

RECOVERY ZONE

OCTOBER

2020

CONGRATS TO THE 2020 SOUTHEAST DESALTING ASSOCIATION AWARD WINNERS!!

Membrane Plant Award Winners

> 5.0 MGD Plant of the Year:
City of Palm Coast WTP #2



< 5.0 MGD Plant of the Year: Town and
Country Utilities at Babcock Ranch



Operators of the Year

2020 Chief Operator of the Year



Timothy James - Collier County

2020 Operator of the Year



Marcos Marrero-Tamayo
Palm Beach County Water Utilities

Message From Our New President

Hello SEDA Members,

First and foremost, my heart goes out to anyone who's been impacted by the COVID-19 virus, either directly or indirectly. I hope you and your families are safe and healthy.

I would like to thank the Board of Directors for putting their trust in me to represent SEDA as its President. It is truly an honor, and I hope to serve the membership this coming year to promote our profession, protect our waters, and work to improve the organization for the benefit of our membership.

I would also like to welcome the four newest Board members, Joey Tippett, Paul Biscardi, Ryan Popko, and Nick Black. They will be joining our returning Board members James Andersen, Jason Bailey, Dave MacNevin, Jack Reed, Amanda Barnes, Laura Gallindo, Jarrett Kinslow, Mo Malki, Michael Spaetzel, and Pierre Vignier.

As we move forward this year, we have added an online training platform to continue to provide quality training to our membership during these challenging times. We are happy to have hosted our first virtual symposium, and we hope everyone enjoyed it. We will continue to host online webinars and other online events. We ask you to continue to check the event calendar on the SEDA website and SEDA App for the latest information on upcoming events.

In addition, I encourage all members to provide content and articles for the Recovery Zone newsletter. If you are interested in serving on a committee, hosting a MOC school or Technology Transfer workshop, or teaching a course, please reach out to me or one of the board members.

Sincerely,

Karla V. Berroteran Castellon
SEDA President 2020/2021
Village of Wellington
Water Treatment Facility Superintendent

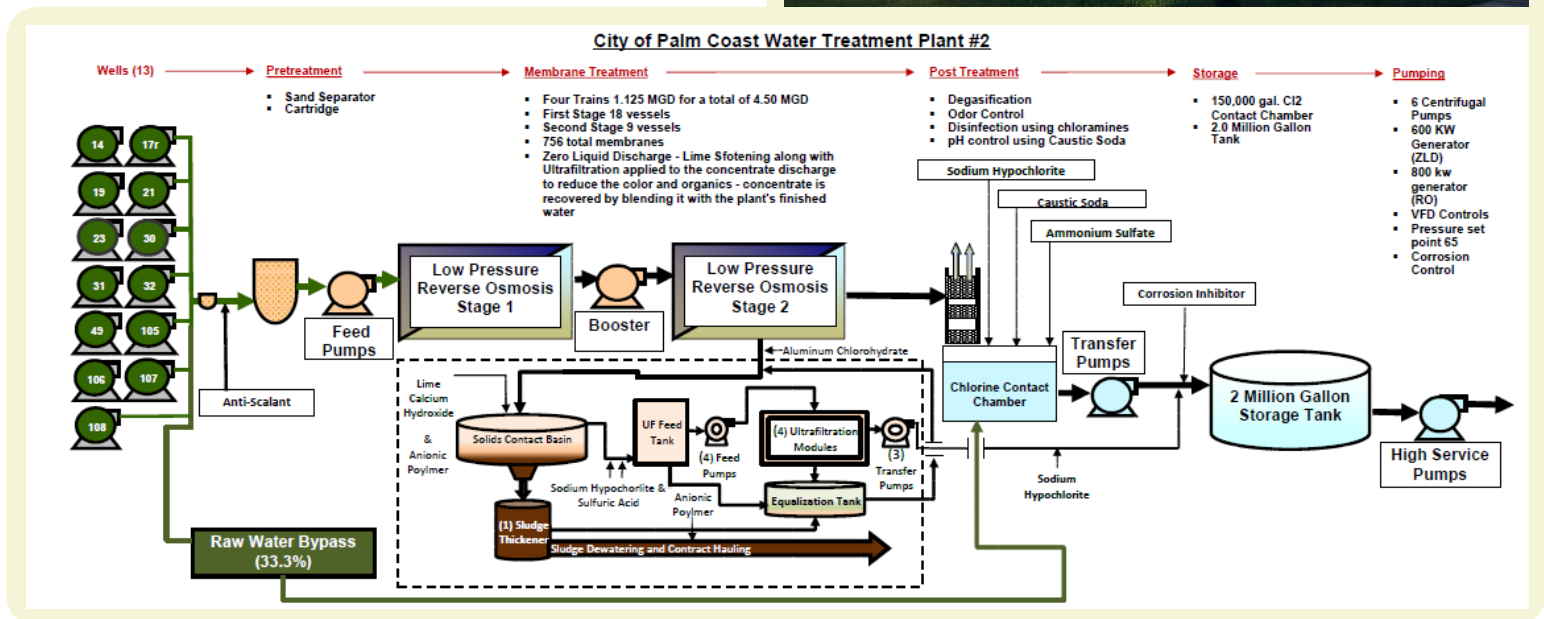


2020 SEDA (>5.0 MGD) Plant of the Year Award Winner: Palm Coast - Making the Grade on Sustainability

Authors: Peter Roussell, Utility Systems Manager, Fred Greiner WTP #2 Chief Operator

A few years back, the City of Palm Coast was confronted with a new regulation requirement that had a significant impact on the operation of Water Treatment Plant #2. The regulation / permit requirement was based on the facility's concentrate discharge to surface water. The regulatory agency's determination regarding our mixing zone was impaired because the discharge to the surface was small in comparison to the volume of the receiving water. In order to comply with the regulation, we were forced to dispose our concentrate somewhere else, or find a solution that does not use surface water for mixing. That's where it all started.

Beginning in 2008, our team initiated the planning, design, bidding, and construction services to build a zero liquid discharge ZLD process to eliminate concentrate discharge to surface water. Several options were considered, but we needed



to secure a viable and reliable long term plan on a very short term schedule. Sorting through some suggested treatment options, it was apparent that utilizing lime softening and ultrafiltration was the only financial and feasible choice.

The new ZLD system started in March of 2015. By recovering and treating nearly all of the concentrate produced by water treatment at WTP#2, the City is able to reclaim the water that previously was wasted and, at the same time, better protect the environment.

The ZLD was designed and built to recover and treat nearly 100 percent of the concentrate produced, saving up to 1.2 million gallons of water per day. Previously, that water had to be discharged to a surface water body. There is no other membrane water treatment plant like Palm Coast's ZLD in the state of Florida.

The primary components of the ZLD process are automated lime-soda softening and ultra-filtration systems (UF). The softened water is conveyed to a UF system to remove additional solids. The ZLD-treated filtrate water is then disinfected before being blended with the existing WTP permeate and raw water bypass.

Sludge removed from the ZLD process is transferred to a solids handling system, where it is thickened prior to dewatering. Various process streams, including the water removed from the sludge through thickening and dewatering, are recycled back into the ZLD treatment process, increasing the recovery of the ZLD system to nearly 100 percent. The City has a contract with a local environmental firm to beneficially reuse the dewatered lime solids. This reuse includes providing dust control for manufacturing various size aggregate material and use as a binder to make paver base.

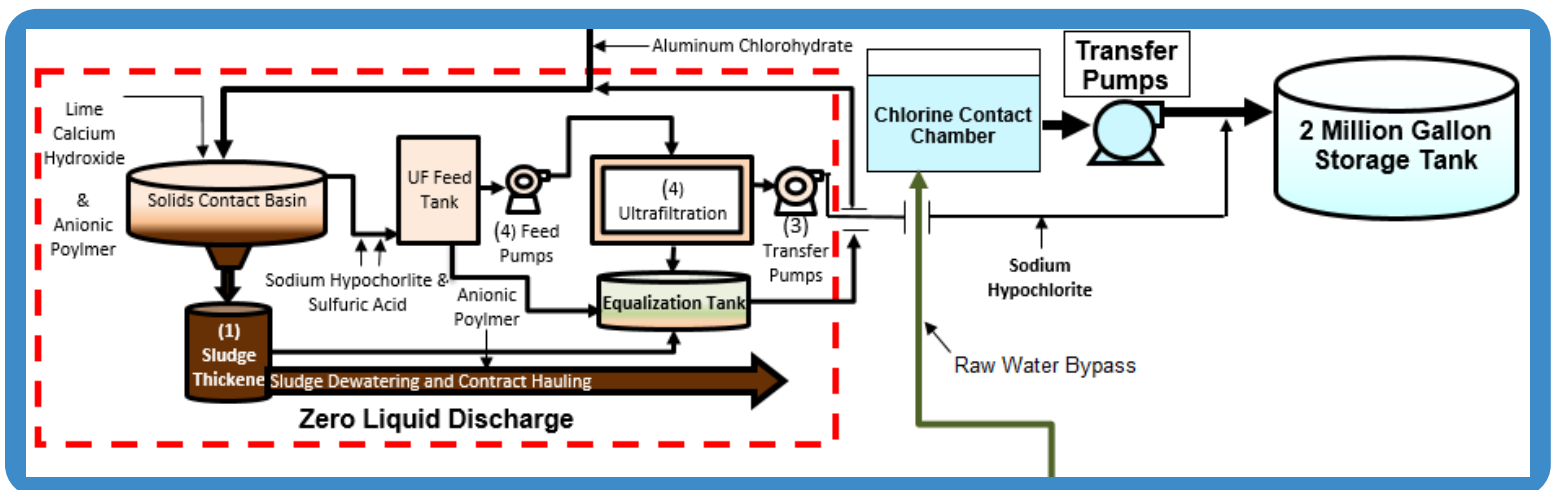
The ZLD system is fully integrated into the existing plant so that both the existing WTP2 reverse osmosis treatment system and the ZLD process effectively operate as one treatment plant – delivering safe drinking water to the residents of Palm Coast.

KEEP THE PROJECT MOVING

The initial project had offered some challenging opportunities for us to consider. During the pilot phase, one operator proposed an idea to use a similar process to reduce the concentrate discharge process at the other facility, Water Treatment Plant #3. We felt that we could positively influence the water source by blending the concentrate from WTP#3 with Water Treatment Plant #1's raw water and use lime softening to treat the concentrate produced at WTP#3. WTP#1 is a lime softening plant built in 1979 and still in operation. The City obtained a cost-share program with one of our regulatory agencies and built the infrastructure to enable an advanced treatment system using ozone treatment for organic and color reduction. The investments to design, construct, and operate the ZLD at WTP#2 and blend the WTP#3 concentrate for further treatment was made to ensure a high-quality, sustainable potable water supply for the citizens of Palm Coast making it important to the City to maintain their currently-permitted allocations from these sources. The WTP#3 project was a spin-off of WTP#2's initiative to recover all of the concentrate.

TRIALS AND TRIBULATIONS

The occurrence of higher than expected TOC levels exiting the solids contact basin and entering the ultrafiltration system was an emerging concern. The high cost involved to precipitate the organics was an ongoing concern. Through field testing and bench scale analysis, the plant implemented a pilot study to reduce TOC and color entering and exiting ultrafiltration membranes and consequently the 2 million gallon storage tank as well. In order to reduce elevated levels of TOC and to ensure ongoing compliance with trihalomethane production, a high coagulant dose had to be applied to the solids contact basin. The high cost attributed to this was undesirable, and a bench scale study was conducted to operate the ZLD in a more efficient and cost effective manner. WTP#2 staff teamed up with our consultants to look at different treatment options to reduce the organic load on the system while looking to reduce the cost. It was determined that the reduction of TOC would occur simply by increasing the pH in the softening basins. Staff conducted multiple jar tests at different pH levels, different base chemicals (such as caustic), and created a jar test scenario to look at relocating the coagulant injection into the ultrafiltration feed tank where



the pH is lowered. Jar tests indicated that increasing the softening basin pH from a 10.5 to 11.5 would achieve similar results as feeding 140 mg/l of coagulant to achieve roughly 45% TOC reduction. Jar tests performed replicated that the coagulant being fed in the UF feed tank after reducing the basin pH from a 12.0 to an 8.0 indicated a 69.6% TOC reduction. As of now, WTP#2 stopped feeding the coagulant increased the basin pH to 11.5 and saved the City approximately \$196,000 in annual coagulant expenses.

WTP#2 provides 4-log virus treatment in accordance with the ground water rule for the ZLD system through turbidity removal in the Ultrafiltration process followed by contact time with a free chlorine residual before final conversion back to chloramines as it enters the 2 million gallon storage tank. From a water quality perspective, this is critical, but can be difficult to implement without using an enormous amount of bleach to treat the filtrate water. The key element to consider is that the recovery rate produces a concentration factor of 4 to 5, meaning the natural ammonia concentration of .4 parts equates to roughly 2 parts passing through the system and finally in the filtrate for Chloramination treatment. In order to maintain a cost effective process, we are undertaking a major improvement to remove the ammonia prior to Chloramination through the use of aeration at an elevated ph.

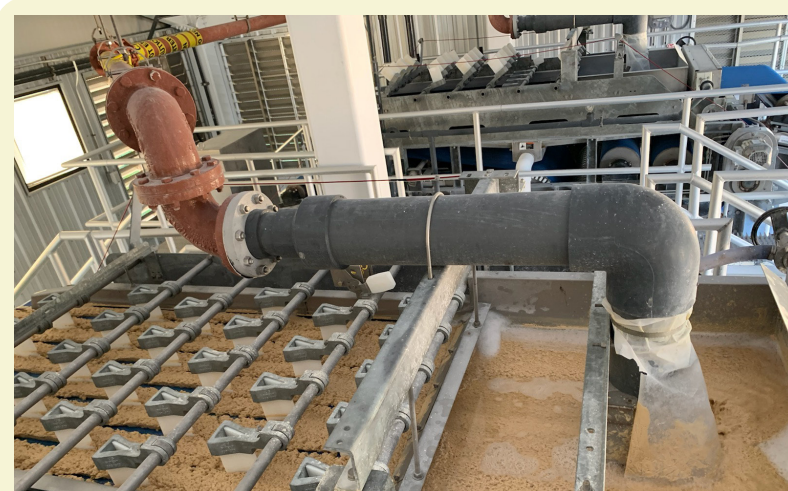
AWARDS & CERTIFICATIONS

WTP#2 was named the 2015 Water Reuse Project of the Year by the Florida Water Environment Association. The award was presented to representatives of the City’s Utility Department, along with the design engineer and the original equipment manufacturer at the Florida Water Resources Conference in Orlando 2016. The City was recognized for developing an exemplary reuse project and being a leader in the industry.

The plant received the Florida Section AWWA “Best Tasting Drinking Water” award in 2019 and again in 2020.

The plant just received the SEDA 2020 “Greater than SMGD Plant of the year Award.”

The City of Palm Coast recognizes the value of operator advancement through additional training, certifications, and obtaining a college degree. In recent years, our city has implemented an “Auto-Promote” policy designed to encourage operators to obtain higher licenses. The “Auto Promote” automatically advances an operator’s pay grade and a 5% compensation in pay. The City of Palm Coast also implemented a “Certification Pay” program designed to encourage operators to obtain a college degree or complete the SEDA MOC School for an increase in pay between 1-3%. Obtaining a higher education or advanced certifications in treatment operations is a priority for our Utility.



Belt press operation for Lime sludge



Filtrate Check Valve Replacements

Restoring Floridan Aquifer Water Quality for an RO Plant

Author: Pierre Vignier, Project Coordinator, City of Port St. Lucie and Douglas P. Dufresne, PG, Ardaman & Associates, Inc.

Introduction

The City of Port St. Lucie has had several Floridan aquifer wells with increasing chloride concentrations over the years, which led to increases in feed pressures at the reverse osmosis drinking water treatment plant when these wells are on-line. Well rehabilitations were necessary to improve water quality and help reduce feed pressures on membranes. The first occurrence of high salinity intrusion was observed in 2008 in Well F9, and since then, three (3) additional wells have been rehabilitated for the same problem. Well F10 was the most recently successfully rehabilitated well in May 2019 and is the main subject of this paper.

Plant Background

The James E. Anderson Reverse Osmosis Facility is a 22.5 MGD brackish facility consisting of twelve (12) 1,829 gpm Floridan wells and one (1) 1,500 gpm shallow zone Floridan blend well. The RO plant build-out capacity was completed in 2008 with ten (10) 2.0 MGD skids and a blend of 2.5 MGD at 80% recovery. The Floridan aquifer wells are located on the East Coast of Florida also known as the Treasure Coast Region. Since 2009, water quality in four (4) existing wells had declined due to some higher salinity upconing from below the production zone. The Utility Systems Department in conjunction with a water resources consultant and water well driller have successfully restored well water quality by implementing an evaluation, testing, and rehabilitation program.

Well Rehab Story

Well F10 was constructed in 2003 with an open hole interval from 757 to 1,350 feet below land surface (bls). When the well first went on-line in 2005, the chloride concentration was 1,050 mg/L. By the beginning of 2007, the chloride concentration in well F10 had slowly increased to 1,125 mg/L. Then between January 2007 and December 2017, the chloride concentration steadily increased to 4,825 mg/L. The chloride concentration had risen about 360% in well F10 from 2005 to 2017. Due to changes in water quality over time for well F10, the RO plant feed pressures when the well was in operation had increased significantly, leaving the well out of the well service rotation. The City of Port St. Lucie decided to implement a testing and rehabilitation program in an attempt to improve the water quality within well F10 and to return the well to service rotation.

Testing of the well involved video logging, geophysical logging including flow logs, packer testing, water quality sampling, and specific capacity testing. The photo shows the site setup during the video and geophysical logging phases of the testing program. The video showed turbidity increased at approximately 1,275 ft bls making for poorer visibility, and it got progressively worse to the bottom of the well. This condition was likely due to poor flow conditions at the bottom of the well. Review of the video log also helped locate two potential packer setting-depths of 1,100 ft bls and 1,255 ft bls. The video log performed of well F10 showed no visible signs of changes to the well, such as collapsed borehole, fouling, or infilling as compared to the original video performed at the time of construction.



Site Setup for the Video and Geophysical Logging



The geophysical logs performed were reviewed to determine whether any information regarding water quality and productivity could be ascertained. Flow logs results were analyzed to determine the recent distribution of flow within the well. These results were compared to the distribution of flow results within the well at the time of F10 construction in 2003. The log results show that the distribution flow has changed from 15+ years of use, and the percentage of flow appears to have decreased between 1,000 and 1,260 ft bls. The water quality at the bottom of the well degraded over time leading to a higher density water that affected the driving head. Changes in the deeper water disrupted the overall flow distribution of the well, and lead to an overall degradation of the water quality in the well. The recent flow distribution results are provided in the Flow Log Results chart.

FLOW LOG RESULTS

F10 Depth Interval (ft bls)	Flow Distribution
759 to 800	15%
800 to 1,020	21%
1,020 to 1,140	22%
1,140 to 1,260	16%
1,200 to 1,260	4%
1,260 to 1,300	22%
1,300 to 1,350	0%

Once the logging was completed, particular zones within the well were selected for further investigation through packer testing. Packers are tools that are inflated in the borehole to isolate specific borehole zones to help define water quality and production in those zones. After a packer is set, the packer zone from the packer to the bottom of the well can be tested as well as the annular zone from the bottom of the casing to the top of the packer. Samples were collected from both above and below the packers, and specific capacities were determined for each. In well F10, the upper zone water quality was significantly fresher water than the water quality of the lower zone for both packer tests performed. The picture shows the packer used in the packer tests.



Inflatable Well Packer

Hazen

hazenandsawyer.com

David M. Laliberte

919.833.7152

dlaliberte@hazenandsawyer.com

Rehabilitation Work

The well rehabilitation included back plugging of a portion of the open borehole, acidization, and development of the well. It was determined the well would benefit from back plugging the bottom of the well from 1,350 ft bls to 1,100 ft bls sealing off the lower quality water. The water well contractor mixed Type II neat cement at the site for multiple stages of grouting of the cement plug. The final back plugged depth was measured at 1,103 feet bls. A test pump was installed, and the well was pumped an averaged 1,855 gpm for a total of 7 hours. The water level drawdown had increased to 89.2 feet compared to a 2011 drawdown reading of 10 feet. A well acidization was required to increase the well's specific capacity and improve drawdown in the well. Past experience had demonstrated that a diluted acid mixture of hydrochloric acid resulting of a pH of about 2.0 best reacts with limestone formation over a long period of time. The acidization occurred over a 24-hour period at a depth of 1,000 ft bls. The results of the acidization were positive, and the city selected to move with a second acidization to further improve the productivity of the well. Specific capacity tests were performed on the well after completion of the back plugging as well as after each acidization event. The specific capacity increased from 21.3 to 45.3 gpm/ft after the two acidizations. The table below summarizes the specific capacity test results.

SPECIFIC CAPACITY TEST RESULTS

Test	Pump Rate (gpm)	Drawdown (feet)	Specific Capacity (gpm/ft)	Comment
1	1,904	89.2	21.3	After back plugging
2	1,930	49.9	38.7	After 1st acidization
3	1,972	43.5	45.3	After 2nd acidization

Conclusions

The successful well rehabilitation improved the water quality in the single well and the overall wellfield management by allowing more wells to rest in the rotation. Water quality results after back plugging and first acidization with the total depth of well F10 set of 1,103 feet bls showed a chloride concentration of 1,400 mg/L, down from the 4,825 mg/L concentration in December 2017. In regard to the decrease in pumping water level, city staff and pump vendors were able to modify the pump characteristics without increasing motor HP requirements. An added 10-foot section of suction column pipe helped maintain well production flow. Project cost, including consulting, water well driller, and pump modification, was \$288,000.00, which is an exceptional value in creating longevity for the RO membranes.



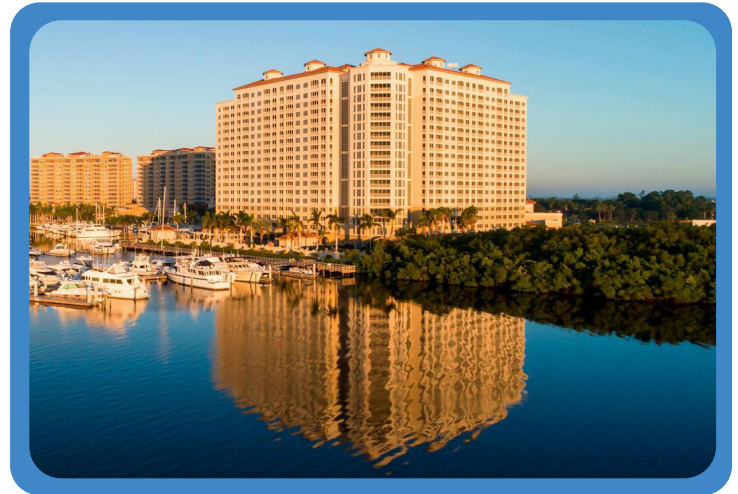
CALL FOR PRESENTERS!!!

The Southeast Desalting Association (SEDA) is developing the program for its 2021 Spring Symposium which will be held May 30th through June 2nd, 2021 at The Westin Cape Coral Resort at Marina Village in Cape Coral, FL.

Interested presenters, should fill out the speaker bio/abstract form and return it via email to Michele Miller at admin@southeastdesalting.com, no later than November 12th, 2020.

Topics of interest for this Symposium's program include those listed below with an emphasis on membrane treatment in drinking water and wastewater applications:

- Reverse Osmosis and Nanofiltration (RO/NF)
- Microfiltration and Ultrafiltration (MF/UF)
- Membrane Bio-Reactors (MBR)
- Source Water Issues and Membrane Pretreatment
- Troubleshooting and Cleaning
- Post Treatment
- Case Studies (suggestions below):
 - o Staff Training and Start-Up
 - o New Facilities
 - o Overcoming Operations Challenges
 - o Cyber Security
- Process Instrumentation, Monitoring, and Controls
- New Membrane Applications and Technologies
 - o Treatment of Emerging Contaminants
 - o Research and Innovation in Membranes
 - o Equipment Used in Membrane Treatment
- Managing and Leveraging Operating Data
- Concentrate Disposal Methods and Issues
- Regulatory and Permitting Issues
- Direct/Indirect Potable Reuse Applications



Important Dates to Remember:

- Friday November 12th, 2020 – Deadline for submission of speaker bio and abstract form
- Friday, November 30th, 2020 – Notification of selected presenters
- Friday, April 30, 2021 – Deadline for PowerPoint presentations from selected speakers. Presentations must be submitted on the template provided by SEDA. A technical paper is not required.

In the event that it becomes necessary to produce the event virtually selected speakers agree to be available for a virtual event.

Please contact Michele Miller at admin@southeastdesalting.com or 772-781-7698, with any questions. On behalf of our program committee, we look forward to receiving your submittals!

Revisiting Four-Log Virus Treatment New Monitoring Tools versus Salt Passage

Authors: David MacNevin, PhD, P.E. CDM Smith and Pierre Vignier, City of Port St Lucie

In this article, we explore some emerging alternatives for RO/NF membrane integrity monitoring that, while not yet approved by FDEP, could demonstrate greater than two (2) log (99% removal) virus removal credits for RO and NF systems. Under the Groundwater Rule (GWR), the Florida Department of Environmental Protection requires water treatment plants (WTPs) treating only groundwater to either conduct 1) triggered and assessment microbial monitoring of their groundwater sources, in response to distribution system coliform sampling results; or 2) provide four-log (99.99% removal) virus treatment with compliance monitoring. FDEP's October 2009 Guidelines for Four-Log Virus Treatment provide two (2) log removal credits for RO systems with $\leq 5\%$ salt passage and NF systems with $\leq 25\%$ salt passage. Online conductivity probes are used to estimate salt passage, thus providing continuous indirect integrity monitoring for each membrane unit. However, if these salt passage requirements are not met, a utility will receive no pathogen removal credits for membranes.

While many utilities opt for triggered and assessment monitoring, the downside of this approach is the risk of a Tier 1 Public Notice should a triggered source water monitoring sample return a positive result from a fecal indicator. Utilities unable to get virus removal credits for RO/NF membranes might choose to increase treatment with free chlorine, and for some water treatment plants this is easy to attain. For other facilities, going for 4-log virus credits with the use of free chlorine could result in added capital costs or operational headaches from higher chlorine contact times (CTs) if a clearwell expansion is required, or if the formation potential of disinfection by products (DBPs) increases.

Since the 2009 guidelines, potable reuse projects have demonstrated alternative virus removal surrogates to salt passage that have supported awarding 2.0 log virus removal credits for RO/NF membranes. While conductivity and total organic carbon (TOC) can be monitored through online methods, their percent removal by RO/NF is often less than 99% (2.0 log reduction). Paired grab samples of calcium, strontium, or sulfate have indicated >2.5 log reductions ($>99.6\%$ removal) for RO membranes, although similar data for NF membranes was not located. Another promising surrogate for virus removal by membranes is free adenosine triphosphate (ATP). ATP is a high molecular weight (507 g/mol) biological marker commonly used to track microbial activity in municipal water systems. To demonstrate a >2.5 log reduction, a utility would need at least >30 picogram/milliliter (pg/mL) of free ATP in their RO feed water given that the most common ATP analysis method has a detection limit of 0.1 pg/mL. Additionally, ATP test results can be obtained within minutes using a low-cost benchtop meter.

Utilities with groundwater supplied RO/NF WTPs having salt passage exceeding the FDEP requirements may wish to explore the use of free ATP or the other surrogates described in this column. An extended sampling program of paired feed and permeate grab samples could be used to build a case to local regulators that membranes are indeed an effective barrier to viruses and are worth 2.0 log of credits or more for pathogen removal. Sensitive online monitoring tools are now available for Ca, SO₄, and ATP that were not available in 2009 when FDEP issued its guidelines.



SCHOLARSHIP SPOTLIGHT

1. **How did you get introduced or interested into the water industry?**

After being enrolled in a non-engineering graduate program, I realized that I desired something different. I had been searching for an alternative career path and learned from friends of the Environmental Engineering program at the University of Central Florida.

2. **What area of the industry do you enjoy the most?**

I enjoy working with the potable water community.

3. **Are you a SEDA member? If so, for how long?**

I am glad to report that I recently joined this exciting organization.

4. **Have you attended any SEDA events? If so, what did you enjoy about it/them?**

No, not yet. I had planned to attend the 2020 Spring Symposium, which was canceled due to the pandemic. I hope to join one or more of the sessions offered in the 2020 Virtual Symposium.

5. **What do you hope to contribute to the water industry in the future?**

I hope to be a contributing member of the potable water industry by solving emerging water quality problems.

6. **What is the most recent book you have read or concert you have been to?**

I'm currently reading "Modeling of Mass Transfer and Synthetic Organic Compound Removal in a Membrane Softening Process" by Steven J. Duranceau. This work was referred to me by Dr. Steven Duranceau.

7. **What activities do you enjoy in your free time?**

I enjoy hiking, jogging, traveling, listening to music, and playing soccer.



Courtney Powell

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MEMBRANE WATER TREATMENT SYSTEMS



2020 SEDA OPERATOR

1. **How long have you been a member of SEDA?**
I became a member 12 years ago at the beginning of my career at Collier County.

2. **Why did you join SEDA?**
I joined as a new Operations Team Member, at the County's South 20 MGD Reverse Osmosis Plant. SEDA was recognized by the staff as an important source of information for what was then, a nearly new complex. As the Plant has aged, the SEDA resource has lost none of its importance.

3. **What is something that you have gained/or hope to gain by being a member of SEDA?**
I was hoping to and have frequently gained access to the Association's wealth of information on the Reverse Osmosis process, as well as all sorts of technological updates. The Spotlights on other Plant's successes, failures, and their solutions, has also been very helpful. A friendly resource that addressed some of the same issues that my Plant was experiencing continues to ring all the right Bells. I have been a frequent attendee at conferences and always enjoy the opportunity to earn some CEU's and get a bit of training. As the public in general is completely mystified as to how that water comes from their tap, I really enjoy being able to talk to others who understand what a totally unique job we do.

4. **How did you get involved in the Water and Wastewater Industry?**
In 1999 I sold the Builders Hardware and Security business I had run for 20 years and spent 4 years living in Mexico, running a Jewelry Manufacturing business in the City of Taxco. After returning with my family to the United States, we settled into Naples, Florida as our new home. With my existing business experience and a strong interest in chemistry and mechanics, I thought the Water Treatment Industry would be a good fit. I applied for an entry position, starting a totally new career, as a Collier County Operator Trainee. With the support of the entire organization, I have been able to advance through the program to become the Plant's Chief Operator. Looking back, I was right, it has been a very good fit.

5. **What is the most recent book you have read or concert you have been to?**
I just finished an account of Churchill and the Blitz called "The Splendid and the Vile", by Erik Larson. I favor nonfiction, but I'm a sucker for a good story.

6. **What activities do you enjoy in your free time?**
I am currently doing a house remodel, play a fair Jazz Guitar, and have recently been very active in the 3D printing and design community. Having become a Silversmith during my time in Mexico, I enjoy spending time in my workshop making a few pieces of Jewelry for my family and friends. With most of my family living just a short drive away and a very active 80-pound Labrador for company, my wife and I seldom lack for something to do. I'm also a voracious reader and like I mentioned before, a sucker for a good story.

2020 Chief Operator of the Year



Timothy James

TOPICS OF THE YEAR

2020 Operator of the Year



Marcos Marrero-Tamayo

the drinking water operator course and passed the state exam. I'm very fortunate for the opportunity PBC gave me to start as an apprentice back in 2016 and now as a licensed Operator I. I love my job and the satisfaction that it brings to serve my community by providing safe drinking water to the residents of Delray/Boca Raton area. I'm very grateful for the opportunity to work for PBC and my colleagues who have inspired and supported me along the way. I look forward to the future with anticipation, with all the advances in the RO industry and the opportunities that will come, I know that the best is yet to come.

1. How long have you been a member of SEDA?
I am recently a new member to SEDA.

2. Why did you join SEDA?
I was intrigued to join SEDA from one of the classes offered with the great Mo Malki. It was really unique to see the importance of how to properly run and care for membranes and what can happen when unforeseen circumstances arise. Mo has the ability to take the complexity of membrane desalination and explain it in a way that anyone can understand.

3. What is something that you have gained/or hope to gain by being a member of SEDA?
My knowledge in membranes is greatly due to SEDA from the membrane autopsy classes and membrane cleaning classes I attended. At the time, Palm Beach County's Water Treatment Plant #3 was in the process of replacing their older Nano Membranes to a new Hybrid RO/Nano setup. All the knowledge gained during these classes helped me understand how the membrane process works, how to clean membranes, and the importance of data collection to ensure the longevity of the membranes.

4. How did you get involved in the Water and Wastewater Industry?
I started out my education going to Florida Atlantic University where I received my bachelor's degree in Finance and Business Management. When I graduated in 2008, the financial collapse of the housing market changed my ambition to pursue the finance industry. While working in property management, a friend of mine gave me a tour of one of Palm Beach County's water plants. This inspired me to go back to school to become a water operator. I completed

5. What is the most recent book you have read or concert you have been to?
I recently read "The 21 Irrefutable Laws of Leadership" by John C. Maxwell; a great read on developing leadership qualities.

6. What activities do you enjoy in your free time?
I enjoy working out in the gym, going to the beach, watching movies, and most importantly spending quality time with my family.

2020 SEDA (<5.0 MGD) Plant of the Year Award Winner: Town & Country Utilities at Babcock Ranch

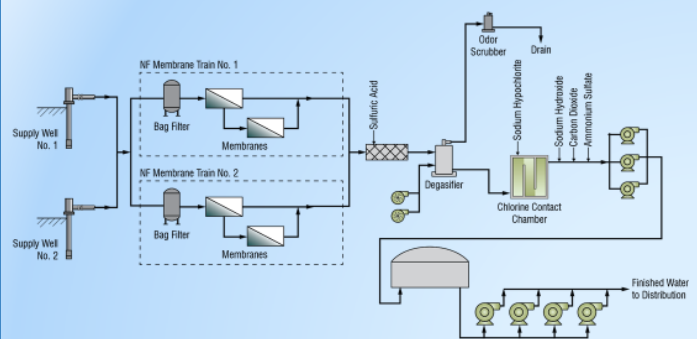
Author: Nathaniel Mastroeni, Utilities Operations Manager

Babcock Ranch Water Treatment Facility is operated by MSKP Town and Country Utilities (TCU) to provide service to the new Babcock Ranch Community, located at 12150 State Road 31, Babcock Ranch Florida. The 0.250 MGD Nanofiltration Facility was commissioned into service November 2016. Town and Country Utilities mission is providing value through superior leadership, customer service, safety, innovation, and quality with a focus on long-term customer relationships while protecting public health.

Brief Outline of the Process from Source to Distribution

- Process description: A 250,000 gallons per day (gpd) nanofiltration (NF) membrane system Water Treatment Facility to serve the Babcock Ranch Community Development.
- Three (3) raw water pumps for the three raw water wells, PS-1 & PS-2 rated at 200 gallons per minute (gpm) each, and 25,000 linear feet (LF) of 8" PVC raw water transmission main.
- Two pre-treatment 5-micron cartridge filters with a design capacity of 0.125 million gallons per day (mgd) (87 gpm) for each of the two membrane skids and a design capacity for the cartridge filter on the raw water blend line is 0.050 mgd (35 gpm).
- Two (2) membrane feed pumps each rated at 93 gpm for the two membrane skids, each producing a permeate flow of 0.100 mgd and a raw water blend of 0.050 mgd for a total design flow of 0.250 mgd.
- Static mixers and anti-scalant pre-treatment system.
- Chemical treatment systems consisting of sulfuric acid, sodium hypochlorite for primary disinfection, ammonium sulfate chloramination, carbon dioxide for pH and alkalinity adjustment, and sodium carbonate (soda ash).
- Post Treatment consisting of a clearwell detention area for disinfection, degasification system rated at 0.250 mgd, and an odor control scrubber system.
- Three (3) transfer pumps each rated at 87.5 gpm, three (3) high service pumps each rated at 175 gpm, and a jockey pump rated at 70 gpm.
- 1.0 MG finished water storage tank and on-yard piping, flow meters and valves.

Treatment Process includes NF Membranes, Packed Tower Aeration, and Disinfection



Flow Diagram



Babcock Ranch Water Treatment Facility

Production of solar energy at a utility scale is a key part of our sustainability commitment. We partnered with Florida Power & Light (FPL) to ensure that the net production of clean, renewable energy at Babcock Ranch exceeds the total amount the town will consume. Babcock Ranch donated the land for the solar facility – but it is owned and operated by FPL. Residents are billed for the energy they use at the same rates as any other FPL customer. Savings come via the energy efficiency of homes that don't need as much power to operate.

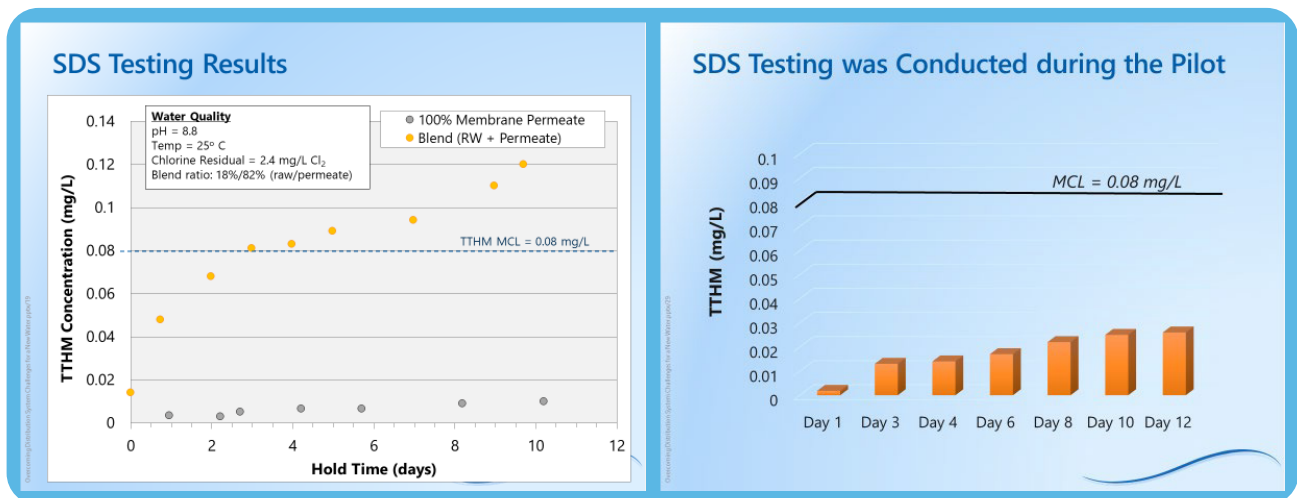


Solar facility

In August 2017, Town and Country Utilities was presented with a problem regarding elevated total trihalomethane (TTHM) levels in the potable supply. Wellfield analysis indicated TOC levels ranging between 3.2 to 3.9 mg/l. As shown in the water treatment process flow diagram, 20% of the raw water was used as a by-pass for adding hardness back into the blended permeate. At that period, water age exceeded 12 days causing the accelerated TTHM levels to spike. TCU began working with its consulting engineer on testing and modeling and found that over one quarter of the detention time was attributed to the 1 MG ground storage tank. They found that the ground storage tank becomes less of the contributing factor as the flows increase. So one of the options to correct the problem was to reduce the tank level and operating volume of the tank. Utility Operations Manager, Nathaniel Mastroeni, implemented water production scheduling changes to facilitate maintaining a ground storage tank level of about one half (1/2), which was acceptable considering that the tank was not needed to meet fire flow requirements. Fire flow is provided by the Water Reclamation Facility discharging to an onsite 112-acre storage pond. Detention times were reduced to acceptable levels at 500 + gpm and the system piping matches well with demand flows at this rate. This entire issue is a result of a greenfield site or new pressure zone that has been sized for future demands but was operated initially under low startup demands. TCU and its consulting engineer explored three optional tools to evaluate disinfection by-product potential (DBP) formation, Formation Potential Test (FP), Uniform Formation Condition Tests (UFC), Simulated Distribution System Tests (SDS). TCU selected (SDS) which further defined three options to evaluate:

- Plant planning & evaluation tool
- Disinfect under site-specific conditions
- Control Strategies

SDS testing commenced in or around November 2017, two samples were collected: 100% NF permeate, Blended water (80% permeate, 20% raw water blend), The initial chlorine residual was 2.4 mg/l.



Permeate vs Blended Water Results

Further review of the process control information helped Town & Country Utilities to realize that the NF membranes were rejecting a large portion of the total organic carbon (TOC) in the raw water supply as it was introduced into the membrane skids. The area of concern became the raw water by-pass and how TOC could effectively be removed prior to disinfection.

Discussion began between Town & Country Utilities plant staff and their consulting engineer. TCU had operational experience with Anionic Ion Exchange Treatment and felt this particular treatment option would best compliment the NF membrane treatment process more easily than selecting another alternative disinfectant.

Town & Country Utilities conducted a three-month pilot program utilizing a 2cu-ft Twin Alternating Anionic Ion System to further prove that this treatment technique would invariably complement the overall treatment scheme. The SDS Pilot Testing graph shows a substantial reduction in the overall production of TTHM's as compared to the graph of TTHM concentrations without the anionic ion system. Full scale operation of the twin alternating anionic ion system was designed and built six months later.



Town and Country Plant Staff

Maintenance Management

Town & Country Utilities has created its own computerized maintenance management program utilizing Excel in which every piece of equipment is tracked, maintained according to the operation & maintenance manuals. Utility personnel updates these spreadsheets on a weekly basis ensuring all equipment is properly maintained. As each highlighted task is complete, the operator inserts the completion date. Field monitoring is collected on a daily basis, such as chlorine, total hardness, TDS, pH, Temperature, SDI, and Turbidity. On plant grounds Town & Country is equipped with the latest cutting-edge technology this includes distribution, concentrate, raw water, finish water, and blended water analyzer racks that report to our Scada system 24/7/365. Trends are reviewed daily to ensure the best possible potable water production is available.

Safety Education

Town & Country Utilities, as the operator of this facility, is committed to providing employees with a safe and healthful workplace. It is the policy of this organization that employees report unsafe conditions and do not perform work tasks if the work is considered unsafe.

Town & Country Utilities Operation Manager and his team are required to implement safety measures and improve safety and health conditions inside the facility. All accidents, injuries, and unsafe conditions must be reported to supervisors and human resources department.

For the past several months, the Safety Coordinator, Myles Adrian, has been required to have safety meetings with each respective team. These safety meetings consist of different videos or articles to promote safe working practices and principles. Also, all employees are provided with proper personal protective equipment (PPE). Safety meetings are held weekly with signoff by attendees.

Inside the facility, all safety equipment is properly labeled and easily identifiable. Any equipment that may present a hazard to personnel and visitors is properly identified. Chemical material safety data sheets are readily available and reviewed with plant staff often.

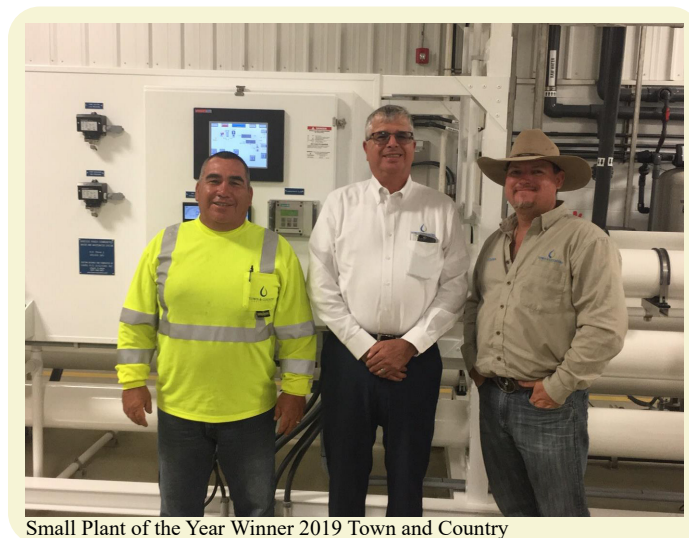


One effective means of training is giving each team member the task of researching and composing operation and maintenance (O&M) sequence of operations (SOPs) that are reviewed with the Operations Manager and Utility Director. This creates a sense of ownership in the employee, and they learn at the same time.

Conclusion

Babcock Ranch, America's first solar-powered hometown, was founded on core principles of sustainability and eco-responsibility. Babcock Ranch Water Utilities received the 2018 & 2019 Domestic Plant Operations Excellence Award for Drinking Water Plant Operations from the Florida Department of Environment Protection. Living a better life at Babcock Ranch means knowing that we are protecting our beautiful eco-friendly landscape and natural habitats for all to enjoy. Town and Country Utilities (TCU) at Babcock Ranch wishes to thank the Southeast Desalting Association (SEDA) for their consideration and recognition of the TCU as a SEDA Plant of the Year Award Winner in 2020. We invite you to visit our web site:

<https://www.babcockranchliving.com/168/Water-Utilities>



Small Plant of the Year Winner 2019 Town and Country

Online Membrane Operator Certification (MOC) Course

Author: Jason Bailey, Avista

At the Incoming Board meeting in June of 2020, the SEDA board approved work on an online version of the MOC School. The vision pre COVID 19 was to set up a program that can be taken by operators at the times that work best for them. The MOC Committee has been working with Instructional Design and Performance professionals to create the online MOC school environment.

This online program will divide the chapters into twelve to fifteen 10 to 20 minute topics. This will allow the student to sit and take a section with a review quiz, drawn from a bank of questions, at the end of each section. The student will have the opportunity to review a section that they want more practice on as many times as they need to understand the concept and practice without having to cover the entire chapter again. The quiz will have immediate feedback for all questions.

During past MOC schools, we received many comments about the appreciation for “war stories” or “lessons learned” but also comments that reflected the tendency to dwell too long and detract from the detail of the concept being taught. There will be examples to apply each concept throughout the lesson; however, any significant lessons learned will be broken out into a separate short section to better enhance the learning while not having a quiz on the lesson learned itself. This separates out the applications from tested material.

After each chapter is completed, an overall quiz will be given for each student to take. This allows the student to see if there is a section they may want to review again before moving on to the next chapter.

With this new training option, each student will be able to progress as their schedule allows. Once all chapters are completed, the student may request to take the MOC test. Details on the final test, whether online or taken at a proctored location, will be submitted to the SEDA Board for approval. The current goal is to have Module 1 ready for online use beginning in January 2021.

The City of Boca Raton Utility Services Response and Adaptations during the COVID-19 Pandemic

Authors: Lisa Wilson-Davis, Operations & Environmental Compliance Manager, and Rick Chamness, Water Treatment Operations Superintendent

The most important part of our utility's response has been to maintain clear and honest communication with our team members.

We were one of the first cities to implement an Emergency Order, effectively shutting down all non-essential services. In this, we stressed the importance of our team members' health and safety, and for the time being, all team members would receive full compensation. We also stressed there were many uncertainties, listened to concerns, and addressed those concerns quickly. We adapted our shifts and schedules by using an A and B shift staggered schedule for the plant operators and created four field response teams who were put into four one-week rotations (one week on, three weeks off). Plant maintenance, engineering, quality control, and others also used staggered schedules according to their resources/needs. Administrative and other team members were instructed to telecommute as much as possible. We made the decision to continue with our current and planned construction projects; however, all vendors, contractors, and consultants were prohibited from entering our buildings unless there was actual work being done in the building. Also, since early March, all meetings and trainings have been conducted electronically.

Very early on, we implemented regular disinfection of work areas, which included wiping down surfaces/tools, vehicles, and "fogging" common areas and vehicles. We also purchased several air purifying machines and located them in higher traffic areas. Team members were instructed to maintain the six-foot social distancing whenever possible, wash/sanitize hands frequently, avoid touching their faces, and self-monitor for any symptoms and, most importantly, staying home if they had any. As information about the use of masks emerged, we mandated the use by team members, vendors, and contractors ahead of county and local mandates.

One of the initial challenges we faced with this situation was the uncertainty of being able to obtain wipes, sanitizer, masks, thermometers, foggers, disinfectants, and some PPE in a reliable and timely manner. This is understandable considering the overwhelming demand for such items. Networking with existing vendors and other utilities was crucial in being able to obtain these items. As supplies have become more readily available, we have increased the amount of these items we stock on a regular basis.



Men pictured in the photo from Left to Right are: Robert Whitney, WTP Trainee , Kirk Lai (vendor) Hydranautics, Edson Vil, WTP Operator.

During the past 22 weeks, we have continued to network with other utilities, vendors, and contractors to share information and adapt our guidance and practices as needed. One key learning critical to maintaining our operations is that since this pandemic is continuously evolving, we must always plan for and evaluate the “what ifs” as well as have the ability to quickly adapt to the current situation.

As an example, our most recent challenge came about at the end of July with a potential landfall of Hurricane Isaias in Palm Beach County. This was the first time we were under a tropical storm/hurricane watch/warning during a pandemic. We had to quickly evaluate if and how we would modify our response plan. Some modifications we implemented were a reduced pre-deployment of resources, reduced number of team members who would shelter-on-site during the storm as well as delaying when we would have those team members deploy. We also decreased the number of team members (citywide) in the EOC and used virtual communication tools. Fortunately for us, Isaias skirted by Florida, and we were spared any real impact.

Moving forward, we are also looking at increasing our ability to “telecommute” on a more regular as well as on an emergency basis and have now made available the needed hardware and software to effectively conduct training and meetings electronically.

As we transition to what may become the new normal, other issues we are faced with and are working thru include: when to reestablish disconnects for non-payment, team member child care issues, how to maintain effective communication, and most importantly give our team members the assurances they need during these unprecedented times. We are committed to providing a safe and healthy workplace and ensuring our team members have the tools and supplies to make this happen – we are in this together.

2020 Spring Symposium Wrap-Up 20/20 Clear Vision on Membrane Technology

While COVID may have interfered with this year’s in-person Spring Symposium, our informative technical program was repurposed for SEDA’s first-ever “Virtual” Symposium. On September 16 we wrapped up the digital event which had over 70 attendees and 14 speakers. Attendees have earned CEUs or PDHs over the last several weeks by tuning in on Water Learning Wednesdays at noon and listening to technical presentations covering a wide variety of membrane topics such as potable reuse, optimizing pre- and post-treatment, and PFAS removal. The program committee is grateful for the time dedicated by the speakers and moderators and the support of the event sponsors who helped make our first virtual symposium a big success! We look forward to seeing you in 2021 at the Westin Cape Coral, mark your calendars now May 31 – June 3, 2021.

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Phone: (561) 746-0228

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2020 Annual Membership Summary

Author: Jim Andersen, P.G., Membership Committee Chair

For the year ending May 30, 2020, SEDA membership has increased from last year and now has a total of 831 members. Division 1 members make up 78% of the membership and include public agencies, industrial users, water suppliers, and individual water/wastewater operators). Division 2 makes up 6% of the membership and includes manufacturers, suppliers, and consulting firms (large and small). Division 3 includes individuals affiliated with Divisions 1 and 2, other individuals, libraries, and students. Division 3 makes up 14% of the membership. Division 4 includes 17 lifetime members (2% of the membership).

Earlier this year SEDA transitioned to MemberClicks software. The old software system was outdated and of very limited use. The new software provides a member management system that provides a member database, support for accounting, event management, reporting, email notifications and is expandable if the SEDA Board and membership decide more tools are needed in the future.

A photograph of a laboratory setting. In the foreground, a woman in a white lab coat is seated at a desk with two computer monitors. In the background, a man in a white lab coat and safety glasses is working at a desk. To the right, another person in a white lab coat and hard hat is operating a piece of industrial equipment. The RAWC logo is overlaid on the top left of the image.

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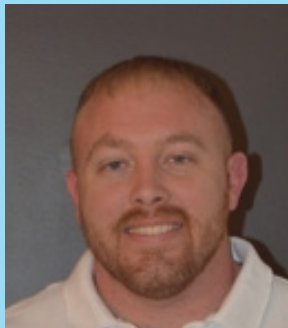
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Awards / Scholarships



Paul Biscardi
Program



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Ryan Popko



Jarrett Kinslow
By-laws



Nick Black



Mo Malki
Technology Transfer

SEDA QUIZ

By: Brian Matthews, City of Palm Coast,
Environmental Compliance Manager

- Which of the following chemicals are not used for treatment in a Nanofiltration membrane treatment plant?
 - Sulfuric Acid
 - Sulfur Diacetate
 - Sodium Hydroxide
 - Sodium Hypochlorite
- What does MTC stand for?
 - Micro Treatment Conditioner
 - Multiple Thread Count
 - Mass Transfer Coefficient
 - Misc. Treatment Considerations
- Where would Ammonia be fed in the treatment process?
 - Just ahead of the membrane inlet valve
 - In the Concentrate line past the final control valve
 - In the Clean-In-Place tank
 - Downstream of the chlorine if monochloramine is being used
- What Voltage would normally be used for a 100hp High Pressure Feed Pump?
 - 110Vac
 - 3 Phase
 - 480 vac
 - 240 vdc
- After returning from the wellfield and doing morning rounds you discover the chlorine residual monitor is not functioning, which rule requires this monitoring?
 - The EISWTR
 - The SWTR
 - The LCMR
 - The GWR
- How long between Cartridge Filter Changeouts?
 - 2 years if the LSI is low
 - 4-6 Months if the DP is low
 - 4-6 Months if the MTC is low
 - Depends on the budget
- How long between Train Cleaning?
 - Depends of DP
 - Depends on increase in FP
 - Depends on TMP
 - All of the above
- Who is responsible for your safety while working in the Plant?
 - The Chief Operator
 - The shift lead Operator
 - The Human Resources Department
 - You
- What does PPE stand for?
 - Personal Protective Equipment
 - PolyPropyleneEster
 - Proprietary Personal Equipment
 - None of the above
- What License level is required to operate a 4.0 mgd Reverse Osmosis Plant?
 - Class D
 - Class C
 - Class 7
 - None required

Answers can be found on the SEDA website at
<http://www.southeastdesalting.com/members-only/quiz/>



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- ◆ Water Supply
- ◆ Control System Upgrading
- ◆ Energy Recovery and Optimization
- ◆ Concentrate Disposal



Upcoming And On Demand Webinars

On Demand

SCADA System Security &
New Trends
0.1 CEUs/1.0 PHDs

Membrane Autopsy Case Studies
0.1 CEUs/1.0 PHDs

Well Maintenance
0.1 CEUs/1.0 PHDs

To register for any of our On Demand classes go to www.southeastdesalting.com, the list of classes is on our home page, with the agenda and the CEUs/PDHs to be earned. Click the register button to the right of the agenda and complete the online form.

Upcoming

October 8th, 2020 10am
Concentrate Disposal
0.1 CEUs/1.0 PHDs

October 13th, 2020 2pm
The 5 Questions of Membrane
Autopsy
0.1 CEUs/1.0 PHDs

October 14th, 2020 2pm
Understanding Membrane Rejection
0.1 CEUs/1.0 PHDs

WELCOME TO OUR NEW MEMBERS



ANDREW FULLER
SAFBON WATER TECHNOLOGY

COURTNEY POWELL
UNIVERSITY OF CENTRAL FLORIDA

DAVID SMITH
VILLAGE OF WELLINGTON

JASON FUES
NALCO WATER

JORI NELSON
CITY OF TARPON SPRINGS

MERLE MEDINA
BROWARD COUNTY

PATRICK DIOS

RICHARD RIVERS
PALM BEACH COUNTY WATER UTILITIES

ROMAN PIKALOV
SAFBON WATER TECHNOLOGY

SHALEENA SMITH
SAFBON WATER TECHNOLOGY

TIM REES
AMERICAN WATER CHEMICALS

WILFREDO LEON
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UTILITIES



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