

# Desalination: the challenge of the '90s

by Mark Wilsey

The International Desalination Association and the National Water Supply Improvement Association held a conference in Washington, D.C. Aug. 26-31, entitled "Water: The Challenge of the '90s." The IDA is chartered to promote desalination technology worldwide, although its members may tend to cater to a cash-and-carry clientele. As one salesman commented, "our biggest problem with the Third World is getting paid."

A pre-conference workshop was held on Aug. 25, on the research and development needs for desalination. This seminar was co-sponsored by the U.S. Department of the Interior's Bureau of Reclamation. Dennis Underwood, commissioner for the Bureau of Reclamation, explained that desalination is needed not only for keeping and adding to our supply of water, but also for waste cleanup and water treatment. The "practical transfer" of this technology is necessary for "sustained economic growth in the 1990s," Underwood said.

William Warne, a water resource consultant from California, voiced a very succinct answer to this challenge: "Think desalination now." Warne sees the 1990s as the "desalt decade." He forecasts that in the next 10 years, desalination activities will be taking place in Arizona, California, Colorado, Florida, North and South Carolina, New Mexico, Oklahoma, and Texas. In California, after five years of drought, "we have completely exhausted our reserves," Warne states. He points to "institutional deadlocks" and a tendency to think of desalination as a technology of the future. "Desalination is ready now," Warne said, and he called on water authorities and power utilities to work together to develop strategies for utilizing it now.

Dr. Dennis Kasper, vice president of Engineering Science and consultant to the water treatment industry, suggested that a planning guide be developed as a resource for those wanting to build desalination plants. This guide would help people make their way through the myriad federal, state, and local permits and red tape required for such a project.

Neil Cline, manager of the Santa Ana Watershed Project Authority in California, reported on the current and future usage of desalination in his area. At present, desalination plants are providing 12.3 million gallons per day (mgd). In the next five years another 28.0 mgd will be added. Plants are planned along the Santa Ana River, downstream from a large concentration of dairies, where the runoff from 300,000

head of cattle can be treated on site. By 2015 Cline expects 121.0 mgd in desalination plants to be on line.

## Desalination technologies

One of the oldest techniques for obtaining purified water is distillation. When this principle is used for desalination, it results in multi-stage flash (MFS) plants, where heated water is sprayed into a chamber where the pressure has been lowered, and a portion of the water "flashes" into steam. Water boils at a lower temperature when the pressure is lowered, thus reducing the heat energy need for the system. The steam is condensed through other stages till the desired purity is reached. Over half the desalination plants in the world are MFS plants.

Since its commercialization 20 years ago, reverse osmosis (RO) has grown tremendously. Over 30% of the world's desalination plants now use this technology. Reverse osmosis uses pump pressure to force water through a semi-permeable membrane, thus separating a portion of the water from the dissolved salts. E.I. Du Pont de Nemours and Co. was the first to develop these membranes. Today Du Pont dominates the market, and 27% of the world's RO desalination plants use Du Pont membranes.

At the pre-conference seminar Dr. Irving Moch, applied technology manager at Du Pont, spoke on the need to develop more advanced membranes to allow more flow with lower energy consumption, provide higher purity, and have longer life. To this end, Moch suggested that research should go into new polymer chemistry work and to re-engineer plant components for greater efficiency.

## The politics of water control

The IDA leadership heavily represents U.S., British, and Saudi political interests. Their bias was very clear in the resolution passed by the body condemning Iraq for "releasing oil into the Arabian Gulf with the possibility to disrupt and interfere with the desalination plants." While there may be condemnable damage resulting from the Gulf war, the overriding issue before the world community today is the mass suffering in Iraq resulting from the systematic destruction of water, power, and infrastructure done by the 40 days of "coalition" bombing.

The conference was a platform for Dr. Joyce Starr, an operative for the interests of the World Bank and the U.S. State Department which have intervened to prevent financing for modern desalination in the Third World, and to see it limited to Saudi Arabia, Kuwait, and a few other favored countries. Starr gave a featured presentation promoting her "Middle East Water Summit," scheduled for Istanbul Nov. 4-8. This is intended to set up water control schemes, instead of water development for the region. "We are very proud of the involvement of the World Bank, which sent a team of experts to visit 22 nations to assist in the preparation of their country papers for the summit," she said.