VENTILATION SHAFT WATER INFLOW CONTROL

ROSSARDEN TIN MINE, TASMANIA, AUSTRALIA

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ABSTRACT

The Rossarden tin and tungsten mine in Tasmania Australia was opened in 1923 and was operated until recently by Aberfoyle Ltd. The last major development operation in this mine was the construction of a 1.2m diameter ventilation shaft to permit the expansion of workings in a new orebody, "The Lutwyche Prospect", 380m below ground level. Because of a long history of reasonably dry mine workings and for reason of economics it was decided to construct the new ventilation shaft using the raise bore pilot hole as an investigation hole in advance of raise boring operations. The only water inflows expected were near the bottom where water had been intersected in mineral exploration holes. This paper examines the course of the shaft construction operations, the problems of water inflow and analyses the impact of assumptions made in advance on likely ground conditions on the project.

INTRODUCTION

In 1978 the Rossarden tin and tungsten mine in north west Tasmania, Australia (Figure 1), then operated by Aberfoyle Tin Ltd., was the subject of a ventilation shaft development project to serve a new mine development known as the Lutwyche Project. The shaft was designed to permit an upcast airflow of 850m³/min to be exhausted to the surface and was to be completed at 1.22m diameter over a full depth of 385m.

The material to be penetrated included fractured rocks known to be water bearing at depth. If an inflow of greater than 4.0 L/s were to exist into the shaft on completion, adequate ventilation for the development would be lost and any remedial work would be expensive. Further, any significantly larger inflow could place stress on the mine drainage system as well as impose a heavy penalty on mining costs.
LOCALITY PLAN
FIGURE 1