Pit Mapping and Structural Modelling using AdamTech and Leapfrog

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Abstract

The Oyu Tolgoi copper and gold project is located in the Southern Gobi region of Mongolia and is being developed by Oyu Tolgoi LLC. The project is expected to be a significant contributor to regional development and is jointly government owned. The project is expected to be a significant contributor to regional development and is jointly government owned. The geology of Oyu Tolgoi is structurally complex with several reactivation events within Devonian and Carboniferous rocks. Since the commencement of operations at the Oyu Tolgoi open pit mine, 80 major faults and over 150 minor faults have been identified. Some of these have been a factor in the 110 wall failures (single and several benches) which have taken place during the mine operations.

The Oyu Tolgoi Surface Mine Geology team map pit wall geological and structural data and integrate this data into geological models in order to predict further pit failures. However, pit wall access is sometimes restricted due to safety or operational concerns, so comprehensive face mapping is not always achievable. 3D Adamtech software is proposed as a solution and can be used for collecting the geological and structural data in open pit walls. This is followed up by interpretation and 3D modelling in the Leapfrog Geo software package.

The 3D surface is then created and exported from AdamTech to Leapfrog Geo as an object file with actual colour photos. Within Leapfrog Geo, interpretation takes place by comparing the wall which is located on the upper benches as well as the existing faults and geology model. There are many advantages of using Leapfrog. For example interpretation on the wall surface ranges several to over ten benches, seeing the original wall with coloured photos, creating disks, polylines and points, and connecting these data to structure model update, comparing structural data on several benches at same time and doing interpretation on all benches from current 835mRL to 1155mRL of the pit. Hence we are searching for possible ways to use drone imagery and survey scan for geological model update