NASSAU COUNTY, NY'S NITROGEN REDUCING SEPTIC SYSTEM GRANT PROGRAM

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ABSTRACT

Nitrogen pollution from cesspools and septic systems has been identified as a leading cause of degraded water quality on Long Island, contributing to restrictions on shell fishing, toxic algae blooms, and massive fish kills. Tens of thousands of properties on the North Shore of Nassau County are currently served by cesspools and septic systems. Reversing degradation of water quality will depend on the replacement of existing systems with new nitrogen reducing technologies.

In an effort to incentivize these technologies and protect the public and environmental health, Nassau County and New York State have initially invested $5 million to create a septic system replacement program for eligible properties. The Septic Environmental Program to Improve Cleanliness (S.E.P.T.I.C.) provides grant funding of up to $20,000.00 to eligible homeowners, not-for-profits, and small businesses to replace conventional septic systems and cesspools with a nitrogen-reducing innovative and alternative onsite wastewater treatment system (IA OWTS).

The program was launched in May of 2021 with enough funding to provide 200 grants. To-date there have been 205 applicants, 54 executed grant agreements, and 29 installations with an additional 25 pending installation. A total of $390,000 has been reimbursed to date. Due to the success of the Program, both New York State and Nassau County are in the process of establishing funding to allow for additional installations.

BACKGROUND AND INTRODUCTION

Nassau County New York, located between Queens and Suffolk counties on Long Island, is largely sewered. However, Nassau's North Shore is 90 % unsewered and relies primarily on cesspools and deep leaching pools (Figure 1) which provide minimal soil treatment and do not reduce a significant amount of nutrients, specifically, nitrogen. This concentrated area of approximately forty thousand onsite systems is in the contributing area of the Long Island Sound. Historically, the estuary has been greatly impacted by nitrogen pollution although the significant advances have been made over the last several decades in reducing nitrogen loading to the sound. Current environmental efforts have been focused on reducing nutrient pollution from runoff, fertilizer, and onsite septic systems which has been identified as a leading cause of degraded water quality on Long Island. Excess nutrient loading contributes to beach closures, restrictions on shell fishing, toxic algae blooms, and massive fish kills. In addition to the concerns of environmental impacts

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of onsite systems, Long Island receives its drinking water from the ground underneath these deep leaching systems, and EPA designated sole source aquifer with trends of increasing nitrate levels.

The average residential septic system discharges between 4.8 to 13.7 lbs. of nitrogen per person (US EPA, 2002). There are on average 2.95 persons per household in Nassau and Suffolk Counties on Long Island (US 2020 CENSUS) which amounts to a range of 14 to 40 lbs of nitrogen per household per year. Cesspools and deep leaching structures were never designed to remove significant amounts of nutrients. In addition, low oxygen transfer and limited treatment capacity make them substandard technologies (US EPA, 2002). These practices coupled with increased density of some north shore communities has led to excess nitrogen loads making wastewater the largest source of nitrogen in greater than 80 % of Suffolk County Surface Waters (SCDHS 2020)

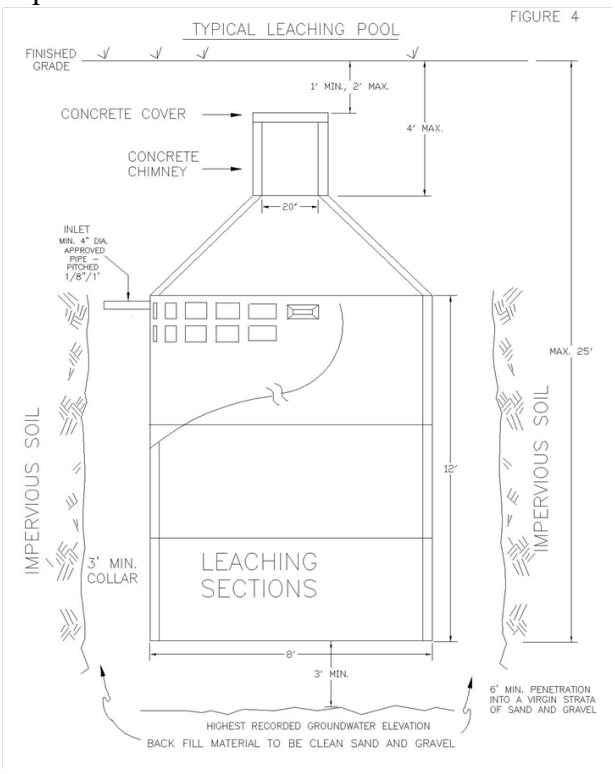

Figure 1: Typical Leaching Pool Structure on Long Island. Source: Suffolk County Department of Health Services

Reversing this decline in water quality is dependent on the replacement of existing cesspools and septic systems with new nitrogen-reducing technologies also referred to as Innovative and Alternative Onsite Wastewater Treatment Systems (IA OWTS, or IA). When properly designed, sited, installed, managed, and maintained, these IA systems provide a cost-effective and environmentally sound alternative to sewers in areas that are outside designated sewer areas. These systems significantly reduce nitrogen, biochemical oxygen demand and total suspended solids, before being discharged below grade to leaching structures.

In an effort to incentivize these technologies and protect the public and environmental health, both Nassau and Suffolk counties on Long Island have created their own IA Grant Programs.
Suffolk County NY, to the east of Nassau has been at the forefront of this issue as 75% of that County is unsewed. In 2014, the County established the Reclaim Our Water (ROW) initiative which is largely focused on building the framework for a strategic science-based upgrade program as the County transitions from cesspools and conventional deep leaching structures to nitrogen-reducing systems. In 2017, Suffolk County launched their Septic Improvement Program (SIP) which initially utilized County funds to provide grants of up to $10,000 to incentivize homeowners to install nitrogen-reducing septic systems (SCDHS, 2017) .

In 2018, The New York State Department of Environmental Conservation in cooperation with the New York State Environmental Facilities Corporation (EFC) established the New York State Septic System Replacement Program (SSRP) which established awards to participating counties

to make grants of $10,000.00 available to qualified property owners looking to upgrade their septic systems.

The SSRP allocated $75 million to support a multi-year program that resulted in five (5) allocations of $15 million dollars. Over 70% of the first $15 million allocation, made in 2018, was awarded to Long Island. Suffolk County received $10 million, and Nassau County received $1 million. A second allocation of the same amount was made in 2021, and the third and fourth allocations were announced in April of 2022. As of August 31, 2022, Nassau County has been allocated $4 million in SSRP funds and Suffolk has been allocated $30 million. Although the SSRP funding can be used to upgrade failing systems with conventional systems in other parts of New York State, it is important to note that Nassau and Suffolk decided to limit the use of the grant specifically for nitrogen-reducing septic systems (NYS DEC / NYS EFC, 2021).

Suffolk County was first to couple County and State funding so that property owners could qualify for additional funding to offset the increased cost of nitrogen-reducing systems. In addition, Suffolk used an Assignment of Payment (AOP) process which was modeled on the State of Maryland's Program to allow the property owner to instruct the County that the grant funds may be paid directly to the contractor on the property owner's behalf. The AOP process allowed the program to function more as a guided program with step-by-step assistance from the County than a simple reimbursement program, which are typically overly burdensome to the property owner. As of August 31, 2022, Suffolk County's SIP is in it's fifth year and has seen over 1,000 installations.

In 2021, after delegating the Nassau County Soil and Water Conservation District (District) as the administrative entity for the grant program, the County launched the Septic Environmental Program to Improve Cleanliness **(**S.E.P.T.I.C.) which provides grant funding to eligible homeowners, not-for-profits, and small businesses to replace conventional septic systems and cesspools with a nitrogen-reducing system. The S.E.P.T.I.C. grant program is based off Suffolk County's program and consists of both State and County grants which are coupled to offer eligible property owners grants of up to $20,000 per tax parcel.

MATERIALS AND METHODS

Although the S.E.P.T.I.C. grant program was modeled after the Suffolk County program, several differences between the two counties dictated the need for Nassau to develop a more streamlined and condensed grant program. The Nassau Program consists of the following key elements: 1) funding; (2) administration; (3) management and acceptance of technologies; (4) grant eligibility; (5) application process; (6) design process; (7) permitting; (8) installation; (9) payment process; (10) outreach.

S.E.P.T.I.C. Funding Sources

The S.E.P.T.I.C. grant program utilizes two sources of funding, both State and County. The Clean Water Infrastructure Act of 2017 established the "State Septic System Replacement Fund" and allocated $75 million to support a multi-year program. Nassau County received notification from NY State Department of Environmental Conservation (DEC) and New York State Environmental Facilities Corporation (EFC) that $2,000,000 has been awarded to Nassau County.

The County of Nassau has received and appropriated monies from the Coronavirus Local Fiscal Recovery Fund (CLFRF), established by Subtitle M of Title IX of the American Rescue Plan Act of 2021 (ARPA). Published CLFRF Program Guidance provides a nonexclusive listing of permissible uses for CLFRF funding, including making necessary investments in water, sewer, and broadband infrastructure. The County has dedicated $2,000,000 in ARPA funds towards grants for the coordinated installation of Innovative and Alternative Onsite Wastewater Treatment Systems (IA OWTS), which constitute a necessary improvement and as such, are considered eligible projects pursuant to the terms of the Clean Water State Revolving Fund.

Program Administration

The Nassau County Legislature has directed the Nassau County Soil and Water Conservation District (District) to administer the Program on behalf of Nassau County. Soil and Water Conservation Districts are political subdivisions of New York State and are established to coordinate assistance from all available sources, public and private, local, state, and federal to develop locally driven solutions to natural resource concerns. Nassau County felt that the District was better suited and positioned to be able to handle the day-to-day operation of the program. This is a unique situation compared to Suffolk County as their Program is run out of the County Department of Health Services. This innovative approach has streamlined program development and implementation and serves as a model for other New York counties to use to administer a septic replacement program. The Program operates in accordance and under the authority in existing agreements between the County, State, and District and receives money from Nassau County to Administer the program. As a result the district was able to hire a wastewater management consultant and an additional conservation technician. Currently, the District has 4 full time employees, 1 part-time employee, an IT consultant, and a wastewater management consultant. The S.E.P.T.I.C. responsibilities are split among the staff and assistance is provided from various County Departments.

The District is responsible for the overall day-to-day management and operation of the program including but not limited to: application intake, website and portal management, program design and development, outreach and promotion, contract and document tracking, and payment process review and preparation. The Department of Public Works takes the lead on County S.E.P.T.I.C. Requirements and all payments are processed through the County Comptroller's Office.

Management and Acceptance of Nitrogen-Reducing Technologies

As previously mentioned, because of the work Suffolk County has done testing and certifying systems for use, Nassau County decided to launch their program simply by acknowledging that the technologies approved for use in Suffolk County may also be used in Nassau County. Although this decision was necessary to get the program off the ground, it became apparent that the District needed to establish procedures for new manufactures to be able to enter the market and for existing manufacturers to provide routine sampling results to the District. The guidelines do allow for reciprocity with Suffolk County but establish submission requirements and enforcement

provisions to remove a technology if they fail to meet nitrogen limits of 19 mg/l. These guidelines are currently under review and should be in place by the end of 2022.

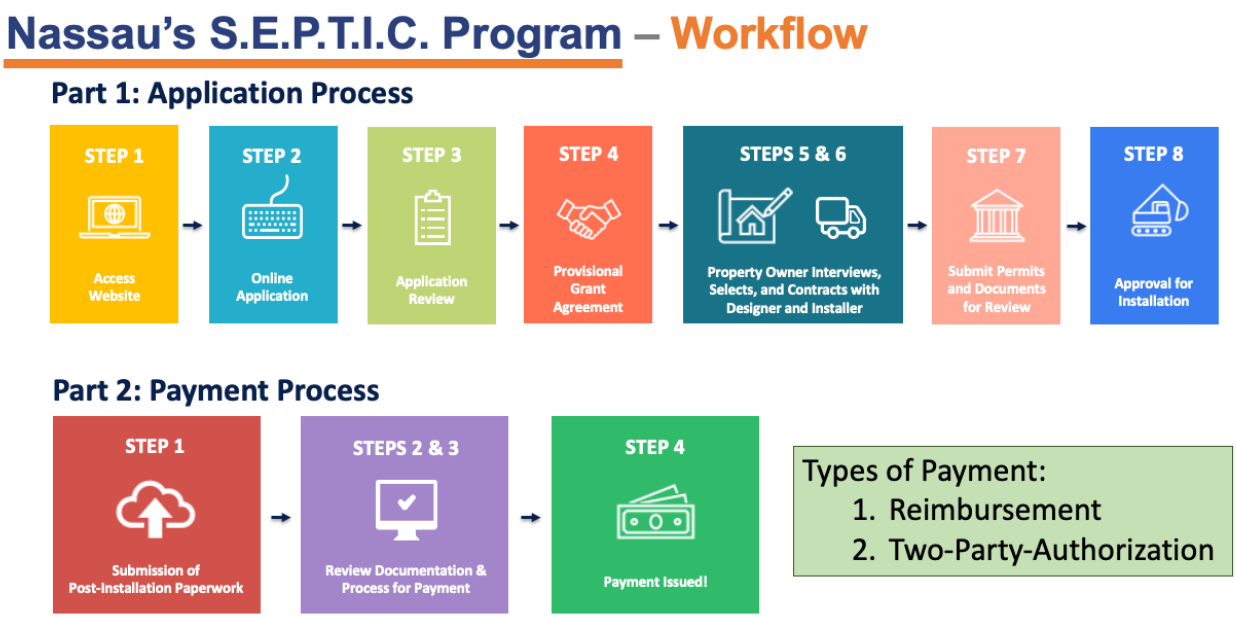

Figure 2: Nassau S.E.P.T.I.C. Grant Process

Eligibility – Grant

The S.E.P.T.I.C. Grant Replacement Program is subject to the availability of funds and is offered to Property Owners of single-family, two-family, not-for-profit organizations and small businesses with existing and proposed sanitary design flow not exceeding 1,000 gallons per day (GPD). Vacant lots or any properties with property tax liens or foreclosure actions are not eligible for S.E.P.T.I.C.

Participating properties must have a valid certificate of occupancy, certificate of completion, or equivalent issued by the pertinent city, town or village. The property must be served by an existing septic system or cesspool and not be connected to a public or private sewer or located within an existing or proposed sewer district. There are two exceptions to the sewer rule: (1)
If the property is located in an existing sewer district but is unable to connect due to site constraints documented by the Sewer District in question, the property may be eligible, provided the applicant meets all other eligibility requirements; and (2) a qualifying Residential Parcel may, at the sole discretion of the County, be located in a proposed sewer district where such Residential Parcel is served by an existing septic system or cesspool, and there is documentation that such septic system or cesspool has failed or is failing.

Eligibility - Costs

For costs to be covered by the grant incurred costs must be reasonable and necessary for work done. The grant will cover the purchase of the IA OWTS and associated leaching materials and required electrical components. It will cover the cost of labor installation of the IA system and associated leaching structures. It will also cover the system warranty and excavation and backfilling.

Design costs are eligible only as a reimbursement to the property owner if additional grant funds remain after the installation. Applicants are expected to pay for the design out-of-pocket. Reimbursement is limited only to work needed to complete an approved design, including needed site investigation, as-built drawings, and inspections.

There are several items that are not covered under the grants. These includes irrigation repairs, non-essential site restoration and beautification, and any other improvements not necessary for the installation of the system. In addition, funds cannot be used for sales tax, fines, penalties, or permitting fees. Finally, the grant does not cover pumping and abandonment of the existing system, routine pumping, or maintenance of the installed system.

Grant Application Process

Conservation technicians are available to provide support and information to the applicants to ensure they understand the program specifics and potential financial implications. Interested applicants can then apply online at nassaucountyny.gov/SepticReplace. The District worked with County IT staff to create a very quick and simple application process. Upon successful submission of the application, the District reviews the applicant for compliance with the eligibility criteria and will issue Provisional Approval if all the criteria are met and there are available spots in the grant queue. The property owner will then receive an automated provisional approval award letter and have thirty (30) days to sign and execute the Grant Agreement with Nassau County. The entire process can be done online. The applicant can electronically sign the grant agreement and then upload back to the application portal, the District then checks the agreement, and if correct, can update their status to "Approved".

The Property Owner has a total of twelve (12) months from the date of the executed Grant Agreement with the County to install their I/A System. Property Owners may be granted an extension if they can demonstrate they are moving forward with the Program and submit an updated timeline for Project completion.

Design Process

After successful execution of the Provisional Grant Agreement, the Property Owner has 60 days to submit a signed contract with a Design Professional, which in NY is a Registered Architect or Professional Engineer. The Property Owner is responsible for direct payment to the design professional but these fees can be reimbursed if grant funds remain after payment/reimbursement for the installation. Upon being hired by the Property Owner, the Design Professional will prepare design plans for submission to the property's corresponding village, city, or town on behalf of the property owner. The Design Professional shall also secure any other permits, such as New York State wetlands permit or town plumbing or electrical permit(s), if required.

After the completion of the Design and acquisition of any State Permits, the Property Owner has sixty days to select and enter into a contract with an Installer. The installers must be properly licensed by the Nassau County Department of Consumer Affairs and meet that Department's insurance requirements. The Property Owner is required to upload a copy of the accepted contract to the website. The Installer and Designer will then work with the Property Owner to submit to the property's corresponding village, city, or town for approval of the septic system designs.

Permitting
The Nassau County Department of Health regulates the design of new sanitary systems to serve realty subdivisions of five (5) or more lots. The Department also requires and approves engineering plans for commercial sanitary sewage disposal system having a design flow of 1,000 gallons per day or more and issues Specific Pollutant Discharge Elimination System (SPDES) permits under the delegated authority of the NYSDEC. The Department however does not regulate the design of individual replacement sanitary systems for single family homes but does require that engineering plans be submitted to the Department for regulated commercial modified or replacement sanitary systems.

The permitting authority for individual replacement sanitary systems for most of the S.E.P.T.I.C. applicants then falls to the individual towns and villages, of which there are 40 of on the North Shore of Nassau County. Each town and village may have their own individual requirements. The District has provided the towns and villages with recommended construction guidelines, checklists, and inspection certification forms. Future efforts to streamline and standardize these practices will be needed.

Installation
The Installer is responsible for coordinating the installation date with the property owner, permitting entity, District, and the Designer. The installer installs the IA system and completes the Installation Completion Packet created by the District. The issuing village, city or town may also complete inspection of the installation and issues a certificate of completion (or equivalent). In addition, the property owner would need a copy of the final itemized invoice and signed maintenance agreement before the District can prepare the payment voucher.

Payment Process
Grant recipients can elect to pay for the entire project cost out of pocket and be reimbursed or elect a "Two-Party Authorization" process by which the property owners minimize out-of-pocket expenses by paying only for the design services out of pocket and the grant funds are then paid to the contractor in a two-party check that has to be endorsed by both the property owner and the contractor. This process is riskier to the Installer as they have to rely on the property owner submitting completed documents in a timely manner to the County and then waiting approximately four weeks for the County to audit the file and process the payment. Due to this risk, not all participating S.E.P.T.I.C. installers are willing to partake in the tow-party authorization. However, property owners looking to pay out-of-pocket and get reimbursed to the County should apply and enter into agreement with the County prior to installation because reimbursements are not guaranteed and are contingent on the availability of funds but grant funds are allocated to the property owner when the grant agreement has been fully executed with the County.

Outreach
Outreach and engagement has been key to the success of the S.E.P.T.I.C. Grant Program. The District has worked with the Nature Conservancy and the North Shore Land Alliance to promote the grant program. This consisted of coordinated outreach to both towns and villages and property owners as well as dedicated staff to assist property owners through every step of the process. In 2021, The District and County worked with over 16 partner groups and offered over 14 public

presentations, 3 press conferences, 7 presentations to Towns and Villages, and an industry information exchange.

Responsibility Management Entity and Maintenance
It is also important to note that the New York State Department of Health Design Handbook for Residential Onsite Wastewater Treatment Systems identifies the need to develop a Responsible Management Entity type structure for these IA OWTS that includes defining program goals and requirements; educating engineers, contractors, and public on these technologies including design, site evaluation, construction, and maintenance; providing tracking of systems, maintenance verification and record keeping; confirming the availability of service providers for products to be used and establishing adequate authority, enforcement, and compliance incentives.

Currently, the District requires that the installation of the nitrogen-reducing systems include a three-year manufacturers parts warranty and a three-year maintenance agreement. Annual maintenance, at a minimum, is required for the life of the system and the property owner's failure to maintain the system in accordance with these requirements can result in the claw back of grant funds received. If a maintenance provider is not completing the maintenance in accordance with manufacturer certification and best management practices they can be removed from participating in the S.E.P.T.I.C. Program moving forward and the manufacturer would need to identify a new service provider to honor the existing agreements. The County's grant application portal was constructed with very basic maintenance tracking features for the first five years. The District is investigating additional RME and maintenance tracking tools for implementation in 2023.

Figure 3: Operation and Maintenance Requirements

RESULTS

The program was launched in May of 2021 with enough funding to provide 200 grants. The interest in the program is strong as it is providing property owners with solutions to wastewater water problems they have had to deal with for decades. Many of the installations occurred in areas that would be difficult for conventional systems as seen in Figure 3. To-date there have been 309 applicants, 187 current applicants, 54 executed grant agreements, and 29 installations with an additional 25 pending installation. A total of $380,000 has been reimbursed with an additional $200,000 being processed as indicated in Table 1.

Table 1: S.E.P.T.I.C. Funds Expended, Allocated, and Remaining

Item	Amount
Total Amount of funds allocated to Nassau County	$4,000,000.00
Total amount of funds Reimbursed as of 9/01/2022	$380,000.00
Total Amount of pending payments as of 9/01/2022	$200,000.00
Total Amount of Funds Allocated as of 9/01/2022	$1,080,000.00
Total Amount of Unallocated Funds Allocated as of 9/01/2022	$2,492,000.00
Average Grant Award	$20,000.00

The graphic below depicts the breakdown of grant applications received by the month. The orange lines indicate significant Grant Program events. The Program coverage received from Clean Water Vendor Day and the County Executive's Press conference announcing an increase in funding in July and August were by far the most successful at attracting applicants. Applicants have slowed in 2022 due to limited spots available until the funding for the next 200 systems is finalized this fall. Being cognizant of the most effective methods to increase public awareness and interest in the Program will allow the District to work with partners to host more of these types of events moving forward.

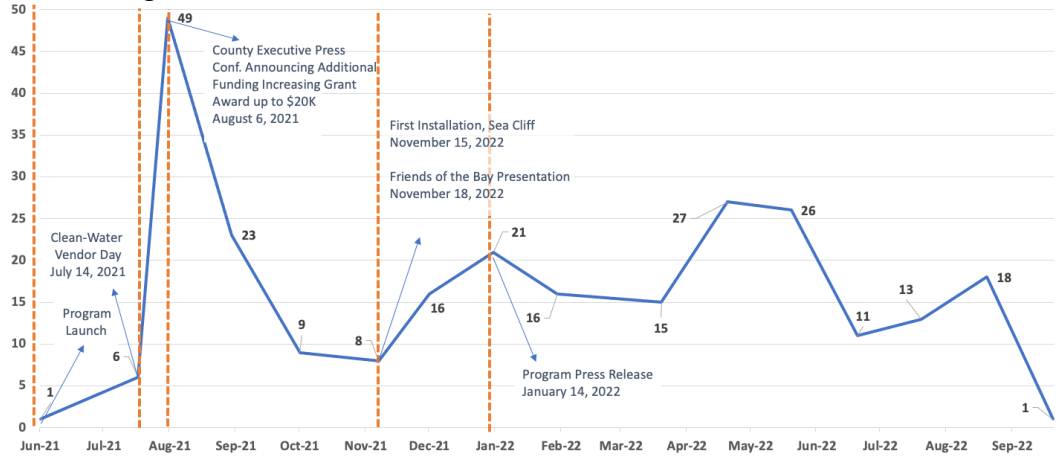

Figure 4. Nassau S.E.P.T.I.C. Applications as of 9.9.22

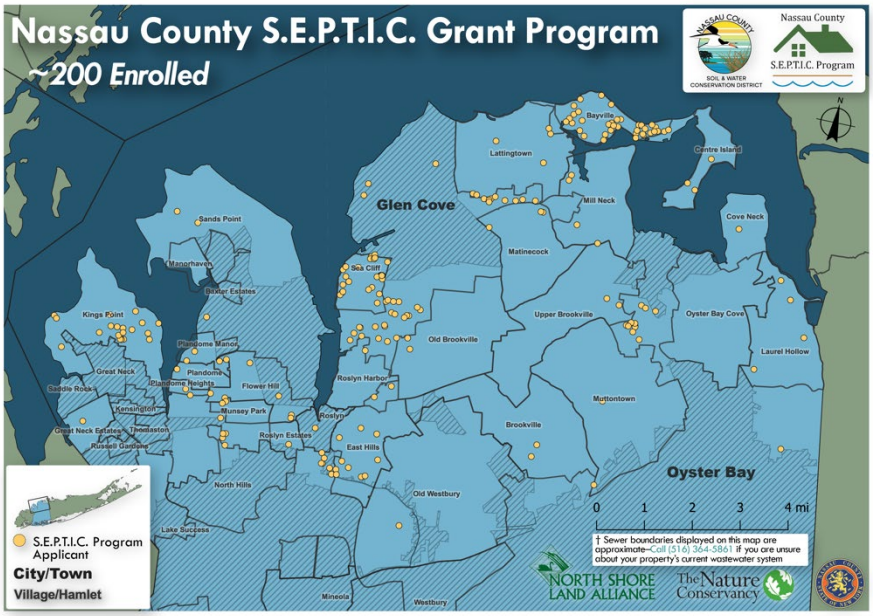

Figure 5: GIS Map of 200 Current Applicants

Of the installations paid out to date, the average cost for design and installation was $24,115.03, representing an average minimum out-of-pocket expense of just over $4,000.00. The project cost depends on specific site characteristics such as depth to water table, slope, lot size, location of system, and depth of the building sewer. As such, the installations costs can be significantly different from one lot to the next. The lowest cost installation was $20,850.00 which is in stark contrast to the highest installation cost of $40.950.00.

DISCUSSION

The materials and methods in this report detailed key components that jurisdictions need to consider and account for in developing a septic system grant program. However, the process must be adapted and modified for a grant program to remain successful. It is important to point out some of the obstacles and lessons learned throughout the process.

After the Program launch in May of 2021, it became apparent that there needed to be some program modifications to better serve the needs of the applicants. Standing weekly meetings between the District and the County have been held with participation of our partners The Nature Conservancy and the North Shore Land Alliance. In addition, weekly meetings have also been held with the County's IT Department to fine-tune the online process.

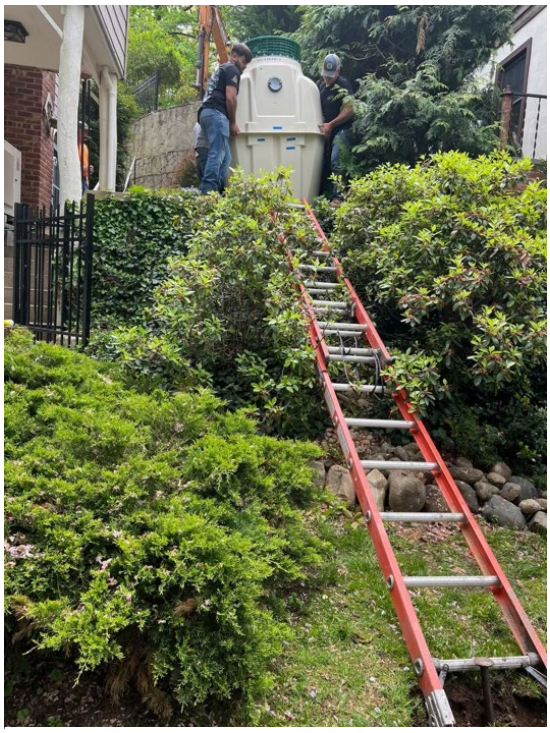

Figure 6. Installing a FujiClean Unit on Difficult to Access Site

The District put in place the following Program Modifications to further incentives and streamline the process for property owners looking to upgrade their existing cesspools and septic systems to help the County and State to realize nitrogen load reduction goals.

Identification and Allocation of Additional Funding

The initial grant amount of $10,000 was not enough to offset the cost of IA materials. On July 12, 2021 the Nassau County Legislature approved the County's request to appropriate $3,000,000 of ARPA funding to provide for a total grant of up to $20,000.00

Simplified the Application Process

Initially there were many questions about the condition of the existing system and the service history. Most property owners did not know this information and as a result either guessed their responses or grew frustrated and did not finish the application. The District decided to eliminate

questions on the application that were not applicable to nitrogen reducing septic systems, or changed the workflow so that certain information is collected at different stages of the Process.

Decision to Allow Two-Party Authorizations

Property Owners may now choose to assign their grant payment directly to an installer on the District's list to minimize out-of-pocket expenses. Initially the program was set-up for reimbursement only, this prevented many early adopters from moving forwards because they didn't have the funds easily available to install the system without a guarantee that they were going to receive the reimbursement.

Issue a Request for Expression of Interest (RFEI) for Designers and Installers

This process allows Installers and Designers who are interested in participating in the Grant Program to submit documentation through an online portal. If the interested companies meet State and County requirements, they are added to a list maintained by the District.

Consultation and Guidance to Local Jurisdictions

As mentioned, the permitting authority for retrofits and replacement of existing systems lies at the local City, Town, or Village level. These systems are totally new to most building officials, and they requested some guidance to follow when reviewing Designer's plan submissions. The District's consultant produced several guidance documents that outlined industry recognized procedures and construction details that should be included on a site plan. There will be additional work in regards to multi-jurisdictional permitting authorities in 2023.

LOOKING FORWARD

As Program success and momentum continue to grow, the District is dedicated to addressing unresolved program obstacles such as working with various permitting jurisdictions to streamline permits for repairs and replacements, developing unified permitting procedures, developing a streamlined management system for tracking system performance, inspections, and maintenance, and implementing a septic industry training program.

Due to the success of both the Nassau and Suffolk Programs, on July 7th, 2022, NY State announced that the Suffolk County's SIP program had been allocated an additional $20 million and that Nassau County's S.E.P.T.I.C. grant program has been awarded an additional $2 million in Environmental Facilities Corporation (EFC) funding. This funding to these Long Island counties is a testament to not only the public's understanding and acceptance of these systems but of the bigger need for adequate waste disposal that had largely gone ignored until recently. As funding for these types of grant programs are beginning to gain momentum, the Authors hope this paper provides guidance and direction to those jurisdictions looking to develop a septic system grant program.

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APPENDICES – LIST OF NASSAU COUNTY, NY S.E.P.T.I.C. PROGRAM RESOURCES

1. Nassau County S.E.P.T.I.C. Grant Program Portal
2. Nassau County S.E.P.T.I.C. Grant Program Information
3. Nassau County S.E.P.T.I.C. Resources Page
4. Nassau County S.E.P.T.I.C. Industry Resources Page