



The development of an underground rock mechanics laboratory at Boulby, UK

D. Petley

International Landslide Centre, University of Durham, Durham, United Kingdom (d.n.petley@durham.ac.uk / +44 191 334 1801)

The Boulby mine in North Yorkshire in Northeast England is a deep, active works that extracts rocksalt and potash. The shaft depth is 1,100 m, although workings currently extend both up-dip and down-dip to a maximum depth of about 1,300 m below the surface. For 20 years the mine has housed a physics laboratory, principally focussed on the detection of “Dark Matter”, funded by the UK Science and Technology Facilities Council. However, for the last six years the mine site has also been the host of an active geoscience research programme, focussing on a range of issues including the mechanics of subsidence; the use of satellite technologies for deformation monitoring; coastal rock mechanics; mass movement processes; and microbiology in extreme environments. In consequence, the University of Durham in conjunction with the mine owner, Cleveland Potash Ltd, has established a project to explore the potential for the mine to be used as a geoscience laboratory, providing access to both surface and subsurface environments to researchers from a wide range of areas. The aim is to create a set of underground and surface spaces, making use of the range of stress and lithological conditions within the mine, that can be used for experiments in for example rock deformation; fluid movement; carbon capture and storage; coastal erosion; and mass movement processes. Experimental facilities will be supported by suitable infrastructure and personnel. Phase One of the project will start in April 2009, consisting of an 18 month proof of concept project, supported by a £1 million grant from the Regional Development Agency. If successful, Phase 2 will then represent a two year design stage, and Phase 3 will allow construction of the full facility. The aim is ultimately to establish a world class facility hosting high quality experiments from a wide range of nations.