GREEN TECHNOLOGY ACCELERATOR CENTER

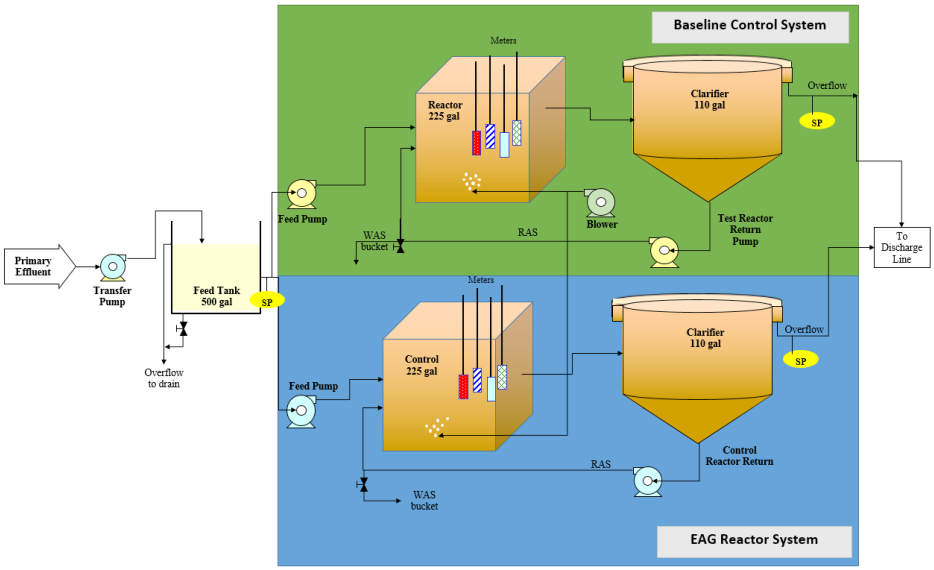
CASE STUDY

NYSP2I Evaluates Electroactive Attached Growth Activated Sludge for BioEnergySp, Inc.

BioEnergySP, Inc. (BioEnergySP) located in Spencer, New York specializes in Activated Sludge technologies, often utilized in wastewater treatment processes. BioEnergySP has developed a new Electroactive Attached Growth (EAG) technology that is claimed to increase wastewater treatment capacity of conventional Activated Sludge systems. BioEnergySP expects the EAG to increase Activated Sludge throughput five-fold and reduce both processing energy and residual bio-solids.

CHALLENGE

BioEnergySP requested assistance from New York State Pollution Prevention Institute (NYSP2I) to conduct a comparative evaluation of BioEnergySP's EAG pilot scale system vs. a conventional system, comparing the operational performance of both systems.



NYSP2I Mechanization for BioEnergySP EAG Performance Evaluation

SOLUTION

NYSP2I conducted the comparative testing on-site at a wastewater treatment facility. In preparation for the evaluation, BioEnergySP contracted the design, fabrication and installation of the test apparatus. A single effluent tank collected wastewater at the Municipal Wastewater Treatment Plant. Two identical feed pumps delivered wastewater to two aerated sludge tanks from a common feed tank. The sludge tanks discharged into identical clarifiers, which drained into a common discharge line. All components in the two systems were identical with the exception of a conventional sludge blanket in the baseline control system and an attached growth panel rack in the EAG Reactor System. Instrumentation was installed and monitored by NYSP2I and a laboratory test protocol was implemented.

CHALLENGE

- BioEnergySP requested NYSP2I compare their EAG technology to a conventional Activated Sludge system in a scale treatment plant

SOLUTION

- NYSP2I and BioEnergySP developed a test plan using pilot scale Activated Sludge systems to compare EAG technology with conventional Activated Sludge technology in-situ

RESULTS

- NYSP2I defined instrumentation and lab measurements to compare both systems
- Due to unanticipated design and application issues, performance differences between the EAG and conventional systems were not identified
- BioEnergySP plans to incorporate key findings including scale and automation, from the pilot into the next iteration of the EAF pilot scale test system
- Detailed results are available from BioEnergySP upon request

BIOLOGICAL ENERGY

RESULTS

The work performed by NYSP2I and BioEnergySP led to important takeaways for future EAG system design and application. Findings included the dilution of nutrients from excess rain, variation in waste sludge rate, system component failures, and insect larvae infestations. As a result, performance comparisons were not possible. However, key observations were noted:

- Control of a combined sewage/sewer treatment plant is difficult at a small scale and susceptible to variable rain flow
- Manual waste sludge removal rate is difficult to manage, especially in the presence of heavy rain. An alternative control method should be considered in future testing
- Insect larvae were able to enter the system through multiple paths. Even after they were eradicated and the pilot system was sealed, another infestation entered through the waste water treatment system and due to the size of the pilot, the conventional and EAG systems were overwhelmed by the investation
- Small scale wastewater treatment plants are difficult to control when the influent rate and composition is allowed to fluctuate. Changes in influent can disrupt both conventional and the BioEnergySP EAG systems

Additionally, BioEnergySP plans to explore how contact surface area between EAG panels and waste sludge affect, automation of RAS and clarifier wasting, and significantly increasing scale affect the EAG's system performance.

TESTIMONIAL

"We had a great experience working with NYSP2I, from setting up the project to executing the pilot and gathering all the data. They are an exceptional team and institution that can help any organization. We learned a lot about our product with the help of NYSP2I, and will be implementing some of those suggestions in the future."

– Adrian Cosma, CEO
BioEnergySP, Inc.

NYSP2I PARTNERS

R·I·T

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New York Manufacturing Extension Partnership

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