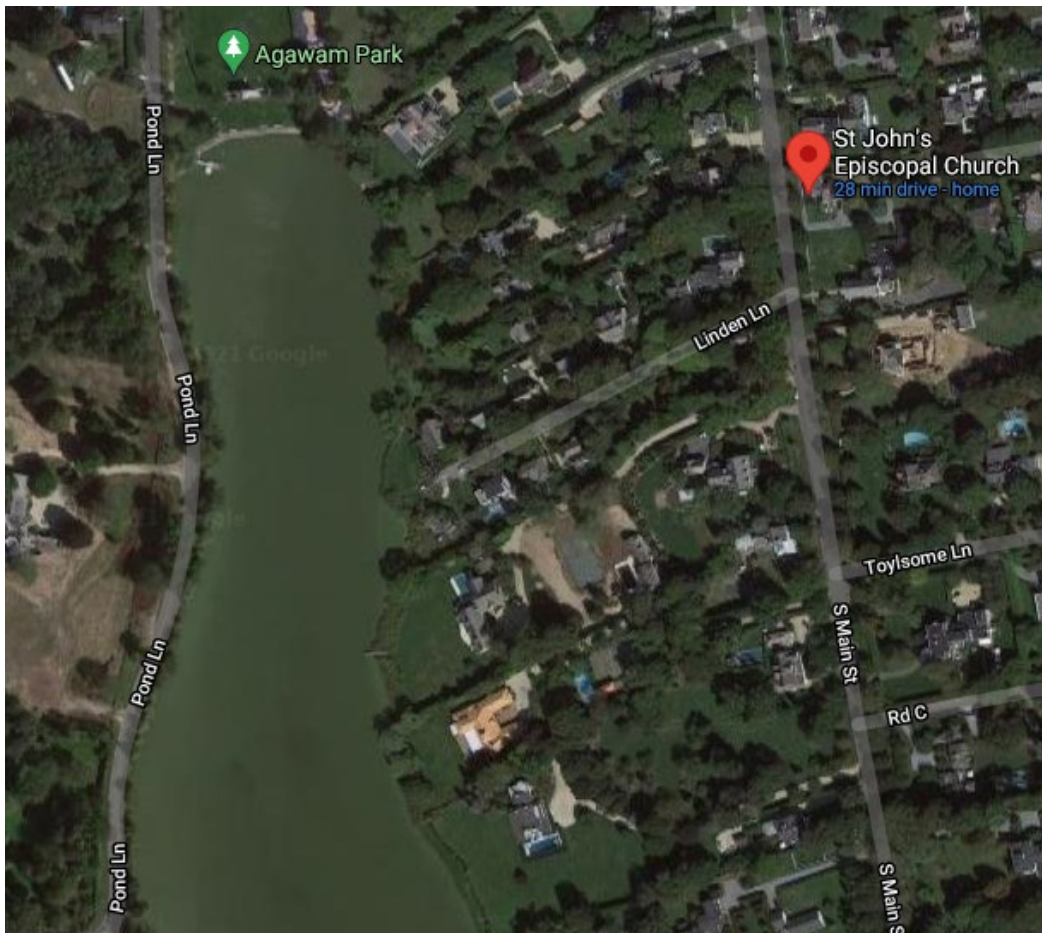




**Nitrogen Reducing Biofilter  
for  
St John's Episcopal Church  
near  
Agawam Lake**

**2021 Grant Funding Application  
to  
COMMUNITY PRESERVATION FUND (CPF)**





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

Project Applicant: St John’s Episcopal Church

Project Title: Nitrogen Reducing Biofilter for Rectory at St John’s Episcopal 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	William McCoy
Affiliation	St John’s Episcopal Church
Organization	St John’s Episcopal Church
Address	100 S. Main St, Southampton, NY 11968
Phone	718-762-6683
Email	<a href="mailto:wemccoy@aol.com">wemccoy@aol.com</a>

Project Address: 100 South main St, Southampton, NY 11968

SCTM #(S)\_0904015000300022000

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, St John’s Episcopal Church seeks funding to replace their existing cesspool system with a nitrogen reducing biofilter at the church rectory in Southampton, NY. The rectory is located in a High Priority Area, about 200 yards from Agawam Lake.

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.

- Wastewater Treatment Improvement
  - Project Non-point source abatement and control
  - Aquatic habitat restoration
  - 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 \(WQIPP\)](#).

- 303(d) Impaired
- High
- Medium
- Outside High and Medium priority areas\*

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

Agawam Lake - Subwatershed Plan Final Rank 1 (highest)

Subwatershed Plan PWL Number XXX

3. PROJECT DESCRIPTION

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

For the past twenty years, monitoring by the Gobler Laboratory has demonstrated that Lake Agawam is plagued with annual, reoccurring toxic cyanobacterial blooms, also known as blue green algae. The specific cyanobacteria forming blooms in Lake Agawam including *Microcystis* and *Anabaena* that makes the toxins microcystin and anatoxin-a, which are gastrointestinal and neurotoxins, respectively. When first identified in the 20<sup>th</sup> century, these toxins were identified as fast death factor and very fast death factor, respectively, due to their ability to cause rapid mortality in mammals. NYSDEC has a comprehensive, blue-green algae monitoring program that tracks blooms in all 62 counties of NY from May through November. Since 2014, **no lake in all of NYS has had blooms of blue-green algae more consistently than Lake Agawam.** Given microcystin is a potent toxin of concern, it is regulated at the federal level by US EPA. In 2018, US EPA set a guideline threshold level of below 8 micrograms per liter for recreating in a water body. Since 2003, there have been more than 200 weeks during which Lake Agawam has exceeded this level, all during the months individuals might recreate within the Lake (May through October). In 2004, the fillets and visceral of fish caught in Lake Agawam were analyzed for microcystin and both types of tissue were found to contain microcystin above guideline level set by the World Health Organization (WHO). Experimental research performed in Lake Agawam since 2005 has consistently demonstrated that excessive nitrogen loading promotes the growth of *Microcystis*, cyanobacterial and the levels of microcystin in Lake Agawam (Gobler et al., 2007; Davis et al., 2010; Jankowiak et al., 2019). Modeling studies performed in 2008, 2017, and 2019 performed by the Gobler Laboratory have all demonstrated that **70% of nitrogen to Lake Agawam is from on-site septic systems** within its watershed.



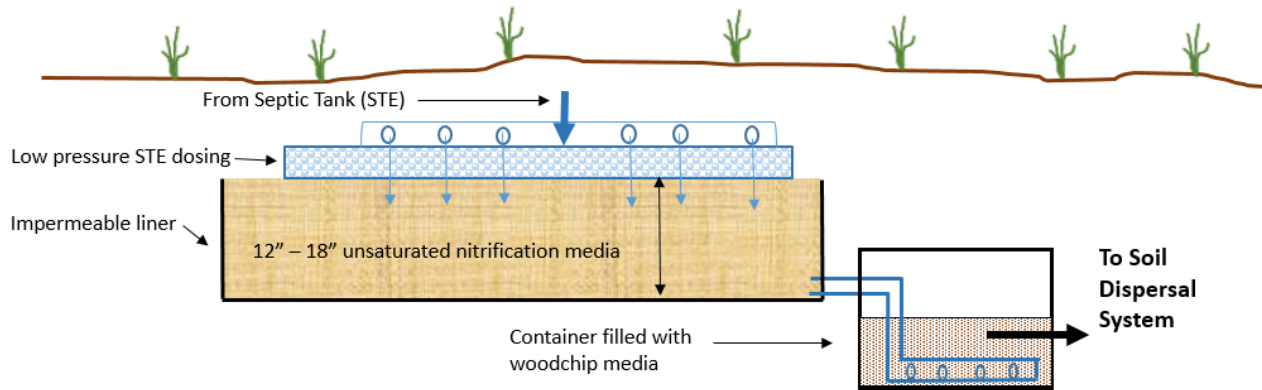
3b. How the proposed solution addresses the issue in the context of Reduction, Remediation and/or Restoration as per the CPF Water Quality Project Plan. Note all remediation and restoration projects must assure that reduction measures are also addressed.

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 Agawam Lake.



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<sup>-1</sup> in final effluent at recommended loading rates compared with ~ 43 mg-N L<sup>-1</sup> 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).

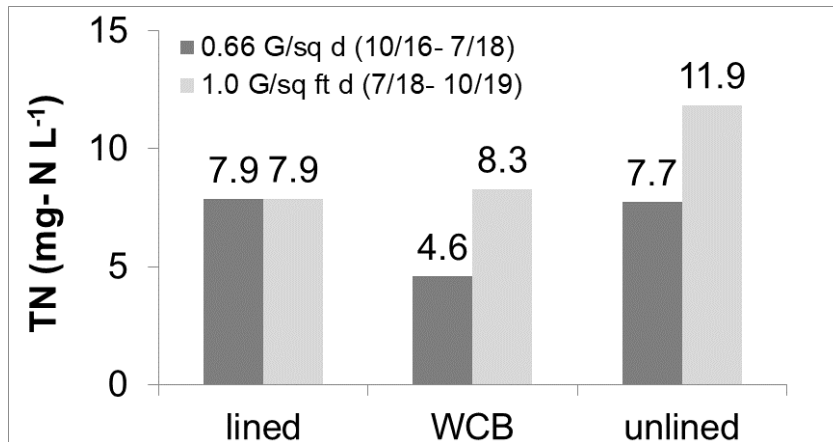


Chart 1. Results of increased wastewater loading rates at the Massachusetts Alternative Septic System Test Center. The NYS Center for Clean Water Technology recommends sizing for NRB at loading rates of 1.0 G f-2 d-1 for lined and woodchip box systems and 0.75 G f-2 d-1 based on results from installations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

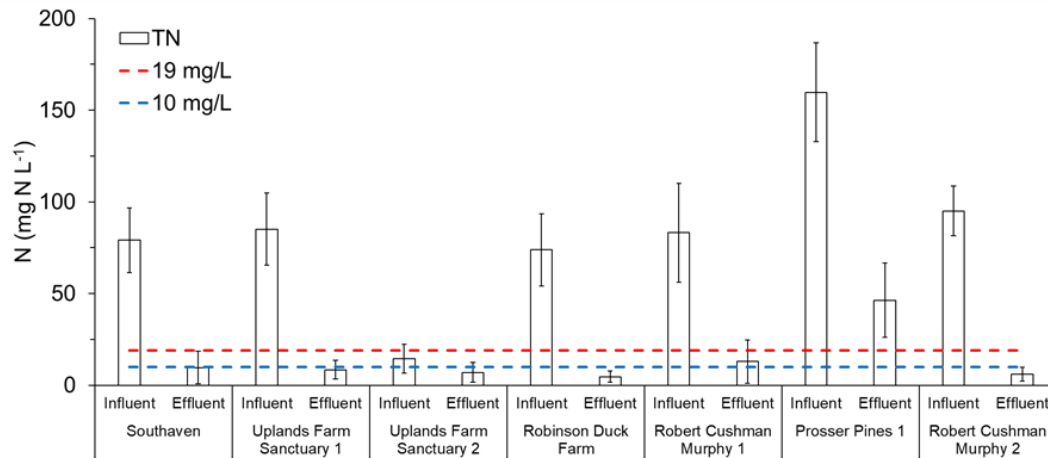


Chart 2. Total nitrogen in influent (left bar) and final effluent (right bar) from installations in Suffolk County since inception (between April 2018 and August 2019).

3d. How the project supports Town of Southamptton, 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 Agawam Lake, the primary benefit to Southamptton 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, please indicate how your project addresses the requirements indicated.

YES	N/A	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>If stormwater system or drainage is proposed:</b> The project must indicate compliance with the New York State Stormwater Design Manual (2015 and as updated).
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>If project is related to farmland:</b> Describe any Agricultural Stewardship Plan or other long term strategy for Nitro-gen abatement.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<b>If the project is for habitat restoration:</b> The narrative must address how underlying causes are being ameliorated and expected outcomes for local species populations or other ecological considerations are given.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>If project is a Sewage Treatment Plant (STP) or cluster treatment system:</b> Fund allocation request is based on cost for reduction of pre-existing conditions and not for purpose of accommodating new density (describe pre-existing density and associated flow (gallons per day) and total projected nitrogen reduction in narrative). Include detailed information 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.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>If the project is requesting grant match:</b> 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.



⑥

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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 United States for decades.

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#### 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 \$79,438. Of that amount, \$29,438 in matching funds would be provided by NYS CCWT. We are requesting \$50,000 from the CPF.

##### 5b. Describe any matching funds to be provided.

CCWT paid for the site evaluation 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.



## 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.

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## 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.

St John's Episcopal Church (the 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.

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## 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.



## 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-step1> 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

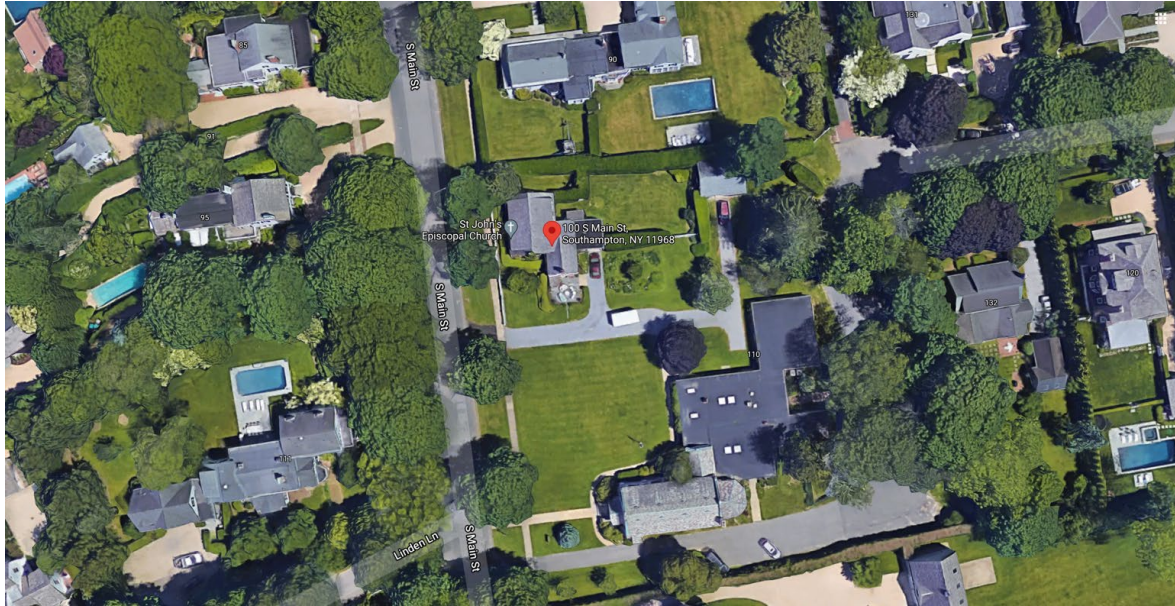
List other attachments provided, including cost estimates, bids, plans, documentation of matching funds, and other as appropriate to demonstrate project readiness, quality, feasibility, and cost effectiveness

### List of Attachments:

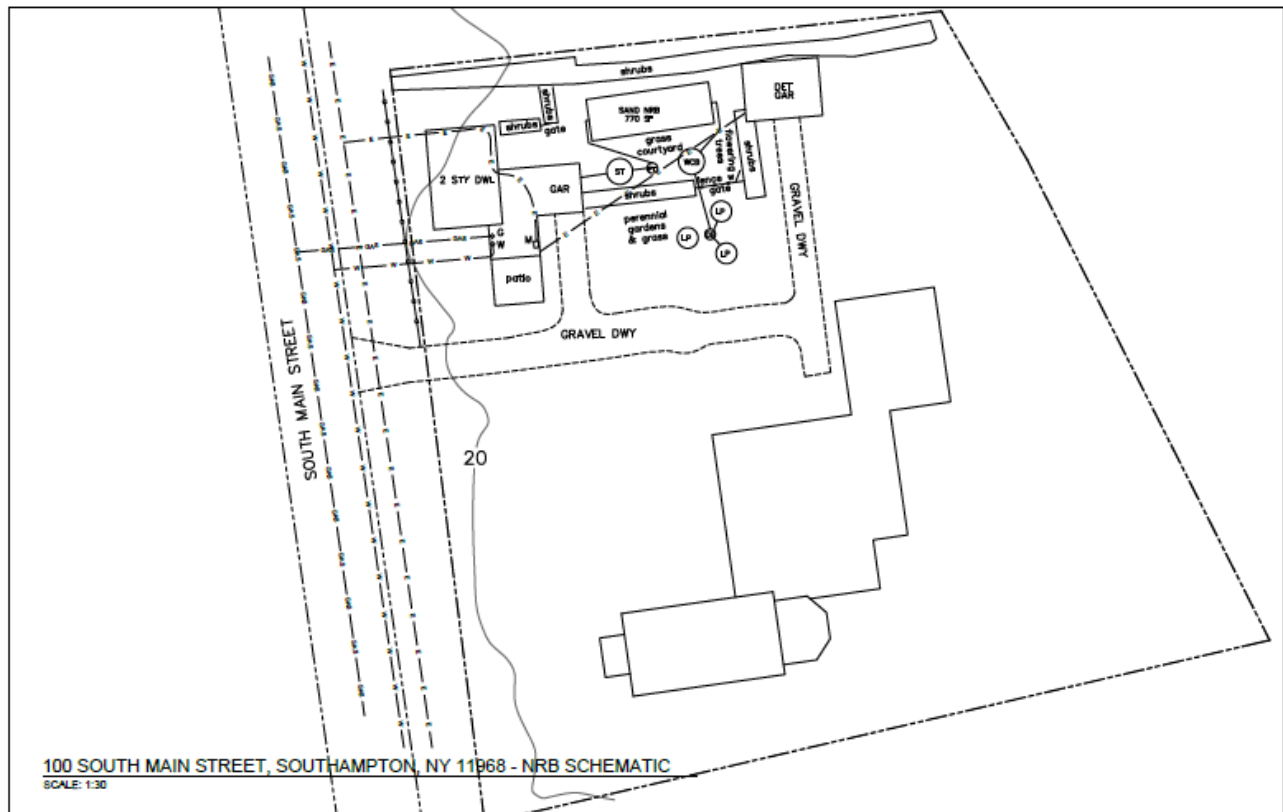
- 1) Photos – pg 10
- 2) Location Map – pg 11
- 3) Project Budget and breakout of CCWT Match – pg 12
- 4) Project Cost Estimate by Tom O’Dwyer, Homeport Engineering, P.E – pg 15
- 5) Project Schedule - 16
- 6) Assessment of Water Quality in Agawam Lake - 17
- 7) Pollutant Loads in lieu of STEPL Calculation - 20
- 8) Ownership Commitment – LOI - 21



## Photos



Aerial view of site (system would go in back yard to the right of the red marker)



Proposed layout of new NRB system

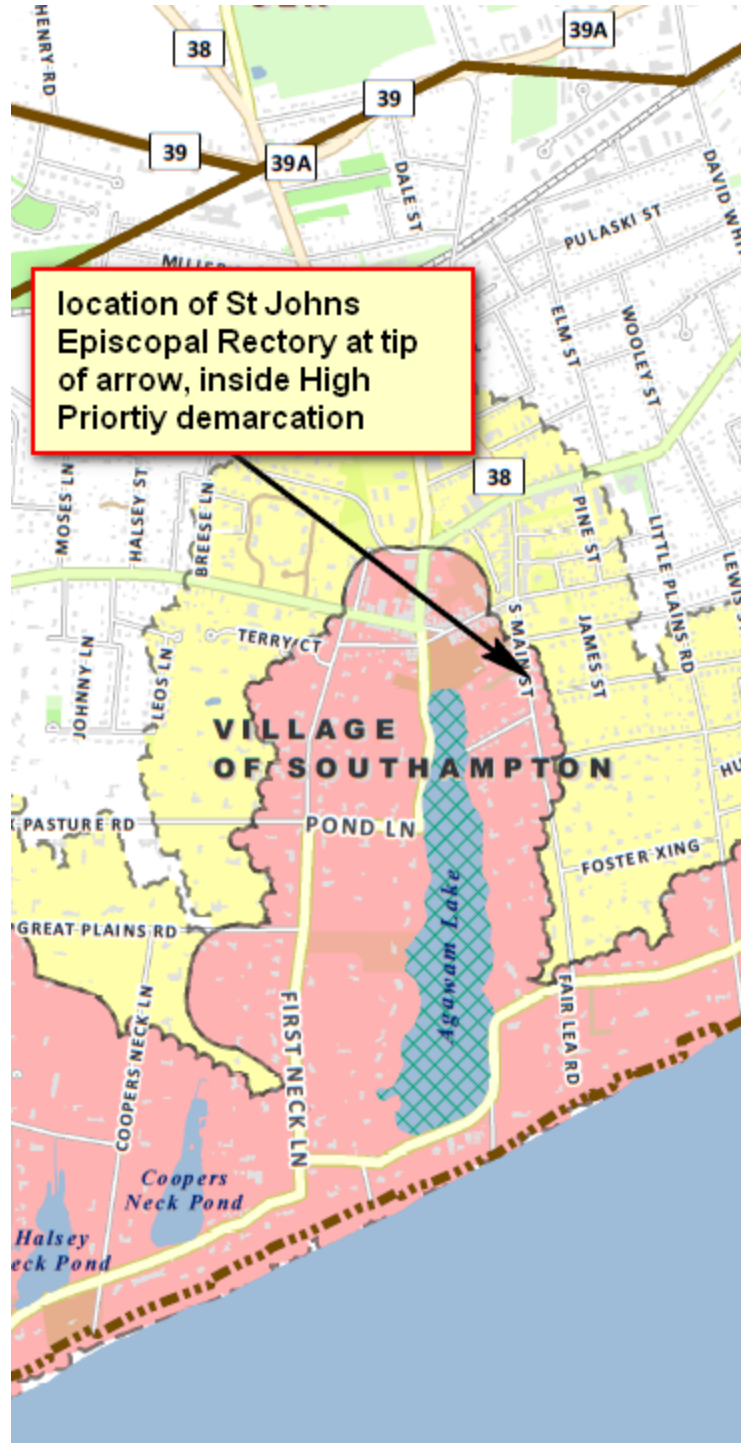


Back yard where NRB system would go



## Location Map

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





## 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
<b>Contractual Services</b>				
Preliminary Inspection		1,200		1,200
Engineering Design		4,000		4,000
Survey		3,500		3,500
Test Hole / Soil Boring		600		600
Utility Markout		1,000		1,000
Camera inspection and location of waste pipe		-		-
SCDHS WWM Permit		472		472
Contractual Services Cost Total	-	10,772	-	10,772

Continued next page



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	5,000			5,000
3 Days Contractor Construction, Labor, Mobilization, Demobilization, equipment cost	20,000			20,000
Licensed Electrician	2,000			2,000
Interior Plumbing Modifications	1,500			1,500
				-
<b>Construction &amp; Site Improvements Cost Total</b>	<b>30,000</b>	<b>-</b>	<b>-</b>	<b>30,000</b>
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	2,500			2,500
500 Gallon Pump tank with Simplex Biotube Effluent Pumping System and Control	4,000			4,000
Geomatrix or Infiltrator Leaching System Components and Piping	4,000			4,000
NRB Liner	2,500			2,500
C-33 Sand	1,500			1,500
Woodchip Box	2,500			2,500
¼ - Inch Woodchips	350			350
Distribution Box / Sampling Basin	150			150
Precast Leaching Pools	2,500			2,500
Pan Lysimeters	-			-
<b>Equipment/Materials/Supplies Total</b>	<b>20,000</b>	<b>-</b>	<b>-</b>	<b>20,000</b>
Additional Cost				
				-
				-
				-
<b>Additional Cost Total</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Planning/Engineering/Design Cost Total (from page 7)</b>	<b>-</b>	<b>10,772</b>	<b>18,666</b>	<b>29,438</b>
<b>Total Project Cost</b>	<b>79,438</b>			
Applicant matching funds committed	10,772			
Applicant matching funds pending approval (e.g. grant request submitted pending determination)	18,666			
<b>Total CPF Funds Requested</b>	<b>50,000</b>			



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

<b>In kind Contribution Schedule</b>					
<b>NYS Center for Clean Water Technology</b>					
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
<b>Subtotal Monitoring Costs</b>					\$14,062.43
			hours	hourly rate	
<b>Management &amp; Installation Oversight</b>					
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
<b>Total NYS CCWT</b>					\$18,666.30



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

**H O M E P O R T**

**ENGINEERING PC.**

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

May 6th, 2021

Stony Brook University  
Center for Clean Water Technology

RE: Residential NRB Pilot System – 100 South Main Street, Southampton, 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 technically feasible for this property but not ideal due to the limited amount of open usable property space, existing landscaping & hedges, and number of bedrooms in the home. The existing home has 7-bedrooms which would require a very large NRB system. My rating for this site would be a C- overall. If the Church agrees to remove a portion of the privet hedges and relocate landscaping as necessary it would improve the feasibility rating for the site.

The usable space for the NRB becomes tight after factoring in SCDHS sanitary setbacks and existing physical obstructions such as shrubs, landscaping, existing structures, utilities, etc. The property is landscaped with mature privet, flowering trees and perennials which would need to be removed or relocated in order to construct the NRB. There is also a buried electrical utility between the house basement and detached garage that would need to be crossed, relocated or replaced as necessary depending on exact location.

If this site is selected for an NRB system then a meeting should be held with the church property owners and their associated board to discuss the scope of work, site disturbance, location of NRB structures, covers to grade, aesthetics, etc.

The pastor's home is reportedly 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 7-bedrooms with one bedroom being used as a study. The design flow is 770 GPD but the actual flow is likely much less.

Based on the preliminary site evaluation the Engineer has drafted a mock 7-bedroom woodchip box NRB based on tax map property lines (accuracy unknown). The mock NRB includes: 2000-gallon septic tank, separate simplex pump tank, lined NRB sand bed, 2000 gallon septic tank woodchip box, distribution box and two(2) 8' diameter x 10' deep precast leaching pools.



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### Existing Site Conditions

The existing property SCTM# 0904015000300022000 located at 100 South Main Street in Southampton is owned by the St Johns Episcopal Rectory. The property is 1.60 acres in size and has multiple structures including the residing Pastor's home, detached garage and church building. The pastor's home and church operate with separate onsite sanitary systems which are both older in age. The overall property would be classified as Commercial use per SCDHS. The pastor's home would have residential type wastewater strength.

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 7-bedroom home is reportedly occupied full-time by the Pastor and his family.

The property was evaluated by the Engineer on Tuesday April 27<sup>th</sup>, 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. 7-bedrooms total. Residential type wastewater flow calculated at 770 GPD.

Existing Wastewater System: The existing Cesspool is located on the East side of the home inside the grass courtyard area. The type of cesspool is unknown (block vs precast), there may be multiple overflow cesspools closer to the detached garage structure, further investigation is necessary. There are no records of the sanitary system. We are assuming the existing cesspool structures will be pumped, abandoned or removed as necessary if the new NRB system is installed. Existing structures will not be reused as part of the NRB system.

Existing Water Source: Public water service pipe enters the front of the home from South Main Street. The water service is visible in the cellar/basement.

Existing Site Utilities: Underground electrical and gas utilities enter the front cellar/basement from South Main Street. Water service also enters the front of the home from South Main Street. The sanitary pipe leaves the rear (East side) of the home through the crawlspace. There is a buried electrical utility that leaves the rear of the home and feeds the detached garage, this electrical utility likely runs through the area of the proposed NRB system, site mark-outs are necessary to determine the location of existing site utilities.

Other major utilities may be present between the home, church building and detached garage structure, thorough private site mark-outs including ground penetrating radar is necessary. The property is historic in nature so it may have other buried unknown obstructions. Also note there is likely an irrigation system which will need to be replaced if excavation work is performed onsite.

Wastewater Invert and Water Service Locations: Public water service pipe enters the front (West side) of the home. The waste pipe leaves the rear (East) side of the home. The waste pipe invert is fairly shallow, roughly 18" below grade. The waste pipes are located in a very tight crawlspace with limited access.

Electrical Service: Existing 200 Amp service panel and sub panel located in the basement. There is ample space for new breakers and additional circuits. The panel is newer in age.

Surrounding Site Use: The area surrounding the home is landscaped grass lawn, privet hedges and gardens with a few scattered trees. The courtyard area within the hedge in the rear of the home between the home and the garage is the best location on the property to install the NRB system. Since the home has 7 bedrooms the NRB will have a large footprint size. The entire NRB system will not fit within this area, it appears the woodchip box and leaching pools will need to be located outside of the courtyard area in the garden area near the driveway.

Other portions of the property are used for church activities.



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**Topography:** The property is fairly flat, the elevation is roughly 25' +/- per Suffolk County GIS records.

**Soil Type:** The soil type is likely silty sand in the upper layers with sand below based on test boring from the adjacent properties that were acquired via SCHDS FOIL. 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 25'+/-. The groundwater is anticipated to be around elevation 7' +/- per USGS groundwater data maps and monitoring wells. There is enough groundwater separation for a wood chip box system and two 8' diameter precast leaching pools.

**Potential NRB Location:** The grassy courtyard area in the rear of the home is a good location for the NRB bed system, it is a very tight fit. A portion of the NRB system will need to be located outside of the courtyard in the garden area. The area is surrounded by mature gardens and landscaping. There is no vehicular traffic in this area other than grass cutting. This site will fit a septic tank, pump, and NRB sand bed with the wood chip box and the leaching pool structures. Note the NRB system would be a very tight fit and would likely require relocating the electrical service between the home and the detached garage.

**Existing Survey and Site Information:** The overall property is 1.6 acres in size. 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 to do the SCDHS design. Other site information required for SCDHS sanitary system design includes: utility mark-out utilizing ground penetrating radar and soil boring test hole.

**Machine Access:** Machine access is available from the driveway, gates and fences will need to be temporarily removed, the access into the courtyard area is tight. Removal and relocation of landscaping and small trees is necessary for machine access.

### **Rough Cost Estimate (approximate +/-)**

#### **Design Fees:**

Preliminary Inspection: \$1200.

Engineering Design: \$4000 +/-

Survey: \$3500 +/- (large survey)

Test Hole / Soil Boring: \$600 +/-

Ground Penetrating Radar Mark-Out: \$1000 +/-

SCDHS WWM Permit Fee: \$472

**Total Design Associated Fees: \$10,772**

#### **Woodchip Box NRB Material Cost:**

2000 Gallon Concrete Septic Tank w/ baffle, risers, covers and accessories: \$2500 +/-

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

Geomatrix or Infiltrator Leaching System Components and Piping: \$4000 +/-

NRB Liner: \$2500 +/-



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C-33 Sand: 45 yards +/- @ \$35/yard (variable): \$1500 +/-

Woodchip Box: 2000 Gallon Septic Tank W/Accessories, Risers, Covers, etc: \$2500 +/-

¼- Inch Woodchips: 10 yards +/- @ \$32/yard (variable): \$350 +/-

Distribution Box / Sampling Basin: \$150

Precast Leaching Pools: \$2500

Pan Lysimeters: TBD\*

Total Material Estimate: **\$20,000**

Construction Costs:

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

Licensed Electrician: \$2000 +/-

Electrical Service Relocation: \$1500 +/-

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

Landscaping repair: \$5000 +/-

4 Days Contractor Construction, Labor, Mobilization, Demobilization, equipment cost: \$20,000 +/-.

Total Installation Cost: **\$30,000**

Total Estimated Cost: \$60,772 (\$50,000 Construction Cost).



**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.



## **ASSESSMENT OF WATER QUALITY IN Agawam Lake**

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



## **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 Agawam Lake, alone, cesspools/septic systems and atmospheric deposition contribute the highest nitrogen loads.



May 11, 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 St Johns Episcopal Church Southampton located at 100 South Main St in Southampton, 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.

I am a duly authorized officer of the church.

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

Thank you,

Signature: William E. McCoy

Name: WILLIAM E. MCCOY

Title: WARDEN/TREASURER

Organization: ST-JOHN'S EPISCOPAL CHURCH

Date: 11 MAY 2021



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

**APPLICANT'S INFORMATION**

Owner: St John's Episcopal Church Southampton \_\_\_\_\_

Contact First and Last Name: William McCoy \_\_\_\_\_

Contact Address: 100 South Main St, Southampton, NY 11968 \_\_\_\_\_

Contact Phone: 718-762-6683, 631-537-0758 \_\_\_\_\_

Contact Email: wemccoy@aol.com \_\_\_\_\_

**CONTRACT RECIPIANT INFORMATION**

Name/Organization: Same \_\_\_\_\_

Contact Person/Officer: \_\_\_\_\_

Contact Address: \_\_\_\_\_

Contact Phone: \_\_\_\_\_

Contact Email: \_\_\_\_\_

**PROJECT INFORMATION**

Project Title: Nitrogen Reducing Biofilter for Rectory at St John's Episcopal Church Southampton \_\_\_\_\_

Project Location 100 South Main St, Southampton, NY 11968 \_\_\_\_\_

Project Description (1-3 sentences): Facilitated by the CCWT, St John's Episcopal Church seeks funding to replace their existing septic system with a nitrogen reducing biofilter at the church rectory in Southampton, NY. The rectory is located near a High Priority Area, about 200 yards from Agawam Lake. 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. \_\_\_\_\_