

Success Story — 70%+ Energy Reduction

F. Wayne Hill WRC, Gwinnett County GA

Summary

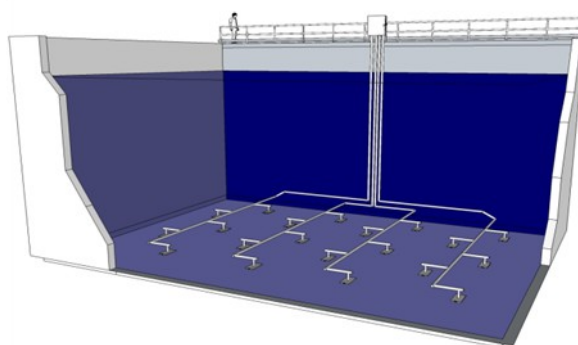
- BioMix™ system demonstrates 70%+ power savings versus leading submersible mechanical mixer
- Maximum efficiency through multiple basin application

A full-scale demonstration project performed from April - September 2009 at the F. Wayne Hill Water Resources Center (WRC) in Gwinnett County, Georgia, demonstrated that BioMix™ provides comparable mixing to a submersible mechanical mixer, but uses significantly less power. 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. Power consumption is limited to the compressed air source (which may be used for multiple process tanks) plus the 110 VAC BioMix™ controllers.



F. Wayne Hill WRC Biological Treatment Basins

The F. Wayne Hill WRC has ten parallel trains of biological treatment tanks. Within each train are anaerobic, anoxic, and oxic cells with recycles for biological nutrient removal.



BioMix™ Configuration Example (F. Wayne Hill WRC)

For the demonstration, BioMix™ was installed in four cells in Train 10. Within Cell A1 (42' x 55' x 24' deep), BioMix™ was compared directly against the previously-installed 15 HP submersible mechanical mixer with controls. The BioMix™ system consisted of an Ingersoll Rand 5-15 HP variable speed rotary screw compressor, sixteen floor-mounted nozzles, piping, and controls.



BioMix™ Nozzle

Success Story — 70%+ Energy Reduction (cont.)

Within Cell A1, mixing results were comparable; however, the BioMix™ system used only ±50% of the power. (See Table 1.)

TABLE 1
Submersible Mixer BioMix™

Amps	22.05	6.80
Volts	472.2	483.1
Power Factor	0.56	0.91
Horsepower	13.54	6.91
HP/1000 ft ³	0.244	0.125
Kilowatts	10.10	5.16

Power readings were also observed when mixing all four Train 10 process cells. Each tank had similar BioMix™ configurations but utilized the same 5-15 HP compressor. As a result, the system showed *even greater power reduction (70%+)* when compared to four submersible mixers. (See Table 2.)

TABLE 2
Submersible Mixer (x4) BioMix™

Amps	88.20	13.10
Volts	472.2	487.1
Power Factor	0.56	0.93
Horsepower	54.16	13.76
HP/1000 ft ³	0.244	0.062
Kilowatts	40.40	10.27
\$/Year*	\$21,234.24	\$5,397.91

* Based on \$0.06/KW-hr

Demonstrated Results

The BioMix™ system provides significant power savings when compared to single unit submersible mechanical mixer installations. However, when installed in multiple process basins, the compressed air source may be utilized up to its capacity. This maximizes the compressor power efficiency, and in turn minimizes power cost. The BioMix™ system installed in four cells at F. Wayne Hill WRC demonstrated a *70%+ power reduction* when compared to four submersible mechanical mixers in similar application.

Mechanical mixers, which are typically sized by unit volume (HP/1000 ft³), require multiple units for multiple basins, and consume respective multiples of power per equally-sized unit. However, BioMix™ system power utilization may be efficiently applied across multiple tank systems, which share a single, optimally-sized compressor.

Contact EnviroMix

Please contact EnviroMix to size your particular application. We look forward to working with you to minimize power, while effectively mixing, reducing maintenance, and providing nutrient removal.

Contact Your Local Representative

