New York State Center for Clean Water Technology
Stony Brook University

Nitrogen Reducing Biofilter
for
Westhampton Presbyterian Church Parsonage
near
Quantuck Bay

2021 Grant Funding Application
to
COMMUNITY PRESERVATION FUND (CPF)

New York State Center for Clean Water Technology

Stony Brook University

COMMUNITY PRESERVATION FUND (CPF)
WATER QUALITY IMPROVEMENT PROGRAM
PROPOSAL SUMMARY

Project Applicant: Westhampton Presbyterian Church

Project Title: Nitrogen Reducing Biofilter for Parsonage at Westhampton Presbyterian Church

Project Manager Name: New York State Center for Clean Water Technology at Stony Brook University ("CCWT")

Name	Frank Russo
Title	Associate Director
Organization	CCWT
Address	1000 Innovation Rd, Suite 100, Stony Brook, NY 11794-6044
Phone	631-252-3797
Email	frank.russo.3@stonybrook.edu

Property owner (if different from Project manager organization):

Name	Venessa Winter
Affiliation	Westhampton Presbyterian Church
Organization	Westhampton Presbyterian Church ("WPC")
Address	90 Meeting House Rd, Westhampton Beach, NY 11978
Phone	631-288-2576
Email	revvanessawinters@gmail.com

Project Address: 90 Meeting House Rd, Westhampton Beach, NY 11978 SCTM #(S) 0900370000300035000

Type of Project (Check all that apply):

☒ Reduction ☐ Remediation ☐ Restoration

Project Summary: (Provide a brief narrative description of proposed WQIPP project)

Facilitated by the CCWT, the WPC seeks funding to replace their existing cesspool system with a nitrogen reducing biofilter at the church parsonage in Westhampton Beach. The parsonage is located in a High Priority Area, about 300 yards from Quantuck Bay, one of the most impaired water bodies in Eastern Long Island.

The new system is capable of bringing total nitrogen in the residential wastewater from this home down below 5 mg/L, the best performance of any I/A system currently available in Suffolk County.

If additional information is needed to describe the project; a project narrative can accompany the application. Please limit the narrative to approximately 3 pages of project description, provide a summary of water quality benefits/objectives of approximately 2 pages and provide a cost estimate of approximately 2 to 4 pages with supporting estimates. Any additional materials should be focused specifically on the proposed project with references to other studies that are pertinent

1. PROJECT TYPE (check all that apply)

Must meet at least one of the definitions of "Water Quality Improvement Project" per State Law Chapter 551 cited above. Check all that apply.

- [x] Wastewater Treatment Improvement
- [ ] ProjectNon-point source abatement and
- [ ] control Aquatic habitat restoration
- [x] Pollution prevention
- [ ] Operation of Peconic Bay National Estuary Program (Grant Match)

Note: Monitoring costs are only potentially eligible for CPF funding within Aquatic habitat restoration projects.

2. PRIORITY AREA(S) (check all that apply)

Priority areas are defined in the Water Quality Improvement Project Plan (WQIPP).

- [x] 303(d) Impaired
- [x] High
- [ ] Medium
- [ ] Outside High and Medium priority areas*

*If Outside High and Medium priority areas, explain how the project is relevant to WQIPP goals.

Subwatershed Priority Ranking, pg 2-215, SCSWP, Quantuck Bay, SWP PWL Number 1701-0042+0303, Rank: 1

3. PROJECT DESCRIPTION

3a. Existing conditions of applicable groundwater/sub-watershed/waterbody and most recent and relevant data available(provide sources).

Located in a High Priority Area, 303 (d) Impaired

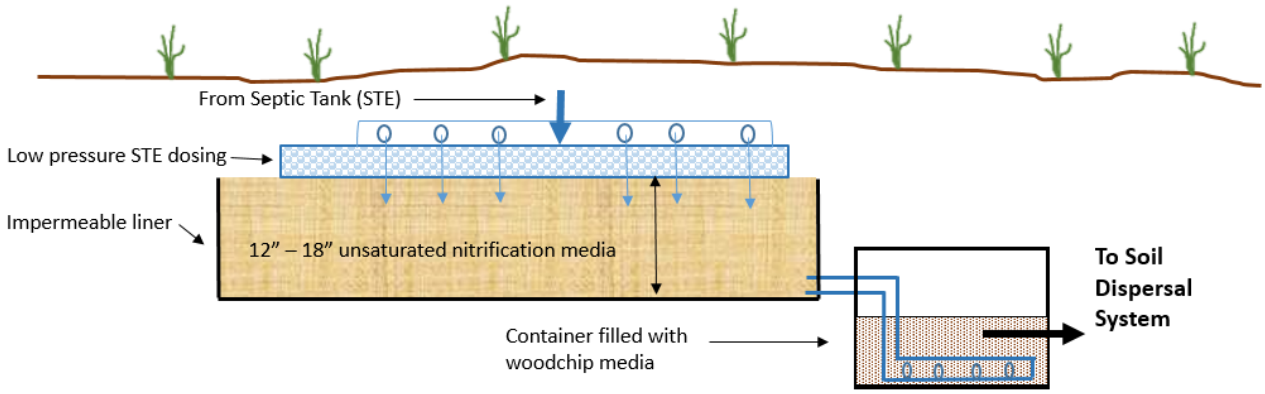
Quantuck Bay has been declared impaired by the New York State Department of Environmental Conservation (NYSDEC). For more than 30 years, these waters have been plagued by recurrent brown tides more frequently than any other water body across Long Island leading to significant losses of shellfish and eelgrass. High levels of nitrogen have been detected in the groundwater under Westhampton Village and this nitrogen flows to coastal water bodies, promoting these brown tides while also contributing toward other nitrogen-related impairments including the loss of salt marshes, the loss of eelgrass, poor water clarity, low oxygen levels, and poor conditions for fish populations. Nitrogen from residential wastewater represents about 53% of the total load.

3b. How the proposed solution addresses the issue in the context of Reduction, Remediation and/or Restoration as per the CPF Water Quality Project Plan. Note all remediation and restoration projects must assure that reduction measures are also addressed.

NRB's have demonstrated the capacity to remove > 80% of nitrogen (N) from most residential wastewater influent. Using median values of 60 mg- nitrogen (N) L-1 in septic tank effluent (Lowe et al 2007) and an estimated average daily generation of 100 gallons of wastewater per person, this NRB installation will save ~ 36 lbs of N annually from leaching to groundwater at this site very close to Quantuck Bay.

3c. Describe the proposed technology and its demonstrated efficacy in similar settings. May include published data.

The proposed technology treats N in wastewater with a very simple but effective configuration. Aside from one pump which assures dosed pulsing to a distribution system (Geomat or Infiltrator) overlaying a drainfield, wastewater flows are entirely gravity-driven and treatment occurs as wastewater simply percolates down thru the layers of sand and sand/woodchip. Aqueous ammonium is nitrified with oxygen in the sand bed and then the water drips down into the anoxic sand/lignocellulose layer where the resulting nitrates are denitrified.



Based on ~ 3.5 years of monitoring 3 variations of the basic NRB design (lined NRB with saturated woodchip biofilter; sand bed with woodchip box and unlined NRB) at Massachusetts Alternate Septic System Test Center, each system has averaged total nitrogen (TN) of ~ 8 mg-N L-1 in final effluent at recommended loading rates compared with ~ 43 mg-N L-1 in septic tank effluent. Results from these 3 NRB designs under Suffolk County's Article 19 Septic Permitting program installed during the past 2 years have produced average TN in final effluent of 4.6 mg/L (n=1) (see charts 1 & 2).

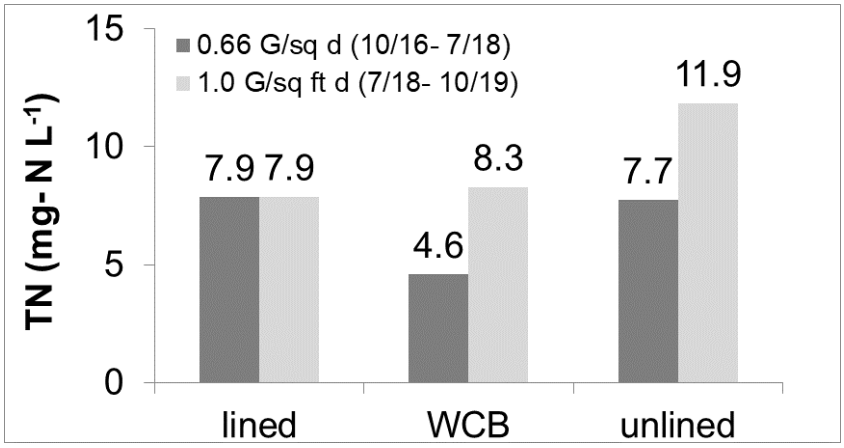


Chart 1. Results of increased wastewater loading rates at the Massachusetts Alternative Septic System Test Center. The NYS Center for Clean Water Technology recommends sizing for NRB at loading rates of 1.0 G f-2 d-1 for lined and woodchip box systems and 0.75 G f-2 d-1 based on results from installations in Suffolk County.

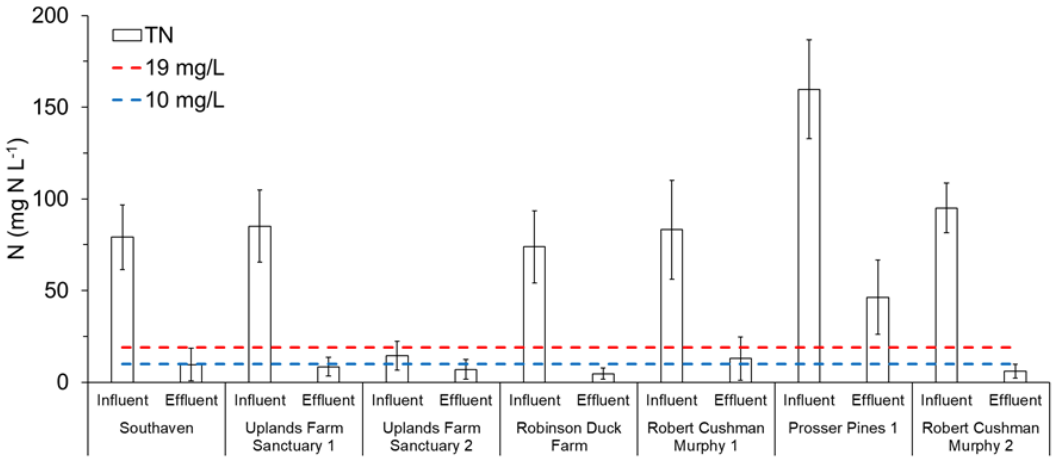


Chart 2. Total nitrogen in influent (left bar) and final effluent (right bar) from installations in Suffolk County since inception (between April 2018 and August 2019.

3d. How the project supports Town of Southampton, Suffolk County, NYSDEC, Long Island Nitrogen Action Plan (LINAP) or other adopted goals/policies (provide references with pages numbers).

Aside from the immediate reduction in N loadings to local groundwater and Quantuck Bay, the primary benefit to Southampton estuaries is in advancing NRB technology under Suffolk County's Article 19 septic permitting program from Experimental to Pilot and then Provisional phase testing, a critical step to general use status on Long Island. The benefit to water quality is expected because the N removal efficiency of NRBs represents a substantial improvement over levels achieved in 2019 by commercial systems provisionally approved by Suffolk County which averaged 15 mg-N L-1.

3e. Review the following statements and indicate whether they are applicable to your project. For all "Yes" responses, pleaseindicate how your project addresses the requirements indicated.

YES	N/A	
☐	■	**If stormwater system or drainage is proposed:** The project must indicate compliance with the New York State Stormwater Design Manual (2015 and as updated).
☐	■	**If project is related to farmland:** Describe any Agricultural Stewardship Plan or other long term strategy for Nitro-gen abatement.
■	☐	**If the project is for habitat restoration:** The narrative must address how underlying causes are being amelioratedand expected outcomes for local species populations or other ecological considerations are given.
☐	■	**If project is a Sewage Treatment Plant (STP) or cluster treatment system:** Fund allocation request is based on cost for reduction of pre-existing conditions and not for purpose of accommodating new density (describe pre-existingdensity and associated flow (gallons per day) and total projected nitrogen reduction in narrative). Include detailedinformation on how many homes the system would treat as well as potential for formation of Sewer District, if required by Suffolk County Health Department or Town Law.
☐	■	**If the project is requesting grant match:** Include information related to funding program source and purpose of application and any relevant items on this checklist. Note: A Town Board resolution will be required in order to encumber matching funds for grant applications.

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4. WATER QUALITY BENEFIT

4a. Identify Nitrogen, Pathogen or Pollutant of Concern (POC) including Existing Condition and Target Reduction.

High nitrogen levels have led to the degradation of salt marshes, which provides buffering against storm surges, as well as to algal blooms. (Gobler et al., 2004, 2011). NRBs will provide Nitrogen reduction from residential wastewater by 80% or greater.

4b. Describe plans for collecting and reporting on water quality over time.

SCDHS Article 19 regulations for reporting nitrogen levels are required. In addition, the NYS Center for Clean Water Technology will monitor wastewater analytes in the final effluent of these systems once installation is complete and report results to the public broadly including to SC DHS, NYS DEC and as part of design-based articles in engineering journals. Wastewater analytes will include Total Kjeldahl Nitrogen, ammonium, nitrate/nitrite, cBOD5, alkalinity, DO, pH, and temperature (final effluent and air), which will be measured on site. The Center has over four years' experience collecting and measuring these analytes; its labs are certified by the NYS Environmental Laboratory Assessment Program (ELAP) for these analytes.

4c. Indicate useful life of proposed technology (must meet or exceed five years).

The useful life is greater than 15 years. Published articles in scientific journals (e.g., Robertson, Logan & Lombardo 2008; Groundwater Monitoring & Remediation 28) indicate woodchips continue to provide carbon for nitrate removal for at least 15 years; anecdotal evidence suggests woodchips may continue to provide carbon for nitrate removal for decades beyond. The other components of the systems have been widely in use across the Unites States for decades.

5. COST FACTORS

5a. Explain how you have confirmed that the proposed budget is reasonable, appropriate and necessary. If available, provide third party estimates or other documentation of how costs were determined.

The proposed itemized budget was based on actual costs for installed NRBs across Suffolk County and prepared by, Tom O'Dwyer of Homeport Engineering, an independent professional engineer. Total project cost would be $63,238. Of that amount, $28,388 in matching funds would be provided by NYS CCWT. We are requesting $34,850 from the CPF.

5b. Describe any matching funds to be provided.

CCWT will pay for the survey, soil boring, utility location, site evaluation and project design by the professional engineer. Also, CCWT will be contributing project management, monitoring services including collection and field sampling, measurement, analysis, and reporting services as in-kind matching funds. CCWT's lab is NYS ELAP certified for measurement of wastewater analytes.

5c. Explain:
i. Why project cannot proceed and intended benefits cannot be achieved without external funding.
ii. if funds are awarded at a lower level than requested, or if there are cost overruns, explain how the project will proceed.

Grants through the Suffolk County SIP and NYS are not eligible until the I/A process achieves Article 19 Provisional Phase approval. In order to gain SCDHS acceptance, eight pilot systems must be installed and operated for at least 2 years. The NYSDEC grant to CCWT does not provide sufficient funds to install that many I/A systems. The Church does not have the funds to make up for lower levels than requested. The CCWT would have to cover cost overruns out of the NYSDEC grants.

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6. MANAGEMENT, EXPERIENCE, ABILITY

6a. Describe applicant's experience in completing similar projects.

NYS Center for Clean Water Technology at Stony Brook University was founded by NY Governor Andrew Cuomo in 2015 to promote technologies to reduce residential nitrogen inputs to groundwater and marine ecosystems. Since inception, CCWT has facilitated the installation of 20 onsite, residential wastewater treatment systems (Nitrogen Removing Biofilters) at locations across Suffolk County. To advance its designs to the pilot phase of Suffolk County Department of Health Services (SC DHS) Article 19 permitting process, CCWT plans to install 5 additional systems. These installations have all been completed within several days and each design is exceeding Article 19 requirements. One system has produced effluent with TN exceeding the 20 mg/L limit but we are looking into what is causing that and confident that the system will return to producing good numbers. There have been no instances of hydraulic or operating problems.

CCWT has hired Tom O'Dwyer, PE, with Homeport Engineering to evaluate the sites, design the systems, estimate the budget, submit the permit application, and make sure the system is properly installed.

6b. Describe community support or opposition to project. If there is opposition, explain how this is to be addressed.

There is no known opposition for these specific projects at this time. Community support for OWTS's is well established. Community opposition to the Subwatershed Plan is largely about expense. By showing the community how to install this technology, we hope to mitigate some of that expense.

6c. Describe any permits needed and time frame/status of approvals. If permits are approved, indicate same.

SCDHS Article 19 compliance is required. SCDHS permitting is under way using the design by P.E Tom O'Dwyer. Approval is expected within several weeks.

7. MAINTENANCE, MONITORING, EVALUATION

Estimate ongoing maintenance costs and explain how these will be supported. Explain stewardship and monitoring activities planned for ensuring sustainability of the project.

Westhampton Presbyterian Church (Owner) will budget for ongoing maintenance and Article 19 reporting compliance by a licensed service provider. CCWT will monitor the performance of the system for research purposes.

8. DURATION OF PROJECT

8a. Provide a projected project timeline.

Project will be shovel-ready. CCWT will engage a professional engineer. Survey, soil borings, design drawings and SC DHS permit application are in process. Upon funding, construction will take 5-7 days. CCWT will then commence monitoring wastewater effluent for 24 months.

8b. If project is multi-year or phased, provide a breakdown of budget and milestones for each year and phase.

Not Phased.
CCWT will monitor the site, collect and analyze samples, and report results for 24 months after construction as part of matching funds.

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9. ATTESTATION

Allocation of CPF funds will not be for the purpose of accommodating new growth, as this is prohibited by State law.

■ Check box to certify that funds will not be directed for projects for the purpose of accommodating new growth.

Signature: _____ Date 5/13/21

REQUIRED ATTACHMENTS Confirm that the following required documents are attached to this application:

■ ⑥ Photos of existing conditions

■ Location Map

☐ State Environmental Quality Review Act (SEQRA) Long or Short Environmental Assessment Form (EAF)
https://www.dec.ny.gov/permits/6191.html

☐ Completed EPA Spreadsheet Tool for Evaluating Pollutant Load (STEPL)
https://www.epa.gov/nps/spreadsheet-tool-estimating-pollutant-loads-stepl or similar standardized methodology (describe)

■ Project budget (see attached template)

■ Ownership commitment is provided via letter of intent (LOI) for non-municipal owners or municipal resolution for municipal owners

10. OTHER ATTACHMENTS

List other attachments provided, including cost estimates, bids, plans, documentation of matching funds, and other as appropriate to demonstrate project readiness, quality, feasibility, and cost effectiveness

List of Attachments:

1) Photos
2) Location Map
3) Project Budget and breakout of CCWT Match
4) Project Cost Estimate by Tom O'Dwyer, Homeport Engineering, P.E
5) Project Schedule
6) Assessment of Water Quality in Quantuck Bay
7) Pollutant Loads in lieu of STEPL Calculation
8) Ownership Commitment – LOI

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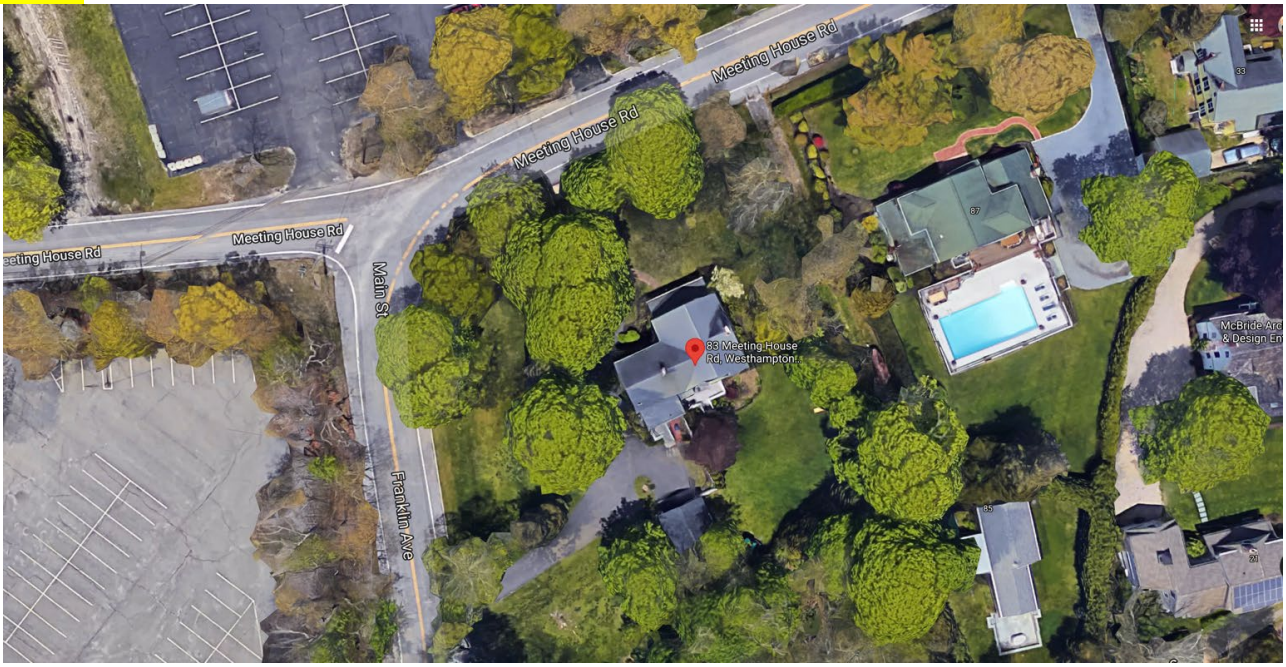
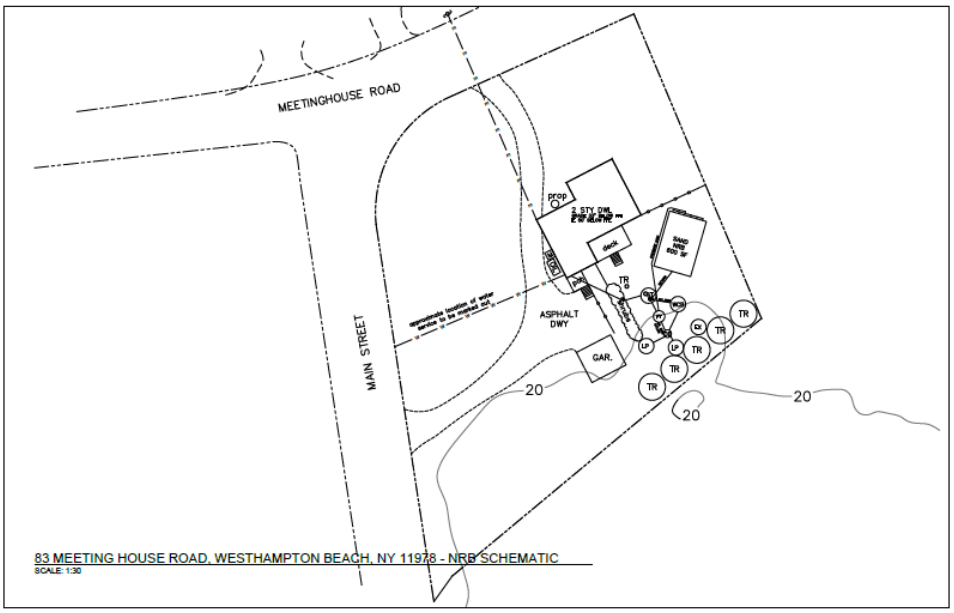
Photos



Aerial view of site (NRB system would go in the back yard below the red marker)



Proposed Woodchip Box NRB Layout Based on Approximate Tax Map Property Boundaries

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Backyard of the Parsonage, where the NRB would go.

Front yard of the Parsonage

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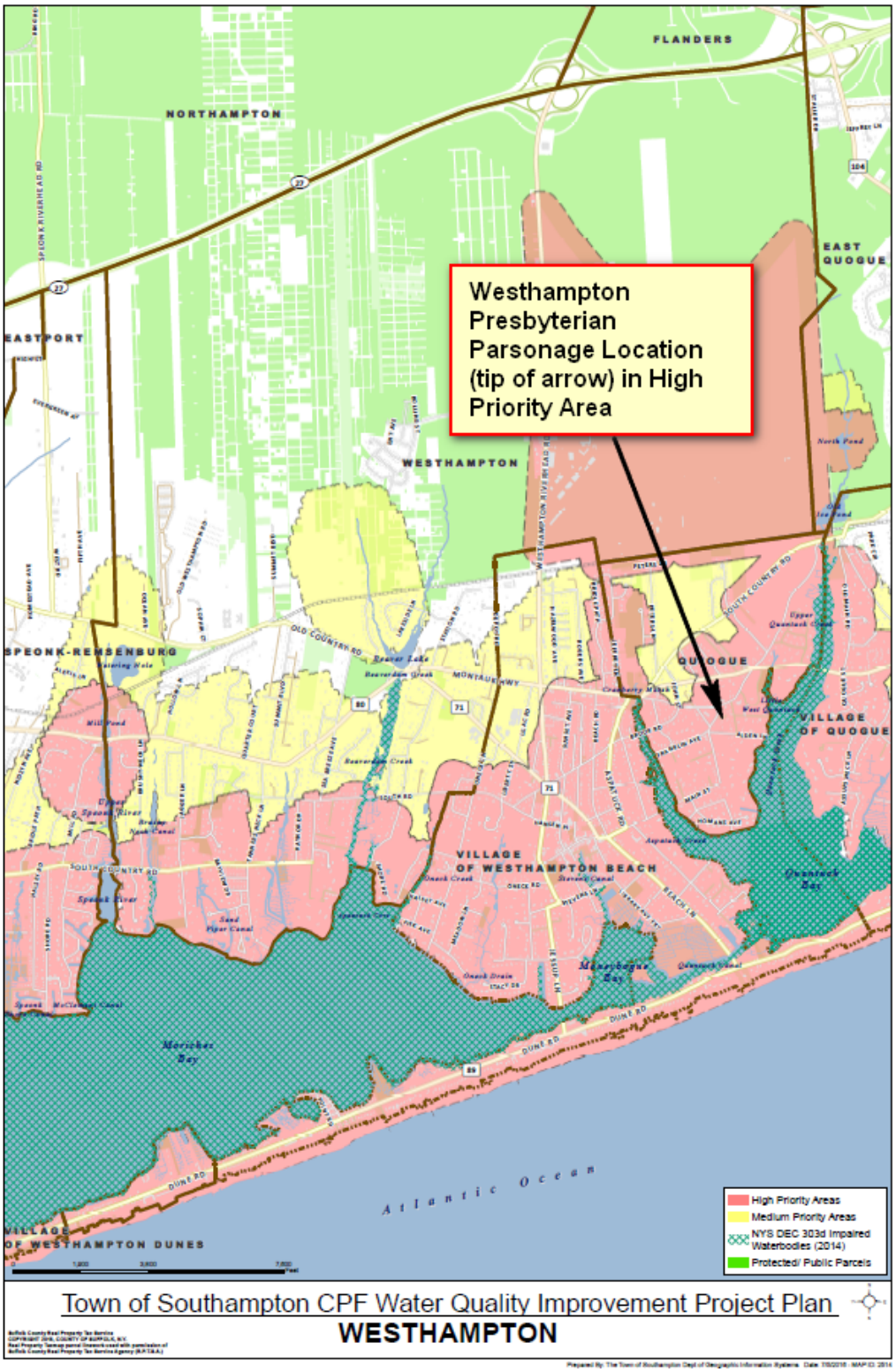
Location Map

Site is located in High Priority Area (Source: Southampton Town CPF WQIPP)



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Budget Proposal

PLANNING/ENGINEERING/DESIGN	Town CPF Request	Matching Funds Committed	Matching Funds Pending	Estimated Total Project Costs
In-House Labor (Provide separate sheet with calc.s)				
Task 1 - Project Management by CCWT			4,604	4,604
Task 2 - Post Installation Monitoring by CCWT - 12 months			2,902	2,902
Task 3 - Post Installation Lab Testing Services by CCWT			11,160	11,160
				-
				-
				-
Planning/Engineering/Design Cost Total	-	-	18,666	18,666
Contractual Services				
Preliminary Inspection		1,200		1,200
Engineering Design		4,000		4,000
Survey		2,500		2,500
Test Hole / Soil Boring		600		600
Utility Markout		350		350
Camera inspection		600		600
SCDHS WWM Permit		472		472
Contractual Services Cost Total	-	9,722	-	9,722

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Construction & Site Improvements				
Decommissioning and Pumping of Existing Cesspool	1,500			1,500
Extra Grading, Import and Export of Fill, Tree Removal	TBD			-
Landscaping repair	-			-
3 Days Contractor Construction, Labor, Mobilization, Demobilization, equipment cost	15,000			15,000
Licensed Electrician	2,000			2,000
Interior Plumbing Modifications	-			-
				-
Construction & Site Improvements Cost Total	18,500	-	-	18,500

Equipment/Materials/Supplies	Town CPF Request	Matching Funds Committed	Matching Funds Pending	Estimated Total Project Costs
1500 Gallon Concrete Septic Tank w/ baffle, risers, covers and accessories	2,000			2,000
500 Gallon Pump tank with Simplex Biotube Effluent Pumping System and Control	4,000			4,000
Geomatrix or Infiltrator Leaching System Components and Piping	3,000			3,000
NRB Liner	1,800			1,800
C-33 Sand	1,100			1,100
Woodchip Box	2,000			2,000
¼ - Inch Woodchips	300			300
Distribution Box / Sampling Basin	150			150
Precast Leaching Pools	2,000			2,000
Pan Lysimeters	-			-
Equipment/Materials/Supplies Total	16,350	-	-	16,350

Additional Cost				
				-
				-
				-
Additional Cost Total	-	-	-	-

Planning/Engineering/Design Cost Total (from page 7)	-	9,722	18,666	28,388

Total Project Cost	63,238
Applicant matching funds committed	9,722
Applicant matching funds pending approval (e.g. grant request submitted pending determination)	18,666
Total CPF Funds Requested	34,850

Source of matching funds	Amount
New York State Center for Clean Water Technology	28,388

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The following Table shows the calculation used to estimate In Kind Contribution Match from CCWT

In kind Contribution Schedule					
NYS Center for Clean Water Technology					
Analytical Services:		cost/sample	mo. samples	duration (mo)	
NH4+		$20	3	12	$720.00
NO3-/NO2-		$12	2	12	$288.00
NO2-		$12	1	12	$144.00
TkN		$28	3	12	$1,008.00
Alkalinity		$15	3	12	$540.00
BOD5		$30	2	12	$720.00
TOC		$80	2	12	$1,920.00
TSS		$20	1	12	$240.00
PO43-		$20	0	0	$0.00
1,4 dioxane		$200	0	0	$0.00
Sampling & Analytical Services per site					$5,580.00
Sites per project					2
Subtotal Analytical costs/yr					$11,160.00
			hours	hourly rate	
Wastewater Analyst	Analysis & Reporting		12	$35.79	$429.51
Field Technician			96	$25.76	$2,472.92
SubTotal Monitoring Labor/yr					$2,902.43
Subtotal Monitoring Costs					$14,062.43
Management & Installation Oversight			hours	hourly rate	
Project Manager	pre- installation select & coord		32	$52.37	$1,675.73
	installation (on-site inspection		32	$52.37	$1,675.73
	Analysis & reporting		12	$52.37	$628.40
Administrator	administrative		12	$52.00	$624.00
SubTotal Management and Admin Costs					$4,603.87
Total NYS CCWT					$18,666.30

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Site Assessment and Cost Estimate
by Tom O'Dwyer, P.E. Homeport Engineering

HOMEPORT
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P.O. BOX 1111, SETAUKET, NY 11733 • (631)-223-8752 • TOM@HOMEPORTENGINEERING.COM

May 6th, 2021

Stony Brook University
Center for Clean Water Technology

RE: Residential NRB Pilot System – 83 Meeting House Road, Westhampton Beach, NY – Parsonage

Preliminary Site Evaluation and Feasibility Study for NRB Pilot System at Pastor's Home.

This report has been prepared by Thomas O'Dwyer, P.E. of HomePort Engineering, PC. Thomas has practiced as a licensed Environmental Engineer for 8 years and is experienced within the industries of Environmental Engineering, Wastewater Treatment, Onsite Wastewater Technology and SCDHS I/A OWTS Design.

Summary/Recommended NRB System:

It is the Engineer's opinion that a woodchip box NRB pilot system is feasible for this property. The property is a good candidate for an NRB system due to full time residential use, ample open space in the backyard, flat site grading, expected soil conditions and utility locations. The negatives aspects include unknown condition of existing waste pipe beneath deck and walkway and <10-foot separation between the potable water service and waste pipe leaving the foundation. My rating for this site would be an A- overall.

The usable space for the woodchip box NRB is ample for a 4 or 5 bedroom system with 1 GPD/SF loading rate. The site grading in the backyard is fairly flat with a slight downhill pitch away from the home which favorable for recirculating the nitrified percolate from the sand bed to the septic tank for additional treatment.

The wastewater leaves the rear of the home through the rear of the home leaving the cellar wall with an invert of 18" +/- below grade. The home is connected to public water service which enters the side of the home from the road (corner lot). The water and waste pipes have <10-foot horizontal separation at the foundation wall which does not meet SCDHS standards for new construction.

The home is used as a full-time residence by the church pastor and family. The wastewater flow should be consistent with a standard residential dwelling. There are 4-bedrooms in the home, SCDHS may consider it a 5-bedroom based on floor plan description by the pastor, further investigation is necessary. Design flow of 440 or 550 GPD as necessary.

Based on the preliminary site evaluation the Engineer has drafted a mock 5-bedroom woodchip box NRB based on tax map property lines (accuracy unknown). The mock NRB includes: 1500-gallon septic tank, separate simplex pump tank, lined NRB sand bed, 1500 gallon septic tank woodchip box, distribution box and two(2) 8' diameter x 8' deep precast leaching pools.

Existing Site Conditions

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The existing property SCTM# 0900370000300035000 located at 83 Meeting House Road in Westhampton Beach is owned by the Westhampton Presbyterian Church. The property is 0.81 acres in size and is used as the residing Pastor's home. There is one home on the property which operates with an onsite septic/cesspool as the only onsite wastewater disposal systems. The overall property would be classified as residential use per SCDHS.

The property is being evaluated as a potential site to pilot the NRB woodchip box septic system which is being developed by the Center for Clean Water Technology. This 4/5 bedroom home is occupied full-time by the Pastor and his family.

The property was evaluated by the Engineer on Tuesday April 27th, 2021 and was accompanied by a representative from the Center for Clean Water Technology.

Existing Home: Pastor's home, occupied full time by the Pastor and family. 4/5-bedrooms total (to be confirmed). Residential type wastewater flow calculated at 440 or 550 GPD as necessary.

Existing Wastewater System: There is a single waste line leaving the home. The cesspool is located in the backyard on the South side of the home. The cesspool is located in a flat area, the cesspool construction (block vs precast) is unknown. The pastor did not have recent information about the system. The area was probed with a metal rod, one definitive concrete cover was found. It is possible there are multiple cesspools. We are assuming it is a single leaching ring cesspool for the purpose of this report.

Existing Water Source: Public water service pipe enters the side of the home, the exact location of the buried utility is unknown, site mark out will be necessary.

Existing Site Utilities: Overhead electrical from Meeting House Road, buried oil tank (UST) on west side of home adjacent to foundation, above ground propane gas tank along foundation. There is an underground public water service entering the cellar on the west side of the home near the rear corner, it is assumed that this water service travels perpendicular from Main Street but a mark out is required. The single waste pipe exits the rear of the home near the Western corner of the cellar. The waste pipe appears to exit the home beneath a wood deck porch/stoop and then travels under a brick walkway and beneath a fence and shrubs to the cesspool in the backyard. The existing buried waste pipe material is unknown, it is recommended to have the pipe inspected via video scope to determine if the existing pipe needs to be replaced or not. The home has an unfinished basement, plumbing and utilities are accessible.

Wastewater Invert and Water Service Locations: The water service enters the side of the home in the cellar, adjacent to the waste pipe but on different faces of the home. The waste pipe leaves the rear of the cellar on a ~45-degree angle but the pipes are less than 10-foot apart which does not meet SCDHS standards. Since the pipes divert in different directions SCDHS will likely allow the water service location to remain without relocation. The waste pipe is cast iron at the foundation penetration, the invert is approximately 18-inches below grade. The condition and material of the existing buried waste pipe in the yard is unknown, further evaluation is necessary (see above).

Electrical Service: Existing updated 200 Amp Square D service panel located in the basement. There are no open breakers but a licensed electrician should be able to add circuits if necessary. The panel is newer in age so parts should be readily available.

Surrounding Site Use: The area surrounding the home is grass lawn and a few scattered trees and perimeter shrubs. The backyard on the South side of the home is mostly an open flat grass, this would be the best location for the NRB system.

Topography: The property is generally flat with a gentle slopes from North to South. The elevation is approximately 20' +/- based on Suffolk GIS contour maps. Note the site conditions should allow for recirculation of the sand filter percolate back to the septic tank if necessary.

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Soil Type: The soil type is unknown but is likely silty sand in the upper layers with sand below based on soil borings which were obtained via SCDHS FOIL from new construction homes built in the vicinity. We anticipate good soil and groundwater setbacks for final disposal with precast concrete leaching structures.

Groundwater Elevation: The potential NRB site is located at approximately elevation 20'+/-. The groundwater is anticipated to be around elevation 0-5' +/- per USGS groundwater data maps. Test borings in the area found ground water at approximately el 2' based on NAVD88 datum. There is enough groundwater separation for a wood chip box system and two(2) 8' diameter precast leaching pools. There may be enough groundwater setback for a single 10' diameter leaching pool, further investigation is necessary. I recommend a test boring be performed per SCDHS standards in the backyard.

Potential NRB Location: The grassy area in the backyard is a good location for the NRB bed system, it is a fairly tight fit. The area is free of trees. There is no vehicular traffic in this area other than grass cutting. This site will fit a septic tank, pump, NRB sand bed, wood chip box and the leaching pool structures.

Existing Survey and Site Information: A land survey was not available at the time of the site evaluation. The Engineer used google satellite maps, GIS data and existing fences to get approximate property boundaries. A full survey with topography will be necessary for the SCDHS design. Other site information required for SCDHS sanitary system design includes: utility mark-out, video inspection of the existing waste pipe, and soil boring test hole with depth to groundwater.

Machine Access: Machine access is available from the side yard behind the garage.

Rough Cost Estimate (approximate +/-)

Design Fees(assuming 5-bedroom system):

Preliminary Inspection: $1200.

Engineering Design: $4000 +/-

Survey: $2500 +/-

Test Hole / Soil Boring: $600 +/-

Utility Markout: standard private site mark out: $350+/-

Camera inspection and location of waste pipe: $600 +/-

SCDHS WWM Permit: $472

Total Design Associated Fees: **$9,722**

Woodchip Box NRB Material Cost:

1500 Gallon Concrete Septic Tank w/ baffle, risers, covers and accessories: $2000 +/-

500 Gallon Pump tank with Simplex Biotube Effluent Pumping System and Control: $4000 +/-

Geomatrix or Infiltrator Leaching System Components and Piping: $3000 +/-

NRB Liner: $1800 +/-

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C-33 Sand: 30 yards +/- @ $35/yard (variable): $1100 +/-

Woodchip Box: 1500 Gallon Septic Tank W/Accessories, Risers, Covers, etc: $2000 +/-

¼ - Inch Woodchips: 8 yards +/- @ $32/yard (variable): $300 +/-

Distribution Box / Sampling Basin: $150

Precast Leaching Pools: $2000

Pan Lysimeters: TBD*

Total Material Estimate: **$16,350**

Construction Costs:

Decommissioning and Pumping of Existing Cesspool: $1500 +/-

Licensed Electrician: $2000 +/-

Interior Plumbing Modifications: $0 +/- (likely not required)

Extra Grading, Import and Export of Fill: TBD but likely minimal.

3 Days Contractor Construction, Labor, Mobilization, Demobilization, equipment cost: $15,000 +/-.

Total Installation Cost: **$18,500**

Total Estimated Cost: **$44,572** ($34,850 Construction Cost).

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Possible Project Schedule (subject to Town schedule and performance by third parties)

5/8/21 – P.E. Site Assessment Completed with Budget Estimate
6/8/21 – Survey, Soil Boring, Ground Penetrating Radar completed
8/7/21 - Review completed Design from Homeport Engineers
8/14/21 - Submit permit application to Suffolk County Dept of Health Services
9/30/21 – Receive SCDHS Permit
10/15/21 – Receive notice of CPF grant award
11/15/21 – Complete contract for CPF funding
11/16/21 – Put out RFP to installers
12/1/21 – Begin Construction
12/8/21 – Complete Construction

Monthly after that for 24 months, CCWT to monitor site, collect samples, lab analyze samples, produce reports.

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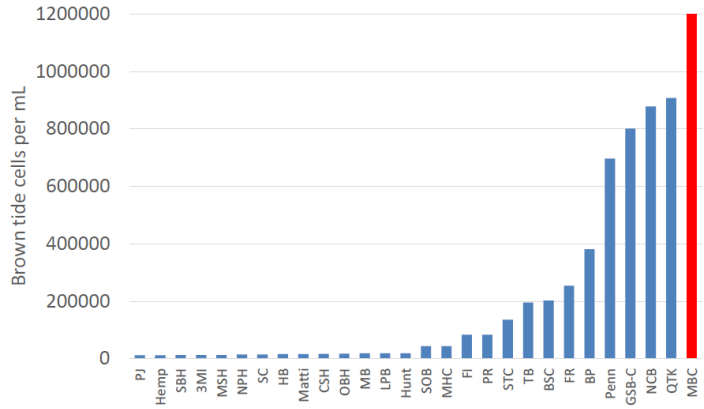
ASSESSMENT OF WATER QUALITY IN QUANTUCK BAY

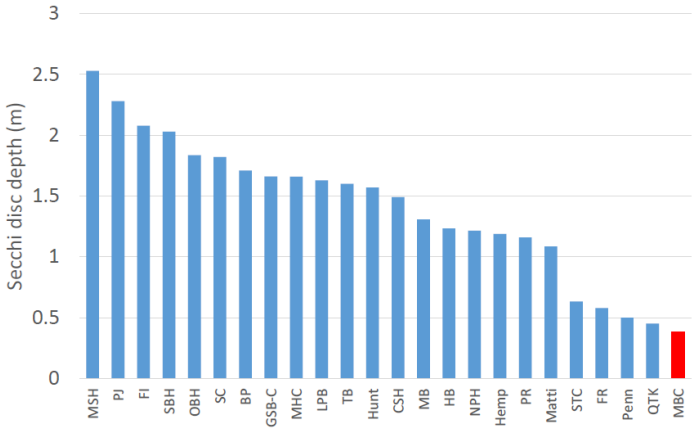
The water quality parameters of Quantuck Bay are among the worst in all of Long Island. They are characterized by the highest concentrations of brown tides which kills grasses and shellfish and devastates the ecosystem.

Source of the following:
QUANTIFYING NITROGEN LOADING FROM THE VILLAGE OF WESTHAMPTON BEACH TO SURROUNDING WATER BODIES AND THEIR MITIGATION BY CREATING A SEWER DISTRICT, Christopher J. Gobler, PhD, June 2017

Brown tide levels across 28 sites around Long Island as measured during the summers of 2014-2016 by the Gobler Lab's water quality reporting to News 12. Quantuck Bay was the second worst site across all of Long Island.



Water clarity across 28 sites around Long Island as measured during the summers of 2014-2016 by the Gobler Lab's water quality reporting to News 12. Quantuck Bay was the second worst site across all of Long Island.



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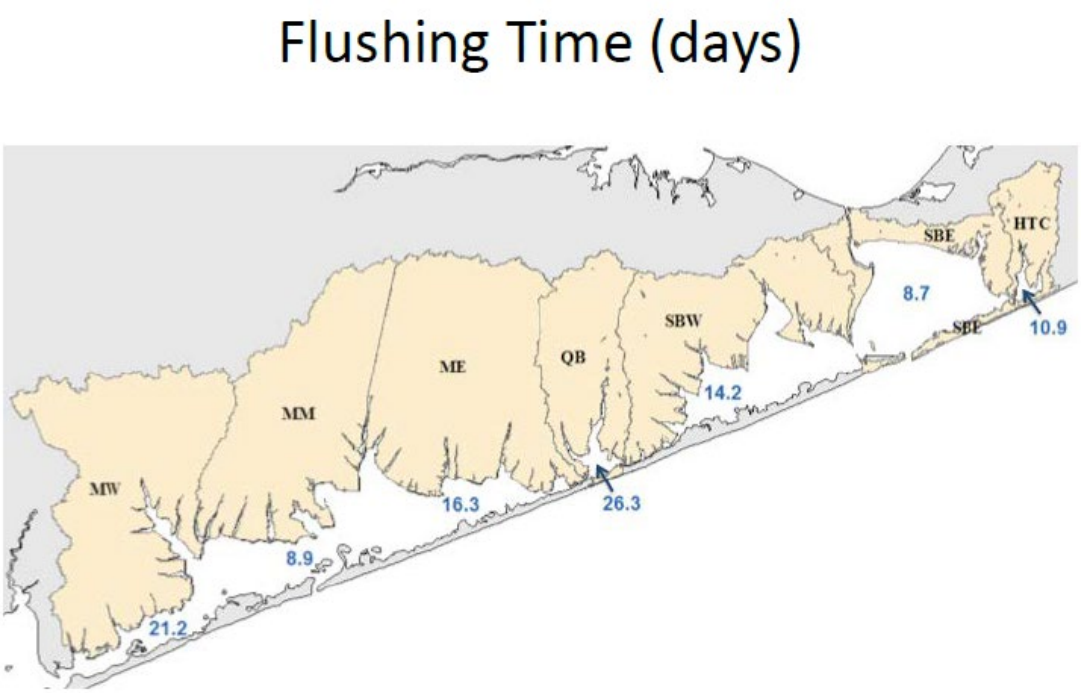
The primary reason why pollution has been so devastating to Quantuck Bay is the extended flushing time. The Bay is surrounded by water bodies that have long flushing times and it is not regularly rejuvenated by clean ocean water from the inlets. Below the map shows



Source: Town of Southampton HAB Modeling, Chris Gobler

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Source: FINAL REPORT for Shellfish Pathogen TMDLs for 27 303(d)-listed Waters
Prepared for:
U.S. Environmental Protection Agency
Oceans and Coastal Protection Division
and
New York State
Department of Environmental Conservation
Division of Water

Prepared by
Battelle
397 Washington Street
Duxbury, MA 02332
July 2007

Quantuck Bay is listed as Class SA 303 (d) Impaired

7.3.23 Quantuck Bay (1701-0042)

Table 7-67. WTM Fecal Coliform Loads to Quantuck Bay – Quantuck Creek

SOURCES	Billion FC/year
POINT SOURCES	
Sewage Treatment Plant	0
RESIDENTIAL/URBAN LAND[1,2]	
MS4 Contribution	1,560,945
Non-MS4 Contribution	0
OTHER NONPOINT SOURCES	
Rural Land	260
Forest	6,543
Waterfowl	1,304
TOTAL LOAD (Billions)	1,569,052

[1] "Urban land" is a combination of residential land, commercial land, industrial land, and roadways.
[2] This source includes the load from domestic pets of 1,156,320 billion FC/year.

Table 7-68. Summary of Current Fecal Coliform Loads and Percent Reductions Necessary to Meet Target TMDL Loads in Quantuck Bay – Quantuck Creek

	Condition	Quantuck Creek	Load Reduction	Load Reduction (%)
Existing Conditions (billion FC/yr)	Nonpoint Sources	8,107	-	-
	Permitted Point Source Contributions—STPs	0	-	-
	Permitted Point Source Contributions—MS4s	1,560,945	-	-
	Total Existing Loads	1,569,052	-	-
TMDL (billion FC/day)	LA	2	20	91
	WLA—STPs	0	0	0
	WLA—MS4s	385	3,892	91
	MOS	-	-	-
	TMDL	387	3,912	91
TMDL (billion FC/yr)	LA	730	7,377	91
	WLA—STPs	0	0	0
	WLA—MS4s	140,485	1,420,460	91
	MOS	-	-	-
	TMDL	141,215	1,427,837	91

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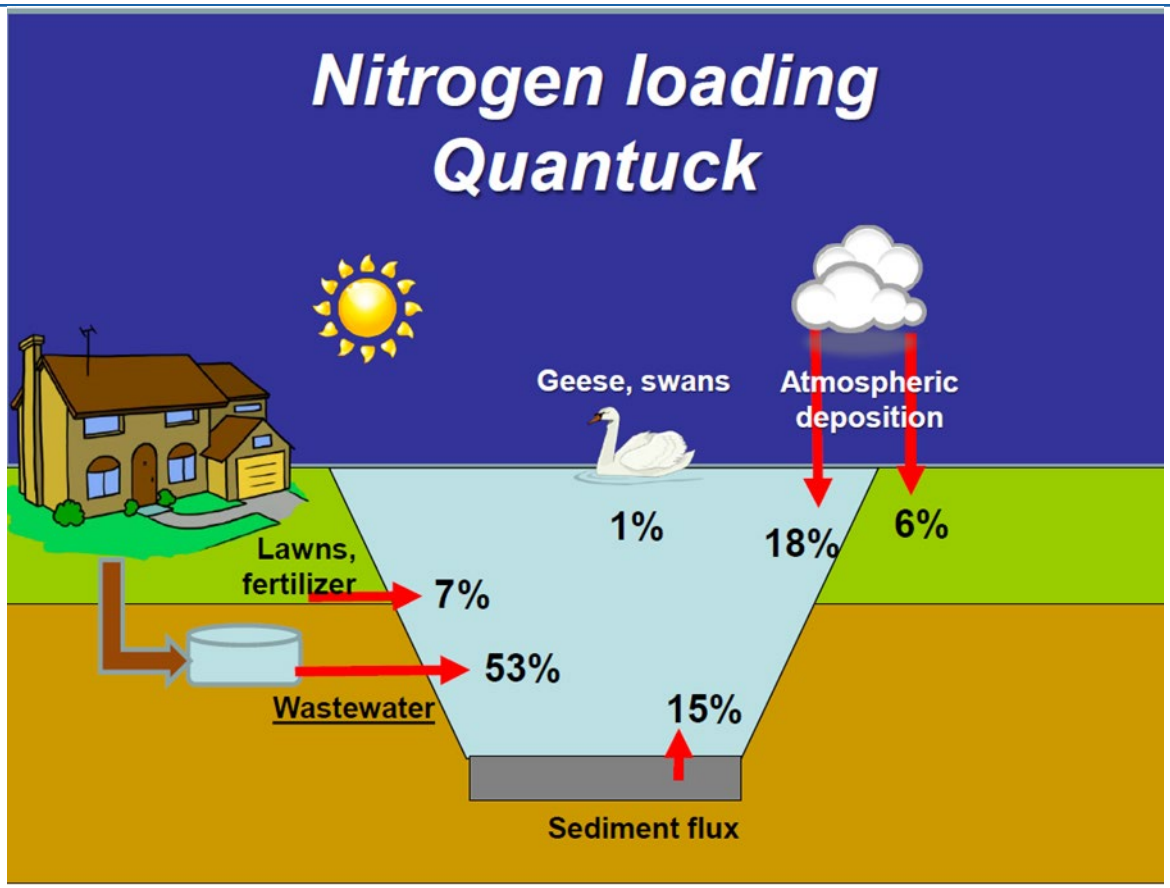

Pollutant Loads In lieu of a STEPL calculation

CCWT used a Nitrogen Loading Model (NLM) described in Bowen, et al (2007). This method has recently been used by Suffolk County. That model shows very strong correlation to actual measurements and that within Quantuck Bay, alone, cesspools/septic systems and atmospheric deposition contribute the highest nitrogen loads.

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May 5, 2021

Town of Southampton
Department of Community Preservation
24 W Montauk Hwy
Hampton Bays, NY 11946

Attention: Jacquie Fenlon

Regarding: Letter of Intent for CPF Grant Application

To Whom it May Concern,
I am writing to confirm the intention of Westhampton Presbyterian Church located at 90 Meeting House Rd in Westhampton Beach, NY, a 501 3C non-profit organization, to proceed with planning and installation of a nitrogen reducing biofilter septic system, assuming the terms and conditions of the various parties are acceptable to the church.

Contact information, a brief description of the project, and the intended timeline are in the attached form.

Thank you,

Signature: 

Name: Frank Russo

Title: Associate Director

Organization: Stony Brook Center for Clean Water Technology

Date: 5/13/21

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COMMUNITY PRESERVATION FUND (CPF)
WATER QUALITY IMPROVEMENT PROGRAM
LETTER OF INTENT

APPLICANT'S INFORMATION

Owner: Westhampton Presbyterian Church

Contact First and Last Name: Reverend Venessa Winters

Contact Address: 59 Hayground Rd, Watermill, NY, 11976

Contact Phone: 631-537-1187

Contact Email: Vanessa Winters <revvanessawinters@gmail.com>

CONTRACT RECIPIANT INFORMATION

Name/Organization: Same

Contact Person/Officer:

Contact Address:

Contact Phone:

Contact Email:

PROJECT INFORMATION

Project Title: Nitrogen Reducing Biofilter for Parsonage at Westhampton Presbyterian Church

Project Location: 90 Meeting House Rd, Westhampton Beach, NY 11978

Project Description (1-3 sentences): Facilitated by the CCWT, the Incarnation Lutheran Church seeks funding to replace their existing cesspool system with a nitrogen reducing biofilter at the church parsonage in Watermill, NY. The parsonage is located in a High Priority Area, about 1000 yards from Mecox Bay. The new system is capable of bringing total nitrogen in the residential wastewater from this home down below 5 mg/L, the best performance of any I/A system currently available in Suffolk County.

ANTICIPATED PROJECT TIMELINE

Begin: May 1, 2021

Complete: 12/8/21

Notes: Project will only take a few days to construct once the site survey, engineering, and permit are obtained which we plan to do before Town Board approval. Timing will also depend on the Town Board approval and Town contracting processes. The site is shovel ready.