

**SPECIAL SYMPOSIUM ON SINKHOLES AND UNUSUAL
SUBSIDENCE OVER SOLUTION-MINED CAVERNS
AND SALT AND POTASH MINES
15-18 OCTOBER 2000
SAN ANTONIO, TEXAS, USA**

**GEODYNAMIC RESEARCH OF THE MIROVO SALT DEPOSIT NEAR
PROVADIJA, NE BULGARIA**

Prof. D Sc. Eng. Georgi VALEV -University of Architecture, Civil Engineering and
Geodesy, Sofia, Bulgaria

Mag. Eng. Georgi JANEV - Director of "Geosol", Provadija, Bulgaria

Mag. Eng. Georgi RAJNOV -Manager of Geoprecise Engineering Ltd, Sofia, Bulgaria

(Abstract)

The Mirovo salt deposit is a unique natural phenomenon with its origin, composition, location and geophysical characteristics. The Mirovo salt diapir has a base area of the order of 200 km² and generally has the shape of a truncated cone in depth of approximately 4000m and its top is 15 to 20m deep. Approximately 73% of the diapir is Sodium Chlorid, the remainders comprising insoluble elements and other evaporites, irregularly distributed through the salt mass. The method of boring is applied at present in the salt pits (more than 30 utilized bore-holes) and more specifically the method of underground salt leaching through which one major raw material for the Devnya chemical plants is produced – brine.

It is a geodynamic project, which was attracting researcher's interest. A dense network of 26 stable pillars and many leveling benchmarks is designed and built-up especially to monitor movements and deformations in the deposit area using precise angular and distance measurements, spirit leveling and GPS. Part of the pillars – outside the central zone – control the detailed over the salt body. Twenty campaigns, after the initial observations in 1990, were taking place. The aim is to examine how far exploration of rock salt is connected to local seismic activity because recently earthquakes occur here more frequently and with increasing strength. To give an idea what the magnitude of the deformations is, these solutions are compared also to the campaign, accomplished in 2000.

Obviously, the general trend of terrain deformations is subsidence of the central zone and, as a by-product, shortening of the distance between the center and the outer margin. Increasing residuals with time span is due to the time-dependent components, whereas the constant part, gives an accuracy estimate.