

## REPORT ON WATER DESALINIZATION PROGRAM

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Legislation providing for the construction of demonstration plants for the conversion of saline or brackish waters to water suitable for beneficial consumptive uses was sponsored in the 85th Congress by Senator Clinton Anderson. The legislation was approved by the Congress and became Public Law 85-883 on September 2, 1958.

The law provides, "for the construction, operation, and maintenance of not less than five demonstration plants for the production, from sea water or brackish water, of water suitable for agricultural, industrial, municipal, and other beneficial consumptive uses. Such plants shall be designed to demonstrate the reliability, engineering, operating, and economic potentials of the sea or brackish water conversion processes which the Secretary (of the Interior) shall select from among the most promising of the presently known processes, and each plant shall demonstrate a different process."

The law also provides that "At least one plant which is designed for the conversion of sea water shall be located on the west coast of the United States, at least one such plant shall be located on the east coast thereof, and at least one such plant shall be located on the Gulf Coast thereof; and at least one plant which is designed for the treatment of brackish water shall be located in the area generally described as the Northern Great Plains and at least one such plant shall be located in the arid areas of the Southwest." At least one of the two plants designed for the treatment of brackish water is to have a capacity of not less than 250,000 gallons per day. The law authorized the appropriation of \$10 million for the construction of the demonstration plants together with additional sums for the operation and maintenance of the plants, and the administration of the program.

The saline water program authorized by Public Law 85-883 is not visionary. The water supply problems which it is designed to meet are much closer at hand than many people realize.

Dr. A. L. Miller, Director of the Office of Saline Water has said, "The problem of converting sea water to potable water is an old one going back before the time of Christ. The problem has always been there but the answers change. The Office of Saline Water has the job of finding new answers. We must find new answers and a new way of converting to potable water some of the saline waters that cover three-fifths of the globe. This is necessary because of population growth and the increased use of industrial and agricultural water. The present use of 260 billion gallons per day from all sources will be 597 billion in 1980. This is an alarming figure and is more than double our present demands."

In many places over the world the cost of converting sea water or brackish is less than the cost of developing alternative fresh water sources. For

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example, a few months ago Colinga, California became the first city in the United States to obtain its drinking water from demineralized brackish water. The cost is a very expensive \$1.45 per 1000 gallons, but this is cheap compared with the \$7 per 1000 gallons that the people of Colinga had been paying to haul in fresh water supplies.

The program of the Office of Saline Water has made great contributions to process improvements which result in reduced conversion costs. Engineering estimates indicate that the million gallon per day sea water conversion plant to be built at Freeport, Texas, will produce fresh water for about \$1 per 1000 gallons. The cost of converting brackish waters should be materially less.

There is good reason to believe that desalinized water for municipal and industrial purposes will become economically competitive with alternative fresh water sources at many points in the United States and experts in the field are of the opinion that ultimately it may even be economic to provide water for irrigation from conversion plants.

In October 1958 the State of New Mexico made a strong appeal to the Secretary of the Interior for the location of one of the brackish water conversion plants in New Mexico. The State's proposal pointed out the immediate need for potable water supplies in many New Mexico communities, the tremendous brackish water resources of the State, and the great boon to the State's economy that would result from a practical method of making those resources usable. The proposal also pointed out that the nature of the brackish water's and the water supply problems encountered in New Mexico are typical of those encountered throughout the arid Southwest, so that the results achieved at any one of the numerous potential New Mexico sites could readily be extrapolated for beneficial application elsewhere.

In November 1958 the State entered a cooperative agreement with the Department of the Interior calling for mutual technical assistance and exchange of information in the field of brackish water conversion. Also in November, application forms were provided to the officials of about twenty communities in New Mexico where a conversion plant might advantageously be located. Subsequently, 11\* of these applications were completed and forwarded to the Secretary of the Interior. All of these applications offered various inducements and measures of cooperation including water rights, plant site, favorable energy rates, and technical assistance.

At least one of our institutions of higher learning has entered a mutual assistance contract with the Secretary of the Interior in connection with the desalinization program, and four of our institutions have expressed interest in contracting for the operation of the plant if it is located in New Mexico. The availability of competent scientists improves our case for locating one of the plants in New Mexico.

Our Congressional delegates have followed the development of the water desalinization program closely and have kept the Office of Saline Water apprised of our continuing interest in having one of the demonstration plants

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\*Jal, Carlsbad, Artesia, Hagerman, Roswell, Alamogordo, Tularosa, Carrizozo, Santa Rosa, Espanola, and Farmington.

located in New Mexico.

On November 7, 1958, the Third Annual New Mexico Water Conference at State University adopted a resolution supporting the saline water program and commending Secretary of the Interior Fred Seaton and Senator Clinton Anderson for their contributions to the program. The resolution also provided for the appointment of a standing committee to take all reasonable measures to obtain one of the treating plants for New Mexico. Rogers Aston was named chairman of the committee, and the members are Lloyd A. Calhoun, Jack Campbell, Jack Hobson, James F. Cole, Dr. Harold Stucky, and myself. This committee has made important and possibly vital contributions to the effort to have one of the conversion plants located in New Mexico. As a result of its activities a large number of organizations in the State, all of which are qualified to speak on the subject of the great benefits that could be derived from the location of a plant in the State, have adopted and forwarded to the Secretary resolutions setting forth reasons why the plant should be located in our State and requesting that a New Mexico site be selected. I am confident that the Secretary is very impressed with the intense public interest in the brackish water problem in New Mexico.

Also, the committee was active in generating support for State legislation which provides for a contribution of up to \$100,000 in cooperative funds for the construction of a conversion plant in New Mexico. An important criterion in the selection of the plant sites is the amount and nature of local contributions. This act of our legislature\* greatly improves New Mexico's chances of having one of the conversion plants.

In April 1959 Mr. Walter Rinne, an engineer from the Office of Saline Water, visited all New Mexico communities which had submitted applications for one of the plants. He was conducted on this tour by representatives of the Technical Division of the State Engineer Office and by representatives of the U. S. Geological Survey who were familiar with the brackish water resources at each of the points visited. I was able to participate in only a part of the tour, but I am confident that Mr. Rinne was favorably impressed with many of the sites in New Mexico.

Thus far the Office of Saline Water is on schedule with the program outlined by Public Law 85-883. Freeport, Texas, has been selected for the first sea water conversion demonstration plant. This plant will utilize the long tube, vertical, multiple effect distillation process. Point Loma at San Diego, California, has been chosen for the West Coast sea water conversion plant which will utilize the multi-stage flash distillation process. This plant will produce a million gallons per day of fresh water and, under an agreement with the AEC, will receive its energy from a nuclear power plant. The reactor will be used to determine the economic and technical feasibility of nuclear reactors for producing process heat.

The Secretary has selected electrodialysis as the third process for the treatment of brackish waters but has not yet decided whether the plant utilizing that process should be located in the Great Plains area or in the arid Southwest.

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\*Chapter 285, Laws of 1959.

The sites being considered for the Southwestern plant have been narrowed to ten, four of which are in New Mexico - namely Alamogordo, Carlsbad, Roswell and Santa Rosa. Five of the potential sites are in Texas - at Wichita Falls, Stamford, Ballinger, Monahans, and Pecos. One-Safford is in Arizona. The Site Selection Board will visit the four "still running" New Mexico communities in the period from November 7 through November 11. Once again, arrangements have been made to have personnel of the State Engineer Office and the U. S. Geological Survey conduct the board on its tour.

I think I am justified in predicting that the Secretary will choose the site for the plant to be located in the arid Southwest in early December, and that that site will be in New Mexico.