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Mexico-USA

President approves SWRO pipeline permit

Despite all the recent talk of constructing an impenetrable wall to separate the US from Mexico, *WDR* has learned that a Presidential Permit has been granted to Southern California's Otay Water District (OWD) to import desalinated seawater from Mexico to the US.

The permit authorizes the "construction, connection, operation and the importation of desalinated seawater at the International Boundary between the United States and Mexico in San Diego County, California." The permit is a requirement of a 1968 Executive Order, which mandates federal agencies to determine whether such a project is in the US national interest.

OWD applied for the permit in November 2013 and, along with the State Department, published a draft environmental impact report/environmental impact statement (EIR/EIS) in May 2014. Following a public comment period, a final EIR/EIS was issued in September 2016.

The District plans to purchase up to 20 MGD (75,700 m^3/d) of desalted seawater from the proposed 100 MGD (378,500 m^3/d) Rosarito Desalination Plant. The plant will be constructed by Aguas de Rosarito (AdR), a special purpose company comprised of Consolidated Water Company's (CWCO) NSC Agua subsidiary, Degrémont and NuWater, in the Mexican state of Baja California, across the US-Mexican border; despite its interest in purchasing water, OWD is not a part of the desal project.

The cross-border pipeline will convey desalted seawater four miles (6.4km), from Mexico across the US border, via a 54-inch (1.2m) diameter pipeline, with metering and pump stations and a disinfection facility. The first, 50 MGD phase of the Rosarito project is expected to be producing water by the end of 2019, while the pipeline has been envisioned as part of the project's second phase, which should be operational in 2024.

The permit will expire in five years if construction has not yet begun, leading to speculation, unconfirmed by OWD or CWCO, that the permit approval might signal that the second phase of the project could be accelerated.

WDR understands that financial closure on the $460+ million project is now expected to take place later this summer, or early fall.

Technology

Energy-Desal Design Winner picked

Last week, a team led by Oak Ridge National Laboratories prevailed in a year-long design effort, winning the *US-Israel Integrated Energy and Design Challenge*. The Challenge—organized by the US Department of Energy (DOE) and Israel's Ministry of National Infrastructure, Energy and Water Resources (MIEW)—was intended to encourage leading US and Israeli engineers to design a novel, integrated energy-desal system that could be suitable for both countries. Challenge specifications were jointly developed by US and Israeli experts, and a parallel competition was conducted for applicants from each country.

The Challenge's goal was to site and design a system that could profitably produce at least 1,000 m^3 (0.26 MGD) of potable water from a feedwater with a TDS of 5,000-20,000 mg/L at a target price of \$0.50/m^3 (\$1.89/kgal), while providing some portfolio of services to the electricity system. A successful system would have a productivity factor of 75 percent and could be sited in the US or Israel. It could achieve the goals by including revenue streams for providing electricity services through on-site energy generation and storage, the utilization of waste heat or cooling or the recovery re-use of waste brines.

The US teams were each led by a principal investigator from one of the National Laboratories, and the Challenge was conducted in two separate phases: a three-page concept phase from which three finalists were selected and each provided with \$50,000 in funding to develop a full design; and, a full design analysis from which the winning team was selected by a panel of expert judges and awarded \$100,000 of funding to further the deveopment of its design.

During a two-day event held in Jerusalem last week, the teams presented their final designs and were then interviewed by the judges. The winning design was selected based on its technical merit, creativity and innovation, team and resource

GWI

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diversity, commercialization potential and program policy factors.

The teams, and a brief description of the designs selected for participation in the finals, were:

Winner: Oak Ridge National Laboratory (ORNL) – An integrated renewable energy-RO design that dynamically controls energy consumption under variable power and salinity conditions, using a feedwater blend consisting of low-salinity wastewater effluent and seawater. The renewable energy components included a hybrid photovoltaic (PV) and an optional modular pumped storage system.

Partners: Brookhaven National Laboratory, Columbia University, Hazen & Sawyer

Principal Investigator: Sujit Das, ORNL

Presenter: Adam Atia, Columbia University

Los Alamos National Laboratory (LANL) – An integrated parabolic trough concentrated solar powered (CSP) cogeneration system to produce steam to generate electricity before being used to drive a multiple effect distillation (MED) process to desalt saline groundwater.

Partners: Norwich Technologies, Creare LLC

Principal Investigator/Presenter: Stephen Obrey, LANL

Sandia National Laboratories (SNL) – An integrated concentrating point-focus solar array and direct-coupled energy storage system to produce steam for a non-condensing steam turbine generator and multi-stage flash (MSF) evaporator, with an optional PV system.

Partners: Arizona State University, Golden State Energy

Principal Investigator: James E. Miller, SNL

Presenter: Ellen Stechel, ASU

Although Israel's MIEW conducted a parallel challenge, the two competing Israeli teams started later and were not as far along in the final design process. So, after their presentations and interviews were completed, it was decided that the winner of the competition between ADAN Technologies' integrated CSP-BWRO-SWRO-MED, and Arava/Rotem's gasification-MED-RO would be selected in about three months.

The US judges were Udi Helman, a consultant with Helman Analytics; Audrey Lee, vice-president of analytics and design for Advanced Microgrid Solutions; James Klausner, professor and chair of Michigan State University's Mechanical Engineering Department; and, *WDR's* Tom Pankratz. The Israeli judges were Jacov Karni, a researcher at Weitzman Institute; Yossi Yaacoby, director of Mekorot's WaTech division; and Avi Moshel, an environmental consultant.

Participating members of the organizing committee included co-chair Diana Bauer, the DOE's Director of Energy Systems Integration Analysis; Sam Bockenhauer, a DOE Physical Scientist; Timothy Walters, a DOE International Relations Specialist; and Einat Magal, the Earth and Marine Sciences Research Manager at Israel's Chief Scientist Office.

More information on the Challenge is available at http://tinyurl.com/mt8yp73.

Australia

Minimum water order for largest SWRO

Despite rainfall and the addition of desalted seawater from the Victorian Desalination Plant (VDP), water storages in the state of Victoria have declined for the past 24 weeks. Melbourne's storages are now 105 million m^3 (27.7 billion g) lower than at the same time two years ago, prompting the government to place a water order for 15 million m^3 (3.4 billion g) of water from the VDP for 2017-2018.

The water order was made in consultation with area water retailers, and should restore Melbourne's storage levels while providing an ongoing buffer against drought. The amount also represents the minimum water order set for the next three years for the 450,000 m^3/d (119 MGD) SWRO plant, and will guarantee continued water security and better plant management.

The government also announced that Melbourne residents would not face additional charges for water purchased from the desal plant, because the purchase will be funded from the sale of surplus Renewable Energy Certificates, which were previously purchased by the plant to offset renewable wind energy, and were not fully utilized because no water orders were made until 2016.

The plant was commissioned in December 2012, but was not operated until earlier this year, when an order for 50 million m^3 (13.2 billion g) was placed in response to falling storages.

California

Reuse plant to get new membranes

New York-based Scinor Water America has been awarded a contract to supply 2,500 membrane filtration modules for the Phase IV expansion of West Basin's 14 MGD (53,000 m^3/d) Edward C. Little Water Recycling Facility in El Segundo (Los Angeles), California. The expansion was completed in 2006 and treats secondary effluent to advanced water

quality standards—employing cartridge filters, chemical addition, MF, RO, decarbonation and UV irradiation—for groundwater injection, to serve as a barrier to seawater intrusion, and for industrial process water.

When originally installed, the Memcor (now Evoqua) six-cell submerged MF system was a pioneering system for its time. However, after nine years of operation, there had been a growing number of largely age-related operational and reliability issues with the submerged polypropylene membrane modules. In addition to cracking in some of the nylon module blocks, there has been a loss of membrane permeability, resulting in a 50 percent reduction in plant production that necessitated more frequent cleaning.

To evaluate its upgrade options, West Basin engaged Separation Processes (SPI) and Suez, the plant's contract operator, to conduct a pilot study, which was followed by a full-scale test that began in late January 2017 to evaluate alternative replacement membranes.

Based on the study results, West Basin awarded Scinor a membrane replacement contract under which it will furnish its TIPS (thermally-induced phase separation) PVDF membranes. The plant will also implement new automation and controls capabilities that are in-line with today's standards.

Tom Poschman, Scinor Water America's president and CEO, said that the installation of the membranes is expected to be completed in the second half of 2017. It will be Scinor's largest US installation, and its third largest in the world.

Conference News

EuroMed 2017, one for the books

Ambassadors, academics, students, utility and industry specialists and invited co-hosts from China and Italy met in Tel Aviv on 9-12 May for EuroMed 2017, the European Desalination Society's (EDS) annual conference, under the theme *Desalination for Clean Water and Energy: Cooperation around the World*.

The first of two keynote presentations was given by Izzeldin Abuelaish, the Professor of Public Health from the University of Toronto, whose talk on *Water for hope, health and peace* served as a perfect prelude to two panel discussions addressing cross-border issues. The discussions involved scientists from Gaza, Israel, the West Bank and international organizations involved in the region.

Ora Kedem, Professor Emerita from the Weizmann Institute of Science and Ben Gurion University of the Negev, gave a second keynote, titled, *Where can electrodialysis compete?* The talk was a fitting lead-in to one of the conference's two parallel technical sessions, which emphasized electrochemical processes.

The program included a highly popular visit to the Sorek plant, the world's largest SWRO plant, hosted by IDE Technologies. Avshalom Felber, the company's CEO, arrived directly from the airport to greet participants.

Kevin Price, who is associated with the Middle East Desalination Research Center (MEDRC), moderated a closing session during which panelists addressed theoretical solutions to Gaza's immediate and long-term water concerns, focusing on the technical, rather than political, needs.

Outgoing President Ursula Annunziata, of Genesys International, introduced Maria Kennedy, Professor of Water Treatment Technology at UNESCO-IHE Institute for Water Education, as EDS' new president, and announced that the next EDS biennial conference and exhibition would be held in Athens, Greece, in May 2018.

She also continued the well-established EDS tradition of performing specially-written desalination songs at the Gala Dinner, accompanied by EDS pianist Richard Furstenheim. Drawing inspiration from well-known musicals by Andrew Lloyd Weber and Rogers and Hammerstein, Annunziata emotionally sang the tale of her tenure as EDS president and made the members chuckle with her desal-themed tongue-twisters.

Genesys' Ursula Annunziata serenading desalters, including (from left) Professors Ora Kedem and Rafi Semiat

Of course, no EDS event could be appropriately summarized without acknowledging Miriam Balaban, the Society's secretary general, for her tireless work organizing an interesting event with such broad, international participation.

In brief

Shanghai-based **SafBon Water Service** will purchase Florida-based **Doosan Hydro Technologies** (DHT) from Korea's Doosan Heavy Industries & Construction for $7.36 million. The deal comes just two months after Safbon completed the purchase of a 21.6 percent stake in IDE-affiliated AquaSwiss AG. DHT was established in 2005, when Doosan Heavy acquired the US water treatment division of American Engineering Services (AES) for $4.7 million. Until the acquisition, Doosan's desal capabilities were limited to MSF projects, although it was also developing a position in the MED market. Based on AES' SWRO references, Doosan was able to immediately engage in the rapidly growing SWRO market.

Built in response to a record drought and commissioned in 1992, **Santa Barbara's SWRO plant** was soon turned off and eventually mothballed, when rains filled the area's nearly empty reservoirs. However, the city wisely continued to maintain its permits and waited patiently for the next drought. In September 2015, following a series of studies, the City awarded IDE Technologies a notice to proceed with the design, construction and reactivation of the 3,125 AFY (10,560 m^3/d) SWRO plant at a total cost of about $70 million. Barring any unforeseen circumstances, the Charles E. Meyer Desalination Facility could become California's fourth operational seawater desal plant later this week, joining the Carlsbad, Catalina and Sand City SWRO plants.

Pre-proposals for its Unsolicited Research Program are being sought by the **Water Environment & Reuse Foundation** (WE&RF). Funding of research project proposals in relevant wastewater, reuse and other sources of water will be considered. A funding total of approximately $300,000 is expected, with typical awards made in the $25,000 to $150,000 range. A minimum 25% cost-share or in-kind support must be contributed, and the maximum project duration is two years. Pre-proposals are due by 13 July and more information is available at http://www.werf.org/unsolicitedresearch.

Evoqua Water Technologies said it would deliver a 50 gpm (43 m^3/h) brackish water desal system employing its Nexed electrochemical technology for demonstration at El Paso Water Utilities' Kay Bailey Hutchison Desalination Plant. The system is expected to be operational next month.

The South Central Membrane Association (SCMA) will hold a membrane operator training course titled ***"MOC-III: Low Pressure Membrane Systems"*** in Richmond (Houston), Texas, on 6-8 June. For information and registration, visit http://tinyurl.com/mlqpero.

The **US Bureau of Reclamation** has awarded a total of $23.6 million to 19 projects in seven states. The funds are for planning, designing and constructing water recycling and reuse projects, developing feasibility studies, and researching desalination and water recycling projects as a part of the Title XVI Water Reclamation and Reuse program. For a list of projects, visit http://tinyurl.com/mrkuxfd.

A 10,000 m^3/d (2.6 MGD) containerized SWRO plant furnished by **RWL Water**, has been commissioned at Pelican Island, near Richards Bay, on South Africa's northeast coast. The Department of Water and Sanitation contracted a partnership of North Coast Water Utility and RWL. The desalted water is reportedly pumped to 20 area reservoirs.

Erratum: In the 9 May 2017 issue of *WDR*, a story on a GE Water **ZeeLung MABR** project in Italy said that the results were for a full-scale installation. In fact, the results covered the first six months of an ongoing 10-month study.

Reminder: The 1 June deadline for submitting applications for AMTA funding opportunities for **grants, research fellowships, scholarships and stipends** for graduate and undergraduate students is approaching. For details, visit http://tinyurl.com/hjmrzau.

Jobs

Scinor Water America is seeking an Applications/Service Engineer to provide technical sales and service support for its hollow-fiber membrane filter products in new-build and retrofit applications. The preferred candidate will have an engineering degree and a minimum of three years MF/UF experience. The position will be based in Southern California and requires up to 50% travel. Please send your resume to joe.tardio@scinor.com.

Save the Date: American Water Summit

The American Water Summit 2017 will be held on 29-30 November in Austin, Texas, at the JW Marriott hotel. For more information, visit http://www.americanwatersummit.com.