

WATER DESALINATION REPORT

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United Arab Emirates

RFP ISSUED FOR MEGA-SWRO PLANT

Abu Dhabi Water and Electricity Authority (ADWEA) has issued a request for proposals (RFP) for its Taweelah RO Independent Water Project (IWP). ADWEA is considering an option for a single contract for the full capacity of 908,400 m³/d (240 MGD) and another option for two parallel plants with capacities of 454,200 m³/d (120 MGD) each.

Of the 25 prospective bidders that submitted statements of qualifications to participate in the project, 13 companies are understood to have been unconditionally prequalified, and 12 companies have been conditionally qualified on the basis that they join a consortium to submit a bid. The companies—with the conditionally qualified firms designated by an asterisk (*)—are:

- Acciona Agua
- Aqualia
- Cobra
- GIC*
- Hyflux*
- IDB Infrastructure*
- Marubeni
- Orascom Construction*
- Power China*
- SNC Lavalin*
- Suez
- Utico*
- Veolia
- ACWA Power
- China Harbor*
- Engie
- GS Inima*
- JGC
- Malakoff
- Mitsubishi
- PAL Group*
- Samsung*
- Sojitz*
- Sumitomo
- Valoriza

The deadline for bids has been set at 29 October, and it has been the intention to select a successful bidder by the end of the year. An advisory team that includes Alderbrook (financial), ILF (technical) and White & Case (legal) is advising the client on design and procurement.

Florida

RFP ISSUED FOR TEMPORARY BWRO

Orlando Utilities Commission (OUC), the electric municipal water utility serving the Orlando area, has issued a request for proposals (RFP) for a temporary RO treatment system during a minimum one-month outage of its existing 600 gpm (136 m³/h) high purity water system. During the outage,

which is scheduled to begin 11 September 2018, OUC will make major repairs and upgrade its existing lime softening clarifier, gravity filters and two demineralizer trains.

The temporary system will treat well water with a TDS of less than 360 mg/L and will include:

- a skid/trailer mounted pretreatment system rated at 800 gpm (182 m³/h) and provided on the basis of an N+1 concept and designed to remove H₂S gas and suspended solids from the well water
- a trailer mounted, single-pass BWRO system rated at 600 gpm with 75% recovery and designed to remove ≥ 90% of the feedwater TDS
- a CIP system capable of cleaning the membrane modules and restoring the full design flow within 4 hours
- a PLC controller for the entire pretreat/RO system
- all necessary chemical feed systems, pretreatment chemicals and cartridge filters
- one lot of RO inlet, permeate and concentrate piping, and up to 200 ft (61m) of temporary piping or hoses
- field support services

The rental system is expected to be located in an area that has been graded and is in close proximity of the existing high purity water system building.

A mandatory pre-proposals conference will be held on 13 June and proposals are due on 6 July 2018. The rental price is to be based on a one-month rental with weekly extensions. For information, contact amaldonado2@ouc.com.

China

HDH PROCESS CONCENTRATES FGD BRINE

Boston-based Gradiant Corporation has commissioned its first humidification-dehumidification (HDH) system to concentrate flue gas desulfurization (FGD) wastewater at a coal-fired power plant in China's Jiangsu province, northwest of Shanghai. The announcement came on the same day the company announced that it had established a new business division based in Shanghai.

Jason Tao Yu has been appointed the managing director of Gradiant China, and told *WDR* that the company's flagship



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Carrier Gas Extraction (CGE) HDH unit is the first of two units planned for the 4x600MW coal-fired power plant. “For the project’s first phase, we furnished a unit designed to treat up to 5 m³/h [22 gpm] of FGD wastewater, whereas the second unit will treat 30 m³/hr [141 gpm],” he said.



Gradiant’s CGE unit concentrating power plant FGD wastewater

“Wastewater is first pretreated using a chemical precipitation process and ultrafiltration before it is introduced to the CGE unit at a TDS of about 18,000 mg/L, where it is concentrated to near saturation at 300,000 mg/L, with a recovery of over 90 percent. The system is designed to operate at a top temperature >80°C [>175°F], using either steam or spent condensate, and a client-furnished spray dryer is used to achieve ZLD.

“CGE electrical consumption is very low and our maintenance requirements are nominal. The system is about as close to zero-CapEx as a ZLD system can get.”

Gradiant CEO Anurag Bajpayee said that China’s strict environmental regulations for industrial discharges have impacted a variety of industries, and offer a wide range of opportunities for the company. Although this first Chinese CGE unit was built in the US, Gradiant now has local resources in place, and has begun the process to build the second unit in China.

Company News

CDI SPECIALIST COMPLETES FUNDING ROUND

California-based Atlantis Technologies has secured a \$2 million Series-A investment from Evapco and CenterGold Capital. *WDR* has learned that the investment also includes an additional line of credit, both of which will be used to increase the production capacity of Atlantis’ proprietary radial deionization (RDI™) system, develop next-generation

devices and systems and expand its global sales and service capabilities.

According to Atlantis CEO Patrick Curran, both investors have a strategic interest in Atlantis. “Evapco is one of the global leaders in cooling tower and HVAC systems. In addition to investing in Atlantis, they will also have an exclusive global licensing and distribution agreement to furnish our RDI systems in cooling water applications.

“Earlier this year, Evapco installed our first commercial RDI system in a 25 gpm [1.6 L/s] cooling tower feedwater application in Indiana. The system operates at an 85-90 percent recovery, discharging brine to a local POTW [publicly owned treatment works]. We have already shipped a second unit to another Evapco client and have received an order for an additional installation,” he added.

Center Gold Capital will have distribution rights for the technology in China, excluding cooling water and HVAC applications, through their Chinese parent company, Nanfang Zhongjin Environment Co, Ltd.

Curran said that RDI differs from other capacitive deionization (CDI) systems because the layered configuration of its radial cylinder provides a much longer flow path, which is said to enable an improved system recovery and lower capital and operating costs.



Atlantis RDI System

“In an RDI system, saline water flows through one or more charged capacitors, removing salt from the water. Once full, the capacitor charge is reversed and a very concentrated, low volume brine stream is generated. Systems can be configured with cylinders in parallel or in series, and multiple skids can be employed to process high flow rates and salinities up to 20,000 mg/L. Typical applications are cooling tower feed trimming, brackish groundwater, industrial wastewater and RO reject,” explained Curran.

Atlantis has a supply/license agreement with Voltea that includes the purchase of rolls of the latest generation of Voltea's electrode/membrane supercapacitors, from which it manufactures its RDI cylinders.

Company News

AQUARION GETS FUNDING & NEW 'OLD' NAME

Flush with €15 million (\$17.65 million) in funding from the Sustainable Growth Fund, a Luxembourg-based private equity fund, and €6 million (\$7 million) from the Green Growth Fund, Switzerland's Aquarion Group announced that it has integrated all of its operating companies under the H+E brand.

Aquarion originally acquired Hager+Elsässer—widely known as H+E—in 2014, and set about restoring the 80-year-old industrial water company's financial strength and stability. Aquarion continued to increase its capabilities by expanding the group to include MFT GmbH (Membran-Filtrations-Technik), GEMWATER s.r.l. and H2Oil & Gas. All of the companies will now be rebranded as H+E, with the former H2Oil & Gas leading the group's oil and gas division.



Back to the future

In announcing the new developments, Aquarion Group CEO Karl Michael Millauer said, “The consolidation of our operating companies into H+E enables us to best serve the needs of the global marketplace. We will continue to grow our global footprint, led internally by H+E, which is dedicated to providing total solutions on an EPC and turnkey basis, as well as through acquisitions of companies that further strengthen our portfolio and broaden our geographic reach.”

The company is active across all membrane, chemical, biological, physical and thermal treatment technologies, with operations in Germany, Switzerland, Austria, Italy, the UAE, UK, Chile, Russia, Australia and Southeast Asia.

South Africa

WINTER RAINS PROVIDE SOME RESPITE

As a result of the past week's rains, Cape Town's dam levels have increased by 7% and collectively stand at 31% of capacity; however, the lowest portion of a dam water is usually not accessible, so the useable water level is approximately 10% less than the actual water level.

A combination of an aggressive conservation effort and the early winter rains has provided a bit of a cushion from the region's 'once-in-a-millennium' drought. And even though Day Zero has been pushed out to 2019, the level 6B restrictions put in place on 1 February remain in effect, with residents required to drop their daily water use to 50 liters (13.2 gal) per person.

The city has installed three temporary seawater RO plants with a combined production capacity of 16,000 m³/d (4.2 MGD). One project is already in operation and the other two should be commissioned later this month. A larger, permanent desal facility is also under consideration, and several possible sites are being evaluated. Groundwater and reuse projects are also under consideration.



Passengers disembarking at Cape Town's airport are reminded of the drought, and hotel guests are given a bucket to collect shower water for the hotel garden and asked to “save like a local”.

Project Funding

RECLAMATION OFFERS PROJECT FUNDING

The Bureau of Reclamation has released a Funding Opportunity Announcement to invite sponsors of ocean and brackish water desal projects to request cost-shared funding for the planning, design and/or construction of projects.

Eligible projects must have a completed Reclamation-reviewed feasibility study, be located in the Western US or US Territories and be included in a state-approved plan. Up to four projects could be awarded a combined total of \$18 million under this program.

Applications must be filed by 27 July and more information is available at <https://tinyurl.com/yayb6jaq>.

Transition

DR ROBERT P. CARNAHAN SR (1936–2018)

Bob Carnahan, a former professor in the University of South Florida's Department of Civil and Environmental Engineering, died at his home in Temple Terrace, Florida, on 2 June. He was 81 years old.

Bob was born and raised in Bradenton, Florida, and earned degrees from the University of Florida (BCE, 1959), the University of North Carolina (MSSE, 1964) and Clemson University (PhD, 1973). He served in the US Army in Vietnam, earning at least nine medals and awards. Following his 1980 retirement from military service as a Lieutenant Colonel, he was awarded a silver medal for distinguishing himself through the design and development of the US Army's revolutionary mobile Reverse Osmosis Water Purification Unit (ROWPU).



Bob joined the University of South Florida in 1983, and was actively involved in teaching and research in innovative water and wastewater treatment technologies. He was named Associate Dean of Research in 1993, and Professor Emeritus upon his 2006 retirement.

His wife Geraldine, three sons and three grandchildren survive him.

IN BRIEF

Although several Orange County Water District board members spoke in strong support of accepting Poseidon Water's revised term sheet for the 50 MGD (189,250 m³/d) **Huntington Beach SWRO project** at last week's board meeting, the issue was tabled and will be considered at its 18 July board meeting. The decision to delay the approval was made to allow more time for the public to review and comment on the changes to the 2015 term sheet. It followed Poseidon's 20-minute presentation of the documents, one hour of comments from speakers in the audience and a 25-minute question and answer session.

ACWA Power, the Saudi Arabia-based developer and investor in power generation and seawater desalination projects, has signed a memorandum of understanding with **China Energy Engineering**, a Beijing-based international EPC contractor. The framework agreement enables both companies to explore joint investment opportunities and cooperate on power and desal projects across the Middle East and Asia where ACWA Power operates.

Finland's **Evac**, a provider of integrated waste, wastewater and water management systems for the marine, offshore and building industries, has acquired **Cathelco**, a UK-based supplier of marine equipment and services, including desalination and ballast water treatment systems. Cathelco reports annual sales of €31 million (\$36.5 million), bringing the combined turnover of both companies to over €136 million (\$160 million). Cathelco had previously acquired Hydro-Electrique Marine (HEM), a French specialist in marine desal and water treatment systems, in 2015.

PEOPLE

Brown and Caldwell has announced that **Wendy Broley**, its former water reuse leader, has been promoted to vice president and One Water leader, where she is responsible for setting the strategy and managing the firm's One Water team. Based in San Diego, California, she may be contacted at wbroley@BrwnCald.com.

Koch Industries has announced that **David Koch** will be retiring from his responsibilities with the organization, including those at Koch Membrane Systems (KMS) where he has been Chairman of the Board, due to declining health. Manny Singh, president of KMS told *WDR*, "The news of Mr Koch's retirement was not unexpected. Because of the care that was taken in succession planning, David's retirement will have no significant impact on KMS' operations. KMS continues to enjoy both the confidence and support of Koch Industries and we remain committed to David's focus on creating cutting-edge, technology-driven solutions to our customers' filtration needs. We wish him better health and thank him for his many contributions to KMS and the membrane industry." Mr Koch will now be Director Emeritus at Koch Industries.