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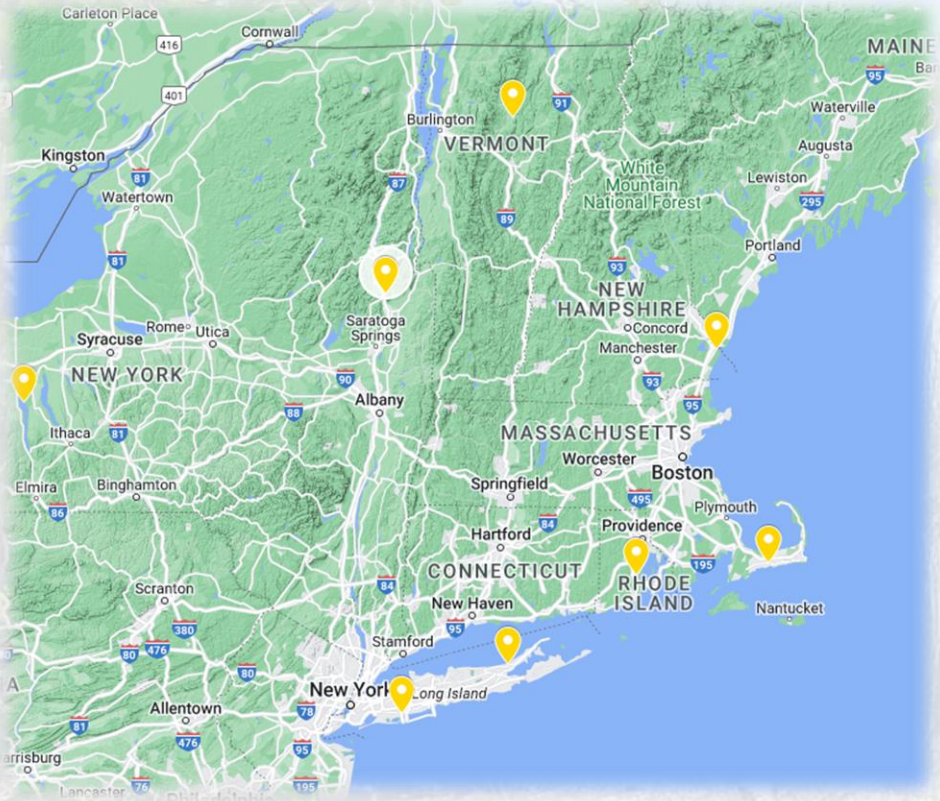

The Need for Regionalized Standard Operating Procedures for the Acceptance, Use, and Management of Nutrient-Reducing Septic Systems

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Agenda

- The Increasing Demand for Nutrient-Reducing Septic Systems
- Summary of Approval Processes in Northeast US
- Problems with Separate Approval Processes in Proximate Jurisdictions
- 3rd Party Certification & Data Sharing Efforts
- Limitations of 3rd Party Certifications and Data Share Efforts
- Potential Framework for 3rd Party Field Verification
- Open Discussion and Industry Feedback
- Wrap Up & Next Steps
- Questions

I BECAME INSANE WITH LONG INTERVALS OF HORRIBLE SANITY

EDGAR ALLAN POE

The Process for the Approval of Nitrogen-Reducing Septic System Technologies

- Approval / Acceptance of Advanced Treatment Technologies is handled at the State or County Level
- Each jurisdiction has different requirements
- Manufacturers must make submissions and demonstrate compliance in each regulatory jurisdiction.
- In New England, many of the approval processes were developed in the late 1990's and have not been significantly updated since.
- Many jurisdictions used demonstration programs to spark the use of Nitrogen-Reducing technologies

Rhode Island Onsite Wastewater Demo Projects

1996 - 2005

Objectives -

- 56 demonstration systems
- Replace failed septic systems with innovative technologies
- Do on jobsite installation training
- Evaluate treatment performance
- Document operation and maintenance needs
- Report to regulatory agency
- Transfer information to clientele

The Increasing Demand for Nutrient-Reducing Technologies

- Mandates
- Funding & Incentives
- Northeastern US Market soars to over 10,000 systems per year

The Increasing Demand for Nutrient-Reducing Technologies

Riverhead News Review

Nitrogen-reducing septic systems to be required in all new construction projects - Riverhead News Review

A new law adopted unanimously by the Suffolk County Legislature last week will require the use of nitrogen-reducing septic systems in all...

Oct 17, 2020

RiverheadLOCAL

New water quality fund and 1/8-cent sales tax hike eyed to address nitrogen pollution in Suffolk

An extension of the Drinking Water Protection Program to 2060, with a 1/8-penny sales tax increase would provide $3.1 billion to reduce...

Feb 21, 2023

Florida Politics

House agrees to Senate language on septic tank, Florida Forever package

The House approved a bill amended by the Senate that will impose stricter standards on septic tanks and enhance the Florida Forever program.

May 3, 2023

The Center Square

Florida's DeSantis signs bill to help preserve Indian River Lagoon

(The Center Square) — Gov. Ron DeSantis signed a bill into law this week that will help protect Florida's water resources and support...

May 31, 2023

New state rules mean thousands of Cape Cod homeowners may need to replace septic systems

June 21, 2023 | By Barbara Moran

The Increase in Funding Nutrient-Reducing Technologies

Maryland's Nitrogen-Reducing Septic Upgrade Program

BIL funds support new septic systems to reduce nitrogen pollution into Long Island Sound

POSTED ON AUGUST 9, 2023 SHARE

A house in Centerport Harbor gets an enhanced nitrogen removal septic system to replace a cesspool. BIL funding is supporting New York State's effort to replace outdated systems to reduce nitrogen pollution into Long Island Sound. Jim Ammerman/LISS photo

Volusia County Septic Upgrade Incentive Program Contractors Information

Contractor Application Portal

Property Owner Page

Septic Upgrade Incentive Program

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Septic Upgrade Information

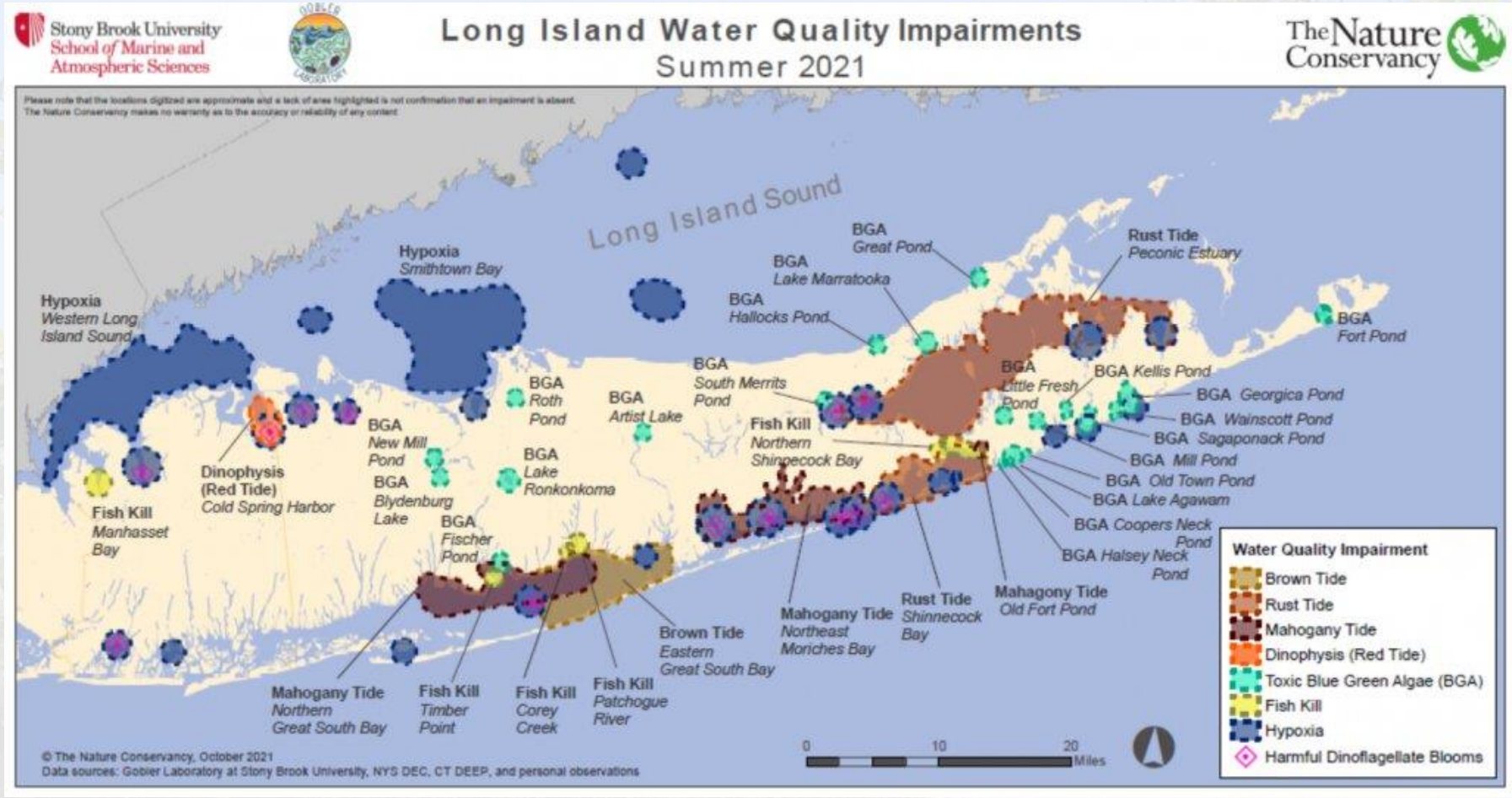
The purpose of the Hernando County Septic Upgrade Incentive Program is to encourage homeowners to voluntarily remediate existing conventional septic systems also known as Onsite Sewage Treatment and Disposal Systems (OSTDS) to include nitrogen reducing enhancements. The incentive program is intended to offset a portion of homeowner costs by providing certified septic system installers and licensed plumbers with up to $7,500 for the installation of enhanced nitrogen-reducing features to existing homes within Hernando County that are located within the Weeki Wachee Springs Priority Focus Area.

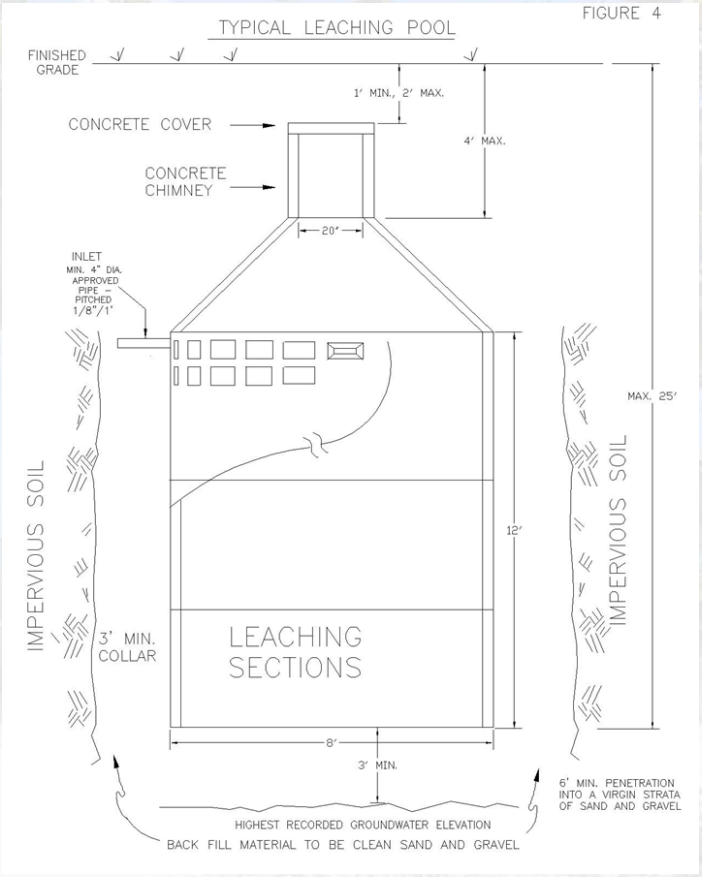
Join the Nassau County Septic Replacement Program

Help keep Long Island waterways clean by replacing your conventional or failing septic system with a new innovative advanced onsite wastewater treatment system. Eligible Applicants will receive a $20,000 reimbursment for installing a nitrogen reducing septic system on their property.

Click here to learn more about the program

The Need for Clean-Water Septic Systems on Long Island





- Over 425,000 On-Site Systems on LI, Hundreds of thousands of cesspools
- 74% of Suffolk County is unsewered, 90 % of Nassau's North Shore is Unsewered
- HAB's, Shellfishing Impacts, Coastal Resiliency, Public Bathing Beaches

Problems with Separate Approval Processes in Proximate Jurisdictions

- Places a burden on regulators reviewing a technology for use
- Expensive for manufacturers to enter new market (~$120,000)
- Can halt innovation, limit competition, and inflate system costs
- Many approval processes are not science based
- Lack of standardized field verification leads to lack of confidence in data from other jurisdictions

Predominate Technologies per Jurisdiction

- Varying processes can lead to significantly different technologies approved for use in neighboring jurisdictions with limited communication between jurisdictions.
  - Orenco's AX-20 is the predominate system installed for nitrogen reduction in Rhode Island with over 7,500 installations
  - BioMicrobics FAST system is the predominate system tracked in Barnstable County's database with 1,680 systems installed
  - FujiClean and Hydro-Action are the predominate systems on Long Island with close to 2,000 of each technology installed

Example: Neighboring States RI and MA have vastly different Approval Processes

Rhode Island: RI Department of Environmental Management (RIDEM) has authority over Onsite Wastewater Treatment Systems (OWTS).

RIDEM's Approval Process consists of three phases:

1) Experimental
   - Must demonstrate that the technology works in practice and theory
   - Applicant must sign a statement agreeing to abandon the experimental technology if the technology fails
   - Applicant must secure a bond or form of financial security to replace the entire OWTS in the event it fails to perform as designed.

2) Class One for Nitrogen-Reduction
   - requires four (4) consecutive years of performance data per installation for no fewer than ten (10) installations with data collected no less frequently than quarterly.
   - if RI data is not available, the Applicant needs four (4) years of data from three (3) other jurisdictions with no fewer than ten (10) installations with data collected no less frequently than quarterly.

3) Class Two for Nitrogen-Reduction
   - requires two (2) consecutive years of performance data per installation for no fewer than ten (10) installations with data collected no less frequently than quarterly.
   - if RI data is not available, the Applicant needs two (2) years of data from another jurisdictions with no fewer than ten (10) installations with data collected no less frequently than quarterly.

<u>Massachusetts:</u> The Massachusetts Department of Environmental Protection (MASDEP) has the authority over the State's onsite wastewater treatment systems under State Environmental Code Title V.

3 Phase Approval Process:

(1) Piloting
(2) Provisional
(3) General Use

- *Piloting technologies must submit data showing performance similar to that of a conventional septic system and are capped at 15 installations of a technology which need to be sampled quarterly for 18 months.*
- *Provisional Approved technologies up to 50 systems may be installed and tested quarterly for three (3) years before General Use Approval can be granted.*
- *Massachusetts does not accept reciprocal approvals.*

Technology Acceptance Processes on Long Island

MASSTC
The Massachusetts Alternative Septic System Test Center

Onsite Wastewater Systems Management in the New Jersey Pinelands

New Jersey Pinelands Commission
P.O. Box 7, New Lisbon, NJ 08064
John C. Stokes, Executive Director
phone: 609-894-7300
fax: 609-894-7330
www.nj.gov/pinelands

Why is Septic System Management Important?

NEW ENGLAND COASTAL REGION/SUFFOLK COUNTY DATA SHARING PROJECT

TEST PLAN APPLICATION TEMPLATE

for Field Verification of

Advanced Onsite Pretreatment Units for Nitrogen Reduction

New England Coastal States and Suffolk County

Chesapeake Bay Data Sharing Project - 2015

MEMORANDUM OF COOPERATION Among the Chesapeake Bay Watershed States, namely, Delaware, Maryland, Pennsylvania, Virginia, and West Virginia

DATA SHARING TO SUPPORT STATES' ANALYSIS AND APPROVAL OF ADVANCED ONSITE PRETREATMENT UNITS FOR NITROGEN REDUCTION

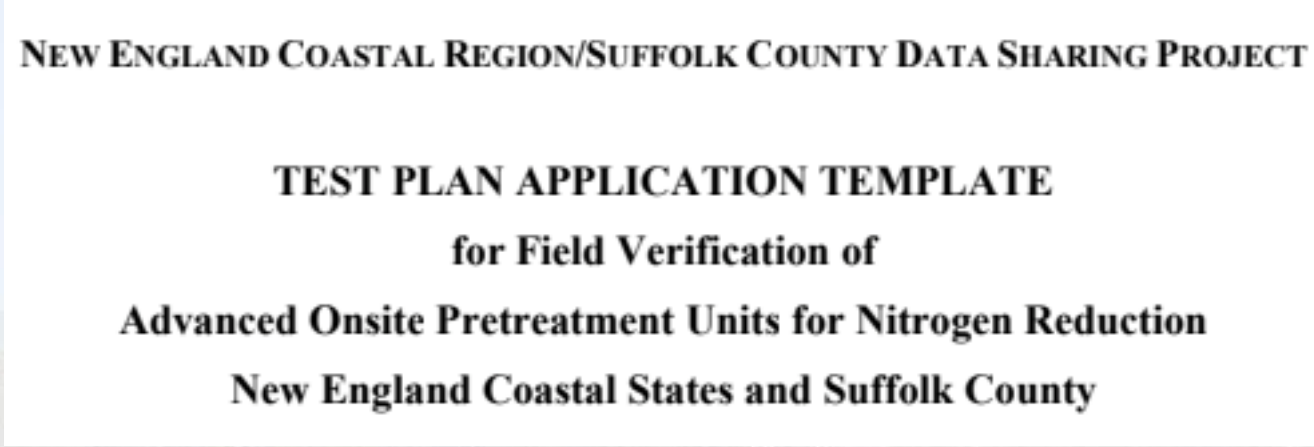
New England Coastal States & Suffolk County Data Sharing Project - 2016

- Following the successful implementation of the Chesapeake Bay Watershed Memorandum of Cooperation, EPA tried to continue these efforts with the New England Coastal States and Long Island.
- The purpose was to provide written commitments in the sharing of field and laboratory data and streamlined process to provide consistent documentation on the performance of advanced nitrogen-reducing septic systems.
- The EPA assembled an expert panel consisting of EPA staff, consultants, and regulators and educators from all involved jurisdictions.

New England Coastal States & Suffolk County, NY Data Sharing Project - 2016

Although, the project is now defunct the collaborative process produced two useful documents which have gone on to help structure the approval and monitoring processes on Long Island.

1. Statistical Analysis of Barnstable County's IA database by Horsley Witten Group, Inc
2. Test Plan Application Template providing SOP's for Field Verification



NEW ENGLAND COASTAL REGION/SUFFOLK COUNTY DATA SHARING PROJECT

TEST PLAN APPLICATION TEMPLATE

for Field Verification of

Advanced Onsite Pretreatment Units for Nitrogen Reduction

New England Coastal States and Suffolk County

Statistical Analysis of Barnstable County's IA database by Horsley Witten Group, Inc

The Horsley Witten Group, Inc (HW). analyzed field sampling data for over 2,000 advanced treatment systems. The analysis sought to answer two questions:

1) How many samples are needed to understand the performance of an individual onsite system?
2) How many systems need to be sampled to evaluate the overall performance of an advanced technology?

- The analysis looked at 208 systems across 12 technologies which encompassed over 4,000 sample points. HW utilized a one-tail. T-test method to estimate the number of sampled need to be withing a 20% range of the true mean and a 90% confidence level.
- The Statistical Analysis found that by field sampling between eight (8) and twenty (20) systems of a technology, with 12 samples collected on each system, would be sufficient to assess the performance of the technology within a 90% confidence level

Test Plan Application Template for Field Verification

The Test Plan application provided standard operating procedures for sample collection and contained the following:

- Key project contacts
- Regulatory Jurisdiction Contact Information
- Details on the frequency and number of samples needed for each jurisdiction.
- Required sampling parameters for each jurisdiction.
- Site preparation and sampling procedures
- Provisions for split samples, audits, and data reporting
- Details on System Operation, Maintenance, and Inspection

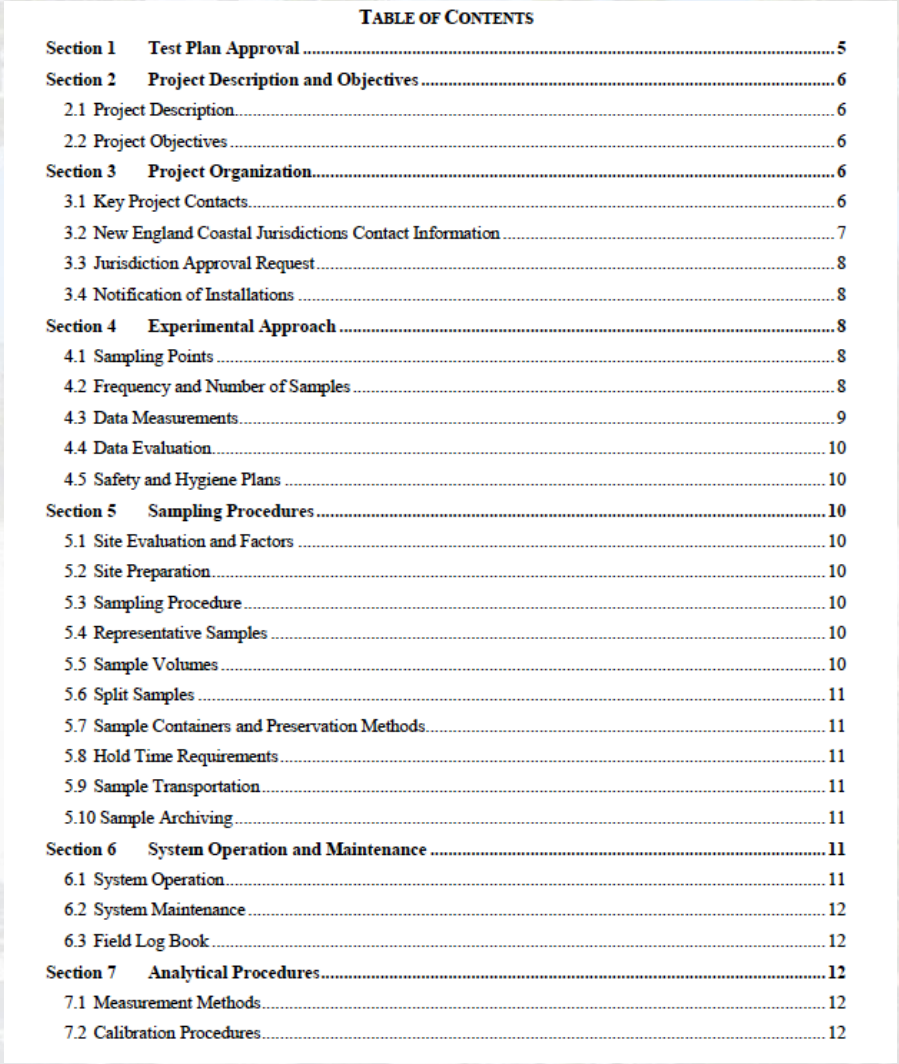


TABLE OF CONTENTS

Suffolk County I/A OWTS Approval Process

Septic Demo	Piloting	Provisional	General Use
			
1-5 Systems Required	8-12 Systems Required	Minimum of 20 Systems Required	Greater than 20 Systems
Dataset of 75% of systems must average 19 mg/L or less	Dataset of 75% of systems must average 19 mg/L or less	Entire dataset must average 19 mg/L or less	Entire dataset must average 19 mg/L or less
Procedures for excluding outliers; Streamlined path to Provisional	Procedures in place for excluding outliers	Cannot exclude outliers	Cannot exclude outliers
NSF 245 or USEPA ETV only	NSF 245, USEPA ETV or approval for N reduction in 2 comparable jurisdictions	NSF 245, USEPA ETV or approval for N reduction in 2 comparable jurisdictions	NSF 245, USEPA ETV or approval for N reduction in 2 comparable jurisdictions
Only installed in households who met specific criteria & agreed to routine visits & monthly sampling by SCDHS	Must be year round residences that agree to routine visits & monthly sampling by SCDHS	20 year round residences sampled every 60 days for 2 years by manufacturer with SCDHS QA/QC	All residential systems sampled every 3 years by O&M Provider with SCDHS QA/QC
Proven technologies with >20,000 installed in similar jurisdictions. Great confidence systems will reduce TN by 50% as certified by NSF & ETV	Proven technologies with >20,000 installed in similar jurisdictions. Great confidence systems will reduce TN by 50% as certified by NSF & ETV	Proven technologies with >20,000 installed in similar jurisdictions. Great confidence systems will reduce TN by 50% as certified by NSF & ETV. Proven ≥ 70% TN reduction on limited dataset in Suffolk County (i.e. achieved 19 mg/L)	Great confidence systems will reduce TN by 70%. Large dataset showing reduction of TN to 19 mg/L in Suffolk County

Note - SCDHS is the first jurisdiction to have a program designed with US EPA statistical analysis. Approval process also allows for an experimental phase which requires an additional 12 months of sampling prior to a technology being accepted into the piloting phase.

Suffolk County, NY

TABLE 19-104.1: Approval Chart for Residential Systems			
Approval Phase	**# of Systems**	**Sampling Frequency**	**Performance Requirement**
Experimental*	2 – 5 year-round	Monthly Sampling 12 months rolling average	For instances where 2 - 3 experimental systems are installed, each system must maintain an individual TN average of 19 mg/L or less. For instances where 4 - 5 experimental systems are installed, all systems must being sampled monthly. The department may omit the data from one of the installed systems. Each of the remaining systems must maintain an average effluent TN of 19 mg/L or less for a period of 12-monthly consecutive samples
Piloting*	8 – 12 year-round	Monthly Sampling 12 months rolling average	The total dataset of 75% of the systems must have a combined average of 19 mg/L or less TN
Provisional 1	First 20 year-round	Bi-Monthly Sampling for 24 months rolling average Minimum 12 samples.	The dataset of all the 20 systems must have a combined average of 19 mg/L or less TN
Provisional 2	All Residential Systems installed during Provisional Use Approval	Samples must be taken within 36 Months from date of installation, and at a minimum of every 36 months thereafter	The annual dataset must maintain a combined average of 19 mg/L or less TN in order to remain in the Provisional phase **
General Use	All Residential Systems	Samples must be taken within 36 Months from date of installation, and at a minimum of every 36 months thereafter	The dataset must maintain an average of 19 mg/L or less in order to remain in General Use phase **

Note: The number of required systems is a cumulative number. The minimum of 20 systems for Provisional Use includes the number of systems installed as part of Experimental and Piloting processes.

Nassau County, NY – Acceptance Criteria

Acceptance Phase	Minimum Required Dataset to Enter Acceptance Phase	Required Minimum # of Samples	Required Minimum Performance Verification Needed for Initial Acceptance	Eligible for Grant Funds
Experimental	third-party verification report	As specified in third-party report	Must submit a third-party evaluation report that demonstrates that the technology is technically capable of reducing TN concentrations to 30 mg/L or less.	Yes, with restrictions[4]
Piloting[1]	2 installations	12 consecutive[3]	NSF 245, equivalent, or third-party entity evaluation for systems installed in any US jurisdiction where the 12-month rolling average TN concentration results are between ≤ 19 and 30 mg/L AND a 50 percent actual reduction in TN concentration (see Memo #2 for details)	Yes, with restrictions[5]
Provisional[1]	12 installations	12 consecutive[3]	Average TN of 19 mg/L or less for systems installed in a jurisdiction where the technology is approved for nitrogen removal and the temperature conditions are comparable to, or colder than, those in Nassau County, NY.	Yes
General Use[2]	20 installations	12 consecutive[3]	Average TN concentration of 19 mg/L or less for all systems Installed in Suffolk or Nassau Counties on Long Island;	Yes

[1]The District honors Piloting and Provisional Approvals from Suffolk County Department of Health Services and State of Massachusetts, provided those technologies are averaging between 19 – 30 mg/L at the time of submission.

[2]The District honors General Approvals from Suffolk County Department of Health Services and State of Massachusetts, provided those technologies are averaging 19 mg/L or less at the time of submission.

[3]Consecutive samples may be submitted in monthly, bi-monthly, or quarterly intervals.

[4]Experimental Acceptance allows for the use of grant funds if the Manufacturer/ Designer of the technology sign a statement agreeing to repair, replace, or modify the Experimental Technology, including to install an OWTS permitted under the County's Approved Alternative Technology List, if the District determines that the proposed Technology fails to perform as designed. The signed statement must clearly state who is responsible for the cost of repairing, replacing, or modifying the OWTS, and the method for ensuring funds to complete this work - whether through a bond or other form of financial security, posted by the Manufacturer or Design Professional, that is acceptable to the District. In addition, the Property Owner must attest and sign a statement that they understand that the Technology does not yet have any data on Long Island installations.

[5]Piloting Acceptance allows for Grant funded installations if the Property Owner attests to understanding the Technology does not yet have a statistical dataset of system performance on Long Island.

Nassau County, NY – Performance Criteria

Acceptance Phase	Maximum # of Systems Allowed to be Installed	Required Treatment Threshold	Minimum Sampling Frequency During Acceptance Phase	Maintenance and Reporting Requirements
Experimental	Up to 5	Average TN of 19 mg/L or less	Monthly Sampling 12 months rolling average	Yes
Piloting	Up to 12	Average TN of 19 mg/L or less	Monthly Sampling 12 months rolling average	Yes
Provisional	No Limit	Average TN of 19 mg/L or less	Bi-Monthly (every 60 days) Consecutive Sampling for 24 months Rolling average of a minimum of 12 samples for the first 20 residential systems need to be monitored	Yes
General Use	No Limit	Average TN of 19 mg/L or less	Sampling must be done within 36 months from date of installation, and every 36 months thereafter	Yes

Data Share Limitations

- Still Placed a great burden on the Industry and Regulators
- Expensive
- No Lead Management Entity
- Individual Jurisdictions were unable to amend their approval processes to accept the Test Plan Application
- Easier to require Technology Certification (i.e. NSF/ETV/BNQ)

Certification Programs: Existing certification, environmental technology verification, & research services.

- NSF International/American National Standards Institute (ANSI) standards
  - Can be tested in all climates
- U.S. EPA's Environmental Technology Verification (ETV) Protocol
  - Can be tested in all climates
- Bureau de Normalization du Quebec (CAN/BNQ)
  - Cold Climate Testing Only
  - Does have field verification component (10% of installs sampled annually, min of 5, max of 10)

Limitations of Certification Programs

- Test center evaluation not field verification.
  - Controlled Conditions: Flow, Source, Temp, Concentrations
- Mainly reserved for Proprietary Technologies which are developed, marketed, and constructed by manufacturer.
  - Non-Proprietary technologies are at a disadvantage because they are typically field built, or engineered to meet the needs of a specific site and are not prepackaged units.
  - Most Jurisdictions don't allow applicants to deviate from NSF Certification
- Actual conditions are often times very different than test conditions
- Does not consider household habits (cleaners, medications, water conservation)
- No long-term use or aging of system components

Benefits of Streamlined Third- Party Field Verification Process

- In retrospect, the more effective way to reach the same result would be the establishment of procedures and protocols that could be used by a third-party entity to evaluate, and field verify technologies for nitrogen removal, similar to how NSF and ETV provides certification in a test center environment.
- A National Field Verification Process would take remove the burden from individual jurisdictions and provide a greater level of confidence in the technologies ability to meet local performance standards
- Provide consistency and assess long-term performance
- Provides path to approval for nonproprietary and field-built systems
- Field Verification Data can be published online and allow regulators to sort based on jurisdiction, climate, age, etc.

POTENTIAL NEXT STEPS

1. Determine if there is Interest to revisit SOP's
2. Assemble Working Group / Expert Panel
3. Identify potential funding to expand statistical analysis of available data
4. Review existing Sampling Plans and Test Plan Applications
5. Identify Potential Funding Sources for 3rd party verification
6. Identify potential 3rd party verification groups
7. Publish Expert Panel Report and Recommendations

DISCUSSION QUESTIONS AND TOPICS

- Is this a Feasible Approach for Industry and Regulators?
- Would it increase innovation and implementation of new technologies?
- Who should be on the Expert Panel?
- Should this be National or Regional Effort?
- Grab vs Composite Samples?
- The statistical analysis could be routinely revisited to include an ever-increasing dataset
- Should jurisdictions investigate adopting reciprocity clauses in their regulation?
- Information collected under standardized procedures could be vetted and posted for consumers, industry professionals, and regulators.
- Who would do the verification? (County Health Departments, Test Centers, Universities, Watershed Groups?)
- Pursue the use of grant funding to offset costs to third-party entities and manufacturers

Coastal Wastewater Solutions, LLC

ANY QUESTIONS?

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