

COUNTY OF SUFFOLK



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SUFFOLK COUNTY DEPARTMENT OF HEALTH SERVICES GENERAL GUIDANCE MEMORANDUM # 34

FOR PROCEDURES FOR THE EVALUATION AND APPROVAL OF SINGLE-FAMILY RESIDENTIAL INNOVATIVE AND ALTERNATIVE ONSITE WASTEWATER TREATMENT SYSTEMS

1) OVERVIEW

This guidance memorandum was prepared to serve as an integrated Standard Operating Procedure for staff who manage the I/A program. It will also serve to educate regulated parties and the public on the program and its associated procedures, to ensure that all stakeholders understand the approval process for Innovative and Alternative Onsite Wastewater Treatment Systems (“I/A OWTS”) in Suffolk County. It also provides the framework for leveraging resources, and ensuring continuous input from industry and regional partners to provide for the most effective I/A OWTS program possible. Suffolk County’s I/A OWTS program is distinguished by:

- The technology verification protocol of I/A OWTS, which was established based on the work completed during the New England Coastal States and Long Island Data Sharing Project.
- The County’s commitment to long term monitoring of I/A OWTS technologies, which includes County personnel obtaining and analyzing samples from I/A OWTS technologies at every phase of approval.
- Creating strong partnerships to create, implement, and improve the County’s I/A OWTS program for long term effectiveness. These partnerships include, but are not limited to, government organizations, non-governmental organizations, academia, manufacturers, the liquid waste industry (installers and operation/maintenance), property owners, and design professionals.

2) AUTHORITY

The Suffolk County Sanitary Code sets forth requirements for approval of innovative and alternative onsite wastewater treatment systems in Suffolk County. The statutory authority for these guidelines can be found in Article 19 with detailed specifications found in the “Standards Promulgated Under

Article 19 for the Approval and Management of Innovative and Alternative Onsite Wastewater Treatment Systems”.

3) PURPOSE

In accordance with Article 19 of the Suffolk County Sanitary Code, Suffolk County Department of Health Services (Department) is the Responsible Management Entity tasked with the role of facilitating development and use of I/A OWTS in Suffolk County as an environmental conservation and public health protection measure. The Department reviews, tests and approves new I/A OWTS technologies for inclusion on a list of all approved technologies for use within Suffolk County in accordance with “Standards Promulgated Under Article 19 for the Approval and Management of Innovative and Alternative Onsite Wastewater Treatment Systems” (“Article 19 Standards”).

Manufacturers and/or design professionals (Vendor) may submit an application to the Department for their I/A OWTS technology to receive approval as an Experimental, Pilot, Provisional, or General Use I/A OWTS. The Department acknowledges that results from individual sites may vary over time. The intent of this guidance memorandum is to document procedures and strategies to guide the Department’s review of I/A OWTS technologies. Also, this elaboration of the Article 19 standards describes the methodology for the Department to determine and verify a technology’s ability to achieve treatment of total nitrogen (TN) to a dataset average of 19 mg/L.

It should be noted that this document discusses I/A OWTS technology approvals for residential use only. Similar means will be used for commercial I/A OWTS technology approvals in future guidance documents.

4) REGIONAL PARTNERS

In order to gather useful data and/or information from established I/A OWTS programs and past/current projects and to expedite the flow of current information, the Department has working relationships with other jurisdictions, non-governmental organizations and institutions that have experience with I/A OWTS sampling, tracking, enforcement, permitting, design, and assessment programs. Such relationships have served to be invaluable sources of information, data, technology, examples of successful program implementation and lessons on potential problematic situations. The following regional partners have provided and continue to provide guidance to the Department:

- **New York State Department of Environmental Conservation (NYSDEC) and Long Island Nitrogen Action Plan (“LINAP”):** The NYSDEC has partnered with Suffolk County to help improve wastewater treatment within Suffolk County to protect water resources. The NYSDEC has provided grant funding for the Suffolk County Septic/Cesspool Upgrade Program Enterprise (“SCUPE”) for the evaluation of I/A OWTS, development of an I/A OWTS program, and to initiate the Subwatersheds Wastewater Plan to prioritize areas in need of improved wastewater treatment. The SCUPE funding enabled the County to hire start-up staff for the I/A OWTS Program and a Responsible Management Entity (RME). It also provided funding for the Septic Improvement Program (SIP, also known as “grant-loan program”). Overall, these programs are early actions in the NYSDEC Long Island Nitrogen Action Plan, a multiyear initiative to reduce nitrogen in Long Island’s surface and ground waters, in which Suffolk County participates as a partner.

- **United States Environmental Protection Agency (EPA):** The EPA has facilitated the New England Coastal States and Long Island Data Sharing Project and initiated the Advanced Septic System Nitrogen Sensor Challenge to develop a sensor which can be placed in an I/A OWTS to monitor treatment. EPA is also spearheading the development of a Suffolk County Health Impact Assessment and a Triple Value (3V) systems and sustainability model, both important in characterizing impacts of septic upgrade programs. EPA's "2003 Voluntary National Guidelines for Management of Onsite and Clustered (Decentralized) Wastewater Treatment Systems" was instrumental in providing Suffolk County with the blueprint for the Responsible Management Entity and Maintenance Contract management model outlined in Article 19 of the Sanitary Code. Suffolk County has worked closely with the EPA on these projects. In addition, the EPA has historically supported several decentralized wastewater demonstration projects which were instrumental in laying the foundation for reliable I/A OWTS technologies in Suffolk County.
- **New York State Department of Health (NYSDOH):** NYSDOH has supported amending the Suffolk County Sanitary Code and Standards pertaining to the use of I/A OWTS technologies in accordance with the NYS Sanitary Code. Both NYSDEC and NYSDOH were consulted at all critical junctures of program development.
- **The State University of New York at Stony Brook Center for Clean Water Technology:** The Center is working to develop and commercialize affordable, reliable, easy-to-operate, and effective treatment systems with reduced infrastructure footprints for individual onsite wastewater that can significantly reduce nitrogen loads and other contaminants to ground and surface waters. The Center is also monitoring the removal of personal care products, pharmaceuticals and other contaminants of emerging concern in wastewater. The Center is currently installing natural reactive barrier I/A OWTS experimental technology on Suffolk County Park properties. The County has worked with the Center on these, and other, wastewater initiatives.
- **The Nature Conservancy (TNC):** The County has teamed with TNC to provide industry training to design professionals and for the promotion of I/A OWTS use within Suffolk County. TNC is also a vital participant and supporter of the US EPA Advanced Septic System Nitrogen Sensor Challenge.
- **Barnstable County Department of Health and Environment (DHE), Massachusetts Alternative Septic System Test Center (MASSTC):** Suffolk County has consulted, and will continue to collaborate with, the MASSTC regarding system performance based on the testing experience and I/A OWTS sampling methods. Suffolk County has adopted a modified version of Massachusetts' process for approving I/A OWTS technologies for use.
- **The University of Rhode Island (URI) and New England Onsite Wastewater Training Program (NEOWTP):** Suffolk County consulted with URI during the development and implementation of Suffolk County's I/A Septic Demonstration Program (both Phase 1 and Phase 2). Suffolk County has worked with the URI training program staff to develop and provide septic system training to design professionals and septic installers within Suffolk County in accordance with revisions to Suffolk County's Liquid Waste licensing requirements.

- **Maryland Department of the Environment (MDE):** Suffolk County consulted extensively with MDE and modeled Suffolk County's Septic Improvement Program (SIP) after Maryland's Bay Restoration Fund (BRF) Grant and Loan Program.
- **The New Jersey Pinelands Commission (NJPC) Alternate Septic System program:** The County consulted with NJPC and incorporated into the Suffolk County Sanitary Code Article 19 a requirement for an annual evaluation report based on the annual evaluation reporting completed by NJPC. Suffolk also toured a successful commercial constructed wetlands wastewater treatment site, as part of the 2014 Septic Tour (including MA, RI, and MD); a report is available on Suffolk County's website.

5) ANNUAL EVALUATION OF I/A OWTS

For continual program improvement and evaluation, the Department shall prepare an annual report outlining the progress of the I/A OWTS program within Suffolk County and recommending process improvements to increase the effectiveness of the program.

The report shall also provide an evaluation of I/A OWTS permitted to be installed in Suffolk County. The report shall also include an investigation of new I/A OWTS technologies not approved for installation in Suffolk County to ensure that performance verification standards represent the best available technologies. The report will include information regarding treatment performance, and re-evaluate the treatment standards to determine if they could be more stringent. This evaluation shall occur, at a minimum, on an annual basis, and more frequently if advances in technology so warrant.

6) GUIDANCE FOR SAMPLING AND APPROVAL

a) **General Requirements for Approval and Sampling:**

All I/A OWTS technologies must be approved by the Department for use in Suffolk County as either an "Experimental", "Piloting", "Provisional", or "General Use" system in order to be permitted for installation as an onsite wastewater treatment system in accordance with the Article 19 Standards. During each phase of approval, the I/A OWTS technology must undergo sampling as stated in the Article 19 Standards. The minimum sampling requirements and resulting combined TN average¹ outlined in **Table 1**, and defined in the Article 19 Standard, shall be required prior to a system receiving approval to move from one phase of approval to the next and eventually to the final approval phase known as "General Use." **Tables 2, 3, and 4** are the minimum sample parameters required for each phase of the I/A OWTS approval process.

TABLE 1: Summary Approval Chart for Residential Systems

Approval Phase	# of Systems	Sampling Frequency	Performance Requirement
Experimental	3 – 5 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
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	The dataset of all the 20 systems must have a combined average of 19 mg/L or less TN
Provisional 2	All Others in Provisional	Every 12 Months	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		Every 36 Months	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. For example, the minimum of 20 systems for Provisional Use includes the number of systems installed as part of Experimental and Piloting phases.

**Suffolk County Sponsored I/A OWTS Demonstration Program may permit a streamlined Pilot approval phase.*

***The combined average of the dataset in Experimental, Piloting and Provisional 1 is the requirement to achieve successful completion of that phase. The combined average of the dataset in Provisional 2 and General Use shall be evaluated to affirm compliance to maintain approval or disclose non-performance to be considered for revocation. See section of revocation of approval on page 13.¹*

¹ The Department utilizes the combined average of a technology's TN results in order to represent the overall ability of a technology. The Department believes that using an average is the best method of evaluating a technology because it is a true indication of how well a technology will protect the environment. Median tends to artificially lower TN results and is not a true indicator of mass loading. Other than Maryland, Suffolk County appears to be the only jurisdictions in close proximity that uses the true TN average to evaluate I/A OWTS performance. A combined average yields a true mass loading versus other methods of analysis. For example, if 4 systems are being sampled and technology A has 2 systems obtain treatment to 18 mg/L and 2 systems obtain 20 mg/L, then the combined average is 19 mg/L. If technology B has 3 systems obtain treatment to 16 mg/L and 1 system obtains 60 mg/L then the combined average is 27 mg/L. If a median analysis is used instead, then the result for technology A would be 19 mg/L and technology B would be 16 mg/L. Therefore, the Department believes that a combined average provides an improved method of analyzing a technology's performance.

TABLE 2: Sampling Requirements for Experimental and Piloting Use Approval		
Parameter	Sample Type	Testing Location
BOD ₅	24 h composite	Laboratory
Total suspended solids	24 h composite	Laboratory
pH	Grab	Test site
Temperature (wastewater)	Grab	Test site
Temperature (ambient air)	Grab	Test site
Effluent Alkalinity (as CaCO ₃)	24 h composite	Laboratory
TKN (as N)	24 h composite	Laboratory
Ammonia-N (as N)	24 h composite	Laboratory
Nitrite-N (as N)	24 h composite	Laboratory
Nitrate-N (as N)	24 h composite	Laboratory

TABLE 3: Sampling Requirements for First 20 Year-Round Provisional 1 Approval		
Parameter	Sample Type	Testing Location
BOD ₅	Grab or 24 h composite	Laboratory
Total suspended solids	Grab or 24 h composite	Laboratory
pH	Grab	Test site
Temperature (wastewater)	Grab	Test site
Temperature (ambient air)	Grab	Test site
Effluent Alkalinity (as CaCO ₃)	Grab or 24 h composite	Laboratory
TKN (as N)	Grab or 24 h composite	Laboratory
Ammonia-N (as N)	Grab or 24 h composite	Laboratory
Nitrite-N (as N)	Grab or 24 h composite	Laboratory
Nitrate-N (as N)	Grab or 24 h composite	Laboratory

TABLE 4: Sampling Requirements for Provisional 2 and General Use Approval		
Parameter	Sample Type	Testing Location
TKN (as N)	Grab or 24 h composite	Laboratory
Ammonia-N (as N)	Grab or 24 h composite	Laboratory
Nitrite-N (as N)	Grab or 24 h composite	Laboratory
Nitrate-N (as N)	Grab or 24 h composite	Laboratory

b) New England Coastal States and Long Island Data Sharing Project

- New England Coastal States and Long Island Data Sharing Project was developed to document and standardize the performance of I/A OWTS for nitrogen reduction and, therefore, to simplify and expedite the approval processes for these technologies.
- Technologies seeking Provisional or General Use approval for nitrogen reduction in jurisdictions within the New England coastal region, including Maine, Massachusetts, New Hampshire, Rhode Island and Suffolk County, NY may participate in the data sharing project by submitting a Test Plan Application maintained by the Department.

- A Vendor's participation in the data sharing project is optional. If a Vendor chooses not to participate, the number of systems outlined in the approval processes above must all be installed in Suffolk County.
- Vendors participating in the data sharing project shall install the number of systems outline in the approval processes above. A minimum of five (5) systems must be installed in Suffolk County, and the remainder of the systems can be split among any of the jurisdictions participating in the data sharing project.

c) Suffolk County-Sponsored I/A OWTS Demonstration Programs:

The Department may solicit participation in I/A OWTS Demonstration Program, whereby a Vendor installs, tests and maintains systems at no cost or at a reduced cost to a Property Owner(s). Systems being tested as part of a Demonstration Program may be subject to a streamlined approval process. Two rounds of septic demonstration programs have been conducted, wherein the Department has approved a technology for Provisional Use if 75% of the units installed have a combined total average effluent TN of 19 mg/L or less for at least 6 months of composite sampling.

The Department will require that technologies participating in a Demonstration Program have NSF 245 certification or United States Environmental Protection Agency (EPA) Environmental Technology Verification (ETV). In the alternative, a technology must have general use approval in at least 2 comparable jurisdictions.

The purpose of a Demonstration Program is to assess the design, operation, maintenance, installation, and overall ability of an I/A OWTS technology to meet nitrogen reduction objectives. A technology's successful completion of a demonstration program allows admittance into the Provisional phase, where rigorous testing and statistical protocols are utilized prior to granting general use approval. Although not used in Maryland or Rhode Island, Suffolk embraced the pilot/demonstration phase, and has sponsored two (2) Demonstration Programs that allowed field testing of I/A OWTS technologies, that have either NSF 245 or ETV certifications. The dual purpose framework of the program included:

- An assessment of system design, operation & maintenance, installation issues, and the overall ability of each technology to meet nitrogen reduction objectives in Suffolk County.
- A framework for *validation of local institutional and programmatic ability* to review, approve, install, and operate the systems, including accelerated construction of programmatic infrastructure. As part of this approach, Suffolk County dedicated significant staff resources to work with manufacturers, who also committed to terms of an intensive cooperative program, including:
 - industry training (designers, installers, O&M contractors)
 - regulatory training (procedures/standards to review/approve, and inspect)
 - cooperative process optimization; i.e., vendors working with Suffolk to optimize systems (recirculation rates, oxygen supply, etc.) given local influent strength, venting configurations, etc.
 - demonstration of systems to design professionals, non-governmental organizations (NGOs), civics, local gov'ts., etc.

The Septic Demonstration Program affords a more comprehensive evaluation of I/A OWTS technologies than the Pilot phase established under Article 19 Standards and, as such, Vendors participating in the demonstration program were subject to a streamlined path to Provisional approval. The following are unique to the Septic Demonstration Program:

- I/A OWTS Vendors agreed to install their treatment units within Suffolk County at selected residential sites while allowing an all access pass by Suffolk County Departments, NYSDEC, NYSDOH, local municipalities, non-governmental organizations, County residents, contractors and design professionals to scrutinize all aspects of the systems installed (e.g. design, installation, operation, maintenance, performance, etc.) under the supervision of the Vendor and the Department. Vendors were restricted from selling their products for use on residential lots until satisfactory completion of the Piloting phase established under the demonstration program. Demonstration sites are selected with strict scrutiny (e.g., non-seasonal, sufficient residents, etc.) to ensure appropriate conditions for validation.
- Vendors donated up to 5 systems of a specific technology for the Department to evaluate in terms of performance, operation and maintenance, installation requirements.
 - The Department oversaw the selection process of the residential sites where the systems would be installed, which was completed by a lottery process.
 - Only households who met specific criteria were allowed to submit applications.
 - Homes were occupied year round by 3 to 9 residents, provided water use records, and agreed to allow Department staff routine access to evaluate the systems.
 - They opened up their properties for industry tours and frequent sampling events.

Sites are used for industry training and tours to help build understanding of the technology in Suffolk County. Demonstration of I/A OWTS at private residences was recommended by The University of Rhode Island's New England Onsite Wastewater Training Program, where over 58 demonstration systems were installed and evaluated over 10 years to help guide Rhode Island's regulatory program.

d) Responsibility for Taking and Performing an Analysis of I/A OWTS Samples:

All I/A OWTS systems are required to be sampled to verify I/A OWTS technology treatment capabilities. All samples used for evaluation by the Department to approve an I/A OWTS for Piloting, Provisional, and General Use shall be taken when the I/A OWTS unit has reached equilibrium.

- Suffolk County will validate Experimental and Piloting phase I/A OWTS technologies by utilizing County personnel to obtain and analyze samples from the technologies to the extent Department resources permit.
- I/A OWTS manufacturers shall be responsible for obtaining and analyzing samples in accordance with Department requirements.

- Suffolk County is committed to periodically obtaining and analyzing samples from I/A OWTS technologies, to the extent Department resources permit, which have received Provisional or General Use approval to validate the continued effectiveness of the technologies to meet treatment objectives.

The responsibilities and procedures for sampling during each phase of approval shall be according to the following:

I. Experimental and Piloting Phase

1. Sampling and analysis of effluent from I/A OWTS during the Experimental and Piloting phases shall be completed by the Department, to the extent Department resources permit, for determination of a technology's approval to move to the next I/A OWTS approval phase.
2. Sampling points of each system shall be via sample port, manhole, etc., as approved by the Department.
3. Samples taken and used to calculate the TN average shall be 24-hour composite samples using an automatic composite sampling unit with refrigeration. The composite sampler shall withdraw a sample at no more than 1-hour intervals but no less than 30-minute intervals for a period of 24-hours.
4. The Department shall clean sample ports, manholes, etc. at least 24-hours but no more than 72-hours prior to commencement of the 24-hour composite sampling event.
5. Samples shall be analyzed by the Suffolk County Department of Health Services Division of Environmental Quality Public and Environmental Health Laboratory or Department of Public Works Division of Sanitation Laboratory. Under certain circumstances, samples may be analyzed by Stony Brook University's Center for Clean Water Technology laboratory.
6. TN levels shall be determined by summing the results of nitrite (NO_2), nitrate (NO_3) and total Kjeldahl nitrogen (TKN) of the analyzed 24-hour composite sample.
7. The Department shall maintain the data during Experimental and Piloting phases.
8. At the completion of the sampling timeframe, the Department will determine whether to approve the I/A OWTS for the next phase of use pursuant to meeting the technology requirements or require an additional period of testing in the current phase of use.

II. Provisional Phase

1. Sampling of effluent from all I/A OWTS during the Provisional phase shall be the responsibility of the Vendor or Vendor's certified operation and maintenance provider.
2. Samples shall be taken by a Department approved responsible party, for review by the Department for consideration of further approval.
3. The Vendor must submit a sampling plan to the Department for their I/A OWTS technology for review and approval prior to commencing the Provisional phase sampling per the Article 19 Standard.
4. A Vendor guidance document must be supplied to the Department for each I/A OWTS technology upon receipt of Provisional approval and prior to commencing Provisional phase sampling, which must include the designated sample collection location for that I/A OWTS technology.
5. The dataset of the samples taken for the first twenty (20) year-round installed systems shall be analyzed to determine the technology's performance for approval to the next phase.

6. Samples taken and used to calculate the TN average shall be grab or 24-hour composite samples.
7. Sampling collection must be taken and stored in accordance with the approved sampling plan, Vendor guidance document, and standard laboratory protocol.
8. The samples shall be analyzed by a New York State certified laboratory. All samples must maintain a chain-of-custody (e.g., custody seals, records) during transfer from the field to the laboratory, in the laboratory, among contractors, and subcontractors.
9. TN levels shall be determined by summing the results of NO₂, NO₃ and TKN of the analyzed grab sample.
10. The Vendor shall provide the Department a copy of the results of each sample event within 2-weeks of completion of the analysis by a New York certified laboratory.
11. The Department reserves the right to sample, test, or inspect any installed I/A OWTS units at any time during the Provisional phase to verify I/A OWTS performance and data provided by the Vendor, provided appropriate notice is given to the Property Owner. The Department expects to collect and analyze samples at least annually from the first twenty (20) year-round installed Provisional systems for each I/A OWTS technology.
12. At completion of the Provisional phase testing, the vendor shall submit results in a full technical report in a format acceptable to the Department for review and consideration of the I/A OWTS technology for General Use approval by the Department.
13. At the completion of the sampling timeframe, the Department will determine whether to approve the I/A OWTS for the next phase of use pursuant to meeting the technology requirements or require an additional period of testing in the current phase of use.
14. A technology may remain in residential Provisional approval phase no more than five (5) years after the installation date of the twentieth system unless Provisional approval is renewed at the Department's discretion.

III. *General Use Phase*

1. Sampling of effluent from all I/A OWTS during the General Use phase shall be the responsibility of the Vendor or Vendor's certified operation and maintenance provider.
2. Samples shall be taken by a Department-approved responsible party for review by the Department to provide long term data to ensure that the systems are operating in optimal configurations for ongoing denitrification.
3. Samples shall be taken no less than once every three years during the time of year determined by the Department.
4. Samples shall be withdrawn from the I/A OWTS unit at a sampling point within the system as identified by the Vendor guidance document.
5. Samples taken and used to calculate the TN shall be grab or 24-hour composite samples.
6. Sampling collection must be taken and stored in accordance with the Vendor guidance document and standard laboratory protocol.
7. The samples shall be tested by a New York State certified laboratory. All samples must maintain a chain-of-custody (e.g., custody seals, records) during transfer from the field to the laboratory, in the laboratory, among contractors, and subcontractors.
8. TN levels shall be determined by summing the results of NO₃, NO₂ and TKN of the analyzed grab sample.
9. The Vendor or Vendor's certified operation and maintenance provider shall provide a copy of the results of each grab sample event to the Department within 2-weeks of completion of the analysis by the New York certified laboratory.

10. The Department reserves the right to sample, test, or inspect any installed I/A OWTS units at any time during the General Use phase to verify I/A OWTS performance and data provided by the Vendor or Vendor's certified operation and maintenance provider, provided appropriate notice is given to the Property Owner. The Department expects to collect and analyze samples at least annually from twenty (20) year-round installed General Use systems for each I/A OWTS technology.

e) The Minimum Number of Samples Required for an I/A OWTS Technology Evaluation:

The number of samples stated in **Table 1** shall be the minimum prescribed number of samples required for each system when calculating the TN average during each phase of the approval process. Systems used for evaluation during the Experimental, Piloting, and Provisional phases to determine the eligibility of an I/A OWTS to move to the next approval phase must be from year-round single-family residences. The samples used to calculate the average shall be consecutive, except as permitted by the Department. Provisional Use sampling protocols were established based on the New England Coastal States and Long Island Data Sharing Project (require a minimum of twelve (12) samples from twenty (20) systems).

I. Experimental Phase

1. During the Experimental approval phase, a Vendor may install a minimum of three (3) but no more than five (5) I/A OWTS systems at year-round single-family residences.
2. Each Experimental I/A OWTS unit installed must be sampled monthly for a minimum period of 12-months after the I/A OWTS has reached equilibrium as determined by the Department and/or Vendor.
3. The average TN results shall be calculated using the results from at least 75% of the systems for at least 12-months of samples from each system. The average TN must be 19 mg/l or less.
 - a. Note if only 3 systems are installed, all 3 must have a combined average total nitrogen of 19 mg/l or less for a minimum of 12-months of consecutive sampling.
 - b. The Department may use any consecutive 12 months of sample data for each system. Note, more than 12-months of data may be used for any system but is not required.

II. Piloting Phase

1. During Piloting approval phase, a Vendor may install a minimum of eight (8) but no more than twelve (12) I/A OWTS systems at year-round single-family residences.
2. Each Pilot I/A OWTS unit installed must be sampled monthly for a minimum period of 12-months after the I/A OWTS has reached equilibrium as determined by the Department and/or Vendor.
3. The average TN results shall be calculated using the results from at least 75% of the systems for at least 12-months of samples from each system. The average TN must be 19 mg/l or less.
 - a. Therefore, if eight (8) to twelve (12) systems are installed, a minimum of six (6) systems (based on 75% of 8 systems) must have a combined average TN of 19 mg/l or less for a minimum of 12-months of consecutive sampling data.
 - b. The Department may use any consecutive 12-months of sample data for each system. Note, more than 12-months of data may be used for any system but is not required.

III. Provisional Phase

1. During Provisional approval phase, a Vendor is not limited to the number of systems that can be installed, but the first twenty (20) year-round single-family residences systems installed (referred to as Provisional 1 in **Table 1**) must be sampled in accordance with the Article 19 Standard and this Guidance Document to obtain General Use approval.
 2. Each of the first twenty (20) year-round Provisional I/A OWTS units installed must be sampled bi-monthly for a minimum period of 24-months after the I/A OWTS unit has reached equilibrium. A system is assumed to have reached equilibrium after 3-months of operation.
 3. In order for a technology to successfully complete the Provisional phase, the average of all the total nitrogen results of the first twenty (20) year-round systems must be 19 mg/l or less.
 - a. The Department may use any consecutive 24 months of sample data for each system.
 - b. Note, more than 24-months of data may be used for any system but is not required.
 4. Any seasonal single-family residence or year-round single-family residence above the initial twenty (referred to as Provisional 2 in **Table 1**) shall have a grab sample taken and analyzed by a New York State certified laboratory at least once a year.
- f) The annual combined TN average of the dataset of all systems installed in Provisional 1 and 2 shall be evaluated to affirm compliance to maintain approval or disclose non-performance to be considered for revocation. See section of "**Revocation or Suspension of Experimental, Piloting, Provisional, or General Use Approval**" section.
- g) **Invalidating Samples from the I/A OWTS Evaluation During the Experimental and Piloting Phases:**

Sample results which are to be analyzed under the technology approval shall be taken once a system has reached equilibrium as determined by the Department and/or Vendor. The Department shall consider an I/A OWTS at equilibrium after a three (3) month period unless actual field sampling results are used to determine if the operation is at equilibrium.

Proper documentation of the reason for exclusion must be submitted in a format acceptable to the Department. No more than 10% of systems of a specific technology shall receive exclusion.

I. Laboratory/Sample Error

1. Experimental and Piloting Phases
 - a. Laboratory errors at Suffolk County facilities due to sample holding times or temperatures, inadequate samples volumes, sampling technique, etc. shall be documented and omitted from the evaluation of the I/A OWTS technology.
2. Provisional and General Use Phases
 - a. Laboratory errors at non-Suffolk County facilities due to sample holding times or temperatures, inadequate samples volumes, sampling technique, etc.
 1. Grab Samples shall be retaken from the I/A OWTS unit immediately upon discovering such error and re-analyzed by the New York State certified laboratory.

II. Mechanical or Electrical Failure

1. Experimental and Piloting Phases

- a.The Department shall be notified immediately (within five business days) by a Vendor of a failure of a pump, mixer, airlift, aerator, power, and/or control panel due to faulty equipment or power outage. The Vendor shall submit documentation of such failure to the Department for review. If the Department deems the failure impaired treatment then the sample may be omitted from the evaluation of the I/A OWTS technology.
 - b.The Vendor shall correct such failure immediately.
2. Provisional and General Use Phase
 - a.Samples due to mechanical error may not be omitted from the sample results.

III. Homeowner Error

1. Experimental and Piloting Phase
 - a.If the system comes out of equilibrium as a result of the introduction of biocides by a homeowner, no more than three (3) months shall be allowed for the system to return to equilibrium. All manufacturers can submit a written request for exclusion of data from a specific site based on homeowner misuse or other reason out of the control of the Vendor and/or Vendor's certified operation and maintenance provider.
 - b.The Department shall be notified immediately (no more than one month after the discovery of the error) by a Vendor of a homeowner error that may have caused reduced treatment of an I/A OWTS system. Homeowner error can be, but not limited, to the following:
 1. Introduction of chemicals to the system such as paints, water softener backwash, cleaning agents, medications in excess quantities.
 2. Introduction of excessive amounts of non-biodegradable products to the unit such as baby wipes, cigarettes, toiletries, rags, etc.
 3. Cutting power to the treatment unit either inadvertently or on purpose
 - c.The Vendor shall submit documentation of such failure to the Department for review. If the Department deems the error has resulted in impaired treatment, then the sample may be omitted from the evaluation of the I/A OWTS technology.
2. Provisional and General Use Phase
 - a.Samples due to homeowner error may not be omitted from the sample results.

h) Revocation or Suspension of Experimental, Piloting, Provisional, or General Use Approval

If there is non-performance shown in the dataset of a technology's sample results that is causing an exceedance of performance requirement, the Department reserves the right to revoke or suspend the approval status of such technology. Action shall be taken in the following manner depending on the approval phase that the technology is in. In addition, if significant nuisance problems and/or if the technology or system has been determined to be a public health threat by the Department, the system may be ordered to be removed at the Vendor's expense.

I. Experimental and Pilot Phases

1. Failure of a technology within Experimental or Piloting phases to reach equilibrium and/or functioning performance level within two years of installation shall result in revocation of the technology's current approval phase, thus no additional permits shall be granted for the

installation of the technology. Manufacturers may reapply to the Department for consideration of their participation in an approval phase along with sufficient documentation of the technology's improvements.

II. Provisional or General Use Phases

2. Failure of a technology within Provisional or General Use phases to consistently meet the Department's performance requirements shall result in the following actions:
 - a. **Minor Violation:** If the annual 12-month rolling average effluent TN concentration of a technology's systems at equilibrium is between 19 mg/L and 30 mg/L, then the Department shall require a Vendor to submit a remedial action plan and timeline to improve the technology's performance. Failure to do so will result in revocation or suspension of the technology's approval for Provisional or General Use.²
 - b. **Major Violation:** If the annual 12-month rolling average effluent TN concentration of a technology's systems at equilibrium exceeds 30mg/L³, the Department may revoke or suspend a technology's approval for Provisional or General Use.

NOTE: All Experimental I/A OWTS must be installed in a manner that a system meeting Conventional OWTS standards is immediately available should the Experimental I/A system fail or be deemed to be not working. I/A OWTS technology certified for General Use can be installed at any site where a Conventional OWTS in compliance with Article(s) 5 and/or 6 of the Suffolk County Sanitary Code could be approved. All I/A OWTS units require a wastewater permit issued by the Department prior to installation at a specific location. This applies to I/A OWTS units installed for Experimental, Piloting, Provisional and General Use.

EFFECTIVE

This document is for guidance purposes only and becomes effective for all I/A OWTS technology received for approval after the date of this memorandum. This document is not a standard and is not meant to substitute for the discretion and common sense of the review staff.

Signature on file

Issued by: Craig Knepper, P.E., Chief
Office of Wastewater Management

² TN of 30 mg/l was utilized to differentiate between minor and major violations based on Maryland's Department of the Environment requirements for I/A OWTS. Based on their program, it is assumed that the influent TN concentration is 60 mg/l, and an I/A OWTS is required to reduce the influent TN concentration by 50% or to 30 mg/l or less.