

ORANGE WATER AND SEWER AUTHORITY: EXPEDITED FINANCING THROUGH STATE AND LOCAL PARTNERSHIPS

SOLUTION OVERVIEW

In order to optimize costs and effort, Orange Water and Sewer Authority (OWASA) combined major energy efficiency improvements with mandated odor control improvements to meet community commitments at their Mason Farm Wastewater Treatment Plant (WWTP). To fund this endeavor, OWASA applied for and received a \$6.56 million, 20-year, no-interest loan from the North Carolina Clean Water State Revolving Fund (CWSRF) Program for the energy efficiency improvements portion of the project. This was made possible by partnering with the University of North Carolina's Environmental Finance Center, which helped analyze the costs and financial benefits of the project.

After considering the potential cost savings and the level of effort and time required to apply for a no-interest loan for the proposed project, OWASA applied for and ultimately received a no-interest loan from the CWSRF Program. In addition to the loan, OWASA received state government permission for sole-source procurement of critical equipment, allowing the project to be completed ahead of schedule. In the 12 months after the energy efficiency improvements were placed into full service, OWASA reported electrical energy savings of about 40 percent.

ORGANIZATION TYPE

Utility/Water, Wastewater, and Reclaimed Water

BARRIER

Meeting mandatory community commitments on a limited budget and short time table

SOLUTION

Securing fast-track approval of a no-interest loan

OUTCOME

Procured key equipment in time to meet the commitments and realize the estimated energy savings of the project

POLICIES

OWASA had not had any experience or established policies or procedures regarding the pursuit of State or Federal loans for infrastructure or energy efficiency projects, and this was the first time pursuing a loan of this kind. In order to get internal stakeholders engaged in the project, OWASA requested that the Environmental Finance Center (EFC) at the University of North Carolina at Chapel Hill independently estimate the net present savings that ratepayers would realize if the loan was received. The EFC estimated ratepayers would save more than \$1.8 million over a 20-year period. This analysis verified OWASA staff's conclusion, and reinforced the organization's confidence to pursue the no-interest loan.

PROCESS

The North Carolina Division of Water Infrastructure agreed to fast-track the loan application and approval process, and the contract/bid specification approval process for the project. This ensured that the project could be completed by a December 31, 2014, deadline for OWASA to complete odor control improvements at the plant. Additionally, the state government and the U.S. Environmental Protection Agency (EPA) approved sole-source procurement of critical equipment (new blowers and mixers), which enabled OWASA to pre-order it, thereby saving substantial time and money.

OWASA hired an engineering consulting firm to fast-track the project design work. They started in September of 2011 and were able to complete the project design by October 2012. During this time OWASA staff prepared the state/federal-required Preliminary Engineering Report (PER) and environmental assessment (EA) documentation, which saved OWASA a substantial amount of money and enabled the consulting firm's design team to focus on the project design. By applying for the no-interest loan, the state gave OWASA's project a higher priority during the plan review and approval process, enabling OWASA to save additional time and allowing for the project to be completed ahead of schedule. This is a standard procedure for the Division of Water Infrastructure whenever State and Federal loans or grants are being applied for to upgrade water and wastewater treatment infrastructure.

In addition to the no-interest loan, OWASA applied for and received a custom energy efficiency incentive payment for the project from Duke Energy, the local utility. The incentive amount was \$168,000, and coupled with the no-interest loan, helped cut down on the overall project cost.

OUTREACH

Before the loan was obtained, OWASA conducted meetings and communicated with the North Carolina Clean Water State Revolving Fund Program staff to discuss the project timetable and options for fast-tracking the review and approval process. OWASA also informed customers, local government officials, and other stakeholders, including other agencies and the state energy office,

of the efforts to apply for and obtain the no-interest loan and Duke Energy incentive payment for the project. OWASA informed its customers through their Blue Thumb customer newsletters. Interested customers/stakeholders had the opportunity to review and comment on the Board's agenda materials and decisions relating to the project, including proposals to apply for and accept the no-interest loan.

For the first year after the energy efficiency improvements were completed, OWASA sent out regular e-mails updating internal staff, funding partners, and other interested stakeholders on the progress and energy savings realized from the project, as can be seen in the Tools and Resources section below.

At the request of the American Water Works Association (AWWA), OWASA made a presentation about this project at a Clean Power Plan/Energy Efficiency technical session at the AWWA's June 2015 Annual Conference and Exposition in Anaheim, California.

TOOLS AND RESOURCES

To assist OWASA, the EFC used its "*Subsidized Funding Benefits Calculator*" tool to determine whether it would make economic sense for OWASA to pursue and accept a subsidized loan for the project. The tool enables the quick comparison of the net present costs (savings) of alternative debt financing strategies.

OWASA kept customers and stakeholders informed through periodic updates, such as a December 2014 *Blue Thumb* newsletter with a feature article about the project.

MEASURING SUCCESS

The key success metrics for the energy efficiency improvements project at the Mason Farm WWTP are:

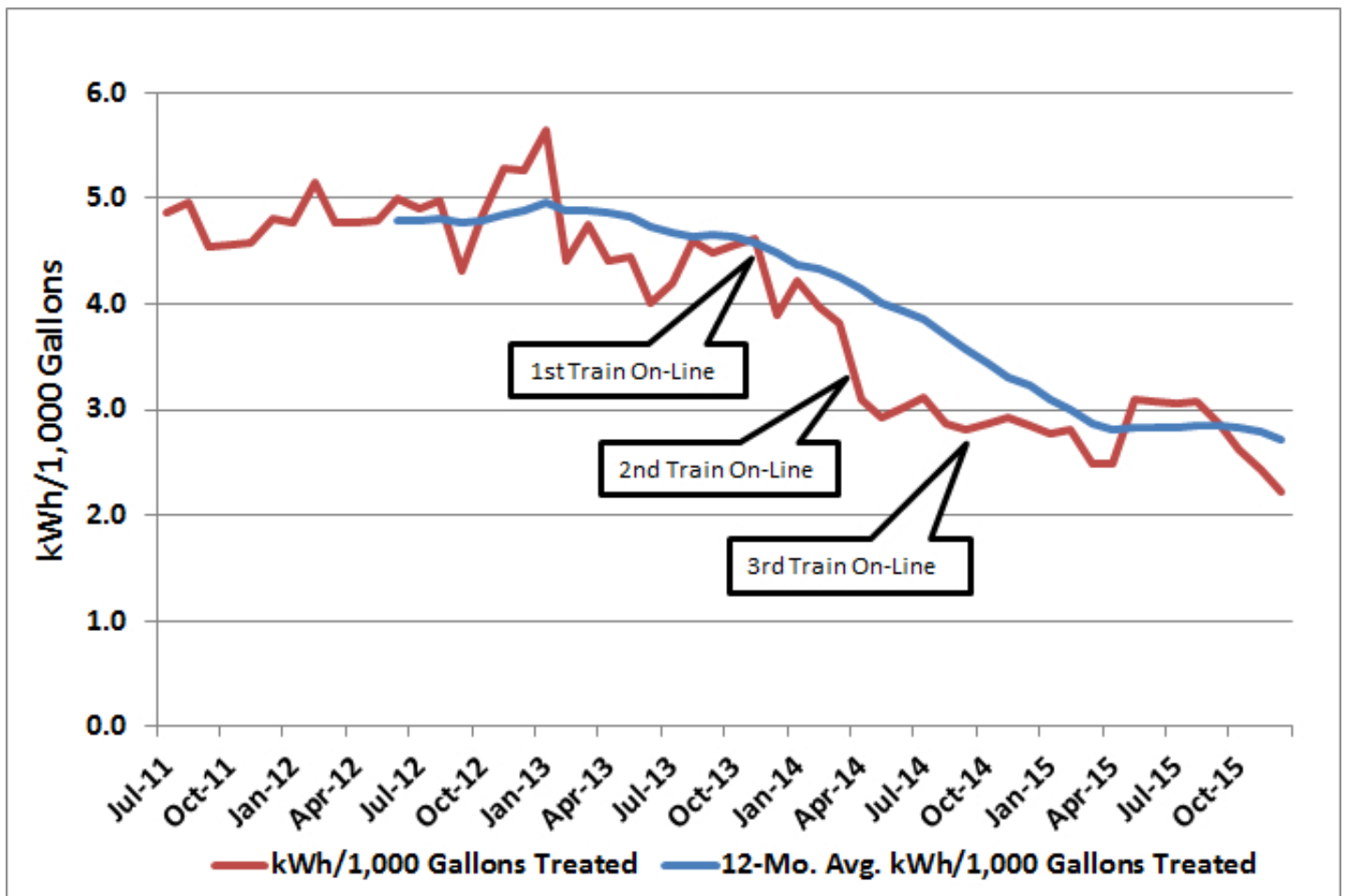
- 0. Reductions achieved in energy use intensity (kWh used/1,000 gallons of wastewater treated)
- 0. Total annual reduction in use of electricity (kWh)
- 0. Reduction in peak power demand (kW)
- 0. Reduction in annual electrical energy costs

OWASA analyzes electrical energy use, costs, and plant flows on a monthly basis and updates the calculations for the above metrics.

Energy use at the Mason Farm WWTP is monitored in real-time using the plant's Supervisory Control and Automated Data Acquisition (SCADA) system. The system includes information and trends about energy use and costs, and alerts plant operators when high energy consumption is occurring during peak time-of-use periods. When coupled with plant performance data, the energy use trending data enables operators to determine whether certain tasks, such as filter backwashing, blower operation, digester transfers, rotary press operation, etc., can be shifted to off-peak rate periods. WWTP energy use is also monitored on a monthly basis, and used to update energy performance metrics such as energy intensity of wastewater treatment in kWh/1000 gallons.

OUTREACH

Installation of the energy efficiency improvements at the Mason Farm WWTP has substantially reduced electricity use at the facility. Prior to commencement of the project, energy use intensity (EUI) averaged 4.89 kWh per 1,000 gallons of wastewater treated, and total kWh used over the preceding 12-month period was 13.91 million. After the project was completed, EUI dropped by almost 43 percent to 2.79 kWh per 1,000 gallons of wastewater treated, and total electricity use for the subsequent 12-month period was 8.36 million kWh – representing a near-40 percent reduction. The following graph shows the decline in EUI at the plant through December 2015. (Please note that the above energy use totals also include electrical energy use for OWASA’s reclaimed water system.)



The project also resulted in major energy cost savings for OWASA. For the 12 months prior to project construction, OWASA’s electric energy bills for the WWTP totaled almost \$810,000. In the 12 months after the energy efficiency improvements were in place, the electric bills totaled only \$468,000 – a savings of 42 percent. The project enabled OWASA to work with Duke Energy to substantially reduce the peak kW contract demand charges applicable to the facility.