

Lombardo Associates, Inc.

Representative Nitrogen Removal
Project Descriptions
Multi Family & Institutional Applications



- Suffolk County Environmental Center, Islip, Long Island, NY
- Croatan High School, Newport, NC

Environmental Engineers/ Consultants

LOMBARDO ASSOCIATES, INC.

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Scully Estate – Environmental Center Suffolk County, Islip, NY



ON-SITE WASTEWATER TREATMENT SYSTEM

Project Application Data:

- **Location:** Scully Estate – Suffolk County Environmental Center
- **Site Application:** Islip, NY
- **Installation Date:** November 2008
- **Start-up:** Summer 2011

Wastewater Engineer: Lombardo Associates, Inc.
Boston, MA & Malibu, CA
www.LombardoAssociates.com

Design Profile:

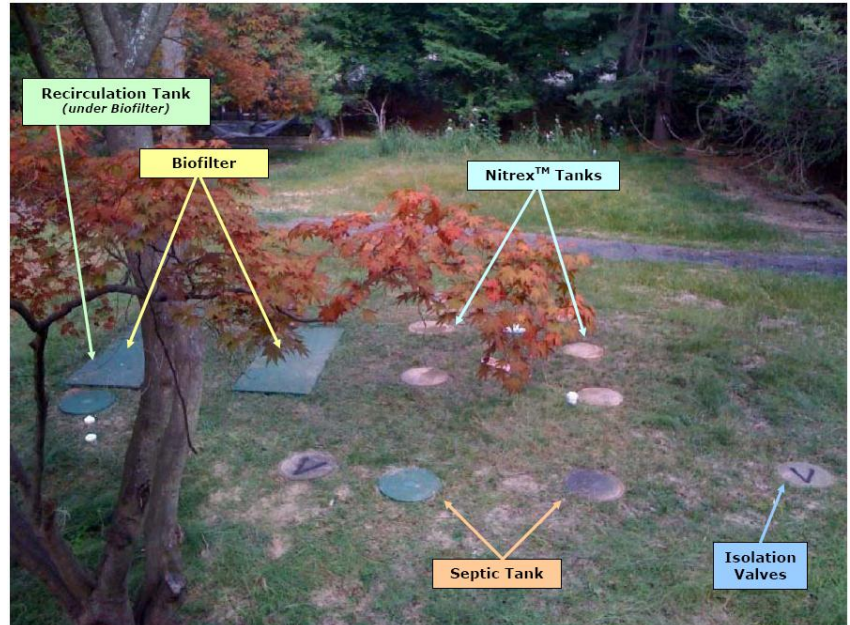
- Design Wastewater Flow = 1,300 gpd
- Wastewater Treatment Process:
Septic Tank → BioFilter → Nitrex™ → Drainfield

Project Description:

The Scully Estate is located on South Bay Avenue in Bay Shore, Islip, NY, approximately 6,500 feet south of Montauk Highway. Daily design flow is 1,300 gpd. Because of the small flow and the distance and expense involved in connecting to the municipal sewer, an on-site treatment and disposal system was selected by Suffolk County.

Nitrogen removal was the critical wastewater issue due to the groundwater sole source aquifer and coastal embayment environmental sensitivity to nitrogen. For this reason, the Nitrex™ system was sole source selected by Suffolk County.

The entire project is LEED compliant. The basic treatment process is nitrification followed by the Nitrex™ denitrification reactor, then to the drainfield. Due to the low alkalinity water supply and high nitrogen strength wastewater, an alkalinity feed system is part of the system which enables full nitrification to occur.



Date	Wastewater Influent	Nitrex™ Effluent	Nitrex™ TN % Removal
	Total Nitrogen (TN) (mg/l)	TN (mg/l)	
10/04/11	70.4	1.6	97.8%
03/21/12	81.3	5.1	94.6%
04/03/12	81.0	5.2	93.6%
04/10/12	81.0	4.8	94.1%
04/12/12	90.0	3.8	95.8%
04/17/12	81.0	3.4	95.8%
04/24/12	81.0	5.2	93.6%
08/21/12	85.2	4.9	94.3%
Geometric Mean		4.0	94.9%

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Bogue Sound Elementary School & Croatan High School Newport, NC



ACHIEVING TOTAL NITROGEN < 3 MG/L

Project: Bogue Sound Elementary
Location: School & Croatan High School
 Newport, NC
Owner: Carteret County Board of Education
Wastewater Engineer: Lombardo Associates, Inc.
 Boston, MA & Malibu, CA
www.LombardoAssociates.com



Nitrex™ Design Profile:

- Design Wastewater Flow: **12,000 gpd**
- Nitrex™ Influent Total Nitrogen (TN): **70 mg/l**
- Effluent Requirements:
 - TN <10 mg/l
 - cBOD₅ <15 mg/l
 - TSS <15 mg/l
 - Fecal Coliform < 200 MPN/100ML

Wastewater Treatment Process:

Septic Tank → Recirculating Sand Filter → Nitrex™ Filter → Recirc. Sand Filter → UV Disinfection → Drainfield

Lombardo Associates, Inc. (LAI) was retained by the Carteret County Board of Education (CCBoE) to design, permit and build a Nitrex™ Nitrogen Removal wastewater system serving Croatan High School and Bogue Sound Elementary School. The existing wastewater system for the School consisted of three recirculating sand filter (RSF) cells with UV disinfection prior to discharge to a drainfield. The LAI design included modifications to the piping of the RSF to optimize denitrification and construction of a Nitrex™ filter, and using one of the RSFs for polishing. The Croatan High School and Bogue Sound Elementary School On-Site Wastewater Treatment System became operational in December 2009 and was immediately performing within permit requirements. Performance data is:

Bogue Sound Elementary School & Croatan High School, Newport, NC							
Date	Start-up	Septic Tank Effluent		Nitrex™ System Effluent			
	10-Dec-09	BOD	TKN	BOD	TSS	TN Calc.	Fecal Coliform
	Units	mg/l	mg/l	mg/l	mg/l	mg/l	mpn / 100 mL
	Permit			15	15	10	200
Geometric Mean		178	104	1.2	1.3	2.52	1.2

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