

# Case study

May 2013



## Budd Inlet Treatment Plant

*Cogeneration system and blower retrofit expected to save nearly \$230,000/yr utility costs  
Olympia, Washington*

*The LOTT Cleanwater Alliance helps preserve and protect public health, the environment, and water resources by providing wastewater management services for approximately 90,000 people. Its four government partners – Lacey, Olympia, Tumwater, and Thurston counties (LOTT) – jointly provide wastewater facilities, including a central treatment plant, major interceptor sewer lines, pump stations, and reclaimed water plants. At the heart of the LOTT Cleanwater Alliance system is the Budd Inlet Treatment Plant, through which ten to twelve million gallons of wastewater flow on an average day.*

### Challenge

LOTT Cleanwater Alliance's Budd Inlet Treatment Plant flared most of its methane gas, a by-product of the wastewater treatment process, into the atmosphere. This loss of energy was costly. The flaring was also noticed by nearby residents who complained that this was a waste of energy and on multiple occasions falsely reported a fire to the fire department. In alignment with its mission to preserve and protect public health and the environment, LOTT Alliance sought an energy saving solution for its methane gas issues.

### Solution

#### Largest energy conservation grant

After evaluating several Energy Services Companies (ESCOs), LOTT Alliance used a Washington State Department of General Administration Energy Services Performance Contract (ESPC) to procure design and installation services from Trane for cogeneration system and blower retrofit projects. The ESPC allows LOTT to leverage energy use and operational savings to support its strategic business objectives. The largest energy conservation grant ever issued by Puget Sound Energy (PSE) was secured to help fund the projects.

#### Collaboration and communication

To begin, Trane representatives conducted an audit of the cogeneration facilities and met with facility owners to discover the challenges the sites experience on a day-to-day



*From almost 50,000 homes and businesses, wastewater flows through a series of underground pipes to the Budd Inlet Treatment Plant.*

basis. Working in collaboration to ensure alignment of goals and outcomes, LOTT and Trane shaped the Budd Inlet Treatment Plant project through the selection of design, equipment, contractors and solutions.

Trane created a contracting project advisory team to periodically meet with LOTT Cleanwater Alliance representatives at their offices, throughout the course of the project, to discuss budget, schedule and overall progress. Working together, the two groups developed action plans to resolve issues and ensure that the project had no effect on their treatment process.

## High-efficiency cogeneration system

The LOTT/Trane team outlined its goals for the cogeneration project. They sought to achieve the best overall utilization of the available digester gas, eliminate flaring, reduce pollutants and emissions, and maximize energy conservation incentives from Puget Sound Energy.

The team designed and installed a high efficiency cogeneration system consisting of a new gas treatment system, a new 335 kW reciprocating engine with a heat recovery unit, and two small 1.5 MM Btu natural gas boilers. In addition, a high efficiency turbine blower system with variable frequency drive was installed, which became the primary operating unit, serving approximately 95 percent of the Budd Inlet Treatment Plant's aeration system needs.

## Results

Trane partnered with LOTT Cleanwater Alliance to install a new cogeneration system and blower retrofit at the Budd Inlet Treatment Plant. The projects, funded with assistance from Puget Sound Energy conservation incentives totaling 70 percent of the project cost, were completed prior to established deadlines.

The cogeneration system provides sufficient heating energy to serve the site as a "district" heating plant. It eliminates the need to flare excess digester gas and greatly reduces annual emissions, including over 1,800 metric tons of carbon dioxide. The projects are saving more than 2.8 million kilowatt hours per year, enough to power more than 210 Thurston County homes.



*The cogeneration system project included the installation of a new gas conditioning unit.*

A follow-up performance audit shows that the system substantially reduces the amount of energy needed for treatment processes and plant buildings, exceeding expectations. Using treatment by-products as fuel, the plant's renewable energy system, coupled with an aeration blower retrofit, is expected to save LOTT Cleanwater Alliance more than \$228,000 per year in utility costs.

"Trane was a prequalified ESCO through the State of Washington," said Brian Topolski, LOTT Cleanwater Alliance, Engineering Director. "We selected them for the cogeneration system and blower retrofit projects because we liked their experience and the professionalism of the group. They definitely knew what they were talking about."

Trane and LOTT Cleanwater Alliance have recently initiate a third project together, a \$1.2 million boiler upgrade.



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