



**TOWN OF FALMOUTH**  
Office of the Town Manager & Select Board  
59 Town Hall Square, Falmouth, Massachusetts 02540

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**TO:** Mike Renshaw, Town Manager  
**FROM:** Peter Johnson-Staub, Assistant Town Manager *PJS*  
**SUBJECT:** Urine Diversion Feasibility Study Status Report  
**DATE:** August 28, 2024

The working group you appointed for this project (myself, Steve Leighton as a representative of the Water Quality Management Committee, and Kim Comart as a representative of the Freshwater Pond Advisory Committee) has been meeting weekly with representatives of the Massachusetts Alternative Septic System Test Center (MASSTC) and its consultants to move this project forward. As you know, this feasibility study seeks to address a number of complex questions some of which rely upon answers from the state plumbing board and the Massachusetts Department of Environmental Protection.

We will not be able to meet the ambitious goal to complete the feasibility study by the end of this month as called for in the scope of work of the intergovernmental agreement executed with MASSTC. I am more than satisfied with MASSTC's work on this project to date. We are making steady progress and learning a lot about the challenges and opportunities for Urine Diversion as a potential option for meeting the nitrogen reduction targets required by state regulation. The members of the working group and the MASSTC staff lead for this project, Bryan Horsley, are confident that the feasibility study will be completed by December so the Town will have the information required to make an informed decision about funding a pilot project at the April 2025 Annual Town Meeting.

Mr. Horsley has provided a detailed status report which is attached for your reference.

**CC:** Select Board  
Keith Schwegel, Finance Committee Chair  
Kim Comart  
Steve Leighton  
Bryan Horsely

//UD Status Report Cover 08-28-2024

## Falmouth Urine Diversion Pilot Project Planning Status Report

August 28, 2024

Beginning on May 9, 2024, the Town of Falmouth entered into an intermunicipal agreement (IMA) with the Massachusetts Alternative Septic System Technology Center (MASSTC) to evaluate the feasibility of a future urine diversion (UD) pilot project as has been discussed around town since August of 2023. MASSTC subsequently subcontracted with a team of expert ecological sanitation and urine diversion consultants on June 20, 2024, and began working on the project scope shortly thereafter. The scope of work for this IMA aims to provide the Town with the information necessary to determine if financial investment in a future UD pilot project is in the Town's best interest. Specifically, the Town is seeking to determine if UD can gain all necessary regulatory approvals and if it can be utilized as a nutrient reduction strategy in watershed management plans.

The IMA project team has met weekly since their first meeting on June 20, 2024. Team members include Assistant Town Manager Peter Johnson-Staub, Water Quality Management Committee representative Steve Leighton, Freshwater Ponds Committee representative Kim Comart, MASSTC Project Assistant Bryan Horsley, MASSTC Director Brian Baumgaertel, MASSTC Project Manager Sara Wigginton, and MASSTC's expert consultant team: Conor Lally and David Luken of Nutrient Networks, Abe Noe-Hays and Arthur Davis of the Rich Earth Institute, Kelsey McWilliams of Point of Shift, and Mathew Lippincott a regulatory expert from the University of Michigan. During weekly meetings, the team has discussed strategies, reported progress, and made decisions about how a future project should be designed and implemented.

At the start of the IMA project the Town set a series of deadlines for completion of each individual task, all of which fell on or before August 30, 2024, with the intention of being prepared to request funding for a future pilot project within the Town's capital budget process. Prior to initiation of the IMA the project team acknowledged the very short timeline for completing work which included regulatory approvals from both the Massachusetts Department of Environmental Protection (MassDEP) and the Massachusetts Board of State Examiners of Plumbers and Gas Fitters (commonly referred to as the state plumbing board). Realizing that timely results were dependent on regulatory decisions that notoriously take time, the IMA project team decided to take on the project with optimism and intention to do as much as possible in the available time frame.

As of writing this status report it has become apparent that many of the tasks within the IMA scope of work will require more time to complete and will unfortunately not be ready in time to include a funding request in the current capital budget planning cycle. Despite not meeting the intended timeline the project team has made significant progress toward completion of the scope tasks and has built momentum toward success at identifying regulatory pathways, initiating approval processes, and engaging with the workforce needed to manage a future UD pilot project. Following are specific updates on each task within the IMA project scope of work.

## Participant Agreements

The future UD pilot project will entail the voluntary installation of UD toilet fixtures and collection systems in the homes of Falmouth residents, which presents some concerns in terms of funding and liability. The project team envisions that all costs (up to a financial cap yet to be determined) for UD system assessment, design, permitting, installation, and monitoring will be paid by the Town and managed by MASSTC. Any desired work such as additional toilet fixture installations and/or related renovation work that exceeds that financial cap would be paid by the participants. To ensure that homeowners who have installed UD systems with funds from this project remain committed to participate throughout the project period, the project team envisions a financial incentive in the form of a loan forgiveness program. The intention of a participant agreement is to document and agree upon both the project financial structure, the respective responsibilities of the participants, the project management team, and the Town, and to address the liabilities of all parties involved.

While the team has developed a draft agreement, additional information is needed including an approved monitoring plan from MassDEP to confirm UD system design details, final cost estimates for installation of UD systems to inform subsidy amount, approval of UD toilet systems by the State Plumbing Board, and a review of liability and legal considerations. The project team is gathering this information, although the timeline for regulatory approvals is difficult to predict.

## Toilet Fixture Selection and Approval

The project team has developed a list of suitable UD toilet fixtures, including split bowl UD toilets, urine only toilets and waterless urinals, although final selection will depend on which systems are able to gain the approval of the State Plumbing Board.

The project team is actively working with contacts at the local level (plumbers and plumbing inspector) and at the State Plumbing Board to review project plans and to prepare an application for approval of fixtures and collection system configurations. This same process was successful during the previous 2012 Falmouth Eco-Toilet Project at gaining provisional approval for various UD and composting toilet systems and the team is optimistic that the same approval pathway is achievable for this planned project. While the timeline for regulatory determinations is difficult to predict we can expect to continue progressing through this process and reach a determination.

## Approval of Monitoring Plan

The purpose of this task is to develop a plan for monitoring nutrient removal performance of installed UD systems and to gain approval from MassDEP for utilization of resulting data toward the Town's watershed plan nutrient accounting. Following a series of communications with MassDEP, as of August 27, 2024, we have been successful in reaching a determination for our intended approval of a watershed based nutrient accounting method. This determination

allows the Town to measure urine nutrients that are collected and removed from a particular watershed and to claim credit for those nutrients toward watershed targets (TMDLs). With this approach, UD participants would have the freedom to install any number of UD toilets (one or more) and to use them at any intensity they desire during and after the pilot project.

Furthermore, at the start of this IMA project period MassDEP had indicated that the future pilot project would need to advance UD systems to general use approval following the approval pathway designed for IA septic systems, which would entail installing and monitoring at least 50 UD participating residences for 3-years. With this newly determined watershed-scale nutrient accounting approach general use approval is not required and that the Town may be able to achieve the same objectives by piloting less than 50 UD installations for a period of less than 3 years, although greater numbers of installations will produce more robust data and accurate estimates for UD sourced nutrient removal credits in future watershed plans. MassDEP has offered to provide a recommended number of installations and monitoring timeline for the Town's planned pilot project.

While this determination is a significant achievement toward the Town's objectives it has advanced our team to the next steps in attaining full approval from MassDEP, which entails completing an official application for provisional approval and developing a quality assurance project plan (QAPP) that will thoroughly describe all steps in monitoring, sampling, analysis, data management, etc. We expect to complete these next tasks over the next couple of months.

### Collection and Storage Systems Design and Approval

Each individual UD installation will require a site-specific plan that shows the complete plumbing system including the toilet fixture, pipes connecting to a storage tank, high water overflow to septic system, venting, pump out ports, etc. The project team is working to review existing template UD system drawings with local plumbers, the State Plumbing Board and MassDEP to ensure that future pilot project site plans meet all local and state regulations. While we have received valuable input, final approvals have not yet been attained and the project team is actively working toward those approvals. With the MassDEP nutrient credit determination completed we plan to shift more focus to this effort and the previous task of toilet fixture approvals.

### Assess Prospective Participants

Thanks to outreach help from local non-profit groups, we have a list of more than 150 potential participants. To conduct a preliminary assessment of these potential participants the project team has developed a list of survey questions that aim to assess project sites for UD system compatibility. In order to complete this survey, the project team needs final determinations from MassDEP and the State Plumbing Board regarding approvals of UD toilet fixtures, collection and storage systems, and monitoring requirements. Ongoing cost estimating work will inform the amount of financial subsidy the Town will offer. Once we have this necessary

information the project team will contact potential participants and request completion of the preliminary assessment survey, with the goal of identifying the most suitable sites for the future pilot project.

### Urine Collection and Disposal Plan

A key feasibility issue for this planned UD pilot project is how to manage the volume of urine that is collected in participating households. The current management scheme would entail having a licensed septage hauler and/or MASSTC staff pump out UD storage tanks and dispose of the contents at wastewater treatment plants. The project team has confirmed two licensed septage haulers who are willing to provide pumping and disposal services for this project and for UD participants on an ongoing basis. MASSTC is also willing to set-up a pumping rig which may be preferable to working with contracted haulers as it may be more efficient to complete volume measurement and sampling at the same time as removing the urine from each site. Additionally, the option to freeze-concentrate the urine could reduce the total volume by more than 6-times, which would make the option of transporting further distances (perhaps to Vermont where the urine could be recycled as fertilizer) more feasible. With this information we feel confident that managing the urine volume from this project will not be an issue, although the project team plans to continue conversations about additional collection and disposal options.

### Supplementary Funding and Geographic Expansion

MASSTC has applied for a grant from MassDEP to supplement funding for UD pilot installations and monitoring but has yet to hear a response. We are open to applying for additional grants and are keeping watch for opportunities. The US EPA funded Southeast New England Program (SNEP) recently announced new funding opportunities and is targeted as a next source to apply to. Potential participants from other towns on Cape have expressed interest and notably among Martha's Vineyard residents. Although no funding opportunities have been identified to support non-Falmouth residents at this time, the project team intends to continue working to identify means to support both Falmouth and non-Falmouth residents which would reduce the burden on Falmouth to fund all of the installations and monitoring needed to collect the necessary data.

### Report

The project team is actively developing a draft report to document all efforts and information gathered during the scope of this project and will finalize and submit at the completion of this IMA, which ends on November 29, 2024.

