

CASE STUDY: Bradford, Pennsylvania, Wastewater Treatment Facility



Application:	Aerobic Sludge Digestion
Design Flow (ADF):	8.8 MGD
Mixing Efficiency:	≈ 0.14 hp/1000 ft ³
Compressors:	One (1) 40 HP Compressor
Blowers:	Two (2) 75 HP PD Blowers
Design Engineer:	Gannett Fleming



Bradford's wastewater treatment plant

BioCycle-D™ Optimized Aerobic Digestion Process Delivers Low Maintenance Solution

Located in western Pennsylvania just south of the New York border, Bradford is a town of about 8,000 residents. In 2019, the Bradford Sanitary Authority upgraded their wastewater facility to expand its capacity. They also constructed new aerobic digesters to remove pathogens and condition sludge and added reed beds to de-water and compost sludge. Prior to the upgrade, the plant stabilized their sludge with lime and sent it through two belt filter presses.

EnviroMix's BioCycle-D Optimized Aerobic Digestion Process was selected as the best technology for the aerobic digesters based on the energy cost savings as well as the ability to effectively mix up to 3.5% solids, which would not be possible with diffused aeration alone. **BioCycle-D offered the plant energy cost savings of over \$55,000 per year versus diffused aeration and blowers, yielding a payback period of approximately five years.**

BioCycle-D operates on the principle of alternating between aerobic and anoxic conditions and using real-time data to optimize digestion and save energy. By decoupling aeration from mixing, plants satisfy oxygen demand and achieve significant energy savings.



ENERGY EFFICIENCY

Savings of \$55,000 per year versus traditional diffused aeration design approach



STRAIGHTFORWARD OPERATION

Automatically adjusts operating cycle based on loading conditions
Minimal, localized maintenance



PROCESS OPTIMIZATION

Precise process control improves volatile solids destruction and sludge dewaterability



UNPARALLELED FLEXIBILITY

Bottom-up, uniform mixing supplements aeration
Ability to accommodate a tank out of service

“In regard to maintenance and ease of operation, it just doesn’t take much effort... It kind of runs itself.”

Donnie Hayden, Bradford Operations Manager

The Bradford plant has both a conventional activated sludge process and a sequencing batch reactor (SBR) process that waste to the BioCycle-D aerobic digesters. So, the aerobic digesters currently receive sludge from three different sources: primary sludge (8-10%), waste activated sludge (WAS) from the conventional system, and WAS from the SBRs. Bradford operates the digesters independently, letting one fill and then switching to the second.

BioCycle-D’s ease of operation and maintenance make it a great solution for the small staff at Bradford. Donnie Hayden, Bradford’s operations manager, estimates his staff only spends 6-8 hours a month maintaining the BioCycle-D system — checking the compressors, checking the blowers, and cleaning the instruments. **Hayden commented, “The maintenance is very low. You pretty much set it, observe it, and leave it be.”**

Along with the significant reduction in energy costs and maintenance, the BioCycle-D process eliminates the need to add chemicals. Hayden’s staff no longer has to deal with the mess of adding lime to the sludge.

As a customizable solution, EnviroMix’s BioCycle-D Optimized Aerobic Digestion Process allows plants to optimize their aerobic digesters for Class B stabilization, energy use, chemical consumption, nutrient recycle loads, and disposal costs.



BioMix Compressed Gas Mixing is integrated seamlessly with the fine bubble diffused aeration system to decouple aeration from mixing.



The Master Control Panel controls the BioMix system as well as the blowers through online instrumentation.



Contact sales@enviro-mix.com today to discuss the ways EnviroMix can optimize your aerobic digestion solutions.