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The Subsurface 3D Modelling of the Handeresi (Kalkim-Canakkale) Area, NW of Turkey, Pb-Zn-Cu Ore Zones

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A number of 3D softwares are available for subsurface modelling. Some of the complete 3D softwares are Go-CAD, LYNX, TECHBASE, VULCAN, GeoBLOCK, MVS, MICROMINE and RockWorks. These softwares have their own merits and demerits. RockWorks, one of these softwares, has efficient data management capabilities. It facilitates easy entry of different types of subsurface data such as lithological, geophysical, and geochemical data. It has a simple and well organised structure to handle these data. As a result, it takes comparatively less time to develop a model. Therefore, this software is selected for this research.

The topographic map of the studied area, which has been digitized before, worked up into 3D topographic surface modelling by the aid of RockWorks2006 software. After this modelling, the 25 borehole data which has been taken from the MTA's (General Directorate of Mineral Research & Exploration of Turkey) boreholes were input the software. Firstly, the ore zones in the subsurface modeled with solid modelling. But, because of the boreholes numbers were not enough, it's arguable that the accuracy of the areas modelling which has been outside of the boreholes. In this case, with the aim of supporting the modelling more, %Pb, %Zn, and %Cu data were input the software and the distribution of these elements in the subsurface were 3D modeled. The values of these elements were modeled with the cut off grades which have %Pb$\geq$7, %Zn$\geq$4, and %Cu$\geq$0.3 values and this model was superposed with ore subsurface solid model. Finally, the intersecting areas were marked.

As a result, there were two ore zones which have seen intensively in this area. One of them indicates the area in which the galleries are operated now. The other one comes across the area in which has been never operated. By the help of this modelling, the new ore zone has been determined which had not been detected before. The only deficiency of this modelling is the structural factors could not be reflected to the software because of the data insufficiencies. However, since the results were compared with the study area's data, the modelling's accuracy has been exhibited because of the operated ore zones in the area have also been determined with this modelling. Nevertheless, when the borehole numbers are raised and the geophysical data are added the software, it will be inevitable to find truer results and new potential ore zones.

Key words : Rockworks, 3D, subsurface modelling, Handeresi, Turkey, Pb, Zn, Cu