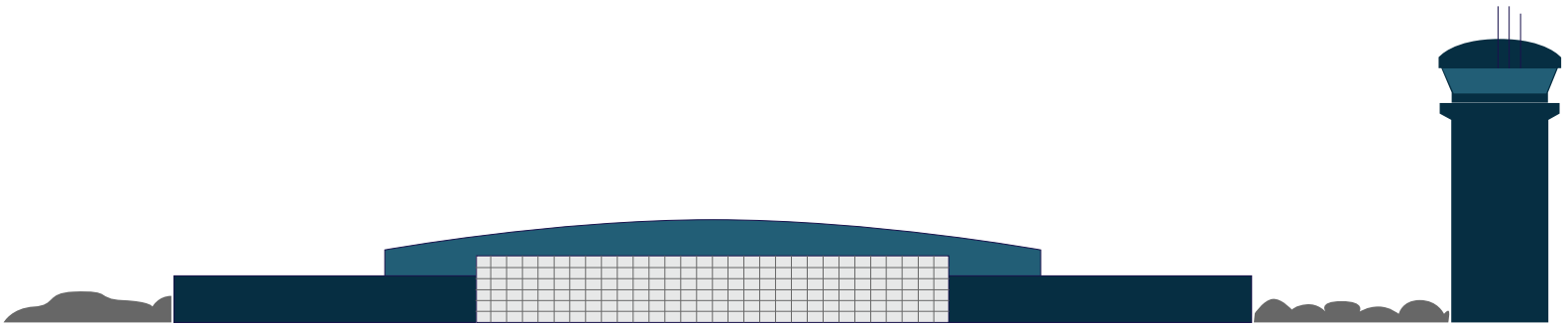
Cape Cod Gateway Airport PFAS Public Involvement Plan (PIP) Discussion

December 18, 2023

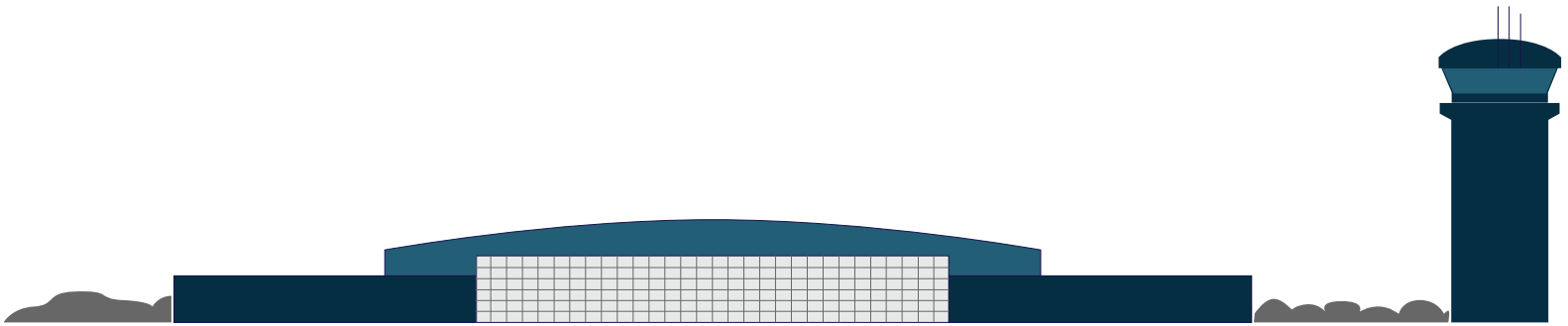
PFAS Reports

- https://flyhya.com/airport-info/pfas/
- https://eeaonline.eea.state.ma.us/EEA/FileViewer/Rtn.aspx?rtn=4-0026347



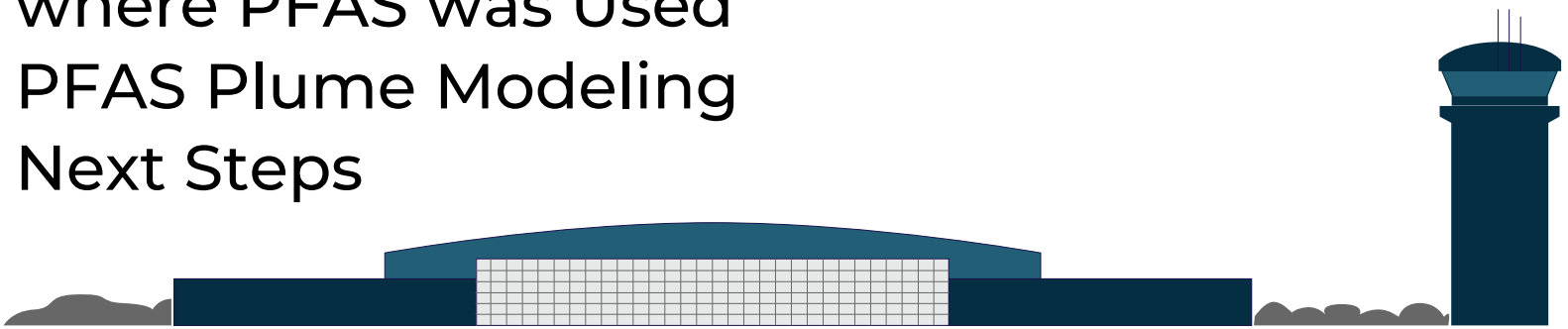
Airport Timeline and Investigation

- The airport began investigating PFAS in 2016 at the request of MassDEP.
- Between 2016 and 2023, the Airport has collected over 131 soil samples, 210 groundwater samples, eight fire truck spray samples, and three surface water (Upper Gate and Lewis Pond) samples for PFAS analysis.



Today's Discussion…

- Airports Investigation Timeline
- What are Per and Poly Fluoroalkyl Substances (PFAS)
- Aqueous Film Forming Foam (PFAS Containing Fire Fighting Foam) Use at the Airport
- Airport PFAS Investigation
  - Nature and extent of PFAS impacts
  - Completion of Protective Caps in Areas where PFAS was Used
  - PFAS Plume Modeling
  - Next Steps



PFAS Timeline at the Airport

2016

August: MassDEP Request for Information (RFI) from the Airport

September: Airport Provides Information

November: MassDEP requires IRA

December: IRA Plan Provided

2017

April: IRA Status Report 1

October: RFI for Construction Soils

October: IRA Status Report 2

November: Phase I Report and Tier Classification

2018

April: IRA Status Report 3

October: IRA Status Report 4

2019

April: IRA Status Report 5

July: Draft Public Involvement Plan (PIP)

September: Final PIP

October: Draft IRA Modification for Caps

October: IRA Status Report 6

GATEWAY CAPE COD AIRPORT

PFAS Timeline at the Airport (Continued)

2020

April: IRA Status Report 7
October: IRA Status Report 8
December: Draft Phase II Report

2021

January: Final Phase II Report
April: IRA Status Report 9
October: IRA Status Report 10

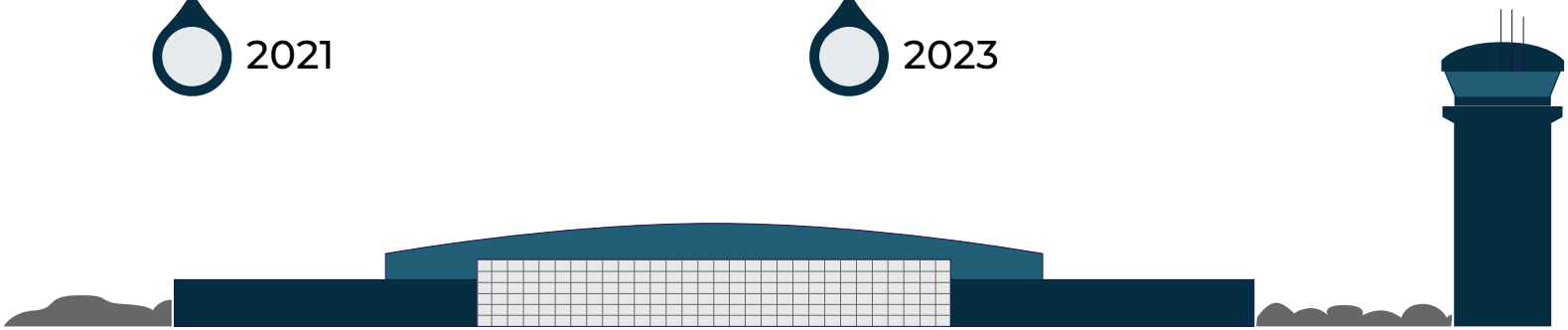
2022

January: Revised Phase II Report
April: IRA Status Report 11
April: Draft Phase III Report
June: Final Phase III
October: IRA Status Report 12
November: Draft Phase IV Report

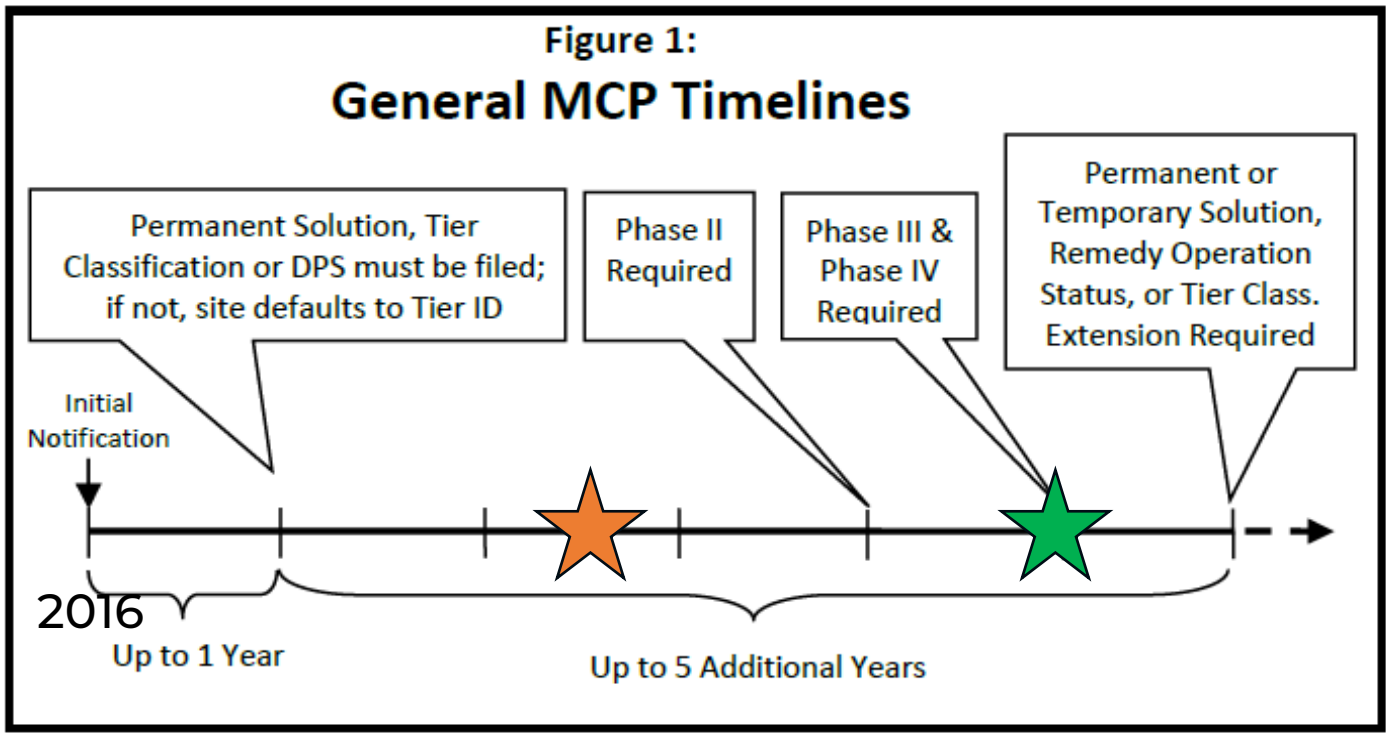
2023

January: Final Phase IV Report
April: IRA Status Report 13
October: Draft IRA 14, IRA Completion Statement, Phase IV Final Inspection Report and Completion Statement

GATEWAY CAPE COD AIRPORT



Airport Regulatory Reporting Since 2016-Continued



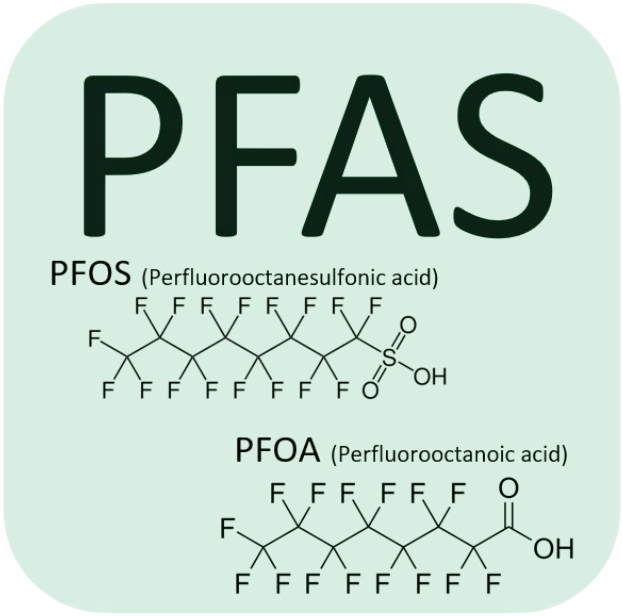
★ = BFTA is moving towards Phase II

★ = Airport is entering Phase V (final Phase before Closure)

✈ https://flyhya.com/airport-info/pfas/

Per- and Polyfluoroalkyl Substances (PFAS)

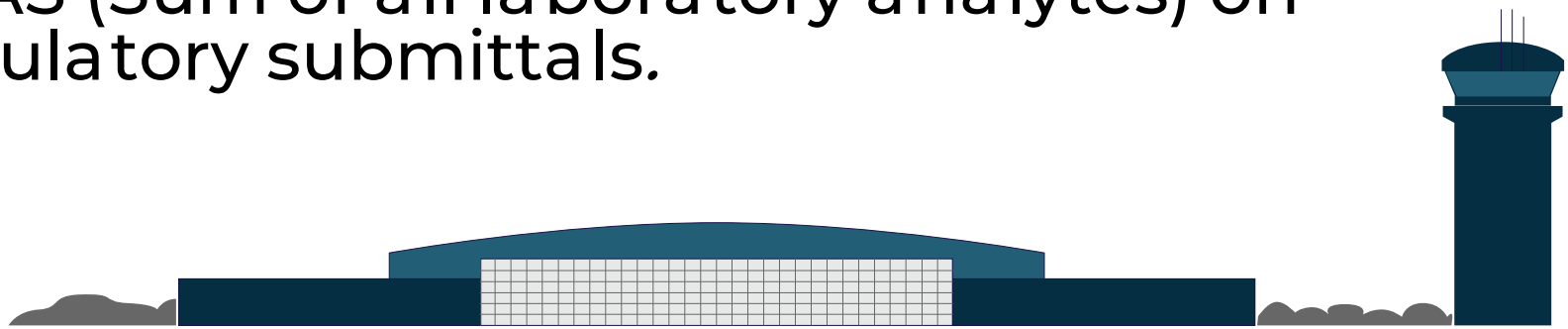
- An emerging contaminant
- Man-made fluorine-containing chemicals
- Water, grease, and stain resistant
- Resistant to breakdown (the forever chemical), migrate easily, and bioaccumulate



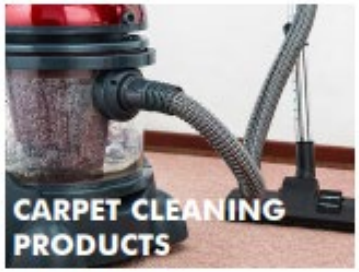
PFAS Analytes Currently Regulated by MassDEP

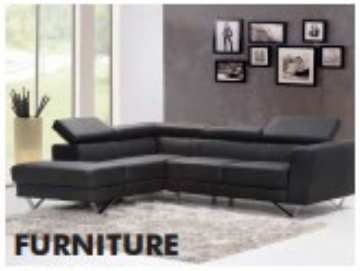
- ✈ Perfluorodecanoic Acid (PFDA)
- ✈ Perfluoroheptanoic Acid (PFHpA)
- ✈ Perfluorohexanesulfonic Acid (PFHxS)
- ✈ Perfluorooctanoic Acid (PFOA)
- ✈ Perfluorooctanesulfonic Acid (PFOS)
- ✈ Perfluorononanoic Acid (PFNA)

- ✈ Noted as “Sum of Six” for groundwater and individually for soil.
- ✈ Airport reports Sum of 6, 6:2 FTS and Total PFAS (Sum of all laboratory analytes) on regulatory submittals.



Sources of PFAS





GATEWAY
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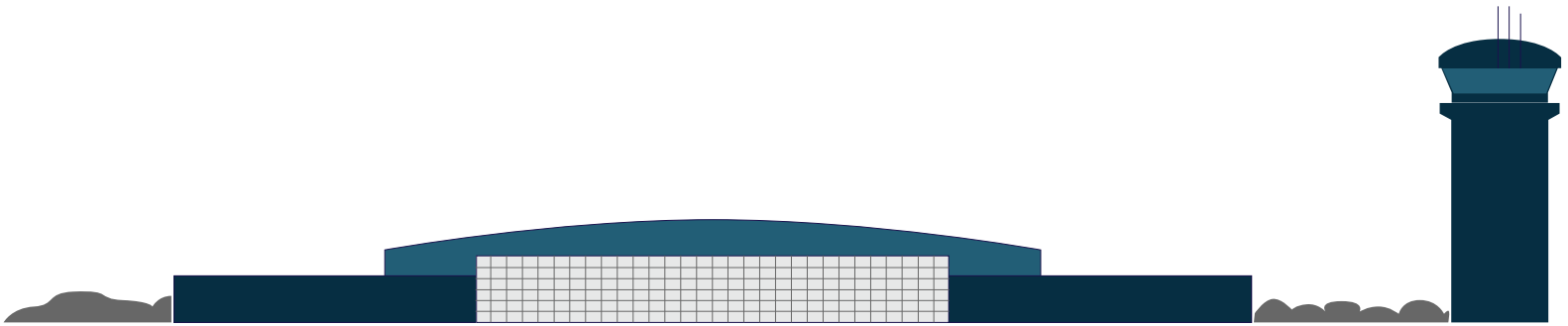
AIRPORT

Use of Aqueous Film Forming Foam (AFFF) at the Airport

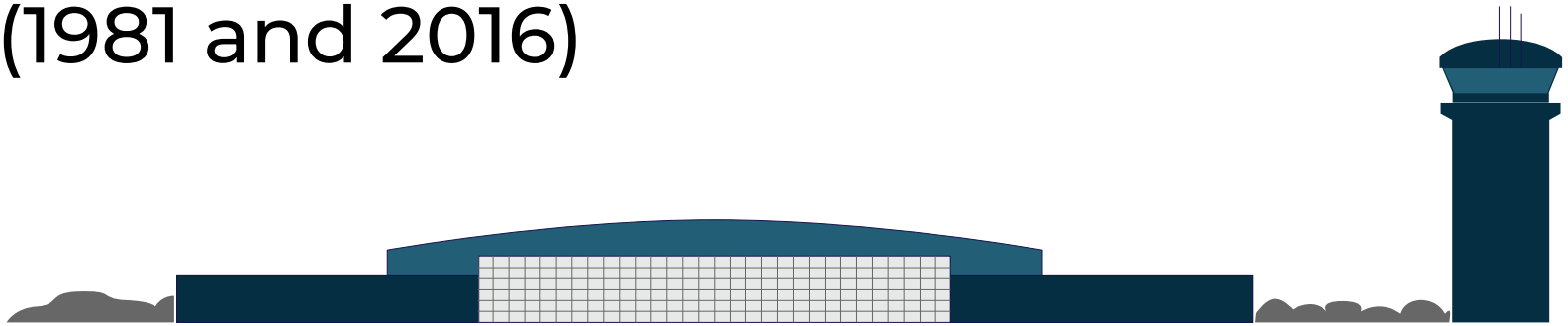
- Aqueous Film Forming Foam (AFFF) which contains PFAS- Used for emergency responses when fires are possible.
- Required by the FAA.
  - No other FAA approved PFAS-free options exist.
  - The FAA has approved a fluorine-free option currently under industry testing for PFAS.



Use of Aqueous Film Forming Foam (AFFF) at the Airport (Continued)

✈Historically, AFFF used during:

- Triannual training exercises (1991 to 2012)
- Annual testing of firefighting equipment is required by the FAA (2004 to 2015)
- Responses to two emergencies (1981 and 2016)



Ecological Cart

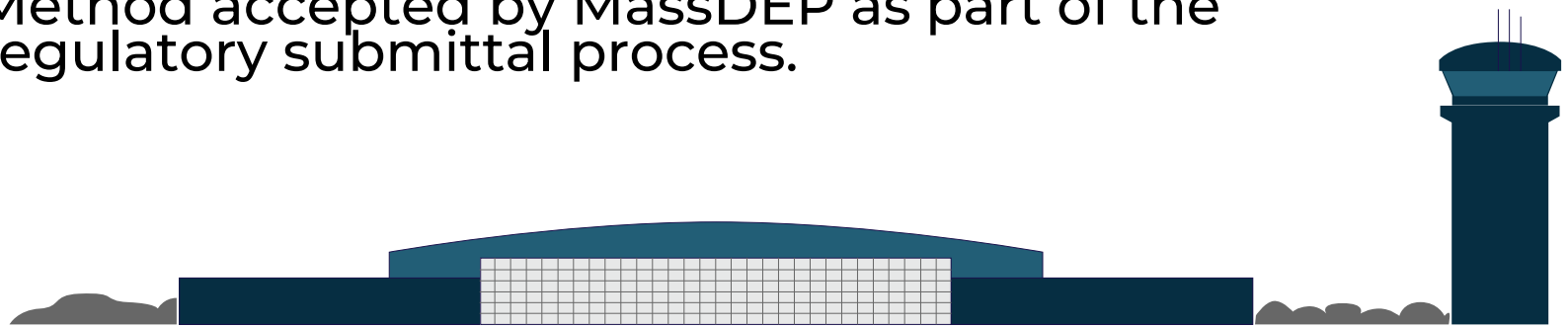
- First airport in Massachusetts to purchase the ecologic unit (2016)
- Unit purchased before receipt of FAA approvals for use
- Eliminates the need to use foam during annual FAA required fire fighting equipment testing

Recent Use of AFFF at the Airport

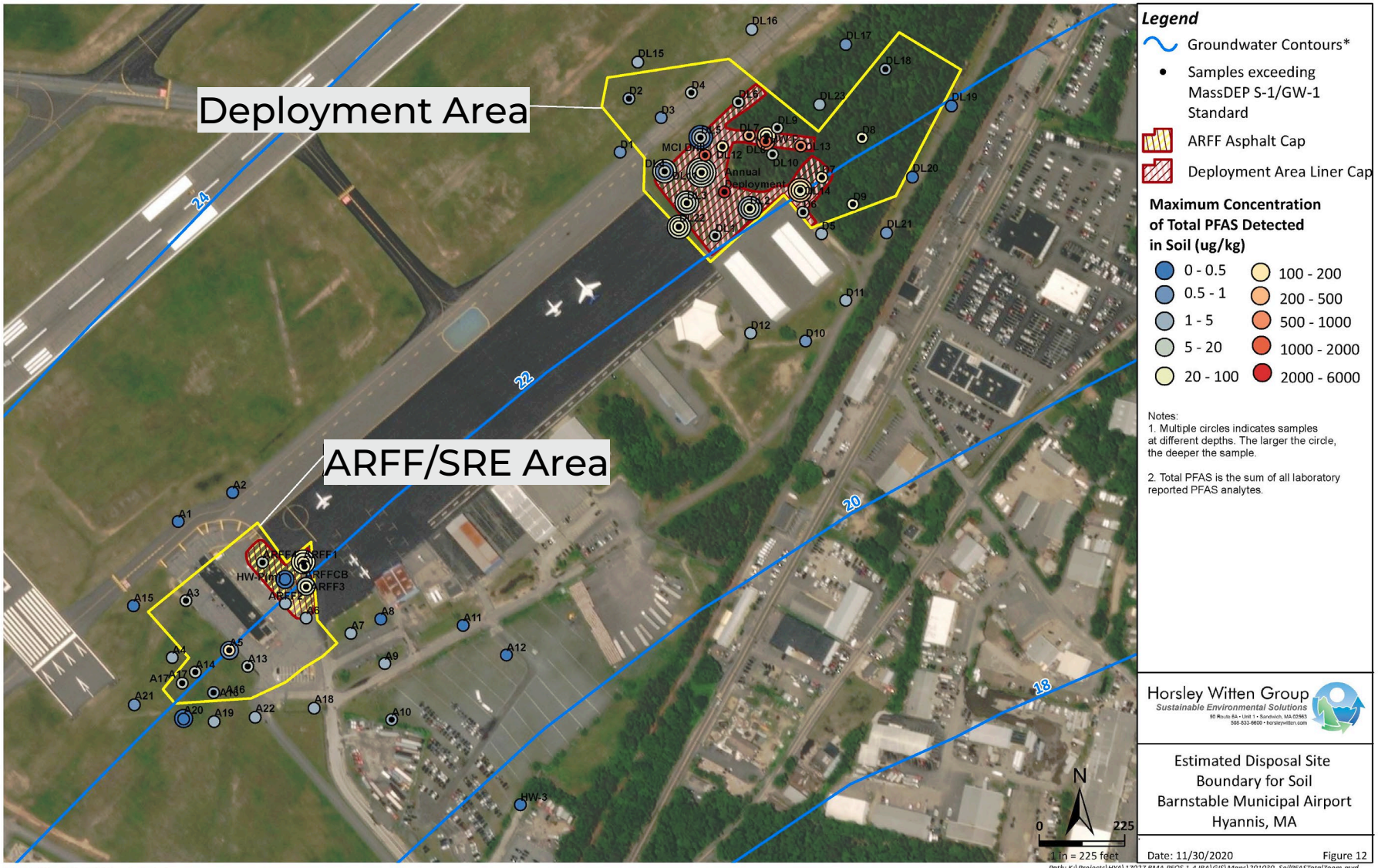
- Since 2015 AFFF has not been used for training or testing at the Airport
- AFFF last used in 2016 to respond to aircraft accident
  - 10 gallons of foam concentrate applied to asphalt at the site of the accident
  - Foam captured in an enclosed catch basin, vacuumed out and removed from the site for disposal.

Airport Evaluation and PFAS Source Delineation

- Airport has collected over 131 soil samples, 210 groundwater samples, and 3 surface water samples (Upper Gate and Lewis Ponds) for PFAS analysis.
- Forensic analysis used to determine extent of PFAS plumes relating to:
  - Airport
  - BFTA
  - Other Industrial Sites
- Airport plume extent = estimated using USGS modeling utilizing pumping rates at the Maher Wells
  - Method accepted by MassDEP as part of the regulatory submittal process.

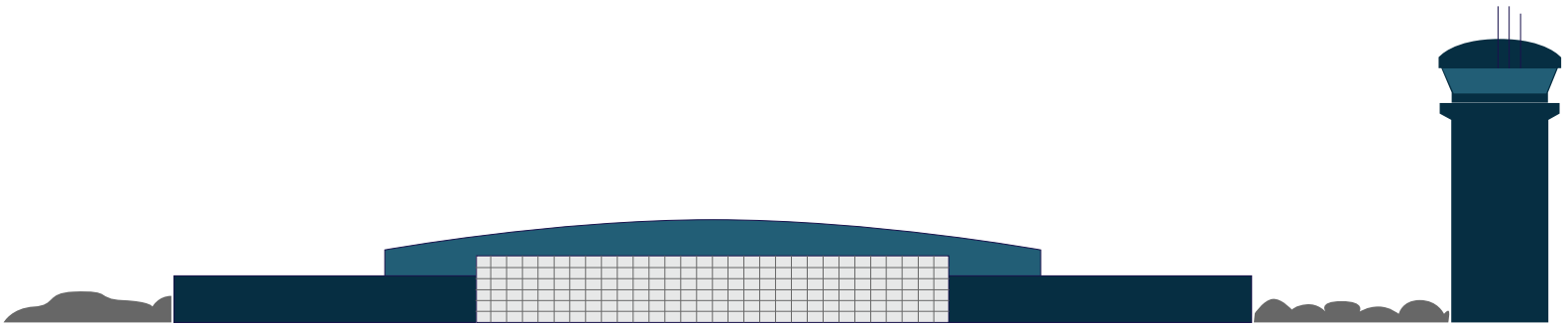


Soil Sample Locations and Extent of PFAS in Soil from AFFF Usage

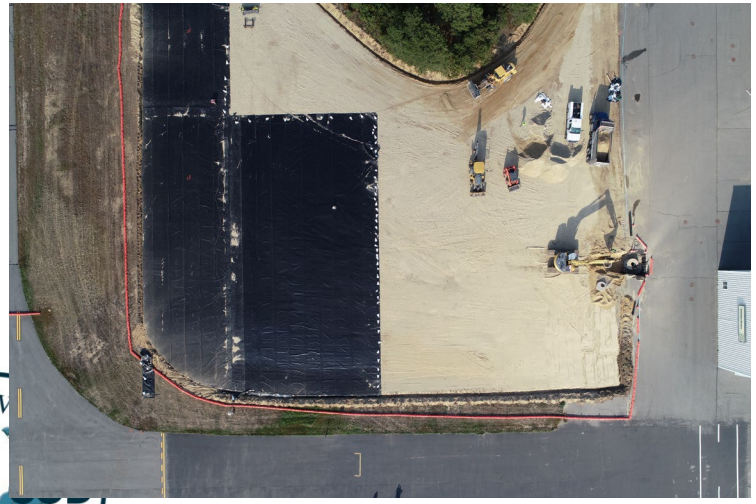


PFAS Caps Installed

- PFAS impacted soil in the Deployment Area and at the ARFF/SRE Building Area has been capped to prevent further groundwater impacts
  - ARFF/SRE Building Area – Pavement used to create the cap
  - Deployment Area – Geomembrane (30 mil Plastic liner), covered by topsoil and grass
- Both prevent rain from leaching through the soils and entering groundwater

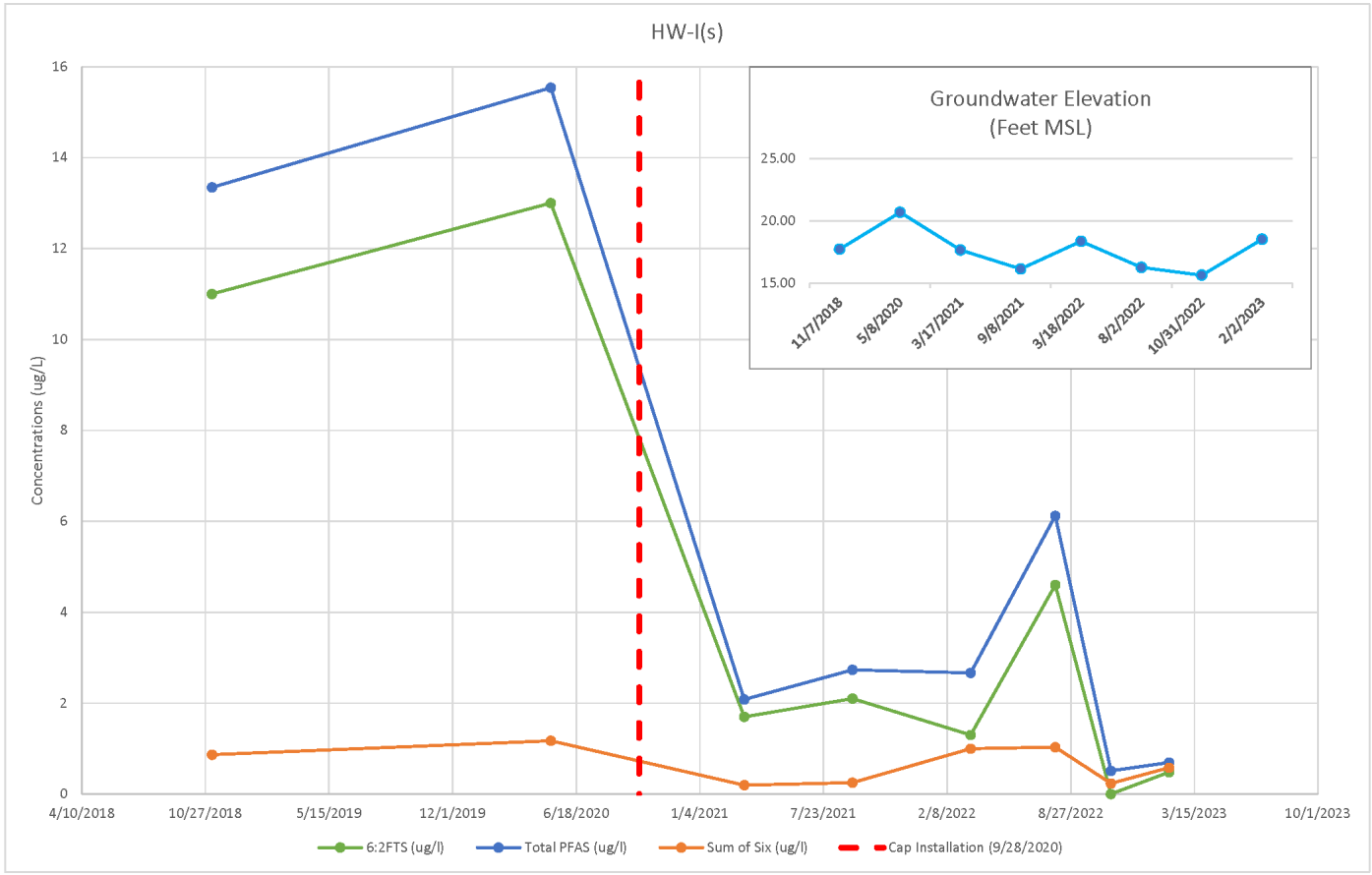


Deployment Area Cap

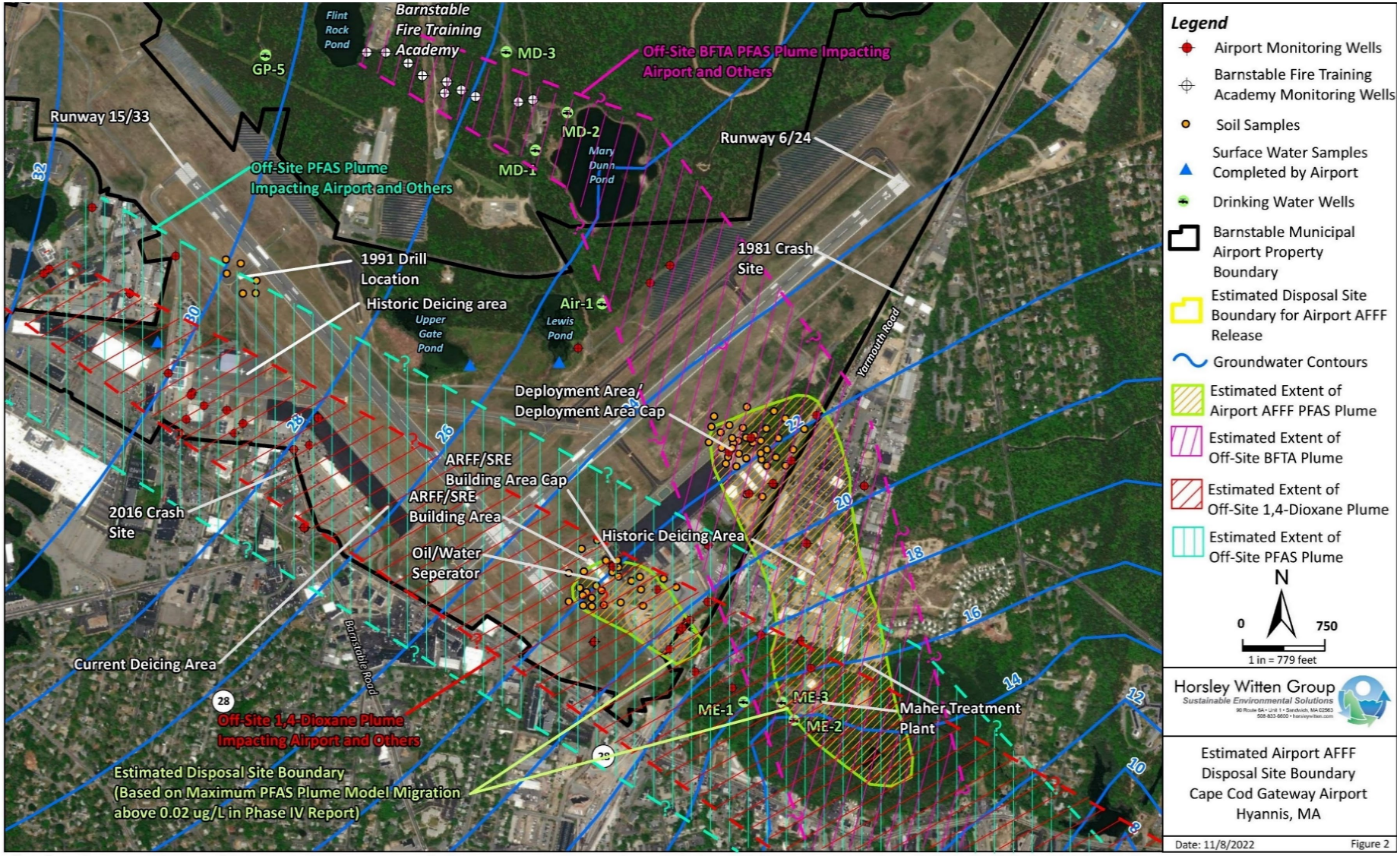


ARFF Area Cap

Deployment Area Cap Effect on Groundwater Quality Update



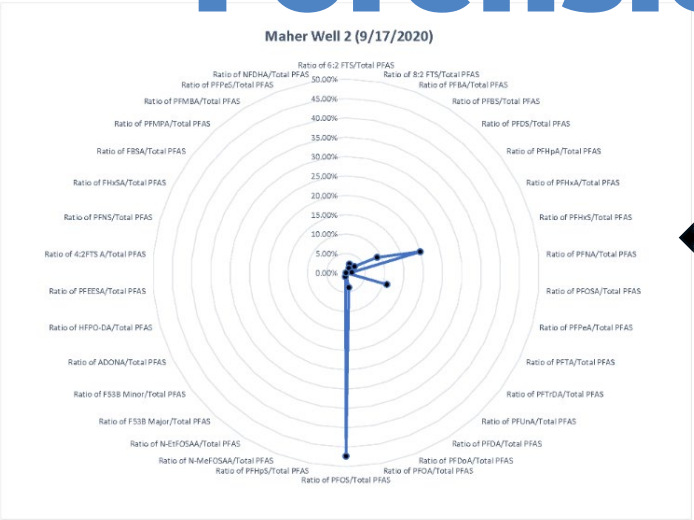
Extent of PFAS Plumes



* Cape Cod Commission (CCC) Groundwater Contours

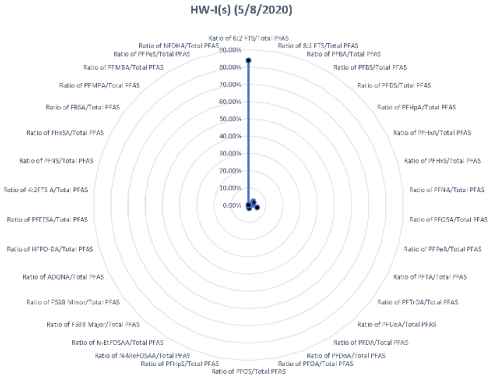
Path: K:\Projects\HYA\17027 BMA PFOS 1-4 IRA\GIS\Maps\Disposal Site Map bjm 2.mxd

Forensics Applications

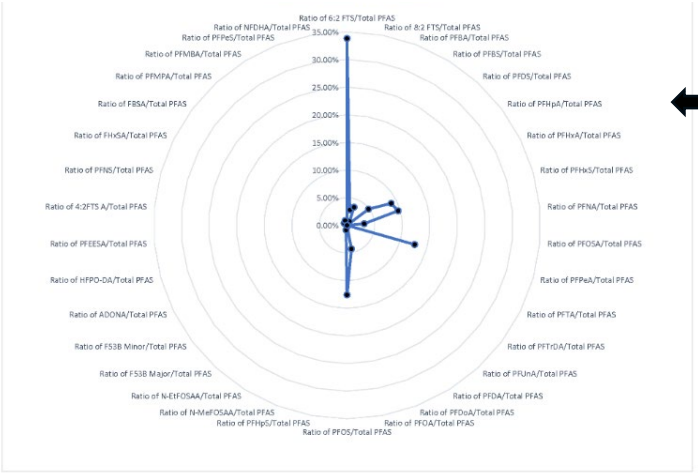


Year 2020

Maher 2 Signature = BFTA

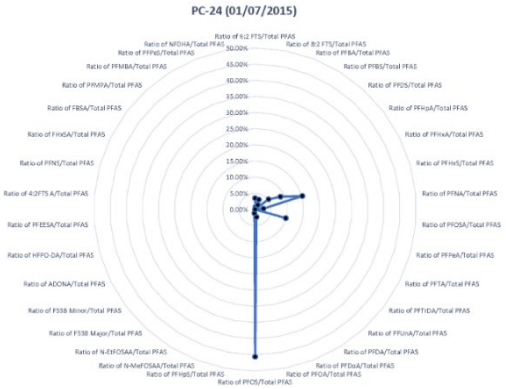


Airport Signature Reference



Year 2022

Maher 2 Signature = Both BFTA and Airport



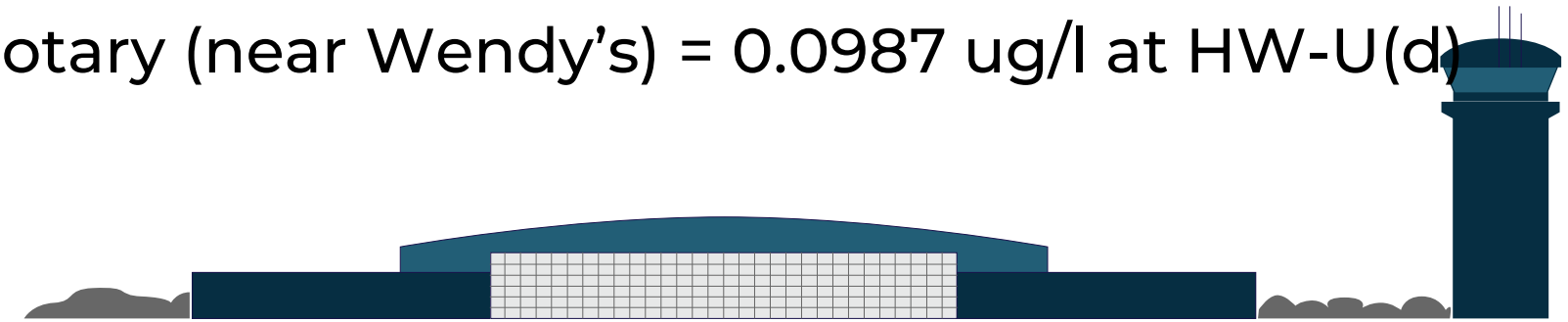
BFTA Signature Reference

GATEWAY CAPE COD AIRPORT

Highest Sum of Six in Groundwater Comparison

- Regulatory limit for GW-1 = 0.02 micrograms per liter (ug/l) or 20 nanograms per liter (ng/l)
- Regulatory limit for GW-3 ranges from 500 to 40,000 ug/l (individual PFAS)

- Airport = 1.2902 ug/l at HW-I(s)
- Barnstable Fire Training Academy = 205.40 ug/l at PC-11
- Industrial park area (Airport Road) = 0.0574 ug/l at HW-M
- Rotary (near Wendy's) = 0.0987 ug/l at HW-U(d)



Groundwater Travel Times (~285 feet per year)

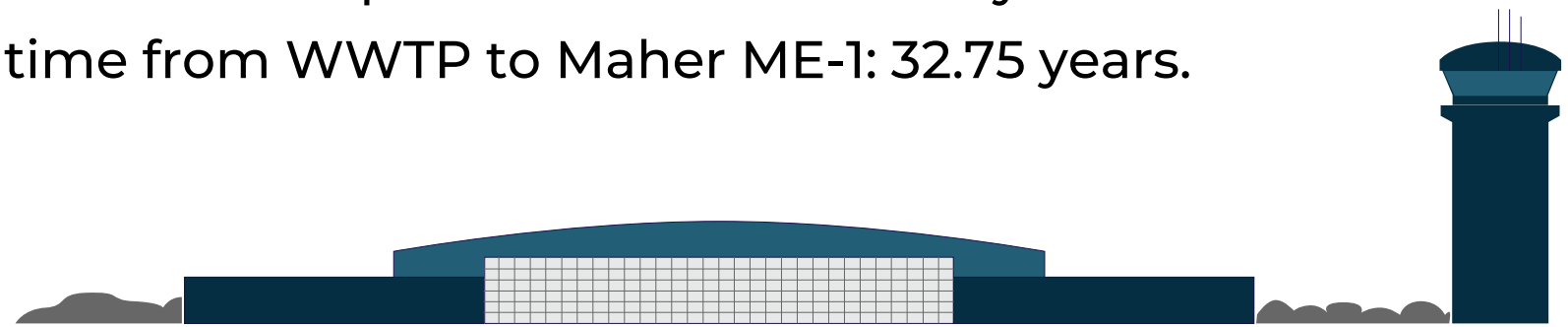
- Fire Training Academy Opens: 1959 - AFFF in use (ITRC): 1960's
- Airports first recorded use of AFFF on-site: 1991
  - Used every 3-years for training between 1991-2012
  - Annual testing requirements 2004 to 2015
  - Aircraft accident in 2016

✈Travel time from BFTA to Mary Dunn Wells 1&2: 5.6 years.

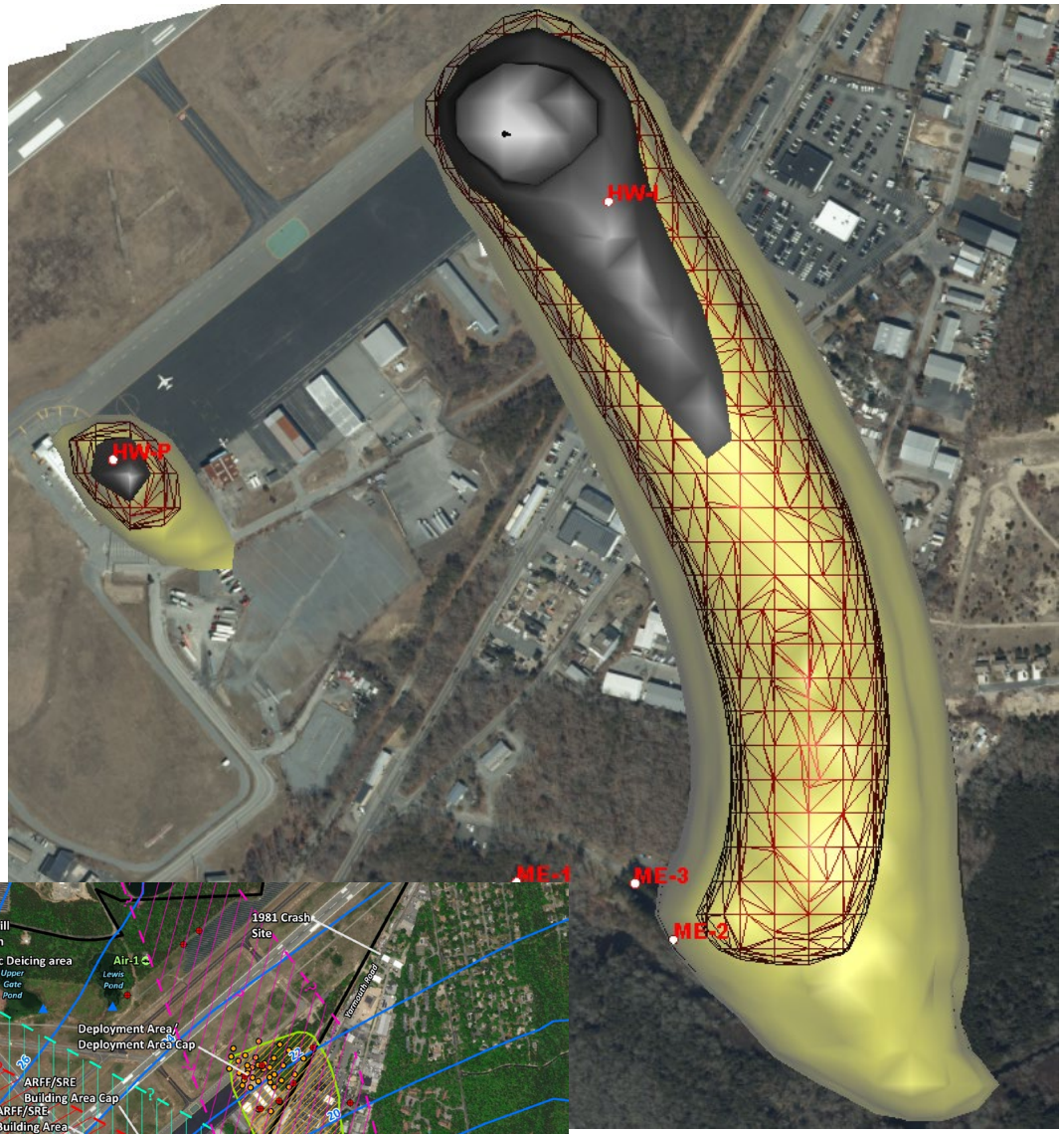
✈Travel time from BFTA to Maher ME 2&3: 26.3 years.

✈Travel time from Airport to Maher ME-2: 8.7 years

✈Travel time from WWTP to Maher ME-1: 32.75 years.



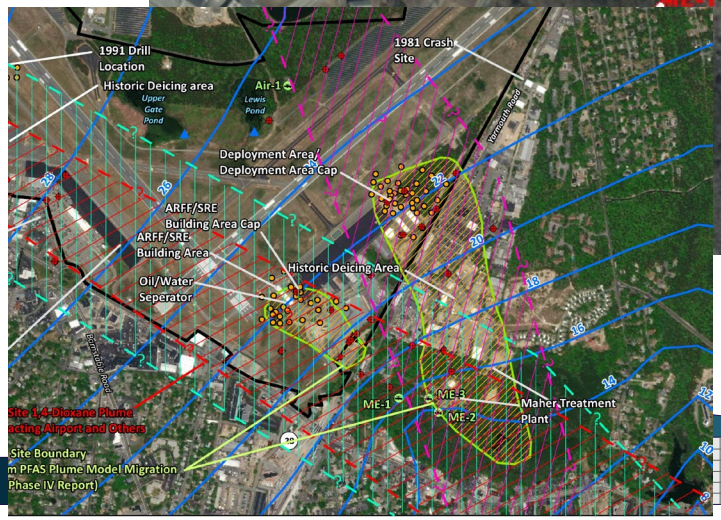
Airport PFAS in Groundwater Modeling
(Airport Plume Only)



Legend

Concentration (µg/L)

- 0.2
- 0.04
- 0.02
- 0.01



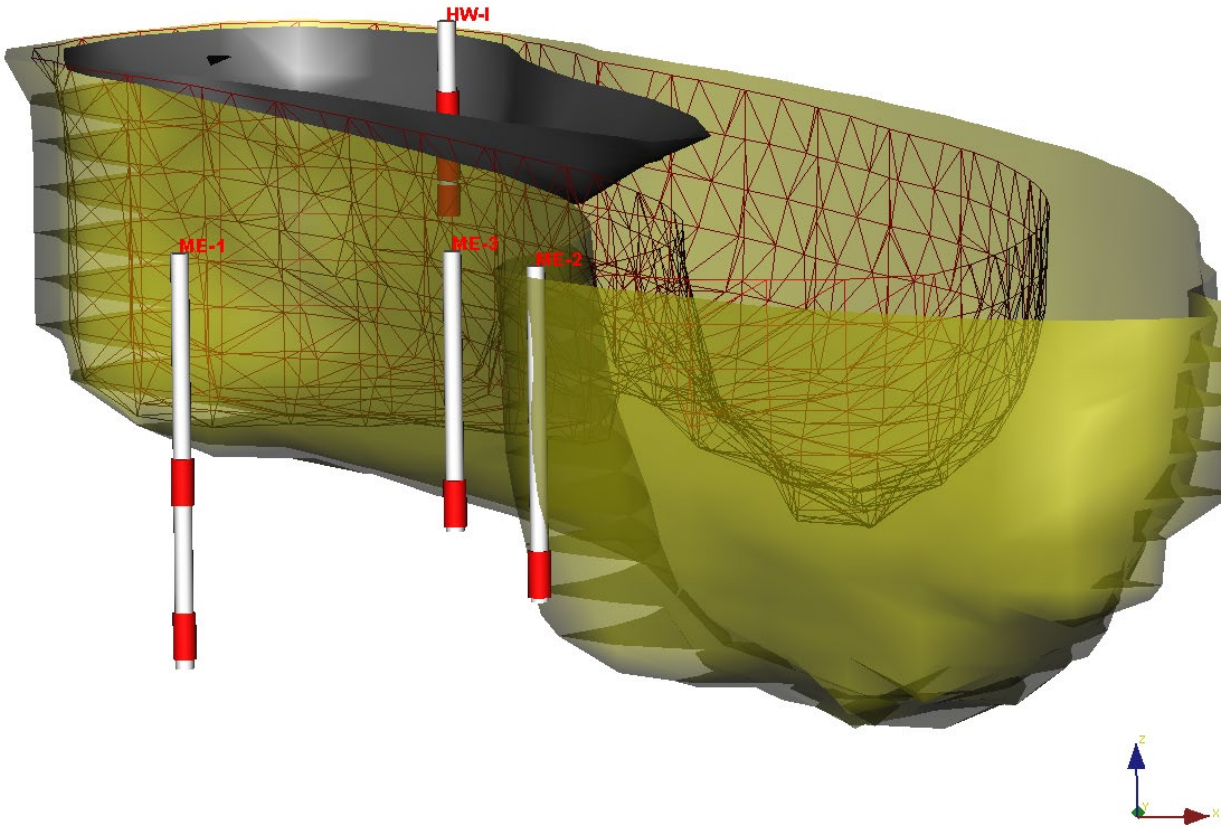
MassDEP Method 1 Standards:

GW-1 = 0.02 ug/L

GW-3 = 500 to 40,000 ug/l

GATEWAY CAPE COD AIRPORT

Airport PFAS in Groundwater Modeling
(Airport Plume Only)



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- 0.02
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MassDEP Method 1 Standards:

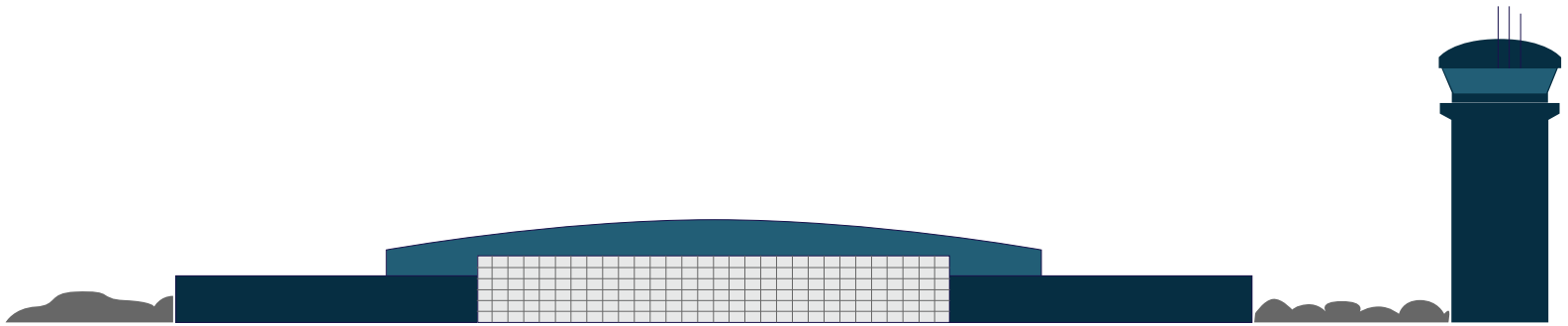
GW-1 = 0.02 ug/L

GW-3 = 500 to 40,000 ug/l

GATEWAY CAPE COD AIRPORT

Next Steps

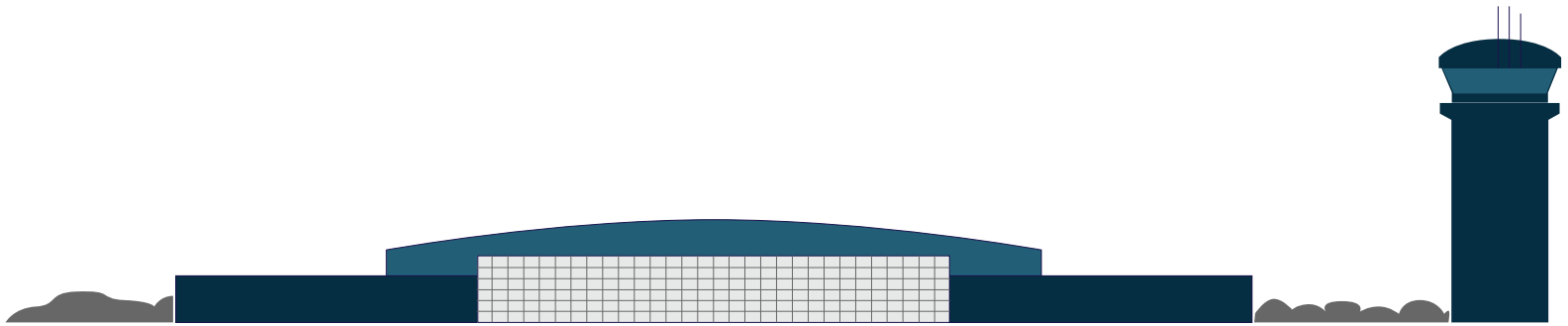
- Continue Monitoring PFAS in Groundwater to Evaluate the Performance of the Caps
  - Monitoring Funds Included in Airport Capital Improvement Plan Budget (CIP).
- Continued inspection of the Caps to verify integrity.
- Final resolution to include financial contribution to support ongoing PFAS treatment at Maher Wells.



Next Steps (Continued)

- Town of Barnstable continues to provide drinking water to residents that meets MassDEP regulatory requirements.

- Highest SUM of Six Concentrations at the Airport are less than GW-3 standards which are protective of surface water.



Questions?