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NUMERICAL SIMULATION OF CAVITY LEACHING WITH COMPRESSIBLE PADS

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SUMMARY AND CONCLUSIONS

The problem of maintaining a fixed pad/brine interface when using a compressible pad (nitrogen, air, etc.) has been analized. As an initial solution of this problem, a set of computer routines have been developed and interfaced with the cavity development program (SALT77). These routines calculate the amount of gas that needs to be added or removed from the cavity to keep a constant pad level with changes in pressure during the leaching operation.

Various example calculations are reported. Results indicate that even for constant circulation rate significant amounts of gas have to be added after initial startup in order to keep the pad/brine interface stationary. Significant adjustements have also to be made whenever the rate of water circulation is varied. These adjustements become larger as leaching goes on and cavity brine gains in saturation.

The routines currently used involve simplifying assumptions. Temperature is assumed to be independent of circulation rate and to follow a linear distribution with depth. Solubility of the gaseous pad in cavity brine is assumed to be insignificant. An in-depth analysis of gas temperature distribution and pad solubility would constitute significant extensions of this project.

In spite of these limitations, the current solution provides useful guidelines for planning cavity development projects requiring compressible pad fluid.