

**PROFESSIONAL REVIEW**

# Fluke power monitor saves California wastewater plant thousands of dollars

*The power monitor paid for itself in five months by eliminating the need to use contractors.*

**Name:** Jordan Dietz

**Job role:** Electro-Mechanical Specialist

**Company:** Crestline Sanitation District

**Tools:** 3540 FC Three-Phase Power Monitors®, Fluke Connect® Condition Monitoring

## Key benefits:

3540 FC Three-Phase Power Monitor:

- Reduces energy costs significantly by detecting inefficient motors
- Justifies replacement of old energy-wasting motors with new energy-saving ones
- Enables energy efficiency studies to be brought in-house saving thousands of dollars
- Ensures systems operate efficiently to keep the environment safe and clean

Wastewater treatment plants across the U.S. face aging system infrastructures and increasing compliance and regulatory requirements. Crestline Sanitation District, headquartered in Crestline, CA, operates and maintains three wastewater treatment plants and three lift stations in the scenic San Bernardino Mountains and Lake Gregory area. Its facilities range from 45 to 65 years old, as the district continues to rely on processes and infrastructure developed in 1947.

“When I started here 10 years ago, our district was formed on the basis of maintain, maintain, maintain, but never replace,” says Jordan Dietz, Electro-Mechanical Specialist for Crestline Sanitation District. “Our shared 14-person maintenance team manages more than 300 assets, including redundancies.”

Crestline Sanitation District provides sewage collection, treatment, and disposal services to 4,700+ commercial and residential customers. The system’s pipeline winds through mountainous terrain and, not surprisingly, some portions can only be accessed on foot.

“The topology creates extremely unique conditions,” Dietz says. “We have the normal challenges of a mountainous environment, but the largest challenge is the fault line. The entire mountain sits on the San Andres fault. We have breaks in our pipeline constantly. We have root intrusion and we have pipes that sag because of the sinking in the earth.”



## A potential sewage spill triggers lift-station alarms

The system utilizes gravity mains, force mains, and lift stations to move the wastewater through the treatment plant and to the eventual disposal site. Its critical lift station pumps move influent from lower to higher elevations where grades are unfavorable, and the gravity feed system isn't enough to drive the flow.

A few months ago, the maintenance team started receiving high-level alarms signaling that its Gregory Station was on the brink of spilling raw sewage into a public lake. The maintenance team acted quickly and reported to the station to begin running pumps by hand. Fortunately, the station alarms are designed to allow 30 minutes to respond before critical errors start to cause failures.

The team discovered that the two lift pumps at its Gregory Station were showing unusual activity. The identical pumps normally operate at 20-minute intervals to keep wastewater flowing continuously. They couldn't determine why the motor variable frequency drive (VFDs) control system and certain starters were showing different amperages.

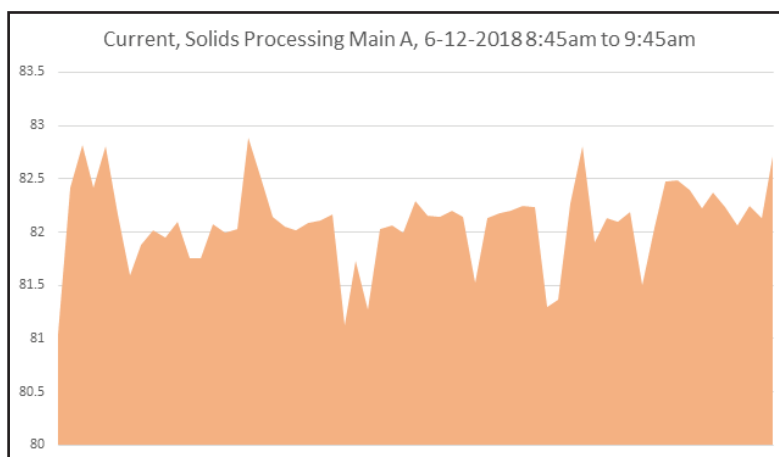
"The fact that two identical pumps had two different trends was really the key that got us to see that something was wrong," Dietz says. "We were seeing pump failures that we couldn't explain."

"Even if the water level got to the same point, it wasn't starting the motors as quickly as it should. The control system saw that as a non-working pump which triggered the station's alarms. After further troubleshooting, we got to the point where we knew it wasn't a mechanical problem."

## Power monitoring helps root out the cause

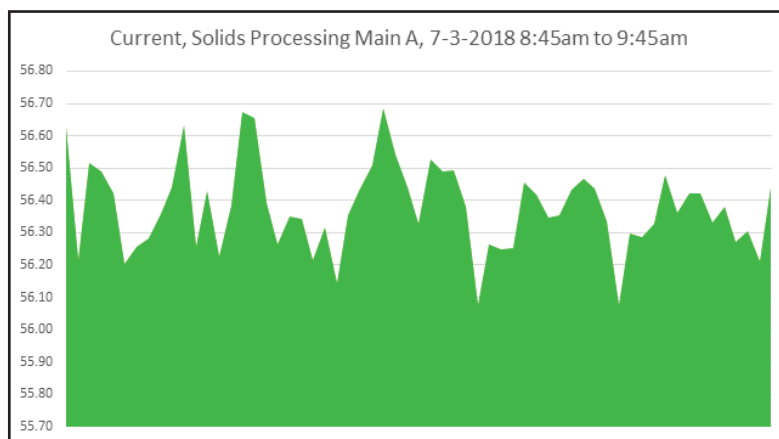
With mechanical issues ruled out, the team redirected its efforts and centered on potential electrical problems. Dietz received permission to invest in a power monitor to help them identify the problem. The team regularly works with Fluke products, so Dietz felt confident when selecting the Fluke 3540 FC Three-Phase Power Monitor to do the job.

"It was using power monitoring that enabled us to see that the pumps, and ultimately the entire station wasn't grounding properly," Dietz explains. "We isolated it down to harmonics and line voltage fluctuations that were causing varying amperages and VFD anomalies. The 3540 FC helped us realize and confirm that we needed to install a new station grounding system."



## Phase A Amperage, Pre-Efficiency Study

Pre-Efficiency Study numbers relating to power have been calculated with an average of 39,815 Watts over the course of the highlighted hour.



## Phase A Amperage, Post-Efficiency Study

Post-study numbers equate to an average of 28,279 Watts for the same period. This equals an average power savings of 29% after the efficiency upgrades were performed.



### **The Fluke 3540 FC becomes a regular**

Crestline Sanitation District is looking to the future and seeks to stay ahead of new regulatory requirements and the expected need to add service. Therefore, the District is replacing wastewater pipe systems and performing a large volume of energy efficiency studies and upgrades. Because the 3540 FC is portable, the team is using it constantly to monitor pumps, motors, and entire systems.

“We are carrying out a full efficiency study on every electric motor at every single plant,” Dietz says. “A part of what we’re doing is looking into expansion of the plants and planning our available electricity and energy efficiency upgrades based upon a full study of current conditions at every single plant.”

Recently, teams started monitoring several systems including those at its Houston Creek Plant. The facility has single-phase 120/240-volt systems, three-phase 240-volt systems, and 460-volt systems.

Before using the Fluke 3540 FC, the team had been assuming that because the three-phase 460-volt system had undergone years of tie-ins and modifications, it would most likely need replacing. After using the power monitor to test the system, team members discovered it was in fact the most efficient.

“We were creating trend charts from our own handwritten data logs,” Dietz explains. “It was the before and after monitoring that was done by the operators that really helped quantify the data that we saw on the Fluke 3540 FC. We verified both energy efficiencies and standardization of our motors.”

### **What’s ahead**

The Crestline Sanitation District maintenance team expects the upgrades and energy efficiency studies to take about a year to complete. Dietz hopes to add a computerized maintenance management system (CMMS) soon and is considering the eMaint CMMS from Fluke. The team will use the software to manage its maintenance and assets more effectively and consolidate operations all in one place.

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