

Water/Wastewater Case Study:
Paradise Irrigation District

Background

- Type of Agency: Water, providing potable and irrigation water
- Location: Butte County
- Population Served: 26,000
- Water Connections: Approximately 9,900
- Treatment plant capacity: 22.8 million gallons per day (MGD)
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Summary

Paradise Irrigation District has 180 miles of pipeline and is one of nine major suppliers of water in Butte County. In 2001, as the cost of power was increasing, the district set out to reduce energy consumption and save money. The district cut energy use by installing generators, dropping of the grid, utilizing new clarifying technology and replacing leaks. Paradise also participated in employee and public awareness campaigns.

Referenced in Water/Wastewater Guides:

- #1, "Reduce Energy Use in Water and Wastewater Facilities Through Conservation and Efficiency Measures"
- #2, "Promote Energy Conservation and Efficiency Through Public Outreach, Incentives and Assistance"

Plan

Prior to the start of projects, Paradise analyzed its past energy usage and costs. The treatment plant superintendent worked with the treasurer and heads of departments to design and implement programs. In 2001, the district decided to focus primarily on optimizing the treatment plant's filtration filter/clarifier runs (filters are backwashed to clean accumulated suspended matter).

Programs: Conservation

✓ **Alternative and/or renewable energy sources:**

Agreed to cut full power usage during peak times at the treatment plant in an agreement with Ancillary Services Coalition, and use a generator to run the treatment plant. The district dropped off the grid one time for four hours in 2001. Total cost was fuel cost only. Paradise anticipated a rebate of \$4,000.

In 2001, the district installed a generator at the equipment yard and provided portable generators in offices. The original impetus for generators was Y2K concerns.

✓ **Employees:** Communicated conservation tips (such as turning off lights and computers) to employees. The response by personnel was very good. Paradise began the "Putting Ideas Down" program, where employees who recommended cost saving measures could receive a cash award.

Programs: Efficiency

✓ **Treatment plant:** Used a new chemical/polymer, which extended the time between clarifier flushes. Clarifier run times were increased by a factor of two or greater during the summer of 2001. In other words, clarifiers were flushed every eight to 10 hours instead of normal four to five hours. This cut power usage for the clarifier flushing in half. Paradise does not have any reliable savings statistics.

✓ **Water mains:** In 1993, Paradise was losing 32 percent of water through 660 leaks (i.e., out of 1000 acre feet of water, 320 acre feet of water was lost). After implementing a water main replacement program in 1993 and a leak detection program in 2000, water loss fell to 16 percent and the number of leaks fell to 140 in 2001. District staff used a listening device/microphone to listen to flow of water through the pipes. Staff also hired two consultant companies to detect leaks using a "leak correlator," a computer-based device that analyzes signals from both ends of a pipe. The cost of water main replacement was \$600,000/year. The cost of water leak detection was less than \$10,000. Paradise saw less water loss and less energy usage.

✓ **Water pumps:** Tested the efficiency of its pumps, and found them to be operating as designed. Staff looked at the

volume of water being pumped and energy used to do the pumping.

Programs: Public Outreach

✓ **Internet:** Posted water conservation assistance on its website, including water use regulations, water fact quizzes and simple water conservation tips on topics ranging from lawn watering to fixing leaking faucets to help customers reduce water and energy bills.

✓ **Water audit:** Conducted water audit program.

✓ **AWWA collateral:** Worked with town of Paradise to disseminate water conservation literature from AWWA.

✓ **Tours:** Held an open house once a year.

Budget and Finance

Funding for the projects came from the normal operating budget; there were no significant expenditures.

Results

Clarifier run times were increased by a factor of two or greater during the summer of 2001. In other words, clarifi-

ers were flushed every eight to 10 hours instead of the normal four to five hours. Power usage for the clarifier flushing was cut in half.

Savings were hard to quantify because of utility rate changes and weather. For example, temperatures between May and June 2001 was warmer than the 2000 period, which could have contributed to higher energy usage. Paradise did not have the resources to accurately evaluate energy used in offices while taking into account changing conditions (i.e., weather).

Lessons Learned

Paradise had a difficult time getting Ancillary Service Coalition and PG&E to exchange energy-use information.

Paradise Irrigation also found that its staff was more reliable in detecting leaks via listening devices than external consultants with high-tech and costly computer-based technology.