

SUCCESS STORIES

AQUA-AEROBIC SYSTEMS, INC.



FROM PRETREATMENT... TO REUSE

PLANT NAME/LOCATION: Rutter's Dairy/York, PA

TYPE OF PLANT: Industrial/Food and Beverage Processor

DESIGN DAILY FLOW: 0.05 MGD (189 m³/day) **PEAK FLOW:** 0.1 MGD (379 m³/day)

AQUA-AEROBIC PRODUCTS: Single-basin AquaSBR[®] System

AQUASBR[®] SYSTEM ACHIEVES 96% BOD REMOVAL AT RUTTER'S DAIRY

Rutter's Dairy, located in York, Pennsylvania is operated as a pretreatment system prior to discharge to the municipal sewers. Before the installation of an AquaSBR system, Rutter's Dairy was discharging its wastewater directly to the municipality. Like many other food processors throughout the United States, Rutter's Dairy was assessed high municipal surcharges when wastewater BOD₅ and TSS exceeded 300 mg/l.



Single basin AquaSBR system measures 47" in diameter x 16' SWD

The dairy plant processes over 22,000 gallons of milk, 12,000 gallons of processed drinks such as punch and lemonade, and 1300 gallons of ice cream EACH DAY. Not to mention the other products produced on a daily basis: butter, yogurt, creamers, and cottage cheese. Rutter's Dairy serves the dairy market from York, Pennsylvania to Maryland, Delaware and Washington, DC and is still growing. Bottling of the plant's products is also done at the facility to assure maximum quality and freshness.

According to Maintenance Supervisor, Don Loucks, "We were in the same situation as many other food processing plants. Surcharges were so high that we were forced to install a pretreatment system, but we couldn't afford the expense of installing a conventional system. We certainly didn't have anyone at the dairy who could operate a complicated system either." The solution to the problem of high surcharges and complicated treatment plant operation came with the installation of the AquaSBR system in the fall of 1987. Since its installation, the AquaSBR system has achieved 96% BOD removal.



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

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The AquaSBR system differs from conventional treatment systems in a number of ways. Complete treatment is accomplished within a single reactor, eliminating the need for separate basins for aeration, mixing, and clarification. Because the flexibility is a key feature of the AquaSBR system, it can be operated to achieve the desired treatment results. The separation of mixing from aeration, through the use of diffused air and the AquaDDM mixer, allows the operator to create a variety of reactor environments ranging from anoxic to aerobic. This allows the AquaSBR system to be operated for BOD and TSS removal, nitrification and denitrification, nutrient removal, and the control of filamentous growth.

AQUASBR® SYSTEM PROCESS

The AquaSBR system operates on a simple concept of introducing a quantity of waste to a reactor, treating the waste in an adequate time period, and subsequently discharging a volume of effluent plus waste sludge that is equal to the original volume of waste introduced to the reactor. This "Fill and Draw" principle of operation involves the basic steps of Fill, React, Settle, Decant, and Sludge Waste. The system may be designed to include seven individual phases of operation but the inclusion or duration of any individual phase is based upon specific waste characteristics and effluent objectives.

Where nutrient removal is required, a simple adjustment to the SBR's operating strategies permits nitrification, denitrification, and biological phosphorus removal. Optimum performance is attained when two or more reactors are utilized in a predetermined sequence of operation.

DESIGN CHARACTERISTICS

The single-basin AquaSBR system at Rutter's Dairy has an average design daily flow of 0.05 mgd (189 m³/day) and peak design daily flow of 0.1 mgd (379 m³/day). Since the start-up of the AquaSBR system,

the plant has experienced exceptional phosphorus removal of 7.2 mg/l and effluent BOD₅ and TSS levels are well below permit (as shown in the table below).

ANNUAL AVERAGE OPERATING DATA

Loading	Design Influent	Current Influent	Current Effluent	Permit Effluent
Avg Flow mgd	0.05	0.37	-----	-----
Peak Flow mgd	0.1	-----	-----	-----
BOD ₅ mg/l	4000	3000	130	300
TSS mg/l	1000	800	130	300

AQUASBR® SYSTEM ADVANTAGES:

In addition to avoiding high surcharges and having a system which is easy to operate, Rutter's Dairy experiences other benefits from the AquaSBR system:

- 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