

Pilot Showcases Cost-Effective Solution to Achieve ZLD Compliance

End-to-End Solution Pilot Saves Millions Annually

Case Study

Location

Southeastern United States

Owner

Power Utility Company

Problem

Our customer needed a more robust water treatment plan at its coal-fired power plant to comply with FGD regulations and keep it operating for another 10 years. To reach this goal, the company would need to achieve zero liquid discharge and wastewater treated at or beyond the point of potability.

To tap into the EPA's Voluntary Incentives Program (VIP) for Flue Gas Desulfurization (FGD) wastewater and avoid potential noncompliance penalties, the company had to act quickly. The company set out to find a partner that could address the project's complex requirements and identify the best way to achieve zero liquid discharge while optimizing spend.

Working with its owner's engineer, the power utility company selected WesTech for a pilot project to test a full-scale system and process. For the project, we would have to outline an effective strategy to handle the flue gas desulfurization wastewater from the plant's towers.

Solution

WesTech executed the pilot in 5 months, meeting the customer's aggressive timeline. The WesTech team set up several options for pretreatment, reverse osmosis, and evaporations and encapsulation.

We provided all of the necessary equipment and engineering support to get everything set up, including the interconnected piping. In all, WesTech deployed equipment for physical chemical treatment, RO membranes, mechanical vapor recompression, and crystallization.

The reverse osmosis component was especially important, and WesTech had two approaches running simultaneously – one traditional and one with a vibrating membrane – to establish which would be the most effective.

We also needed a way to manage the brine created throughout the process. The brine had to be disposed of efficiently, safely, and at scale. WesTech chose to mix fly ash from the plant with the brine, effectively encapsulating the materials so that they can be safely stored.



Pilot pre-treatment equipment included: thickener, reaction tanks, and clarifier shown here.



System installation was expedited with the use of hoses and temporary containment.

Results

The pilot was viewed as a success by our customer.

WesTech learned that a simple phys-chem treatment for heavy metals precipitation and suspended solids removal was sufficient. Proving pre-treatment could be done without softening represented significant projected cost savings to the overall full-scale project.

The water originally had levels of dissolved liquids similar to seawater but needed to be even cleaner than drinking water. After our pilot process, the wastewater came out as clean, potable water with nearly zero-dissolved solids.

The engineering, operations, and chemistry excellence exhibited by the pilot showcased our end-to-end solution capabilities to this utility company. They valued our multi-faceted approach to each step to identify the best, most efficient methods.

The result: The customer contracted us to create a modified full-scale system that would reduce selenium in the water and meet regulatory guidelines. The data our team gathered during the pilot – as well as the confidence in WesTech that the pilot instilled – proved invaluable as WesTech moved ahead with the relationship.

Highlights

- Saved \$3 million annually by demonstrating that softener was unnecessary
- Proved ability to process 150 gallons of water per minute
- Won contract for full-scale capital equipment system to remove selenium



Solutions Summary

- Process Engineering
- Rental
- Operations
- Lab Testing



Visual water quality results during wastewater treatment process.

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