PLANT NAME/LOCATION: Leacock Township Authority WWTP/Intercourse, PA

TYPE OF PLANT: Municipal/Domestic

DESIGN DAILY FLOW: 0.30 MGD (1135 m^3/day) **PEAK FLOW:** 0.75 MGD (2839 m^3/day)

AQUA-AEROBIC PRODUCTS: Dual-basin AquaSBR® System

LEACOCK TOWNSHIP RETROFITS DIFFUSERS: AN OPTION THAT SAVED MONEY AND INCREASED OVERALL PLANT EFFICIENCY

In 1991, the village of Intercourse located in Leacock Township, PA was in need of a new wastewater treatment system. The system was to be efficient, reliable, and simple to operate and maintain. At the time, Sequencing Batch Reactor technology was emerging as an efficient and economical alternative to conventional flow-through systems. Knowing this, the township's engineer, Rettew Associates, turned to Aqua-Aerobic Systems and began looking at the AquaSBR® system as a possible treatment system for Leacock Township.

Following the evaluation of other treatment methods, Rettew and Aqua-Aerobic's local representative proposed to the township that the best option was a state-of-the-art AquaSBR system. The new plant would consist of a dual-basin system that would be designed to treat an average flow of 0.30 MGD and a peak flow of 0.75 MGD. Each of the basins would include retrievable coarse-bubble diffusers, AquaDDM® mixers and AquaDecanters.

In September of 1991, the new AquaSBR system went on-line and for the past nine years has consistently met the plant's treatment objectives of BOD_5, TSS, NH_3-N and Total Phosphorus. Over the course of several years, the organic and ammonia loadings to the plant increased to the point where they routinely exceeded the nominal design values. The plant was originally designed to handle influent BOD_5 of 250 mg/l but was receiving an average of 340 mg/l. By proper management of the existing aeration capacity and careful solids management, the plant operator was able to maintain effective levels of treatment, however, it became apparent that the long-term solution to the excessive loadings was to provide additional oxygen.

Engineers at Aqua-Aerobic evaluated several possible solutions for the plant and presented recommendations to the Township's engineer.

PRODUCTS

Aqua-Jet®
Surface Aerator

Aqua-Jet II®
Contained Flow Aerator

AquaABF®
Automatic Backwash Filter

MixAir®
Aeration System

AquaDDM®
Direct Drive Mixer-Blender

AquaSBR®
Sequencing Batch Reactor

AquaDisk®
Cloth-Media Filter

AquaDiamond™
Cloth-Media Filter

AquaDrum™
Cloth-Media Filter

ThermoFlo®
Spray Cooler

Aqua EnduraDisc®
Fine Bubble Diffuser

Aqua EnduraTube™
Fine Bubble Diffuser

Aqua CB-12™
Coarse Bubble Diffuser

Aqua CB-24®
Coarse Bubble Diffuser

AquaMB Process™
Multiple-Barrier Membrane System

MSBR®
Modified Sequencing Batch Reactor

SERVICES

Process and Mechanical Engineering

Quality Manufacturing

Aftermarket Sales & Service

International Expertise

CONTACT US

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One option was to build a third SBR basin, but obviously this would be costly. A second option was to increase the amount of air being put into the reactors. This would involve replacing the existing retrievable coarse-bubble diffused air system with a retrievable fine-bubble system. Doing so would increase the amount of oxygen transfer thus promoting successful BOD reduction and nitrification.

To minimize cost as well as maintain both SBR basins in operation during the aeration system upgrade, Aqua-Aerobic proposed that the change-out be done using the same track beams for the coarse-bubble diffusers racks. The new fine-bubble assemblies would simply be retrofitted onto the existing tracks.

In June of 2000, the aeration expansion at Leacock Township was completed in just one day without de-watering the basins. Both reactors, each with 2 (10 tube) coarse-bubble diffuser racks were retrofitted with (20 tube) fine-bubble assemblies. The existing blowers were re-sheaved to operate at a higher capacity and the motors upgraded from 15 to 20 HP, so there was no need to purchase new blowers.

One of the old retrievable coarse-bubble diffuser racks being removed from the basin.

The new fine-bubble assembly on the existing track is being lowered into the basin.

The aeration upgrade has saved Leacock Township considerable expense compared to building a third reactor. The upgrade has allowed the AquaSBR system to be re-rated by the DEP to a higher organic and ammonia loading capacity, and extended the life of the facility well into the foreseeable future.

Recent performance has been excellent, with effluent BOD less than 5 mg/l, TSS less than 10 mg/l, ammonia nitrogen less than 0.70 mg/l and Total Phosphorus less than 2 mg/l.

According to Jerry Brackbill, Plant Operator, "*The aeration expansion was easy to install by Township employees and the actual changing of air diffuser assemblies took less than one day with no interruption to the plant flow or performance.*"

AQUASBR® SYSTEM ADVANTAGES:

- All components retrievable and accessible
- Tolerates variable hydraulic loads
- Controls filamentous growth
- Tolerates variable organic loads
- Provides quiescent settling
- Separation of aeration and mixing
- Lower installation costs
- Return activated sludge pumping eliminated
- Small footprint
- Simple to expand or upgrade
- One company accountability