Salt — An Arizona Resource

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Geologist

It was November of 1968 when Gerald J. Grott, the brains and driving force behind the Southwest Salt Co., decided to risk hard cash in a costly drill hole near Luke Air Force Base northwest of Phoenix. The hole was the culmination of much searching effort on his part for clues as to the whereabouts of salt/rock salt resources as close to Phoenix as possible.

Well, he found it — many *cubic miles* of natural, high-purity rock salt. Grott's first hole topped the salt just 880 feet below the surface; the salt continues for several thousands of feet in depth.

The Geological Survey Branch of the Arizona Bureau of Mines has more than a little interest in the development of this salt. As Mr. Grott will be the first to tell you, it played a significant role in preliminaries leading up to his discovery.

The discovery of the deposit is a fascinating contribution to knowledge of Arizona's geologic history, and the salt itself is a valuable natural resource. Both aspects are of interest to the Bureau.

Presently, the largest markets for the dried, ground, and sized product are in the cattle feeding and water softening industries, though there are numerous lower-volume users. Prior to Grott's discovery, all salt products were imported into Arizona.

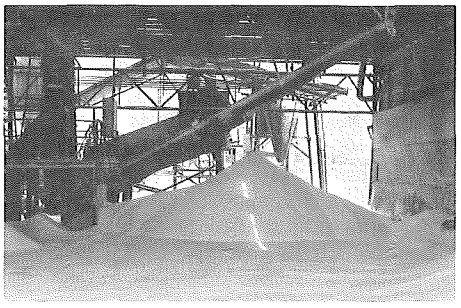

Fig. 7. Cal Gas' railroad tanker propane loading and unloading facility. Product goes into or comes from solution cavities in salt via pipeline. White Tank Mountains and agricultural land in background.

Processing involves pumping water into the salt to dissolve it, then pumping the resulting brine into solar evaporation ponds. The cavern-like areas created by the dissolving process have attracted another industry to the state — an energy industry. Since the salt walls do not dissolve in contact with hydrocarbons, these large caverns are ideal for storage of propane, a form of liquid petroleum gas (LPG).

Propane vaporizes at normal pressures, and so it is widely used as a fuel for heating where the more common energy sources (natural gas and electricity) are not readily available. Also, it serves as a back-up generating fuel for power companies normally dependent on now-scarce natural gas.

Cal Gas has made an agreement with Southwest Salt whereby the salt company processes the brine produced by the dissolving process, and the energy company leases the newly-created storage space. Cal Gas' facilities are now operational and include an intriguing self-contained system for loading and unloading railroad tank cars via a short-distance pipeline to the underground storage cavities. This Arizona installation now serves as Cal Gas' western distribution center.

Fig. 8. Brine from solutioning of a storage cavity enters evaporation pond.

Because of the large size of the salt deposit, coupled with its strategic location with respect to railroads, pipelines, and Arizona's largest urban center, it would indeed be difficult to predict the extent of its ultimate development. But since Arizona is an energy importer, and we *can* predict probable future energy materials shortage, it behooves State officials to plan ahead.

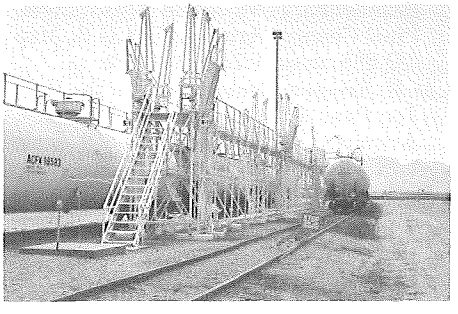

Fig. 9. Harvested, dried, and screened salt ready for bulk loading.

Energy planning must consider materials storage; it therefore seems likely that the salt will one day figure strongly in energy logistics for Arizona, if not for an even larger region of the western United States.

Uranium Resource Study Continues

For almost a year, the Geological Survey Branch of the Arizona Bureau of Mines has been studying the uranium potential of the Mogollon Rim area of Arizona.

As reported in the September 1974 issue of FIELDNOTES, the U.S. Geological Survey awarded a one-year grant in response to a proposal submitted by H. Wesley Peirce, a Bureau geologist. The proposal was to study certain rock formations that are exposed along the Mogollon Rim of east-central Arizona between Oak Creek Canyon south of Flagstaff and Whiteriver south of Show Low. Northward, these rocks are buried beneath the Mogollon Slope and have been encountered by petroleum exploration companies in scattered test drilling.

The U.S. Geological Survey awarded similar grants to several other states as part of a major effort to learn more about the nation's uranium potential, especially the potential that exists in rocks that remain buried beneath large regions.

Because uranium is radioactive and surface occurrences can be detected by almost anyone carrying or flying the proper instruments, the easily found deposits are already known. This means

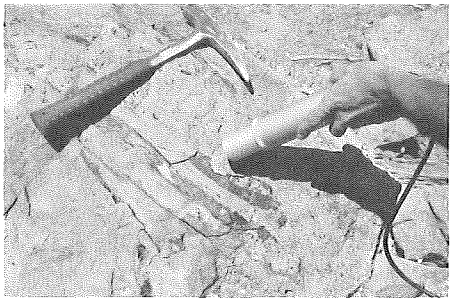

Fig. 10. Hand of Nile Jones holds scintillator probe against conglomeratic material to check radioactivity level contained in uraniferous plant debris that has been carbonized.

that new reserves will be difficult to find, and it will take a combination of scientific know-how, good luck, time, and money to find them if they are to be found. Obviously, most of the rocks of the world are

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