How do I contour my down-hole data and post this information on cross sections?

- Jim Greig, ConeTec, Vancouver, BC, Canada

To contour down-hole data, the easiest method is to 'trick' the Randcont program into thinking it is contouring X, Y data when it is actually plotting X, Z information. Below is the technique described step by step:

Step 1: Composite your down-hole data to assign an X, Y and Z location for each down-hole data point.

- Create a Composite table with Easting, Northing and Elevations fields with unique names, and fields for each value you would like to contour i.e.: Comp_East, Comp_North, Comp_Elev, Comp_Cu.
- Composite down-hole data using a length composite with a length appropriate for your data. Keep in mind that the longer the composite length, the smoother your down-hole contours will be.

Step 2: Create a cross-section posting the down-hole data you would like to contour. Consider whether you would like to post composited data as points, or non-composited down-hole data along drillhole traces. The former will more closely correspond to resulting contours, the later is original data which has not been mathematically altered. We recommend that you select N-S or E-W sections to make the next filtering step easier.

Step 3: Contour your composited down-hole data using the Randcont program.

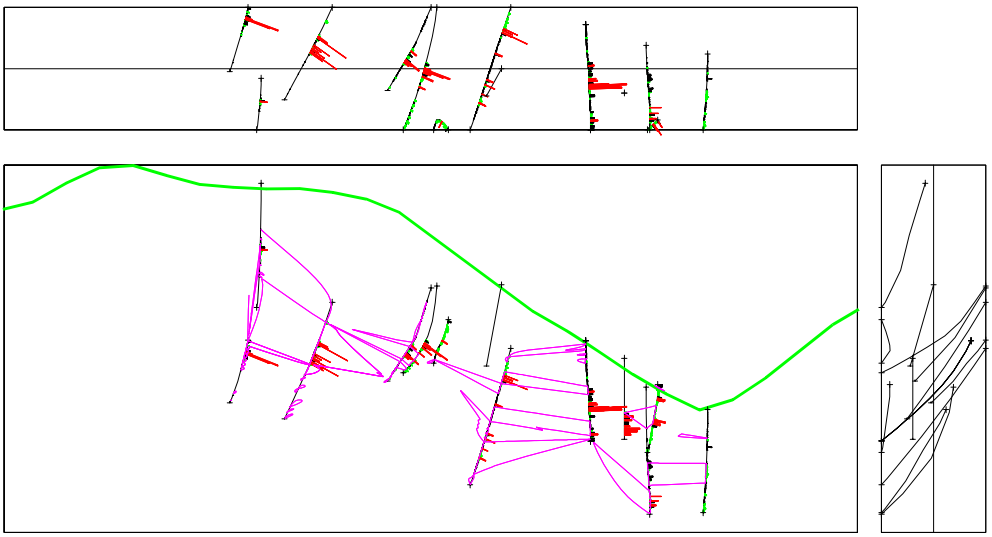
- Using cross-section end points, set filters to restrict the contoured data to the cross-section corridor you have selected. The following example will use an E-W section with end points: Left X = 260,900, Y = 156,500; Right X = 265,000, Y = 156,500 and Z = 6000 to 7500 projected 250 ft. front and back.
- First, while in RandCont, set a filter for your composited downhole data, in this case:

  Filter 1; Comp_East >= 260,900 and Comp_East <= 265,000
  Comp_North >= 156,250 and Comp_North <= 156,750 (# 250' front,back)
  Comp_Elev >= 6,000 and Comp_Elev <= 7,500

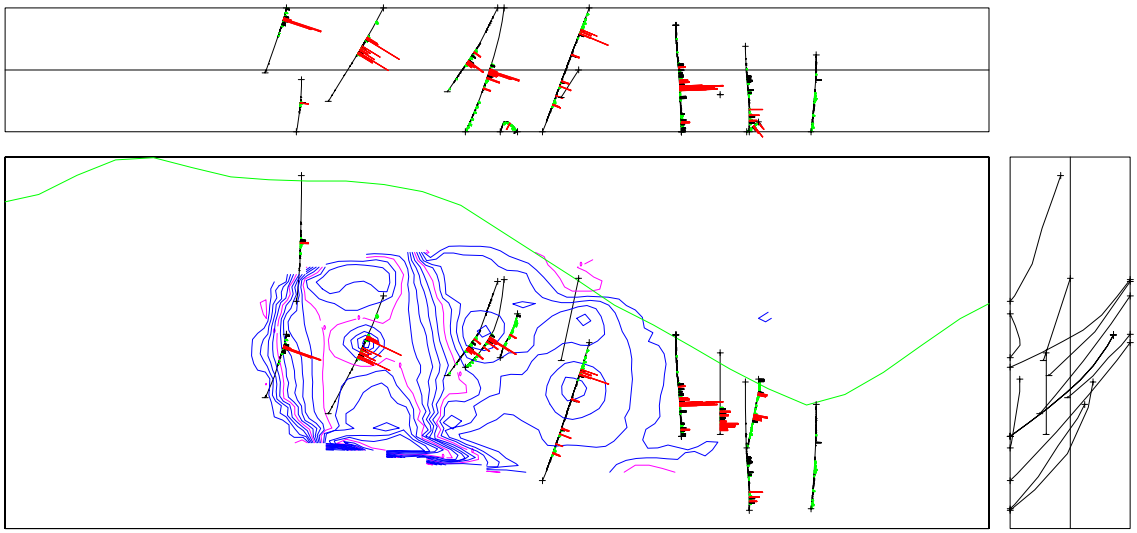
- In RandCont, set scaling equal to that used in your cross-section. Next, set the endpoints to the corners of your cross-section. Range: Left X = 260,900, Right X = 265,000, Bottom Y = 6,000, Top Y = 7,500. Draw a border, but not a grid.
- Contour your down-hole data. Set; X = Comp_East, Y = Comp_Elev, Value = Comp_Cu (or whatever downhole composited data you wish to contour). Select appropriate contour intervals and label sizes. When entering contour parameters, the number of derivative points will strongly influence your resulting contour map. A higher number will result in a smooth interpolation between drillholes, a small number will honor local trends.

Step 4: Combine the cross-section metafile with the down-hole contour metafile. Open your cross-section metafile in MFWIN. Open the down-hole contoured data created in Step 3, selecting Clear currently-loaded graphics = No. Refresh your display and the two metafiles will be registered. Voila - contoured down-hole data.

You will need to experiment with down-hole composite and contour intervals to create a graphic which displays your data effectively. Some samples of resulting graphics are shown on the following page.



In the example above, this tabular deposit is contoured using 25' composite intervals (most samples are 5' or less), 4 derivative points, and a subgrid resolution of 2000. A fairly coarse contour interval was selected to project overall trends while eliminating geochemical 'noise'. In the above example, automated contouring very closely mimics geological interpretations of the nature of this mineral deposit.
If down-hole contours of your data are not as smooth or regularly distributed as you would like, better results might be achieved if you model your data into a block table, then contour modeled data as shown below:.



Values were first modeled into a block table (Model) with cell size 50' x 50' x 50'. For reference, the section is projected 250 feet front and back of the center line. The modeled data is then contoured using Randcont. In RandCont, the modeled fields were: X: Model_xc, Y: Model_zc and Value: Model_Cu. A filter was first set to limit the contouring to just one row of blocks.

In the section above, note that the drill holes in the western portion of the W-E section are contoured, while those in the eastern portion of the section are not. This is because a row of blocks 100 ft. N of the section line was selected for contouring. This row of blocks did not intersect mineralization further S and W on this section. Experimentation will be needed to select appropriate section orientation and block sizes to best represent your down-hole data.