Stability aspects of wide cavities, solution mined in layered salt formation

by

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Abstract

Results are presented from a comprehensive study of wide cavity stability in layered Halite/Carnallite/Bischofite deposits, where the Halite layers form the cavity roof and floor. The study is based on a stress path analysis approach, using combined numerical and experimental investigations.

Axisymmetric finite element models, incorporating visco-elastic salt behaviour have been used to determine the stresses and stress changes (represented by stress paths) around cavities having different height to diameter ratios and exposed to various brine pressures. Triaxial strength and creep tests have been conducted along these predicted stress paths to arrive at strength values at the most appropriate stress conditions.

Cavity stability is assessed by combining the numerical analysis with results of the triaxial strength and creep tests, which where carried out on cored salt sections.