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Meeting Paper



**First Gaz de France Horizontal
Salt Cavern Experiment**

by

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ABSTRACT

In 1993 GAZ DE FRANCE started a research project for the construction of salt cavities suitable for natural gas storage in thin salt layers. It was soon obvious that in such conditions vertical axisymmetrical shapes can offer only limited volume for stability reasons. Studies were therefore performed on solution-mining cavern with non-axisymmetrical shapes and particularly horizontal tunnel shapes.

The bibliography provides many articles either about horizontal tunnels, or about leaching, but very few about horizontal leaching. The most interesting information on the subject was probably from a paper on an old experimental leaching in Wieliczka mine (Poland). The schematic cavern shape obtained in this experiment was available, but the leaching process itself was very poorly documented. Other horizontal leaching information are available from brine producers. The documentation of the leaching process is in this case better (flow rates, salinity) though not complete (depth of strings, sonar surveys). A major unknown in these data is the original dissolution path initiated by the hydro-fracturation. Due to the lack of precise data, GAZ DE FRANCE invested research effort on an experimental horizontal cavity.

The cavity was leached in a mine near Mulhouse (East of France). This place was chosen because it was possible to drill a horizontal borehole at relatively low cost for leaching and also short vertical boreholes into the cavity in order to monitor the growth of the cavity (sonar surveys, conductivity measurements). The actual leaching process occurred from May 95 to November 95, and resulted in a 40 m long cavity with a volume of 750 m³ (26 000 cu ft). This paper presents the experiment (preparation, problems, constraints) and some results.

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