

WATER DESALINATION REPORT

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Australia

SWRO IS CITY'S WATER INSURANCE POLICY

When Melbourne Water made a 2007 decision to build the Victorian Desalination Plant (VDP) in Wonthaggi, dam levels hovered around 35 percent and the region was in the midst of the ten-year Millennium Drought. By the time the 450,000 m³/d (119 MGD) SWRO plant was finally commissioned in December 2012, water storage levels were at 80%, and the plant was shuttered and mothballed.

The plant sat idle for the next few years, and it wasn't until March 2016 that water supplies had declined to the point that authorities ordered the plant to be reactivated so that it could deliver 50 million m³ (40,533 AF) by mid-2017. The State's Minister for Water later announced a standing minimum order of 10% of its annual production capacity, for the next three years.

In March 2019, Melbourne Water's water storage levels again fell below 55% and an order was placed for 125 million m³ (101,335 AF), or 83% of the VDP's nameplate capacity, to prevent water storages from dropping to a point where they pose a significant risk to water security.

Australia's 2025 winter (January-June) was very dry, and streamflows in Melbourne's catchments were over 60% lower than 2024 levels, the lowest since the Millennium Drought. As a result, VDP production has been stepped up, delivering 16 million m³ (4.2 million gal) since early July, to keep Melbourne's water storages topped up.

Permanent water-saving rules remain in force across Greater Melbourne, and according to Chris Brace, Melbourne Water Executive General Manager of Service Futures, "Desalination has been our winter lifeline and every drop counts."

Conveying Melbourne's Water – Melbourne Water's water storage capacity, which includes 10 major reservoirs, is 1,812 million m³/d (1.47 million acre-feet), and its average water demand is about 1.3 million m³/d (343.5 MGD).

Its Victorian Desalination Plant (VDP) is capable of supplying about 33% of the demand. VDP is operated by Watersure, a private operator under contract to AquaSure.

By March 1st of each year, Melbourne Water is required to provide desalinated water order advice to the Victorian

Government. The advice is based on a detailed technical analysis of 'five principles' that considers the level of storage volumes and the customer impacts. The principles are:

- The chance of falling into the 'Critical Water Use Only Zone'
- The chance of falling into the 'Be Proactive Zone Storages'
- Storage
- Recovery Risk of desalted water causing avoidable foregone harvest
- Customer impacts

These principles are considered alongside the value of water in storage, spillway flows, and climate outlooks. To support water resource and price modelling, the Department of Energy, Environment and Climate Action (DEECA) provided estimates of costs associated with each of the desalinated water order volume options based on the best available information.

As a result of this year's analysis, 50 million m³ (40,533 ac-ft) of desalination water has been ordered for the 2025/2026 financial year.

Florida

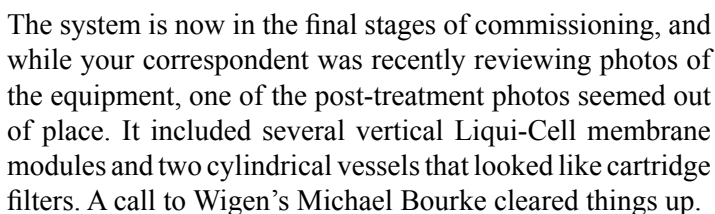
POTABLE REUSE DEMO BEING COMMISSIONED

JEA, Florida's largest municipally owned water and electric utility, relies on groundwater as its sole water supply. In 2011, it was granted a consumptive use permit with an allocation of 142 MGD (537,471 m³/d), and it's assumed that the allocation will not be increased. Because of this, JEA, formerly known as Jacksonville Electric Authority, has been using reclaimed wastewater, where possible, to conserve its potable water.

Hoping to add potable water reuse to its water supply portfolio, the utility began a 3-phase, multi-year program to evaluate and optimize an appropriate treatment system, which could also be used for staff training and a public outreach center.

Between 2016-2019, during the first phase of the program, JEA conducted a side-by-side pilot study of two leading

For Phase II of the program, which began in 2019, JEA conducted a progressive design-build procurement with Haskell and Black & Veatch to build a 1 MGD (3,785 m³/d) demonstration plant that consists of an MF/RO/AOP and post-treatment system (see process flow diagram, below), and a visitor education center.



According to Bourke, “The Wigen-designed and fabricated Liqui-Cel train is composed of three parallel trains with three contactors in series, per train. The system will operate in an N₂ sweep plus vacuum combo mode to maximize O₂

removal. Based on an O₂ feed concentration of around 9,050 ppb, the membrane contactors can consistently reduce the levels to less than 20 ppb O₂, although on average, they are expected to achieve less than 10 ppb.”

Popko said that the degasification step was not included in the original design, explaining, “It was added proactively, to mitigate the risk of releasing arsenic in the groundwater. We had considered using a conventional vacuum degasifier but found it nearly impossible to get a performance guarantee that would meet our specified requirements. The only way we could do so was with the membrane system.”

JEA’s Purification Center will be the State of Florida’s first potable reuse plant. In addition to a visitor education center featuring educational exhibits, it also is designed to host visitors and events beginning in 2026, with a 100-person training room and student wet lab. A separate pilot room is also included to advance the science and conduct research.

Technology

PVDF’S FUTURE AS THE GO-TO MF/UF MEMBRANE

Last week’s *WDR* addressed the European Chemical Agency’s (ECHA) recent draft report proposing a ban on the manufacture and use of PVDF as a membrane material. Such a ban reflects the fact that as a fluoropolymer, PVDF is a PFAS, and its manufacturing process may result in potentially harmful emissions of other, more harmful PFAS.

In a subsequent blog titled “Definitely, Maybe”, Graeme Pearce, a UK-based low-pressure membrane expert, further explored the subject, and suggested that a potential solution could allow continuation for use of PVDF in MBR, where it is considered nearly ‘irreplaceable’, while gradually introducing replacements in drinking water treatment applications through time-limited derogations (exemptions).

WDR asked Pearce about the difference of making PVDF and making PVDF membranes, and if both processes result in potentially harmful emissions or particulates. He explained that PVDF resin is made via a polymerization process in a pressurized reactor to produce a high molecular weight fluoropolymer, which is then pelletized. However, PVDF membranes are made using a much less “aggressive” process in which PVDF pellets, a common solvent, and hydrophilic, pore-forming additives are blended and cured to make flat sheets, or extruded to form hollow fibers.

“Most of PFAS’ environmental and human health impacts concern the manufacture of the PVDF resin. But once polymerized, the fluorinated carbon molecules are very stable and virtually indestructible. It therefore seems probable that PVDF will not be allowed to be made in the EU. But it will

likely continue to be made in Southeast Asia, regardless of EU actions, since it’s so useful, and they have a large enough indigenous market to justify its production.

“It is possible that PVDF made outside the EU could be used to make components for some licensed uses in the EU, such as MBR membranes, because there are clearly going to be some exceptions in the ban for critical and irreplaceable uses.” opined Pearce.

Although it is possible that a ban could take place in as few as 6.5 years, Pearce definitely believes 10-15 years is more realistic. Maybe.

Company News

SPECIALTY RO/NF IS COMPANY’S MARKET FOCUS

California-based Transfilm Technology, an RO and NF membrane research, development, and manufacturing company founded in 2007, has announced the launch of Sunnyvale, California-based IonClear Solutions to provide localized engineering, customization, and application support specific to regional needs in the American, Canadian and Mexican markets.

Cady Yu, the CEO of Transfilm and IonClear, told *WDR*, “With a marked trend towards the return of manufacturing to the US, Transfilm saw an opportunity to enhance its market penetration, customer service, and R&D capabilities by integrating manufacturing into its operational structure. IonClear was specifically launched to fill the gaps in advanced manufacturing capacities, especially for customized and specialty products, within North America, aligning with our mission to innovate and support local economies.”

The company offers numerous unique RO, NF, and specialty membrane products. Although the membrane flat sheets are currently made in China, the final products are produced in California based on specific customer requirements. The company plans to increase US manufacturing capabilities in the US, which are said to include several innovative features:

- *Dry membranes* – enhances storage and handling efficiencies,
- *Tailor-made products* – customized coatings, including use of nanotechnology to impart specific properties to meet specific requirements,
- *Enhanced chemical resistance* – improved formulations and crosslinking to resist acid and oxidative degradation, tolerate wider pH ranges to improve cleaning efficiency,
- *Low-pressure options* – reduced fouling in water reuse applications operating at 100-120 psi (7-8.3 bar),
- *Anti-fouling* – for reuse, resource recovery, and ZLD.

The company encourages inquiries from clients with new and challenging applications. NSF certification is now underway and expected shortly.

News by AI

LOST IN TRANSLATION

Last Thursday, the following online news headline caught your correspondent's attention: *Reverend Henry Williams voices opposition to Ann Arbor desalination at city council meeting*. The only Ann Arbor that comes to mind is Ann Arbor, Michigan, the home of the University of Michigan, with easy access to two of the US' freshwater Great Lakes. It seems an unlikely place for a city council to be considering desalination, and if so, is it possible that someone would oppose it on religious grounds?

The only thing remarkable about the 190-word story was how little information it provided. No description of the plant, its size, or any hint of the 'complex issues' that make it 'a point of contention', or why the good Reverend was opposed to it. The most confusing part of the story was his (alleged) comment: "I feel like I'm a citizen of about city council meetings now."

The photo accompanying the story was the first clue that something was wrong. Anyone who has been to a recent Corpus Christi, Texas, council meeting will instantly recognize the glib smile of the young man at the podium. The man pictured was addressing council members during the public comment portion of a council meeting, but he is not Reverend Williams. Rather, he was a 'regular', who would sometimes offer multiple rambling opinions at a single meeting.

The final clue that something was wrong with the story was a note that said: "This article was created by AI summarizing key points discussed."

From this evidence, it was easy to deduce that "Ann Arbor" was a malapropism for "Inner Harbor", the name of Corpus Christi's recently canceled desalination project.

Not only is the project's location 1,400 miles from Ann Arbor, the story's lack of information renders it useless, even if the location had been accurate. Garbage in, garbage out.

IN BRIEF

The two 2025 **NWRI/AMTA Graduate Fellowship progress reports** have been published. The recipients are undertaking cutting edge and innovative research that advances membrane technology in the fields of wastewater or water reuse. **Ali Abdelkawi** (University of Minnesota) is researching the crystallization kinetics of gypsum in small-scale brine management systems. See his video at <https://tinyurl.com/yrka9my4>. **Hyuck Joo Choi's** (Georgia Tech) research focus is membrane technologies to address food and water security challenges, and his video can be seen at <https://tinyurl.com/5t4m4hh4>.

Energy Recovery Inc. has prepared a case history of a low-pressure retrofit of a 4,480 m³/d (1.2 MGD) BWRO train to include two LP-PX energy recovery devices. The retrofit represented a ~1% CapEx investment, resulting in a ~25% energy reduction in the RO feed pump. To download the case history, visit <https://tinyurl.com/2bnkcxcw>.

PEOPLE

Sara Gardner has been appointed market segment leader at Hydranautics. A 25-year marketing veteran, she brings extensive experience in strategic marketing, product management, and marketing communications. A former director at Hach and at Ecolab, she will remain based in Colorado and may be contacted at sara.gardner@nitto.com.

Duane Devall has been appointed regional sales manager for IDE Water Solutions N.A. and is responsible for the Texas and central US region. With 20 years of water industry experience, he has held business development positions with Magna Imperio and Water Standard. He is based in Houston, Texas, and may be contacted at duaned@ide-tech.com.

JOBS

IonClear Solution is seeking a *Sales Manager* for a customer-facing role, with lead generation, closing sales, and sales tracking experience. Water treatment and marketing experience is a plus. Position can be remote, or onsite in Sunnyvale, California. Please submit your resume to rebecca@ionclear.com

HBD MJP