City of Bremerton





Challenge

Aging equipment at the wastewater treatment plant, the City of Bremerton's highest energy user, had become inefficient and unreliable. Of particular concern was the plant's primary effluent pumping

system, considered the heart of the treatment plant and critical to its operation. Knowing that a system failure could result in a catastrophic environmental hazard, the plant worked diligently to keep the 25-year-old equipment operating, providing daily maintenance and custom fabricating parts to replace those no longer available. While the City knew it needed to replace the equipment, it was challenged to complete the project in a timely fashion, without disruption to its service, and at a cost that fit within its Capital Improvement Plan budget.

"If you can imagine trying to build an airplane while you are trying to fly the airplane. It was such a difficult task to figure out how and when to do it."

- **Chal Martin,** Director, Public Works and Utilities Department

City of Bremerton Bremerton, Washington

PROJECT HIGHLIGHTS

Energy Savings Performance Contract enables upgrades at wastewater plant without significant staff time investment; two-phase project realizes annual savings of \$167,000 in energy and \$30,000 in maintenance, \$500,000 in grants and \$400,000 in incentives.

Built in 1985, the City of Bremerton Wastewater Treatment Plant serves a growing population of 45,000 with a main sewer plant and thirty-nine pump stations answering the challenges of the area's hilly.

Solution

Simplifying the procurement and funding process

Trane met with plant management and presented an alternate procurement option available through the State of Washington Energy Savings Performance Contracting (ESPC) Program administered by the Department of Enterprise Services (DES). The ESPC program prequalifies vendors through an RFP process that is repeated every few years. Selecting Trane, a prequalified contractor saved the City the hours it normally takes to initiate a public bid process, evaluate proposals and select an energy services company (ESCO).

Providing a single point of accountability

As the design/build contractor for the upgrade, Trane provided a single point of accountability, with a designated team of professionals offering continuity from planning through project completion. The Trane team offered project design, procurement of equipment and subcontractors, and management of construction risks, ensuring that the project solutions and scope matched the City's objectives.

Identifying potential ECMs and funding options

Trane moved forward with the upgrade. After a preliminary analysis, Trane performed an Investment Grade Audit, engaged a design consultant and DES program manager in validating potential energy conservation measures (ECMs), worked with the plant to set priorities, and bid out equipment and services. A complete project proposal was prepared that included a maximum project cost, as well as performance and energy savings guarantees. Trane also compiled data and administered documents to assist the City in applying for Department of Commerce grants, and incentives from Puget Sound Energy (PSE) based on the guaranteed energy savings.



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Taking a collaborative approach

Working in collaboration, the City of Bremerton and Trane initiated the primary effluent pumping system upgrade, with the plant providing input regarding equipment, subcontractor selection, and scheduling; and Trane offering professional guidance. Pumps were shut down and flow through the plant was held for more than nine hours in order to remove a portion of the discharge piping, install a new in-line flow meter and six bypass pumps, and tie in the isolation system. The system's five primary effluent pumps were replaced with state-of-the-art pumps with variable frequency drive (VFD) controls. The team worked diligently to ensure work was completed with minimal disruption, and in compliance with National Pollutant Discharge Elimination System permits. "It was like working with my own staff," said Rick Zimburean, wastewater maintenance supervisor, City of Bremerton. "We knew what we needed to communicate, what the benchmarks were, and when the key components had to be done. With our knowledge and Trane's expertise, we did something that had never been done before. It was a daunting task and it was pulled off flawlessly."

Implementing Phase II upgrades

Based on the success of the primary effluent system upgrade, the City and Trane entered into a second ESPC to implement Phase II upgrades. The project included replacing the return activated sludge (RAS) pumps with new pumps with VFD, upgrading the aeration blower with a turbo blower, and retrofitting the existing constant speed fans serving the scrubbers with new VFD fans.

Results

Through an Energy Savings Performance Contract with Trane, the City of Bremerton implemented upgrades at its and verification data show a total energy savings of more than \$167,000 for the two project phases, exceeding Trane guarantees by 10 percent for Phase I and 50 percent for Phase II.

To help fund Phase I, the City obtained Department of Commerce grants of \$500,000. PSE incentives for the two phases totaled \$413,000. The Trane design/build performance contracting solution enabled the City to obtain the equipment and contractors they desired, while minimizing staff time required to complete upgrades. The upgrades also resulted in maintenance savings of more than \$30,000/yr. "We saved \$60,000 in electrical cost off the front and that doesn't include maintenance costs," said Pat Coxon, wastewater division manager, City of Bremerton. "That savings will continue to increase."

"I can't say enough about this process," added Martin. "It was a very large, difficult and complex project. It's astounding to me how it could be done so quickly, so well."





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About City of Bremerton

To minimize the risk of a catastrophic system failure, the aging primary effluent pumping system was replaced with stateof-the-art pumps with variable frequency drive controls.