

SUCCESS STORIES

AQUA-AEROBIC SYSTEMS, INC.



FROM PRETREATMENT... TO REUSE

TYPE OF PLANT: Industrial/Pharmaceutical

DESIGN DAILY FLOW: 0.12 MGD (454 m³/day)

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

PHARMACEUTICAL WASTEWATER TREATMENT PLANT WAS DESIGNED WITH AN AQUASBR[®] SYSTEM FOR CONTROL FLEXIBILITY AND VARIABLE LOADS HANDLING CAPABILITIES

A manufacturer of nutritional supplements originally discharged its wastewater directly to the Western Carolina Sewer Authority (WCRSA). Because its effluent BOD and TSS exceeded WCRSA limits on many occasions in 1989, a wastewater treatment facility was designed in 1990 to bring its discharge into compliance.

The 0.035 mgd treatment facility went into operation in August of 1992 and was managed by an engineering and utility management firm, PM Associates Inc.

The plant's treatment process consisted of a pre-equalization basin, employing a single AquaDDM[®] direct-drive Mixer, followed by a single basin AquaSBR system, and an aerobic digester. The AquaSBR system was chosen to treat the high-strength supplement waste because of its ability to handle high variations in organic loadings and its control flexibility, which allowed the plant to avoid discharge upsets and surcharges to the WCRSA.



One of the AquaSBR basins in operation.

As a result of the manufacturer's steadily increasing flows beyond system design, due to increased supplement production, an expansion was implemented in 1997. It included the addition of two AquaSBR basins and a sludge holding basin, which employs an AquaDDM Mixer, an AquaDecanter and retrievable coarse bubble diffusers. The former single SBR basin was converted into a sludge holding basin and the existing pre-equalization and digester basins remain part of the treatment process.



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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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 pharmaceutical plant's dual basin AquaSBR system is designed to handle an average daily flow of 0.12 MGD and to manage the high variable loadings of BOD and TSS that are commonly supplied by the plant's high-strength supplement waste. In addition to pre-treating the supplement waste before it is discharged to the sewer plant, the AquaSBR system also handles the manufacturer's domestic waste.

The treatment facility currently operates five days a week and has been known to regularly operate seven days a week in response to increased production demands.

The plant operators say they could not be happier with the AquaSBR system. In fact, they are proud to have received the *2000 Compliance Excellency Award* presented by Western Carolina Regional Sewer Authority (WCRSA) for their outstanding discharge. This is the second award they have earned since the plant's start-up and they expect to receive future awards for compliance.

January through December	Permit Required (Lbs/day), Daily Average			
	Daily Avg.		Daily Max	
	BOD ₅	TSS	BOD ₅	TSS
	667	584	1001	877

Operating Data 1/01 - 11/01

Month	Flow (MGD)	Effluent (Lbs/day)	
		BOD ₅	TSS
January	0.06	393	226
February	0.05	78	172
March	0.08	130	232
April	0.08	278	59
May	0.04	59	187
June	0.07	17	20
July	0.07	11	21
August	0.04	74	121
September	0.06	43	90
October	0.08	15	23
November	0.06	50	149

*Actual influent BOD and TSS are not monitored. Design BOD influent loading is 2502 Lbs. BOD/day at 0.12 MGD.

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