

Town and County of Nantucket Select Board • County Commissioners

Brooke Mohr, Chair
Thomas M. Dixon
Matt Fee
Dawn E. Hill Holdgate
Malcolm W. MacNab



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C. Elizabeth Gibson
Town & County Manager

AGENDA FOR THE JOINT MEETING OF THE SELECT BOARD AND BOARD OF HEALTH SEPTEMBER 10, 2024 - 5:00 PM REMOTE PARTICIPATION VIA ZOOM WEBINAR NANTUCKET, MASSACHUSETTS

YOU TUBE LINK FOR VIEWING ONLY:
https://youtube.com/live/r_zQRLDJWUY

ZOOM WEBINAR REGISTRATION LINK TO VIRTUALLY ATTEND MEETING:
https://us06web.zoom.us/webinar/register/WN_X-el-giNSf6TTksEhHDtQA

- I. CALL TO ORDER***
- II. MEETING WITH MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION REGARDING PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS)***
 - 1. Introductions**

Welcome and Agenda Overview
Panelist Introductions
Town Manager Welcome
 - 2. Town of Nantucket PFAS Cycle and Associated Projects**

Town staff will provide a high-level overview of the PFAS cycle, as well as the work that the Town is doing to address PFAS issues. This will include an update on specific projects that are underway to address key points in the PFAS cycle, major Town accomplishments, and the resources associated with the Town's efforts. After this section, there will be a brief Q&A discussion with the panelists.
 - 3. PFAS Projects: A Deeper Dive**

Two of the Town's projects are particularly impactful and support a deeper level of discussion - the Landfill Groundwater and Surface Water Sampling project, and the Town's response to drinking water regulations and testing. Both projects will include a status update and highlight the Town's next steps in the projects. After this section, there will be a brief Q&A discussion with the panelists.
 - 4. Massachusetts DEP Update**

Representatives from the Massachusetts Department of Environmental Protection will discuss current and future drinking water standards, specific projects the impact

the Town, the MCP process at a high-level, and key focus areas for the Town to remain prepared, proactive, and in compliance with regard to PFAS and water quality standards. After this section, there will be a brief Q&A discussion with the panelists.

5. Nantucket Land and Water Council Update

6. Nantucket PFAS Action Group Update

7. Action Items and Closing

After any final questions of the panelists, we will close the session by sharing existing and upcoming resources for Nantucket residents related to PFAS, as well as avenues for follow-up after the session.

PANELIST LIST

Facilitator:

- Catherine Carter, Vice President, Raftelis, Inc.

Massachusetts Department of Environmental Protection:

- Gerard Martin, **Regional Director**, Bureau of Waste Site Clean Up
- John Handrahan, **Deputy Regional Director**, Bureau of Waste Site Clean Up
- Angela Gallagher, **Chief, Site Management Section**, Bureau of Waste Site Clean Up
- Navpreet Borowski, **Environmental Analyst**, Bureau of Waste Site Clean Up
- Rachel Stevens, **Environmental Analyst**, Bureau of Waste Site Clean Up
- Mark Dakers, **Chief, Solid Waste Section**, Bureau of Air and Waste
- Jennifer Wharf, **Environmental Analyst**, Bureau of Air and Waste

Nantucket Select Board:

- Brooke Mohr, Chair
- Matt Fee, Vice Chair
- Thomas Dixon, Member
- Dawn Hill Holdgate, Member
- Malcolm MacNab, Member

Nantucket Board of Health:

- Malcom MacNab, Chair
- Meredith Lepore, Vice Chair
- James Cooper, Member
- Kerry McKenna, Member
- Ann Smith, Member

Nantucket PFAS Action Group:

- Ayesha Kahn, Co-Founder

Nantucket Land and Water Council:

- Emily Molden, Executive Director

Town of Nantucket Staff:

- C. Elizabeth Gibson, Town Manager
- Gregg Tivnan, Assistant Town Manager
- Charles Larson, Manager of Strategic Projects
- Roque Miramontes, Public Health Director
- John Hedden, Chief Environmental Officer
- Mark Willett, Water Department Manager
- David Gray, Sewer Department Manager
- Christopher Lowe, Solid Waste Manager
- Michael Cranson, Chief, Nantucket Fire Department

Consultants:

- George Aronson, Principal, Commonwealth Resources Management Corporation
- Andy Miller, Associate, CDM Smith, Inc.
- Emily Schick, Principal, CDM Smith, Inc.
- Eric Spargimino, Environmental **Engineer**, CDM Smith, Inc.

III. ADJOURNMENT



AGENDA PROTOCOL

For all Town of Nantucket Boards, Committees, Commissions, Work Groups, Councils and Trusts
(herein collectively referred to as "Committees" in this document)

Roberts Rules: Town of Nantucket Committees follows Roberts Rules of Order to govern its meetings as per the Town Code Charter.

Public Comment: Public Comment is to bring matters of public interest to the attention of the Committees. At the Committee's discretion, matters raised under Public Comment may be directed to Town Administration and/or appropriate departmental staff, or may be placed on a future agenda, allowing all viewpoints to be represented before the Committee takes action, if any. Except in emergencies, the Committee will not normally take any other action on Public Comment in its sole discretion.

To facilitate that any individual who wishes to provide Public Comment has the opportunity and to ensure the ability of the Committee to conduct its business in an orderly fashion, the following rules and procedures are adopted consistent with the United States Constitution and the Massachusetts Declaration of Rights.

The agenda for regular Committee meetings will include a Public Comment period at the beginning of the meeting unless there is more urgent business for the Committee to take up first. This time is reserved for speakers to address the Committee on matters that are not related to any other Agenda item. If a speaker wishes to address the Committee on a matter that is related to another Agenda item, the Chair will accept public comment when that Agenda item is reached during the meeting.

All speakers are encouraged to present their remarks in an orderly and peaceable manner, without disruption to other speakers.

All remarks will be addressed through the Chair of the meeting.

The Chair of the meeting may not interrupt speakers who have been recognized to speak, except that the Chair reserves the right to terminate speech which is not protected under the United States Constitution and the Massachusetts Declaration of

Rights because it constitutes true threats, incitement to imminent lawless conduct, or engages in conduct that disrupts other speakers.

Each speaker may not exceed three (3) minutes during any Public Comment portion of the meeting.

Disclaimer: Public Comment is not a time for debate or response to comments by the Committee. Comments made during the Public Comment period do not reflect the views or positions of the Committee. Because of free speech principles, the Committee does not have authority to prevent all speech that may be upsetting and/or offensive made during the Public Comment period.

Unanticipated Business: Topics not reasonably anticipated by the Chair 48 hours in advance of the meeting may be brought up for discussion in accordance with the Open Meeting Law.

Public Participation: The Committee welcomes valuable input from the public at appropriate times during the meeting with recognition from the Chair at their sole discretion. For appropriate agenda items, the Chair will introduce the item and take public input. Individual Committee Members may have questions on the clarity of the information presented. The Committee will hear any staff input and then deliberate on a course of action.

Committee Report and Comment: Individual Committee Members may have matters to bring to the attention of the Committee during a meeting. If the matter contemplates action by the Committee, Committee Members will consult with the Chair and/or appropriate Town officials or employees in advance and provide any needed information by applicable Committee deadlines and/or schedule the matter for a future Committee meeting. Otherwise, except in emergencies, the Committee will not normally take action on Committee Comment.

Approved: March 27, 2024



Agenda Item Summary

Agenda Item #	II.
Date	9/10/24

Staff

Assistant Town Manager, Manager of Strategic Projects, Chief Environmental Health Officer

Subject

Public PFAS Information Session with Massachusetts Department of Environmental Protection (MassDEP)

Executive Summary

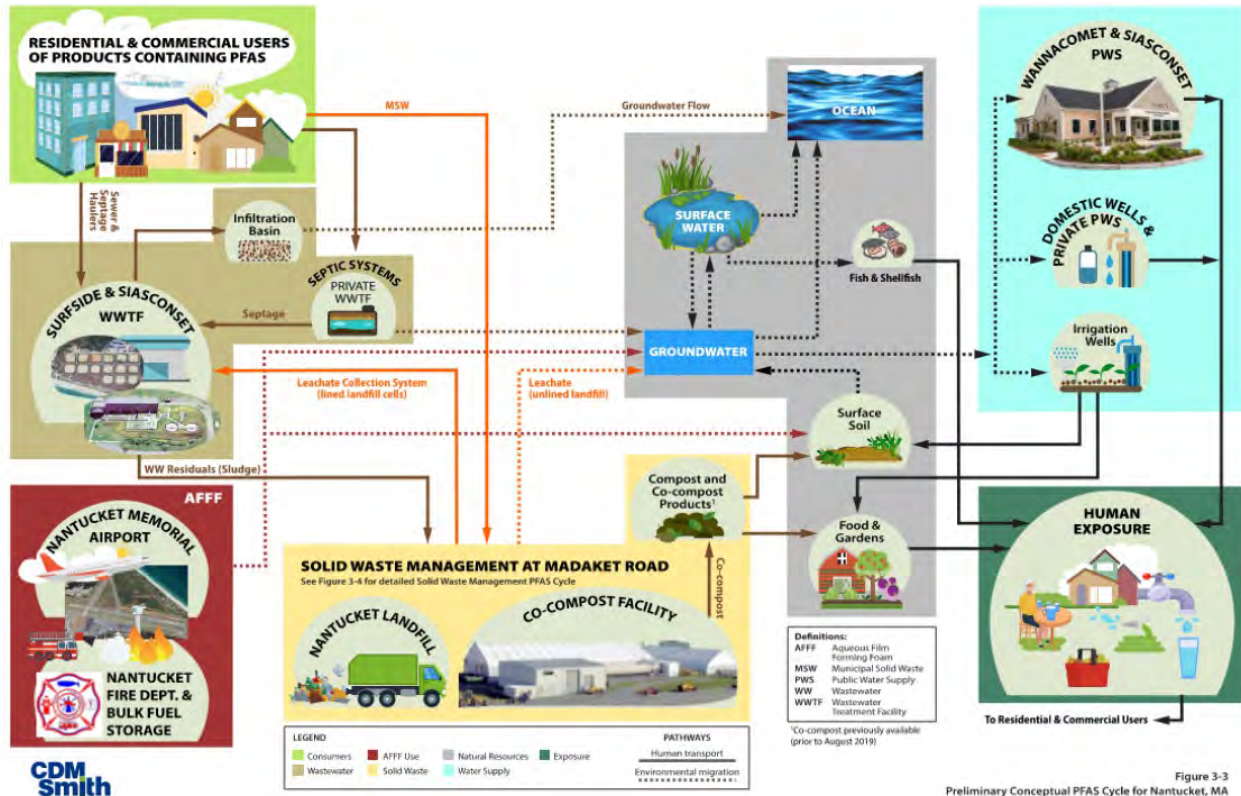
At a 7/22/24 virtual meeting with MassDEP to review the Town's various PFAS-related efforts, the Town requested MassDEP to participate in a public information session with the Town to discuss various PFAS issues and get feedback from MassDEP on topics of interest to Nantucket residents as well as Town officials. This public meeting is a terrific opportunity to engage directly with our state partners and is designed as an open dialog between MassDEP and the Nantucket Select Board, Nantucket Board of Health, Town staff, the Nantucket PFAS Action Group, and the Nantucket Land and Water Council, with opportunity for the public to submit questions and comments beforehand. There will be limited opportunity for open questions at the end of the session. This is a professionally facilitated meeting.

Background/Discussion

This is seventeenth (18) public update on the Town's PFAS-related efforts.

Since 2020, the Town has appropriated \$15,000,000 for PFAS-related efforts which does not include the work by the Nantucket Memorial Airport to address PFAS contamination and cleanup on property under Airport jurisdiction. Approximately \$7.0M has been expended to date through twenty (21) contracts to perform a variety of island-wide PFAS-related projects, including the water main expansion project west of Nantucket Memorial Airport completed in spring '24. Aside from the Landfill Groundwater PFAS Sampling Program which is being undertaken with the support of the MassDEP, these voluntary efforts are being undertaken proactively to learn more about potential PFAS issues in the community and identify short and long-term solutions.

NANTUCKET PFAS CYCLE: The PFAS cycle for the community of Nantucket has been developed and is being used to target the transmission pathways and contaminated materials in the environment for source reduction and control, and as a tool to guide project development:



FUNDING: \$15,000,000 in funding commitments from the Town to support PFAS-related efforts:

PFAS PROJECTS STATUS SUMMARY (as of 6/25/24)			
PFAS FUNDING SOURCES:		Appropriated	Remaining
2020 ATM Article 8 (Free Cash)		\$750,000.00	\$ -
2021 ATM Article 10 – PFAS Groundwater Soil Investigations (Borrowing)		\$750,000.00	\$ 61,210
2022 ATM Article 18 – PFAS Soil Investigation (Borrowing)		\$2,000,000.00	\$ 1,797,163
2022 ATM Article 22 – WWTF PFAS Removal Pilot Program (Borrowing)		\$2,500,000.00	\$ 2,386,829
		\$6,000,000.00	\$ 4,245,203
SRF WATER MAIN EXPANSION FUNDING:		Appropriated	Remaining
\$9,000,000 – 2022 ATM Article 10 – New Water Main West of Airport (Debt exclusion, \$8.3 MADEP SRF Loan awarded for project)		\$9,000,000.00	\$6,058,348.12
\$9,000,000 – 2022 ATE Ballot Question 1 (approved 1,738 Yes, 496 No, 140 Blank) (Debt exclusion, \$8.3M DEP SRF Loan awarded for project)			

Impact: Environmental	☒	Fiscal	☒	Community	☒	Other	☒
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Other: Public Health

Board/Commission Recommendation
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N/A

Public Outreach

The Town’s PFAS-related projects have been updated to the public on 18 occasions since July 2020. This does not include Airport outreach.

- 7/22/20 Select Board Meeting
- 10/28/20 Select Board Meeting
- 12/8/20 Joint SB-BoH Meeting
- 2/10/21 Select Board Meeting
- 5/12/21 Select Board Meeting
- 7/7/21 Select Board (Water Main specific)
- 8/4/21 Select Board (Water Main specific)
- 11/3/21 Select Board
- 3/16/22 Select Board
- 5/2/22 Select Board (Article 10 2022 ATM)
- 7/13/22 Select Board
- 10-5-22 Select Board
- 10/12/22 Select Board (Water Main specific)
- 12/8/22 Water Main Public Outreach Session
- 3/22/23 Select Board
- 5-3-23 Select Board
- 6-25-24 Joint Select Board/Board of Health Meeting
- 9/10/24: Joint MassDEP-Select Board virtual information session

Information on all Town-sponsored PFAS-related efforts can be found on the Town’s PFAS project page: <https://www.nantucket-ma.gov/1574/PFAS>

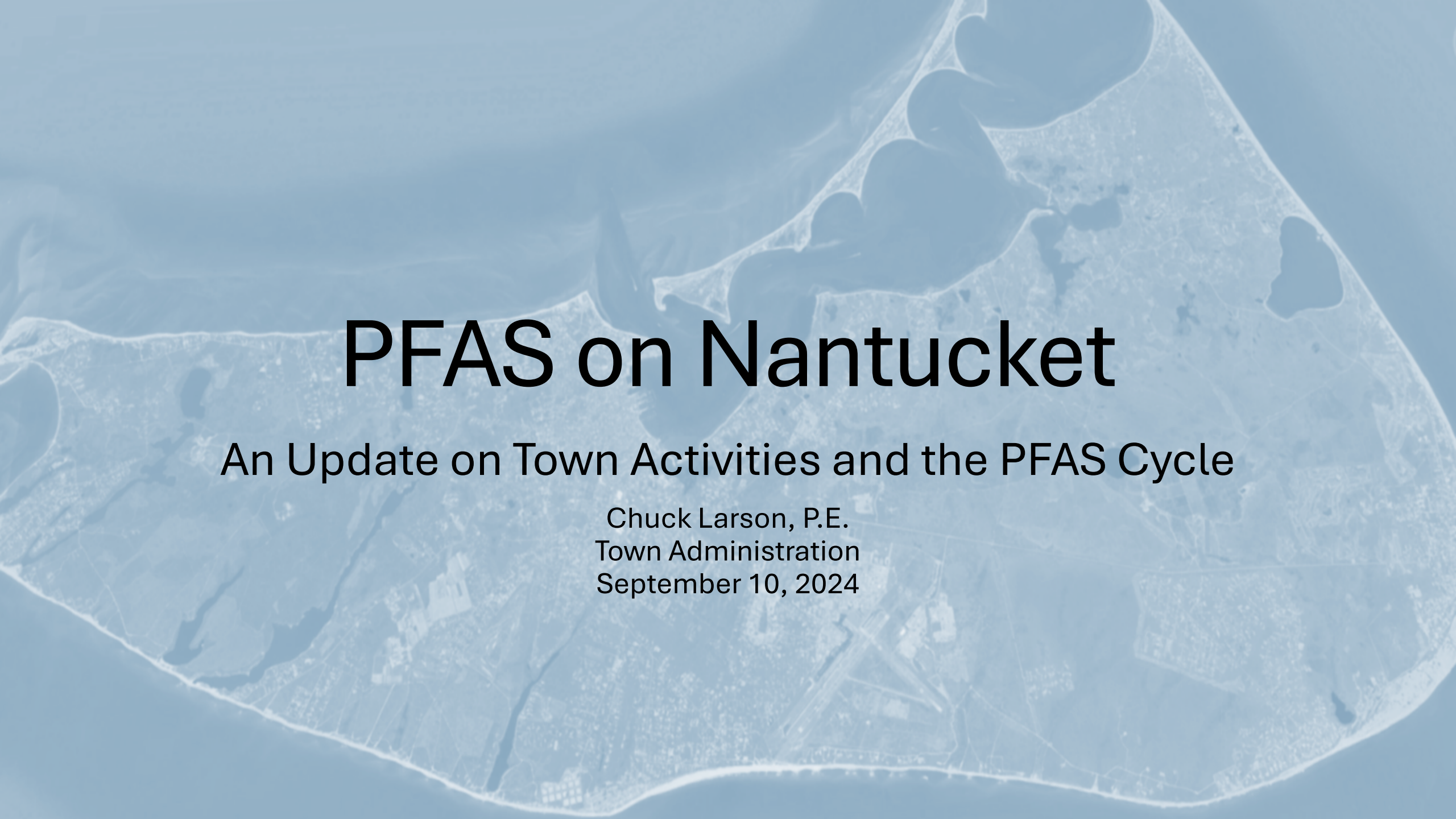
- | |
|--------------------|
| Attachments |
|--------------------|
- Town of Nantucket PFAS-Related Accomplishments 09/10/2024
 - Town Regulations Chapter 386 - Wells

TOWN OF NANTUCKET
PFAS-RELATED ACCOMPLISHMENTS

FY	ACCOMPLISHMENTS	COSTS	DELIVERABLES
FY21	Island Wide Potential PFAS Source Assessment	\$86,388	<i>Preliminary Assessment of PFAS Planning Report (2/4/21)</i>
FY21	PFAS-Free Firefighter Turnout Gear	\$161,000	New turnout gear purchased at department discretion (not part of negotiations)
FY22	MassDEP State Revolving Loan Application (Water Main Project West of Nantucket Airport)	\$14,000	SRF Application successfully submitted and approved; \$8.3M interest-free loan received
FY22	PFAS Assessment Recommendation Implementation	\$407,489	On-going: Informing current and future Town projects
FY22	Environmental Contaminant Administrator Position	\$124,000	Created and hired the first-of-its kind position in the State dedicated to PFAS; Hired former MassDEP Division of Water Supply Manager
FY22	Public Water System Capacity Buildout Modelling	\$147,700	Water capacity buildout successfully delivered in time to inform water main expansion project
FY22	PFAS Influent PFAS Sampling Program	\$266,267	On-going: Multi-year influent data; PFAS source identification
FY23	Water Main Expansion West of Nantucket Airport (Design, Permitting and Bidding)	\$357,403	MassDEP SRF-approved design and successful bidding
FY23	PFAS Handling Protocols	\$34,993*	On-going: <i>PFAS Impacted Materials Management for Utility Workers</i> memo (March 2023)

**TOWN OF NANTUCKET
PFAS-RELATED ACCOMPLISHMENTS**

FY24	Landfill Groundwater PFAS Sampling Program	\$109,225*	On-going: Collection of groundwater samples in accordance to MassDEP requirements; Sampling report received August 2024
FY24	Water Main Expansion West of Nantucket Airport (Construction)	\$5,319,386*	On-going: Installation of 12,500 linear feet of public water main completed in March 2024.
FY24	Amendment to Private Well Regulation	N/A	September 2023 Board of Health adopts first-of-its-kind private well PFAS sampling regulation.
FY24	On-Call PFAS Consulting Services	\$89,248*	On-going: Professional support and guidance on a PFAS-related matters
FY24	WWTF PFAS Destruction Foam Benchmark Study	\$113,170*	On-going: Pilot foam fractionation treatment study to explore potential to reduce/eliminate PFAS entering the WWTF
FY25	Public Water System Capacity Buildout Modelling	\$0*	On-going: Updated capacity modelling for additional water main expansion (study expected 5/2025) \$197,000 contract
TOTAL (as of 9/10/24)		\$7,227,269	
*Not final expenditure; project not yet completed or not yet started			

An aerial photograph of Nantucket, Massachusetts, showing the island's coastline, water bodies, and land features. The image is overlaid with a semi-transparent blue filter.

PFAS on Nantucket

An Update on Town Activities and the PFAS Cycle

Chuck Larson, P.E.
Town Administration
September 10, 2024

What is PFAS?

Per- and Polyfluoroalkyl Substances

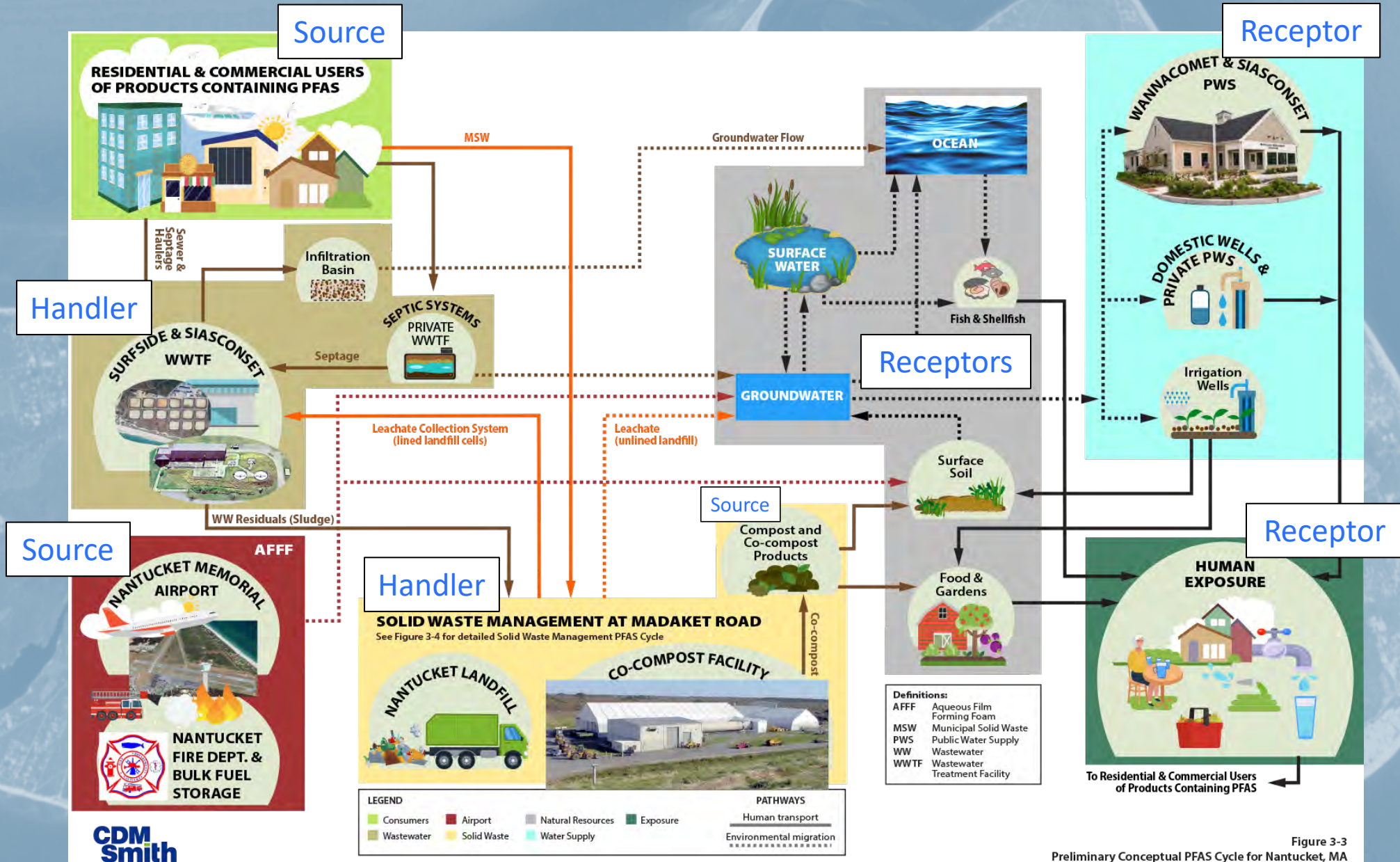
- A class of more than 10,000 chemicals.
- Typically used to make products that resist water, oil, stains and heat.
- Chemically, individual PFAS can be very different. However, all have a carbon-fluorine bond, which is one of the strongest bonds in nature.
- Called “forever chemicals” because they do not naturally break down and can accumulate the environment.
- PFAS are mobile in soil and groundwater.
- Some of these chemicals have been shown to bioaccumulate, or build up, in blood and organs over time, and may pose risks to human health.



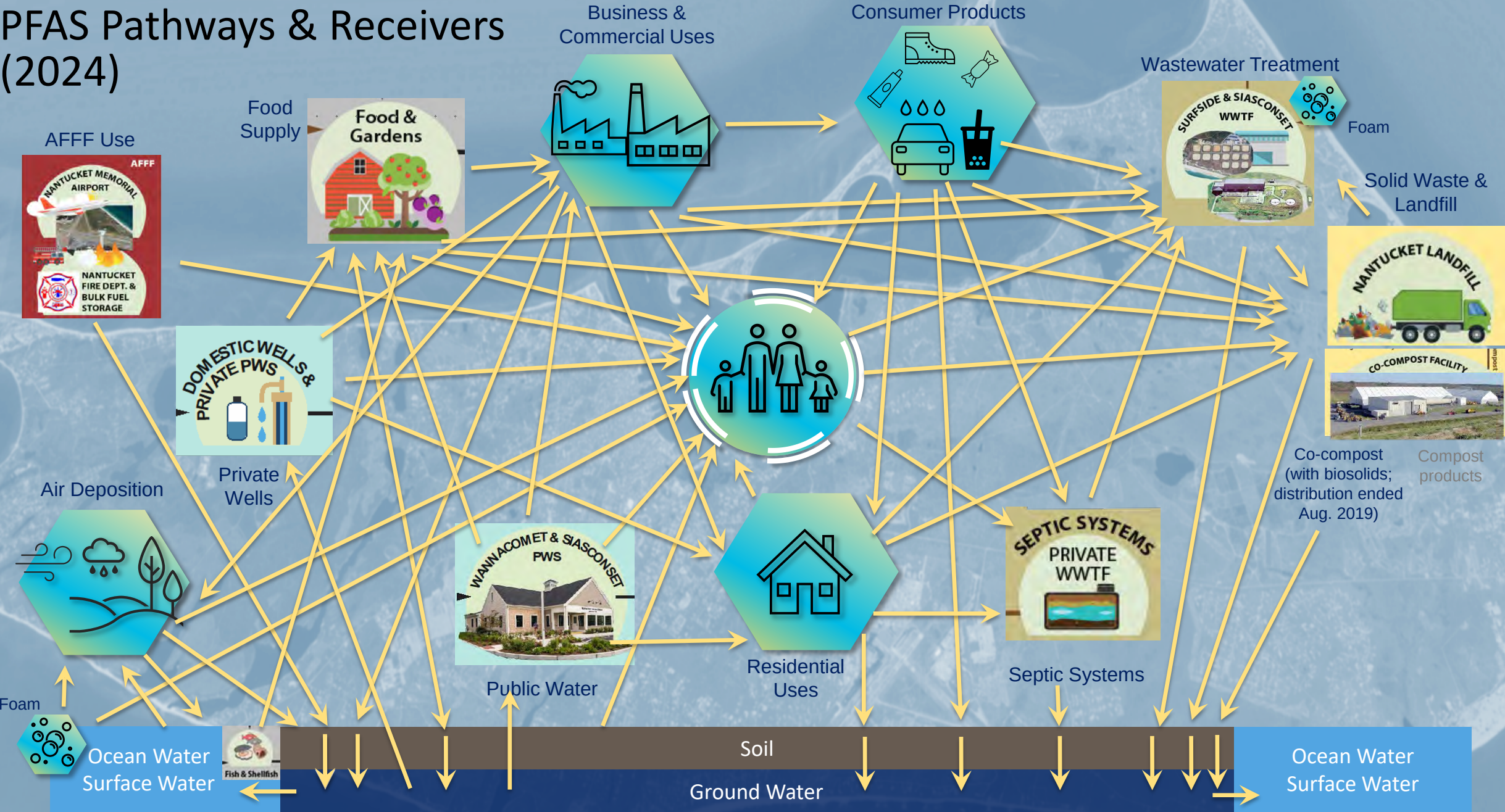
Image credit <https://riversideca.gov/understanding-pfas>

Island-wide PFAS Cycle (2021)

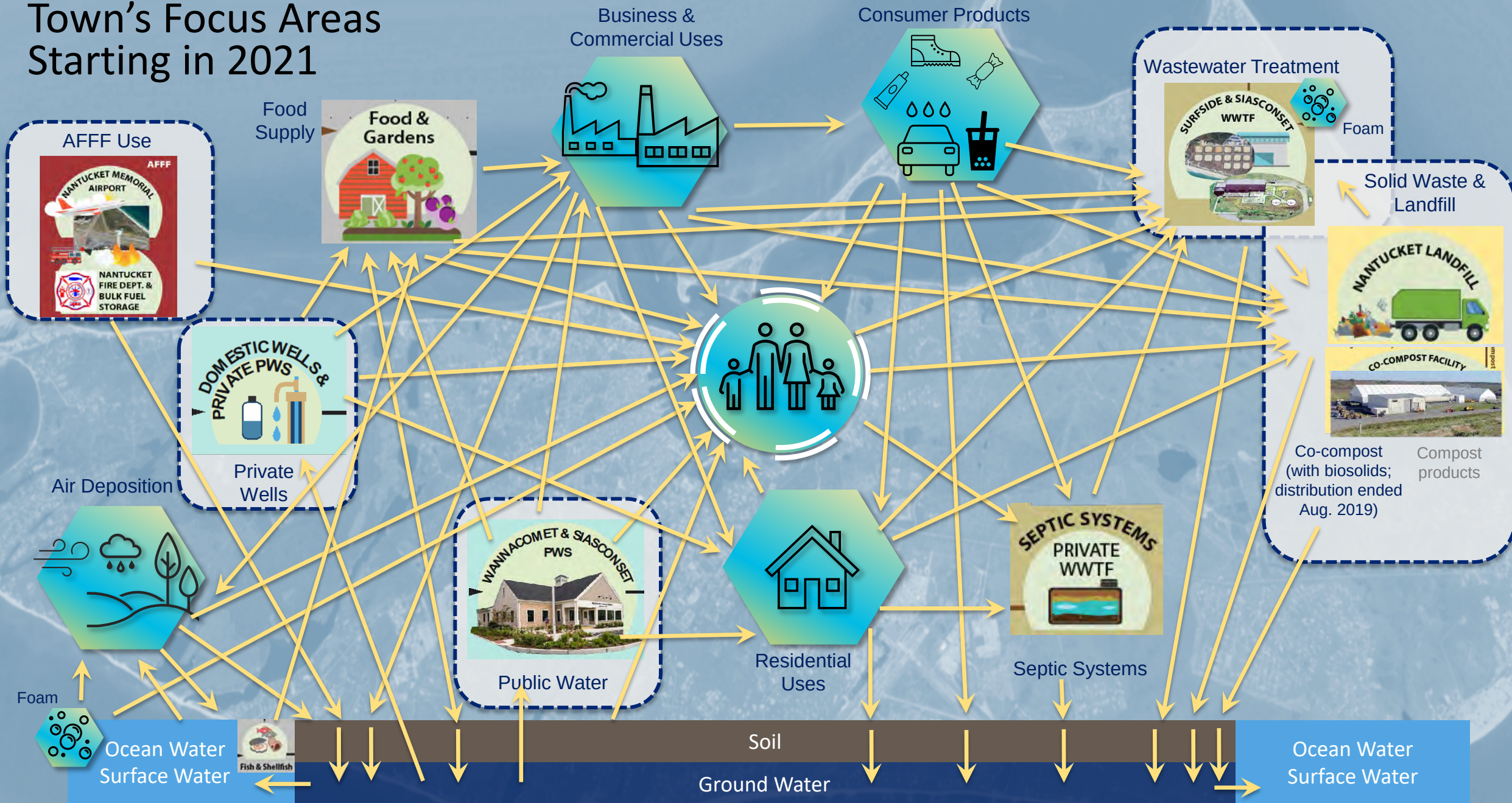
- Sources
- Handlers and/or Transporters
- Receptors
(entity which is vulnerable to harm from the contamination source)
- Pathways



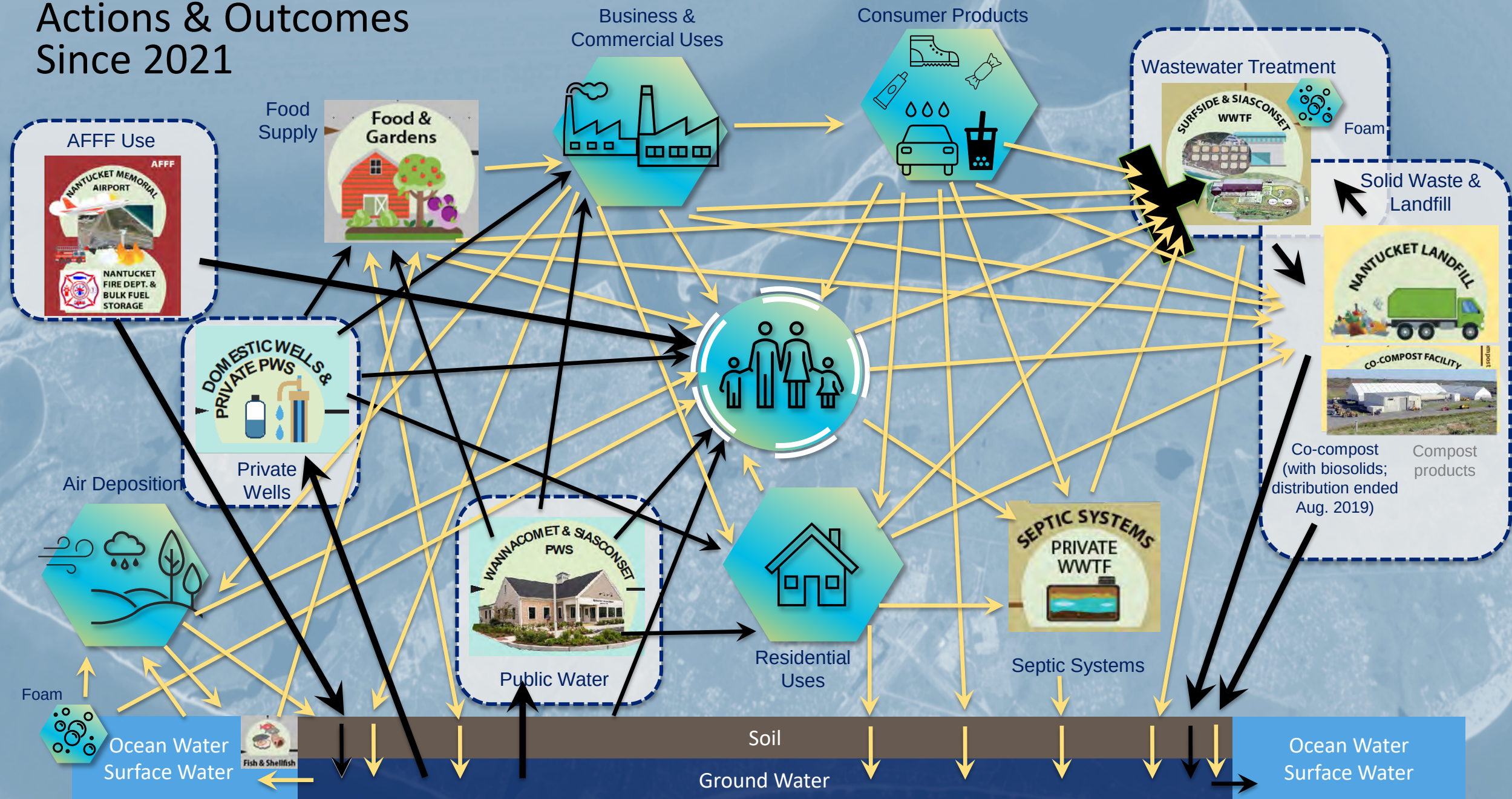
PFAS Pathways & Receivers (2024)



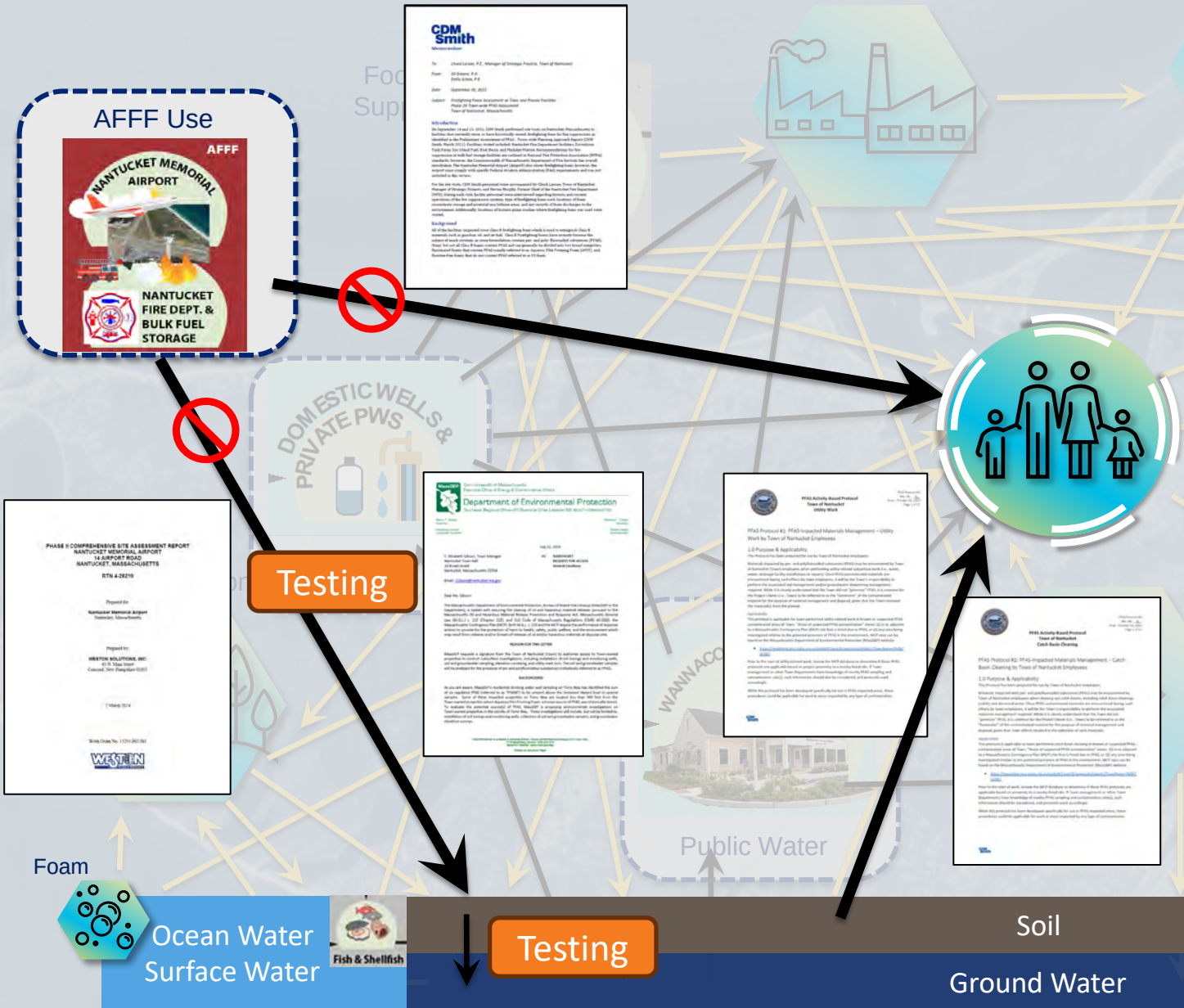
Town's Focus Areas Starting in 2021



Actions & Outcomes Since 2021

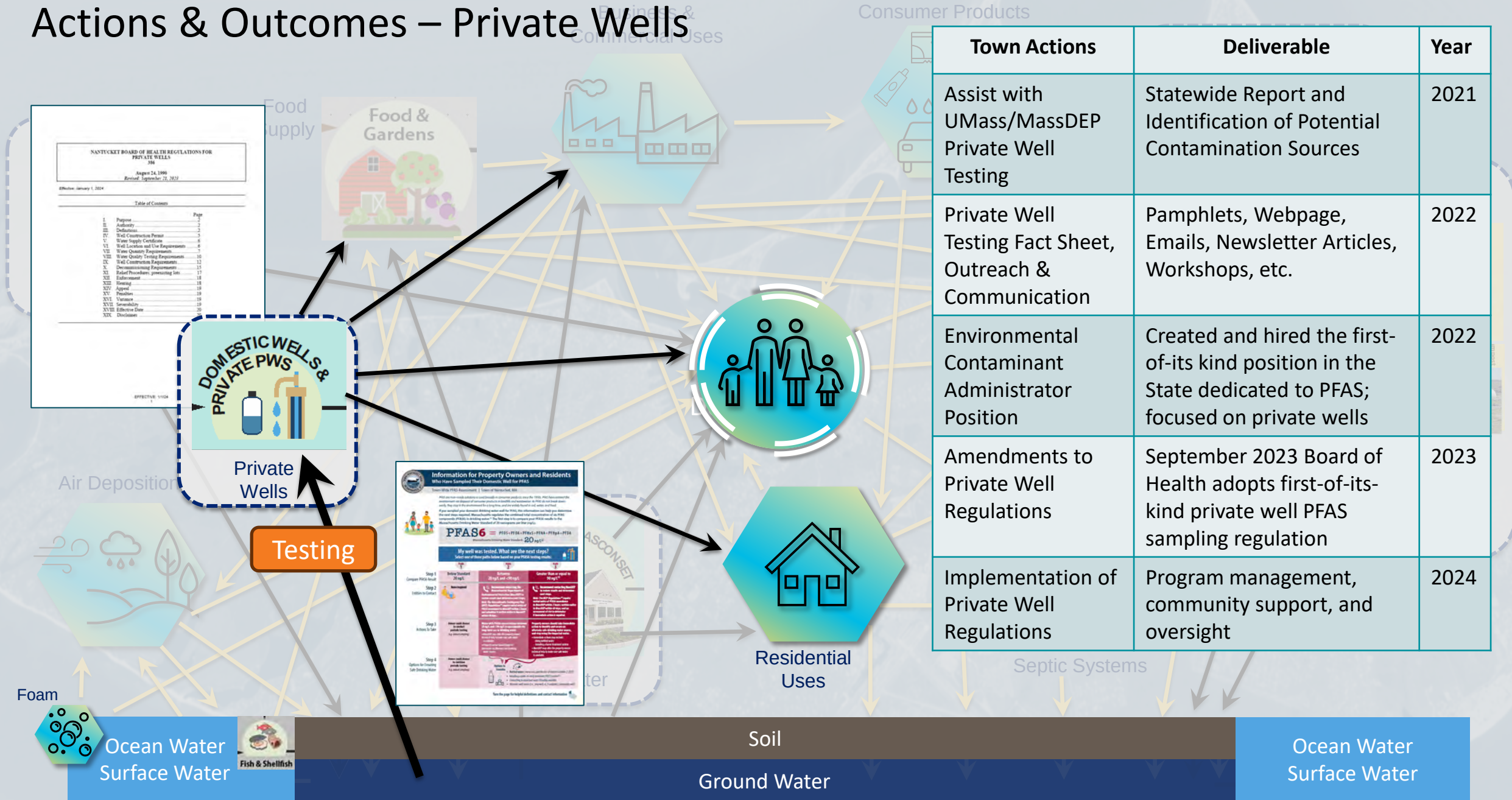


Actions & Outcomes – AFFF & Related Items



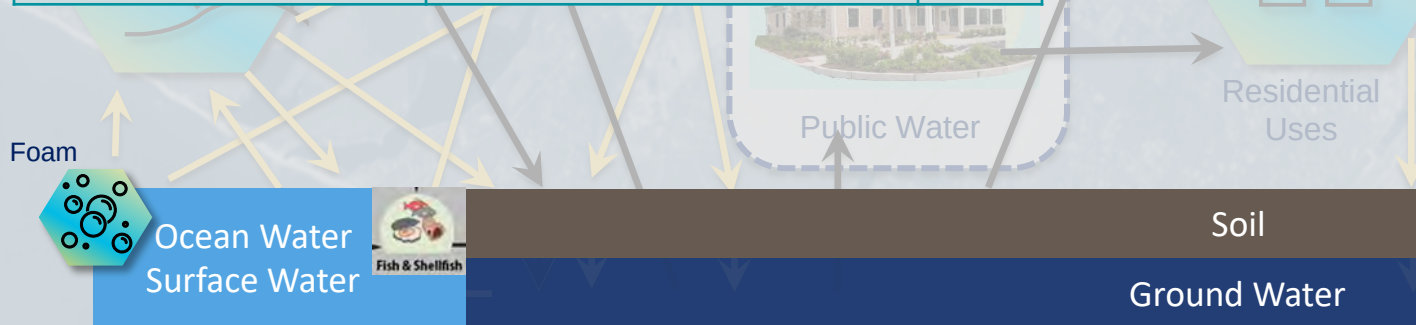
Town Actions	Deliverable	Year
Respond to requests & coordinate with Airport's MCP project team. Review data and documents posted on the MassDEP website.	Information to understand the work being done and potential environmental and health impacts adjacent to the Airport. For example, submitted a review of the Phase II CSA for discussion with the Airport.	2020 to pres.
PFAS-Free Firefighter Turnout Gear	New turnout gear purchased at department discretion (not part of negotiations)	2021
Firefighting Foam Assessment at Town Facilities	Report & Recommended Best Management Practices	2022
Protocols for handling material with potential PFAS contamination	Municipal Guidelines for Subsurface Excavation & Cleaning Catch Basins, Including Disposal	2023
Source Investigation Tom's Way Area	Assist MassDEP, Participate as needed	2024

Actions & Outcomes – Private Wells



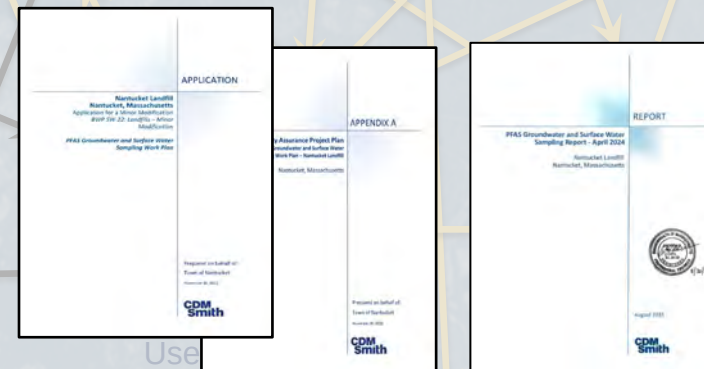
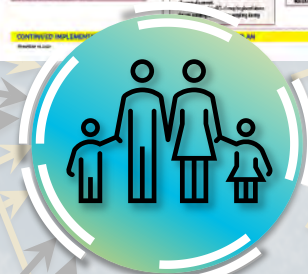
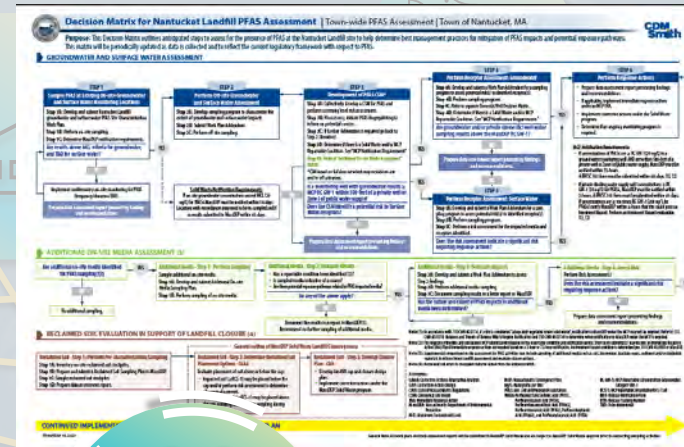
Town Actions	Deliverable	Year
Assist with UMass/MassDEP Private Well Testing	Statewide Report and Identification of Potential Contamination Sources	2021
Private Well Testing Fact Sheet, Outreach & Communication	Pamphlets, Webpage, Emails, Newsletter Articles, Workshops, etc.	2022
Environmental Contaminant Administrator Position	Created and hired the first-of-its kind position in the State dedicated to PFAS; focused on private wells	2022
Amendments to Private Well Regulations	September 2023 Board of Health adopts first-of-its-kind private well PFAS sampling regulation	2023
Implementation of Private Well Regulations	Program management, community support, and oversight	2024

water

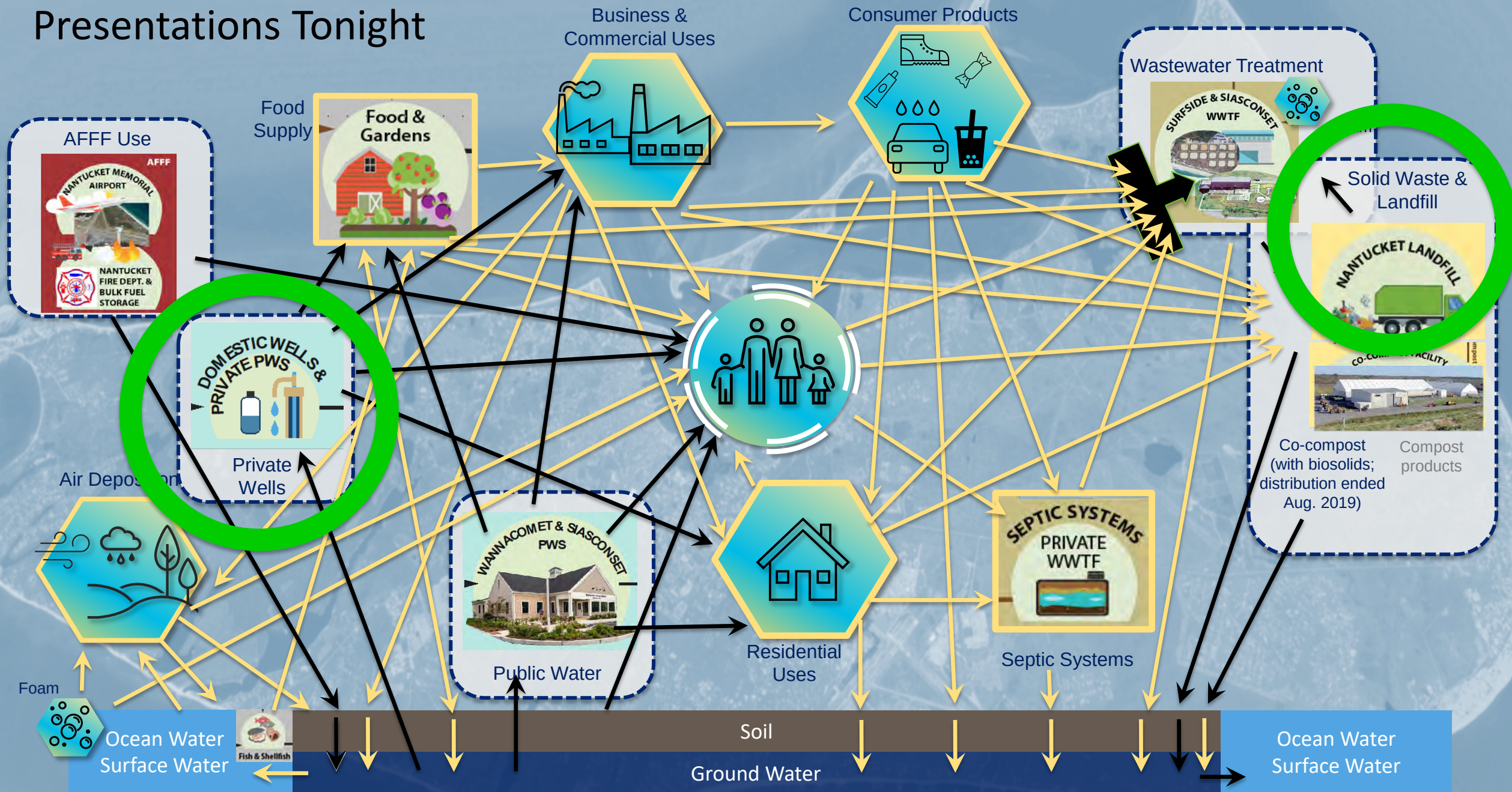


and MSW Related

Town Actions	Deliverable	Year
Public distribution of Co-compost halted by WON (continued distribution of other compost materials)	Co-compost used on landfill site	2019
Quarterly testing of Co-compost (per MassDEP)	Sampling & testing by WON; Town prepared fact-sheets for the public	2020
Decision Matrix for Landfill PFAS Assessments	Detailed Decision Matrix with recommended steps	2021
Dewatered sludge placed in lined cells; no co-compost produced	WON obtained permission from MassDEP	2021
MassDEP requested a PFAS testing plan for surface- and ground water at landfill	Town submitted the workplan for sampling & testing	2021
2023 approval by MassDEP, sampling performed by Town, meetings with MassDEP	Report with SOW for additional sampling for MassDEP review/approval	2023 2024



Presentations Tonight





Nantucket Landfill PFAS Update



PFAS Public Information Session



Andrew Miller, PE

September 10, 2024



Solid Waste Management at Madaket Road

Addressing PFAS in Groundwater at the Landfill

■ Goal

- Assess potential offsite migration of PFAS in groundwater toward residential wells and Long Pond

— Actions

- Developed PFAS decision matrix for stakeholders to understand the landfill assessment process

— Accomplishments

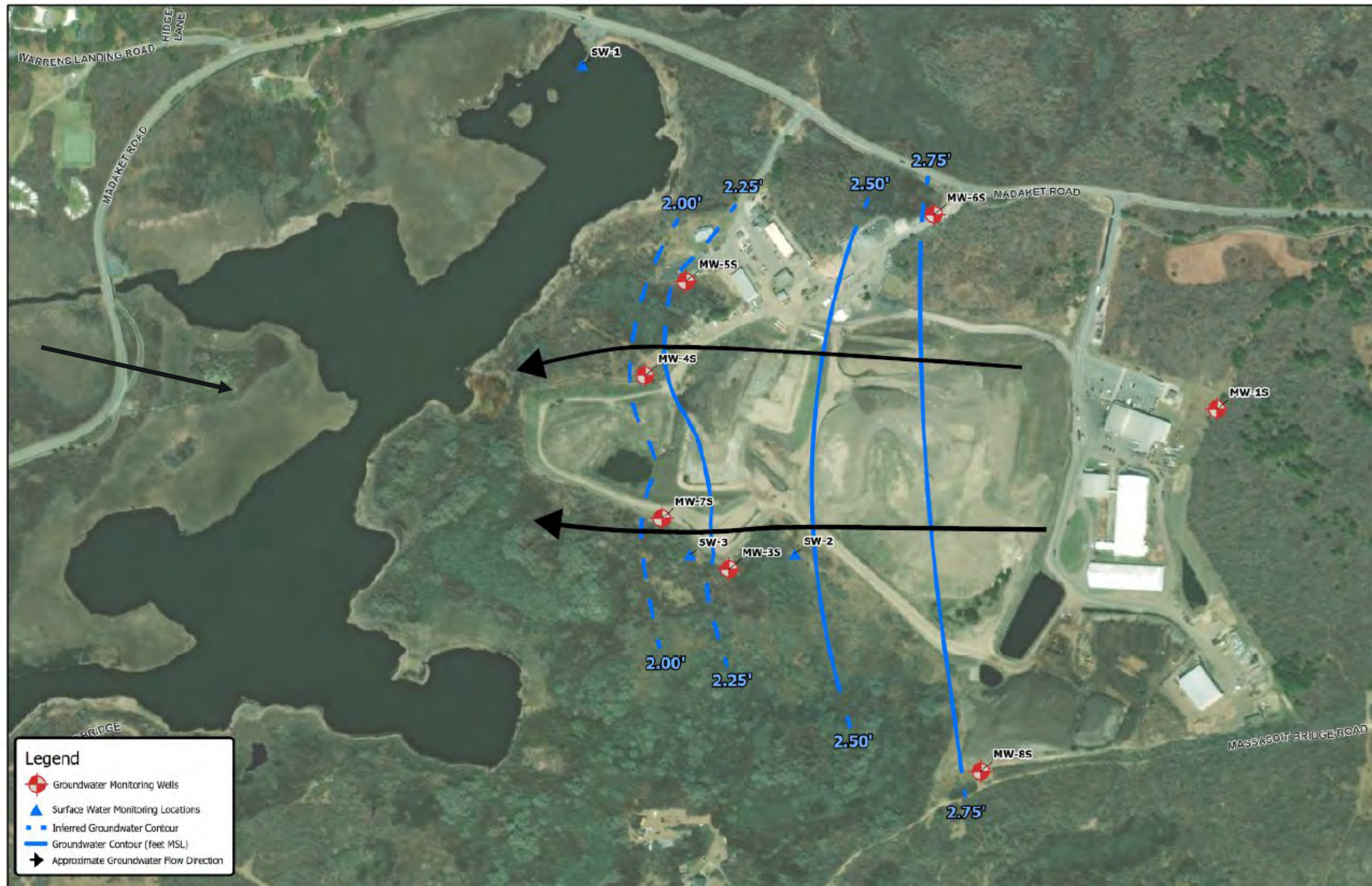
- Completed 2 rounds of PFAS sampling at landfill monitoring wells and surface water stations
- Based on conceptual model, developed work plan for nature and extent assessment



Nantucket Landfill Vicinity



Groundwater Flow –from east and west to Long Pond



PFAS6 Concentrations in Groundwater (GW) & Surface Water (SW)

Shallow Wells (~20 ft)



Deep Wells (~60 ft)



SW GW

- <20 ng/L
- 20-100 ng/L
- 100-1,000 ng/L
- >1,000 ng/L



Next Steps

- Continue PFAS sampling of groundwater and surface water on a semi-annual basis
- Field Investigation to assess nature and extent of PFAS in groundwater at the landfill site
 - Additional monitoring wells
 - Assess potential for PFAS to extend beneath Long Pond
 - Assess any impacts to Madaket Ditch
- Following field investigation, report preparation and further recommendations



listen. think. deliver.

PFAS Public Information Session



CDM
Smith

Private Drinking Water Well Regulations and PFAS

JOHN HEDDEN
CHIEF ENVIRONMENTAL HEALTH OFFICER
TOWN OF NANTUCKET



Background

- On October 2, 2020, MassDEP published its PFAS public drinking water standard of 20 nanograms per liter (ng/L) (or parts per trillion(ppt))*
 - Individually or for the sum of the concentrations of six specific PFAS for Public Water Supplies.
- This established the PFAS6 as the metric for Maximum Contaminant Level.

- PFAS6

PFOS	Perfluorooctane sulfonic acid
PFOA (aka C8)	Perfluorooctanoic acid
PFNA	Perfluorononanoic acid
PFHxS	Perfluorohexanesulfonic acid
PFHpA	Perfluoroheptanoic acid
PFDA	Perfluorodecanoic acid

*Published in 310 CMR 22: The Massachusetts Drinking Water Regulations.

- Applies to Public Water Supplies



State & Local PFAS Updates

- In March of 2023, MassDEP publishes an update to its Model Board of health Regulations for Private Wells.
- Revised model regulation includes a section for private drinking water wells be tested for PFAS at time of property transfer.
- In March of 2023, Nantucket Board of Health discussed revisions to its local well regulation.
 - The board adopted revisions, based off the Model Board of Health Regulations for Private wells, to its local well regulation.
- Nantucket becomes the first municipality in the state to adopt a local well regulation which includes a requirement for PFAS sampling at the time of property transfer.
- The regulation went into effect on January 1, 2024.



Fast Forward to April 2024

- EPA announces new standards to apply to public water supplies.
- May 2024, MassDEP revises its private well guidelines to include the new EPA standards for PFAS and HFPO-DA.
- MassDEP Private Well Guideline include both the PFAS6 and EPA Standard that will be used for public water supplies in 3 years.
- Private Drinking Water Wells are regulated by the Nantucket Board of Health.



Nantucket Community Information



CAS#	REGULATED PFAS CONTAMINANTS	Result ¹ ng/L	Result ² Qualifier	MCL [*] ng/L	MDL ng/L	MRL ng/L
1763-23-1	(PFOS) Perfluorooctane Sulfonic Acid	ND			0.631	2.00
335-67-1	(PFOA) Perfluorooctanoic Acid	1.30	J		0.631	2.00
355-46-4	(PFHxS) Perfluorohexane Sulfonic Acid	1.18	J		0.631	2.00
375-95-1	(PFNA) Perfluorononanoic Acid	ND			0.631	2.00
375-85-9	(PFHpA) Perfluoroheptanoic Acid	1.13	J		0.631	2.00
335-76-2	(PFDA) Perfluorodecanoic Acid	ND			0.631	2.00
PFAS6 (sum of PFOS, PFOA, PFHxS, PFNA, PFHpA and PFDA; only include Results at or above the MRL; do not include estimated Results as described by a Result Qualifier in the next column)		ND		20		

CAS#	UNREGULATED PFAS CONTAMINANTS	Result ¹ ng/L	Result ² Qualifier	MCL [*] ng/L	MDL ng/L	MRL ng/L
375-73-5	(PFBS) Perfluorobutane Sulfonic Acid	2.08			0.631	2.00
307-55-1	(PFDoA) Perfluorododecanoic Acid	ND			0.631	2.00
307-24-4	(PFHxA) Perfluorohexanoic Acid	1.52	J		0.631	2.00
376-06-7	(PFTA) Perfluorotetradecanoic Acid	ND			0.631	2.00
72629-94-8	(PFTrDA) Perfluorotridecanoic Acid	ND			0.631	2.00
2058-94-8	(PFUnA) Perfluoroundecanoic Acid	ND			0.631	2.00
2991-50-6	(NEtFOSAA) N-ethyl Perfluorooctanesulfonamidocetic Acid	ND			0.631	2.00

2355-31-9	(NMeFOSAA) N-methyl Perfluorooctanesulfonamidocetic Acid	ND			0.631	2.00
763051-92-9	(11Cl-PF3ONS) 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic Acid	ND			0.631	2.00
756426-58-1	(9Cl-PF3ONS) 9-chlorohexadecafluoro-3-oxanone-1-sulfonic Acid	ND			0.631	2.00
919005-14-4	(ADONA) 4,8-dioxa-3H-perfluorononanoic Acid	ND			0.631	2.00
13252-13-6	(HFPO-DA) Hexafluoropropylene Oxide Dimer Acid	ND			0.631	2.00

¹ A field reagent blank (FRB) must be analyzed and reported on a separate PFAS form if any PFAS are detected above the MRL.

² All qualifiers must be described under Lab Analysis Comments on page 2.

How Do I Interpret My Sampling Results

CAS#	REGULATED PFAS CONTAMINANTS	Result ¹ ng/L	Result ² Qualifier	MCL ³ ng/L	MDL ng/L	MRL ng/L
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PFAS6 (sum of PFOS, PFOA, PFHxS, PFNA, PFHpA and PFDA; only include Results at or above the MRL; do not include estimated Results as described by a Result Qualifier in the next column)		ND		20		

MassDEP must be notified if your results are over 20ppt of PFAS6 total.



Filtration

➤ Types of Treatment:

- Point of Use (POU)
- Point of Entry Treatment (POE or POET)

➤ Types of Filters:

- Charcoal (Granular Activated Carbon or GAC): These filters use carbon to trap chemicals as water passes through them.
- Reverse Osmosis (RO) Systems: Reverse osmosis is a process that forces water through an extremely thin barrier that separates chemicals from the water.
- Ion Exchange Resins: Resins are tiny beads that act like powerful magnets that attract and hold the contaminated materials from passing through the water system.

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Chapter 386

WELLS

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[HISTORY: Adopted by the Town of Nantucket as indicated in article histories. Amendments noted where applicable.]

TOWN CODE REFERENCES

Underground fuel storage tanks — See Ch. 135.

Zoning — See Ch. 139.

TOWN REGULATIONS REFERENCES

Administration and enforcement of Board of Health regulations; definitions — See Ch. 223.

Underground tanks — See Ch. 363.

Subdivisions — See Ch. 358.

Wellhead Protection District — See Ch. 382.

ARTICLE I

Private Wells

[Adopted by the Board of Health 8-22-1990, effective 8-24-1990¹; amended in its entirety 9-21-2023 , effective 1-1-2024]

§ 386-1. Purpose.

The purpose of this regulation is to provide for the protection of the public health, safety, welfare and the environment by, among other things, requiring the proper siting, constructing and testing of private wells. Regulations were modeled after MassDEP Private Well Guidelines and MassDEP Model well regulations.

§ 386-2. Authority.

These regulations are adopted by the Nantucket Board of Health, pursuant to its authority under MGL c. 111, § 31. These regulations supersede all previous regulations for private wells adopted by the Board of Health.

§ 386-3. Definitions.

Unless the context or subject matter requires otherwise, the following words and phrases shall, for the purposes of this document, have the meanings specified in this section.

Words and phrases used in the present tense include the future; words and phrases used in the masculine gender include the feminine and neuter; and the singular number includes the plural and the singular.

Words and phrases not defined in this section shall have their conventional meanings unless expressly stated otherwise.

ABANDONED WATER WELL — A well that that is out of service and that meets any of the following criteria: 1) construction was terminated prior to completion of the well, 2) the well owner has notified the local Board of Health that use of the well has been permanently discontinued, 3) the well has been out of service for at least three years, 4) the well is a potential hazard to public health or safety and the situation cannot be corrected, 5) the well is in such a state of disrepair that its continued use is impractical, or 6) the well has the potential for transmitting contaminants from the land surface into an aquifer or from one aquifer to another and the situation cannot be corrected.

AGENT — Any person designated and authorized by the Board to implement, in whole or part, these regulations. To the extent provided by the Board, the agent shall have all the authority of the Board and shall be directly responsible to the Board and under its direction and control.

ALTER A WELL or WELL ALTERATION — Change the structural or hydraulic characteristics of an existing well including but not limited to deepening, decommissioning, performing well yield enhancement, or performing casing extension, replacement, perforation or repair.

APPLICANT — Any person who applies to construct a private well.

AQUIFER — A geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.

ARTESIAN AQUIFER — An aquifer that is bound above and below by impermeable material or materials or distinctly lower permeability than the aquifer itself. The water in an aquifer confined in this manner will rise in a drilled hole or well casing above the point of initial penetration (above the bottom of the confining,

1. Editor's Note: The Board of Health approved the codification of its regulations, as revised, 6-16-2022.

or impermeable, layer overlying the aquifer).

BENTONITE — A mixture of swelling clay minerals containing at least 85% of mineral montmorillonite (predominantly sodium montmorillonite) which meets the specifications of the most recent revision of API Standard 13A.

BENTONITE GROUT — A mixture of bentonite (API Standard 13A) and water in a ratio of not less than one pound of bentonite per gallon of water.

BOARD — The Board of Health of Nantucket, Massachusetts or its authorized agent.

BUSINESS OF WELL DRILLING — Performing for commercial purposes, the activity of drilling or altering wells.

CASING — Impervious durable pipe placed in a boring to prevent the walls from caving and to serve as a vertical conduit for water, other fluids, or gases in a well.

CERTIFIED COMPANY — A person authorized by nontransferable certification with the Department, under 310 CMR 46.00, to engage in the business of well drilling and alteration, determining well yield and pump Installation.

CERTIFIED LABORATORY — A laboratory certified by the Department for the analysis of drinking water and required water quality analytes. Provisional certification is acceptable.

CERTIFIED WELL DRILLER — An individual authorized by nontransferable certification with the Department to drill or alter wells, as specified in 310 CMR 46.03(3) and who is working for a certified company.

CONCRETE — A mixture consisting of Portland cement (ASTM Standard C150, type I or API Standard 10, Class A), sand, gravel, and water in a proportion of not more than five parts of sand plus gravel to one part cement, by volume, and not more than six gallons of water. One part cement, two parts sand, and three parts gravel are commonly used with up to six gallons of water.

DEPARTMENT — Massachusetts Department of Environmental Protection.

DISINFECT — Any oxidant, including but not limited to chlorine, chlorine dioxide, chloramines, and ozone, which is added to water in any part of the treatment or distribution process, and is intended to kill or inactivate pathogenic microorganisms.

DOME — Area within the highest hydrological regional contour line. There are currently seven dome areas on Nantucket.

DRINKING WATER — Water used for human consumption.

INSTALL A PUMP or PUMP INSTALLATION — Install, replace, or alter a pump or any component thereof for a well.

IRRIGATION WELL — A well used for the sole purpose of watering or irrigation and not for drinking water. The well shall not be connected at any time to a dwelling or a building unless it meets the requirements of a private drinking water well and has the Board's written approval.

NEAT CEMENT GROUT — A mixture consisting of one bag (94 pounds) of Portland cement (ASTM Standard C 150, Type I or API Standard 10, Class A) to not more than six gallons of clean water. Bentonite (API Standard 13A), up to 2% by weight of cement, shall be added to reduce shrinkage. Other additives, as described in ASTM Standard C494, may be used to increase fluidity and/or control setting time.

OVERBURDEN WELL — Any well that is exposed to and draws water from any type of unconsolidated material, including but not limited to sand and gravel deposits.

PERSON — Any agency or political subdivision of the federal government or the commonwealth, any state, public or private corporation or authority, individual, trust, firm, joint stock company, partnership, association, or other entity, and any officer, employee or agent of said person, and any group of said persons.

PRIVATE DRINKING WATER WELL — Any private well that is used for the purpose of supplying water used for drinking water.

PRIVATE WELL OR WELL — Any hole or shaft drilled into the ground to inject or withdraw water, other fluids, or gasses, monitor soil gasses, monitor groundwater levels or water quality, transfer heat, or provide cathodic protection that is not regulated as a public water supply under 310 CMR 22.00.

PRIVATE WELL YIELD — The gallons per minute (gpm) of water that can flow or be withdrawn from a well, at a sustained rate after a minimum of two hours if the water level has stabilized (water level does not fluctuate more than three inches) for the last 30 minutes of the test.

PUMP or PUMP SYSTEM — The mechanical equipment or devices used to remove water from a well. For a well with a pitless adapter, the pump system includes all piping and the pitless adapter. For a well with a submersible pump and without a pitless adapter, the pump system includes all piping up to the metering device, or if none, then up to the main control valve inside the foundation of the structure served by the well. For a well without a submersible pump and without a pitless adapter, the pump system includes all piping up to and including the wellhead. For installation or repair purposes, the pump or pump system includes all piping up to the metering device or, if none, then up to the main control valve inside the foundation of the structure served by the well.

PUMPING (AQUIFER) TEST — A procedure used to determine the characteristics of a well and adjacent aquifer by installing and operating a pump.

REPLACE A PUMP or PUMP REPLACEMENT — Installation of a pump of the same horsepower as the pump that was last removed, installation of any component of a pump with a component of the same size and capacity as the one that was last removed; also, removal and replacement of a pump or any component thereof.

SAND CEMENT GROUT — A mixture consisting of Portland cement (ASTM Standard C150, Type I or API Standard 10, Class A), sand, and water in the proportion of one part cement to three or four parts sand, by volume, and not more than six gallons of water per bag (94 pounds) of cement. Up to 5%, by weight, of bentonite (API Standard 13A) shall be added to reduce shrinkage.

STATIC WATER LEVEL — The distance from established ground surface to the stabilized water level in a well which is neither being pumped nor under the influence of pumping.

STRUCTURE — A combination of materials assembled at a fixed location to give support or shelter, such as a building, framework, retaining wall, fence, or the like.

WATER USED FOR HUMAN CONSUMPTION — Water that is used for drinking, bathing, showering, cooking, dishwashing, or maintaining oral hygiene; see also "drinking water."

WELL YIELD ENHANCEMENT — A process to increase the production of water and yield by using water under pressure, or another substance the Department has approved for use in the process, to clean out existing fractures to allow water to flow into the well from other areas.

WELLHEAD — The above ground component or structure built over a well.

§ 386-4. Well construction permit.

A. No person shall install, alter, repair, replace or use any private well, or any component thereof,

installed after the effective date of this regulation unless such installation, alteration, repair, replacement, or use is duly permitted by the Board and is in compliance with all provisions of this regulation and all other applicable federal, state and local laws concerning the use of water from private wells.

- B. A certified well driller or certified company shall obtain a permit from the Board of Health prior to the commencement of any installation, alteration, repair or replacement of a private well or any component thereof. Emergency repairs can be made prior to receipt of a permit, subject to providing notice to the Agent, complying with all other requirements of this regulation and obtaining the necessary permit at the earliest practicable time. The fee may be waived by the Agent for emergency repairs or maintenance and the work shall be limited to the minimum work necessary to abate the emergency. No person shall perform any installation, alteration, repair, or replacement on a well or any component thereof, in an emergency or otherwise, unless they are a certified well driller.
- C. Each permit application shall include the following:
 - (1) The property owner's name and address.
 - (2) The well driller's name and proof of valid Massachusetts certification.
 - (3) A plan with a specified scale, signed by a registered surveyor or engineer, showing the location of the well or proposed well in relation to existing or proposed above or below ground structures.
 - (4) Proof that the owner of any property within 400 feet of the applicant's well site has been notified, by certified mail, return receipt requested, of the applicant's intention to install a well.
 - (5) A description of prior and current land uses within 200 feet of the proposed well location, which represent a potential source of contamination, including but not limited to the following:
 - (a) Existing and proposed structures.
 - (b) Subsurface sewage disposal systems.
 - (c) Subsurface fuel storage tanks.
 - (d) Public and private ways.
 - (e) Utility rights-of-way.
 - (f) Any other potential sources of pollution.
 - (6) A permit fee.
- D. A copy of the permit shall be on-site at all times that work is taking place. Each permit shall expire upon completion of the work or within two years from the date of issuance unless revoked for cause or extended. Permits may be extended for one additional six-month period provided that a written explanation for the request is received by the Board prior to the two-year expiration date.
- E. Permits are transferable to a new certified well driller or certified company prior to expiration or revocation of a permit and upon appropriate written notice from the new certified well driller.
- F. No permits for installation of a new well will be issued if the property location has access to municipal water service. Applicants must tie into the municipal water system. In the case of a property with an existing well connecting to a public water supply, the existing well must be abandoned if PFAS limit

exceeds the current MassDEP public drinking water standard/Massachusetts Maximum Contaminant Level (MMCL); otherwise, the existing well can be for irrigation purposes only.

§ 386-5. Water supply certificate.

- A. No person shall use a well that was installed, altered, repaired or replaced after the effective date of this regulation unless the Board of Health has issued a water supply certificate and the well is in compliance with all provisions of this regulation and all other applicable federal, state and local laws concerning the use of water from private wells.
- B. The issuance of a water supply certificate by the Board shall certify that the private well may be used as a drinking water supply. A water supply certificate must be issued for the use of a private well prior to the issuance of an occupancy permit for an existing structure or prior to the issuance of a building permit for new construction which is to be served by the well.
- C. The following shall be submitted to the Board of Health to obtain a water supply certificate:
 - (1) A well construction permit;
 - (2) A copy of the Well Completion Report as required by MassDEP well driller Program regulations (310 CMR 46.00);
 - (3) A copy of the pumping test report required pursuant to § 386-7 of these regulations; and
 - (4) A copy of the water quality report required pursuant to § 386-8 of these regulations.
- D. Upon the receipt and review of the above documents, the Board shall make a final decision on the application for a water supply certificate. A final decision shall be in writing and shall comprise one of the following actions:
 - (1) Issue a water supply certificate.
 - (2) Deny the applicant a water supply certificate and specify the reasons for the denial.
 - (3) Issue a conditional water supply certificate with those conditions which the Board deems necessary to ensure fitness, purity and quantity of the water derived from that private well until full compliance can be achieved. These conditions may include, but not be limited to, requiring treatment and/or additional testing of the water and deadlines for achieving full compliance.

§ 386-6. Well location and use requirements.

- A. In locating a well, the applicant shall identify on a plan all potential sources of contamination which exist or are proposed within 400 feet of the site. When possible, the well shall be located upgradient of all potential sources of contamination and shall be as far away from potential sources of contamination as possible, given the layout of the property.
- B. No well shall be permitted unless it meets the following setback requirements:
 - (1) Five feet from the property line.
 - (2) Ten feet from public or private roadway.
 - (3) Ten feet from right-of-way.

- (4) Fifty feet from building sewer line or septic tank.
 - (5) One hundred feet from leaching field or drywell.
 - (6) One hundred feet from stable, barnyard, manure storage.
 - (7) One hundred feet from an underground fuel storage or pesticide tank.
 - (8) Twenty five feet from any surface water, including, but not limited to, wetlands.
- C. The Board reserves the right to impose minimum setback requirements from other potential sources of contamination not listed above. All such additional setback requirements shall be listed, in writing, as a condition of the well construction permit.
- D. Each private well shall be located so that it is accessible for repair, maintenance, testing, and inspection. The well shall be completed in a water bearing formation that will produce the required volume of water under normal operating conditions.
- E. No private well permit application shall be approved if the well is to be within a 100-foot separation distance from existing and proposed leaching facilities and a 300-foot separation distance in a downgradient groundwater flow direction from existing or proposed leaching facilities.
- F. Groundwater flow directions will be determined using Water Table Map #2 prepared by HWH, Inc. as part of its Nantucket Water Resources Management Plan, March 1990, as may be amended from time to time. In the alternative, the Board, in its sole discretion, may accept field data submitted by the applicant, Board of Health or its agent, which field data shall be gathered by measuring the site-specific flow conditions using at least three observation wells in which water table elevations will be measured.
- G. All wells located in the dome areas shown on Map #2, HWH Water Management Report, March 1990, on file with the Board of Health ("HWH Map #2"), as may be amended from time to time, shall be exempt from the 300-foot separation distance in a downgradient groundwater flow direction from existing or proposed leaching facilities but shall maintain a 100-foot separation distance from said facilities. A "dome" is defined as the area within the highest hydrological regional contour line. There are currently seven dome areas on Nantucket.
- H. The Board reserves the right to impose minimum lateral distance requirements from other potential sources of contamination not listed above. All such special well location requirements shall be listed, in writing, as a condition of the well construction permit.
- I. Water supply lines shall be installed at least 10 feet from and 18 inches above any sewer line. Whenever water supply lines must cross sewer lines, both lines shall be constructed of Class 150 pressure pipe and shall be pressure tested to assure watertightness.
- J. No private well, or its associated distribution system, shall be connected to either the distribution system of a public water supply system or any type of waste distribution system.

§ 386-7. Water quantity requirements.

- A. The applicant shall submit to the Board for review and approval prior to issuance of a well construction permit and again prior to issuance of a water supply certificate for installation of a new well or replacement of an existing well a pumping test report. The pumping test report shall include at a minimum: the name and address of the well owner, well location referenced to at least two

permanent structures or landmarks, date the pumping test was performed, depth at which the pump was set for the test, location for the discharge line, static water level immediately before pumping commenced, discharge rate and, if applicable, the time the discharge rate changed, pumping water levels and respective times after pumping commenced, maximum drawdown during the test, duration of the test, including both the pumping time and the recovery time during which measurements were taken, recovery water levels and respective times after cessation of pumping, and reference point used for all measurements.

- B. No well construction permit or water supply certificate for installation of a new well or replacement of an existing well shall be issued unless the pumping test report demonstrates that the well will have the ability to supply a sufficient quantity of water for the use of the property to be served by the well.

§ 386-8. Water quality testing requirements.

- A. After the construction of the well has been completed and disinfected, and prior to issuance of a water supply certificate, baseline water quality testing shall be conducted.
- B. After any construction and/or maintenance of septic systems as identified in 310 CMR 15.000: Septic systems ("Title 5") located within a 100-foot separation distance from an existing well and a 300-foot separation distance in a downgradient groundwater flow direction from an existing well, baseline water quality testing shall be conducted from the existing well.
- C. A water sample shall be collected either after purging three well volumes or following the stabilization of the pH, temperature and specific conductance in the pumped well. The water sample to be tested shall be collected at the pump discharge or from a disinfected tap in the pump discharge line. In no event shall a water treatment device be installed prior to sampling.
- D. Water quality testing of the private drinking water well, utilizing the applicable US EPA approved method for public drinking water testing, shall be conducted by a Massachusetts or EPA certified laboratory and shall include analyses for the following parameters:

Arsenic

Chloride

Copper

Fluoride

Hardness

Iron

Lead

Manganese

pH

Sodium

Total coliform bacteria

E. coli bacteria

Nitrate/Nitrite

PFAS (Per- and polyfluoroalkyl substances) including the following six PFAS chemicals referred to as PFAS6:

Perfluorooctane sulfonic acid (PFOS)

Perfluorooctanoic acid (PFOA)

Perfluorohexane sulfonic acid (PFHxS)

Perfluorononanoic acid (PFNA)

Perfluoroheptanoic acid (PFHpA)

Perfluorodecanoic acid (PFDA)

Note: Nantucket Board of Health will require sampling for any additional Per- and Polyfluoroalkyl Substances (PFAS) substances as identified by MassDEP/U.S. Environmental Protection Agency (EPA) as they update the National Primary Drinking Water Regulations (NPDWR). Samples must meet the prescribed limits.

- E. In wells drilled into bedrock the Board of Health requires that in addition to the parameters listed above, a gross alpha screen and radon test be performed. If the gross alpha screen detects radiation of 15 pCi/L or more, then the water must be analyzed for uranium concentrations. If the Gross Alpha screen detects radiation of 5 pCi/L or more, then the water must be analyzed for radium and uranium concentrations.
- F. Testing for water quality parameters not listed in § 386-8C and D for which there is a US EPA or MassDEP approved method for public drinking water testing shall be conducted by a MassDEP or EPA certified laboratory or any other certification authority approved by MassDEP.
- G. The owner of every well used for drinking water including those serving a property which is rented or leased shall have its water tested at a Massachusetts certified laboratory for the following chemical and bacteriological parameters at a minimum of once a year: total coliform bacteria, e. coli bacteria, nitrate, nitrite, pH, conductivity, sodium, and iron. All other required chemical parameters listed in § 386-8D should be tested at a minimum of every 10 years. Wells installed in bedrock aquifers should also be tested at a minimum of every 10 years for the radiological parameters described in § 386-8E. The Board of Health may require more frequent testing, or testing for additional parameters, where other water quality problems are known or suspected to exist.
- H. The owner of a rental property shall make results of all water quality tests available to all tenants of the property and the Board of Health upon request. In cases where the well water does not meet the water quality standards outlined above, the Board of Health may require the property owner to provide an alternative approved source of drinking water for the tenants.
- I. Prior to selling, conveying, or transferring title to real property, the owner shall have tested the water of every private drinking water well serving that property. A water sample from each well shall be submitted to a Massachusetts certified laboratory for testing for the parameters listed in the water quality section² of this document. This water quality testing shall have been performed not more than one year prior to transfer of the property. Results of the water quality testing shall be submitted to the Board of Health prior to property transfer.
- J. In addition, the owner shall give copies of all available water quality test results of which he/she has knowledge (regardless of age of results) for the private well in question to any buyer and/or broker

2. Editor's Note: See § 386-8, Water quality testing requirements.

involved in the transfer. In the event that there is no buyer at the time the water is tested, a copy of all water test results must be given by the owner to the buyer before the property is put under agreement.

- K. The Board reserves the right to require retesting of the above parameters, or testing for additional parameters when, in the opinion of the Board, it is necessary due to local conditions or for the protection of public health, safety, welfare and the environment. All costs and laboratory arrangements for the water testing are the responsibility of the applicant.
- L. Following a receipt of the water quality test results, the well owner shall submit a Water Quality Report to the Board, which includes:
 - (1) A copy of the certified laboratory's test results.
 - (2) The name and contact information of the individual who performed the sampling.
 - (3) Where in the system the water sample was obtained.
- M. This regulation requires that private drinking water wells meet all current Massachusetts' Primary and Secondary Drinking Water Standards and Guidelines adopted by the MassDEP Office of Research and Standards (ORS). In any case where a private drinking water well does not meet such Standards or Guidelines, as it deems necessary for the protection of public health, safety or welfare, that the Board may take action, but not limited to, requiring the property owner to provide an alternative source of drinking water, tie into municipal water system if available and install POE/POE treatment.

§ 386-9. Well construction requirements.

- A. No person shall install, alter, repair, or replace any private well, or any component thereof, unless they are a certified well driller.
- B. Any work involving the connection of the private well to the distribution system of the residence must conform to the local plumbing code. All electrical connections between the well and the pump controls and all piping between the well and the storage and/or pressure tank in the house must be made by a pump installer or certified well driller, including the installation of the pump and appurtenance(s) in the well or house.
- C. A physical connection is not permitted between a water supply which satisfies the requirements of these regulations and another water supply that does not meet the requirements of these regulations without prior approval of the Board.
- D. General well design and construction.
 - (1) All private wells shall be designed and constructed such that:
 - (a) The materials used for the permanent construction are durable in the specific hydrogeologic environment that occurs at the well site.
 - (b) No unsealed opening is being left around the well that could conduct surface water or contaminated groundwater vertically to the intake portion of the well or transfer water from one formation to another.
 - (2) Permanent construction materials shall not leach or contribute toxic substances, taste, odors, or bacterial contamination to the water in the well.
 - (3) The driller shall operate all equipment according to generally accepted standards in the industry

and shall take appropriate precautions to prevent damage, injury or other loss to persons and property at the drilling site.

- (4) Well construction design shall ensure that surface water does not enter the well through the opening or by seepage through the ground surface. Construction site waste and materials shall be disposed of in such a way as to avoid contamination of the well, any surface water or the aquifer. During any time that the well is unattended, the contractor shall secure the well in a way as to prevent either tampering with the well and/or the introduction of foreign material into the well.
- (5) All water used for drilling, well development, or to mix a drilling fluid shall be obtained from a source, which will not result in contamination of the well or the water bearing zones penetrated by the well. Water from wetlands, swamps, ponds and other similar surface features shall not be used.
- (6) Water shall be conveyed in clear sanitary containers or water lines and shall be chlorinated to an initial concentration between 50 milligrams per liter (mg/L) and 100 mg/L. All drilling equipment including pumps and down hole tools, shall be cleaned and disinfected prior to drilling each new well or test hole.
- (7) All drilling fluids shall be nontoxic. Drilling fluid additives shall be stored in clean containers and shall be free of material that may adversely affect the well, the aquifer, or the quality of the water to be pumped from the well. Surfactants shall be biodegradable. The use of biodegradable organic polymers shall, when possible, be avoided.
- (8) All wells, including those that have been hydro fractured, shall be developed in order to remove fine materials introduced into the pore spaces or fractures during construction. One or more of the following methods shall be used for development: over pumping, backwashing, surging, jetting, air-lift pumping.
- (9) The completed well shall be sufficiently straight so that there will be no interference with installation, alignment, operation or future removal of the permanent well pump.

E. Well casing.

- (1) Private water supply wells shall be constructed using either steel or thermoplastic well casing. The casing shall be of adequate strength and durability to withstand anticipated formation and hydrostatic pressures, the forces imposed on it during installation, and the corrosive effects of the local hydrogeologic environment.
- (2) All casing used in the construction of private wells shall be free of pits, breaks, gouges, deep scratches and other defects. If previously used casing is installed, it shall be decontaminated and disinfected prior to installation.
- (3) Installation of water well casing shall be done in a manner that does not alter the shape, size, or strength of the casing and does not damage any of the joints or couplings connecting sections of the casing. A standard drive shoe shall be used when casing is installed. The drive shoe shall be either welded or threaded to the lower end of the string of casing and shall have a beveled metal cutting edge forged, cast, or fabricated for this specific purpose.
- (4) Upon completion of the installation procedure, the entire length of the casing above the intake shall be watertight.

- (5) Well casing shall not be cut off below the land surface unless a pitless adapter or a pitless unit is installed or an abandoned well is being permanently plugged. Well casing terminating above-grade shall extend at least 12 inches above the predetermined ground surface at the wellhead except when the well is located in a floodplain. When a well is located in a floodplain, the well casing shall extend at least two feet above the level of the highest recorded flood. The top of the well casing shall be reasonably smooth and level.

F. Well screen.

- (1) A well screen is required for all drilled wells that are completed in unconsolidated formations. All well screens shall be of Grade 304 stainless steel. Wells completed in bedrock do not require a screen unless the bedrock formation is brittle in nature or has a potential for collapse. The well screen aperture openings, screen length, and diameter shall be selected so as not to limit the aquifer's water yielding characteristics while preventing access of soil particles that would detract from well efficiency and yield.

G. Grouting and sealing.

- (1) Private wells drilled in bedrock shall be grouted from the ground surface or from the bottom of the pitless adaptor (if present) to 15 feet into competent bedrock. Neat cement grout, sand cement grout, or Bentonite grout shall be used. It shall have a permeability of at least 1×10^{-7} and be emplaced using standard grouting techniques as described in the MassDEP Private Well Guidelines, as amended.
- (2) All wells completed with the casing extending above grade shall have a surface seal designed to eliminate the possibility of surface water flowing down the annular space between the well casing and the surrounding backfilled materials. The surface seal shall extend to a depth below the local frost line.

H. Wellhead completion.

- (1) All wells shall be equipped with a sanitary seal or watertight cap designed to prevent surface water and foreign matter from entering the well.
- (2) All wells except flowing artesian and dug wells shall be vented. The opening of the vent pipe shall be covered with a twenty-four-mesh corrosion-resistant screen and shall be large enough to prevent water from being drawn into the well through electrical conduits or leaks in the seal around the pump when the pump is turned on. The vent pipe shall terminate in a downward position at or above the top of the casing.
- (3) All connections to a well casing made below ground shall be protected by either a pitless adapter or a pitless unit that complies with the most recent revision of National Sanitation Foundation Standard Number 56, entitled "Pitless Well Adapters."
- (4) Above-grade connections into the top or side of a well casing shall be at least 12 inches above the established ground surface or two feet above the level of the highest known flood, whichever is higher. Above-grade connections shall be sealed so that they are watertight.
- (5) The ground immediately surrounding the well casing shall be sloped downward and away from the well in all directions to eliminate the possibility of surface water ponding.

I. Disinfection.

- (1) Upon completion of well construction, the well driller shall disinfect the well. If a pump is to be installed immediately upon completion of the well, the pump installer shall disinfect the well and the pumping equipment after the pump has been installed.
- (2) If the pump is not installed upon completion of the well, the pump installer shall, upon installation, disinfect the well and the pumping equipment. The pump installer shall also disinfect the entire water supply system immediately after any maintenance or repair work is done on the pump.
- (3) When a well is disinfected, the initial chlorine concentration shall be 100 mg/L throughout the entire water column.
- (4) For newly constructed or altered wells in which the pump is not immediately installed, the chlorine concentration used to disinfect the well shall be 100 mg/L. Upon installation of the pump, the well, the pumping equipment, and the distribution system, if connected, shall be disinfected with a chlorine concentration of 100 mg/L.
- (5) The disinfectant solution shall remain undisturbed in the well for a minimum of two hours. After all the chlorine has been flushed from the water supply system, a water sample shall be collected and submitted to a Massachusetts certified laboratory. For new wells, the sample shall be tested pursuant to § 386-6 of these regulations.
- (6) Only certified well drillers are authorized to physically alter, or repair a well. For wells, that have undergone repair, a sample shall be tested for total coliform bacteria and any other parameters deemed appropriate by the Board, prior to being put back in use.

§ 386-10. Decommissioning/abandoning requirements.

- A. Abandoned wells, test holes, and borings shall be decommissioned so as to prevent the well, including the annular space outside the casing, from being a channel allowing the vertical movement of water.
- B. The owner of a private well shall abandon and decommission the well if any of the following criteria are met:
 - (1) Construction of the well is terminated prior to completion of the well.
 - (2) The well owner notifies the Board that the use of the well is to be permanently discontinued.
 - (3) The well has been out of service for at least three years.
 - (4) The well is a potential hazard to public health or safety and the situation cannot be corrected.
 - (5) The well is in such a state of disrepair that its continued use is impractical or unsafe.
 - (6) The well has the potential for transmitting contaminants from the land surface into an aquifer or from one aquifer to another and the situation cannot be corrected.
 - (7) The well is sampled as per § 386-8C and D and fails the water quality parameters established by US EPA or MassDEP and the property location has access to municipal water service. In the event of abandonment due to the presence of contamination, the property owner will not be permitted to install a new well if the property can be connected to the municipal water system.
- C. The property owner shall ensure that that all abandoned wells and test holes or borings associated with the well installation are properly plugged before work at the site is completed. Only certified

well drillers may plug abandoned wells, test holes, and borings.

- D. Abandoned overburden wells or borings shall be completely filled with a low permeability grout, which cures with a final permeability of less than 1×10^{-7} cm/sec. Wells shall be plugged with neat cement grout, sand cement grout, concrete, or bentonite grout.
- E. Regardless of the type used, the grout used for plugging shall:
 - (1) Be sufficiently fluid so that it can be applied through a tremie pipe from the bottom of the well upward;
 - (2) Remain as a homogeneous fluid when applied to the subsurface rather than disaggregating by gravity into a two-phase substance;
 - (3) Be resistant to chemical or physical deterioration; and
 - (4) Not leach chemicals, either organic or inorganic, that will affect the quality of the groundwater where it is applied.
- F. The plugging materials shall be introduced at the bottom of the well or boring and placed progressively upward to a level approximately four feet below the ground surface. Sealing materials shall not be poured from the land surface into the well, borehole, or annular space being sealed.
- G. The well driller shall install a surface seal after the well or boring has been plugged. Before the surface seal is placed, casing remaining in the hole shall be cut off. The remaining four feet at the top of the well or boring shall then be filled with concrete. The top of the seal shall comprise a concrete slab above the top of the plugged well or boring. This concrete slab shall be at least six inches thick and shall be at least two feet greater in diameter than the well casing or borehole wall.

§ 386-11. Relief procedures: preexisting lots.

- A. Whenever a person has submitted a subdivision or preliminary subdivision plan followed within seven months by a definitive plan, or a plan referred to in MGL c. 41, § 81P, as the case may be, the land shown on such plan shall be governed by the provisions of the state Environmental Code and Board of Health regulations, if any, which differ from the code which are in effect at the time of first submission of the plan. Such provisions shall apply while the plan is processed until rejected, or if approved, until three years from the date of filing pursuant to MGL c. 111, § 127P.
- B. Any lot not covered by Subsection A which is shown or referred to in a deed or shown on a plan duly recorded at the Nantucket Registry of Deeds, or filed in the Land Registration Office before the effective date of this regulation, August 24, 1990, shall comply with § 386-6A of the regulation to the maximum extent possible, meaning that wells shall be located as close to the regulation distance requirements as lot size and contours permit. As a minimum requirement, said lot shall comply with current state Sanitary Code regulations and local regulations in effect prior to August 24, 1990. In the event that a preexisting lot cannot comply with the 300-foot separation requirement set forth in § 386-6A, then, in that event, the Board of Health, or its agent, shall in any case grant to said lot an exemption from the 300-foot separation requirement upon the following conditions:
 - (1) The applicant shall submit to the Board of Health a design plan stamped by a professional engineer or land surveyor showing the location of the proposed well, the proposed or existing leaching facilities on said lot, locations of all wells and leaching facilities within 400 feet of the proposed well, or as far from the locus as deemed necessary to determine that compliance with this section cannot be met, and the groundwater gradient and direction of flow for said lot (as

determined by Map #2, HWH Water Management Report, March, 1990 on file with the Board of Health).

- (2) For preexisting, vacant lots being held in contiguous ownership prior to the effective date of this regulation, the applicant shall also file a stamped plan with such design and location information showing maximum compliance with the 300-foot separation requirement for contiguous lots abutting the subject lot.
- (3) All new leaching facilities on an improved lot shall, if necessary, be relocated on said lot to the maximum separation distance attainable at the time the facilities are replaced up to 300 feet provided it includes Innovative Alternative (IA) technology and meets maximum feasibility compliance under 310 CMR 15.00.
- (4) Adjustments of preexisting lot lines shall not subject said lot to compliance with the 300-foot separation requirement on the condition that such adjustments do not create an additional "buildable" lot and the distance between the well and leaching facility on said lot is not diminished.

§ 386-12. Enforcement.

- A. The Board has authority to investigate suspected or known violations of these regulations and/or violations of any water supply certificate conditions. The Board may take actions, as it deems appropriate, within its authority for the protection of public health, safety welfare, or the environment, and to enforce any of the provisions of this regulation.
- B. If any investigation reveals a violation of these regulations or the water supply certificate conditions, the Board may order the private well owner, and/or any other person responsible for the violation, to comply with the violated provision(s), and/or take other action within its authority as the Board deems appropriate, including but not limited to suspension or revocation of a well construction permit or water supply certificate.
- C. Any order the Board issues shall be in writing and served upon the owner of the well and the party responsible for the violation by delivering a copy to the person's last known address. For purposes of service, the Board may rely on information provided by the applicant, the records of the Town's Board of Assessors, the records of the Department with respect to certified well drillers and certified Companies, and any other reliable information. If the last known address of the person responsible for the violation cannot be determined, it shall be the property owner's responsibility to comply with the order.

§ 386-13. Hearing.

Any person to whom the Board issues an order may request a hearing before the Board by filing with the Board within seven days after the day the order was served a written request for a hearing. Upon receipt of a hearing request, the Board shall set a time and place for the hearing and shall inform the well owner and responsible party in writing. At the hearing the person requesting the hearing shall be given an opportunity to be heard and show why the order should be modified or withdrawn. After the close of the hearing, the Board shall issue a written decision to sustain, modify, or withdraw the order and shall mail a copy of the decision, by certified mail, return receipt requested, to the person who requested the hearing and the well owner. If the Board sustains or modifies the order, it shall be carried out within the time period allotted in the original order or in the modification. A request for a hearing shall not relieve the responsible party of its obligation for complying with the order unless and until it is modified or vacated by the Board.

§ 386-14. Appeal.

Any person aggrieved by the final order, Variance, well Construction Permit, or certificate of water supply determination of the Board may appeal to any court of competent jurisdiction as provided by the laws of the commonwealth.

§ 386-15. Penalties.

- A. This regulation may be enforced by duly authorized agent of the Board. Whoever violates any provision of this regulation may be penalized by a noncriminal disposition process as provided in MGL c.40, § 21D and the Town's noncriminal disposition bylaw. If noncriminal disposition is elected, the noncriminal fine for each such violation, if not otherwise specified, shall be:

First offense: \$100

Second offense: \$200

Third and subsequent offenses: \$300

- B. Each day or portion thereof shall constitute a separate offense. If more than one, each condition violated shall constitute a separate offense.
- C. Whoever violates any provision of this regulation may be penalized by indictment or on complaint brought in the district court. Except as may be otherwise provided by law and as the district court may see fit to impose, the maximum penalty for each violation or offense shall be \$1,000. Each day or portion thereof shall constitute a separate offense. If more than one, each condition violated shall constitute a separate offense.
- D. The Board of Health may enforce this regulation or enjoin violations thereof through any lawful process, and the election of one remedy by the Board of Health shall not preclude enforcement through any other lawful means.

§ 386-16. Variance.

- A. The Board may grant a variance to any provision of this regulation when, in its opinion, the enforcement would result in manifest injustice, and the applicant has demonstrated that the equivalent degree of protection will be provided without strict application of the particular provision(s) sought to be varied.
- B. Every request for a variance shall be in writing, shall state the specific provision of this regulation from which variance is sought, the reasons for seeking the variance and proof of the notice required below. The request shall also contain the information to establish manifest injustice and equivalent degree of protection. At least 10 days prior submission of the application to the Board, the applicant shall provide notice of their intent to the request a variance as follows: a) by certified mail, return receipt requested to all abutters of the property upon which the private well will be or is located and b) publication in a newspaper of general circulation in the Town. The notice shall include at a minimum: the name and address of the well location, a statement of the provision(s) of this regulation from which a variance is sought, and the reason for seeking the variance. Any grant or denial of a variance shall be in writing and shall contain a brief statement of the reasons for approving or denying the variance.
- C. The Board may issue a variance subject to such conditions as it deems necessary to public health, safety, welfare or the environment. Any such conditions shall be stated in writing in the Board's grant

of the variance. The Board may revoke, modify or suspend, in whole or in part, a variance after the property owner has been notified in writing and is afforded an opportunity to be heard, pursuant to § 386-11 of these regulations.

§ 386-17. Severability.

If any provision of these regulations or the application thereof is held to be invalid by a court of competent jurisdiction, the invalidity shall be limited to said provision(s) and the remainder of these regulations shall remain valid and effective. Any part of these regulations subsequently invalidated by a new state law or modification of an existing state law shall automatically be brought into conformity with the new or amended law and shall be deemed to be effective immediately, without recourse to a public hearing and the customary procedures for amendment or repeal of such regulation.

§ 386-18. Effective date.

These regulations were adopted by vote of the Nantucket Massachusetts Board of Health, at public meeting held on September 21, 2023, and are to be in full force and effect on and after January 1, 2024. Before said date, these regulations shall be published and a copy placed on file in the Board of Health Offices and filed with the Department of Environmental Protection, Division of Wastewater Management in Boston. These regulations or any portions thereof may be amended, supplemented or repealed from time to time by the Board, as provided by law and applicable regulations.

§ 386-19. Disclaimer.

The issuance of a well permit shall not be construed as a guarantee or certification by the Board or its agents that the water system will function satisfactorily or that the water supply will be of sufficient quality or quantity for its intended use.

Massachusetts Department of Environmental Protection (MassDEP)

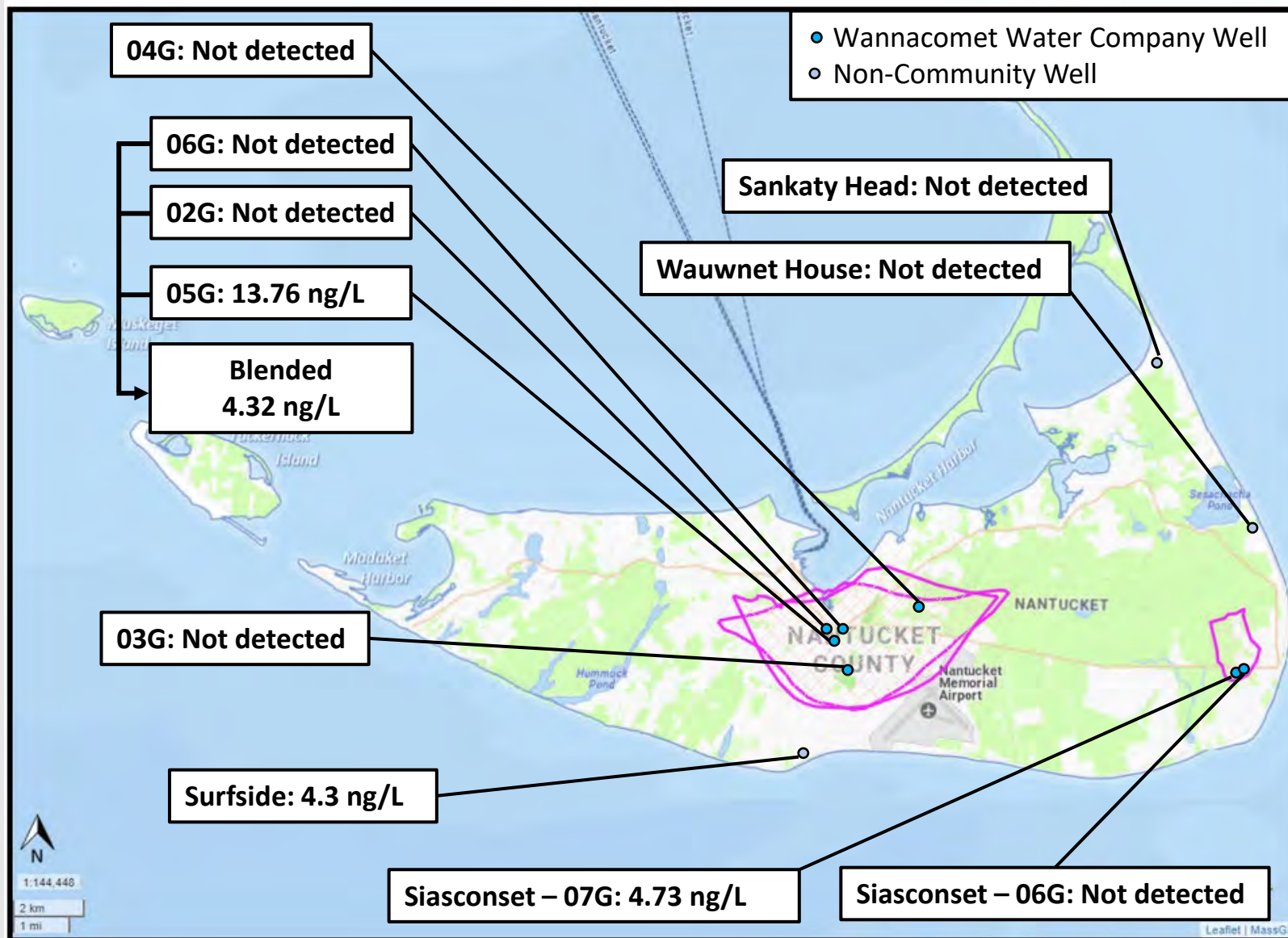
PFAS Informational Session - Nantucket

- Public Water Supplies
 - Toms Way
- Nantucket Airport
- Nantucket Landfill

September 10, 2024



PFAS6 in Nantucket Public Water Supplies



Waste Site Cleanup Program

- **Regulations the govern cleanups – Massachusetts Contingency Plan (MCP)**
- **Semi-Privatized Program**
 - Potentially Responsible Parties (PRPs), usually property owners, hire Licensed Site Professionals (LSP) to conduct assessment and cleanup work
 - MassDEP audits the work conducted by the PRP/LSP
 - MassDEP may conduct response actions if PRPs have not been identified
 - The degree of MassDEP direct involvement is determined by site complexity, potential risk to public health and the identification of PRPs
- **Phased process of assessment and remediation (could be 6 year or more process)**
 - Phase I – Initial Site Assessment
 - Phase II – Comprehensive Site Assessment and Risk Assessment
 - Phase III - Remedial Action Plan
 - Phase IV - Remedy Implementation Plan
 - Phase V - Status and Remedial Monitoring Report
 - Immediate Response Actions could be required in response time-critical release conditions
- **90% of releases are closed with a Permanent Solution within one year**
 - A small percentage of releases take longer than six years



PFAS Releases at Nantucket Airport

- **Sources of PFAS:**

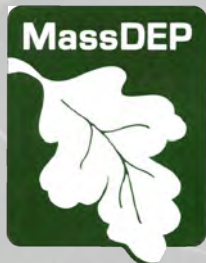
- Several source areas identified from aqueous film-foaming foam (AFFF) use at the Airport
- Sun Island was issued an NOR in April 2022 – continuing with response actions
- Airport Gas / Car Wash property owned by the Airport

- **Municipal Water Connections**

- As part of an Immediate Response Action under the MCP, residences impacted with PFAS6 > 20 ng/L from the airport were connected to municipal water funded by the Airport

- **Status of MCP Response Actions**

- Phase II Comprehensive Site Assessment was completed by the Airport on March 8, 2024
- DEP met with the Airport and conducted a site inspection on May 2, 2024;
- MassDEP is conducting an audit of the work completed and will be issuing a Notice of Audit Findings concluding the audit;
- An additional 10-15 homes with PFAS detections will be connected to municipal water



Toms Way/Fairgrounds Road Site Discovery

- **UMASS sampling detected PFAS6 > 20 ng/L near Fairgrounds Road**
- **MassDEP initiated sampling – August 2023 through May 2024**
 - Almost 70 private wells sampled
 - 20 private wells exceeded the Massachusetts Maximum Contaminant Level (MMCL) for PFAS
 - MassDEP was preparing to install point-of-entry treatment systems on wells with PFAS6 > 90 ng/L
- **Winter 2023/2024 – Nantucket installed a water line**
 - All homes on Toms Way have been connected to Nantucket public water
- **BWSC conducting Site Discovery work in the area**
 - Groundwater flow is difficult to infer and may be northeasterly
 - Contractor hired to install monitoring wells and ***tentatively*** scheduled for mid-November



Solid Waste Program

- **Solid Waste Management Facilities are regulated by two sets of regulations**
 - Site Assignment Regulations at 310 CMR 16.00
 - Solid Waste Management Facility Regulations at 310 CMR 19.000 (regulations that govern Environmental Assessment and Monitoring at landfills)
- **MassDEP's Solid Waste Section provides direct oversight of the Landfill assessment and sampling**
- **Solid Waste Regulations utilize MCP Standards and similar phased**
 - Initial Site Assessment (ISA)
 - Comprehensive Site Assessment (CSA)
 - Corrective Action Alternatives Analysis (CAAA)
 - Corrective Action Design (CAD)
 - Corrective Action Implementation (CIA)



PFAS at the Nantucket Landfill

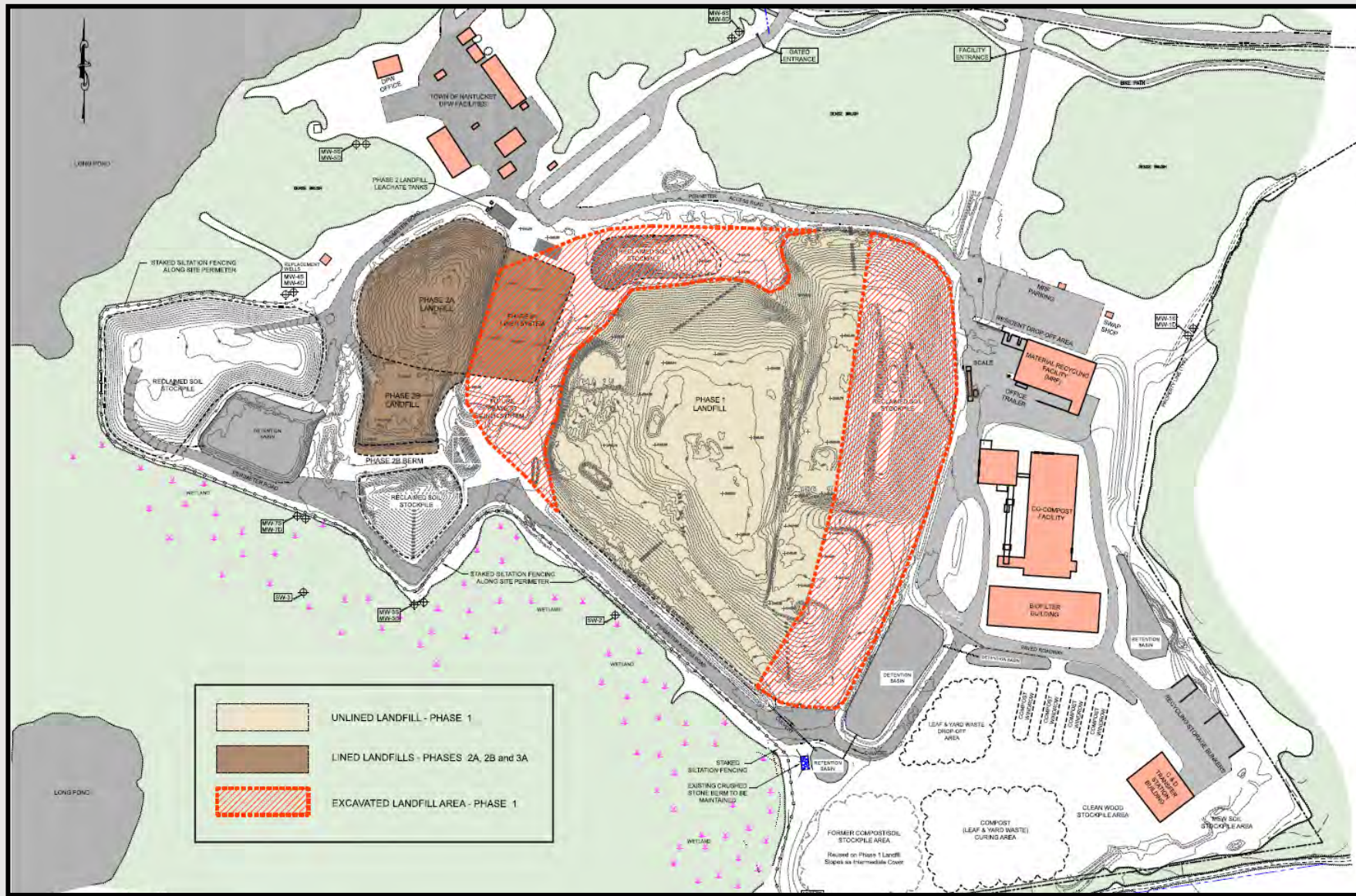
- **MassDEP Solid Waste PFAS Landfill Strategy**
 - The Town of Nantucket was proactive in addressing PFAS at the Landfill
 - Submitted a sampling scope of work (SW-22 Permit application) for PFAS sampling
 - MassDEP approved the sampling scope in September 2023
- **BWSC initiated sampling of residential water supply wells in vicinity of the Landfill in May 2024**
 - Six private wells sampled: PFAS not detected in 4 wells; 2 wells had PFAS6 < 20 ng/L.
 - Additional sampling planned near the Landfill and Madaket Road Fire Station
 - At this time, it cannot be concluded that the Landfill is a source of PFAS in the private wells



PFAS at the Nantucket Landfill

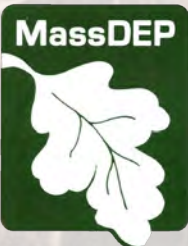
- Nantucket Landfill is on a 73-acre Parcel with 15-acres of waste area
- Phase 1 Landfill approx. 10 acres
- Phase 2 & 3 Landfill approx. 5 acres
- Landfill Assessment: Completed 1996-1998
- PFAS was not evaluated at that time (1996-1998)
- Now Landfills universally considered potential sources of PFAS

Nantucket Landfill



PFAS at the Nantucket Landfill

- December 2021 – Town of Nantucket proactively initiated PFAS evaluation
 - 14 Groundwater Monitoring Wells
 - 3 Surface Water Sampling Locations
- October 2023 and April 2024 – town collected PFAS samples at all groundwater and surface water locations
- August 30, 2024, Town submitted a Report with results of April 2024 sampling and proposed additional assessment
 - Groundwater monitoring wells, piezometers, surface water locations and soil sampling on the Landfill site
- MassDEP is currently reviewing the August 30, 2024, Report



MassDEP Team for Follow-up Questions

- **Gerard Martin, Regional Director** - Gerard.Martin@mass.gov
- **John Handrahan, Deputy Regional Director, BWSC** - John.Handrahan@mass.gov
- **Angela Gallagher, Chief, Site Management, BWSC** - Anglela.Gallagher@mass.gov
 - **Navpreet Brolowski, BWSC** - Navpreet.Brolowski@mass.gov
 - **Rachel Stevens, BWSC** - Rachel.Stevens@mass.gov
- **Mark Dakers, Chief, Solid Waste, BAW** - Mark.Dakers@mass.gov
- **Jennifer Wharff, Solid Waste, BAW** - Jennifer.Wharff@mass.gov



Nantucket Land and Water Council Public PFAS Workshop

9/10/24

Willa Arsenault- Environmental
Program Coordinator



**The Nantucket PFAS Well Project was born out
of a collaborative spirit**



Nantucket PFAS Action Group brought news of a potentially helpful screening method to the NLWC

- Dr. Graham Peaslee of Notre Dame has been working on Proton-Induced Gamma Emission (PIGE) methods in order to extract and indentify the presence of flourine in water



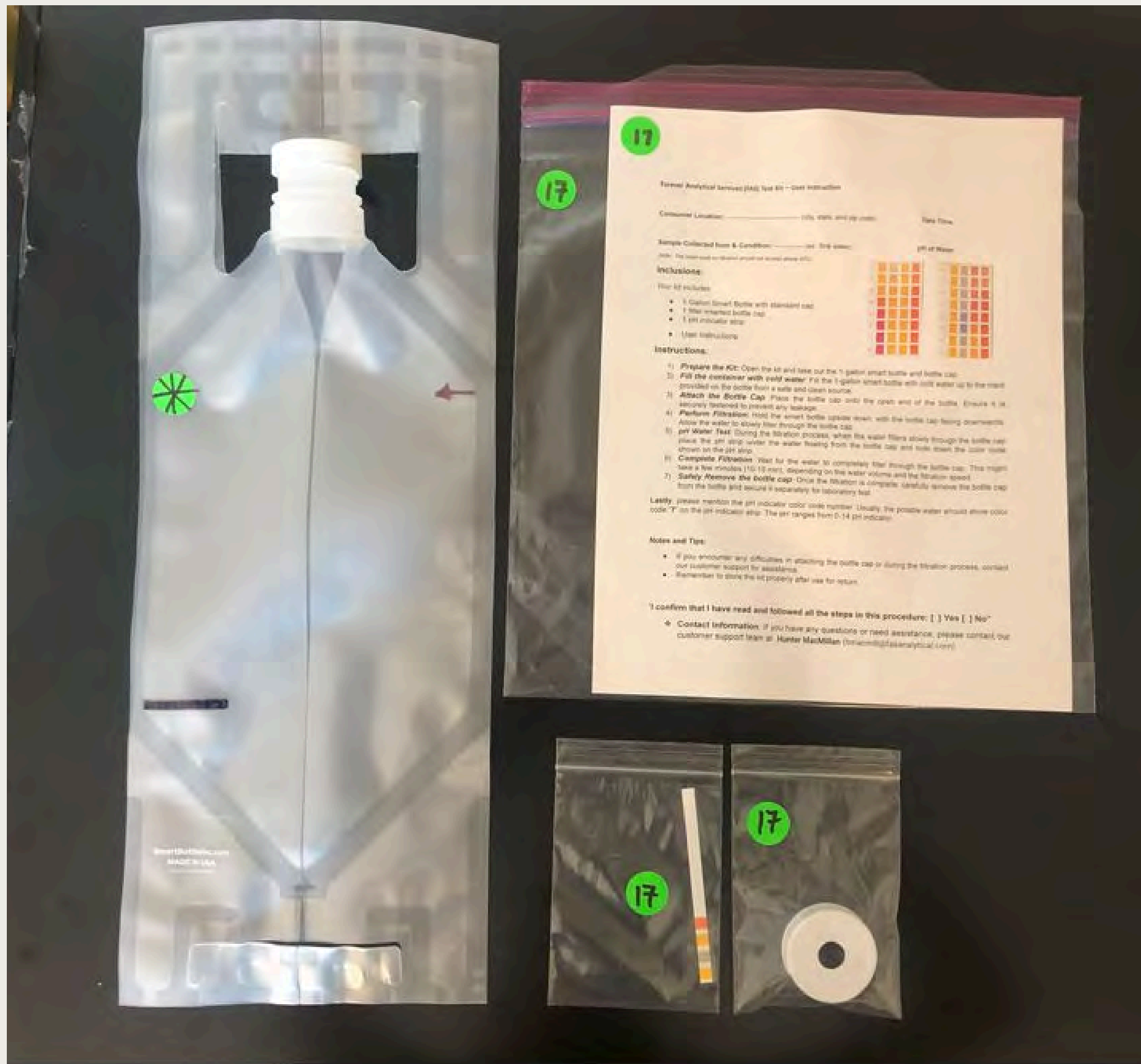
The PIGE Screening Kit is a comparatively accessible option for private well owners to look into their water supplies

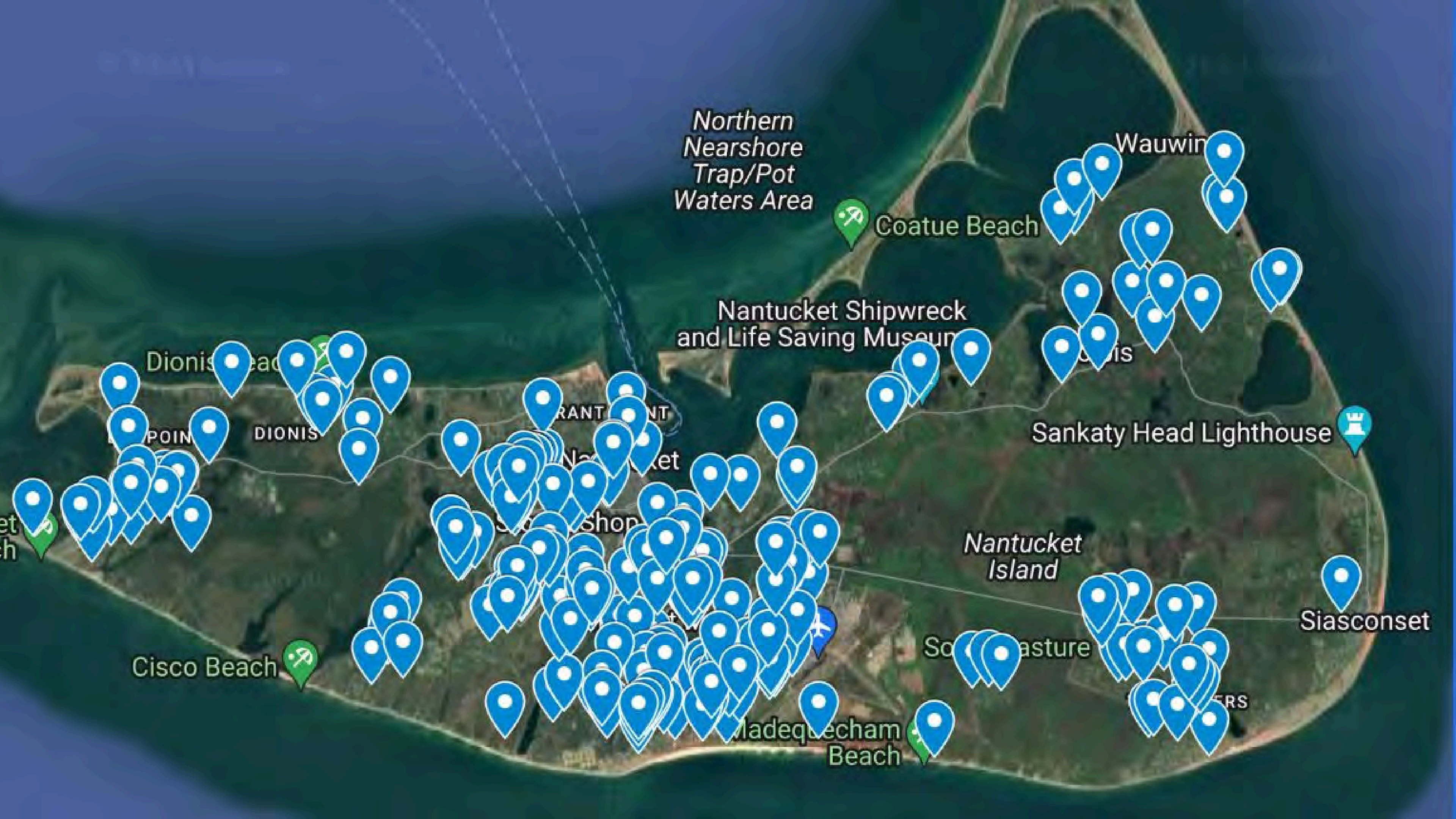
- Cheaper
- Simple to administer
- Does not need immediate processing



Administering the kit consists of:

1. Filling up the
provided bag with
water from your tap
2. Screwing on the lid
with the filter
3. Letting the water drip
out
4. Taking note of the PH





Northern
Nearshore
Trap/Pot
Waters Area

Wauwinet

Coatue Beach

Nantucket Shipwreck
and Life Saving Museum

Sankaty Head Lighthouse

Nantucket
Island

Siasconset

So. pasture

Madequecham
Beach

Cisco Beach

Dionis Beach

DIONIS

RANT

Nantucket

shop

ERS

Extended Testing Sites

A satellite map of Nantucket Island, Massachusetts, with various locations marked as testing sites. Blue circular icons with a white checkmark indicate confirmed or active sites, while green pin icons with a white crosshair indicate potential or historical sites. The map includes labels for several locations: Northern Nearshore Trap/Pot Waters Area, Wauwinet, Coatue Beach, Polpis, Sankaty Head Lighthouse, Nantucket Shipwreck and Life Saving Museum, Nantucket Island, South Pasture, TOM ERS, Madequecham Beach, Cisco Beach, Dionis Beach, EEL POINT, DIONIS, Nantucket, Nantucket Memorial Airport-ACK, and St. Onset. The map also shows the coastline, water, and some inland features like roads and fields.

Results are currently getting processed by an
outstanding team of Analytical Chemists

The goal is to provide a clear and legible report back to all participants

- What has been found
- What that means
- What to do next



PFAS AND DRINKING WATER: CHOOSING A FILTER



PFAS (per- and polyfluoroalkyl substances) are a group of persistent, industrial chemicals released into the environment through spills and waste products. Contaminated drinking water is one of the main ways people are exposed to PFAS.



Some PFAS can stay in people’s bodies for a long time. Health effects of PFAS are not fully understood, but they have been linked to some cancers, high cholesterol, and developmental and reproductive health concerns.

What you can do: Filter your drinking water

No filters will remove all PFAS from your water, but with regular maintenance, ANY filter will be better than no filter at all.

Contaminated drinking water poses the greatest exposure concern. Filtering water from kitchen taps and/or your refrigerator, and changing filters on the recommended schedule, can help reduce exposure.

pitcher filter



refrigerator filter



reverse osmosis (under the sink)



activated carbon filters

Some filters perform better than others...



% short-chain PFAS removed



% long-chain PFAS removed



Filters are better at removing "long-chain" PFAS (larger compounds) than "short-chain" PFAS. Reverse osmosis performs better than activated carbon filters.

less than 8 carbons

8 or more carbons

% removed % left over

...but they cost more to buy and maintain

(approximate costs*)

	pitcher filter	refrigerator filter	reverse osmosis (under the sink)
up-front cost	\$20+	comes with fridge (\$0)	do it yourself \$200+ professional help \$1,000
annual maintenance	\$50+	\$80+	\$80+ \$275



Regular maintenance is important

The best way to limit PFAS exposure in your drinking water is by replacing filters and other parts using the schedule recommended by the manufacturer



Data Sources

Herkert, N., et al. 2020. Assessing the Effectiveness of Point-of-Use Residential Drinking Water Filters for Perfluoroalkyl Substances (PFAS). Environmental Science & Technology Letters. <https://dx.doi.org/10.1021/acs.estlett.0c00004>

Knappe, D. 2018. "How do fluorochemicals get into our drinking water, and how can we get them out?" http://mleed.umich.edu/files/UMPFASWebinar_20180516_Knappe_HowDoFluorochemicals.pdf

*Cost assumptions: filter replacement every 6 months



SUPERFUND
Research Center

early life exposures, later life consequences



National Institute of
Environmental Health Sciences
Superfund Research Program

NC STATE
UNIVERSITY

Water filter images all from The Noun Project
Water pitcher - Ben Davis
Fridge - DAVIVONGSA PATHRPOL
Reverse Osmosis - lastspark

Test Your Blood

Out-of-Pocket Testing

Eurofins US

Quest Diagnostics Lab (\$299 + \$7 physician service fee)

Health Insurance Testing (Not all insurance will cover PFAS Blood Tests)

Quest Diagnostics PFAS Serum/Plasma Test

- Test Code: 39307
- CPT Code: 82542

Whats Next?

- In order to best tackle the issue of PFAS we need collaboration across all sectors
- The NLWC plans to address PFAS from the top down as well as from the bottom up

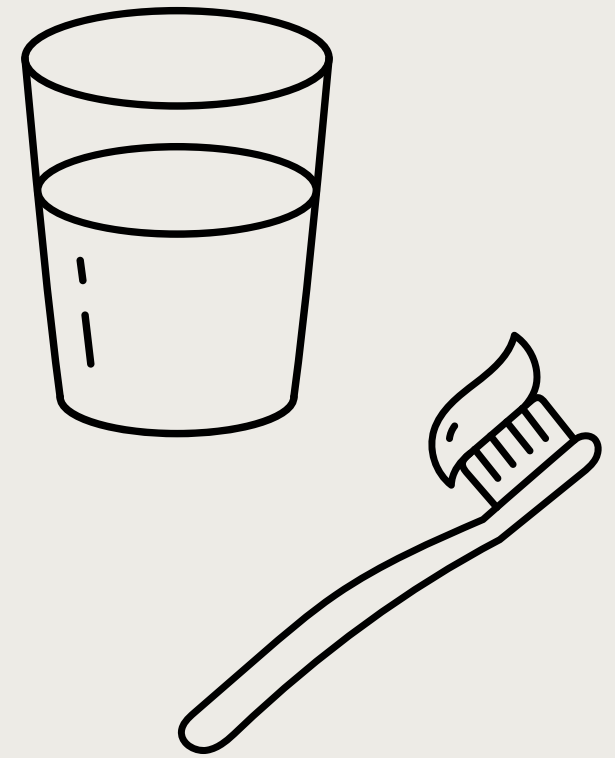
Continued education efforts and monitoring of regulations

- The NLWC works to stay up to date on all relevant policy decisions made in regards to PFAS and create opportunities to spread awareness.





**Future collaboration with
the town on addressing
consumer products**



Thanks!