SOLUTION MINING RESEARCH INSTITUTE

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RESEARCH PROJECT REPORT
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STATE OF THE ART OF SOLUTION MINING FOR SALT, POTASH AND SODA ASH

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research program are very scarce as they are reluctant to discuss their program with anyone.

Several other companies are reported to be interested in soda ash solution mining, but have adopted a wait and see policy. Companies reported to be in this categoray include:

a) Saline Processors

b) Texasgulf

c) Allied Chemicals

These companies are reportedly awaiting the outcome of Vulcan's and FMC's endeavors before embarking on their own programs.

The Jet Propulsion Laboratory has been conducting experiments related to solution mining of soda ash at Searles Lake (77). As mentioned earlier, there are many layers of high grade trona at Searles Lake, but production presently comes from the interstitial brines found there.

The approach suggested in this research program is to leach out trona with heated sodium sulfate. Presumably the trona would go into solution and sodium sulfate would precipitate in situ. Heat for the solution is critical for attaining the proper solubility relationships and would be proved by salinity gradient solar ponds.

Concerns and Research Needs in Soda Ash

There appears to be little doubt that the need for increased soda ash production exists or that solution mining techniques can profitably be applied to soda ash. The major concerns appear to be centered around environmental questions.

The Wyoming DEQ, Vulcan and FMC are all concerned with the question of subsidence. The Denver Research Center plans to submit project proposals for FY 1982 addressing the question of subsidence. Discussions with Vulcan

indicated that they would find a predictive subsidence model useful and that they would be willing to provide model verification data from their test site. They suggested, in fact, that they may dissolve their cavity until the point of collapse to provide a maximum amount of data. There is some doubt that such a plan would ever receive the approval necessary, however.

There is reportedly a need for improved basic heat transfer and rate of solution data. Both FMC and Vulcan indicated that the literature lacks much of the basic data they need in these two areas.

The Wyoming DEQ is reportedly concerned with the possibility of subsidence and groundwater pollution at these sites.

SUMMARY

Solution mining of salt is a well established technology which began in the 1860's in western New York by explorers drilling for oil. The single well solution mining process spread quickly throughout the Salina Basin and to the salt domes of the Gulf region. Today about two-thirds of the U.S. salt production is solution mined.

In 1933 Trump patented a single well solution mining system using a blanket or pad of hydrocarbons (diesel fuel) that allowed increased control of cavity shape. The Trump method became the dominant solution mining method used up until the 1950's.

After the 1950's, multiple well systems using fracturing and other connection methods predominated. Utilization of solution cavities for storage of crude oil, compressed air and petrochemicals have become common.

Solution mining wells are characterized by their long life. Some cavities are solution mined for more than 20 years.