

# BIOSTYR® Improves Health of the Long Island Sound

## Biological Treatment | Case Study

### Westchester County, NY

#### The Client

The New Rochelle Wastewater Treatment Plant is located in the Westchester County, New York, discharging to the Long Island Sound. It serves a population base of 65,000 people and is permitted to treat average flows of up to 20.6 MGD. Operating with primary clarification and pure oxygen-based activated sludge treatment since a 1979 upgrade, the plant only removed BOD and TSS from the wastewater.



#### The Benefits

- Guaranteed compliance with TN limits
- Minimal footprint
- Integrates well with existing treatment system
- Odor free treatment

#### The Client's Needs

It has long been known that nitrogen discharges into the Long Island Sound are a key factor in its water quality. New SPDES limits issued in 2005 and a negotiated Order-of-Consent would require an upgrade to the New Rochelle WWTP to remove nitrogen from its discharge. On average, the mass-based nitrogen requirement would require the facility to meet a TN discharge of 4.0 mg/L or less at design flow. In addition, tighter restrictions on CBOD and TSS would be included in the new permit. Land availability in New York is scarce, so the solution needed to fit on the existing site. Dozens of technologies were evaluated by the client's Engineer, Savin Engineers, PC, to determine the preferred solution, including pilot scale testing. At the conclusion of the evaluation phase, a competitive life-cycle based procurement was bid and the Veolia BIOSTYR® Biologically Active Filter (BAF) technology was selected as the preferred alternative due to its compact footprint and proven reliability removing nitrogen.



#### The Solution

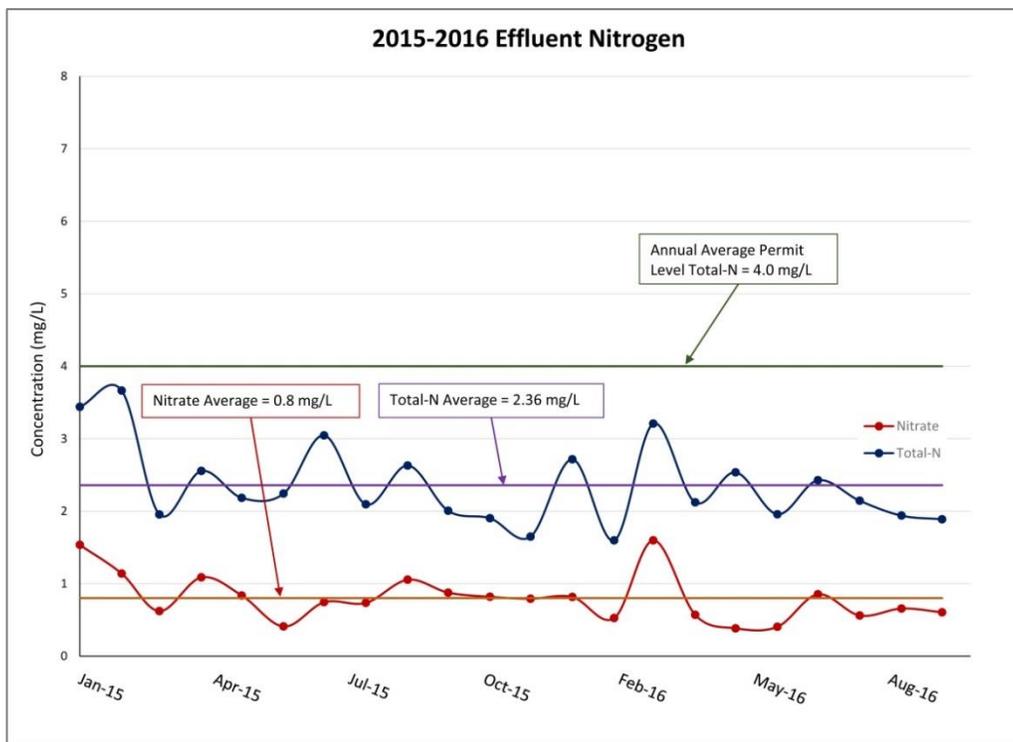
BIOSTYR® is a high-rate biological system for treating wastewater that offers full treatment capabilities for BOD, TN and TSS removal in a single process; in 10% of the footprint of other technologies. The system utilizes multiple treatment cells operating in parallel to biologically treat and simultaneously filter the wastewater, producing an effluent free of contaminants and solids. Biological growth occurs on a fixed bed of innovative BIOSTYRENE® media, which is contained within each cell and not exposed to the atmosphere. Flow enters at the bottom of each cell and clean effluent collects at the top of each cell. This makes for a very clean installation that fits well into facilities with nearby communities such as urban, densely populated areas.

## Process Description

To meet the new SPDES permit requirements of this facility, Veolia designed a BIOSTYR® system containing 2 distinct stages of operation. The first stage is fully aerobic and targets complete nitrification to convert incoming ammonia into nitrate. This stage consists of 12 parallel cells, each with a footprint of 940 ft<sup>2</sup>. The second stage is anoxic in the lower portion of the BIOSTYRENE® biological filter bed to target denitrification of the incoming nitrates. Methanol is fed to the influent of this stage to serve as a carbon source for the microorganisms as the influent to this stage contains very little BOD. To protect against increased BOD levels in the effluent due to unused methanol, the second stage cells include an aeration grid within the filter media to allow fully aerobic operation of only the uppermost layer of media. The system was designed to meet future flow needs of up to 31 MGD average and 61.5 MGD peak with guaranteed effluent nitrogen performance. In addition to the BIOSTYR® system, Veolia provided an upgrade to the existing pure-oxygen activated sludge system. This upgrade to the OASES® pure oxygen system included new oxygen supply control equipment, new instrumentation for monitoring oxygen levels, and new aerator/mixer equipment. This system provides improved CBOD removal and more stable influent to the BIOSTYR® process.

## Results

The New Rochelle WWTP has been operational since late 2014 and has been a tremendous success, reducing the plant TN discharge from 2,000 lb/day in 2014 to 200 lb/day in 2015. Summer and winter performance tests were completed in 2015 to fully demonstrate the system's capabilities, and exceptional nitrogen removal has continued throughout 2016. Thus, the BIOSTYR® system is allowing Westchester County to improve the health of the Long Island Sound.



### Kruger

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