

# WATER DESALINATION REPORT

The international weekly for desalination and advanced water treatment since 1965

Volume 43, Number 38

14 October 2007

## Spain

### WDR GOES TO MASPALOMAS

*Water Desalination Report* will be attending the IDA World Congress in Maspalomas, Gran Canaria, Spain next week and a daily edition of the newspaper will be published and distributed to all 1,100 delegates each morning. Subscribers will also receive each conference issue via e-mail.

Each special issue will include news from the exhibition floor, reviews of selected technical papers, movements of people in the industry, late-breaking news briefs from around the world and an abbreviated schedule of the sessions/papers for the day.

If you have news that would be of interest to conference attendees, contact one of our staff members or send us an e-mail.

To help defray expenses, the conference issues of *WDR* will also be including a special advertising section. If you are interested in advertising in one of the special issues, contact Alison Ireland ([ai@globalwaterintel.com](mailto:ai@globalwaterintel.com)) or Beth Fullana ([ef@globalwaterintel.com](mailto:ef@globalwaterintel.com)) as soon as possible.

We'll see you there!

## California

### FOOLING SOME PEOPLE, SOME OF THE TIME

Seawater desalination is frequently – and correctly – referred to as a ‘drought proof’ water supply. But that fact alone is never justification to construct a new seawater desalination plant unless it proves necessary, economically justifiable and its development takes place in a transparent and environmentally responsible manner.

Articles written opposing desalination often give the impression that seawater desalination is being proposed irresponsibly and haphazardly, whether it's needed or not, and in lieu of all other alternatives. They may leave the reader believing it is the only option under evaluation, doesn't work and/or is an environmental catastrophe. Many ‘news’ stories play so fast and loose with the truth that they compete with supermarket tabloids for outrageousness.

Even fairly reputable organizations like World Wildlife Foundation (WWF) seem capable of being duped. In a recent report they say, “The considered view of WWF is that seawater desalination has a limited place in water supply, which needs to be considered on a case-by-case basis in line with integrated approaches to the management of water supply and demand.”

Where is it being considered where this not happening? Developing a seawater desalination facility is too expensive to do unless it makes sense. Admittedly, it is the most expensive way to treat water, but in many coastal locations it is the only remaining option that provides a reliable *local* water supply source should the imported supply be interrupted. In virtually every location outside the Middle East or Caribbean where it is being considered, desalination is only being considered to a *limited extent*, on a *case-by-case basis*, as part of a *balanced, integrated approach*.

California is a case in point. At least nine seawater desal plants greater than 10 MGD (37,850 m<sup>3</sup>/d) have been proposed, and in each example, it is being proposed as a part of a long-term strategy that includes both conservation and reuse. In almost every case, desal would represent less than 15 percent of the local water supply. For every proposed facility, construction will be preceded by a one-year pilot study and numerous environmental studies that include significant opportunities for public and stakeholder input.

In at least three California projects, environmental mitigation is the very reason seawater desalination is being considered. In most (all?) other cases, it is being considered on the basis of the unreliability of imported water and desalination's dependability in the face of potential natural disasters. Although it is understandable to be opposed to certain aspects of a desalination project, it does not make sense to entirely dismiss desalination as a water supply option because of a project-specific issue.

While it is fair to discuss Tampa Bay's problems and consider how they should be avoided in the future, it is not reasonable to use Tampa as a justification to say flatly, “it [seawater desalination] doesn't work.” It's fair

to evaluate desal economics to ensure its costs aren't prohibitive, but it's ridiculous to say that "the cost of implementing ocean desal including infrastructure could be as high as \$3,000 per acre-foot [\$9.20/kgal; \$2.43/m<sup>3</sup>]," when any water supply solution would bear most of the same infrastructure costs.

These are two examples of the "Top Ten Reasons to Oppose Ocean Desalination" published by the group *Public Citizen* and reproduced by *Food & Water Watch* and *Residents 4 Responsible Desalination*. Other equally unbalanced and misinformed reasons given include desal's questionable water quality and the fact that it is claimed to promote environmental and social injustice.

Fortunately, good reason seems to ultimately prevail. As *WDR* reported last week, the San Diego County congressional delegation offered its unanimous support of the Carlsbad project. It was not a blanket endorsement of seawater desalination, nor the recognition that desalination is a panacea for all the state's water supply problems. It was a show of support for a specific project based on the merits of that project and a consideration of the alternatives.

## California

### STANDING ROOM ONLY: CARLSBAD SOLD OUT

Olivenhain Municipal Water District's (OMWD) has become the eighth and final public water agency to sign a contract with Poseidon Resources to purchase desalinated seawater from the company's proposed Carlsbad Desalination Plant. Last week, the board unanimously approved a contract to purchase up to 5,000 acre-feet/year (4.5 MGD) of desalinated seawater from Poseidon, ensuring that the plant's production capacity is fully subscribed.

OMWD is also one of ten agencies that have joined together to form San Diego Desalination Partners, a group of local agencies whose goal is to assist and develop the potential for desalinated water in the region, including the Carlsbad plant.

Board vice president Robert Topolovac said, "Desalination will enable the District to diversify its water supply portfolio while providing us with a reliable drought proof water source." The District's water production facilities include a 34 MGD (128,690 m<sup>3</sup>/d) UF surface water treatment plant that when initially constructed, was the largest of its kind in the US. According to Topolovac, "The desalination contract presented today places 100

percent of the risk and liability on Poseidon to deliver the project and the water with no downside to the District's customers."

With this final water purchase agreement in place for the full production capacity, Poseidon has taken a major step forward in bringing large-scale seawater desalination to California. It also has virtually unanimous support of local and state politicians, a poll indicating overwhelming public support for the project, as the region faces a potentially significant court-ordered reduction in its current water supply.

Although the final and perhaps largest hurdle still stands before it – in the form of the Coastal Commission issuance of a Coastal Development Permit – it is growing increasingly difficult to see how Southern California could get by without the plant.

## California

### CONSULTANT SOUGHT FOR SWRO PILOT

California-American Water Company (CalAm) has invited five consultants to submit proposals to provide technical expertise to guide the execution of a one-year SWRO pilot study at Dynegy's Moss Landing Power Plant near Monterey. The study's goal is to obtain operational and performance data to support the development of a design concept for a 10 MGD (37,850 m<sup>3</sup>/d) SWRO plant that CalAm is proposing to construct at the site.

A 20 gpm (1.3 L/s) pilot unit was designed and supplied by Acciona Agua. Although Acciona and RBF Consulting drafted a preliminary test plan for the work, the selected consultant must develop a final test plant outline to satisfy the California Department of Health.

A Memcor UF pretreatment system is installed on one of the pilot plant skids and provisions have been made for another pretreatment skid to be tested. Initially, a skid-mounted array of Norit Seaguard UF elements will be installed in this spot; additional technologies can also be tested. The consultant will provide recommendations regarding promising technology for CalAm to consider for pilot testing.

Feed water for the pilot will be obtained from the condenser circulating water discharge at the Moss Landing Power Plant, and the source of the water is the Elkhorn Slough, a coastal marine estuary subject to tidal and freshwater flows.

Consultants receiving RFPs are Black & Veatch, Carollo Engineers, CDM, CH2M Hill and MWH. Proposals are due on 22 October with award expected by 1 November

Poseidon Resources has proposed a 20 MGD (75,700 m<sup>3</sup>/d) at the nearby National Refractories site and is currently characterizing source water for a planned pilot study of its own.

### Singapore 16" SWRO ELEMENTS IN OPERATION

Large diameter SWRO elements have made their commercial debut at PowerSeraya's 10,000 m<sup>3</sup>/d (2.6 MGD) seawater desalination plant, co-located at the 3,100 MW Pulau Seraya Power Station in Singapore. The system is now in operation producing two qualities of water: 9,000 m<sup>3</sup>/day of high-grade service water, and 1,000 m<sup>3</sup>/day of domestic drinking water.

The two train system was furnished by GrahamTek and employs Hydranautics 16-inch diameter, 40 inch long elements, with four elements contained in each Codeline pressure vessel. The two-stage system is arranged in a 2:1 array providing a 42 percent recovery with an average first pass design flux of 24.2 Lmh (14.2 gfd) and an average second pass flux of 41.5 Lmh (24.4 gfd).

Pretreatment consists of a 3mm strainer followed by two-stage granular media pressure filters, and the system is equipped with a PEI hydraulic turbocharger energy recovery device.

RO concentrate from the first pass SWRO system is discharged to the power plant's existing outfall for disposal to the sea. Concentrate from the second pass is used to backwash the pretreatment filters.

The \$13.5 million facility was designed and built by CH2M Hill.

### Technology HALOPHYTIC DESALINATION

Three weeks ago, this newspaper reported on the 'Seawater Greenhouse' process that recreates nature's hydrological cycle to desalinate saline water to improve crop production. Solaris Cybernetics, a Pennsylvania-based company, employs the same natural desalination process to desalinate water using salt-tolerant, *halophytic* plants cultivated in a controlled environment to desalinate both brackish and seawater via transpiration.

Company president Rudy Behrens told *WDR* that the key to the process success is a proprietary artificial intelligence system that constantly monitors the environment in a semi-enclosed octahedron-shaped structure. "Ideal growth conditions are maintained by adjusting sunlight and nutrients so the enclosure becomes a mechanical organism that adapts to changing conditions as a plant would. Using photovoltaic cells or wind power to provide energy needs, we estimate that a 5 MGD (18,925 m<sup>3</sup>/d) system would require one-acre of land and would have a capital cost of less than one million dollars. The chemical-free process could produce water for less than \$35/acre-foot," he said.

The system was developed with assistance from Rutgers, Drexel and the University of Delaware.

The process has been demonstrated with a 500-gpd (1.9 m<sup>3</sup>/d) pilot unit and the company is now looking for a client who would be interested in a 5,000 to 10,000 GPD (19 to 38 m<sup>3</sup>/d) demonstration unit to further evaluate the process. Depending on the location's relative humidity, such a unit would have a footprint of approximately 30 x 30 feet (9m x 9m). According to Behrens, "For the right client, we would provide a turnkey unit – including a renewable energy power system – at no charge."

Interested parties can contact Behrens at [info@solariscybernetics.com](mailto:info@solariscybernetics.com)

### Spain SWRO PLANTS SELECT ERDS

Two Spanish SWRO plants with production capacities totaling 440,000 m<sup>3</sup>/d (116.25 MGD) have chosen to use Energy Recovery Inc's (ERI) PX energy recovery device.

ERI's Borja Blanco told *WDR* that the 240,000 m<sup>3</sup>/d (63.4 MGD) Torrevieja plant being built by Acciona Agua would include more than 300 of his company's pressure exchange devices. "Acciona Agua will equip the plant with 585 solar panels to reduce power demand from the grid and PX technology to reduce process energy consumption. The system will have 16 trains and we anticipate the SWRO energy consumption for high-pressure pump, ERD and booster will be less than 2.3 kWh/m<sup>3</sup>," he said.

Located in Alicante, half of the plant's capacity will be used for agricultural irrigation and it has been designed

to produce water with a boron content less than 0.5 mg/L. The plant should be operational by the end of 2008.

A consortium including Suez Degremont, Agbar and ACS has selected ERI's pressure exchanger for the 200,000 m<sup>3</sup>/d (52.8 MGD) Barcelona Desalination Plant it is constructing. The ten-train system will have a process energy consumption of less than 2.3 kWh/m<sup>3</sup>, and is scheduled for a 2009 startup.

## Iowa

### UF MEMBRANE INTEGRITY A NON-ISSUE

After more than one year of operation, Keokuk Municipal Water Works' general manager Bill Cole told *WDR*, "Norit's membranes have exceeded our expectations. We thought we would have to fix a few broken fibers each month, but have had only one broken fiber in the past year. And, we have virtually eliminated chemical cleaning, dramatically reducing operating costs."

The Iowa utility started up its first 3 MGD (11,355 m<sup>3</sup>/d), 100-cartridge UF skid last September and has recently started a second unit to treat Mississippi River water.

"Based on the initial pilot study, we planned to clean the membranes monthly, and we did daily CEBs [chemically enhanced backwashes] during the first six months of operation. But based on the membrane performance, we haven't cleaned the membranes in more than six months and stopped the CEBs, saving over \$100 a day in chemical costs. We do continuously pre-chlorinate with 2 ppm of free chlorine which allows us to run with a TMP [transmembrane pressure] of 4 to 4.5 psi [0.3 bar]," said Cole.

Norit X-Flow's Rick Rosberg told *WDR* that the membrane integrity experience at the Keokuk plant is no surprise. "We have just evaluated the membrane repair costs of three large UF installations with a combined capacity of 46 MGD (174,110 m<sup>3</sup>/d) that employ more than 27.5 million fibers. The plants had a combined total of three broken fibers with a repair cost of less than \$200 per year," he said.

With a year of operating experience under his belt, Cole succinctly summed up his opinion of UF plant maintenance saying, "Membranes don't have to be a pain."

## IN BRIEF

Emad Zreikat, director of **Aqaba Water Company**, last week announced plans for a 137,000 m<sup>3</sup>/d desalination plant for the southern Jordanian city of Aqaba located on the Red Sea coast. The project would provide more than 25 percent of the water for the city, which is currently experiencing water shortages. Terms of reference for the project are currently being prepared.

American Water Chemicals (AWC) has announced the establishment of a new website outlining their line of onsite and offsite membrane system services and membrane-related products. Interested parties can visit [www.membranechemicals.com](http://www.membranechemicals.com)

## PEOPLE

After a 3-year hiatus, longtime desalter Dave Laker is back and working with Calder Energy Recover. His first job in the RO industry was with Ajax in 1969 and much of his career was spent with DesalCo, including some time after its acquisition by Calder. He retired in 2004 but told *WDR*, "This is the most exciting time in the history of SWRO, during which time I've participated in a number of its milestones; I don't want to miss out on the climax." He can be contacted at [david.laker@calder.ch](mailto:david.laker@calder.ch)

## JOBS

**IDE Technologies** is seeking to hire highly qualified project managers, lead process engineers and lead mechanical engineers with vast experience in the design, construction and start up of large SWRO desalination plants for its projects around the world. Interested individuals should e-mail their resume to [resume4ide@ide-tech.com](mailto:resume4ide@ide-tech.com)

**ACCIONA Agua**, one of the world's leading international water companies in desalination and water & wastewater treatment is seeking degreed engineers, preferably electrical and mechanical, with experience in RO desalination plants for its projects in Australia, Algeria, UK and its headquarters in Madrid. Please send your resume to [www.acciona.com](http://www.acciona.com) to the International Engineers Acciona Agua job opportunity.