

## Philadelphia, PA – Southwest WPCP

## Case Story of Success

### Philadelphia Southwest WPCP Retrofit of Diffused Aeration Channel Mixing System with Energy Efficient BioMix™ Compressed Gas Mixing System Saves Substantial Energy

Location: Philadelphia, Pennsylvania	Solution: BioMix™ Compressed Gas Mixing
Design Engineer: Gannett Fleming	Design Flow (ADF): 200 MGD
Application: Channels	Compressors: Plant Air System
Mixing Efficiency: $\approx 0.04$ HP/1000 FT <sup>3</sup>	Quantity of Mixing Nozzles: 726

Established in 2009 the City of Philadelphia’s Greenworks initiative is focused on advancing sustainability across City departments. Toward that end, projects focused on lowering energy consumption are paramount and the installation of a BioMix™ Compressed Gas Mixing System at the City’s 200 MGD Southwest WPCP met that goal.

The design of the wastewater treatment plant is typical of large facilities, consisting of primary clarification, biological reactors and clarification basins. Distribution and conveyance of primary effluent and mixed liquor is accomplished through nearly one mile of open channels. To prevent deposition of solids within these channels and provide uniform concentration of the distributed medium, the channels were mixed with coarse bubble diffused aeration.

The aerated mixing system consumed approximately 25,000 CFM of air and nearly 800 horsepower on a continuous basis. This energy consumption is proportionally consistent with aerated channels at most treatment facilities. As part of the Greenworks initiative, a BioMix™ Compressed Gas Mixing System was installed to retrofit the coarse bubble mixing system in 2014.

The BioMix™ Compressed Gas Mixing System retrofit achieved an 80% reduction in annual energy consumption, with annual savings of over \$300,000. The City qualified for a \$400,000 rebate from PECO the City’s utility provider, as an incentive for retrofitting their antiquated, coarse bubble mixing system. This incentive, significantly reduced an already attractive payback period.

Both small and large facilities with channels being mixed with conventional diffused aeration or mechanical mixers can benefit from a BioMix™ Compressed Gas Mixing System. The magnitude of energy savings and short payback period realized by the City of Philadelphia are typical of aerated channel retrofits to BioMix™.



BioMix™ Compressed Gas Mixing Advantages for Channel Mixing

- Bottom up mixing in any size tank
- Uniformly distributed mixing energy
- Operator adjustable mixing parameters
- Lowest energy consumption mixing technology
- Non-clog, maintenance free in-basin nozzles and nozzle headers
- Minimized and localized maintenance requirements
- Fixed floor and removable design options