

The sinkhole of the cavity LR 50/51 in la Rape area

A case history - RHODIA company

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Abstract

In the La Madeleine area (10 km at the east of Nancy, France), solution mining of rock salt has been carried out by NOVACARB and its predecessors since 1880 for the need of the soda ash plant.

The present production reach 1 Mt salt/year, representing a mean flow rate of 300 m³/h of saturated brine.

The salt deposit is a bedded salt (Triassic age) with 80m thickness and found between 150 and 220 m depth (roof salt).

The conception and exploitation mode of the historical fields dedicate it to subsidence and to the formation of a sinkhole mainly created between 1969 and 1984. These sinkholes are all located on fields where RHODIA company is owner on a large perimeter. The crater size is around 150m diameter and 20m depth and they are filled with limestone materials. After remediation, these fields can generally recover their original agricultural use.

This paper deals with the information and operations we get from our last sinkhole, occurred in la Rape area in December 2004 and today owned by RHODIA company :

- history of the salt exploitation of the cavity between 1974 and 1993,
- upward migration of the cavity over the salt roof between 1993 and 2000 with sonar and gamma ray measurements,
- arrangements made in 2001 in provision of a collapse (retention dam, fence, information to the mayor and population concerned),
- emptying the cavity between December 2001 and April 2002,
- the sinkhole process with water injection (December 2003 to December 2004)
- enlargement of the crater (January 2005 to June 2005)