

3D engineering and geomechanical survey for open pit redesign of Kovdor Bdy-Ap-Mag deposit

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The worldwide commodity production mainly depends on world-class deposits. E.g. only 200 first-rate deposits among more 20000 known ones provide about 85% of Russian annual mining. But majority of them have problems with the depletion of actual project reserves and redesign for excavating ore from deep levels using underground mine or deep open pit. Last variant is economically preferable and allows arranging construction without stop of mining. However it requires executing the whole complex of detailed engineering and geomechanical investigations. New technology was developed and tested within Kovdor Bdy-Ap-Mag deposit. The technology includes: 3D mapping of the faults and its kinematics on surface and on orientated drill core; reconstruction of the paleo- and modern stress including its determinations “in situ”; the special geophysical, geotechnical and hydrogeological researches; the seismographic observations and monitoring of the rock massif deformations; the accumulation and analysis of the spatial data base; 3D modeling and geometrization of the dangerous structures. Result of the survey allows redesigning deep open pit taking into account all possible geohazards.