

BioMix™ Success Story — 60%+ Energy Reduction

F. Wayne Hill WRC, 60 MGD, Gwinnett County GA

Project Details

- BioMix™ system provides 60%+ power savings versus leading submersible mixer
- Compressed air mixing system fires short bursts of gas through engineered nozzles affixed to tank floor
- Eliminates costly maintenance associated with mechanical mixers
- Maximum efficiency through multiple basin application
- No mechanical or electrical components in the wastewater



Continued operation of a BioMix™ installation at the 60 MGD F. Wayne Hill Water Resources Center (WRC) in Gwinnett County, Georgia, provides comparable mixing to a submersible mechanical mixer, but uses significantly less power and requires less maintenance.

In 2009, BioMix was installed in multiple biological treatment cells within Train 10 of the facility's modified Bardenpho process. The innovative BioMix system provides mixing in liquids by firing short bursts of compressed air through engineered nozzles affixed to the floor of the tank. Standard firing parameters of 0.5 second duration at 4.0 to 5.0 second intervals provide proven, effective mixing. Virtually all power consumption is limited to the compressed air source (which may be used across multiple process tanks).

Within anaerobic selector Cell A1 (41'6" x 55' x 24' deep), BioMix was compared directly against the previously-installed 15 HP submersible mixer with controls. The BioMix system consisted of an Ingersoll Rand 15 HP rotary-screw compressor, thirty floor-mounted nozzles, piping, and controls. Within Cell A1, mixing results were comparable; however, the BioMix system used 46% less power.

Power readings were also observed when mixing three Train 10 process cells. Each tank had similar BioMix configurations but utilized the same 15 HP compressor. As a result, the system showed *even greater power reduction (60%+)* when compared to three submersible mixers. See the following table:

	Submersible Mixer (x3)	BioMix
Amps	66.15	15.14
Volts	472.2	483.0
Power Factor	0.56	0.93
Horsepower	40.62	15.79
HP/1000 ft ³	0.247	0.097
Kilowatts	30.30	11.78
\$/Yr @ \$0.06/kW-Hr	\$15,926	\$6,192
\$/Yr @ \$0.09/kW-Hr	\$23,889	\$9,287
\$/Yr @ \$0.12/kW-Hr	\$31,851	\$12,383



BioMix tank installation at F. Wayne Hill WRC

Facility Summary

- Treatment process includes ten parallel trains of modified Bardenpho process, each with anaerobic, anoxic, and oxic cells with recycles for biological nutrient removal
- Discharges to Lake Lanier, the primary drinking water reservoir for Metro Atlanta

Demonstrated Results

BioMix systems provides significant power savings as compared to mechanical mixer installations. Mechanical mixers, which are typically sized by volume (HP/1000 ft³), require at least one unit per basin, and the total installed power is commonly increased to accommodate standard motor sizes. However, BioMix system power utilization is efficiently applied across multiple tank systems, by using a single, optimally-sized and easily-maintained compressor.