



The Droplet

Florida Water Environment Association Integrated Water Resources Committee

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From the IWRC Chairman

One of the goals of the IWRC is to further the dialogue between water professionals throughout Florida. Another goal is to provide timely, high-quality information and education on water as a valuable resource that can be used to meet current and future water resources and water supply challenges throughout Florida.

The Committee has begun planning events this year and is excited about the upcoming events. IWRC is planning to organize a luncheon in 2015 (which will be a biennial event), and there are also talks of organizing an encore presentation of the 1-day seminar held in January 2014, to be held in another region of the state in 2014-15. Such events will bring more recognition to the committee and will definitely be rewarding for anyone associated with the committee in a leadership position, which is another goal of the committee.

The IWRC definitely has an exciting year ahead of it! If you are interested in becoming a member of IWRC or nominating yourself for an open position, please contact me at JChristopherson@Geosyntec.com

And keep an eye out for more details on the upcoming events organized by the IWRC in future issues of this newsletter.

*Jason Christopherson
(FWEA IWRC Chair)*

FY 2014-2015

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Florida Water Reuse Week May 18 – 23, 2014

Florida is recognizing the benefits of **Water Reuse** this month. **Water Reuse** is important to the sustainability of Florida's water supply and ecosystem. Water Reuse Week provides a chance for water management districts, city and county governments, water and wastewater utilities, state agencies, engineering firms, and other organizations to provide reuse education activities to the citizens in their respective jurisdictions. For more information and proclamations go to www.dep.state.fl.us/water/reuse/week.htm.

Like FWEA on Facebook

Stay current on events, participate in industry discussions and more!

www.facebook.com/CleanWaterFl

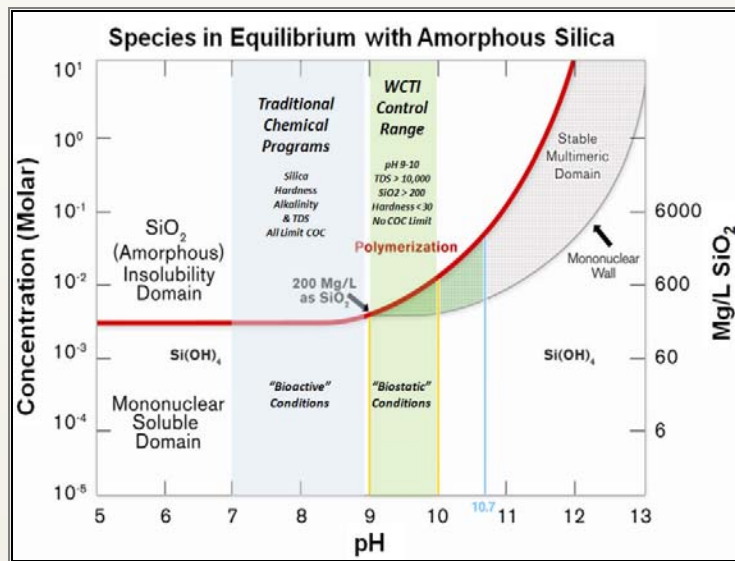




“Best Available Technology” for Cooling Towers

Cooling Towers are one of the most inexpensive systems to remove heat by evaporating pure water to the atmosphere. When evaporation occurs the minerals in the source water are concentrated and bond to heat transfer surfaces causing corrosion, fouling, and bio-growth throughout the cooling tower system. Traditional tower water treatment is to blow down (dilute the concentrating minerals with fresh water) and add chemicals to the tower, most of which are toxic to various degrees. “Blow down” or “bleed” results in a significant waste of water and the discharge of active and toxic chemicals into the environment. It is estimated that some 400 million pounds of corrosion inhibitors and biocides are wasted annually into our environment.

Water Conservation Technology, Inc (WCTI) is a Patented Silica Based Technology for Cooling Towers. The technology is based on the fundamental principles of water chemistry that take advantage of the components and properties of natural water and silica. By eliminating hardness through a high efficiency softener (HES), and under the correct pH, silica will electrochemically bond in a monolayer fashion onto metal surfaces. Once bonded, it protects piping and equipment from corrosion and micro propagation. Once the ionic bond between silica and the metal is satisfied, the film does not build on itself and therefore does not form excessive scale or obstruct flow. Silica’s ability to protect surfaces has been recognized and employed in many industries previous to now- it is the basis for this patented technology.



Silica based technology eliminates the need for costly “blow-down” and “bleed”, and eliminates the handling and discharge of environmentally restricted organic phosphate, heavy toxic metal-containing chemicals and biocides used in traditional water treatment. Though some water treatment specialists are currently removing hardness minerals from cooling water, they continue to rely on traditional toxic chemical treatment and don’t recognize the opportunity to change silica from a threat to a resource in corrosion protection and water conservation. This technology is a reliable and cost effective process that is now available to water treatment professionals and their customer applications.

Application Experience

WCTI has over 300 applications within the United States and has been in operation for over 15 years. Customers include industrial, food and commercial/institutional systems and mission critical facilities. The benefits of the technology have been professionally researched and validated on various metals including carbon, stainless and galvanized steel, aluminum, copper and zinc. Typical case studies and corrosion results can be provided at request or for additional information please visit www.water-cti.com.

Benefits

- ✓ Substantial water savings from Elimination of blow down
- ✓ Up to 5 LEED Credits
- ✓ Elimination of a hazardous toxic chemical room and personnel risk,
- ✓ Elimination of the use and discharge of toxic chemicals into water streams
- ✓ Increased energy efficiency through state of the art corrosion inhibition
- ✓ Bio-Static environment with no bio or pathogen growth
- ✓ Easy retrofit onto existing evaporative cooling towers, and

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- ✓ Reduce Capital, Operation and Energy Costs (typically ROI positive)

Silica chemistry technology works equally effectively on reverse osmosis reject, reclaim, or brackish water as it does with typical municipal water supplies. The technology is simple, proven, and robust.

J&A Associates Engineers and Managers, Inc. is an agent representative of WCTI, Inc. We assist with preliminary design and operation and maintenance cost savings with the WCTI technology. The installation, operation and maintenance of the system are then handled by a local distributor.

Ashley Miele, P.E.
J&A Associates Engineers and Managers, Inc.

Reclaimed Water Transmission Main Interconnect – Central to South AWWT Plant - Challenges and Innovation

The City of Fort Myers owns and operates two municipal wastewater treatment plants that serve a population of approximately 180,000, the Central and South Advanced Wastewater Treatment Plants (AWTP). The permitted capacity of the Central AWTP is 11 MGD and discharges into the Caloosahatchee River. The Central Plant is permitted to produce 6.0 MGD of reclaimed water for unrestricted public use. The South AWTP has a permitted capacity of 12 MGD, and discharges all of its effluent into the Caloosahatchee River.

The City's goal is to dispose of 100% of its effluent through a reclaimed water system and is planning projects to upgrade the facilities to produce reclaimed water and to develop reclaimed water interconnects. One of these projects is to interconnect reuse water between the Central and South AWTPs which are roughly 7.5 miles apart. Interesting discoveries and lessons learned were provided from the design of this interconnect.

ISSUES AND CHALLENGES

A preliminary report proposed an alignment of approximately 26,000 feet. A water model was created of the route and the main was sized at 24 inch. Subsequently the City selected TKW to perform an alternative route study and design the reclaimed water transmission main interconnect constructed through the heart of the City's service area (See Figure below).

TKW discovered that there was a 30-inch gravity sewer system that was surcharged along the same route as the proposed reclaimed water route. This led to additional critical planning and design considerations for the project. The City decided to incorporate the design and construction of the new 36" wastewater force main replacement trunk line to the South AWTP into the project.

Critical planning and design considerations for the reclaimed water interconnect:

- Thorough site investigations and research during the route study phase
- Using existing easements to create a shorter, more economical route.
- Use of trenchless technologies.
- Combining of projects in the same ROW.



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ROUTE STUDY

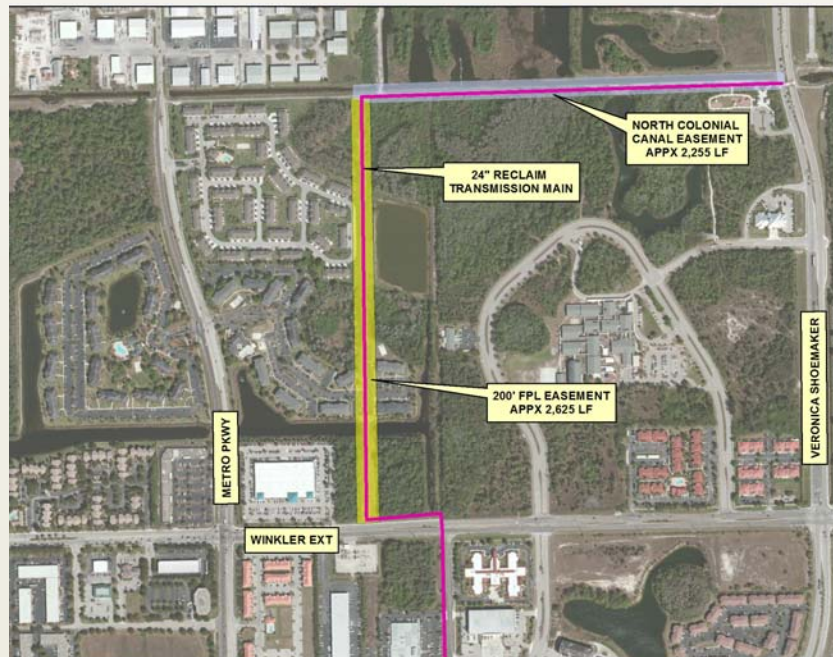
Using the original preliminary route information, TKW performed field investigations to determine if a shorter route could be found. It was discovered that as part of the installation of the existing 24-inch force main along the south side of Colonial Boulevard to the South Plant, a second parallel casing and carrier pipe had been installed at seven different crossings. These crossings involved jack and boring a 42-inch casing pipe and installing a 24-inch carrier pipe inside. Six of these crossings were under roadways and the seventh was under the Seminole Gulf Railroad. A sub-contractor was hired to perform some strategic subsurface utility engineering (SUE) investigations which were performed simultaneously with the route survey. Several strategic soft-digs were performed to locate the pipe and the dry line pipe was cut open to determine the condition of the pipe. Another sub-contractor then video-taped the interior of the pipe and the pipe was found to be in excellent condition. This eliminated the need for jack and boring under the Seminole Gulf Railroad, several busy roadways, and several canals which would have been a very large expense. There were also ARV valves installed at each crossing, but it was determined that they were not usable and should be replaced. Project savings from reusing these crossings was \$400,000.

It was also found that over 1,100 feet of undocumented 24-inch PVC had been installed along a Canal embankment that was in the general path of the proposed reclaimed main. The SUE sub-contractor located this pipe and a video inspection confirmed it could be reused. This pipe was aligned with the planned route and provided cost savings in that it was already installed. Project savings from incorporating this already installed pipe was \$100,000.

EXISTING EASEMENTS SHORTEN ROUTE

TKW investigated other easements such as storm water, electric company, and railroad company easements to determine if a shorter route could be assembled. If an opportunity presented itself, the owner of the easement was contacted to explore the possibility of using their easement to co-locate the reclaimed main interconnect.

An FPL easement was located that, if used, would shorten the route and eliminate many conflicts. This existing FPL easement was 100' wide and included 2,625 feet of the alignment (See Figure below). The proposed route would run parallel to the FPL towers. By incorporating the FPL easement (See Figure below) and crossing under the Seminole Gulf Railroad easement, the cost of the project was reduced by \$100,000.



Another significant route segment incorporated the north bank of the Galloway Canal Easement. By constructing in the canal easement for approximately 6,250 linear resulted in cost savings by eliminating the need for expensive construction along Colonial Boulevard, an FDOT highway (SR 884). This route segment involves using the existing 42" casing and 24" carrier pipe for the Fowler Avenue and the US 41 roadway crossings for the proposed new reclaimed water interconnect. It also shortens the path to the South AWTP by about 4,000 feet from the original alignment. The savings of not having to install this pipe and the additional crossings was roughly \$400,000.

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TRENCHLESS TECHNOLOGIES

Additional cost savings were realized by designing to minimize maintenance of traffic (MOT) and restoration costs by employing various trenchless technologies. Horizontal directional drill (HDD) segments, using 30" HDPE pipe, were used to cross several canals. Over 900 linear feet of HDD canal crossings and over 700 linear feet of jack and bore roadway crossings were used to reduce surface impacts and MOT issues.

COMBINING PROJECTS IN THE SAME ROW

An existing 30-inch gravity sewer trunk main, located along the west bank of the Iona Canal, was surcharging. The main was constructed as a 30-inch gravity pipe but a 24-inch liner had been installed reducing capacity. Two 24-inch force mains were feeding into this now 24-inch gravity system and during peak flow the system surcharged. This canal drainage easement segment was along the same route as the proposed 24" reclaimed water interconnect.

TKW recommended replacement of this failing sewer trunk line aligned with the proposed reclaimed interconnect as part of the project. The last 3,000 foot segment of both the new 24" reclaimed water interconnect and a new 36" sewer main were routed side by side along two drainage canal easements (See Figure below). Construction of portions of the reclaimed interconnect pipeline, as well as the new 36" sanitary sewer main, is anticipated to begin in 2015 as funding becomes available.



CONCLUSIONS

- Use of existing casings and dry lines resulted in a pipeline route offering significant cost savings.
- Discovery and use of existing easements shortened alignment by about 4,000 feet and avoided construction in busy ROWs. The total length of the 24" reclaimed water interconnect transmission main was reduced by 4,000 feet from 26,000 feet to 22,000 ft.
- Trenchless technologies minimize MOT, restoration, and environmental concerns.

The projected cost of the reclaimed water interconnect is \$5.5 million. By finding the existing jack and bores already in place, finding 1,100 feet of existing in-ground pipe, eliminating the need for a railroad ROW permit, and locating existing easements which could be used to shorten the alignment by 4,000 feet, an estimated \$1 million in construction costs were saved. When completed the reclaimed interconnect will help the City of Fort Myers achieve the goal of 100% water reuse.

Patrick J. Day, P.E., BCEE, Environmental Engineering Manager
J. Michael McGee, P.E., Senior Project Manager

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FWEA Integrated Water Resources Award 2014 (Nominees)

In the March 2014 newsletter, the Droplet presented the 2014 Integrated Water Resources Award to Tracy Mercer, City of Clearwater Public Utilities Director. In this article we would like to present the other nominees for this award for their contributions to the industry. Those nominees are Jack Hampson, National director for Water Resources Information Technologies at Atkins, and Keith Riger, City of Deland Public Wks Director/City Engineer.

Jack Hampson, CMS, CFM - National director for Water Resources Information Technologies at Atkins

Jack Hampson has been engaged with geospatial technologies for water resources in Florida since 1991. After graduating from Princeton in Geology and Geophysics he worked for the USGS for 10 years as a marine geologist and got his Masters in Oceanography; but, then he discovered geospatial software development. After receiving training in PC Arc/Info in 1991, Jack was able to combine his experience as a physical scientist with GIS to calculate model inputs for flood risk and water quality modeling in Allen's Creek watershed (Pinellas County, FL). He then became the GIS manager at RS&H; then at PBS&J (now Atkins).

Jack has led the use of integrated geospatial planning and analysis to advance water resources in Florida. Creation of an ArcView application with Enterprise GIS backend to integrate well data with environmental and property data in GIS won an ASPRS Joint Mapping Conference award for Tampa Bay Water in 1999. In 2001 he was an early adopter of the ESRI data model for water/wastewater systems in Polk County and conducted a pilot integration of GIS, simulation model results, SCADA, and operations and maintenance data in a geospatial relational database. This led to the opportunity to be the project manager for implementing South Florida Water Management District's Arc Hydro Enterprise Database, where he met and collaborated with Dr. David Maidment. During this collaboration Jack was able to coordinate the needs of a broad range of scientists, engineers, operations, and IT staff at SFWMD; and formulate a vision and long-term goals for integrated water resources planning. As a result of this project SFWMD won the Florida Institute of Consulting Engineers Grand Award for Engineering Excellence in 2004.

Jack went on to manage a follow-on project at SFWMD where the concept of integrating real time and historic water data and climate data from sensors, simulation model inputs and results, and operational parameters, to create a virtual watershed and real-time water budget, was first implemented as the Water Control System Tracker, a proof-of-concept that has since grown into the Operations Decision Support System. Jack continued his support of Florida water resources as one of two representatives from the consulting community on the statewide Florida Arc Hydro Working Group focusing on Arc Hydro coordination among Florida's Water Management Districts and Universities. The relationship with Dr. Maidment also led to Jack's steady involvement with the AWRA GIS conference and inclusion in the time-series integration design conference in Redlands that led to the Observations Data Model and Hydrologic Information System. Jack was on the organizing committee that hosted the AWRA GIS conference in Orlando in 2010, where he moderated that meeting's plenary session (featuring Jack Dangermond of ESRI and a cross-section of invited water managers from Florida and Federal agencies). Jack and his team combine internal funding from Atkins with project funding to continue research and development in the application of integrated water resources information systems for low impact development best management practices, for climate impact assessment, green infrastructure siting and design, water use planning, and coastal and estuarine analysis and restoration. They team with universities and researchers to consult on a national basis to the Department of Energy, EPA, and USACE, as well as engagement with Florida water resources information systems at SFWMD, SRWMD, SWFWMD, SJRWMD, FDOT, City of Bonita Springs, and many others.

Keith Riger, P.E. - Public Works Director/City Engineer, City of Deland

Keith Riger has worked diligently since 2008 to develop an integrated water resource strategy to satisfy the water needs of residents in west Volusia while complying with the Blue Spring minimum flow regime (MFR). He has led the efforts of the West Volusia Water Suppliers (WVWS) to develop an integrated water resource strategy for the residents of west Volusia. The WVWS group formed as a technical group in 2008 shortly after the disbanding of the Water Authority of Volusia (WAV). Their primary mission was to identify solutions to future water supply issues in western Volusia County as a result of the Blue Spring MFR. The Blue Spring MFR established mandatory springflow increases in 2019 and 2024 which would potentially necessitate dramatic decreases in pumping by utilities within the springshed.

The WVWS members, and contracted design professionals, prepared specialized groundwater modeling tools, quantified potential water supply benefits of specific conservation and reclaimed water strategies and identified a series of new water supply projects and initiatives

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to meet the MFR and satisfy existing and future water supply needs. Mr. Riger led the group through the process and was instrumental in achieving the final result. The result was a MFL Prevention and Recovery Strategy for Blue Spring which included: reclaimed water, artificial recharge, alternative supply and new groundwater supply projects, outside of the springshed. The total anticipated cost of the projects is approximately \$130M. Mr. Riger and other group members worked tirelessly from 2009 -2013 to prepare a series of technical documents and project recommendations. In 2013 WVWS members met frequently with SJRWMD staff to adopt a prevention and recovery strategy which incorporated the WVWS project recommendations. Ultimately, the strategy was adopted and included as part of the 2014 District Water Supply Plan.

Mr. Riger has a B.S. in Civil Engineering from the University of Florida and a M.S in Sanitary Engineering from Georgia Institute of Technology. He has served as Deland's Public Services Director since 1998 and has previous work experience with private consulting firms including Reynolds, Smith & Hills; Zev Cohen Assoc., Inc. and Russell & Axon.



Sarasota Bay Estuary Program

SBEP is an intergovernmental partnership dedicated to restoring and protecting Sarasota Bay. Their partners include Sarasota and Manatee counties; cities of Sarasota and Bradenton; Town of Longboat Key; Southwest Florida Water Management District; Florida Department of Environmental Protection; and the US Env. Protection Agency. SBEP is one of our nation's 28 national estuary programs.

Mission

SBEP is dedicated to restoring the region's most important natural asset – Sarasota Bay. The program strives to improve water quality, increase habitat and enhance the area's natural resources for the use and enjoyment by the public. Since 1989, SBEP and its partners have had a vision of Sarasota Bay with clear waters, healthy habitat, abundant wildlife, and a growing community enjoying the Bay's resources and recreation.

There are numerous opportunities to participate in water quality / restoration projects in our region. Sign up as a Bay Guardian Volunteer, for the e-newsletter or just visit the website to learn about upcoming events. <http://sarasotabay.org/>

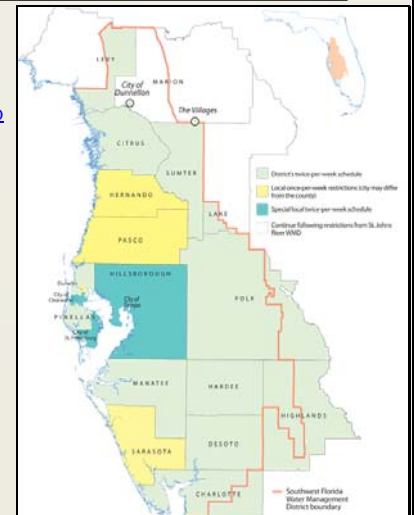
Other Water News and Events

- WERF Innovation Award Applications due June 1, 2014. <https://www.werf.org/i/Awards/>
- Florida Ballot Measure "Water and Land Conservation Amendment" (November 4th). [http://ballotpedia.org/Florida_Water_and_Land_Consevation_Initiative_Amendment_1_\(2014\)](http://ballotpedia.org/Florida_Water_and_Land_Consevation_Initiative_Amendment_1_(2014))

Official ballot summary reads: "Funds the Land Acquisition Trust Fund to acquire, restore, improve, and manage conservation lands including wetlands and forests; fish and wildlife habitat; lands protecting water resources and drinking water sources, including the Everglades, and the water quality of rivers, lakes, and streams; beaches and shores; outdoor recreational lands; working farms and ranches; and historic or geologic sites, by dedicating 33 percent of net revenues from the existing excise tax on documents for 20 years."

- Phase II Water Restrictions for Tampa Bay Area in effect through July 31, 2014.

www.swfwmd.state.fl.us/conservation/restrictions/phase2.php



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IWRC Calendar of Events

<u>Date</u>	<u>Description</u>
June 3	Monthly IWRC Teleconference
July 1	Monthly IWRC Teleconference
August 5	Monthly IWRC Teleconference

IWRC Goals and Focus

The goals of the IWRC are:

- To further the dialogue between water professionals throughout Florida to meet our growing needs in all areas of water resources.
- To provide timely, high-quality information and education on water as a valuable resource that can be used to meet current and future water resources and water supply challenges throughout Florida.
- To provide rewarding leadership opportunities to water professionals at all levels of experience.

The focus of the IWRC encompasses the following areas of water resources practice:

- water quality
- watershed and stormwater management
- water supply
- water conservation and reuse
- ecological and hydrologic restoration
- groundwater recharge
- hydrologic and hydraulic modeling
- funding and grant opportunities
- regulations and policies

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