

The background of the slide is a light gray gradient with several realistic water droplets and bubbles of various sizes scattered across it. The droplets have highlights and shadows, giving them a three-dimensional appearance.

WATER SUPPLY DIVISION

PFAS AND OUR WATER

SAMUEL WILSON, CHAIR

BARNSTABLE MUNICIPAL WATER SUPPLY BOARD

SPECIAL TOWN COUNCIL MEETING | APRIL 11, 2024

PAST

PRESENT

FUTURE

PAST | PFAS HISTORY

Hyannis Water System PFAS contamination began decades ago

Sources include the Fire Training Academy & Barnstable Municipal Airport

PFAS First detected in May 2010 – Silent Spring Emerging Contaminants Study

EPA had a health advisory at the time, no Maximum Contaminate Limit

PFOA – 22ppt – EPA guideline: 400 ppt

PFOS – 110ppt – EPA guideline: 200 ppt

PAST | PFAS LEVELS 2013/2014

Straightway Booster (mix)

Nov. 2013 – 61 ppt PFOS

Mary Dunn #1 Well

Nov. 2013 – 190 ppt PFOS

May 2014 – 98 ppt PFOS

Mary Dunn #2 Well

Nov. 2013 – 170 ppt PFOS

May 2014 – 430 ppt PFOS

Mary Dunn #3 Well

Nov. 2013 – 110 ppt PFOS

May 2014 – 210 ppt PFOS

Maher Booster (mix)

Nov. 2013 – 60 ppt PFOS

May 2014 – 86 ppt PFOS

PAST | PFAS REGULATION/TREATMENT TIMELINE

2013
2014

- EPA Unregulated Contaminant Monitoring Rule-3 (UCMR-3) mandated sampling & testing

November
2014

- Meeting with MassDEP regarding test results of UCMR-3 sampling

Spring
2015

- Manifold installed at Mary Dunn treatment plant supply lines
- Install carbon filtration units at Mary Dunn 1 & 2
- Temporary overland connection with Yarmouth Water System

PAST | PFAS REGULATION/TREATMENT TIMELINE

May
2016

- EPA lowers health advisory from 200 ppt to 70 ppt for PFOS
- Install carbon filtration units at Mary Dunn 3 & temporary connection to COMM water system
- Begin re-activation of Straightway 1 and Mary Dunn 4 well

Fall
2016

- Construct enclosure of Mary Dunn 1-3 carbon filtration units

June
2018

- MassDEP sets goal for PFAS 6 to 70 ppt
- Start construction of treatment plant for Maher wells
- Install carbon filtration units at Airport, Hyannisport, Simmons Pond, and Straightway

PAST | PFAS REGULATION/TREATMENT TIMELINE

June
2019

- MassDEP sets MCL for PFAS 6 at 20 ppt

Fall 2020

- Maher treatment plant goes online
- Cease buying water from Yarmouth & COMM

Fall 2021

- County caps Fire Training Academy site

PAST | COST OF WATER - YARMOUTH

DATE	PRICE per 1000 gallons
Jul 2015 – Nov 2015	\$3.32 + \$50,000
Apr 2016 – May 2017	\$3.32
Jun 2017 – May 2018	\$3.53
Jun 2018 – May 2019	\$3.53 + \$15,000
Jun 2019 – May 2020	\$3.53 + \$18,000
Jun 2020 – Dec 2020	\$3.53 + \$20,000

TOTAL EXPENDITURE

Interconnect	\$ 540,000
FY2017	\$ 760,000
FY2018	\$ 450,000
FY2019	\$ 550,000
FY2020	\$ 970,000
FY2021	\$ 230,000
TOTAL	\$ 3,500,000

PAST | COST OF WATER - COMM

DATE	PRICE per 1000 gallons
2016 – 2019	\$1.25
2020	\$1.55

TOTAL EXPENDITURE

Interconnect	\$ 770,000
FY2017	\$ 40,000
FY2018	\$ 70,000
FY2019	\$ 60,000
FY2020	\$ 80,000
FY2021	\$ 110,000
TOTAL	\$ 1,135,000

PRESENT | CURRENT TREATMENT

- ACTIVATED CARBON FILTRATION
 - 20 FILTRATION UNITS
 - CONDITIONED UNITS
 - MAHER
 - MARY DUNN WELLS
 - OPEN AIR UNITS
 - HYANNISPORT
 - SIMMONS POND
 - STRAIGHTWAY
 - AIRPORT



PRESENT | CURRENT TREATMENT COSTS

COSTS: ~\$1.2M PER YEAR

~25% Of the operating budget

**DEBT SERVICE FOR EXISTING
TREATMENT FACILITIES (FY23)**

Principal - \$630,000

Interest - \$265,000

COUNTY PAYMENTS FOR TREATMENT

FY2018: \$360,000

FY2019: \$360,000

FY2020: \$210,000

FY2021: \$250,000

FY2022: \$360,000

Going forward: \$360,000

PRESENT | PFAS LEVELS – TREATED WATER

CCR Regulated Chart for PFAS detects in 2022

Regulated Contaminant	Date(s) Collected	Range Detected ppt	Average Detected ppt	MCL ppt	Possible Source of Contamination	Health Effects
PFOS, PFOA, PFNA, PFHxS, PFHpA, PFDA	Quarterly	ND	0.23 *	20	Man-made chemicals. Used as surfactants to make products stain or water resistant, in fire-fighting foam, for industrial purposes, and as a pesticide. Used in fluoropolymers (such as teflon) cosmetics, greases and lubricants, paints, adhesives and photographic films. PFOS U.S. manufacturing phased out in 2002; PFOS may still be generated incidentally or in imported products.	Long-term exposure to PFOS and PFOA in drinking water may affect the liver, cholesterol and thyroid hormone levels. Some studies indicate that exposure to elevated levels of PFOS and PFOA could cause immunological effects, developmental effects and some types of cancer in laboratory animals. Scientists are working to better understand the degree of risk to people. Based on studies of laboratory animals and chemical similarity to PFOS and PFOA depending on the level and length of exposure, PFNA, PFHxS, PFHpA and PFDA in drinking water may affect the liver, cholesterol levels, thyroid and immune system and may cause developmental effects.
PerfluoroHexanoic (PFHxA)	Quarterly	ND-4.38	0.96	**	Man-made chemical; used in products to make them stain, grease, heat and water resistant.	Based on studies of laboratory animals, people exposed to elevated levels of PFHxA for several years could experience effects on the liver. It is less toxic and is cleared from the body much faster than PFOS, PFOA and other longer-chain PFAS.

On October 2, 2020, the Massachusetts Department of Environmental Protection (MassDEP) published final regulations establishing a drinking water standard, or a Maximum Contaminant Level (MCL), for the sum of six per- and polyfluoroalkyl substances (PFAS). The MCL is 20 parts per trillion (ppt) for what the regulations call PFAS6, or the sum of six PFAS compounds: perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA), perfluorohexane sulfonic acid (PFHxS), perfluorononanoic acid (PFNA), perfluoroheptanoic acid (PFHpA), and perfluorodecanoic acid (PFDA). PFAS are a family of chemicals widely used since the 1950s to manufacture common consumer products. They have been linked to a variety of health risks, particularly in women who are pregnant or nursing, and in infants. In using the sum of six PFAS compounds, the new standard protects public health for sensitive subgroups including pregnant women, nursing mothers and infants. Please consult your health practitioner if you have any health related questions. For a consumer factsheet on PFAS see: <https://www.mass.gov/doc/massdep-fact-sheet-pfas-in-drinking-water-questions-and-answers-for-consumers/download>

* Running Annual Average** There is no ORS Guideline or UCMR3 reference concentration health benchmark for this compound. However, the Minnesota Department of Health established a drinking water guidance value of 2,000 ppt for PFBS. See <http://www.health.state.mn.us/divs/eh/risk/guidance/gw/pfbsinfo.pdf>. EPA also has draft toxicity assessments for PFBS at <https://www.epa.gov/pfas/genx-and-draft-toxicity-assesments>

FUTURE | TREATING WATER

COMBINED STRAIGHTWAY AND HYANNISPORT TREATMENT FACILITY

- IN DESIGN PHASE
- EXPECTED COST: \$36M
- DELIVERY: 2026
- DEBT SERVICE: \$2.35M PER YEAR
 - 20 YEARS

MARY DUNN & AIRPORT TREATMENT PLANT

- PRELIMINARY DESIGN PHASE
- EXPECTED COST: \$27M
- DELIVERY: 2028
- DEBT SERVICE: \$1.55M PER YEAR
 - 20 YEARS

CONCLUSION | LEADING THE TREATMENT

- THE HYANNIS WATER SYSTEM WAS THE FIRST ON CAPE COD TO BE IMPACTED BY PFAS
- QUICK ACTION TO SHUT-OFF AFFECTED WELLS AND ADD TREATMENT SYSTEMS
- TREAT 100% OF THE WELLS FOR PFAS 6 TODAY TO BELOW DETECTABLE LIMITS
 - MEET ALL FEDERAL AND STATE STANDARDS
- CONTINUING TO EXPAND AND IMPROVE TREATMENT FACILITIES