Compliance Pillar

VISION FOR THE FUTURE

Nearly a decade ago, Pima County launched planning efforts for the Regional Optimization Master Plan (ROMP) to comply with state environmental standards at the Ina Road and Roger Road Water Reclamation Facilities (WRFs). Through that process, it was decided that instead of rehabilitating the Roger Road WRF, that the facility should be replaced. The facility that replaced the Roger Road WRF has been named the Agua Nueva WRF. The Ina Road WRF was renamed the Tres Ríos WRF. With substantial completion of both facilities in 2013, the Arizona Department of Environmental Quality's (ADEQ) environmental requirements have been met.

The vision now includes continued efforts to build on prior successes at improving the quality of our discharges that sustain flow in the Santa Cruz River and the quality of recycled water produced at Pima County's regional and sub-regional facilities. PCRWRD will continue to be an industry leader in taking innovative approaches to meeting environmental regulatory objectives. Future work will enhance and maintain the rapport and professional respect we have developed with key regulatory agencies.

The future Water and Energy Sustainability Center ("Water Campus") will also continue to provide opportunities to address future water quality and sustainability issues for the entire community.

OPPORTUNITIES

Disinfection Enhancements

Disinfection is the most critical step in the treatment process for ensuring protection of public health. This process also presents the greatest challenge for maintaining compliance, especially when chlorination is the method of disinfection. Chlorination requires careful management because of daily sampling requirements. Numerous chemical interactions also require keen attention. In addition to daily monitoring of disinfection parameters (E. coli & fecal coliforms), PCRWRD must keep surface water discharges free of chlorinating agents, maintain adequate dissolved oxygen levels, and prevent excessive formation of disinfection by-products such as Trihalomethane (THM).

Fairgrounds WRF

The Fairgrounds WRF is a small, 20,000 gallons per day (on a monthly basis average), evaporative/percolation lagoon facility that operates under a general permit. Upgrades to this facility are problematic since any improvements would necessitate a nutrient removal process. Additionally, the sporadic nature of flows makes biological treatment difficult, if not altogether impossible. A possible solution would involve diversion of flow from the Fairgrounds WRF to a nearby interceptor or to the Corona de Tucson WRF.

Corona de Tucson WRF

Despite producing high-quality denitrified water, the Corona de Tucson WRF does not have an engineered disinfection system. Instead, it relies on soil aquifer treatment. Unfortunately, this method can result in false exceedances and is prone to interferences caused by inclement weather. For these reasons, the department has plans to install a more traditional disinfection process.

OUR GOAL

To ensure continuous compliance with regulatory requirements and participate in the dialogue of emerging regulatory issues.

Biological Nutrient Removal

A common complication of the biological nutrient removal process is the increased potential for forming THMs when using chlorination for disinfection. PCRWRD evaluated two options for THM control: THM formation prevention and post-formation stripping. THM formation prevention is being tested at the Tres Ríos WRF and so far is proving viable for larger WRF facilities. Post formation stripping also proved viable, but it is better suited for small-facility flows where pumping costs are lower.

Industrial Wastewater Control Program

Each year, the Industrial Wastewater Control (IWC) program employees conduct over a 1,000 samples at a variety of businesses and organizations in Pima County. The sampling serves to ensure discharges into the sanitary sewer system are in compliance with Pima County's pre-treatment ordinance. Sampling also determines if the organizations are meeting monitoring requirements and environmental permit requirements. Compliance inspections were conducted at over 700 permitted and non-permitted facilities last year. IWC issues 30-50 Notices of Violations (NOV) each year to users. There is an opportunity to work more closely with commercial and industrial users to reduce the number of NOV issued annually.

Research and Education Partnerships

With the completion of the Water and Energy Sustainability Center expansion, the University of Arizona (UA) will provide staff and students from the Agricultural and Life Sciences Department to conduct research on the next generation of treatment technology. This is an opportunity to prepare for the anticipated new regulatory requirements for such things as emerging contaminants and other predicted changes to federal and state regulations. Additionally, there is an opportunity to partner with the City of Tucson, the UA, and the private sector firm CH2M Hill to study advanced oxidation treatment for direct potable reuse.

MAJOR PROJECTS AND PROGRAMS

Biological Nutrient Removal

An official report on the pilot project to test the use of THM formation prevention at the Tres Ríos WRF will be completed by the end of 2014. Following the release of the report, a scope of work will be developed for a project to be implemented at the facility.

Disinfection Enhancements

Last year, the Compliance and Regulatory Affairs Office (CRAO) held detailed discussions with the Arizona Department of Environmental Quality (ADEQ) to establish optimal sampling locations at the Corona de Tucson WRF to provide more reliable and accurate readings. These discussions led to a detailed evaluation of our point of compliance monitoring. As a result, CRAO is currently developing a scope of work to provide disinfection using a precast chlorine contact basin at the Corona de Tucson WRF. A hydrostatic tank will be repurposed from the decommissioned Roger Road WRF and will be incorporated into the service water system at the Corona de Tucson WRF.

Trihalomethanes Formation Prevention at Tres Ríos WRF

PCRWRD is designing a full-scale THM mitigation pilot for large-scale operations such as the Tres Ríos WRF, in which a portion of the high strength ammonia-laden centrate will be used to create chloramine and thereby minimize THM formation.

Total Residual Chlorine

Compliance with Total Residual Chlorine (TRC) limits can be problematic because the extremely low Arizona Pollutant Discharge Elimination System (AZPDES) permit limit of eight milligrams per liter is below the practical detection limit of the approved methodologies. If the laboratory is able to detect it, the facility is immediately in non-compliance with the regulatory limit. To address this challenge, PCRWRD worked closely with the Western Coalition of Arid States (WESTCAS) to develop a strategy that allows for the monitoring of sulfite, a component in the dechlorinating agent, in lieu of TRC monitoring. Stoichiometry dictates that if sulfite exists in solution, then all of the residual chlorine is effectively neutralized. As a result, maintaining a residual concentration of sulfite demonstrates full compliance with the residual chlorine permit limit. With ADEQ's concurrence, a study period has been incorporated into Agua Nueva WRF's AZPDES permit with projected completion in FY 2014/15.

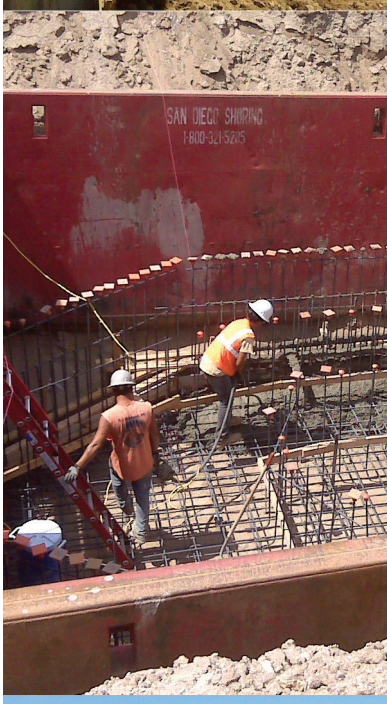
Water Quality Research

To better understand the impacts of improved water quality on infiltration rates and other environmental changes in the wetland/riparian areas of the Santa Cruz River, PCRWRD is partnering with Pima County Regional Flood Control District and Pima County Office of Sustainability and Conservation in the Living River Project. This project is funded through a grant from the Environmental Protection Agency.

Recharge and Groundwater Storage at Sub-Regional WRFs

In an effort to maximize recharge and groundwater storage, PCRWRD is looking to recharge reclaimed water from sub-regional facilities, where possible. Corona de Tucson, the only sub-regional WRF with a groundwater storage permit, has served as a proving ground enabling PCRWRD to enhance operational efficiency and increase recharge credits. PCRWRD is now looking to build on this success and secure permits for two more facilities.

- **Avra Valley WRF** – As part of the Avra Valley WRF expansion to a capacity of 4 million gallons a day, the percolation basins were emptied, excavated deeper and reconfigured to maximize future recharge infiltration. A pre-application meeting was held with the Arizona Department of Water Resources (ADWR). A groundwater storage permit application will be submitted in 2014 with groundwater recharge credits beginning to accrue in 2015. With a potential recharge capacity of over 1,400 acre-feet annually, these credits add to the county's long-term storage account at ADWR. This stored water can be recovered throughout the Tucson Active Management Area and be used to offset groundwater pumping. Credits also can be sold or exchanged for property, easements, or anything else of value.
- **Green Valley WRF** – The Green Valley WRF currently operates a biological nutrient removal process and an older aerated lagoon system. Water discharged from the Green Valley WRF is recharged off site. This discharge generated



KEY PERFORMANCE INDICATORS

- Number of non-compliance events
- Number of Sanitary Sewer Overflows (SSO) per mile of conveyance pipeline
- Number of SSOs per year

over 1,100 acre-feet of recharge credits in 2013. Recently, PCRWRD held a pre-application meeting with ADWR and expects to complete facility and basin modifications in 2015. A groundwater storage permit application seeking approval for storage of up to 2,335 acre-feet a year will be submitted to ADWR in calendar year 2014.

SHARP Constructed Recharge Project

In 2011, Pima County and the City of Tucson entered into an inter-governmental agreement for a joint constructed recharge project known as the Southeast Houghton Area Recharge Project (SHARP). A Joint Recharge Oversight Committee (JROC) was formed with city and county administrative and technical staff to supervise and review the project activities. With JROC direction, the selected design firm (CH2MHill) is prepared to proceed with design and ADEQ/ADWR permitting tasks. Once completed, Pima County will use this facility for recharging the balance of its metropolitan reclaimed water in a constructed rather than managed facility. In this manner, the county will receive 100% credit for the reclaimed water that reaches the aquifer in this favorable up-gradient location. PCRWRD can wheel reclaimed water to the site through Tucson Water's reclaimed water delivery system.

Evaluation of Conditions at Mt. Lemmon WRF

The Mt. Lemmon WRF is a small facility operating under a general permit that serves a very small population of users in the Summerhaven community. PCRWRD is planning to shut down the Mt. Lemmon WRF in order to perform a comprehensive condition evaluation. The evaluation will result in a decision to 1) renovate the facility, 2) shut down the facility for an extended period and haul the community's wastewater for treatment at one of the department's metropolitan facilities, or 3) replace the old plant with a new state-of-the-art facility that will serve the needs of the community for the foreseeable future.

BENEFITS

Long term benefits of the department's commitment to the Compliance Pillar include:

- Meeting regulatory compliance and decreasing permit non-compliance;
- Reducing the risk of fines, penalties and adverse publicity associated with late or inaccurate agency reports, noncompliance events, and improving public perception;
- Maintaining permit compliance schedules and budgets;
- Improving accessibility, timeliness and accuracy of environmental information;
- Monitoring trends in a proactive manner;
- Improving communication and feedback;
- Creating accurate and secure records and reports;
- Increasing accountability in new regulations;
- Increasing goodwill, flexibility, and cooperation from regulatory agencies; and
- Increasing infiltration rates at managed recharge projects.