

BUILDING A SUSTAINABLE FUTURE

A D A P T L E A D T R A N S F O R M

2016 CSU FACILITIES MANAGEMENT CONFERENCE

BPA WINNING CAMPUS:

California State University,
Stanislaus

PROJECT NAME:

Cooling Tower
Reclaimed Water Project

BUDGET:

\$130,000

DELIVERY METHOD:

N/A

KEY CONTRIBUTORS:

CSU Stanislaus
Building Service Engineers
Plumbers
Electricians
D&D Water Filter Systems
Pacific West Controls

SCHEDULE:

January 2015 – September 2015

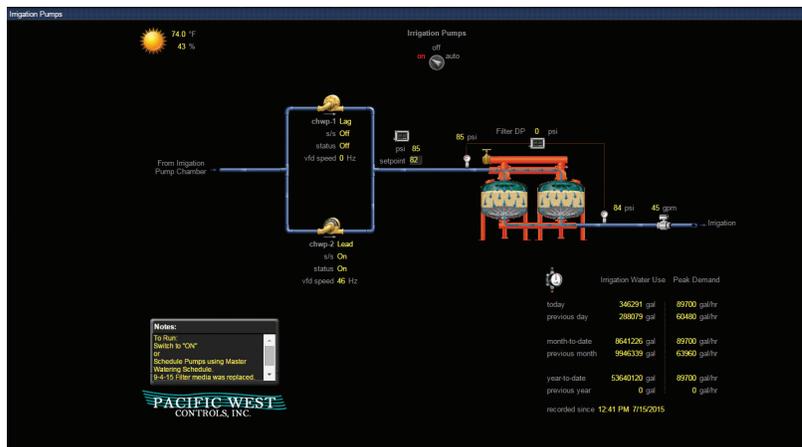
BEST PRACTICE AWARD CATEGORY: FACILITIES/PHYSICAL PLANT OPERATIONS

Key Challenges

1. Periodic pressure fluctuations in the reclaimed supply line cause the towers to switch water supplies. A control sequence was developed that monitors loop pressure and will switch to alternate water supply if the loop drops below 30 psi. It will then continue to monitor loop pressure for 30 minutes before it will switch back. This was necessary to assure a continuous and reliable supply of water to the towers.
2. Evaluation of environmentally friendly water treatment vendors to assure there is no negative impact to the campus lakes.

What makes this project a Best Practice Award Winner?

1. **Innovative:** CSU Stanislaus is using reclaimed rain water for the campus cooling system, water that would otherwise be lost to the regional stormwater system. In addition, the campus is reclaiming and reusing nearly 10,000 gallons a day of blow-down water that would otherwise be lost to the city sewer system.
2. **Cost Savings:** \$22,000 a year estimated savings. Project is still in its first year of operation, however early results are very promising.
3. **Process Improvement:** The Central Plant with cooling and heating equipment such as chillers, boilers, cooling towers and energy management systems controls is the heart of the mechanical system that supports all campus activities—generating, distributing and controlling all building heating, cooling and ventilation systems. The biggest improvement introduced by this project was the dramatic reduction in campus potable water use which helped to comply with the governor's water use reduction mandate. In addition, it reduces water costs, city sewer impact and provides a constant supply of irrigation water for the campus.



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- 4. Replicated on Other Campuses:** Partially. Many campuses do not get necessary rain water/agricultural water to support converting the Central Plant cooling tower system water supply from using campus potable water to reclaimed water. However, most campuses could benefit from reclaiming cooling tower blow down water and reusing it for campus irrigation.
- 5. Contribution to Success of the Campus:** Yes. CSU Stanislaus' mission statement includes a commitment to encourage personalized student learning, foster interactions and partnerships with our surrounding communities, and provide opportunities for the intellectual, cultural, and artistic enrichment of the region. This project supports the campus mission in being water and energy efficient as well as environmentally responsible. As a result of this project the Facilities staff was able to reach out to the academic and student community about the uniqueness of their campus water system through classroom presentations and campus facility tours of the water reclamation system.
- 6. Other Criteria Developed by Committee:** A big part of the project was to educate the campus community on how the campus collects and uses reclaimed water, particularly with the governor's mandate. As part of this process the campus created a water website to inform the faculty, staff, students and the surrounding campus community of its water reclamation and operation efforts. The campus plumbers, building service engineers and electricians were largely responsible for the implementation of the project, performing all the work to install the necessary filters, piping and needed conduit for power and control of the new system.



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Project Description

Goals and Strategies: The project goals and strategies were to save approximately 5 million gallons of potable water annually by converting the cooling towers to use reclaimed water. This strategy also included recycling the tower blow-down thereby saving an additional 10,000 gallons of water daily.

The governor's mandate to reduce water consumption required innovative thinking by the Facilities team. They studied the campus water needs and uses and found that the biggest user of campus potable water was the Central Plant cooling tower system. Given the abundant supply of reclaimed rain water in their lakes, it was natural to use this water in areas where potable water was not necessary. By converting the cooling towers to use this reclaimed rain water, there was potential to reduce potable water use by approximately 5 million gallons annually which equates to a nearly 23% reduction of total campus use.

This conversion was accomplished by installing a high efficiency 5-micron filter with a UV component to clean and purify the water for use in the cooling tower. A sophisticated control system monitors and operates a series of valves and controls which supply the cooling towers with reclaimed water. In addition, the Facilities team also modified the cooling tower blow down piping and installed metering to recover all the water discharged from the towers for processing and reuse in the campus irrigation system.

The potential was realized as the result of the project was a 22% reduction in campus potable water use which equates to approximately 5 million gallons annually. The project also included the recycling of the cooling tower blow-down and reusing it in the campus irrigation system. Another benefit of the project was a substantial reduction in water costs and a reduction in waste water discharge to the city sewer system which resulted in reduced sewer costs. The project has been highly successful and has been a key factor in helping the campus to meet the governor's state wide water use reduction mandate.

