



TITLE

High Strength Waste Project Update

RECOMMENDATION

Receive an update from City staff on High Strength Waste Project.

CONTACT

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BACKGROUND & ANALYSIS

The following is an informational update. No Council action is requested at this time.

Background

In 2020, the City of American Canyon began evaluating options to enhance the performance and energy recovery potential of its Water Reclamation Facility (WRF). The facility, which is a membrane bioreactor (MBR) facility, is designed to treat an average dry weather flow of 2.5 million gallons per day (MGD) and currently treats approximately 1.5 MGD.

In partnership with ENGIE, an energy services company (ESCO), the city initiated discussions on the potential to upgrade the WRF to accept and process High-Strength Liquid Organic (HSLO) waste from local food and beverage industries. The evaluation considered not only the sustainability and operational efficiency of the facility but also the potential for the project to function as an economic model, creating local jobs and fostering partnerships with regional businesses.

To support this effort, process modeling and technical analysis were conducted to compare two anaerobic treatment technologies: a traditional anaerobic digester system and an Anaerobic Membrane Bioreactor (AnMBR). These evaluations considered multiple future operating scenarios to assess treatment performance, energy recovery potential, operational reliability, lifecycle cost-effectiveness, and economic impacts.

A technical memorandum was prepared in 2024 based on the modeling work and peer-reviewed by Dr. Damien Batstone, a globally recognized expert in anaerobic digestion and the lead developer of the International Water Association's Anaerobic Digester Model No. 1 (ADM1)—the industry

standard for advanced anaerobic digestion modeling.

GHD, a global professional services firm specializing in engineering, environmental, and construction services, engaged Dr. Batstone to review and validate the conceptual design for upgrading the WRF to manage imported HSLO waste. GHD also tasked Dr. Batstone with confirming the reliability of the BioWin model results used in the analysis.

The modeling outcomes and independent peer review conducted in 2023 confirm that the AnMBR process is technically viable for implementation. The AnMBR technology provides a robust and energy-efficient treatment solution capable of handling variable organic loads, producing high-quality effluent, and maximizing biogas recovery.

In conjunction with the modeling work, the city conducted technical meetings throughout late 2024 and 2025 with leading engineering firms specializing in high-strength waste treatment and renewable gas production. These meetings were led by Assistant Public Works Director Norman Woods, WRF Chief Plant Operator Nolan Garcia, Environmental Services Manager Pam Phillips, and Utility Consultant Brian Anderson. Participating engineering firms included Brown and Caldwell, Carollo, Black & Veatch, West Yost, and GHD, providing expertise and insights on the viability of the proposed technologies.

Analysis

A key factor in selecting AnMBR technology is that the City's WRF operates as a Leap MBR facility using ZeeWeed membranes, and the staff possess unique qualifications in advanced membrane-based wastewater treatment, including specialized training, hands-on experience, and industry expertise. This operational foundation positions the city to implement AnMBR technology effectively, reducing startup risk and enhancing operational reliability.

Based on the technical evaluation, peer review, and the existing facility capabilities and staff expertise, the AnMBR represents a sound, defensible, and sustainable technology choice for the proposed WRF upgrade, supporting both long-term operational efficiency and regional economic development goals.

The proposed High-Strength Waste Receiving Station and Anaerobic Membrane Bioreactor (AnMBR) system at the American Canyon Water Reclamation Facility is estimated to require a total capital investment of approximately \$60 to \$70 million. This figure includes process equipment, civil and site improvements, ancillary systems, renewable natural gas (RNG) recovery infrastructure, and contingency, permitting, and engineering services. The cost estimate aligns with comparable regional investments in advanced digestion and energy recovery facilities.

The project is expected to generate long-term operational savings by producing biogas that can be upgraded to RNG for onsite energy use or sale into renewable fuel markets. Preliminary estimates indicate potential energy cost offsets or revenue of \$500,000 to \$1 million annually, with additional

opportunities for participation in federal and state renewable energy incentive programs. Construction of the facility would support dozens of local construction and engineering jobs and create permanent skilled positions for ongoing operations.

Regional business partners such as Mezzetta, Hess Collection, and Infinity Bottling could benefit through reduced disposal costs and participation in sustainable waste-to-energy partnerships. Overall, the \$60 million investment supports the City's goals for renewable energy generation, resource recovery, and economic development, while positioning the Water Reclamation Facility for long-term operational cost savings and sustainability.

Staff is seeking Council feedback and direction on the recommended technology at this time. The next steps will be proposing a capital improvement project for Fiscal Year 2026/27 to begin design. In addition to design, City staff will evaluate a range of delivery methods such as design-bid-build, design-build, and design-build-finance and associated financing structures to determine the most feasible and cost-effective approach for project implementation that will be brought back to Council for additional consideration in the future.

COUNCIL PRIORITY PROGRAMS AND PROJECTS

Economic Development and Vitality: "Attract and expand diverse business and employment opportunities."

FISCAL IMPACT

The project is not budgeted at this time as it's been in the preliminary stages to determine initial feasibility of the project. Next steps include add this as a capital project in Fiscal Year 2026/27. Staff is evaluating potential project delivery methods - including "Progressive Design-Build" as recently permitted by SB 991 (Attachment 3).

ENVIRONMENTAL REVIEW

None

COMMUNICATION

Level 2: Targeted Communication

Staff will continue to engage our current and potential future high-strength waste customers as the project proceeds.

ATTACHMENTS:

1. [Anaerobic MBR Example #1 FSat \(AnMBR\)](#)
2. [Anaerobic MBR Example #2 ADI \(AnMBR\)](#)
3. [CA SB 991 Fact Sheet](#)
4. [High Strength Waste Presentation](#)