#:** | Unknown / Unknown | **Magnetic Declination:** | 6.723 ° |
| **Survey Name:** | Final Survey - Cimarex Canyonlands 2 State Com 2H 0ft to 16218ft (Surcon Corrected) | **Total Gravity Field Strength:** | 998.4634mgn (9.80665 Based) |
| **Survey Date:** | June 29, 2018 | **Gravity Model:** | GARM |
| **Tort / AHD / DDI / ERD Ratio:** | 216.319 ° / 5516.946 ft / 6.219 / 0.472 | **Total Magnetic Field Strength:** | 48010.111 nT |
| **Coordinate Reference System:** | NAD83 New Mexico State Plane, Eastern Zone, US Feet | **Magnetic Dip Angle:** | 59.959 ° |
| **Location Lat / Long:** | N 32° 14' 25.30017", W 103° 26' 7.60538" | **Declination Date:** | August 22, 2018 |
| **Location Grid N/E Y/X:** | N 452337.390 ftUS, E 818948.260 ftUS | **Magnetic Declination Model:** | HDGM 2018 |
| **CRS Grid Convergence Angle:** | 0.4790 ° | **North Reference:** | Grid North |
| **Grid Scale Factor:** | 0.99999736 | **Grid Convergence Used:** | 0.4790 ° |
| **Version / Patch:** | 2.10.740.0 | **Total Corr Mag North->Grid North:** | 6.2443 ° |
| | | **Local Coord Referenced To:** | Structure Reference Point |

| Comments | MD (ft) | Incl (°) | Azim Grid (°) | TVD (ft) | VSEC (ft) | NS (ft) | EW (ft) | DLS (°/100ft) | Northing (ftUS) | Easting (ftUS) | Latitude (N/S ° ' ") | Longitude (E/W ° ' ") |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SHL [390' FSL, 1000' FEL] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | N/A | 452337.39 | 818948.26 | N 32 14 25.30 | W 103 26 7.61 |
| | 198.00 | 1.14 | 27.96 | 197.99 | 1.73 | 1.74 | 0.92 | 0.58 | 452339.13 | 818949.18 | N 32 14 25.32 | W 103 26 7.59 |
| | 291.00 | 1.15 | 28.17 | 290.97 | 3.36 | 3.38 | 1.80 | 0.01 | 452340.77 | 818950.06 | N 32 14 25.33 | W 103 26 7.58 |
| | 389.00 | 1.25 | 36.20 | 388.95 | 5.07 | 5.11 | 2.89 | 0.20 | 452342.50 | 818951.15 | N 32 14 25.35 | W 103 26 7.57 |
| | 480.00 | 1.34 | 32.24 | 479.92 | 6.76 | 6.81 | 4.05 | 0.14 | 452344.20 | 818952.31 | N 32 14 25.37 | W 103 26 7.56 |
| | 570.00 | 1.32 | 28.60 | 569.90 | 8.55 | 8.61 | 5.10 | 0.10 | 452346.00 | 818953.36 | N 32 14 25.38 | W 103 26 7.55 |
| | 662.00 | 1.03 | 29.01 | 661.88 | 10.19 | 10.26 | 6.01 | 0.32 | 452347.65 | 818954.27 | N 32 14 25.40 | W 103 26 7.53 |
| | 753.00 | 1.08 | 15.81 | 752.86 | 11.72 | 11.80 | 6.64 | 0.27 | 452349.19 | 818954.90 | N 32 14 25.42 | W 103 26 7.53 |
| | 844.00 | 1.23 | 25.66 | 843.85 | 13.42 | 13.51 | 7.30 | 0.27 | 452350.90 | 818955.56 | N 32 14 25.43 | W 103 26 7.52 |
| | 926.00 | 1.44 | 23.45 | 925.82 | 15.15 | 15.25 | 8.09 | 0.26 | 452352.64 | 818956.35 | N 32 14 25.45 | W 103 26 7.51 |
| | 1023.00 | 1.28 | 23.26 | 1022.80 | 17.25 | 17.36 | 9.00 | 0.17 | 452354.75 | 818957.26 | N 32 14 25.47 | W 103 26 7.50 |
| | 1118.00 | 0.91 | 40.53 | 1117.78 | 18.79 | 18.91 | 9.91 | 0.52 | 452356.30 | 818958.17 | N 32 14 25.49 | W 103 26 7.49 |
| | 1213.00 | 0.38 | 76.82 | 1212.77 | 19.42 | 19.56 | 10.71 | 0.68 | 452356.95 | 818958.97 | N 32 14 25.49 | W 103 26 7.48 |
| | 1307.00 | 0.52 | 37.66 | 1306.77 | 19.82 | 19.96 | 11.27 | 0.35 | 452357.35 | 818959.53 | N 32 14 25.50 | W 103 26 7.47 |
| | 1400.00 | 0.68 | 154.70 | 1399.77 | 19.65 | 19.80 | 11.77 | 1.10 | 452357.19 | 818960.03 | N 32 14 25.50 | W 103 26 7.47 |
| | 1495.00 | 1.71 | 188.55 | 1494.75 | 17.74 | 17.89 | 11.80 | 1.27 | 452355.28 | 818960.06 | N 32 14 25.48 | W 103 26 7.47 |
| | 1589.00 | 1.55 | 183.66 | 1588.71 | 15.09 | 15.23 | 11.51 | 0.23 | 452352.62 | 818959.77 | N 32 14 25.45 | W 103 26 7.47 |
| | 1684.00 | 1.52 | 175.83 | 1683.67 | 12.55 | 12.69 | 11.52 | 0.22 | 452350.08 | 818959.78 | N 32 14 25.42 | W 103 26 7.47 |
| | 1778.00 | 1.32 | 183.33 | 1777.65 | 10.23 | 10.37 | 11.55 | 0.29 | 452347.76 | 818959.81 | N 32 14 25.40 | W 103 26 7.47 |
| | 1872.00 | 1.57 | 178.72 | 1871.62 | 7.86 | 8.00 | 11.51 | 0.29 | 452345.39 | 818959.77 | N 32 14 25.38 | W 103 26 7.47 |
| | 1966.00 | 1.50 | 180.81 | 1965.58 | 5.34 | 5.48 | 11.52 | 0.10 | 452342.87 | 818959.78 | N 32 14 25.35 | W 103 26 7.47 |
| | 2060.00 | 1.66 | 178.17 | 2059.55 | 2.75 | 2.89 | 11.55 | 0.19 | 452340.28 | 818959.81 | N 32 14 25.33 | W 103 26 7.47 |
| | 2155.00 | 1.63 | 184.02 | 2154.51 | 0.03 | 0.17 | 11.50 | 0.18 | 452337.56 | 818959.76 | N 32 14 25.30 | W 103 26 7.47 |
| | 2249.00 | 1.71 | 184.65 | 2248.47 | -2.70 | -2.56 | 11.29 | 0.09 | 452334.83 | 818959.55 | N 32 14 25.27 | W 103 26 7.47 |

| Comments | MD (ft) | Incl (°) | Azim Grid (°) | TVD (ft) | VSEC (ft) | NS (ft) | EW (ft) | DLS (°/100ft) | Northing (ftUS) | Easting (ftUS) | Latitude (N/S ° ' ") | Longitude (E/W ° ' ") |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2344.00 | 1.80 | 181.32 | 2343.42 | -5.60 | -5.47 | 11.14 | 0.14 | 452331.92 | 818959.40 | N 32 14 25.25 | W 103 26 7.48 |
| | 2439.00 | 1.75 | 186.06 | 2438.38 | -8.53 | -8.40 | 10.95 | 0.16 | 452328.99 | 818959.21 | N 32 14 25.22 | W 103 26 7.48 |
| | 2533.00 | 1.67 | 181.09 | 2532.34 | -11.33 | -11.20 | 10.78 | 0.18 | 452326.19 | 818959.04 | N 32 14 25.19 | W 103 26 7.48 |
| | 2627.00 | 1.67 | 187.25 | 2626.30 | -14.05 | -13.93 | 10.58 | 0.19 | 452323.46 | 818958.84 | N 32 14 25.16 | W 103 26 7.48 |
| | 2722.00 | 0.58 | 197.22 | 2721.28 | -15.88 | -15.76 | 10.26 | 1.16 | 452321.63 | 818958.52 | N 32 14 25.14 | W 103 26 7.49 |
| | 2816.00 | 1.32 | 6.89 | 2815.27 | -15.26 | -15.14 | 10.25 | 2.01 | 452322.25 | 818958.51 | N 32 14 25.15 | W 103 26 7.49 |
| | 2909.00 | 1.71 | 13.77 | 2908.24 | -12.86 | -12.73 | 10.71 | 0.46 | 452324.66 | 818958.97 | N 32 14 25.17 | W 103 26 7.48 |
| | 3004.00 | 2.23 | 15.17 | 3003.18 | -9.71 | -9.57 | 11.53 | 0.55 | 452327.82 | 818959.79 | N 32 14 25.20 | W 103 26 7.47 |
| | 3098.00 | 2.52 | 17.41 | 3097.10 | -5.98 | -5.83 | 12.63 | 0.32 | 452331.56 | 818960.89 | N 32 14 25.24 | W 103 26 7.46 |
| | 3193.00 | 3.24 | 26.50 | 3191.98 | -1.61 | -1.43 | 14.45 | 0.90 | 452335.96 | 818962.71 | N 32 14 25.28 | W 103 26 7.44 |
| | 3288.00 | 2.45 | 34.57 | 3286.86 | 2.43 | 2.64 | 16.80 | 0.93 | 452340.03 | 818965.06 | N 32 14 25.32 | W 103 26 7.41 |
| | 3382.00 | 2.80 | 36.73 | 3380.76 | 5.90 | 6.14 | 19.31 | 0.39 | 452343.53 | 818967.57 | N 32 14 25.36 | W 103 26 7.38 |
| | 3476.00 | 1.55 | 49.69 | 3474.69 | 8.53 | 8.80 | 21.66 | 1.42 | 452346.19 | 818969.92 | N 32 14 25.39 | W 103 26 7.35 |
| | 3571.00 | 2.99 | 60.76 | 3569.62 | 10.53 | 10.84 | 24.80 | 1.58 | 452348.23 | 818973.06 | N 32 14 25.41 | W 103 26 7.32 |
| | 3666.00 | 4.64 | 75.00 | 3664.41 | 12.67 | 13.04 | 30.67 | 1.99 | 452350.43 | 818978.93 | N 32 14 25.43 | W 103 26 7.25 |
| | 3761.00 | 5.72 | 84.02 | 3759.02 | 14.05 | 14.53 | 39.09 | 1.42 | 452351.92 | 818987.35 | N 32 14 25.44 | W 103 26 7.15 |
| | 3855.00 | 7.81 | 89.31 | 3852.36 | 14.48 | 15.10 | 50.14 | 2.32 | 452352.49 | 818998.40 | N 32 14 25.45 | W 103 26 7.02 |
| | 3950.00 | 8.07 | 100.27 | 3946.45 | 13.21 | 13.99 | 63.15 | 1.61 | 452351.38 | 819011.41 | N 32 14 25.43 | W 103 26 6.87 |
| | 4044.00 | 8.31 | 99.14 | 4039.50 | 10.79 | 11.73 | 76.35 | 0.31 | 452349.12 | 819024.61 | N 32 14 25.41 | W 103 26 6.72 |
| | 4138.00 | 7.79 | 91.56 | 4132.57 | 9.38 | 10.48 | 89.43 | 1.26 | 452347.87 | 819037.69 | N 32 14 25.40 | W 103 26 6.56 |
| | 4232.00 | 9.49 | 95.20 | 4225.50 | 8.33 | 9.60 | 103.52 | 1.90 | 452346.99 | 819051.77 | N 32 14 25.39 | W 103 26 6.40 |
| | 4326.00 | 10.44 | 95.43 | 4318.08 | 6.62 | 8.09 | 119.71 | 1.01 | 452345.48 | 819067.97 | N 32 14 25.37 | W 103 26 6.21 |
| | 4421.00 | 10.55 | 97.50 | 4411.49 | 4.46 | 6.14 | 136.90 | 0.41 | 452343.53 | 819085.16 | N 32 14 25.35 | W 103 26 6.01 |
| | 4515.00 | 8.75 | 95.18 | 4504.16 | 2.50 | 4.38 | 152.56 | 1.96 | 452341.77 | 819100.82 | N 32 14 25.33 | W 103 26 5.83 |
| | 4609.00 | 8.53 | 94.23 | 4597.09 | 1.17 | 3.22 | 166.63 | 0.28 | 452340.61 | 819114.89 | N 32 14 25.32 | W 103 26 5.67 |
| | 4704.00 | 9.74 | 99.40 | 4690.89 | -0.84 | 1.38 | 181.58 | 1.54 | 452338.77 | 819129.84 | N 32 14 25.30 | W 103 26 5.49 |
| | 4798.00 | 9.67 | 98.21 | 4783.54 | -3.46 | -1.04 | 197.24 | 0.23 | 452336.35 | 819145.50 | N 32 14 25.27 | W 103 26 5.31 |
| | 4893.00 | 8.95 | 97.58 | 4877.29 | -5.76 | -3.16 | 212.47 | 0.77 | 452334.23 | 819160.72 | N 32 14 25.25 | W 103 26 5.13 |
| | 4986.00 | 8.27 | 94.33 | 4969.24 | -7.39 | -4.62 | 226.31 | 0.90 | 452332.77 | 819174.56 | N 32 14 25.24 | W 103 26 4.97 |
| | 5081.00 | 6.64 | 94.62 | 5063.44 | -8.50 | -5.57 | 238.59 | 1.72 | 452331.82 | 819186.85 | N 32 14 25.23 | W 103 26 4.83 |
| | 5176.00 | 5.75 | 93.07 | 5157.88 | -9.32 | -6.27 | 248.82 | 0.95 | 452331.12 | 819197.08 | N 32 14 25.22 | W 103 26 4.71 |
| | 5270.00 | 5.12 | 92.49 | 5251.46 | -9.87 | -6.71 | 257.71 | 0.67 | 452330.68 | 819205.97 | N 32 14 25.21 | W 103 26 4.61 |
| | 5364.00 | 5.87 | 85.50 | 5345.03 | -9.78 | -6.51 | 266.70 | 1.07 | 452330.88 | 819214.95 | N 32 14 25.21 | W 103 26 4.50 |
| | 5458.00 | 6.87 | 82.68 | 5438.45 | -8.82 | -5.42 | 277.06 | 1.11 | 452331.97 | 819225.32 | N 32 14 25.22 | W 103 26 4.38 |
| | 5554.00 | 6.82 | 82.10 | 5533.76 | -7.44 | -3.90 | 288.41 | 0.09 | 452333.49 | 819236.66 | N 32 14 25.24 | W 103 26 4.25 |
| | 5648.00 | 7.16 | 80.87 | 5627.06 | -5.88 | -2.21 | 299.72 | 0.40 | 452335.18 | 819247.98 | N 32 14 25.25 | W 103 26 4.12 |
| | 5743.00 | 6.98 | 79.78 | 5721.34 | -4.06 | -0.24 | 311.24 | 0.24 | 452337.15 | 819259.50 | N 32 14 25.27 | W 103 26 3.98 |
| | 5836.00 | 6.99 | 78.94 | 5813.65 | -2.11 | 1.85 | 322.36 | 0.11 | 452339.24 | 819270.62 | N 32 14 25.29 | W 103 26 3.85 |
| | 5932.00 | 6.70 | 78.11 | 5908.97 | 0.03 | 4.12 | 333.57 | 0.32 | 452341.51 | 819281.83 | N 32 14 25.31 | W 103 26 3.72 |
| | 6026.00 | 5.52 | 74.39 | 6002.43 | 2.25 | 6.47 | 343.29 | 1.32 | 452343.86 | 819291.55 | N 32 14 25.34 | W 103 26 3.61 |
| | 6120.00 | 6.45 | 83.99 | 6095.92 | 3.91 | 8.24 | 352.90 | 1.45 | 452345.63 | 819301.16 | N 32 14 25.35 | W 103 26 3.50 |
| | 6215.00 | 6.49 | 85.78 | 6190.31 | 4.73 | 9.19 | 363.56 | 0.22 | 452346.58 | 819311.82 | N 32 14 25.36 | W 103 26 3.37 |
| | 6309.00 | 6.20 | 83.08 | 6283.74 | 5.60 | 10.19 | 373.90 | 0.44 | 452347.58 | 819322.15 | N 32 14 25.37 | W 103 26 3.25 |
| | 6403.00 | 6.01 | 86.68 | 6377.21 | 6.38 | 11.09 | 383.85 | 0.45 | 452348.48 | 819332.11 | N 32 14 25.38 | W 103 26 3.14 |
| | 6497.00 | 6.92 | 86.81 | 6470.61 | 6.85 | 11.69 | 394.41 | 0.97 | 452349.08 | 819342.67 | N 32 14 25.38 | W 103 26 3.01 |
| | 6591.00 | 7.18 | 88.00 | 6563.90 | 7.23 | 12.21 | 405.94 | 0.32 | 452349.60 | 819354.20 | N 32 14 25.39 | W 103 26 2.88 |
| | 6686.00 | 7.23 | 87.60 | 6658.15 | 7.54 | 12.67 | 417.85 | 0.07 | 452350.06 | 819366.10 | N 32 14 25.39 | W 103 26 2.74 |
| | 6780.00 | 6.76 | 87.04 | 6751.45 | 7.93 | 13.20 | 429.28 | 0.51 | 452350.59 | 819377.54 | N 32 14 25.40 | W 103 26 2.61 |
| | 6874.00 | 6.45 | 85.84 | 6844.82 | 8.47 | 13.87 | 440.07 | 0.36 | 452351.26 | 819388.33 | N 32 14 25.40 | W 103 26 2.48 |
| | 6968.00 | 6.04 | 84.75 | 6938.26 | 9.18 | 14.70 | 450.26 | 0.45 | 452352.09 | 819398.52 | N 32 14 25.41 | W 103 26 2.36 |
| | 7062.00 | 5.79 | 84.04 | 7031.76 | 10.01 | 15.65 | 459.90 | 0.28 | 452353.04 | 819408.16 | N 32 14 25.42 | W 103 26 2.25 |
| | 7157.00 | 5.52 | 81.79 | 7126.30 | 11.04 | 16.80 | 469.19 | 0.37 | 452354.19 | 819417.45 | N 32 14 25.43 | W 103 26 2.14 |
| | 7251.00 | 5.37 | 83.08 | 7219.88 | 12.11 | 17.97 | 478.03 | 0.21 | 452355.36 | 819426.29 | N 32 14 25.44 | W 103 26 2.04 |
| | 7346.00 | 5.94 | 83.27 | 7314.41 | 13.11 | 19.09 | 487.33 | 0.60 | 452356.48 | 819435.58 | N 32 14 25.45 | W 103 26 1.93 |
| | 7441.00 | 7.35 | 91.52 | 7408.78 | 13.39 | 19.50 | 498.28 | 1.79 | 452356.89 | 819446.54 | N 32 14 25.45 | W 103 26 1.80 |
| | 7536.00 | 6.90 | 93.86 | 7503.04 | 12.70 | 18.96 | 510.05 | 0.56 | 452356.35 | 819458.31 | N 32 14 25.45 | W 103 26 1.67 |
| | 7630.00 | 5.49 | 96.15 | 7596.49 | 11.71 | 18.09 | 520.16 | 1.52 | 452355.48 | 819468.41 | N 32 14 25.44 | W 103 26 1.55 |
| | 7725.00 | 5.70 | 91.50 | 7691.04 | 10.99 | 17.48 | 529.39 | 0.53 | 452354.87 | 819477.65 | N 32 14 25.43 | W 103 26 1.44 |

| Comments | MD (ft) | Incl (°) | Azim Grid (°) | TVD (ft) | VSEC (ft) | NS (ft) | EW (ft) | DLS (°/100ft) | Northing (ftUS) | Easting (ftUS) | Latitude (N/S ° ' ") | Longitude (E/W ° ' ") |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 7819.00 | 5.65 | 90.60 | 7784.58 | 10.70 | 17.31 | 538.68 | 0.11 | 452354.70 | 819486.94 | N 32 14 25.43 | W 103 26 1.33 |
| | 7914.00 | 4.85 | 86.75 | 7879.18 | 10.77 | 17.49 | 547.37 | 0.92 | 452354.88 | 819495.63 | N 32 14 25.43 | W 103 26 1.23 |
| | 8009.00 | 5.43 | 86.76 | 7973.80 | 11.15 | 17.97 | 555.87 | 0.61 | 452355.36 | 819504.13 | N 32 14 25.43 | W 103 26 1.13 |
| | 8104.00 | 5.38 | 93.08 | 8068.38 | 11.06 | 17.99 | 564.80 | 0.63 | 452355.38 | 819513.06 | N 32 14 25.43 | W 103 26 1.03 |
| | 8198.00 | 4.75 | 90.40 | 8162.01 | 10.69 | 17.72 | 573.10 | 0.72 | 452355.11 | 819521.35 | N 32 14 25.43 | W 103 26 0.93 |
| | 8293.00 | 4.41 | 89.26 | 8256.71 | 10.62 | 17.74 | 580.68 | 0.37 | 452355.13 | 819528.94 | N 32 14 25.43 | W 103 26 0.84 |
| | 8387.00 | 4.07 | 84.77 | 8350.45 | 10.88 | 18.09 | 587.62 | 0.51 | 452355.48 | 819535.87 | N 32 14 25.43 | W 103 26 0.76 |
| | 8482.00 | 3.54 | 82.06 | 8445.24 | 11.52 | 18.81 | 593.88 | 0.59 | 452356.20 | 819542.14 | N 32 14 25.44 | W 103 26 0.69 |
| | 8576.00 | 4.15 | 100.76 | 8539.03 | 11.21 | 18.57 | 600.09 | 1.47 | 452355.96 | 819548.35 | N 32 14 25.43 | W 103 26 0.62 |
| | 8670.00 | 4.05 | 106.08 | 8632.79 | 9.57 | 17.02 | 606.63 | 0.42 | 452354.41 | 819554.88 | N 32 14 25.42 | W 103 26 0.54 |
| | 8765.00 | 2.60 | 125.83 | 8727.63 | 7.32 | 14.83 | 611.60 | 1.92 | 452352.22 | 819559.85 | N 32 14 25.40 | W 103 26 0.48 |
| | 8859.00 | 1.52 | 130.45 | 8821.57 | 5.23 | 12.77 | 614.27 | 1.16 | 452350.16 | 819562.53 | N 32 14 25.38 | W 103 26 0.45 |
| | 8955.00 | 0.98 | 116.06 | 8917.55 | 4.03 | 11.58 | 615.98 | 0.65 | 452348.97 | 819564.24 | N 32 14 25.36 | W 103 26 0.43 |
| | 9050.00 | 0.33 | 92.45 | 9012.54 | 3.64 | 11.22 | 616.98 | 0.73 | 452348.61 | 819565.24 | N 32 14 25.36 | W 103 26 0.42 |
| | 9144.00 | 0.09 | 145.16 | 9106.54 | 3.57 | 11.14 | 617.30 | 0.30 | 452348.53 | 819565.55 | N 32 14 25.36 | W 103 26 0.42 |
| | 9239.00 | 0.35 | 286.61 | 9201.54 | 3.59 | 11.17 | 617.06 | 0.45 | 452348.56 | 819565.32 | N 32 14 25.36 | W 103 26 0.42 |
| | 9333.00 | 0.57 | 285.71 | 9295.53 | 3.81 | 11.37 | 616.34 | 0.23 | 452348.76 | 819564.59 | N 32 14 25.36 | W 103 26 0.43 |
| | 9427.00 | 0.75 | 272.87 | 9389.53 | 3.98 | 11.53 | 615.27 | 0.25 | 452348.92 | 819563.53 | N 32 14 25.36 | W 103 26 0.44 |
| | 9521.00 | 1.12 | 306.82 | 9483.52 | 4.58 | 12.11 | 613.92 | 0.69 | 452349.50 | 819562.18 | N 32 14 25.37 | W 103 26 0.46 |
| | 9616.00 | 1.69 | 316.43 | 9578.49 | 6.17 | 13.68 | 612.21 | 0.65 | 452351.07 | 819560.47 | N 32 14 25.38 | W 103 26 0.48 |
| | 9711.00 | 2.12 | 289.38 | 9673.44 | 7.80 | 15.28 | 609.59 | 1.04 | 452352.67 | 819557.85 | N 32 14 25.40 | W 103 26 0.51 |
| | 9805.00 | 2.66 | 264.33 | 9767.36 | 8.21 | 15.64 | 605.78 | 1.24 | 452353.03 | 819554.04 | N 32 14 25.40 | W 103 26 0.55 |
| | 9900.00 | 2.95 | 254.44 | 9862.24 | 7.39 | 14.77 | 601.23 | 0.59 | 452352.16 | 819549.49 | N 32 14 25.40 | W 103 26 0.60 |
| | 9993.00 | 2.45 | 244.60 | 9955.14 | 5.95 | 13.28 | 597.13 | 0.73 | 452350.67 | 819545.39 | N 32 14 25.38 | W 103 26 0.65 |
| | 10088.00 | 1.93 | 253.31 | 10050.07 | 4.66 | 11.95 | 593.76 | 0.65 | 452349.34 | 819542.02 | N 32 14 25.37 | W 103 26 0.69 |
| | 10184.00 | 1.34 | 266.74 | 10146.03 | 4.16 | 11.42 | 591.09 | 0.73 | 452348.81 | 819539.35 | N 32 14 25.36 | W 103 26 0.72 |
| | 10280.00 | 0.69 | 292.65 | 10242.02 | 4.34 | 11.58 | 589.44 | 0.81 | 452348.97 | 819537.70 | N 32 14 25.37 | W 103 26 0.74 |
| | 10375.00 | 1.53 | 295.11 | 10337.00 | 5.12 | 12.33 | 587.76 | 0.89 | 452349.72 | 819536.02 | N 32 14 25.37 | W 103 26 0.76 |
| | 10469.00 | 1.90 | 307.60 | 10430.96 | 6.63 | 13.82 | 585.39 | 0.56 | 452351.21 | 819533.65 | N 32 14 25.39 | W 103 26 0.79 |
| | 10563.00 | 1.63 | 329.79 | 10524.91 | 8.76 | 15.92 | 583.48 | 0.78 | 452353.31 | 819531.74 | N 32 14 25.41 | W 103 26 0.81 |
| | 10658.00 | 1.42 | 13.56 | 10619.88 | 11.08 | 18.24 | 583.08 | 1.21 | 452355.63 | 819531.34 | N 32 14 25.43 | W 103 26 0.82 |
| | 10752.00 | 1.43 | 11.54 | 10713.85 | 13.36 | 20.52 | 583.59 | 0.05 | 452357.91 | 819531.85 | N 32 14 25.45 | W 103 26 0.81 |
| | 10846.00 | 1.11 | 358.69 | 10807.83 | 15.41 | 22.58 | 583.80 | 0.45 | 452359.97 | 819532.06 | N 32 14 25.48 | W 103 26 0.81 |
| | 10940.00 | 0.90 | 309.59 | 10901.82 | 16.80 | 23.96 | 583.21 | 0.91 | 452361.35 | 819531.47 | N 32 14 25.49 | W 103 26 0.81 |
| | 11035.00 | 1.16 | 312.14 | 10996.80 | 17.94 | 25.08 | 581.92 | 0.28 | 452362.47 | 819530.18 | N 32 14 25.50 | W 103 26 0.83 |
| | 11113.00 | 1.26 | 324.06 | 11074.78 | 19.17 | 26.30 | 580.84 | 0.35 | 452363.69 | 819529.09 | N 32 14 25.51 | W 103 26 0.84 |
| | 11159.00 | 1.50 | 319.34 | 11120.77 | 20.05 | 27.17 | 580.15 | 0.58 | 452364.56 | 819528.40 | N 32 14 25.52 | W 103 26 0.85 |
| | 11191.00 | 2.92 | 16.59 | 11152.75 | 21.15 | 28.27 | 580.11 | 7.68 | 452365.66 | 819528.36 | N 32 14 25.53 | W 103 26 0.85 |
| | 11222.00 | 7.21 | 25.99 | 11183.62 | 23.64 | 30.77 | 581.18 | 14.05 | 452368.16 | 819529.44 | N 32 14 25.56 | W 103 26 0.84 |
| | 11254.00 | 11.77 | 23.47 | 11215.18 | 28.42 | 35.58 | 583.37 | 14.31 | 452372.97 | 819531.62 | N 32 14 25.60 | W 103 26 0.81 |
| | 11286.00 | 16.49 | 22.56 | 11246.20 | 35.57 | 42.77 | 586.41 | 14.77 | 452380.16 | 819534.67 | N 32 14 25.67 | W 103 26 0.77 |
| | 11317.00 | 21.52 | 20.22 | 11275.50 | 44.93 | 52.17 | 590.06 | 16.41 | 452389.56 | 819538.32 | N 32 14 25.77 | W 103 26 0.73 |
| | 11349.00 | 26.12 | 17.16 | 11304.77 | 57.12 | 64.42 | 594.17 | 14.88 | 452401.81 | 819542.43 | N 32 14 25.89 | W 103 26 0.68 |
| | 11380.00 | 30.17 | 13.88 | 11332.10 | 71.16 | 78.51 | 598.06 | 13.98 | 452415.90 | 819546.31 | N 32 14 26.03 | W 103 26 0.63 |
| | 11412.00 | 32.76 | 10.77 | 11359.39 | 87.43 | 94.82 | 601.61 | 9.55 | 452432.21 | 819549.86 | N 32 14 26.19 | W 103 26 0.59 |
| | 11444.00 | 35.29 | 7.79 | 11385.91 | 105.06 | 112.49 | 604.48 | 9.47 | 452449.88 | 819552.73 | N 32 14 26.36 | W 103 26 0.56 |
| | 11475.00 | 36.28 | 5.64 | 11411.06 | 123.04 | 130.49 | 606.59 | 5.16 | 452467.88 | 819554.85 | N 32 14 26.54 | W 103 26 0.53 |
| | 11506.00 | 39.86 | 4.66 | 11435.46 | 142.05 | 149.52 | 608.30 | 11.71 | 452486.91 | 819556.56 | N 32 14 26.73 | W 103 26 0.51 |
| | 11537.00 | 43.73 | 4.40 | 11458.57 | 162.62 | 170.12 | 609.93 | 12.50 | 452507.51 | 819558.19 | N 32 14 26.93 | W 103 26 0.49 |
| | 11569.00 | 47.66 | 4.44 | 11480.92 | 185.43 | 192.94 | 611.70 | 12.28 | 452530.33 | 819559.95 | N 32 14 27.16 | W 103 26 0.46 |
| | 11601.00 | 51.07 | 2.65 | 11501.75 | 209.64 | 217.18 | 613.19 | 11.47 | 452554.57 | 819561.44 | N 32 14 27.40 | W 103 26 0.45 |
| | 11632.00 | 53.76 | 0.83 | 11520.66 | 234.18 | 241.73 | 613.93 | 9.85 | 452579.12 | 819562.18 | N 32 14 27.64 | W 103 26 0.43 |
| | 11664.00 | 56.08 | 359.77 | 11539.05 | 260.36 | 267.91 | 614.06 | 7.74 | 452605.30 | 819562.32 | N 32 14 27.90 | W 103 26 0.43 |
| | 11696.00 | 60.24 | 359.61 | 11555.93 | 287.54 | 295.09 | 613.91 | 13.01 | 452632.48 | 819562.17 | N 32 14 28.17 | W 103 26 0.43 |
| | 11727.00 | 65.04 | 0.43 | 11570.17 | 315.06 | 322.61 | 613.93 | 15.66 | 452660.00 | 819562.18 | N 32 14 28.44 | W 103 26 0.43 |
| | 11851.00 | 76.60 | 0.76 | 11610.84 | 431.95 | 439.53 | 615.15 | 9.33 | 452776.91 | 819563.41 | N 32 14 29.60 | W 103 26 0.40 |
| | 11945.00 | 80.60 | 1.42 | 11629.42 | 524.03 | 531.64 | 616.91 | 4.31 | 452869.02 | 819565.16 | N 32 14 30.51 | W 103 26 0.37 |
| | 12039.00 | 82.38 | 0.59 | 11643.33 | 616.95 | 624.58 | 618.54 | 2.09 | 452961.97 | 819566.79 | N 32 14 31.43 | W 103 26 0.34 |

| Comments | MD (ft) | Incl (°) | Azim Grid (°) | TVD (ft) | VSEC (ft) | NS (ft) | EW (ft) | DLS (°/100ft) | Northing (ftUS) | Easting (ftUS) | Latitude (N/S ° ' ") | Longitude (E/W ° ' ") | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 12133.00 | 83.56 | 359.28 | 11654.83 | 710.23 | 717.87 | 618.43 | 1.87 | 453055.26 | 819566.69 | N 32 14 32.35 | W 103 26 | 0.34 |
| | 12228.00 | 85.14 | 359.34 | 11664.19 | 804.77 | 812.40 | 617.29 | 1.66 | 453149.79 | 819565.55 | N 32 14 33.29 | W 103 26 | 0.34 |
| | 12322.00 | 84.80 | 359.86 | 11672.43 | 898.40 | 906.04 | 616.64 | 0.66 | 453243.42 | 819564.89 | N 32 14 34.21 | W 103 26 | 0.34 |
| | 12416.00 | 85.46 | 359.83 | 11680.41 | 992.06 | 999.70 | 616.38 | 0.70 | 453337.08 | 819564.64 | N 32 14 35.14 | W 103 26 | 0.33 |
| | 12509.00 | 86.90 | 357.89 | 11686.60 | 1084.84 | 1092.46 | 614.54 | 2.59 | 453429.85 | 819562.79 | N 32 14 36.06 | W 103 26 | 0.34 |
| | 12604.00 | 90.03 | 356.62 | 11689.15 | 1179.73 | 1187.31 | 609.99 | 3.56 | 453524.69 | 819558.25 | N 32 14 37.00 | W 103 26 | 0.39 |
| | 12699.00 | 91.34 | 356.62 | 11688.01 | 1274.62 | 1282.13 | 604.39 | 1.38 | 453619.52 | 819552.65 | N 32 14 37.94 | W 103 26 | 0.44 |
| | 12793.00 | 91.03 | 356.81 | 11686.07 | 1368.50 | 1375.96 | 599.00 | 0.39 | 453713.34 | 819547.26 | N 32 14 38.87 | W 103 26 | 0.50 |
| | 12887.00 | 91.13 | 357.77 | 11684.30 | 1462.43 | 1469.83 | 594.56 | 1.03 | 453807.22 | 819542.82 | N 32 14 39.79 | W 103 26 | 0.54 |
| | 12982.00 | 91.10 | 359.57 | 11682.45 | 1557.40 | 1564.79 | 592.35 | 1.89 | 453902.17 | 819540.61 | N 32 14 40.73 | W 103 26 | 0.56 |
| | 13076.00 | 90.69 | 359.85 | 11680.98 | 1651.39 | 1658.77 | 591.88 | 0.53 | 453996.16 | 819540.14 | N 32 14 41.66 | W 103 26 | 0.55 |
| | 13170.00 | 91.38 | 0.28 | 11679.28 | 1745.36 | 1752.76 | 591.99 | 0.86 | 454090.14 | 819540.24 | N 32 14 42.59 | W 103 26 | 0.54 |
| | 13264.00 | 91.89 | 0.72 | 11676.60 | 1839.30 | 1846.72 | 592.81 | 0.72 | 454184.10 | 819541.06 | N 32 14 43.52 | W 103 26 | 0.52 |
| | 13358.00 | 91.00 | 0.29 | 11674.23 | 1933.25 | 1940.68 | 593.63 | 1.05 | 454278.06 | 819541.89 | N 32 14 44.45 | W 103 26 | 0.50 |
| | 13452.00 | 91.20 | 359.97 | 11672.43 | 2027.22 | 2034.66 | 593.85 | 0.40 | 454372.04 | 819542.10 | N 32 14 45.38 | W 103 26 | 0.49 |
| | 13547.00 | 92.20 | 359.51 | 11669.61 | 2122.18 | 2129.62 | 593.42 | 1.16 | 454467.00 | 819541.67 | N 32 14 46.32 | W 103 26 | 0.49 |
| | 13641.00 | 91.89 | 0.08 | 11666.25 | 2216.11 | 2223.56 | 593.08 | 0.69 | 454560.94 | 819541.34 | N 32 14 47.25 | W 103 26 | 0.48 |
| | 13735.00 | 90.07 | 0.11 | 11664.64 | 2310.09 | 2317.54 | 593.24 | 1.94 | 454654.92 | 819541.49 | N 32 14 48.18 | W 103 26 | 0.47 |
| | 13829.00 | 91.20 | 3.36 | 11663.60 | 2403.98 | 2411.48 | 596.08 | 3.66 | 454748.86 | 819544.34 | N 32 14 49.11 | W 103 26 | 0.43 |
| | 13924.00 | 89.69 | 2.06 | 11662.87 | 2498.81 | 2506.36 | 600.57 | 2.10 | 454843.74 | 819548.83 | N 32 14 50.05 | W 103 26 | 0.37 |
| | 14019.00 | 94.09 | 0.75 | 11659.73 | 2593.66 | 2601.26 | 602.90 | 4.83 | 454938.64 | 819551.16 | N 32 14 50.99 | W 103 26 | 0.33 |
| | 14101.00 | 91.82 | 358.33 | 11655.50 | 2675.54 | 2683.13 | 602.24 | 4.04 | 455020.51 | 819550.50 | N 32 14 51.80 | W 103 26 | 0.33 |
| | 14196.00 | 92.17 | 357.66 | 11652.20 | 2770.46 | 2778.02 | 598.92 | 0.80 | 455115.40 | 819547.18 | N 32 14 52.74 | W 103 26 | 0.36 |
| | 14290.00 | 91.55 | 356.98 | 11649.15 | 2864.35 | 2871.87 | 594.53 | 0.98 | 455209.24 | 819542.78 | N 32 14 53.67 | W 103 26 | 0.40 |
| | 14384.00 | 91.27 | 358.00 | 11646.83 | 2958.28 | 2965.75 | 590.41 | 1.12 | 455303.12 | 819538.67 | N 32 14 54.60 | W 103 26 | 0.44 |
| | 14478.00 | 90.72 | 358.25 | 11645.20 | 3052.24 | 3059.68 | 587.34 | 0.64 | 455397.06 | 819535.59 | N 32 14 55.53 | W 103 26 | 0.47 |
| | 14572.00 | 90.38 | 357.25 | 11644.30 | 3146.20 | 3153.60 | 583.65 | 1.12 | 455490.98 | 819531.90 | N 32 14 56.46 | W 103 26 | 0.50 |
| | 14667.00 | 91.07 | 359.45 | 11643.10 | 3241.18 | 3248.55 | 580.91 | 2.43 | 455585.92 | 819529.17 | N 32 14 57.40 | W 103 26 | 0.53 |
| | 14760.00 | 90.65 | 358.96 | 11641.70 | 3334.17 | 3341.53 | 579.62 | 0.69 | 455678.90 | 819527.88 | N 32 14 58.32 | W 103 26 | 0.53 |
| | 14854.00 | 90.93 | 359.11 | 11640.40 | 3428.16 | 3435.51 | 578.04 | 0.34 | 455772.88 | 819526.30 | N 32 14 59.25 | W 103 26 | 0.54 |
| | 14948.00 | 90.93 | 359.99 | 11638.88 | 3522.14 | 3529.49 | 577.30 | 0.94 | 455866.86 | 819525.56 | N 32 15 0.18 | W 103 26 | 0.54 |
| | 15042.00 | 91.69 | 359.27 | 11636.73 | 3616.11 | 3623.46 | 576.69 | 1.11 | 455960.84 | 819524.95 | N 32 15 1.11 | W 103 26 | 0.54 |
| | 15136.00 | 91.65 | 359.55 | 11633.99 | 3710.07 | 3717.42 | 575.73 | 0.30 | 456054.79 | 819523.98 | N 32 15 2.04 | W 103 26 | 0.54 |
| | 15232.00 | 91.31 | 359.24 | 11631.51 | 3806.04 | 3813.38 | 574.71 | 0.48 | 456150.75 | 819522.97 | N 32 15 2.99 | W 103 26 | 0.54 |
| | 15325.00 | 91.20 | 358.80 | 11629.47 | 3899.02 | 3906.34 | 573.12 | 0.49 | 456243.72 | 819521.38 | N 32 15 3.91 | W 103 26 | 0.55 |
| | 15418.00 | 91.93 | 0.03 | 11626.93 | 3991.98 | 3999.30 | 572.17 | 1.54 | 456336.67 | 819520.43 | N 32 15 4.82 | W 103 26 | 0.55 |
| | 15513.00 | 91.48 | 359.10 | 11624.11 | 4086.94 | 4094.26 | 571.45 | 1.09 | 456431.63 | 819519.71 | N 32 15 5.76 | W 103 26 | 0.55 |
| | 15606.00 | 91.55 | 359.41 | 11621.65 | 4179.90 | 4187.22 | 570.24 | 0.34 | 456524.59 | 819518.50 | N 32 15 6.68 | W 103 26 | 0.56 |
| | 15701.00 | 90.31 | 357.69 | 11620.11 | 4274.88 | 4282.17 | 567.84 | 2.23 | 456619.54 | 819516.10 | N 32 15 7.62 | W 103 26 | 0.58 |
| | 15795.00 | 91.65 | 358.44 | 11618.50 | 4368.84 | 4376.10 | 564.67 | 1.63 | 456713.47 | 819512.92 | N 32 15 8.55 | W 103 26 | 0.60 |
| | 15889.00 | 91.69 | 359.48 | 11615.76 | 4462.80 | 4470.04 | 562.96 | 1.11 | 456807.41 | 819511.22 | N 32 15 9.48 | W 103 26 | 0.62 |
| | 15983.00 | 92.20 | 358.84 | 11612.57 | 4556.74 | 4563.97 | 561.58 | 0.87 | 456901.34 | 819509.84 | N 32 15 10.41 | W 103 26 | 0.62 |
| | 16077.00 | 92.34 | 359.35 | 11608.85 | 4650.67 | 4657.89 | 560.10 | 0.56 | 456995.26 | 819508.36 | N 32 15 11.34 | W 103 26 | 0.63 |
| | 16170.00 | 92.30 | 359.58 | 11605.08 | 4743.59 | 4750.81 | 559.23 | 0.25 | 457088.18 | 819507.49 | N 32 15 12.26 | W 103 26 | 0.63 |
| TD, PTB [100' FNL, 382' FEL] | 16218.00 | 92.30 | 359.58 | 11603.15 | 4791.55 | 4798.77 | 558.88 | 0.00 | 457136.14 | 819507.14 | N 32 15 12.74 | W 103 26 | 0.63 |

**Survey Type:** Def Survey

**Survey Error Model:** ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma

**Survey Program:**

| Description | Part | MD From (ft) | MD To (ft) | EOU Freq (ft) | Hole Size (in) | Casing Diameter (in) | Survey Tool Type | Borehole / Survey |
|---|---|---|---|---|---|---|---|---|

| Comments | MD (ft) | Incl (°) | Azim Grid (°) | TVD (ft) | VSEC (ft) | NS (ft) | EW (ft) | DLS (°/100ft) | Northing (ftUS) | Easting (ftUS) | Latitude (N/S ° ' ") | Longitude (E/W ° ' ") |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 0.000 | 23.000 | 1/98.425 | 12.250 | 9.625 | NAL_MWD_IFR1+MS-Depth Only | | Original Borehole / Final Survey - Cimarex Canyonlands 2 State Com 2H 0ft to 16218ft (Surcon | | |
| | | 1 | 23.000 | 23.000 | Act Stns | 12.250 | 9.625 | NAL_MWD_IFR1+MS-Depth Only | | Original Borehole / Final Survey - Cimarex Canyonlands 2 State Com 2H 0ft to 16218ft (Surcon | | |
| | | 1 | 23.000 | 1050.000 | Act Stns | 12.250 | 9.625 | NAL_MWD_IFR1+MS | | Original Borehole / Final Survey - Cimarex Canyonlands 2 State | | |
| | | 1 | 1050.000 | 11792.000 | Act Stns | 8.750 | 7.000 | NAL_MWD_IFR1+MS | | Original Borehole / Final Survey - Cimarex Canyonlands 2 State | | |
| | | 1 | 11792.000 | 16218.000 | Act Stns | 6.000 | 4.500 | NAL_MWD_IFR1+MS | | Original Borehole / Final Survey - Cimarex Canyonlands 2 State | | |

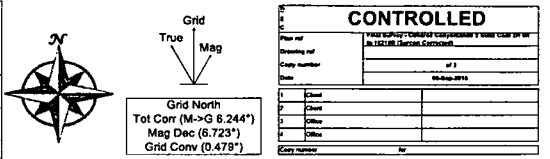
**Schlumberger** **Cimarex** Final PvA **CIMAREX**

| Borehole: | Well: | Field: | Structure: |
|---|---|---|---|
| Original Borehole | Cimarex Canyonlands 2 State Com 2H | NM Lea County (NAD 83) | Cimarex Canyonlands 2 State Com 2H |

| Gravity & Magnetic Parameters | | | | | Surface Location | NAD83 New Mexico State Plane, Eastern Zone, US Feet | | | Miscellaneous | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Model: | HDGM 2018 | Dip: | 59.959° | Date: | 22-Aug-2018 | Lat: N 32 14 25.30 | Northing: 482337.39ftUS | Grid Conv: 0.479° | Slot: | Cimarex Canyonlands 2 State Com 2H | TVD Ref: RKB(3448.9ft above MSL) |
| MagDec: | 6.723° | FS: | 48010.111nT | Gravity FS: | 998.463mgn (9.80665 Based) | Lon: W 103 28 7.61 | Easting: 818948.26ftUS | Scale Fact: 0.99999736 | Plan: | Final Survey - Cimarex Canyonlands 2 State Com 2H 0ft to 16218ft (Surcon Corrected) | |

**Critical Points**

| Critical Point | MD | INCL | AZIM | TVD | VSEC | N(+)/S(-) | E(+)/W(-) | DLS |
|---|---|---|---|---|---|---|---|---|
| SHL [390' FSL, 1000' FEL] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| TD, PTB [100' FNL, 382' FEL] | 16218.00 | 92.30 | 359.58 | 11803.15 | 4791.55 | 4798.77 | 558.88 | 0.00 |




**CONTROLLED**

| | | |
|---|---|---|
| Plan ref: | Final Survey - Cimarex Canyonlands 2 State Com 2H 0ft to 16218ft (Surcon Corrected) | |
| Drawing ref: | | |
| Copy number: | | of 3 |
| Date: | | 16-Sep-2018 |
| 1 | Client | |
| 2 | Client | |
| 3 | Office | |
| 4 | Office | |
| Copy number: | | for |