



LOUISIANA WATER TREATMENT FACILITY

LSU INDUSTRIAL TRAINING AND ASSESSMENT CENTER

Audit Highlights

- The team's report identified three recommendations that estimated annual savings at \$60,176.
- The total implementation cost of the projects is estimated at \$545,160 with an average payback period of 9.06 years.
- The recommended projects incorporate the utilization of higher-efficiency lamps/ballasts, solar heat and the addition of Industrial Internet of Things (IIoT) devices to existing controls to add communication.



Chemical dosing and treatment efficiency can reduce utilities at wastewater facilities. Photo by LSU ITAC students

Facility Highlights

- The site has lagoon-style ponds for water treatment using multiple types of aeration processes.
- The site also incorporates wetland treatment as a final tertiary process in its treatment.
- In addition to the treatment techniques, they have also converted their chemical usage processes to more sustainable compounds that are safer for the downstream environment.

Summary

The LSU Industrial Training and Assessment Center (ITAC), hosted by the LSU College of Engineering, in partnership with the LSU AgCenter, worked with local chemical manufacturers to take the next step into a sustainable future. As part of the U.S. Department of Energy Office of Manufacturing and Energy Supply Chains (MESC) funding, the team of students and faculty provided no-cost sustainability assessments for the manufacturer. The team recommended projects include the utilization of higher efficiency lamps/ballasts and solar heat, as well as the addition of IIoT devices to existing controls to add communication. The assessment took place during the summer 2025 cycle and will hopefully lead to a future successful funding application from the manufacturer.

Application Process

To take part in an assessment with the LSU team or for more information, visit the DOE-ITAC website or email M.P. Hayes at mhayes@agcenter.lsu.edu with questions. This program is designed for manufacturers with annual utility costs of \$100,000 to \$3,500,000 and annual revenue less than \$250 million. Other programs may be available for facilities that do not meet this requirement. In previous years, there have been funding opportunities associated with recommendations for implementations for eligible manufacturers through various federal agencies.



Utilize Higher-Efficiency Lamps and/or Ballasts

The LSU team observed that the facility's lights were outdated during the assessment. During the walkthrough, it was noted that these traditional systems contribute significantly to the facility's electrical load while providing lower-quality illumination compared to modern standards. By transitioning to higher-efficiency LEDs and/or ballasts, the facility can achieve better lumen output while saving 2,628 kWh per year. Furthermore, the shift to higher-efficiency lighting emits far less waste heat, reducing the cooling load on the facility's HVAC system.

Energy Savings
2,628 kWh/year

Total Cost Savings
\$292/year

Implementation Cost
\$510

Payback Period
1.75 years

Add Communication Using IIoT Devices to Existing Control System to Modify Operations

Energy Savings
212,671 kWh/year

Total Cost Savings
\$23,606/year

Implementation Cost
\$141,000

Payback Period
5.97 years

The team observed that the wastewater treatment pond is manually sampled throughout the day to ensure parameters are maintained and pond health is consistent. The facility must send off samples for compliance and does not receive the results for five days, at which time the pond may require increased maintenance. The main energy-consuming equipment in this part of the facility is the aeration, which is used to increase the pond's dissolved oxygen (DO). The current practice is to aerate to prevent any issues while waiting for the results. The team suggests integrating a series of IIoT water quality sensors into the existing centralized control system to modify the operations.

Use Solar Heat to Make Electricity

During the team's visit, the students evaluated the potential for integrating solar technology to make electricity. Dependence on external power grids leaves the facility vulnerable to fluctuating utility costs and potential outages. By transitioning to solar heat technology, the facility can move to clean, on-site electricity. This transition offers key improvements such as a reduction in carbon footprint and long-term budget stability. These panels could also be implemented on open wastewater tanks to prevent shifts in microbial decay from sunlight penetration, while optimizing space for solar energy production.

Energy Savings
326,829 kWh/year

Total Cost Savings
\$36,278/year

Implementation Cost
\$403,650

Payback Period
11.13 years

Future Recommendations

Though not originally reported, this assessment has built a long-term partnership with facility personnel, and since the initial visit, additional recommendations have been made for various projects. A major recommendation is to integrate

sensors into the process to monitor dissolved oxygen generation and chemical dosing for treatment. The recommendations outlined are a summary and not a comprehensive economic analysis of projects.

Authors

M.P. Hayes, Assistant Professor in the School of Plant, Environmental and Soil Science and Louisiana Sea Grant

Chao Wang, Associate Professor in the Department of Construction Management

Chandler Hayes, Assistant Director of Research LSU-ITAC in the Department of Construction Management

Anna Bohannon, Undergraduate Student at LSU College of Engineering



Visit our website: www.LSUAgCenter.com

P4071 (online) 10/26

The LSU AgCenter and LSU provide equal opportunities in programs and employment.