



IN THIS ISSUE

Expansion of City of Los Angeles' Terminal Island Advanced Water Purification Facility
Page 1

Long Beach to Welcome the International Water Association Conference
Page 2

WaterReuse Symposium
Page 3

Chapter Members
Page 3

NEXT MEETING

Thursday,
August 17th
11:30 - 1:30 P.M.

LOCATION:

Black & Veatch
5 Peters Canyon Rd, Suite 300
Irvine, CA 92606

MISSION STATEMENT:

To advance the beneficial and efficient uses of high-quality, locally produced, sustainable water sources for the betterment of society and the environment through advocacy, education, and outreach, research, and membership.

Expansion of City of Los Angeles' Terminal Island Advanced Water Purification Facility: Completing the First Design/Build Potable Water Reuse Facility

by Dr. Adam Adam Zacheis, Ph.D., P.E.¹, Hannah Ford, P.E.¹, Pablo Marti¹, Gil Crozes, Ph.D.¹, Mark Starr, P.E.², and Mike Sarullo, P.E.³ | ¹Carollo Engineers, 707 Wilshire Blvd, Suite 3920, Los Angeles, CA 90017, ²Terminal Island Plant Manager - LASAN, ³Division Engineer, LA BOE - Environmental Engineering Division

The City of Los Angeles, Department of Public Works, Bureau of Sanitation (LASAN) owns and operates the Terminal Island Water Reclamation Plant (TIWRP) and the Advanced Water Purification Facility (AWPF). TIWRP is located in the City of San Pedro, California on Terminal Island in the Port of Los Angeles. The treatment plant has been in operation since 1935. In 2001, LASAN constructed the TIWRP AWPF, as well as a pipeline distribution network, to route up to 6 mgd of recycled water to the Dominguez Gap Barrier (DGB) for groundwater replenishment. TIWRP AWPF Phase 1 key processes included membrane filtration (MF), reverse osmosis (RO), chlorination, and lime stabilization, as shown in black on Figure 1.

The AWPF Ultimate Expansion design/build construction project (Phase 2) increases the advanced

recycled water treatment capacity from 6 mgd to 12 mgd of product water. In addition to producing water for the Dominguez Gap Barrier, AWPF product water will be distributed to Machado Lake to improve and rehabilitate the long-term health of the lake, the San Pedro area for irrigation, the Harbor Generating Station, and to other industrial users. As shown in red on Figure 1, Phase 2 includes additional MF, RO, and advanced oxidation process (AOP) systems and upgrades to existing pumping stations and systems, chemical addition system, auxiliary systems and utilities.

This article presents three important components of the project; Design/Build Challenges, System Monitoring and Reporting, and the use of a Novel Advanced Oxidation System.

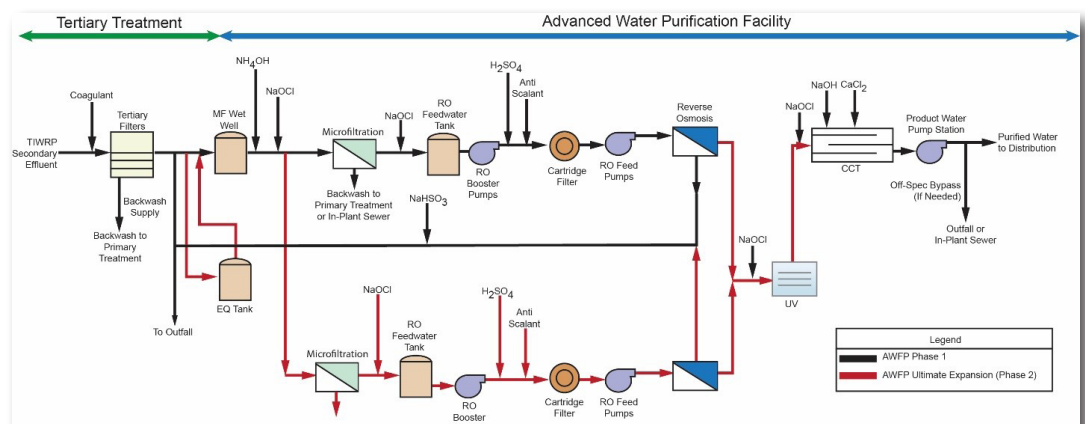
Design/Build: Design/Build projects have historically been implemented for two main

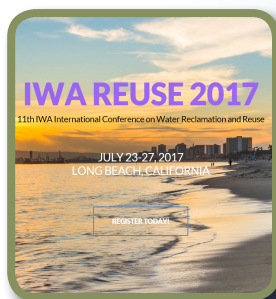


TIWRP is situated on approximately 20 acres of leased land on Terminal Island in the Port of Los Angeles. TIWRP has capacity to provide primary, secondary, and tertiary treatment for an average dry weather flow of 30 mgd.

reasons, increased speed of implementation and reduced overall cost to the Owner. Recognizing that advanced purification for potable water reuse requires complex engineered systems that are tightly coupled, process design must be robust and monitoring must be precise. Both of these

Figure 1





Long Beach to Welcome the 11th Annual International Water Association Conference

The International Water Association (IWA) conference on Water Reclamation and Water Reuse will hold its conference in Long Beach, July 23-27. **This is the first time ever this conference has been held in North America.** The

WaterReuse Association worked very hard to win the bid to have the conference come to the United States and then to Long Beach. National has also done an excellent job of spearheading the conference organizing efforts with Water Environment & Reuse Foundation and the National Water Research Institut.

This event will provide an opportunity to share knowledge regarding water reuse practices in different countries in order to

build trust and further grow water reuse projects. The focus will be to bring together water managers, industry leaders, and cutting edge researchers to learn what's working, what's not and what's next in water reuse policy and regulations, technology, operations, financing and public perception.

For more information on the conference and to register please visit <https://watereuse.org/news-events/conferences/iwa-international-conference-on-water-reclamation-and-reuse>

Expansion of the City of Los Angeles' Terminal Island Advanced Water Purification Facility (cont.)

constraints increase the timeline and cost of the project, running counter to the Design/Build benefits. However, there is a clear path to success for potable water reuse design/build, one that requires tight process and equipment specifications, a clear understanding of health regulations, and a committed effort and focus to potable water quality. In addition to existing site space constraints and the congested underground utilities, the design/build team overcame challenges with existing AVPF cross-connections, the installation of off-spec bypass lines, and other issues that complicated construction but results in greater water quality confidence.

Monitoring and Operations: The design team has also given careful consideration to the inclusion of proper system monitoring instrumentation that the requirements set forth in the TIWRP AVPF Engineering Report and Operations and Optimization Plan (OOP). In order to reconcile the multitude of regulatory documents governing the design and operation of the TIWRP AVPF, the Engineer of Record worked closely with LASAN to carefully study the Waste Discharge and Water Recycling Requirements (WDRs/WRRs) and the CCR to ensure that the final constructed facility will be in full compliance.

Novel UV AOP: Adding to the complexity of this project was the incorporation of the first UV/Hypochlorite system for disinfection and advanced oxidation, the first of its kind anywhere. Pilot scale testing demonstrated that UV/Hypochlorite was lower in cost and had greater performance for disinfection and chemical pollutant destruction compared to UV/H₂O₂ (the standard UV AOP), and has the added benefit of being safer to handle. This novel process relies upon an integrated control system of flow, UV intensity, UV transmittance, sodium hypochlorite dose, sodium hypochlorite residual, and pH; clearly more intricate compared to a conventional UV AOP with H₂O₂, which operates based upon UV reactor power setting and H₂O₂ dose only. The result of this added control complexity is improved treatment performance and far greater precision in system control.



Congested ductbank and pipeline routing on a tight site.



New PVDF membranes for expanded microfiltration



Expanded RO capacity and enhanced monitoring



UV AOP system

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GOT NEWS?

We're always looking for interesting stories and informational articles to keep our members up to speed on all that's happening in water reuse and reclamation. If you would like to contribute an article or have other ideas about this newsletter, please email Debbie Burris (dburris@ddbe.com) or Lisa Knox (lknox@dudek.com)

WaterReuse Association www.watereuse.org/sections/california/orange-county

Newsletter design by **DUDEK**



DO apply water conservatively, utilizing current technology, such as centralized irrigation controllers, rain sensors, master valves and flow sensors.

DON'T allow recycled water to leave the use site.

**DOs
DONT's**

255 Total Attendees - the largest attendance on record
The most conference abstract submissions (77 abstract submissions)