

CASE STUDY

Zero Discharge Project in Tulelake

Project Type: Municipality, Agricultural, Water Reuse

Location: Tulelake, California

HIGHLIGHTS

The project achieved \$1.4 million in savings through post-bid value engineering.

It was the region's first Zero Discharge agricultural reuse project, designed to reuse 100% of the Title 22 treated effluent.

The upgraded system can collectively store 30 million gallons of water for use in irrigating local farm land.

REGIONS FIRST 100% AGRICULTURAL WATER REUSE SYSTEM

Integrated Water Services, Inc. (IWS) completed the construction of the region's first Zero Discharge agricultural reuse project for the City of Tulelake, CA. This innovative project involved upgrading the city's lagoon treatment system and constructing storage ponds to generate and store Title 22 quality water for irrigating local farmland. The project was funded by the Clean Water State Revolving Fund (CWSRF).

CHALLENGES FACED

- **Budget Overrun:** IWS was the low bidder at a total project cost of approximately \$6 million, but this figure exceeded the city's original budget by \$1.4 million.
- **Regulatory and Funding Deadlines:** Despite the budget issue, the owner was under strict regulatory and funding deadlines to complete the project.
- **Meeting Strict Water Quality Requirements:** The goal was to generate and store Title 22 quality water for reuse, a standard that had to be maintained while bringing the constructed cost down.
- **Extensive Earthwork Requirements:** The construction required major civil work, including a total cut and fill earth work that exceeded 100,000 yd³.



SOLUTIONS IMPLEMENTED

- **Modified Construction Approach:** The team implemented modifications to the construction approach, which eliminated the need for a canal crossing and its related infrastructure, yielding significant savings.
- **Specification Adjustments:** Modification of the liner specification for the lagoon and storage ponds.
- **Operational and Size Reductions:** The team achieved savings by reducing the size of the sludge drying bed, utilizing an owner provided generator, and realizing labor savings through collaboration with the owner's operations staff during plant transitions.



OUTCOME AND IMPACT

- **Cost Savings and Budget Alignment:** The Value Engineering achieved \$1.4 million in savings post-bid, successfully bringing the constructed cost in line with the city's budget.
- **Zero Discharge and Water Reuse:** The innovative Zero Discharge project is designed to reuse 100% of the Title 22 treated effluent generated during the year. The upgraded lagoon system will store 30 million gallons of water to irrigate adjacent farmland during the growing season.
Agricultural Benefit: The reclaimed water will be used to irrigate and grow fodder crops like grass or alfalfa.

By working collaboratively on a post-bid Value Engineering process, IWS, the City, and the engineer not only achieved the necessary cost savings but also met the required Title 22 water quality standards and regulatory deadlines. This project demonstrates how Value Engineering can be a critical tool for enabling innovative, large-scale public works—like this system designed to reuse 100% of its effluent to support local agriculture.

“This project wouldn’t have happened without IWS taking a leadership role in the Value Engineering process to bring the constructed cost down to meet our budget. IWS execution of the construction work was first rate, they were very professional and easy to work with. I would rate them a 10 out of 10 as a general contractor.”

Brett Nystrom, Tullake Public Works Director



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