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APPENDIX G

PREDICTION OF SUBSIDENCE RESULTING FROM CREEP CLOSURE OF SOLUTIONED-MINED CAVERNS IN SALT DOMES

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ABSTRACT

The prediction of subsidence rates over a range of areal configurations of solution-mined caverns in salt domes is possible, based on some fifty years of history in solution mining. Several approaches contribute to predictions: site-specific observations obtained from subsidence monitoring; numerical modeling, now becoming more practicable and credible; salt-creep data from testing; and rule-of-thumb methods, based on experience. All of these approaches contribute to understanding subsidence but none are totally reliable alone. The example of subsidence occurring at the Strategic Petroleum Reserve sites demonstrates several principles of cavern creep closure, the main cause of the subsidence, and shows that reliable projections of future subsidence are possible.