FINAL PUBLIC INVOLVEMENT PLAN

Barnstable Municipal Airport

Hyannis, Massachusetts

RTN 4-26347

September 16, 2019

Prepared for:

Barnstable Municipal Airport

480 Barnstable Road

Hyannis, MA 02840

Prepared by:

Horsley Witten Group, Inc.

90 Route 6A

Sandwich, MA 02563

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HYANNIS, MASSACHUSETTS

1.0 INTRODUCTION

The Barnstable Municipal Airport (the "Airport") has prepared this Final Public Involvement Plan ("PIP") in accordance with the requirements of the Massachusetts Contingency Plan ("MCP"). On May 24, 2019 the Airport and the Massachusetts Department of Environmental Protection ("MassDEP") received a petition requesting that the Airport designate itself as a PIP site, pursuant to 310 CMR 40.1404. On June 10, 2019, the Airport notified the petitioners, via first class mail, that the Airport designated itself as a PIP site for MassDEP-regulated activities related to the presence of per- and polyfluoroalkyl substances ("PFAS") and 1,4-dioxane under Release Tracking Number ("RTN") 4-26347. Notices regarding the availability of the Draft PIP and a Public Involvement Plan Meeting were sent to the petitioners, Town of Yarmouth Administrator, Town of Yarmouth Natural Resources, Town of Yarmouth Board of Health, Town of Barnstable Board of Health, Town of Barnstable Town Manager, and the Town of Barnstable Public Works on July 12, 2019. The Draft PIP was uploaded to the MassDEP on July 15, 2019. Comments received from the public on the Draft PIP and the Airport's responses are presented in Section 4.2.

The focus of the PIP is the ongoing assessment of the nature and extent of PFAS and 1,4-dioxane at the Airport which are the subjects of the RTN for which the PIP was requested. There have been prior releases of solvents and petroleum hydrocarbons to soil and groundwater at the Airport which have been managed under a separate RTN (4-0823) and for which a separate PIP was created. The remediation process for the prior releases is complete. Following some additional monitoring, the release associated with RTN 4-0823 is anticipated to be completed and closed out in 2020.

This PIP establishes ways in which the Airport will make information related to RTN 4-26347 available for public review, and opportunities for the public to comment on the ongoing assessment and remediation activities subject to this PIP. Specifically, the PIP describes:

- An overview of the Airport and its location relative to drinking water wells in Hyannis;
- A summary of the applicable regulatory standards and guidelines for PFAS and 1,4-dioxane, including proposed new standards for PFAS in soil and groundwater;
- A description of the uses of aqueous film forming foam ("AFFF") or firefighting foam, a Federal Aviation Administration ("FAA") regulatory requirement, at the Airport and actions taken by the Airport to prevent its release to soil or groundwater. AFFF is a known source of PFAS compounds that can affect soil and groundwater;

- An overview of the soil and groundwater investigations completed to date and a summary of the next steps the Airport must complete under the MCP; and
- A summary of how public comments will be accepted and incorporated in select reports as the assessment moves forward.

The Draft PIP was presented by the Airport at a public meeting on July 29, 2019 at 6:00 PM in the Airport Conference room located in the Airport Terminal Building at 480 Barnstable Road, Hyannis, Massachusetts. Comments on the Draft PIP were accepted between July 29, 2019 and August 19, 2019.

The Airport has revised the Draft PIP based upon feedback received from the public during the public comment period and has implemented the PIP in conjunction with ongoing response activities. As indicated above, comments received from the public on the Draft PIP and the Airport's responses are presented in Section 4.2.

2.0 SITE BACKGROUND

2.1 Site Description

The Airport is located in Hyannis, Massachusetts, and provides scheduled airline service and general aviation services and other aviation related activities. The Airport is currently owned by the Town of Barnstable and is managed through the Barnstable Municipal Airport Commission ("BMAC"). The Airport began as a private airport consisting of a single grass runway before being given to the Town of Barnstable in the 1930's. With the outbreak of World War II, the airport was taken over by the federal government for wartime training and defense purposes. During the 1940's, the U.S. Navy used the Airport and expanded the airfield to include three runways. In 1946, the Airport was returned to a two-runway municipal airport (each runway has a designation at each end, being 15-33 and 6-24). In 1948, the property was conveyed by the United States government (pursuant to the Surplus Property Act of 1944) to the Town of Barnstable, acting by and through its Airport Commission, for the use and benefit of the Airport.

The Airport is comprised of approximately 645 acres of land, with approximately 140 acres that are impervious (e.g. paved areas such as parking lots, runways, taxiways, aircraft parking aprons, concrete walkways, and building rooftops). The Airport's structures include the main terminal and the Air Traffic Control Tower ("ATCT"), which are located south of the runways and taxiways, as well as several hangars used for general aviation and operations services. In addition, the Airport Rescue and Fire Fighting ("ARFF") building is located in the southeast corner of the property. The Airport is located in an area of Hyannis zoned for Business and Industrial uses. A topographic map with the Airport property boundary outlined is attached as Figure 1.

2.2 Hydrogeological Setting in the Vicinity of the Airport

The Airport is located within several zones of contribution (Zone II) to municipal drinking supply wells. Groundwater in the vicinity of the airport is located approximately 23 to 27 feet below ground surface ("BGS"). A regional water table map prepared by the USGS indicates groundwater generally flows in a southeasterly direction across the airport (Figure 2, LeBlanc, et al., 1986). Monitoring well elevation surveys and water level measurements conducted by the Horsley Witten Group ("HW") also indicate groundwater flows in a southeasterly direction. On the southern portion of the airport, groundwater flows parallel to Route 132 and Runway 15-33. In the northern portion of the Airport, the flow is also to the southeast, but turns further south, with groundwater flowing from the area of Mary Dunn Pond onto Airport property and curving south towards the Maher Wellfield located near the intersection of Route 28 and Yarmouth Road (Figure 2). Geologic materials encountered in soil borings at the Airport consist of outwash sands and gravel, indicating the aquifer is moderately to highly permeable, with an estimated hydraulic conductivity of 100 to 300 feet per day.

2.3 Current Status of Hyannis Water Supply Wells

Hyannis receives its drinking water from twelve wells located throughout the village. PFAS compounds have been detected in the raw water pumped from wells in the Mary Dunn Wellfield and the Maher Wellfield, and 1,4-dioxane has been detected at the Maher Wellfield. However, all water provided through the Hyannis Water District (the "District") meets the required state drinking water standards and guidelines for these compounds. The District has constructed treatment facilities at the Mary Dunn Wellfield to treat for PFAS compounds (associated with a release of these contaminants from the Barnstable Fire Training Academy) and has agreements to purchase water from the Town of Yarmouth and the Centerville, Osterville, Marstons Mills Water District. In addition, the District is in the process of installing a treatment system for both PFAS compounds and 1,4-dioxane at the Maher Wellfield.

2.4 Sources of PFAS in the Environment

PFAS are manmade chemicals that have been used widely since the 1950's to manufacture water resistant, stain-resistant, and non-stick products. They are widely used in common consumer products such as coatings on food packaging, clothing, carpets, leather goods, and waxes. PFAS is also found in certain types of firefighting foams used by the military, fire departments, and airports to fight oil and gasoline fires. According to the Interstate Technology Regulatory Council ("ITRC") document titled *History and Use of Per-and Polyfluoroalkyl Substances (PFAS)* dated November 13, 2017, sources of PFAS found in the environment can include the following:

- Consumer Products - shampoo, hair conditioner, sunscreen, cosmetics, toothpaste, dental floss, adhesives, paints, cleaning agents, non-stick cookware, polishes and waxes, pesticides and herbicides, hydraulic fluids, and windshield wipers.

- Textile and Leather Manufactures – factory or consumer applied coatings (i.e., 3M Scotchgard ®) to repeal water, oil, and stains on clothing, umbrellas, tents, sails, architectural materials, carpets, and upholstery.
- Paper Product Manufacturers – factory applied surface coatings to repel grease and moisture from pizza boxes, fast food wrappers, microwave popcorn bags, baking papers, pet food bags, cardboard, carbonless forms, and masking papers.
- Metal Plating and Etching Facilities – coatings used during manufacture for corrosion prevention, mechanical wear reduction, as a surfactant, a wetting agent and fume suppressant, and as a post plating cleaner.
- Wire Manufacture – used as a coating and insulation for wires.
- Industrial Surfactants, Resigns, Molds, and Plastics - used during the manufacture of plastics and fluoropolymers, rubber, compression mold release coatings, plumbing fluxing agents, fluoroplastic coatings, composite resins, and flame-retardant polycarbonate.
- Photolithography and Semiconductor Industry –used as photoresists, top and bottom anti-reflective coatings, etchants, surfactants, wetting agents, and photo-acid generation.
- Class B Fluorine Containing Firefighting Foams - firefighting foams including AFFF, fluoprotein foam ("FP"), and film forming fluoprotein foam ("FFFP") used to extinguish fires.

Some examples of how these materials can be released to the environment include:

- Atmospheric deposition to the ground surface and/or surface water from smokestack emissions where PFAS was used in the manufacturing process;
- Releases to the ground surface, groundwater and/or surface water from industrial facilities where spills have occurred or where wastewater treatment methods were not designed to remove PFAS compounds from the waste stream;
- Littering of materials containing PFAS, like food wrappers
- Degradation of exterior surface coatings (i.e., waxes or 3M Scothgard ®) on materials containing PFAS;
- Releases to groundwater and/or surface water from landfills were PFAS containing wastes were disposed of;
- Releases to groundwater and/or surface water from wastewater treatment plants where wastewater treatment methods were not designed to remove PFAS compounds from the waste stream;
- Releases to groundwater and surface water from residential septic systems where PFAS compounds were used in the household;

- Releases to soil, groundwater and/or surface water from the application of biosolids obtained from wastewater treatment plants; and
- Releases to soil, groundwater and/or surface water from the application of Class B firefighting foams during training exercises, use in extinguishing a fire, or from incidental spillage. The firefighting foam used at the airport is currently the only approved FAA foam on the market and is required for use per federal regulations. However, since PFAS became a known concern, the Airport has restricted the use of firefighting foam to incident/accident response.

2.5 Potential Sources of 1,4-dioxane in the Environment

1,4-dioxane is a synthetic chemical that is completely mixable in water. It has not been detected in any of the Airport groundwater monitoring wells or in the area of a former release of chlorinated solvents associated with RTN 4-0823, located in the southwest quadrant of the Airport. It has been detected in groundwater wells located hydraulically downgradient of the Airport. The Airport is still conducting investigations to determine if a release of 1,4-dioxane has occurred at the Airport. All floor drains within the hangers and businesses located on the airfield have either closed all floor drains, connected them to a tight tank and/or connected them to the sanitary sewer to meet EPA and MassDEP discharge requirements. According to the United States Environmental Protection Agency ("US EPA") document titled *Technical Fact Sheet – 1,4-dioxane* dated November 2017, sources of 1,4-dioxane include:

- Solvent Stabilizer – historically, 90% of 1,4-dioxane use was to stabilize chlorinated solvents such as 1,1,1-trichloroethane. Use of 1,4-dioxane as a solvent stabilizer was phased out under the 1995 Montreal Protocol. Testing of groundwater at the Airport in an area of a historic release of chlorinated solvents did not identify 1,4-dioxane in groundwater.
- Consumer Products - 1,4-dioxane has been found as a by-product in paint strippers, dyes, greases, anti-freeze and aircraft deicing fluids, and in some consumer products such as deodorants, shampoos, and cosmetics. The Airport installed a centralized de-icing and aircraft washing pad in 2015 which directs de-icing fluids and fluids used in aircraft washing to the Barnstable Water Pollution Control Facility.
- Pharmaceuticals and Plastic Manufacture - 1,4-dioxane is used in the manufacture of pharmaceuticals as a purifying agent and is a by-product in the manufacture of polyethylene terephthalate plastic.
- Food - 1,4-dioxane may be present in some food supplements, food containing residues from packaging adhesives or on food crops treated with pesticides that contain 1,4-dioxane.

Some examples of how these materials can be released to the environment include:

- Releases to the ground surface, groundwater and/or surface water from industrial/commercial facilities where spills of materials containing 1,4-dioxane have occurred;
- Releases to groundwater and/or surface water from wastewater treatment plants where wastewater treatment methods were not designed to remove 1,4-dioxane compounds from the waste stream;
- Releases to groundwater and surface water from residential septic systems where 1,4-dioxane compounds were used in the household;
- Releases to the ground surface, groundwater and/or surface water from industrial facilities where polyethylene terephthalate plastic was manufactured; and
- Releases to groundwater and/or surface water from landfills were 1,4-dioxane wastes were disposed of.

2.6 Management of Oil and/or Hazardous Materials at the Airport to Reduce the Potential for a Release

During its normal daily operations, the Airport accepts, stores, handles and transfers a variety of oil and/or hazardous materials ("OHM"), similar to most other airports and similar industries. Daily operations include refueling and maintenance of vehicles and aircraft that require a certain level of OHM storage and use. Over the past 20 years, it has been a priority of the Airport management to implement many OHM use reductions, improvements, and storage and training guidelines, as well as infrastructure improvements that continue to reduce the risk of impacts to environmental receptors at the Airport. Additionally, the ARFF building is where the emergency response vehicles, AFFF and all firefighting apparatus is stored. This is the only location where AFFF is stored at the Airport. Airport personnel are trained first responders and use and maintain the equipment in compliance with local, state and federal regulations. Good housekeeping practices currently implemented at Airport and tenant facilities to reduce the potential release of OHM to the environment include:

- Keeping impervious surfaces adjacent to buildings free of surface debris with brooms;
- Utilizing absorbent materials and drip pans to contain minor discharges of OHM to facility floors in maintenance areas, and promptly removing and containerizing for proper disposal;
- Keeping facility floors free of surface debris to prevent the spread of potential pollutants due to foot traffic;
- Removing surface debris from runways and taxiways seasonally with a streetsweeper;

- Maintenance of hangar doors and roofs to prevent stormwater from entering and exiting the facility during precipitation events;
- Regular garbage and waste container consolidation into common collection containers to encourage proper handling of solid waste;
- Using appropriately sized and constructed containers for the storage of maintenance products or waste products to reduce the potential for a release during storage, application, transfer, or transfer for disposal;
- Storage of maintenance products and waste products indoors, properly sealed and labeled to prevent misuse or premature disposal;
- Prohibition of washing of paved surfaces or facility floors resulting in a discharge of wash water to drainage utilities. Washing of facility floors is permitted where wash water is discharged to municipal sewer through a permitted municipal sewer connection or to a tight tank for proper disposal;
- Implementation of an aircraft deicing and washing program that established procedures for Airport and tenant personnel during use of the South Ramp pad for aircraft deicing or washing. The South Ramp Deicing and Washing Pad which discharges to the Barnstable Water Pollution Control Facility was constructed in 2015 by the Airport to provide tenants and aircraft operators with a central location to complete these activities and reduce the potential for environmental impacts. The MassDEP, Cape Cod Commission ("CCC"), Barnstable Department of Public Works ("DPW"), and Barnstable Water pollution Control Division ("WPCD") reviewed the construction plans;
- Implementation of a Stormwater Pollution Prevention Plan to establishes procedures and methods to prevent the discharge of OHM to the environment via the stormwater drainage system;
- Implementation of a Spill Prevention, Control, and Countermeasure Plan to establishes procedures and methods to prevent the discharge of OHM to the environment;
- Spill containment kits in all Maintenance and Operations vehicles;
- Regular inspections of all Airport facilities to inventory all hazardous materials present at the Airport;
- Closure of several hanger floor drains to meet EPA and MassDEP discharge requirements;
- Installation of Vortech stormwater units on the north side of the airfield and in the main terminal parking lot that are maintained and cleaned on a regular basis;
- Removal of a 20+ year 20,000-gallon jet A fuel tank with the replacement and installation of the new aboveground fuel farm, double wall containment and additional spill containment including the addition of an oil/water separator;

- Purchase and use of the Ecologic Cart testing unit in 2016 to prevent the discharge of firefighting foam on the ground during FAA required annual testing;
- No pesticides are used at the Airport;
- Road salt is not used to treat runways, aprons or taxiways;
- Chemicals are not used on runways, taxiways and aprons during snow removal operations; and
- Removal of the 250-gallon underground diesel fuel tank and replacement with natural gas for the airfield emergency generator.

2.6 Management of Fire Fighting Foam at the Airport

Details concerning the type, usage, and storage of AFFF at the Airport are set forth below.

- Annual testing per Federal Aviation Administration ("FAA") regulations is required to ensure that there is the appropriate AFFF to water mixture. Historically, the test consists of essentially shooting the mixture of AFFF from the fire rescue vehicle at a small square target. Adjustments are made, if needed, to allow for proper spray coverage.
    - Approximately 80 gallons of 3-percent AFFF concentrate was historically used annually to conduct the test.
    - All testing has been conducted in the same location on the Airport for the past 16 plus years (Drill/Deployment area).

In 2016 the Airport purchased an Ecologic Cart system to prevent the discharge of firefighting foam on the ground surface during testing. The Ecologic Cart allows the Airport to test the fire truck's ability to properly mix and dispense foam without ground dispensing as previously required. This unit was the first unit purchased for any Massachusetts airport and well before final FAA testing and approval for universal use at airports.

- All firefighters must attend annual training which occurs off-site at various FAA approved training facilities such as Logan Airport or Concord New Hampshire.
- Tri-Annual Drill Dates:
    - With the exception of the drill in 1991 as shown on the Figure 5, all drills occurred on the East Ramp at the Drill / Deployment area
    - July 17, 1991
    - Nov. 16, 1994
    - Nov. 17, 1997
    - Nov. 2, 2000

- Oct. 18, 2003
- Oct. 25, 2006
- Oct. 22, 2009
- Oct. 11, 2012
- Oct. 28, 2015 (No AFFF used during this drill – just water)
- Sept 5, 2018 (No AFFF used during this drill – just water)

- FAA regulations require a supply of AFFF concentrate on hand to resupply two trucks. This is approximately 405 gallons of the 3-percent AFFF concentrate.
- The Airport removes expired foam that is no longer useable for airport operations using an approved waste disposal company.

Firefighting hoses used in the training are cleaned and stored on the trucks or in the ARFF building fire bays. The hoses, when needed to be cleaned, are done so within the ARFF building only. The ARFF and SRE garage bays feature a floor drain discharging to an oil/water separator for pretreatment prior to discharge to municipal sewer under a permitted connection.

- Personnel working at the Airport since 1980 were consulted to determine when AFFF use occurred during an actual aircraft accident and only two instances were identified. Please note that AFFF is NOT used unless there is a spark of fire. The majority of accidents do not result in the use of AFFF.
    - 1981 crash of a Beech 18 aircraft east of runway 24 between Willow Street and the Airport.
    - 2016 crash of a Cirrus aircraft in the parking lot of the rental car facility west of the terminal building. Approximately 10 gallons of the 3-percent AFFF concentrate was used during the crash response. 100% of this AFFF liquid was contained within a solid bottom manhole and removed during response actions.

The following quantities of AFFF concentrate has been purchased and used by the Airport since 2000:

Year	AFFF Concentrate Type	AFFF 3% Concentrate Purchased	Approximate AFFF 3% Concentrate Used for Training	Approximate AFFF 3% Concentrate Used for Tri-Annual Drill	Approximate AFFF 3% Concentrate Used for Annual Testing	Approximate Total AFFF Concentrate Used Annually	Approximate Total AFFF Concentrate and Water Mix	Approximate AFFF Stockpiled Based on Use*
		(Gal.)	(Gal.)	(Gal.)	(Gal.)	(Gal.)	(Gal.)	(Gal.)
2000	Chem-Guard 3% mil-spec	200	0	40	80	120	4000	485

Year	AFFF Concentrate Type	AFFF 3% Concentrate Purchased	Approximate AFFF 3% Concentrate Used for Training	Approximate AFFF 3% Concentrate Used for Tri-Annual Drill	Approximate AFFF 3% Concentrate Used for Annual Testing	Approximate Total AFFF Concentrate Used Annually	Approximate Total AFFF Concentrate and Water Mix	Approximate AFFF Stockpiled Based on Use*
		(Gal.)	(Gal.)	(Gal.)	(Gal.)	(Gal.)	(Gal.)	(Gal.)
	foam							
2001	None purchased	0	0	0	80	80	2667	325
2002	Chem-Guard 3% mil-spec foam	30	0	0	80	80	2667	355
2003	Chem-Guard 3% mil-spec foam	40	0	40	80	120	4000	325
2004	Chem-Guard 3% mil-spec foam	40	0	0	80	80	2,667	365
2005	None purchased	0	0	0	80	80	2,667	325
2006	Chem-Guard 3% mil-spec foam	220	0	40	80	120	4,000	505
2007	Chem-Guard 3% mil-spec foam	25	0	0	80	80	2,667	350
2008	Chem-Guard 3% mil-spec foam	90	0	0	80	80	2,667	415
2009	Chem-Guard 3% mil-spec foam	90	0	40	80	120	4,000	375
2010	Chem-Guard 3% mil-spec foam	100	0	0	80	80	2,667	425
2011	Chem-Guard 3% mil-spec foam	180	0	0	80	80	2,667	505
2012	None purchased	0	0	40	80	120	4,000	285
2013	None purchased	0	0	0	80	80	2,667	325
2014	Chem-Guard 3% mil-spec foam	180	0	0	80	80	2,667	505
2015	Chem-Guard 3% mil-spec foam	265	80	40	80	200	6,667	470
2016**	Chem-Guard 3% mil-spec foam	250	0	0	80	80	2,667	575
2017	None purchased	0	0	0	0	0	0	575
2018	None purchased	0	0	0	0	0	0	575
2019	Chem-Guard 3% mil-spec foam	105	0	0	0	0	0	680

Year	AFFF Concentrate Type	AFFF 3% Concentrate Purchased	Approximate AFFF 3% Concentrate Used for Training	Approximate AFFF 3% Concentrate Used for Tri-Annual Drill	Approximate AFFF 3% Concentrate Used for Annual Testing	Approximate Total AFFF Concentrate Used Annually	Approximate Total AFFF Concentrate and Water Mix	Approximate AFFF Stockpiled Based on Use*
		(Gal.)	(Gal.)	(Gal.)	(Gal.)	(Gal.)	(Gal.)	(Gal.)
Totals Between 2000-2019	Not Applicable	1,815	80	240	1,360	1,680	56,000	Not Applicable

Notes:
* We are required by FAA regulations to have enough stockpiled AFFF on hand to resupply two (2) trucks. This is approximately 405 gallons.
** In May 2016, the Airport transitioned to the new formulation of Chemguard

2.7 Applicable Regulatory Standards

In accordance with MCP Section 310 CMR 40.0900, the characterization of risk of harm to health, safety, public welfare, and the environment must be evaluated at each disposal site. This characterization includes the site-specific categorization of soil and groundwater based on site location and use, and the comparison of laboratory results of testing samples to their applicable standards. Standards for 1,4-dioxane were promulgated in 2006. The MassDEP currently has an Office of Research and Standards Guideline ("ORSG") for the five PFAS compounds as follows:

- Perfluoroheptanoic acid ("PFHpA");
- Perfluorohexanesulfonic acid ("PFHxS");
- Perfluorononanoic acid ("PFNA");
- Perfluorooctanesulfonic acid ("PFOS"); and
- Perfluorooctanoic acid ("PFOA").

A proposed revision to the MCP provides more stringent standards that may be promulgated for these compounds. The proposed standard will include the sum of the five mentioned above plus:

- Perfluorodecanoic acid ("PFDA")

Groundwater located within a Current Drinking Water Source Area is considered category GW-1. The Airport is located within several zones of contribution (Zone II) for Barnstable Village, the Hyannis Water District and the Town of Yarmouth. Zone IIs are considered current drinking water sources as defined in 310 CMR 40.0006; thus, category GW-1 is applicable, which is the most stringent category.

Groundwater located within 30 feet of an occupied building that has an average annual depth of less than 15 feet is categorized as GW-2. This is primarily a concern because of the possibility of vapor impacts to indoor air. The average annual depth to groundwater at the Airport is greater than 15 feet, therefore GW-2 Standards do not apply. Also, all disposal sites shall be considered a potential source of discharge to surface water, and therefore categorized as GW-3. Based on these criteria, categories GW-1 and GW-3 are applicable to this site.

Pursuant to 310 CMR 40.0933, the applicable soil category is selected based upon the frequency, intensity of use, and accessibility of the Airport by adults and children. Based on these criteria, soil at the Airport is category S-1 & GW-1 and SW-1 & GW-3, which are the most stringent standard.

The current and proposed (2019 proposed MCP Revisions) soil and groundwater standards applicable to the Airport for PFAS and 1,4-dioxane are as follows:

PFAS*							
Current Soil Standard		Proposed Soil Standards		Current ORSG Groundwater Value		Proposed Groundwater Standard	
S-1 & GW-1	SW-1 & GW-3	S-1 & GW-1	SW-1 & GW-3**	GW-1	GW-3	GW-1	GW-3**
None	None	0.2 ug/kg	300 ug/kg	0.07 ug/L	None	0.02 ug/L	500-40,000 ug/L

* PFAS is the sum of perfluorodecanoic Acid ("PFDA"), perfluoroheptanoic acid (PFHpA), perfluorohexanesulfonic acid (PFHxS), perfluorononanoic acid (PFNA), perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA)

**The proposed S-1 & GW-3 standard and the proposed GW-3 standard is not for the sum of PFAS but rather for each of the individual six PFAS compounds listed above.

1,4-dioxane							
Current Soil Standard		Proposed Soil Standards		Current Groundwater Value		Proposed Groundwater Standard	
S-1 & GW-1	SW-1 & GW-3	S-1 & GW-1	SW-1 & GW-3	GW-1	GW-3	GW-1	GW-3
200 ug/kg	20,000 ug/kg	200 ug/kg	20,000 ug/kg	0.3 ug/L	50,000 ug/L	0.3 ug/L	50,000 ug/L

2.8 Environmental Assessment History

The evaluation for 1,4-dioxane at the Airport began in July 2015 when the MassDEP requested samples of existing wells to evaluate the presence or absence of this compound on Airport property. In August 2016, the Airport also conducted an initial round of groundwater sampling to evaluate the presence of PFAS compounds, also at the request of MassDEP. Subsequently, a Notice of Responsibility ("NOR"), dated November 10, 2016, was issued to the Airport by the MassDEP. The NOR requested that the Airport conduct additional field investigations to evaluate sources of two types of contaminants at the Airport and on adjacent properties, and to identify potential impacts to public water supply wells operated by the Hyannis Water District at the Mary Dunn and Maher Wellfields.

Groundwater in the vicinity of historic releases from a floor drain at the former Provincetown Boston Airlines hangar (currently leased to Cape Air) had been known to contain 1,1,1-trichloroethane (1,1,1-TCA). Since 1,1,1-TCA solvent products have been known to potentially contain 1,4-dioxane, the past release of 1,1,1-TCA was investigated as part of this project as a potential source.

In July 2015, HW sampled groundwater from seven monitoring wells on and off the Airport property for analysis of 1,4-dioxane. The contaminant was detected in well OW-9DD at a concentration of 0.93 ug/L, above the 0.30 ug/L standard for 1,4-dioxane. This well is located off Airport property, within the Maher Wellfield property, and is screened from 77 to 87 feet below the ground surface. All samples taken from the other wells at the Airport property did not contain 1,4-dioxane above laboratory reporting levels. Subsequent testing in 2017 of 11 groundwater wells only detected 1,4-dioxane at OW-9DD, OW-19D and OW-18D which are all located off Airport property and within the Maher Wellfield property. An additional well was installed at the Airport in June 2019 as a final attempt to verify that the Airport is not the source of 1,4-dioxane at the Maher Wellfield property. Sampling of this well and select others for 1,4-dioxane was recently conducted and results from this testing will be presented in the next status report due in October 2019.

In response to the August 4, 2016 NOR/ Request for Information ("RFI") the Airport contracted with HW to conduct additional groundwater investigations and collect samples for laboratory analysis. As described in the December 2016 Immediate Response Action Plan, these efforts were focused on suspected PFAS contamination locations on the Airport property based on the understanding of past use or potential release locations as described above.

In accordance with the MCP, HW prepared an Immediate Response Action Plan in December 2016, the most recent status report for which was dated April 2019. Details of the investigations of these contaminants is set forth below.

Summary of Response Actions Conducted between November 2016 and July 2019

- The installation of groundwater monitoring wells at six locations installed in April 2017: in the vicinity of potential sources of PFAS at the ARFF Building, at the firefighting training deployment area adjacent to the East Ramp, and at upgradient locations to evaluate potential off-site sources of PFAS and 1,4-dioxane.
- The first round of groundwater samples for PFAS and 1,4-dioxane were collected on April 5-7 and April 11, 2017. Additional groundwater samples and one surface water sample were collected for analysis of PFAS on June 20, 2017.
- An initial round of three soil samples were collected on December 6, 2016 as reported in the first status report. One sample was taken from each location where it was determined that AFFF had been used at the Airport, including the site of an airplane crash in 1981, the Deployment Area, and the 1991 Drill Location along the dirt road adjacent to the Deployment Area.

- A second round of soil samples were collected on June 20, 2017 adjacent to the ARFF building and within the deployment area to begin to determine the extent of PFAS within the surface soils. Based on the results of these analyses, a third round of samples from these two locations were collected on September 26, 2017. The third round of sampling was designed to further delineate the extent of PFAS in soils both horizontally and vertically, with samples taken at the ground surface and at two and four feet BGS.
- In October 2017, three composite soil samples were taken from piles of sediment and topsoil associated with the redevelopment of Runway 15/33. These piles were located on Airport property at the site of the former Mildred's Restaurant and were analyzed for PFAS compounds to evaluate if sediment removed from the airport as part of this redevelopment contained PFAS.
- Two samples of AFFF concentrate have also been analyzed for PFAS compounds to evaluate the foam previously used at the airport and that the foam that is currently in use.
- Six PFAS soil samples were also analyzed for leaching potential using an SPLP test between September and October 2017. The chosen samples included four samples from within the boundaries of the PFAS sites at the airport and two samples from runway reconstruction soils stockpiled at the airport.
- On August 14, 2018, 24 PFAS surface soil samples were collected in proximity to the ARFF building and the Deployment Area. PFAS compounds were previously detected in these areas and additional samples were collected to determine the vertical extent of PFAS impacts in soil and to refine the Disposal Site boundary at the Airport.
- In October 2018, three soil borings (DL11, DL14 and HW-F) were advanced in the deployment area. One soil boring (ARFF3) was advanced and one surface soil sample (HW-3) was collected near the ARFF Building in order to further delineate the extent of PFAS in soils both horizontally and vertically. All soil borings were advanced using direct push methods.
- In October 2018, six monitoring wells were installed at the Airport. A cluster of three wells (HW-G(s), HW-G(m), and HW-G(d)) was installed at an upgradient location to evaluate potential off-site sources of PFAS. Three additional wells (HW-H, HW-I, and HW-J) were installed southeast of the Deployment Area adjacent to the East Ramp.
- In November 2018, six groundwater samples were collected to evaluate PFAS concentrations in the Deployment Area. Four groundwater samples and one surface water sample from Mary Dunn Pond were also collected for analysis of oxygen and hydrogen isotopes to determine the contribution of pond water from Mary Dunn Pond to the four downgradient wells.
- In December 2018, two soil samples were collected from the 1991 Drill Location to determine if PFAS detected in the area are related to background conditions.

- In February 2019, three additional surface soil samples were collected to further delineate the Disposal Site boundary around the ARFF building.
- In May and June 2019, HW installed an additional nine groundwater monitoring wells to delineate the vertical and horizontal extent of PFAS at the Airport and on adjacent hydraulically upgradient properties. HW is in the process of evaluating the potential groundwater impacts from other off-site sources such as the adjacent Fire Fighting Academy that may be contributing to the detection of PFAS both at the Airport and at the downgradient well fields.

Tabulated soil and groundwater data are included as Tables 1-5, Appendix A and Figures 3 through 5 indicate the sampling locations. PFAS analytical data for the nine recently installed monitoring wells is currently being reviewed and will be submitted to the MassDEP in the October 2019 status report. Additional testing for 1,4-dioxane has also been conducted and will be submitted in the next status report.

As indicated on Figure 3 and 4, numerous soil borings have been advanced in the vicinity of the Deployment Area and ARFF Building. Analytical testing of approximately 76 soil samples from various depths and locations in these areas were utilized to determine the vertical and horizontal extent of PFAS impacts in soil. The approximate delineated extent of these impacts is also indicated on Figures 3 and 4 as a yellow line.

As indicated on Figure 5, numerous groundwater monitoring wells have been advanced both on and off the Airport property. Analytical testing of approximately 34 groundwater samples between 2016 and 2018 from various depths and locations have been used to delineate the vertical and horizontal extent of the PFAS plumes at the Airport. Analytical testing of nine recently installed groundwater monitoring wells were completed in June and July 2019. This data will be used to further define the vertical and horizontal extent of the PFAS plume and further define any contribution of PFAS from off-site sources.

3.0 POSSIBLE REMEDIAL ACTIONS

The Airport is currently evaluating the nature and extent of PFAS and 1,4-dioxane in soil and groundwater consistent with the MCP as part of the Phase II Comprehensive Site Assessment. In order to develop an appropriate remedial action that is protective of the public health, welfare, and the environment, the full extent of soil and groundwater impacts including the potential contribution from off-site sources (i.e., the adjacent Firefighting Academy) must be known. As indicated above, interim steps have been implemented by the District to meet the required drinking water standards and guidelines for these compounds. The District has constructed treatment facilities at the Mary Dunn Wellfield to treat for PFAS compounds and has agreements to purchase water from the Town of Yarmouth and the Centerville, Osterville, Marstons Mills Water District. In addition, they are in the process of installing a treatment system for both PFAS compounds and 1,4-dioxane at the Maher Wellfield. Based on the results of the Phase II Comprehensive Site Assessment and Phase III Evaluation ("Phase II/III Report"), the following remedial actions may be implemented:

- Excavation and off-site disposal of all or a portion of soil identified as a source of groundwater impacts related to operations at the Airport;
- Reducing the ability for PFAS to leach from the soil into groundwater by mixing soil with a binding agent such as activated carbon;
- Excavation, thermal treatment, and reuse on-site of all or a portion of soil identified as a source of groundwater impacts related to operations at the Airport;
- Installation of a non-permeable cap over all or a portion of soil identified as a source of groundwater impacts related to operations at the Airport;
- Injection of a binding agent such as activated carbon to reduce the mobility and leachability to groundwater in areas impacted by Airport operations; or
- Installation of a groundwater pump and treat system to remove impacts from groundwater in areas impacted by Airport operations.

Considering that PFAS is a relatively new and emerging contaminant, the best course for remediation is still under review. Several new PFAS remediation technologies have been developed however, the effectiveness of these technologies has not been fully demonstrated. The above list is not intended to be a complete listing of all available remedial options, but rather a general listing of some PFAS remediation technologies that have been or are currently being evaluated by others for feasibility of PFAS treatment. It should be noted that the investigation of PFAS at the Airport is still on-going and that remedial options will be further evaluated as part of the Phase II/III Report. This report is due to the MassDEP on or before November 10, 2020.

4.0 PUBLIC INVOLVEMENT ACTIVITIES

The Airport is committed to involving the public throughout the response action process. This PIP establishes how the Airport will provide information related to the site and make that information available for public review, and how the public will be able to comment on the ongoing assessment and remediation activities subject to this PIP. The Airport has revised the Draft PIP based upon comments received by the public.

In accordance with the MCP, public involvement activities serve several purposes:

- To identify local concerns and sources of information through interviews and other appropriate measures and ensure that the implementation of the PIP reflects such concerns and the nature and level of relevant public interest;
- To inform the public about response actions and the public involvement process by providing notification of public meetings; and,
- To inform the public of site information related to the remediation of hazardous material releases to the environment.

The Airport has established a mailing list to ensure a reliable means of notifying interested parties of the availability for public involvement opportunities. The mailing list will be used to announce upcoming public meetings, distribute site updates, public comment periods, and the availability of information related to ongoing response actions. Persons wishing to be added to the mailing list should notify the Airport in writing at the address below, or email by contacting Sue Kennedy, Administrative Assistant to the Airport Manager, at Sue.Kennedy@town.barnstable.ma.us

Barnstable Municipal Airport
Attention: Public Involvement Plan
480 Barnstable Road
Hyannis, MA 02601

4.1 Public Involvement History

The Airport has carried out all the public involvement requirements that have applied to the MCP activities it has, and is currently, performing. Bi-annual monitoring and project milestone reports submitted to MassDEP are available for public review at:

https://eeaonline.eea.state.ma.us/EEA/fileviewer/Rtn.aspx?rtn=4-0026347

Additionally, the Board of Health and Chief Municipal Office have been notified of the availability of reports submitted to MassDEP as required by 30 CMR 40.1403 and the ability to review such reports.

4.2 Soliciting Public Input

A public comment period for the Draft PIP begin on July 29, 2019 and extend to August 19, 2019. Comments received on the Draft PIP and the Airport's responses are set forth below. Copies of the Draft PIP comments are included in Appendix C.

Mr. Ronald Beaty, Chief Petitioner

1. *"The Draft PIP describes all of the possible sources of PFAS in consumer products, yet does not explain how those could have affected the releases of PFAS at the Airport related to aqueous film forming foams (AFFF) used for training at the Airport".*

The purpose of this section of the PIP is to document other potential sources of PFAS in the environment besides AFFF. As documented in the PIP, PFAS is found in numerous consumer products and other sources that are not related to the use of AFFF at the Airport. Testing of both soil and groundwater outside of the known PFAS Disposal Site boundary at the Airport have identified concentrations of PFAS that are forensically different than that used at the Airport. These investigations have also identified at least two plumes (not associated with use of AFFF at the Airport) of PFAS impacted

groundwater that are coming onto the airport from hydraulically upgradient source(s). It is very important to consider background and other potential off-site sources when evaluating the nature and extent of PFAS contamination at the Airport. The MCP defines background as *"those levels of oil and hazardous material that would exist in the absence of the disposal site of concern, including both Natural Background and Anthropogenic Background"*. PFAS background as well as the detection of at least two PFAS groundwater plumes entering the Airport from off-site upgradient source(s) will be further discussed and evaluated in the Phase II/III Report. Consistent with the MCP, the Airport is not required to identify the source of PFAS entering the Airport property but rather document that other source(s) of PFAS upgradient to the Airport are being detected and are not related to the use of AFFF at the Airport.

2. The Draft PIP *"describes numerous environmental programs and procedures at the Airport that are laudable, but many do not appear to relate to use of AFFF"*.

The purpose of this section of the PIP is to document that the Airport has taken great steps to reduce the potential for a release of any OHM at the Airport related or not to PFAS. By implementing these procedures, the Airport is demonstrating its commitment to environmental stewardship. As documented in the PIP, the Airport is mandated by the FAA to use AFFF in the event of an emergency. Additionally, the Airport has introduced various steps including the use of a new technology allowing for the testing of firefighting apparatus without spraying foam. By implementing these steps, the Airport has eliminated the discharge of PFAS during training exercises into the environment since 2015.

3. *"The Draft PIP also expresses concerns about possible PFAS contamination from the Fire Training Academy (FTA) impacting the BMA. No data are presented to support this assertion, yet the FTA is called out by name (RE: section 3.0, p.14). In contrast, the assessment summary in the Draft PIP notes that PFAS has been detected in groundwater migrating onto the airport from the west but does not name specific possible sources west of the airport, such as the wastewater treatment facility."*

Groundwater data recently collected does indicate a plume (not associated with use of AFFF at the Airport) entering the Airport from another known PFAS Disposal Site (FTA). It is unclear if the plume entering from this area is solely from the FTA or a combination of the FTA and other upgradient sources. A second plume (not associated with use of AFFF at the Airport) has also been identified as entering the Airport along the western edge. To date, no known PFAS Disposal Site(s) are located in this area. Groundwater data presented in the next status report (October 2019) will document these two plumes. Considerable investigation and expense would be necessary to identify these potential off-site sources. Also, consistent with the MCP, off-site sources of PFAS that are impacting the Airport do not need to be physically identified, but rather documented that they exist. MassDEP may decide to issue Notice of Responsibilities or

Request for Information to other off-site properties to investigate for PFAS at their discretion.

4. *"I request that the BMA and their consultants provide more specifics on how much AFFF was used and to clarify foam concentrate volumes versus total liquid volumes released".*

Details concerning the volume of AFFF versus the total volume of liquid have been incorporated into Section 2.6 above.

5. *"The final PIP should provide detailed information about how PFAS, detected in significant concentrations in soil and groundwater adjacent to the ARFF building, came to be located there, in comparison to the Deployment Area, where it is clearly stated that training and drills took place historically".*

AFFF is stored at the ARFF building within containers. Firefighting apparatus that uses the AFFF is also stored in this area. The detection of AFFF in this area is likely related to incidental spillage and/or the washing of equipment in this area after the completion of drills. It was common practice for the trucks to be flushed after use. Whether that use was to respond to an emergency or after drills/training, all pipes and discharge points require flushing. Flushing commonly occurred in one of two locations, in the Deployment Area or adjacent to the ARFF building, where access to nearby fire hydrants allowed for such activity. The Airport has since purchased an Ecological Cart that allows for the testing of the AFFF mix without the need to deploy AFFF onto the ground; rather, the Ecologic Cart allows the airport to conduct its required FAA annual testing of ARFF to Water concentration within a closed system that is more environmentally friendly. In the event of a future emergency were AFFF is required, equipment used in response to that emergency will be flushed into a tight tank, a vacuum truck, or some other method where collection is possible for future disposal.

6. *"I am concerned about the need for additional information on and clarifications about the proposed clean-up actions for the BMA. The final PIP should address:*
    a. *Remediation or removal of PFAS-impacted soil in the Deployment and ARFF areas: There is no mention of statements made in several prior MCP submittals, including IRA Status reports dating to October 2017 and the official Airport Response to the Oct. 27, 2017 MassDEP Request For Information (RFI), that the airport will be "moving forward" with impacted soil removal. To my knowledge, there has been no soil removal and no IRA Plan submittals to MassDEP about executing such soil removal".*

The Airport is committed to addressing PFAS in soil on Airport property that is related to the use of AFFF. The Airport has collected a substantial amount of soil data to determine the nature and extent of PFAS impacts to soil related to Airport operations. Consistent with the MCP, the nature and extent of the impacts must first be understood, and a complete conceptual site model developed to determine the most appropriate remedial

action. This evaluation is still being conducted and the recent proposed changes to the soil standards have also impacted the facilities that accept PFAS impacted soil. The Airport is currently evaluating the installation of a temporary cap over select areas of PFAS impacted soil as an Immediate Response Action Modification. The Draft Immediate Response Action Modification will be submitted to the public for comment and MassDEP in October 2019. As indicated above, various remedial actions will be evaluated as part of the Phase II/Phase III Report. If it is determined that that additional remedial action is necessary before the completion of the Phase II/Phase III Report, the document concerning the proposed remediation will be provided for review by the public consistent with the PIP.

b. *"The directive from MassDEP to remove or remediate PFAS-impacted soil: The Draft PIP Site history does not mention that MassDEP issued a Request For Modified IRA Plan/ Interim Deadline dated June 18, 2019 for the Airport to cap, remove or otherwise prevent infiltration into the known impacted soils to the BMA to mitigate migration of the PFAS".*

The MassDEP did not mail or otherwise provide the *Request For Modified IRA Plan/ Interim Deadline* dated June 18, 2019 to the Airport. The Airport became aware of this document on August 2, 2019 which was after the submission of the Draft PIP. MassDEP was notified that the document was not received and an extension for response has been granted. As indicated above, the Airport is currently reviewing the feasibility of capping select areas to prevent infiltration of PFAS into the underlying groundwater.

c. *"The specific status of groundwater modeling at the BMA: Groundwater modeling does not appear to be mentioned specifically. This critical work has been described in other MassDEP submittals as "on-going", but no results have been forth coming."*

Groundwater modeling is on-going. Consistent with the MCP, the final interpretation of the data and development of the conceptual site model will be presented in the Phase II/III Report.

d. *"Basing remedial actions on the results of the MCP Phase II Comprehensive Site Assessment (CSA): Section 3.0 notes that possible remedial actions will be based on the results of the MCP CSA. While it is my understanding that the CSA is very important to support decisions on long-term or final remedial actions, more immediate remedial actions should be developed as IRAs. As noted in "a" above, IRAs have been discussed in previous IRA filings for this release. In addition, it is my understanding that two additional MCP Phases, Phase III (evaluation and selection of remedial actions) and Phase IV (design and implementation), must be conducted after the CSA is completed. This implies that a long period of time may elapse before any remedial actions are proposed or implemented. As stated in Section 3.0, the CSA is not due for completion until November 2020. If Phase III and IV are conducted after that*

date, then this indicates that proposed comprehensive remedial actions may be delayed until well into 2021 or 2022. This is a long timeframe to address this PFAS release in a sensitive area."

The MCP provides a timeline for various response actions that the Airport is complying with. Additionally, treatment of groundwater at the Maher well field for PFAS and the purchasing of water from others has been implemented to protect the public from PFAS exposure. The implementation of this treatment along with the continued soil and groundwater assessment is consistent with the MCP definition of an IRA. According to the MCP, an IRA shall assess release, threat of release and/or site conditions and, where appropriate, contain, isolate, remove or secure a release or threat of release of oil and/or hazardous material in order to:

(a) abate, prevent or eliminate an Imminent Hazard to health, safety, public welfare or the environment; and/or

(b) respond to other time-critical release, threat of release and/or site conditions.

As indicated above, treatment of PFAS impacted groundwater obtained from the Maher well field and the purchasing of water from others has reduced the potential for PFAS exposure from drinking water to the public from the release of PFAS at the Airport and by others. Additionally, the delineation of the nature and extent of PFAS in soil and groundwater at the Airport is on-going.

Additionally, as indicated above, the Airport is evaluating the installation of a temporary cap in select areas to reuce the potential for PFAS migration from soil to groundwater. The Draft IRA Modification is expected to be submitted for public comment and to the MassDEP in October 2019.

7. *"I request that the BMA expand public notifications under the PIP beyond the typical MCP milestones and Phase reports and implement periodic updates, e.g., quarterly. For example, updates could be provided on a regular schedule and to describe specific activities, such as groundwater modeling and proposed IRA remedial actions. I also request that the BMA conduct additional public meetings, including public meetings to present findings at every major MCP milestone in accordance with the MCP PIP process regulations in the MCP."*

The Airport is providing opportunities for Public Involvement consistent with the MCP and additional notifications do not appear to be warranted at this time. Additionally, the Airport has developed a mailing list and provided the public will details on how to be added to the mailing list. The mailing list will inform the public on the availability of reports and comment periods during the MCP process.

Massachusetts Breast Cancer Coalition ("MBCC")

1. *"MBCC would like to know if there are any plans for testing PFAS chemicals beyond the 6 included in the newly proposed GW-1 standard."*

The Airport is analyzing for 21 PFAS compounds and is currently reporting the sum of the six for regulatory purposes. Evaluation of the other 15 compounds for forensic (i.e., source identification including both on and off-site sources) and remedial purposes is currently being conducted.

2. *"MBCC is aware that PFAS, especially short-chain PFAS chemicals, are mobile in the environment and can move quickly through the sand and gravel aquifer on Cape Cod. Are there any plans to monitor the movement of PFAS originating on airport property to other locations? How far have these chemicals spread?"*

The airport is currently evaluating the nature and extent of PFAS in soil and groundwater relating to the use of AFFF at the Airport. During this evaluation, two additional off-site sources of PFAS in groundwater (not associated with use of AFFF at the Airport) have been identified as emanating from upgradient source(s). This evaluation is on-going and groundwater modeling is also being conducted to determine the extent of the Airport PFAS plume both on and off the Airport property.

3. *"MBCC would like to see more information in the final PIP about the decision-making process around the proposed remediation strategies. Specifically, who will be the primary decision makers, and will the public have an opportunity to be involved?"*

The remedial strategy will be developed by the Airport's environmental consultant and documented in the Phase II/III Report. The remedial strategy will be based on soil and groundwater data collected, a conceptual site model, and the feasibility to implement the remedial strategy. The public will have an opportunity to review the evaluation of several remedial strategies and the chosen remedial strategy when the Draft Phase II/III report becomes available for public review and comment. Additionally, the Airport is evaluating the installation of a temporary cap in select areas to reduce the potential for PFAS migration from soil to groundwater. The Draft IRA Modification is expected to be submitted for public comment and to the MassDEP in October 2019.

Sierra Club Comments

1. *"Initial PIP interviews were not adequate in number (3) or scope and did not incorporate concerns of the original 21 petitioners (save one). Four officials were interviewed - only two from the Town of Barnstable. No residents that drink water from the Hyannis Water System were included in the PIP interviews! In the Massachusetts Contingency Plan Fact Sheet on Public Involvement in Site*

Cleanup 310 CMR 40.1400, its states: "The person who drafts the PIP must contact the petitioners and appropriate local officials to identify the community's concerns……" This doesn't appear to have happened – to the detriment of the PIP process."

Consistent with the document titled *MCP Q & A: Public Involvement – Subpart N (310 CMR 40.1400) dated December 2017*, *"the key petitioner, Chief Municipal Officer, Board of Health Chairman and Conservation Commission Chairman of the community in which the site is located must be interviewed"*. These interviews were completed as required and are documented in the Draft PIP. In addition, all 21 petitioners and local officials were notified of the public meeting and availability of the Draft PIP with appropriate notice as required by the MCP. The Airport intends to continue to comply with the requirements of the MCP and associated guidance documents related to the PIP process.

2. *"The Airport PIP meeting on July 29 had significantly less attendance than the Barnstable County Fire Training Academy PIP in May. This may partly be due to its timing during the height of the summer season but more likely due to the location of the meeting. The community would be better served by a meeting in a more central Hyannis location."*

The meeting for the Airport was specifically targeted for the summer season when the population swells from 200,000 to over 600,000 so that all residents had the opportunity to comment. Additionally, the airport needed to meet timeframes identified by the PIP Process. The Airport is also easily assessable by the public and provided an opportunity for the public to see the Ecologic Cart that was on display.

3. *"As a means of engaging the public, a PIP Oversight Committee should be established to review all cleanup activities related to the Airport site and to work collaboratively with the Airport and the LSP on a proposed timeline and details for the site cleanup. The PIP Oversight Committee should consist primarily of current or former Hyannis residents/employees/property owners/a technical advisor/an engineer with site cleanup expertise/an Airport representative or LSP/ a DEP representative-- with an option for alternates. PIP Oversight Committee meetings should always be open to the public in a location convenient to the affected community.*

   Previous analyses/reports/communications regarding the Airport site should be made available in a timely manner to the PIP Oversight Committee upon request. All updates on any future submissions and any future communications between DEP/Barnstable County/Town of Barnstable regarding the Airport PFAS sources/sites should made be available to the proposed PIP Oversight Committee, the site mailing list (this can be an opt-in) and on the electronic repository within 24 hours. Full and open transparency is a key requirement that will best serve to

resolve any potential issues about the status of the contamination of the Airport site."

The Airport is providing opportunities for Public Involvement consistent with the MCP and additional notifications do not appear to be warranted at this time. Electronic copies of all reports submitted to the MassDEP can be accessed here: https://eeaonline.eea.state.ma.us/EEA/fileviewer/Rtn.aspx?rtn=4-0026347

Additionally, the Airport has developed a mailing list and provided the public will details on how to be added to the mailing list. The mailing list will inform the public on the availability of reports and comment periods during the MCP process.

4. *"As there were still test results outstanding for the initial July 29 Public Involvement Plan (aka PIP) meeting --including a determination of a 1,4, dioxane release at the Airport and analytical data from 9 recently installed groundwater monitoring wells at the Airport and on adjacent properties-- it is not possible to comment comprehensively without possession of the most current analyses. It is disappointing these were not provided prior to the deadline for public comment.*

    - *"The extent of PFAS in Airport soils--both horizontally and vertically-- and any related plumes needs to be delineated, mapped, and monitored indefinitely"*;

The investigation is being conducted consistent with the MCP including the delineation of PFAS impacts both on and off-site relating to the use of AFFF at the Airport.

    - *"All contributions of PFAS and 1,4 dioxane from both on and off-site should be identified, defined, and sourced back to the site of origin"*;

As indicated above, the Airport is currently delineating the extent of PFAS impacts both on and off-site associated with Airport operations. Consistent with the MCP, it is not the Airport's responsibility to identify other sources of PFAS that have migrated onto the Airport from other upgradient source(s) but rather to inform MassDEP that other sources of PFAS upgradient of the Airport exist. MassDEP will determine if issuing a Notice of Responsibility and/or Request for Information to upgradient properties is necessary.

    - *"There should be PFAS sampling of the water and sediments in the Upper Gate and Lewis Ponds on the Airport property"*;

The Airport recently collected surface water samples from Upper Gate and Lewis Pond which were all below the proposed MassDEP PFAS standards.

- *"Sampling for PFAS in tissues of fish, shellfish, ducks, and deer on the Airport property should be initiated as wild fish and game have been shown to bioaccumulate PFAS"*;

No evidence of fish kills, stressed vegetation or the detection of PFAS above the proposed MCP surface water standards have been detected in surface water at the Airport. In addition, the risk to the environment (i.e., various wildlife) will be addressed and documented in the Phase II/III Report.

- *"Specify the total volume of foam mixture utilized at the Airport as opposed to the volume of foam concentrate as the former may more accurately indicate the extent of the contamination of an area"*; and

This question was answered above and has been incorporated in the Final PIP.

- *"In addition to the 6 PFAS compounds tested by Maxxam, has the Airport selected the suite of PFAS they analyze based only on the legacy AFFF products used at the site over decades or are the newer AFFF replacement products containing a preponderance of short chain PFAS being included?"*

The airport is analyzing for 21 PFAS compounds and is currently reporting the sum of the six for regulatory purposes. Evaluation of the other 15 compounds for forensic purposes (i.e., source identification including both on and off-site sources) and remedial purposes is currently being conducted.

5. *"None of these technologies--alone or even combined--are ideal for complete environmental remediation of the Airport and none are destructive technologies. The PFAS is removed and transferred to another location. There is some potential for the technology of sonolysis which you may wish to consider. SERDP (Strategic Environmental Research and Development Program) is funding studies of sonolysis though the project is not anticipated to be completed until Dec. 2020".*

Appropriate site-specific remedial alternatives will be evaluated as part of the Phase II/ III Report. The remedial examples provided in the PIP are just examples of PFAS remediation alternatives that could be implemented.

<u>Charlie Bloom Comments</u>

1. *"I don't blame the fire training academy for the good work that they do, but responsibility for the contamination must be determined as soon as possible, and action must be taken as soon as possible to protect the citizens of Hyannis, and that includes me and my family and my friends."*

As previously indicated, drinking water at the Maher well field is treated for PFAS and meets the current drinking water standards. The Airport is currently determining the nature and extent of PFAS both on and off-site that is related to AFFF use at the Airport. The current groundwater investigation has identified two other off-site upgradient sources that have PFAS plumes entering the Airport property. These plumes are not associated with the use of AFFF at the Airport.

David Dow Comments

1. *"Given the above observations the proposed Remedial Action Plan for PFAS chemicals in the soil and groundwater at the Barnstable Municipal Airport appears to be inadequate and a more realistic approach needs to be developed".*

Currently the Airport is in the data collection phase to determine the nature and extent of PFAS impacts in soil and groundwater related to the Airport's usage of AFFF. As indicated above, appropriate site-specific remedial alternatives will be evaluated as part of the Phase II/ III Report. The remedial examples provided in the PIP are examples of PFAS remediation alternatives that could be implemented. The public will have a chance to comment on the chosen remedial methods once the Phase II/III Report becomes available for review. Additionally, the Airport is evaluating the installation of a temporary cap in select areas to reduce the potential for PFAS migration from soil to groundwater. The Draft IRA Modification is expected to be submitted for public comment and to the MassDEP in October 2019.

4.3 Interviews with Petitioner and Town Officials

The Airport conducted three interviews as part of the PIP development. The interviews were held with:

- Ronald Beaty, chief petitioner for the 20 people who requested the PIP;
- Daniel Santos, Director, Barnstable Department of Public Works on behalf of the Town of Barnstable; and
- Mark Forest, Select Board Member and Karl von Hone, Natural Resources Director, Town of Yarmouth.

The issues raised during each interview are summarized below. Where possible, responses to the questions raised during the interviews are provided.

Interview with Ron Beaty

- Mr. Beaty asked where the documents and reports were housed and where would they be made available to the public.

- Hard copies of the documents will be made available at the following locations: Hyannis Public Library, West Yarmouth Public Library, and Barnstable Municipal Airport Administration Offices.
- Online via the MassDEP website and Barnstable Municipal Airport's Website.

- Mr. Beaty asked that the Airport clarify the extent of PFAS and 1,4-dioxane contamination and explain the amount of testing that has been conducted to date to evaluate these contaminants.
  - Section 2.7 of the PIP, along with the associated figures and tables provides a summary of what has been done related to these contaminants since work began in 2016.
  - A total of 34 groundwater samples and 76 soil samples have been collected in that time.

- Mr. Beaty also asked if the Airport is sampling for contaminants of emerging concern other than PFAS and 1,4-dioxane.
  - The focus of the investigations since 2016 has been on PFAS compounds and 1,4-dioxane as these emerging contaminants have impacted public supply wells in Hyannis above the state's drinking water standards and guidelines.

- Mr. Beaty asked if the Airport has sampled for PFAS in Upper Gate or Lewis Ponds on the Airport or in Mary Dunn or Lamson Ponds adjacent to the Airport.
  - The Airport recently collected samples from Upper Gate and Lewis Ponds. No PFAS were detected in these samples above the current or proposed standards.
  - Mary Dunn and Lamson Ponds are upgradient of sites at the Airport where PFAS compounds have been used and are not part of the ongoing Phase II investigation.
  - Mary Dunn Pond was sampled by Barnstable County as part of the assessment of firefighting foam use at the Barnstable Fire Training Academy.

- Mr. Beaty asked if there was any issue with a series of soil piles on Airport property alongside Attucks Lane.
  - These soils were moved to this location as part of the redevelopment of Runway 15-33 and were not in an area associated with either the Deployment Area or ARFF building where PFAS compounds were identified in shallow soils.

- Mr. Beaty asked if a map would be furnished that identifies the area of contaminant/plume.
    - The airport has identified the majority of the area of concern but is still in the process of collecting additional data.

Interview with Daniel Santos, Town of Barnstable

- Mr. Santos stressed that the Town of Barnstable's main issue is understanding the impacts to the public supply wells serving Hyannis from firefighting foam use at the Airport. The primary concern he mentioned was to the Maher Wellfield located downgradient of the Airport.
    - Section 2.7 of the PIP provides an overview of the assessment of soil and groundwater contamination conducted to date to evaluate this issue. Further work will be conducted to complete this assessment in order to develop the Phase II/III Report for the Airport as required by MassDEP.

Interview with Mark Forest and Karl von Hone, Town of Yarmouth

The interview with Mark Forest and Karl von Hone included a summary overview of the work done to date at the Airport. In that discussion, Mr. von Hone asked if there has been any evaluation of the impacts of contaminants from the Airport on Mill Pond and the associated herring runs in Yarmouth, just across the town line with Barnstable. He also mentioned the wetland area adjacent to the Maher wellfield that was a former white cedar swamp and stressed the importance of these areas to the Town of Yarmouth. It was discussed that the primary risk associated with PFAS compounds in groundwater is associated with its presence in drinking water. This issue will be evaluated further in the development of the Phase II/III Report.

4.4 Site Information Repositories

All Airport files are available for public review, by appointment only, at MassDEP's Southeast Regional Office. Files may also be reviewed electronically at:

https://eeaonline.eea.state.ma.us/EEA/fileviewer/Rtn.aspx?rtn=4-0026347

The Airport will establish and maintain local information repositories at the Barnstable Airport Manager's Office, the Hyannis Public Library and the Yarmouth Public Libraries. The local information repository will contain site files, including this PIP, MassDEP filings, and all other appropriate site information. Files will also be available at the MassDEP Southeast Regional Office. The locations of these repositories are provided below.

Barnstable Municipal Airport
480 Barnstable Road
Hyannis, MA
(508) 775-2020

Hyannis Public Library
401 Main Street
Hyannis, MA
(508) 775-2280

West Yarmouth Public Library
391 Main Street, Route 28
West Yarmouth, MA
(508)775-5206
South Yarmouth Public Library
312 Old Main Street
South Yarmouth, MA
(508)760-4820

MassDEP Southeast Regional Office
20 Riverside Drive
Lakeville, MA
(508) 946-2700

Information will also be available on the Airport's and MassDEP's websites listed below:

https://airport.town.barnstable.ma.us/about/documents.aspx:

https://eeaonline.eea.state.ma.us/EEA/fileviewer/Rtn.aspx?rtn=4-0026347

4.5 Site Mailing List

The Airport will establish a mailing list to ensure a reliable means of notifying interested parties of the availability for public involvement opportunities. The mailing list shall include: a representative for the original petitioners, local chief municipal officials, local board of health agents, MassDEP, and anyone indicating their desire to be added to the mailing list. The mailing list will be used to announce upcoming public meetings, distribute site updates, public comment periods, and the availability of information related to the site. Persons wishing to be added to the mailing list should notify the Airport in writing at the address below, or email by contacting Sue Kennedy, Administrative Assistant to the Airport Manager at Sue.Kennedy@town.barnstable.ma.us

Barnstable Municipal Airport
Attention: Public Involvement Plan
480 Barnstable Road
Hyannis, MA 02601

4.6 Notification of Major Milestones and Events

The MCP requires a minimum 20-day comment period for response actions at PIP sites including:

- The Phase I Initial Site Investigation Report;
- The Phase II Comprehensive Site Assessment and Phase III Scope of Work;
- The Phase IV Report;
- Implementation of Phase IV Remedy Implementation Plan;
- Implementation of a Release Abatement Measure (RAM); and
- Implementation of a new IRA to address an imminent hazard.

Consistent with the MCP, status reports do not require a public review period. The people listed on the Community Notification List, Table 6, Appendix A, shall be notified of the availability of all future response actions. Notification will also include the Board of Health and Chief Municipal Officers for the Towns of Barnstable and Yarmouth and MassDEP.

4.7 Public Meetings

The Airport conducted a public meeting to present the Draft PIP on July 29, 2019. The meeting included a presentation of the materials included in the draft PIP. A series of informational storyboards, provided here in Appendix B, was also posted in the meeting room to help further explain the ongoing work at the Airport.

The Airport will send notices of any future public meetings to all petitioners on the initial request to MassDEP, all individuals on the site mailing list, Yarmouth and Barnstable Chief Municipal Officers and Board of Health agents, MassDEP, and local newspapers. The Airport will prepare a meeting summary and maintain a copy in the local information repository.

4.8 Public Comment Periods

The Airport will provided the public with an opportunity to submit comments about future response actions at the Airport. The length of the comment period, unless specified otherwise, shall be 20 calendar days from the date of the public notification. All petitioners on the initial request to MassDEP, all individuals on the site mailing list,

Yarmouth and Barnstable Chief Municipal Officers and Board of Health agents, and MassDEP will be notified.

Within 30 days of the close of the public comment period on future response actions, the report will be finalized, and a summary of comments received on the draft report shall be documented into the final report. A copy of the response to comments and the final report shall be made available in the information repositories established for the Airport.

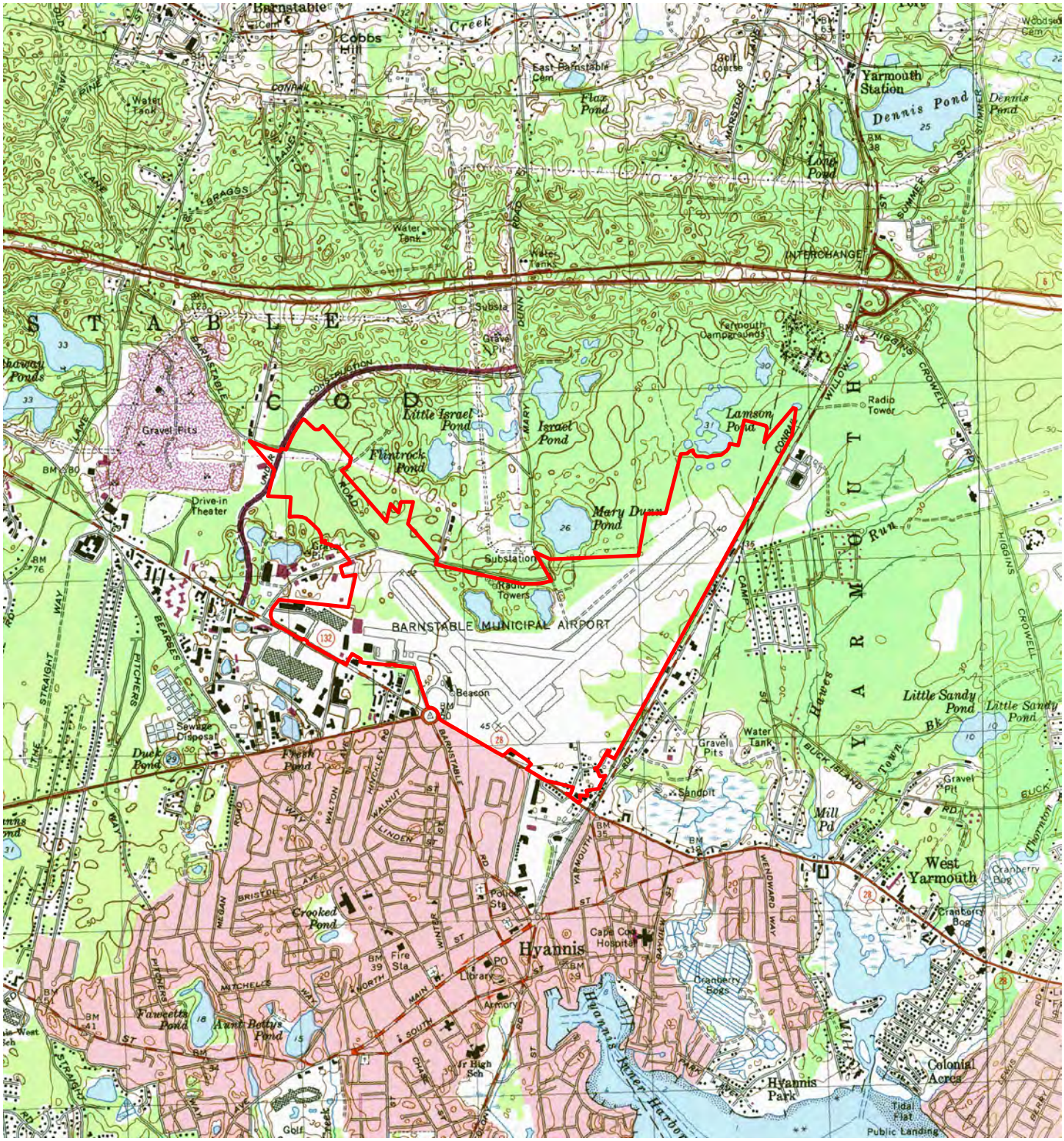
4.9 Public Involvement Plan Revision

This PIP may be revised, when necessary, during the course of the response activities at the Airport. If a revision to this PIP is necessary, the Airport will make a draft available for public review, and shall notify all persons listed in Table 6, and on the site mailing list, of the availability of the draft revised PIP. The Airport will hold a 20-day public comment period prior to the final publishing of the revised PIP and will review and respond to submitted comments.

REFERENCES

1. The Massachusetts Contingency Plan, 310 CMR 40, prepared by the Massachusetts Department of Environmental Protection, dated May 23, 2014.
2. The Draft 2019 Massachusetts Contingency Plan, 310 CMR 40, prepared by the Massachusetts Department of Environmental Protection.
3. MCP Q&A: Public Involvement – Subpart N (310 CMR 40.1400).
4. Technical Fact Sheet - 1,4 Dioxane, prepared by the United States Environmental Protection Agency, dated November 2017.
5. History and Use of Per-and Polyfluoroalkyl Substances (PFAS), prepared by the Interstate Technology Regulatory Council, November 2017.
6. Phase I Report and Tier Classification Report, prepared by Horsley Witten Group, dated November 2017.
7. Immediate Response Action Plan Status Reports 1 through 5, prepared by Horsley Witten Group, dated April 2017 to April 2019.

FIGURES



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Legend

Airport Property Line

**Hyannis Topographic Quadrangle*

N

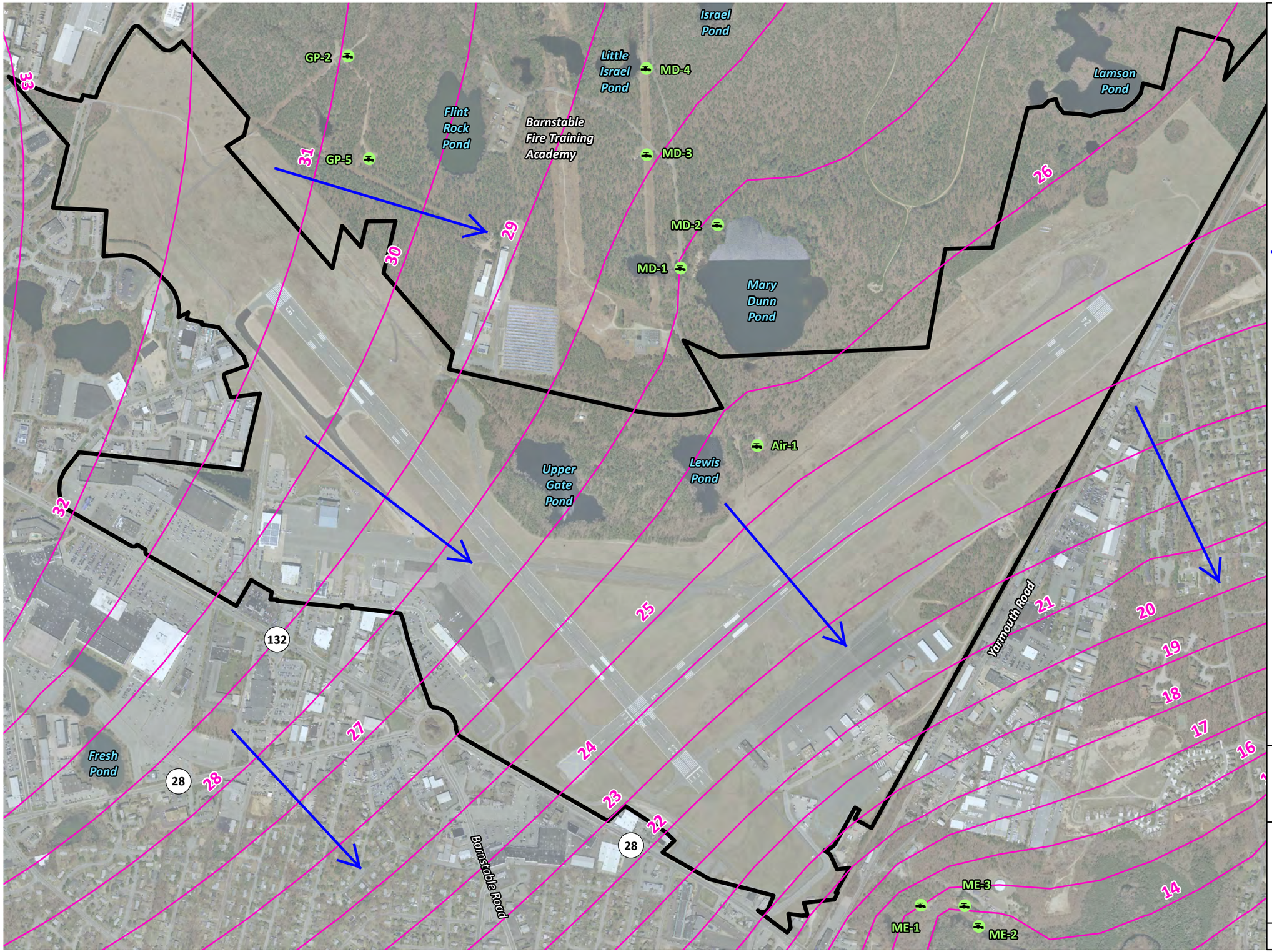
0.5 Miles

Horsley Witten Group
Sustainable Environmental Solutions
90 Route 6A • Sandwich, MA • 02563
Tel: 508-833-6600 • Fax: 508-833-3150 • www.horsleywitten.com

USGS Locus
Barnstable Municipal Airport
Hyannis, MA

Date: 7/2/2019

Figure 1



Legend

- USGS Sagamore Lens Modeled Contours
- Drinking Water Wells
- Barnstable Municipal Airport Property Boundary
- Groundwater Flow Direction

N

0 750

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Sustainable Environmental Solutions
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508-833-8600 • horsleywitten.com

USGS Sagamore Lens Modeled Contours Barnstable Municipal Airport Hyannis, MA

July 1, 2019 Figure 2

*Imagery - MassGIS 2014

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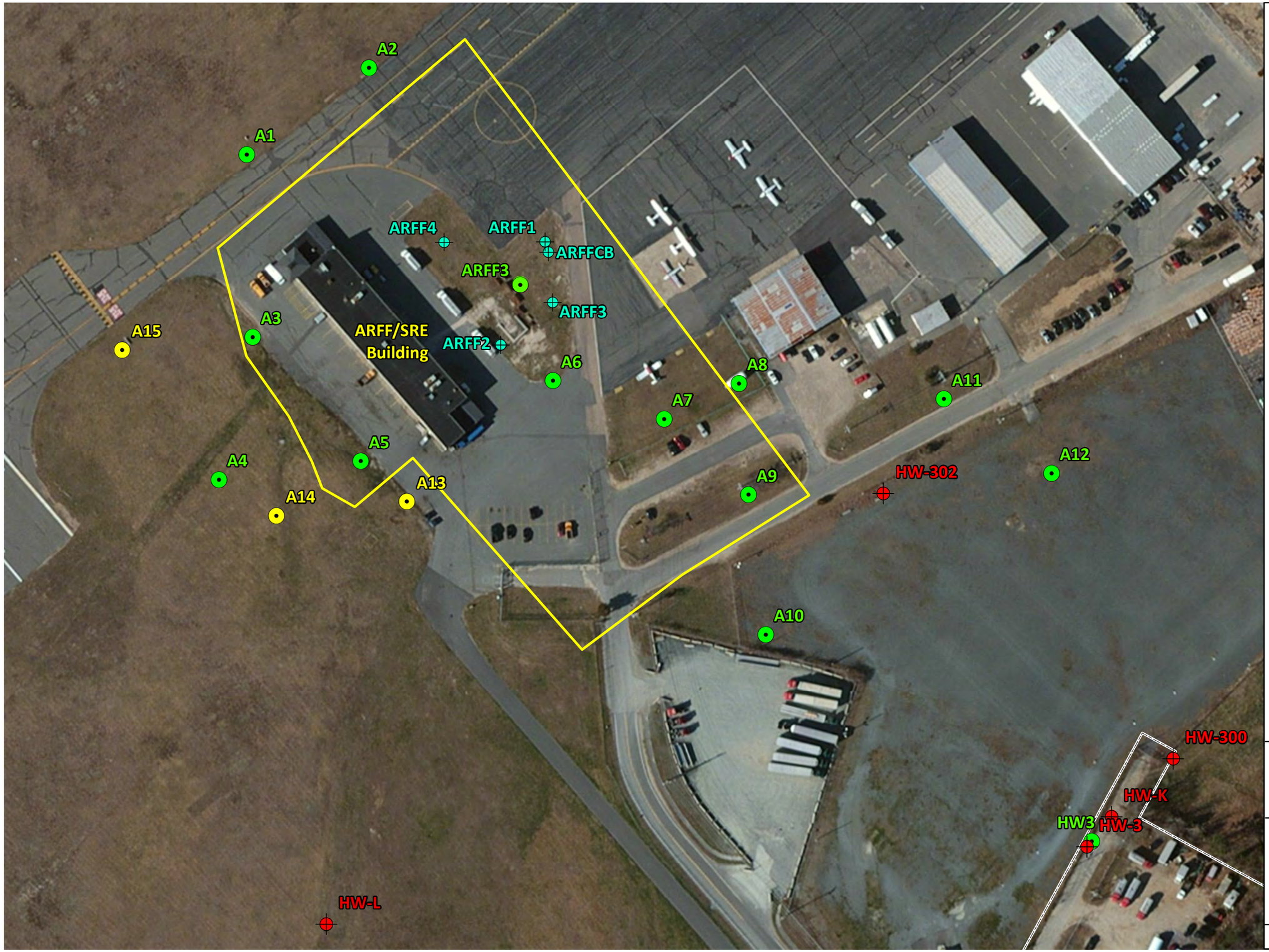

Legend

- 2017 PFAS Soil Samples
- 2018 PFAS Soil Samples
- 2019 PFAS Soil Samples
- Monitoring Wells
- Barnstable Municipal Airport Property Boundary
- Approximate extent of PFAS soil impacts

N

0 100 Feet

1 inch = 100 feet

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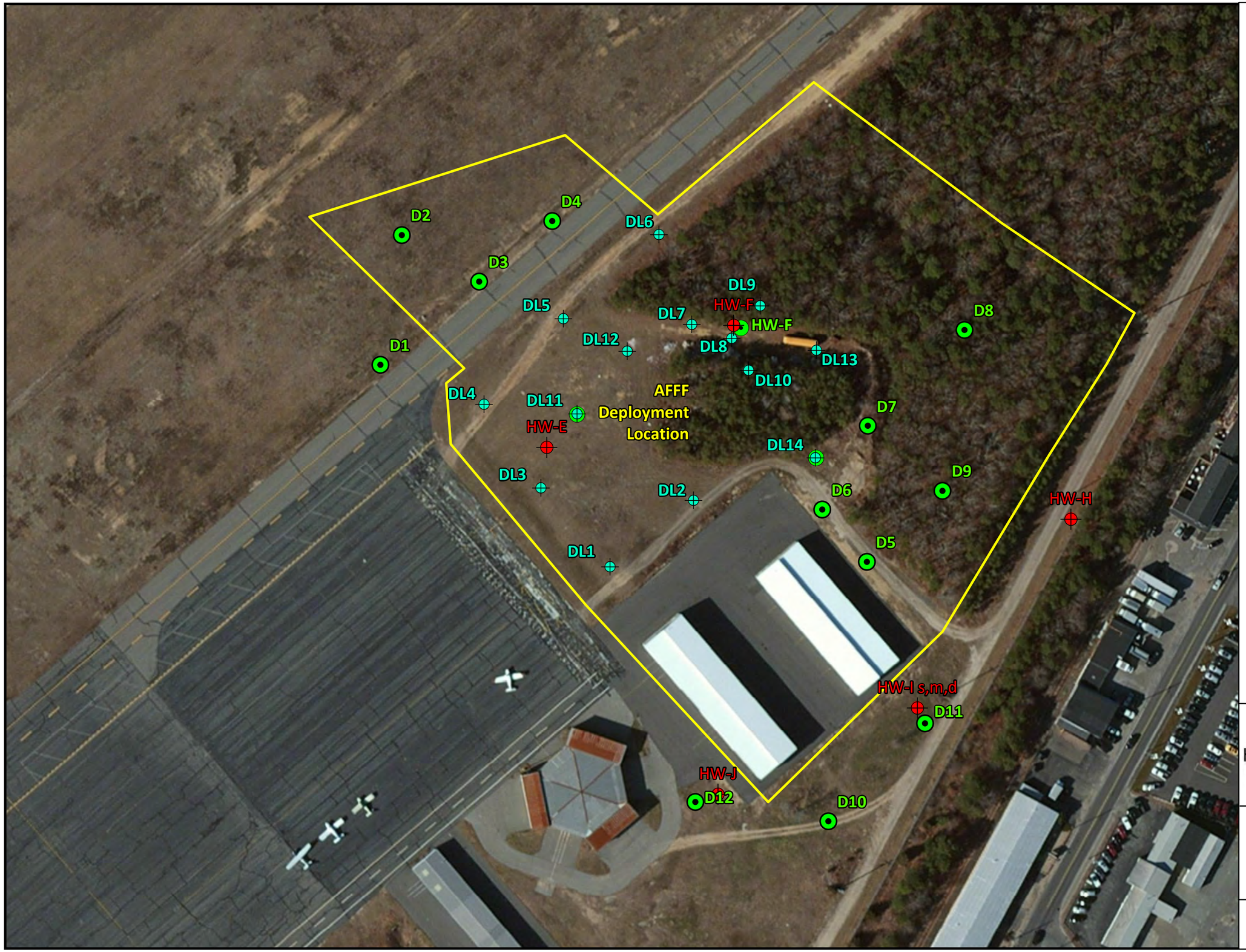
508-833-6600 • horsleywitten.com

PFAS Sampling Locations
ARFF/SRE Building
Barnstable Municipal Airport
Hyannis, MA

July 1, 2019 Figure 3

Path: H:\Projects\HYA\17027 BMA PFOS 1-4 IRA\GIS\Maps\190701_PFOS_ARFF_SamplingLocations.mxd



Legend

- 2017 PFAS Soil Samples
- 2018 PFAS Soil Samples
- Monitoring Wells
- Barnstable Municipal Airport Property Boundary
- Approximate extent of PFAS soil impacts

N

0 100 Feet

1 inch = 100 feet

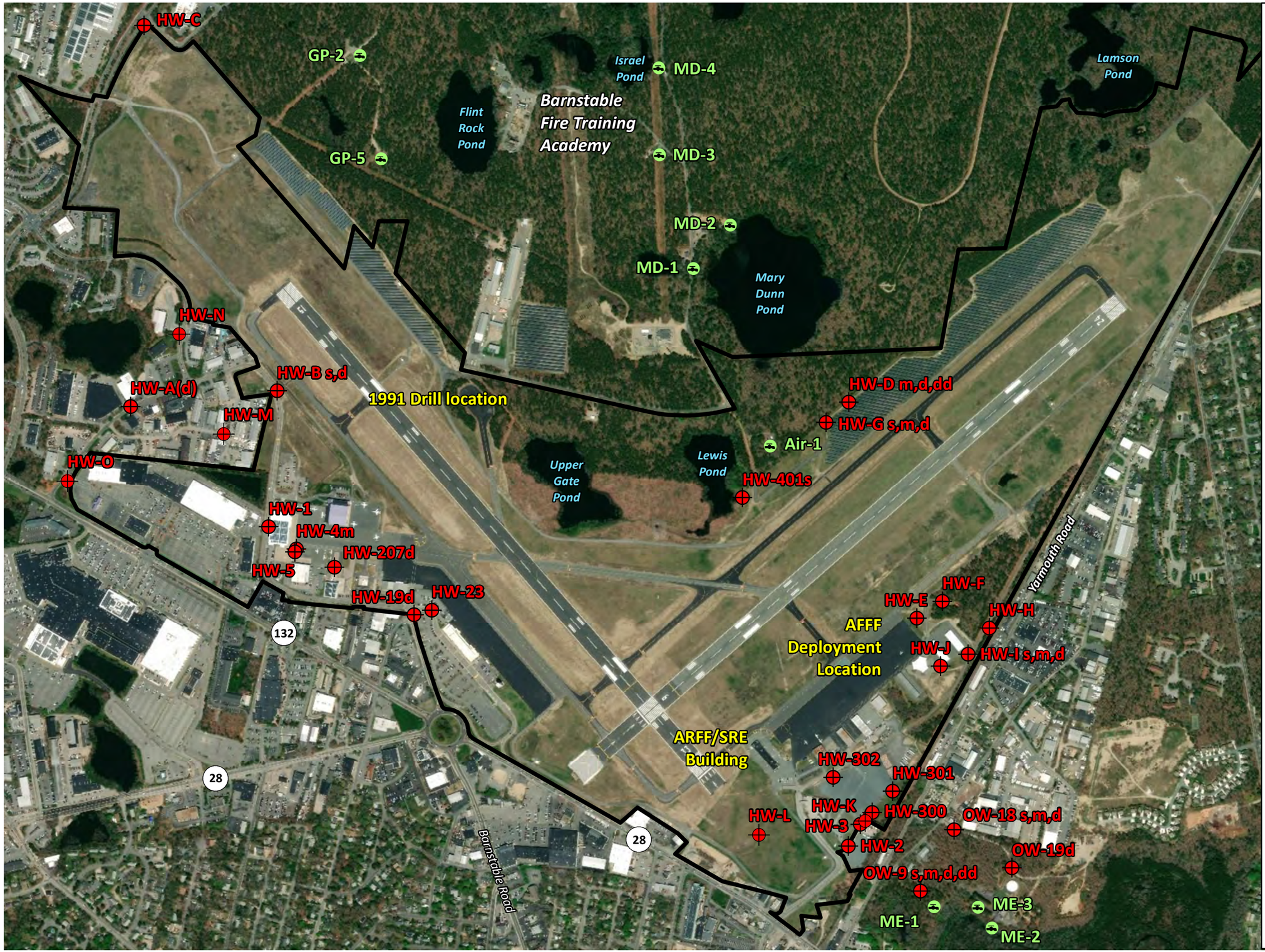
Horsley Witten Group
Sustainable Environmental Solutions
90 Route 6A • Unit 1 • Sandwich, MA 02563
508-833-6600 • horsleywitten.com

PFAS Sampling Locations
Deployment Location
Barnstable Municipal Airport
Hyannis, MA

Date: 7/1/2019

Figure 4

Path: H:\Projects\HYA\17027 BMA PFOS 1-4 IRA\GIS\Maps\190701_PFAS_DEPLOY_Sampling Locations.mxd



Legend

- Monitoring Wells
- Drinking Water Wells
- Barnstable Municipal Airport Property Boundary

N

0 750

1 in = 750 feet

Horsley Witten Group
Sustainable Environmental Solutions
90 Route 6A • Unit 1 • Sandwich, MA 02563
508-833-6600 • horsleywitten.com

Monitoring Well Locations
Barnstable Municipal Airport
Hyannis, MA

Date: 7/1/2019 Figure 5

Path: H:\Projects\HYA\17027 BMA PFOS 1-4 IRA\GIS\Maps\190701_PFAS Well Locations.mxd

APPENDIX A

TABLES

- Table 1 – Total PFAS in Soil at ARFF Area
- Table 2 – PFAS in Soil at Deployment Area
- Table 3 – PFAS in Soil at 1991 Drill Location
- Table 4 – Groundwater Results for PFAS Compounds 2016-2017
- Table 5 – Groundwater Results for PFAS Compounds 2018
- Table 6 – Community Notification List

Table 1: Total PFAS in Soil at ARFF Area

	ARFF1 (0-1') 6/20/2017	ARFF1 (2') 9/26/2017	ARFF1 (4') 9/26/2017	ARFF2 (0-1') 6/20/2017	ARFF3 (0-1') 9/26/2017	ARFF3 (10-12') 10/9/2018	ARFF4 (0-1') 9/26/2017	ARFFCB (0-1) 9/26/2017
Perfluoroheptanoic acid (PFHpA)	0.82 J	1.8	0.66 J	0.17 U	0.60 J	0.32 J	0.75 J	0.60 J
Perfluorohexanesulfonic acid (PFHxS)	0.23 U	0.23 U	0.23 U	0.23 U	0.64 J	0.24 U	0.23 U	0.23 U
Perfluorooctanoic acid (PFOA)	0.75 J	2.6	0.75 J	0.26 U	0.78 J	1.9	0.97 J	0.90 J
Perfluorononanoic acid (PFNA)	2.5	5.7	1.4	0.20 J	0.91 J	3.1	2.9	0.17 U
Perfluorooctane sulfonate (PFOS)	4.5	2.7	1.1	0.29J	4.4	1.1	1.0	1.1
Total PFAS	8.57 J	12.8	3.91 J	0.49 J	7.33 J	6.42 J	5.62 J	2.6 J
	A1 (0-1') 8/14/2018	**A2 (0-1') 8/14/2018**	**A3 (0-1') 8/14/2018**	**A4 (0-1') 8/14/2018**	**A5 (0-1') 8/14/2018**	**A6 (0-1') 8/14/2018**	**A7 (0-1') 8/14/2018**	**A8 (0-1') 8/14/2018**
Perfluoroheptanoic acid (PFHpA)	0.19 U	0.19 U	0.38 J	0.19 U	1.1	0.19 U	0.19 U	0.19 U
Perfluorohexanesulfonic acid (PFHxS)	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
Perfluorooctanoic acid (PFOA)	0.25 U	0.25 U	0.37 J	0.30 J	1.9	0.25 U	0.25 U	0.25 U
Perfluorononanoic acid (PFNA)	0.22 U	0.22 U	0.51 J	0.22 U	0.87 J	0.22 U	0.22 U	0.22 U
Perfluorooctane sulfonate (PFOS)	0.26 U	0.26 U	0.29 J	0.26 U	0.26 U	0.26 U	0.38 J	0.26 U
Total PFAS	0.26 U	0.26 U	1.55 J	0.30 J	3.87 J	0.26 U	0.38 J	0.26 U
	A9 (0-1') 8/14/2018	**A10 (0-1') 8/14/2018**	**A11 (0-1') 8/14/2018**	**A12 (0-1') 8/14/2018**	**A13 (0-1')**	**A14 (0-1')**	**A15 (0-1')**	**HW-3 (0-1') 10/9/2018**
Perfluoroheptanoic acid (PFHpA)	0.19 U	0.19 U	0.19 U	0.19 U	2.0 U	1.9 U	2.0 U	0.19 U
Perfluorohexanesulfonic acid (PFHxS)	0.24 U	0.24 U	0.24 U	0.24 U	2.0 U	1.9 U	2.0 U	0.24 U
Perfluorooctanoic acid (PFOA)	0.34 J	0.25 U	0.25 U	0.25 U	2.0 U	1.9 U	2.0 U	0.25 U
Perfluorononanoic acid (PFNA)	0.22 U	0.22 U	0.22 U	0.22 U	2.0 U	1.9 U	2.0 U	0.22 U
Perfluorooctane sulfonate (PFOS)	0.85 J	0.26 U	0.26 U	0.26 U	2.0 U	1.9 U	2.0 U	0.26 U
Total PFAS	1.19 J	0.26 U	0.26 U	0.26 U	2.0 U	1.9 U	2.0 U	0.26 U

Results in ug/kg = micrograms per kilogram

Maxxim Laboratory analysis

U - Not detected above method detection limit

J = Estimated value, result between laboratory reporting limit and method detection limit

Total = Five (5) combined PFAS compounds (PFHpA + PFHxS + PFNA + PFOS +PFOA)

Note: Totals include estimated values.

Table 2: PFAS in Soil at Deployment Area

	DL1(0-1') 6/20/2017	DL2 (0-1') 6/20/2017	DL2 (2') 9/26/2017	DL2 (4') 9/26/2017	DL3 (0-1') 6/20/2017	DL3 (2') 9/26/2017	DL3 (4') 9/26/2017	DL4 (0-1') 6/20/2017
Perfluoroheptanoic acid (PFHpA)	0.30 J	1.9	1.2	0.48 J	0.84 J	0.17 U	0.17 U	0.31 J
Perfluorohexanesulfonic acid (PFHxS)	0.23 U	1.8	1.3	0.59 J	0.34 J	0.23 U	0.23 U	0.23 U
Perfluorooctanoic acid (PFOA)	0.26 U	1.6	4.1	0.74 J	0.80 J	0.26 U	0.26 U	0.83 J
Perfluorononanoic acid (PFNA)	0.17 U	0.81 J	2.5	0.17 U	0.55 J	0.17 U	0.17 U	2.7
Perfluorooctane sulfonate (PFOS)	0.40 J	12	1.5	0.21 U	0.51 J	0.21 U	0.21 U	2.0
Total PFAS	0.7 J	18.11 J	10.6	1.81 J	3.04 J	0.26 U	0.26 U	5.84 J
	DL4 (2') 9/26/2017	**DL4 (4') 9/26/2017**	**DL5 (0-1') 6/20/2017**	**DL5 (2') 9/26/2017**	**DL5 (4') 9/26/2017**	**DL6 (0-1') 6/20/2017**	**DL7 (0-1') 6/20/2017**	**DL8 (2') 6/20/2017**
Perfluoroheptanoic acid (PFHpA)	0.17 U	0.17 U	2.5	0.40 J	0.50 J	5.0	2.5 J	2.9 J
Perfluorohexanesulfonic acid (PFHxS)	0.23 U	0.23 U	0.49 J	0.49 J	0.23 U	0.23 U	0.23 U	2.3 U
Perfluorooctanoic acid (PFOA)	0.26 U	0.26 U	3.7	1.6	0.26 U	0.26 U	4.2 J	25
Perfluorononanoic acid (PFNA)	0.17 U	3.7	0.19 J	0.17 U	0.17 U	0.19 J	9.6 J	46
Perfluorooctane sulfonate (PFOS)	0.21 U	0.50 J	0.21 U	0.21 U	0.21 U	0.21 U	3.9 J	14
Total PFAS	0.26 U	4.2 J	6.88 J	2.49 J	0.50 J	5.19 J	20.2 J	87.9 J
	DL8 (4') 9/26/2017	**DL9 (0-1') 6/20/2017**	**DL10 (0-1') 6/20/2017**	**DL 11 (0-1') 9/26/2017**	**DL11 (4-6') 10/4/2018**	**DL11 (10-12') 10/4/2018**	**DL11 (14-16') 10/4/2018**	**DL12 (0-1') 9/26/2017**
Perfluoroheptanoic acid (PFHpA)	4.7J	0.66 J	1.3	2.1	1.3	0.31 J	0.23 J	1.2
Perfluorohexanesulfonic acid (PFHxS)	2.3 U	0.35 J	0.94 J	0.82 J	0.24 U	0.24 U	0.24 U	0.23 U
Perfluorooctanoic acid (PFOA)	22	0.68 J	1.7	4.7	2.9	1.9	0.50 J	4.6
Perfluorononanoic acid (PFNA)	1.7 U	0.22 J	0.17 U	16	2.5	0.22 U	0.22 U	7.3
Perfluorooctane sulfonate (PFOS)	2.1 U	0.38 J	0.26 J	29	0.26 U	0.26 U	0.26 U	23
Total PFAS	26.7 J	2.29 J	4.2 J	52.62 J	6.7	2.21 J	0.73 J	36.1 J
	DL13 (0-1') 9/26/2017	**D1 (0-1') 8/14/2018**	**D2 (0-1') 8/14/2018**	**D3 (0-1') 8/14/2018**	**D4 (0-1') 8/14/2018**	**D5 (0-1') 8/14/2018**	**D6 (0-1') 8/14/2018**	**D7 (0-1') 8/14/2018**
Perfluoroheptanoic acid (PFHpA)	1.6	0.19 U	0.21 J	0.19 U	0.95 J	0.22 J	0.25 J	7.8
Perfluorohexanesulfonic acid (PFHxS)	0.23 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
Perfluorooctanoic acid (PFOA)	2.4	0.25 U	0.33 J	0.25 U	1.1	0.25 U	0.28 J	14
Perfluorononanoic acid (PFNA)	1.5	0.22 U	0.67 J	0.22 U	0.98 J	0.22 U	0.22 U	10
Perfluorooctane sulfonate (PFOS)	0.66 J	0.26 U	0.66 J	0.38 J	2.9	0.26 U	0.26 U	3.4
Total PFAS	6.16 J	0.26 U	1.87 J	0.38 J	5.93 J	0.22 J	0.53 J	35.2
	D8 (0-1') 8/14/2018	**D9 (0-1') 8/14/2018**	**D10 (0-1') 8/14/2018**	**D11 (0-1') 8/14/2018**	**D12 (0-1') 8/14/2018**	**DL 11 (0-1') 9/26/2017**	**DL11 (4-6') 10/4/2018**	**DL11 (10-12') 10/4/2018**
Perfluoroheptanoic acid (PFHpA)	1.0	2.7	0.19 U	0.19 U	0.19 U	2.1	1.3	0.31 J
Perfluorohexanesulfonic acid (PFHxS)	0.31 J	0.24 U	0.24 U	0.24 U	0.24 U	0.82 J	0.24 U	0.24 U
Perfluorooctanoic acid (PFOA)	2.2	3	0.25 U	0.25 U	0.25 U	4.7	2.9	1.9
Perfluorononanoic acid (PFNA)	0.59 J	0.83 J	0.22 U	0.22 U	0.32 J	16	2.5	0.22 U
Perfluorooctane sulfonate (PFOS)	2.1	0.67 J	0.54 J	0.91 J	0.44 J	29	0.26 U	0.26 U
Total PFAS	6.2 J	7.2 J	0.54 J	0.91 J	0.76 J	52.62 J	6.7	2.21 J
	DL11 (14-16') 10/4/2018	**DL14 (0-1') 9/26/2017**	**DL14 (4-6') 10/4/2018**	**DL14 (10-12') 10/4/2018**	**HW-F (10-12') 10/4/2018**	**HW-F (14-16') 10/4/2018**		
Perfluoroheptanoic acid (PFHpA)	0.23 J	4.9	0.36 J	0.19 U	0.32 J	1.3		
Perfluorohexanesulfonic acid (PFHxS)	0.24 U	0.71J	0.24 U	0.24 U	0.24 U	0.24 U		
Perfluorooctanoic acid (PFOA)	0.50 J	23	0.58 J	0.32 J	0.25 U	1.4		
Perfluorononanoic acid (PFNA)	0.22 U	10	0.22 U	0.22 U	0.22 U	0.22 U		
Perfluorooctane sulfonate (PFOS)	0.26 U	7.6	0.26 U	0.26 U	0.26 U	0.26 U		
Total PFAS	0.73 J	46.21 J	0.94 J	0.32 J	0.32 J	2.7		

Results in ug/kg = micrograms per kilogram

Maxxim Laboratory analysis

U - Not detected above method detection limit

J = Estimated value, result between laboratory reporting limit and method detection limit

Total = Five (5) combined PFAS compounds (PFHpA + PFHxS + PFNA + PFOS +PFOA)

Note: Totals include estimated values.

Table 3: PFAS in Soil at 1991 Drill Location

	1991A (0-1') 8/14/2018	1991B (0-1') 8/14/2018	1991C (0-1') 8/14/2018	1991D (0-1') 8/14/2018	1991A-B (3-4') 12/14/2018	1991C-D (2-3') 12/14/2018
Perfluoroheptanoic acid (PFHpA)	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
Perfluorohexanesulfonic acid (PFHxS)	0.24 U	0.66 J	0.24 U	0.24 U	0.24 U	0.24 U
Perfluorooctanoic acid (PFOA)	0.25 U	0.26 J	0.25 U	0.25 U	0.25 U	0.25 U
Perfluorononanoic acid (PFNA)	0.22 U	0.22 U	0.22 U	0.30 J	0.22 U	0.22 U
Perfluorooctane sulfonate (PFOS)	0.49 J	1.1	0.55 J	0.36 J	0.30 J	0.42 J
Total PFAS	0.49 J	2.02	0.55 J	0.66	0.30 J	0.42 J

Results in ug/kg = micrograms per kilogram

Maxxim Laboratory analysis

U - Not detected above method detection limit

J = Estimated value, result between laboratory reporting limit and method detection limit

Total = Five (5) combined PFAS compounds (PFHpA + PFHxS + PFNA + PFOS +PFOA)

Note: Totals include estimated values.

Table 4: Groundwater Results for PFAS Compounds 2016-2017

	North Ramp							Lewis PoU		
Sample ID	HW-1	HW-1	HW-4M	HW-5		HW-23	HW-19D	HW-D	HW-401S	HW-C
Sample Date	7/1/2016	6/20/2017	4/5/2017	7/1/2016	4/7/2017	6/20/2017	6/20/2017	4/7/2017	4/7/2017	4/7/2017
Perfluorobutanesulfonic acid (PFBS)	0.009 U	0.02	0.005J	0.009 U	0.0048 U	0.0051J	0.0081J	0.0048 U	0.0048 U	0.0048 U
Perfluoroheptanoic acid (PFHpA)	0.01	0.0042J	0.007J	0.041	0.0084J	0.0045J	0.0052J	0.0033 U	0.0043J	0.0033 U
Perfluorohexanesulfonic acid (PFHxS)	0.018	0.065	0.02	0.011	0.018J	0.021	0.046	0.0089J	0.011J	0.0034 U
Perfluorononanoic acid (PFNA)	0.002 U	0.0057J	0.0046 U	0.002 U	0.0046 U	0.0038 U	0.0065J	0.0046 U	0.0046 U	0.0046 U
Perfluorooctane sulfonate (PFOS)	0.017	**0.24**	0.043	0.12	0.052	0.0079J	0.061	0.022	0.012J	0.0026 U
Perfluorooctanoic acid (PFOA)	0.033	0.022	0.011J	0.031	0.020J	0.0046 U	0.017J	0.0046 U	0.0046 U	0.0046 U
Total	**0.078**	**0.3369**	**0.081**	**0.203**	**0.0984**	0.0334	**0.1357**	0.0309	0.0273	0.0046 U

	Steamship Parking Lot						Airfield		Airport Road	
Sample ID	HW-2	HW-3		HW-300	HW-301	HW-302	HW-E	HW-F	HW-A(S)	HW-B(S)
Sample Date	7/1/2016	7/1/2016	4/5/2017	7/1/2016	7/1/2016	7/1/2016	4/5/2017	4/5/2017	4/7/2017	4/7/2017
Perfluorobutanesulfonic acid (PFBS)	0.009 U	0.009 U	0.0048 U	0.009 U	0.009 U	0.009 U	0.0048 U	0.0048 U	0.017J	0.0077J
Perfluoroheptanoic acid (PFHpA)	0.0071	0.016	**0.1**	0.0096	0.002	0.019	**0.15**	**0.34**	0.0048J	0.049
Perfluorohexanesulfonic acid (PFHxS)	0.0035	0.0043	0.020J	0.012	0.038	0.0063	0.042	0.019J	0.0079J	0.044
Perfluorononanoic acid (PFNA)	0.002 U	0.0063	0.027	0.002 U	0.002 U	0.054	0.0087J	0.0046 U	0.0046 U	0.0046 U
Perfluorooctane sulfonate (PFOS)	0.012	**0.084**	**0.15**	0.017	0.011	0.014	0.047	0.0026 U	0.0026 U	0.026
Perfluorooctanoic acid (PFOA)	0.0063	0.0091	0.065	0.0052	0.0037	0.033	0.053	**0.075**	0.0046 U	0.0094J
Total	0.0289	**0.1197**	**0.362**	0.0438	0.0547	**0.1263**	**0.3007**	**0.434**	0.0127	**0.1284**

	Maher Wells								Surface Water
Sample ID	OW-9S	OW-9D		OW-18S	OW-18M	OW-18D		OW-18D Duplicate	OW-19D	Kmart
Sample Date	7/5/2016	7/5/2016	4/11/2017	7/5/2016	7/5/2016	7/5/2016	4/11/2017	7/5/2016	4/11/2017	6/20/2017
Perfluorobutanesulfonic acid (PFBS)	0.009 U	0.009 U	0.0048 U	0.009 U	0.009 U	0.009 U	0.016J	0.009 U	0.0055J	0.0048 U
Perfluoroheptanoic acid (PFHpA)	0.014	0.0028	0.034	0.0071	0.0029	0.0071	0.015J	0.0063	0.0051J	0.0033 U
Perfluorohexanesulfonic acid (PFHxS)	0.003 U	0.012	**0.12**	0.0068	0.016	0.01	**0.13**	0.011	0.029	0.0034 U
Perfluorononanoic acid (PFNA)	0.0077	0.0036	0.059	0.002 U	0.0076	0.0065	0.0046 U	0.0058	0.006J	0.0043 J
Perfluorooctane sulfonate (PFOS)	0.0074	0.041	**0.5**	0.0083	0.044	0.018	**0.22**	0.019	0.029	0.0026 U
Perfluorooctanoic acid (PFOA)	0.007	0.0052	0.055	0.018	0.0058	0.0059	0.025	0.0059	0.0046 U	0.0046 U
Total	0.0361	0.0646	**0.768**	0.0402	**0.0763**	0.0475	**0.39**	0.048	0.0691	0.0043 J

J = Estimated concentration between the EDL and RDL.

Results in ug/L, micrograms per kilogram

U= Undetected at the limit of quantitation.

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

MDL= Method Detection Limit

Shaded/ Bold results above DEP GW-1 standard (0.07 ug/L)

Total PFAS = Five (5) combined PFAS compounds (PFHpA + PFHxS + PFNA + PFOS +PFOA)

Note: Totals include estimated values. Totals do not include PFBS.

Table 5: Groundwater Results for PFAS Compounds 2018

	North Ramp				Airport Road		Steamship Parking Lot	
Sample ID	HW-1	HW-5	HW-23	HW-19D	HW-B(S)	HW-B(D)	HW-3	HW-302
Sample Date	10/26/2018	10/26/2018	10/26/2018	11/7/2018	10/26/2018	10/26/2018	10/26/2018	12/3/2018
Perfluorobutanesulfonic acid (PFBS)	0.0054 U	0.0054 U	0.0054 U	0.0054 U	0.0054 U	0.0054 U	0.0054 U	0.0054 U
Perfluoroheptanoic acid (PFHpA)	0.013 J	0.0074 U	0.0098 J	0.0080 J	0.012 J	0.0074 U	**0.10**	0.015 J
Perfluorohexanesulfonic acid (PFHxS)	0.018 J	0.0056 U	0.023	0.045	0.047	0.0056 U	0.012 J	0.016 J
Perfluorononanoic acid (PFNA)	0.0087 U	0.0088 J	0.0087 U	0.0087 U	0.0087 U	0.0087 U	0.023	0.0097 J
Perfluorooctanoic acid (PFOA)	0.031	0.011 J	0.011 J	0.014 J	0.020 J	0.012 J	0.057	0.03
Perfluorooctane sulfonate (PFOS)	0.028	**0.12**	0.015 J	0.069	0.019 J	0.010 J	0.053	0.031
Total	**0.09**	**0.1398**	0.0588	**0.136**	**0.098**	0.022	**0.245**	**0.1017**

	Solar Field			Deployment Area				
Sample ID	HW-G(S)	HW-G(M)	HW-G(D)	HW-H	HW-I *	HW-J	HW-E	HW-F
Sample Date	12/3/2018	12/3/2018	12/3/2018	11/7/2018	11/7/2018	11/7/2018	11/7/2018	11/7/2018
Perfluorobutanesulfonic acid (PFBS)	0.0054 U	0.0054 U	0.0054 U	0.0054 U	0.011 U	0.0054 U	0.0054 U	0.0054 U
Perfluoroheptanoic acid (PFHpA)	0.0074 U	0.0074 U	0.0074 U	**0.077**	**0.2**	0.025	0.0074 U	0.0074 U
Perfluorohexanesulfonic acid (PFHxS)	0.0056 U	0.012 J	0.0056 U	0.0056 U	**0.18**	0.0056 U	0.0056 U	0.0056 U
Perfluorononanoic acid (PFNA)	0.0087 U	0.011 J	0.0087 U	0.0087 U	**0.16**	0.028	0.0087 U	0.0087 U
Perfluorooctanoic acid (PFOA)	0.0033 U	0.0033 U	0.0033 U	0.0050 J	**0.26**	0.026	0.0033 U	0.0033 U
Perfluorooctane sulfonate (PFOS)	0.0060 U	0.036	0.0060 U	0.0060 U	0.066	**0.13**	0.0060 U	0.0060 U
Total	0.0087 U	0.059	0.0087 U	**0.082**	**0.866**	**0.209**	0.0087 U	0.0087 U

	Maher Wells							
Sample ID	OW-9S	OW-9M	OW-9D	OW-9DD	OW-18S	OW-18M	OW-18D	OW-19D
Sample Date	12/3/2018	12/3/2018	12/3/2018	12/3/2018	12/7/2018	12/7/2018	12/7/2018	12/7/2018
Perfluorobutanesulfonic acid (PFBS)	0.0054 U	0.0054 U	0.0054 U	0.0054 U	0.0054 U	0.0054 U	0.0054 U	NS
Perfluoroheptanoic acid (PFHpA)	0.048	**0.11**	0.033	0.015 J	0.0074 U	0.0074 U	0.014 J	NS
Perfluorohexanesulfonic acid (PFHxS)	0.023	0.0056 U	**0.12**	0.042	0.0056 U	**0.073**	**0.13**	NS
Perfluorononanoic acid (PFNA)	0.0087 U	0.044	**0.1**	0.038	0.0087 U	0.0087 U	0.0087 U	NS
Perfluorooctanoic acid (PFOA)	0.032	0.052	0.057	0.020 J	0.012 J	0.0060 J	0.019 J	NS
Perfluorooctane sulfonate (PFOS)	0.024	0.0081 J	**0.52**	**0.14**	0.028	**0.24**	**0.32**	NS
Total	**0.127**	**0.2141**	**0.83**	**0.255**	0.04	**0.319**	**0.483**	NS

J = Estimated concentration between the EDL and RDL.

Results in ug/kg, micrograms per kilogram

U= Undetected at the limit of quantitation.

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

MDL= Method Detection Limit

Shaded/ Bold results above DEP GW-1 standard (0.07 ug/L)

Total PFAS = Five (5) combined PFAS compounds (PFHpA + PFHxS + PFNA + PFOA +PFOS)

Note: Totals include estimated values. Totals do not include PFBS.

* HIGHER DETECTION LIMIT

Table 6
Community Notification List
Barnstable Municipal Airport Public Involvement Plan

NAME	ADDRESS
Brad Schiff	bschiff@pierce-cote.com
Bronwen Walsh	bwalsh@barnstablepatriot.com
Chanda Beaty	chanda123@yahoo.com
David Dow	ddow420@comcast.net
Geoff Spillane	gspillane@capecodonline.com
Gerard Martin	gerard.martin@mass.gov
Gordon Starr	gordon.m.starr@gmail.com
Keith Lewison	keit.lewison@gmail.com
Lisa Conners	lconners@pierce-cote.com
Paul Neary	nearyprecinctb@gmail.com
Steve Seymour	steveseymour@comcast.net
Tom Cambareri	tomcambareri@gmail.com
Amanda Rose	504 Pitchers Way Hyannis, MA 02601
Angela Gallagher	MassDEP Southeast Regional Office Bureau of Waste Site Cleanup 20 Riverside Drive Lakeville, MA 02347
Anthony Alva	184 Mockingbird Lane Marstons Mills, MA 02646
Araceli Alcantara	67 Coolidge Road West Yarmouth, MA 02673
Arthur Beatty	699 Cotuit Road Marstons Mills, MA 02648
Bruce Murphy	Health Department Town of Yarmouth 1146 Route 28 South Yarmouth, MA 02664
Charlie Bloom	29 Oak Street Hyannis, MA 02601
Cheryl Osimo	MBCC PO Box 202 Franklin, MA 02038
Christian Cook	37 Maple Avenue Hyannis, MA 02601

Table 6
Community Notification List
Barnstable Municipal Airport Public Involvement Plan

NAME	ADDRESS
Daniel Knapik	Town Administrator Town of Yarmouth 424 Rte. 28 West Yarmouth, MA 02673
Daniel Santos	Department of Public Works Town of Barnstable 397 Main Street Hyannis, MA 02601
Darcy Karie	Conservation Commission Town of Barnstable 397 Main Street Hyannis, MA 02601
David Beaty	137 Harbor Bluff Road Hyannis, MA 02601
Eric Kristofferson	Hyannis Fire Department 95 High School Road Ext. Hyannis, MA 02601
Hans Keijser	Department of Public Works Town of Barnstable 397 Main Street
Janine Voiles	67 Coolidge Road West Yarmouth, MA 02673
Jeanny Fichter	1640 Old Stage Rd. West Barnstable, MA 02668
Karl Von Hone	Yarmouth Natural Resources Town of Yarmouth 424 Rute 28 West Yarmouth, MA 02673
Luiz Gonzaga	92 High School Rd. Hyannis, MA 02601
M. Curley	39 Oak Ridge Road Osterville, MA 02655
Maia Fitzstevens	Silent Spring Institute 320 Nevada Street, Suite 302 Newton, MA 02460

Table 6
Community Notification List
Barnstable Municipal Airport Public Involvement Plan

NAME	ADDRESS
Mainur Kote	106 Betty's Path West Yarmouth, MA 02673
Mainur Kote	106 Betty's Path West Yarmouth, MA 02673
Margo Pisacano	73 Harbor Bluff Road Hyannis, MA 02601
Mark Ells	Town Manager Town of Barnstable 397 Main Street Hyannis, MA 02601
Mark Forest	Board of Selectmen c/o Town Administrator's Office 1146 Route 28 South Yarmouth, MA 02664
Michael Gorenstein	Department of Public Works Town of Barnstable 397 Main Street
Nancy Johns	P.O Box 382 Hyannis, MA 02601
Nancy Wentzel-Johnson	PO Box 342 Hyannis, MA 02601
Peter Burke	Hyannis Fire Department 95 High School Road Ext. Hyannis, MA 02602
Richard A. Zoino	92 High School Road Hyannis, MA 02601
Richard Rougeau	306 Longbeach Road Centerville, MA 02632
Ronald Beaty	245 Parker Rd. West Barnstable, MA 02668
Rong Jian Liu	5 Fishing Brook Road Yarmouth, MA 02664
Scott Beaty	29 Washington Avenue West Yarmouth, MA 02673
Sue Phelan	Green Cape - PO Box 631 West Barnstable, MA 02668

Table 6

Community Notification List

Barnstable Municipal Airport Public Involvement Plan

NAME	ADDRESS
Sylvia Laselva	358 Sea Street Hyannis, MA 02673
Thomas McKean	Board of Health Town of Barnstable 397 Main Street Hyannis, MA 02601
Vilson Kote	106 Betty's Path West Yarmouth, MA 02673

APPENDIX B

INFORMATIONAL STORY BOARDS

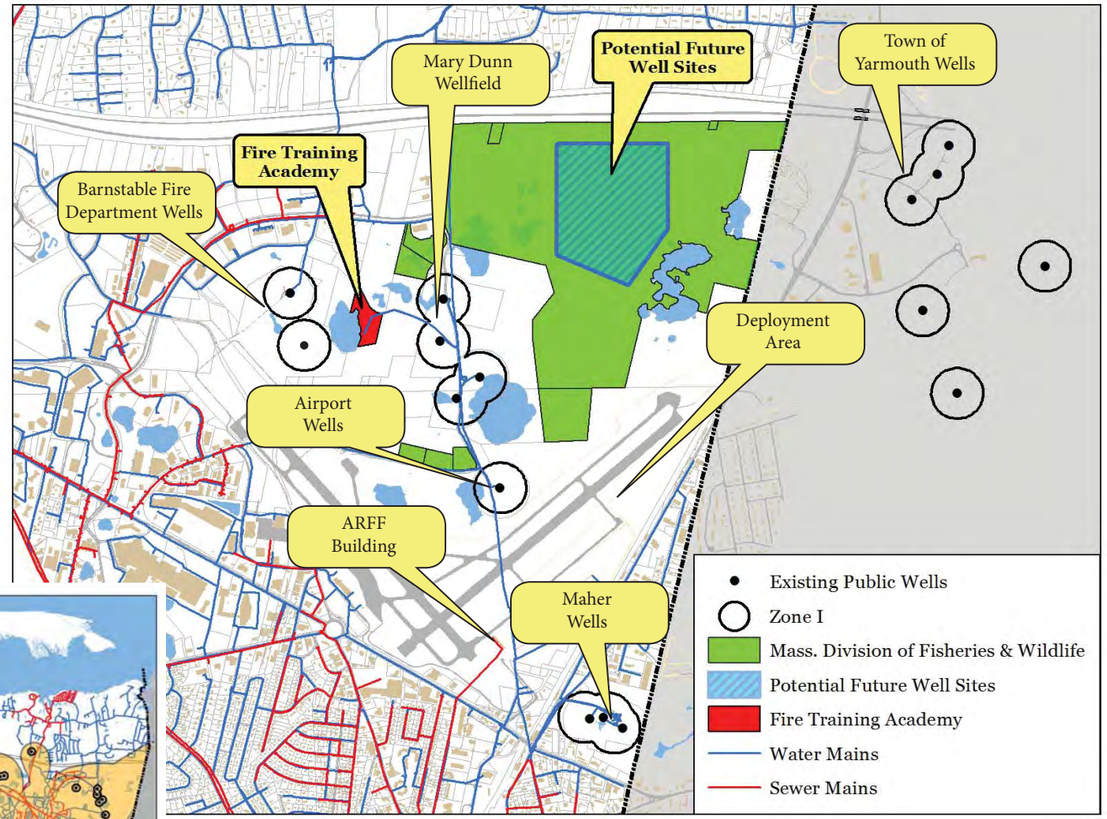
Drinking Water Protection in Hyannis

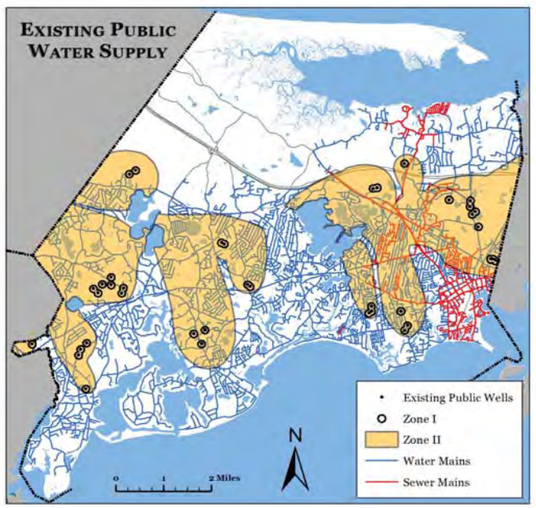
The Hyannis Water System continues to provide drinking water that meets federal and state drinking water standards and guidelines. Water is provided from 12 wells located across Hyannis. Wells in the Mary Dunn and Maher Wellfields (shown here) have been impacted by PFAS compounds.

To compensate for this, the Water District has constructed water filtration systems for the Mary Dunn Wellfield and is in the process of constructing a treatment system for the Maher Wellfield.

The Water District also has interconnections with the Yarmouth and Centerville-Osterville-Marstons Mills Water District to augment the water provided by its own wells.

Planning for future wells in Town is underway, including the evaluation of wells in proctected open space north of the Airport.





Barnstable AIRPORT HYANNIS

Environmental Stewardship at the Airport

Over the last 15 years, a number of improvements have been made to manage hazardous materials at the Airport and to minimize the need for their use. These include:

- **Regular Inspections -** Inspections are conducted at all Airport facilities to inventory all hazardous materials present on the Airport.
- **Upgraded Fuel Farm -** A new fuel storage facility was built in 2015. This consists of storage tanks with secondary containment and monitoring equipment to warn of any unexpected releases of fuel. This replaced a 20,000 gallon underground storage tank that was removed in 2015.
- **Aircraft Deicing/Wash Pad -** A deicing/wash pad was constructed and all aircraft must wash and/or deice at this location. Deicing fluids and approved "green" washing products are captured and treated at the Town's wastewater treatment facility.
- **No Road Salt is Applied to Airport Runways**
- **No Pesticides are Used at the Airport**
- **No Chemicals are Used to Treat Airport Runways**
- **Ecologic Cart -** Since 2016, the Airport has used the Ecologic Cart to test and verify that fire fighting trucks will properly apply foam in the event of an accident. The Cart allows the testing of the equipment without releasing foam to the environment. Barnstable Municipal Airport was the first airport in Massachusetts, required to use such foam by the FAA, to purchase such a unit.
- **Stormwater Management -** During the construction of the new terminal, the Airport installed a Vortech treatment systems and bioretention stormwater facilities that capture and treat runoff before it infiltrates into the ground. Vortech treatment systems were also installed to treat stormwater that drains to Lewis and Upper Gate ponds. These systems are cleaned as necessary by a certified remediation company.
- **Solar Array -** The Airport generates enough solar power to cover all of its electrical needs from a 7 megawatt array along the northern boundary of the airport.
- **SWPPP/SPCCP -** The Airport has a spill prevention plan and stormwater management plan that are designed to minimize impacts from hazardous materials use at the Airport. These plans are updated regularly.
- **Emergency Generator -** The Airport removed a 250 gallon diesel underground storage tank used for the airfield lighting emergency generator and replaced it with a natural gas feed.

Barnstable AIRPORT HYANNIS

Sources of PFAS

Where do we see PFAS in soils?

A recent study in Vermont collected 66 soil samples from background locations away from known releases of PFAS materials. All 66 samples contained dectable levels of PFAS compounds.* A change in habits may be the best solution to reduce sources of PFAS.

*Sources of PFAS obtained from the document titled "History and Use of Per- and Polyfluoroalkyl Substances (PFAS)", prepared by the Interstate Technology Regulatory Council and dated November 2017.

Barnstable AIRPORT HYANNIS

Fire Fighting Foam Use at the Airport

- Federal aviation regulations require the Airport to equip their fire fighting vehicles with foam, and to use foam in response to emergencies.
- The foam used at the airport is the only foam approved for use at an airport by the FAA. At present, the FAA has not identified an alternative foam and requires all airports in the United States to use the foam currently approved and available on the market.
- Foam is needed to suppress or extinguish fires associated with the release of fuels or oils released during an accident or spill.

To Date Last Known Use of Foam at the Airport:

- Foam was most recently used in July 2016 to respond to an airplane crash.
  - Foam was sprayed on pavement and collected in a solid wall stormwater catch basin.
  - It was vacuumed out of the basin within 24 hours and was not allowed to enter groundwater.
  - Ten gallons of the foam solution was used.
- No foam has been released to the ground for training or testing purposes since 2015.
- Prior to 2015, tests and exercises using foam took place in one area on the East Ramp of the Airport called the Deployment Area (pictured below).
  - This area is a primary focus of the ongoing investigations.
- Foam is stored at the Airport Rescue and Fire Fighting (ARFF) Building (pictured below).
  - The area around the building is a second focus area for the ongoing investigation.

- The FAA requires annual testing of the foam/water mixture to meet the standards of the Airport's Federal Aviation Regulation (FAR) Part 139 certificate.
- In 2016 the Airport purchased an Ecologic Cart system to prevent the discharge of foam on the ground during annual testing.
- The Ecologic Cart allows the Airport to test the fire truck's ability to properly mix and dispense foam without using foam.
- The Airport purchased and started using this unit prior to FAA approvals to test in this manner.
- Barnstable Municipal Airport was the first airport in Massachusetts to purchase such a system.

Barnstable AIRPORT HYANNIS

Aircraft Rescue Firefighting/Snow Removal Equipment Building Soil Sampling Locations

Legend

- 2017 PFAS Soil Samples
- 2018 PFAS Soil Samples
- 2019 PFAS Soil Samples
- Monitoring Wells
- Barnstable Municipal Airport Property Boundary
- Approximate extent of PFAS soil impacts

N

0 100 Feet

1 inch = 100 feet

Horsley Witten Group
Sustainable Environmental Solutions

PFAS Sampling Locations
ARFF/SRE Building
Barnstable Municipal Airport
Hyannis, MA

July 1, 2019

Aqueous Film Forming Foam Deployment Area Soil Sampling Locations

Legend

- 2017 PFAS Soil Samples
- 2018 PFAS Soil Samples
- Monitoring Wells
- Barnstable Municipal Airport Property Boundary
- Approximate extent of PFAS soil impacts

N

0 100 Feet

1 inch = 100 feet

Horsley Witten Group
Sustainable Environmental Solutions

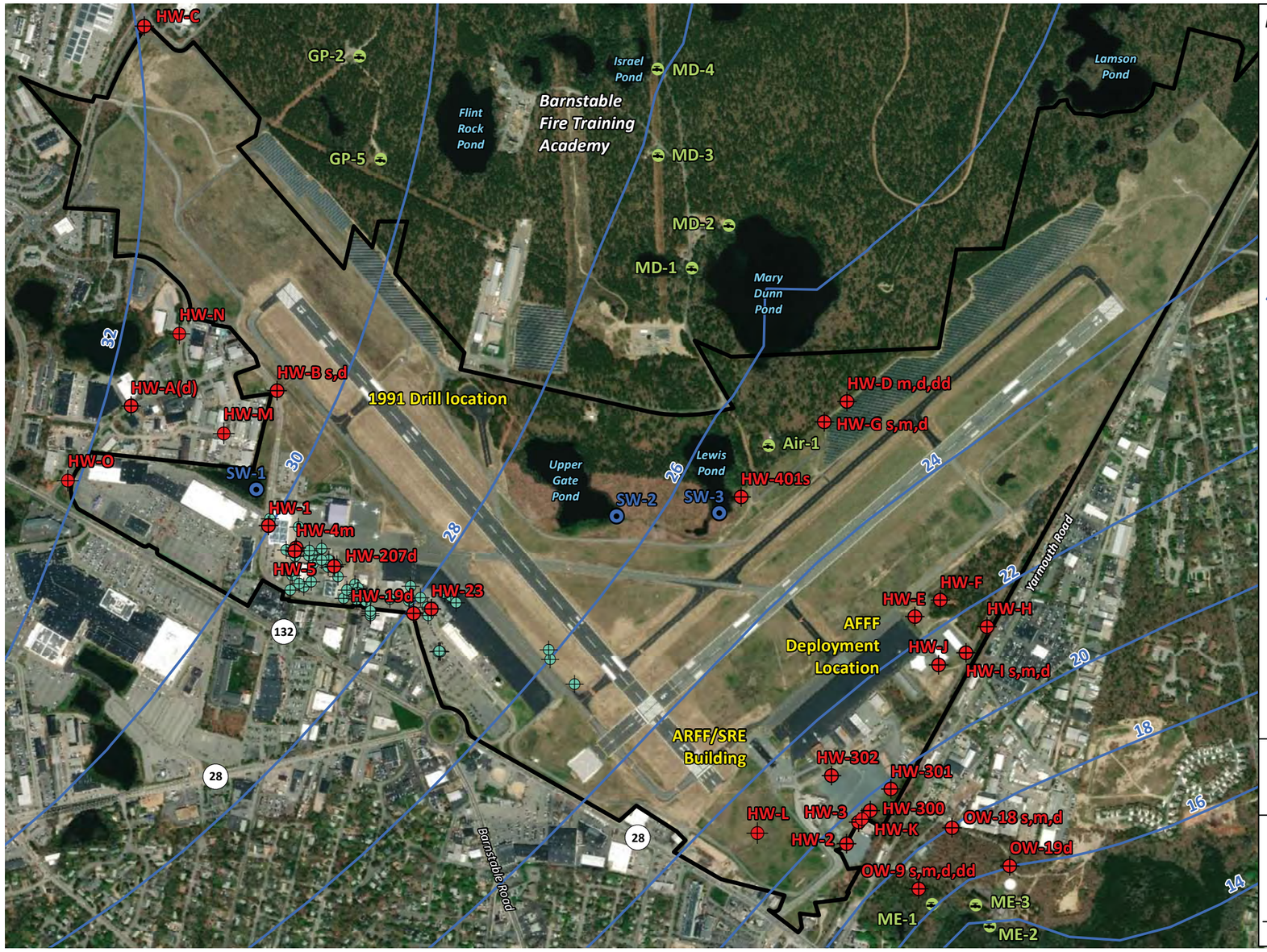
PFAS Sampling Locations
Deployment Location
Barnstable Municipal Airport
Hyannis, MA

Date: 7/1/2019

The FAA requires that airports certified under Federal Aviation Regulation Part 139, such as Barnstable Municipal Airport, test foam to water mixture on an annual basis. The airport now uses the Ecologic Cart to test the foam/water mixture without need to deploy foam on the ground.

Barnstable AIRPORT HYANNIS

Airport Monitoring Well Locations



Legend

- PFAS Monitoring Wells
- Other Monitoring Wells
- Surface Water Samples Completed by Airport
- Drinking Water Wells
- Barnstable Municipal Airport Property Boundary
- Groundwater Contours

N

0 750

1 in = 750 feet

Horsley Witten Group
Sustainable Environmental Solutions
60 Route 6A • Unit 1 • Sandwich, MA 02563
508-833-6600 • horsleywitten.com

Groundwater and Surface Water Sampling Locations
Barnstable Municipal Airport
Hyannis, MA

Date: 7/12/2019

Barnstable AIRPORT HYANNIS

APPENDIX C

DRAFT PIP COMMENTS

August 15, 2019

Attention: Public Involvement Plan
Katie Servis, Airport Manager
Barnstable Municipal Airport
480 Barnstable Road
Hyannis, MA 02840

RE: **Comments on the Draft Public Involvement Plan,** Barnstable Municipal Airport (BMA) PFAS & 1,4 Dioxane Releases, **RTN 4-26347** Dated July 12, 2019

Dear Ms. Servis,

As the Chief Petitioner for the Public Involvement Plan Site petition, I am submitting this letter to document my comments on the referenced Draft Public Involvement Plan (Draft PIP) prepared by Horsley Witten Group, Inc. (HW) for the Barnstable Municipal Airport (BMA), dated July 12, 2019, and presented at the July 29, 2019 Public Meeting at the BMA.

As a petitioner, I thank you for your time and efforts spent engaging in the initial activities of the public involvement process provided under the Massachusetts Contingency Plan (310 CMR 40.0000), the MCP. We look forward to participating in the public involvement process going forward. We, the petitioners and the public, are requesting herein more information on the ongoing MCP response actions at the BMA, and on what is specifically to be implemented at the BMA to address the documented PFAS release from AFFF training. As you know, the airport PFAS releases have impacted groundwater below the airport in a documented, public drinking water supply area amid rapidly evolving regulatory standards on PFAS in groundwater used for drinking water.

GENERAL COMMENTS

The Draft PIP presents summary information on the Airport PFAS release that has been assigned release tracking number (RTN) 4-26437 by the Massachusetts Department of Environmental Protection (MassDEP). However, it devotes a substantial amount of text to discussion of unrelated background information rather than focus on the documented releases of PFAS in soil and groundwater at the Airport Rescue and Fire Fighting (ARFF) facility and Foam Deployment / Training Area at the Airport. For example, the Draft PIP describes all of the possible sources of PFAS in consumer products, yet does not explain how those could have affected the releases of PFAS at the Airport related to aqueous film forming foams (AFFF) used for training at the Airport. It also describes numerous environmental programs and procedures at the BMA that are laudable, but many do not appear to relate to use of AFFF at the BMA.

The Draft PIP also expresses concerns about possible PFAS contamination from the Fire Training Academy (FTA) impacting the BMA. No data are presented to support this assertion, yet the FTA is called out by name (RE: section 3.0, p. 14). In contrast, the assessment summary in the Draft PIP notes that PFAS has been detected in groundwater migrating onto the airport from the west but does not name specific possible sources west of the airport, such as the wastewater treatment facility.

SPECIFIC COMMENTS

Below I have provided comments on selected sections of the Draft PIP.

Section 2.6 - Management of Fire Fighting Foam at the Airport

I request that the BMA and their consultants provide more specifics on how much AFFF was used and to clarify foam concentrate volumes versus total liquid volumes released. The discussion of 80 gallons of AFFF formerly used for annual FAA certification does not clarify that this is 80 gallons of foam concentrate; although we assume it is concentrate volume, based on the context and other BMA submittals to MassDEP. It is my understanding that the concentrate is typically mixed at a 3% ratio with water yielding approximately 2,700 gallons of foam that was sprayed onto the ground during each test. This larger volume may be critical because the higher liquid volume (as the foam releases the water) is available to infiltrate into the ground. The final PIP should provide detailed data on actual AFFF volumes used/released during the Tri-Annual drills that occurred at the airport from 1991 to 2012. No information is provided, and these drills may represent additional large masses of PFAS-containing AFFF released at the Airport in the past.

Section 2.6 and Section 2.8 – Environmental Assessment History

The final PIP should provide detailed information about how PFAS, detected in significant concentrations in soil and groundwater adjacent to ARFF building, came to be located there, in comparison to the Deployment Area, where it is clearly stated that training and drills took place historically.

Sections 2.6, 2.8 and 3.0 - Possible Remedial Actions

I am concerned about the need for additional information on and clarifications about the proposed clean-up actions for the BMA. The final PIP should address:

a.) Remediation or removal of PFAS-impacted soil in the Deployment and ARFF areas: There is no mention of statements made in several prior MCP submittals, including IRA Status reports dating to October 2017 and the official Airport Response to the Oct. 27, 2017 MassDEP Request For Information (RFI), that the airport will be “moving forward” with

impacted soil removal. To my knowledge, there has been no soil removal and no IRA Plan submittals to MassDEP about executing such soil removal.

b.) The directive from MassDEP to remove or remediate PFAS-impacted soil: The Draft PIP Site history does not mention that MassDEP issued a *Request For Modified IRA Plan/ Interim Deadline* dated June 18, 2019 for the Airport to cap, remove or otherwise prevent infiltration into the known impacted soils to the BMA to mitigate migration of the PFAS.

c.) The specific status of groundwater modeling at the BMA: Groundwater modeling does not appear to be mentioned specifically. This critical work has been described in other MassDEP submittals as "on-going", but no results have been forth coming.

d.) Basing remedial actions on the results of the MCP Phase II Comprehensive Site Assessment (CSA): Section 3.0 notes that possible remedial actions will be based on the results of the MCP Phase II Comprehensive Site Assessment (CSA). While it is my understanding that the CSA is very important to support decisions on long-term or final remedial actions, more immediate remedial actions should be developed as Immediate Response Actions (IRAs.) As noted in "a" above, IRAs have been discussed in previous IRA filings for this release. In addition, it is my understanding that two additional MCP Phases, Phase III (evaluation and selection of remedial actions) and Phase IV (design and implementation), must be conducted after the Phase II CSA is completed. This implies that a long period of time may elapse before any remedial actions are proposed or implemented. As stated in Section 3.0, the Phase II is not due for completion until November 2020. If Phase III and IV are conducted after that date, then this indicates that proposed comprehensive remedial actions may be delayed until well into 2021 or 2022. This is a long timeframe to address this PFAS release in a sensitive area.

Section 4.0 – (Proposed) Public Involvement Activities

The Draft PIP noted that only three parties, including myself and a member of the town administration, were interviewed during the development of the Draft PIP. I suggest that the BMA and its consultants actively solicit input on the public involvement process and the assessment and cleanup of the Airport from other local officials and environmentally active residents. It would be beneficial to have input from a broader range of Barnstable/Hyannis citizens and local officials due to the threat to downgradient public water supply wells.

I request that the BMA expand public notifications under the PIP beyond the typical MCP milestones and Phase reports and implement periodic updates, e.g., quarterly. For example, updates could be provided on a regular schedule and to describe specific activities, such as groundwater modeling and proposed IRA remedial actions.

I also request that the BMA conduct additional public meetings, including public meetings to present findings at every major MCP milestone in accordance with the MCP PIP process regulations in the MCP.

SUMMARY

I appreciate the opportunity to present my comments on the Draft PIP to you. Please don't hesitate to contact me with any questions for clarification. I look forward to involvement in the public information process with the BMA and its consultants as the assessment and cleanup of the Airport PFAS releases progresses.

Very truly yours,

Ronald Beaty

Ronald Beaty
Chief Petitioner
245 Parker Road,
West Barnstable, MA 02668
Phone: 774-994-2959

C.
Horsley Witten Group, Inc.
90 Route 6A
Sandwich, MA 02563

GreenCAPE

P.O. Box 631
West Barnstable, MA 02668
(508) 362-5927 info@greencape.org
Non-Toxic Strategies for a Sustainable Cape Cod

SIERRA CLUB
MASSACHUSETTS

August 18, 2019

Katie Riley Servis, Airport Manager
Barnstable Municipal Airport
480 Barnstable Road
Hyannis, MA 02601

Ms. Servis-

To meet the objectives of the MCP (40.1400), the Potentially Responsible Party (in this case, Barnstable Municipal Airport, aka the "Airport") agrees "to inform the public about risks posed by the disposal site" and "to solicit the concerns of the public about the Disposal Site and response actions, and consider, address, and where relevant and material to the response actions, incorporate these concerns into planning response actions."

The Airport's management of all hazardous materials and implementation of several practices and infrastructure improvements over the last 20 years to reduce the potential of release of oil and hazardous materials (including AFFF) demonstrate an increased awareness of its environmental responsibility. The records of fire training exercises go back to 1991 with gallonage of AFFF used (including usage with the two crash emergencies). The Airport has kept pertinent records and performed annual testing of mixing and distribution of the foam as required by the FAA and tri-annual fire drills on site-the last two without AFFF. The Airport was--and still is--under a mandate to use AFFF for actual aircraft accidents but "not unless there is a spark of fire" (Draft Public involvement Plan-July 12, 2019). While it is certainly very concerning that PFAS from the historic use of AFFF at the Airport has contaminated the public drinking water supply, it must be noted the Airport was mandated by the FAA to use AFFF (aqueous film-forming foam) for firefighting. PFAS in the AFFF has yet to be regulated by the USEPA. The Airport draft PIP reports the incorporation of several procedures for pollution prevention in more recent years-including the purchase of an Ecologic Cart System. To its credit, the Airport's extensive environmental management practices appear adequate especially given the current unregulated federal status of all PFAS. However, this level of "adequate" may prove less protective of the water supply as PFAS research continues to be published.

Understanding that the PIP can be revised as necessary during the public involvement process, we are submitting the following for incorporation into the final PIP.

Our interest regarding this PIP primarily involves the adequacy of any proposed remedial actions and ultimately providing PFAS-free water to the residents of Hyannis.

Our concerns with the draft PIP relate to:

1- Public Involvement Process:

-Initial PIP interviews were not adequate in number (3) or scope and did not incorporate concerns of the original 21 petitioners (save one). Four officials were interviewed- only two from the Town of Barnstable. No residents that drink water from the Hyannis Water System were included in the PIP interviews! In the Massachusetts Contingency Plan Fact Sheet on Public Involvement in Site Cleanup 310 CMR 40.1400, its states: "The person who drafts the PIP must contact the petitioners and appropriate local officials to identify the community's concerns……" This doesn't appear to have happened –to the detriment of the PIP process.

- The Airport PIP meeting on July 29 had significantly less attendance than the Barnstable County Fire Training Academy PIP in May. This may partly be due to its timing during the height of the summer season but more likely due to the location of the meeting. The community would be better served by a meeting in a more central Hyannis location.

-As a means of engaging the public, a PIP Oversight Committee should be established to review all cleanup activities related to the Airport site and to work collaboratively with the Airport and the LSP on a proposed timeline and details for the site cleanup. The PIP Oversight Committee should consist primarily of current or former Hyannis residents/employees/property owners/a technical advisor/an engineer with site cleanup expertise/an Airport representative or LSP/ a DEP representative-- with an option for alternates. PIP Oversight Committee meetings should always be open to the public in a location convenient to the affected community.

Previous analyses/reports/communications regarding the Airport site should be made available in a timely manner to the PIP Oversight Committee upon request. All updates on any future submissions and any future communications between DEP/Barnstable County/Town of Barnstable regarding the Airport PFAS sources/sites should made be available to the proposed PIP Oversight Committee, the site mailing list (this can be an opt-in) and on the electronic repository within 24 hours. Full and open transparency is a key requirement that will best serve to resolve any potential issues about the status of the contamination of the Airport site.

-Provision of a general schedule for future PIP activities. While it is understandable that some dates are dependent on the phases of assessment and remediation of the site, at the very least, specific dates should be provided for periodic public updates.

2-Environment and Human Health:

- As there were still test results outstanding for the initial July 29 Public Involvement Plan (aka PIP) meeting --including a determination of a 1,4, dioxane release at the Airport and analytical data from 9 recently installed groundwater monitoring wells at the Airport and on adjacent properties-- it is not possible to comment comprehensively without possession of the most current analyses. It is disappointing these were not provided prior to the deadline for public comment.

-The extent of PFAS in Airport soils--both horizontally and vertically-- and any related plumes needs to be delineated, mapped, and monitored indefinitely;

-All contributions of PFAS and 1,4 dioxane from both on and off-site should be identified, defined, and sourced back to the site of origin;

-There should be PFAS sampling of the water and sediments in the Upper Gate and Lewis Ponds on the Airport property;

-Sampling for PFAS in tissues of fish, shellfish, ducks, and deer on the Airport property should be initiated as wild fish and game have been shown to bioaccumulate PFAS;

-Specify the total volume of foam mixture utilized at the Airport as opposed to the volume of foam concentrate as the former may more accurately indicate the extent of the contamination of an area;

- Analyses for 2018 report only 6 PFASs. There are 4000+ PFAS compounds in commerce. A variety of manufacturers of AFFF have incorporated many different PFASs beyond PFOS and PFOA. The GAC filters out the long chain/higher molecular weight PFAS reliably but research has shown that GAC doesn't eliminate all PFAS. Shorter chain PFAS compounds pass through the filters and even shorten the filters useful life. In addition to the 6 PFAS compounds tested by Maxxim, has the Airport selected the suite of PFAS they analyze based only on the legacy AFFF products used at the site over decades or are the newer AFFF replacement products containing a preponderance of short chain PFAS being included? While short chain PFAS had earlier been regarded as less toxic, ongoing research is now raising some questions about the safety of short chains. There is some evidence that short-chain PFAS can cause similar health issues as their long-chain forbears. Some emerging research shows short chain PFAS accumulating not in the bloodstream, but elsewhere in the body so a broader array of PFAS should be tested proactively as these may presage a future problem and indicate the necessity for additional treatments. Given the limited PFAS analyses, it seems premature to conclude that water post-filtration is PFAS-free, though it may meet the proposed MA drinking water standards and ORSG for six compounds.

-Re: **"Possible Remedial Actions" noted on p. 14 and bolded below** are not proposed for specific impacted sites at the Airport which would have been more useful for comments; some of the technologies chosen for consideration pose concerns and have distinct limitations:

• **Excavation and off-site disposal of all or a portion of soil identified as a source of groundwater impacts related to operations at the Airport**; Offsite disposal would likely be to a lined landfill and liners can be breached and release contaminants and likely become another PFAS source. Excavation does not result in destruction of PFAS-it transplants it.

• **Reducing the ability for PFAS to leach from the soil into groundwater by mixing soil with a binding agent such as activated carbon;** The permanence of adding binding agents is not well studied and the efficacy depends on the site conditions, the PFAS type, and the presence of organic co-contaminants. Information on the long-term stability of PFAS binding agents are limited.

• **Excavation, thermal treatment, and reuse on-site of all or a portion of soil identified as a source of groundwater impacts related to operations at the Airport;** This technology is still developing, and several data gaps exist. In this energy-intensive method it is unknown what the specific temperature requirements are and whether the PFAS are destroyed, reduced to smaller chain PFAS, or volatilized. No documented examples of in situ thermal treatment for PFAS-impacted soil have been identified.

• **Installation of a non-permeable cap over all or a portion of soil identified as a source of groundwater impacts related to operations at the Airport;** While not a destructive technology, this will prevent further leaching of PFAS from soil to groundwater but needs monitoring indefinitely.

• **Injection of a binding agent such as activated carbon to reduce the mobility and leachability to groundwater in areas impacted by Airport operations;** Similar to earlier

mentioned use of a binding agent, the effectiveness of the technique varies with the site conditions and the PFAS type (e.g. chain length and functional group). Not a destructive technology.

• **Installation of a groundwater pump and treat system to remove impacts from groundwater in areas impacted by Airport operations.** This would be beneficial if breakthrough can be avoided. However, this technique has not been proven to remove all PFAS, but primarily just the long chain compounds.

None of these technologies--alone or even combined--are ideal for complete environmental remediation of the Airport and none are destructive technologies. The PFAS is removed and transferred to another location. There is some potential for the technology of sonolysis which you may wish to consider. SERDP (Strategic Environmental Research and Development Program) is funding studies of sonolysis though the project is not anticipated to be completed until Dec. 2020. https://www.ncbi.nlm.nih.gov/m/pubmed/27295064/

For the reasons noted above, it would appear that more consideration needs to be given to fully characterizing the PFAS existing at the Airport site as well as more intense monitoring for other PFAS contaminated areas and associated plumes both within and beyond the Airport boundaries so an appropriate choice of technologies can be selected to guarantee a water supply free of all PFAS.

Thank you for this opportunity to comment on the draft PIP for the Airport-

Sue Phelan, Director
GreenCAPE
West Barnstable, MA 02668
508.494.0276
www.GreenCAPE.org

Keith Lewison, Chair
Cape Cod Group
Sierra Club
508.274.3541
www.sierraclub.org

cc: Millie Garcia-Serrano, Regional Director, MA DEP-SERO
Gerard Martin, DEP-SERO
Angela Gallagher, DEP-SERO
Mark Ells, Town of Barnstable

From:	Kennedy, Sue
To:	Servis, Katie
Subject:	FW: Barnstable Municipal Airport Public Involvement Plan for PFAS
Date:	Tuesday, August 13, 2019 2:42:27 PM

From: David Dow [mailto:ddow420@comcast.net]
Sent: Saturday, August 10, 2019 7:48 AM
To: Kennedy, Sue
Cc: David Dow; Sue Walker
Subject: Barnstable Municipal Airport Public Involvement Plan for PFAS

I am a retired marine scientist and grassroots environmental activist living in East Falmouth, Ma. The Yearling Meadows development where I live is underlain by the Ashumet Valley Plume (AVP) from Joint Base Cape Cod. The AVP has contaminated public and private drinking water wells in Falmouth and Mashpee. The former Fire Training Area at JBCC and two adjacent ponds are source areas for the PFOS and PFOA at levels above 70 ppt. The activated carbon treatment system in the AVP pump and treatment system was unable to remove all of the PFAS chemicals, so the Air Force Civil Engineer Center (AFCEC) had to fund GAC (granular activated carbon) treatment filter systems to remove PFOS and PFOA from the drinking water. I was involved in the Safe Drinking Water Act/ Superfund cleanup at JBCC for over 20 years. In addition, I have recently submitted comments to Ma. DEP on their proposal of a maximum contaminant level of 20 ppt for 6 PFAS chemicals.

Since I am not a resident of Barnstable and aware of the details of the cleanup process at the Barnstable Municipal Airport (other than what has appeared in the print media), I will only make general comments on the Comprehensive Waste Site Assessment process and accompanying Public Involvement plan (PIP). I am a member of the Sierra Club's Toxics Team and represent them on the University of Rhode Island STEEP (Sources, Transport, Exposure and Effect of PFAS) grant Community Advisory Panel and interact with the outreach endeavors of the Silent Spring Institute's REACH (Research, Education and Action for Community Health) grant. Much of the focus of these studies is on the effects of 24 PFAS chemicals in private wells/Barnstable County Fire Training Academy soil/groundwater on the immune system of children 4-6 years of age.

Comments:

*The Fire Training Academy is adjacent to the Municipal import, so the new Ma. DEP PFAS mcl and waste site cleanup standards will apply to both and should be address in an integrated fashion.

* Thermal treatment of unused GAC filters or reverse osmosis concentrates poses serious technical challenges, since very high temperatures are required to destroy PFOS, PFOA and 1,4-dioxane. If this is not done correctly, lower molecular weight PFAS chemicals will be formed which could contaminate air or travel into the groundwater.

* The Ma. DEP procedure for incinerating unused AFFF foams is probably inadequate for the reasons cited above. There are studies underway for various types of redox procedures to destroy AFFF fire fighting foams used at airports in the past.

* Since many of the waste site cleanup sources involve soil/aquatic sediment contamination, alternatives to thermal treatment need to be developed to meet the proposed mcl of 20 ppt for 6 PFAS chemicals. Placing these contaminated soils/sediments in lined landfills for containment is not the long term solution, since these eventually break down.

* Mixing soil with a binding agent like activated carbon is not likely to be successful for low molecular weight PFAS chemicals (the Conservation Law Foundation and Toxics Action Center petitioned Ma. DEP to treat PFAS chemicals as a class with an mcl of 1 ppt).

* Leachate from reverse osmosis is likely to go to wastewater treatment plants which don't remove PFAS chemicals effectively.

Given the above observations the proposed Remedial Action Plan for PFAS chemicals in the soil and groundwater at the Barnstable Municipal Airport appears to be inadequate and a more realistic approach neds to be developed. The Sierra Club's PFAS Working Groups have folks with much better credentials than myself to address this issue. Chemical and Engineering News has some articles that discuss these challenges in greater detail.

* In regards to the PIP, I would suggest using the JBCC SDWA/CERCLA process as an example of engaging the public and concerned activists by setting up advisory committees (Sue Walker served on some of these)/ holding meetings in neighborhoods impacted by off base plumes. For the Ashumet Valley Plume meetings were usually held at the Unitarian Universalist Fellowship of Falmouth. On November 13 the UUFF Adult Religious Education Committee/Silent Spring Institute will hold a meeting on the URI STEEP grant. Engaging communities of faith in the Environmental Justice components of PFAS cleanups might be a step to consider, since this will be an expensive process that will effect seniors with limited income; working poor that live paycheck to paycheck and people of color. Since PFAS chemicals are not listed as hazardous under RCRA or CERCLA, it is not clear to me that the polluter pays or natural resource damage assessment process components will come into effect in the near term. Thus the states and localities will have to bear significant financial burdens. The recent EPA changes in Waters of the US (WOTUS) definition appear to exclude the groundwater-based watersheds
which dominate here on Cape Cod, so that federal grants may be in short supply.

Thanks for your consideration of these comments.

Dr. David D. Dow
East Falmouth, Ma.

From: Kennedy, Sue
To: Servis, Katie
Subject: FW: Public Involvement Plan re: water contamination
Date: Wednesday, July 31, 2019 1:32:32 PM

Just received this…

From: Charlie Bloom [mailto:charlie.bloom@icloud.com]
Sent: Wednesday, July 31, 2019 1:21 PM
To: Kennedy, Sue
Subject: Public Involvement Plan re: water contamination

From the Cape Cod Times 7/31/19: (Commissioner) Beaty told the Times Tuesday that he was concerned that the draft plan "looked as if they were kind of trying to imply that the fire training academy was responsible for some of the contamination in the area without any factual basis to back it up." This is a specious statement that suggests we need more "data" before we jump to any conclusions. Here's all the "data" I need: It's my humble opinion that the foam is sprayed on the ground and the chemicals leech through the soil and eventually contaminate our drinking water. The chemicals are not good to drink. Period. End of "data." I don't blame the fire training academy for the good work that they do, but responsibility for the contamination must be determined as soon as possible, and action must be taken as soon as possible to protect the citizens of Hyannis, and that includes me and my family and my friends. Get this done!

Charlie Bloom
29 Oak St.
Hyannis, MA 02601

Sent from my iPhone

MASSACHUSETTS BREAST CANCER COALITION

August 19, 2019

Barnstable Municipal Airport
480 Barnstable Road
Hyannis, MA 02601

Re: Public Involvement Plan

To whom it may concern:

Massachusetts Breast Cancer Coalition (MBCC) commends the Barnstable Municipal Airport for involving the public in its plans to assess and remediate PFAS and 1,4-dioxane contamination on and around the airport property and appreciates the opportunity to comment on the Draft Public Involvement Plan (PIP).

MBCC is dedicated to preventing the environmental causes of breast cancer through community education, research advocacy and changes to public policy. As part of our mission, in January 2019, MBCC launched a water quality campaign to urge the Massachusetts Department of Environmental Protection to develop an enforceable, lower standard for PFAS in drinking water and in groundwater at contaminated sites in order to protect drinking water quality. MBCC continues to be deeply concerned about the serious health risks to Massachusetts residents from exposure to PFAS chemicals.

With over 4,000 PFAS on the global market and emerging understanding of toxic health effects at low levels of exposure, PFAS pose an enormous public health challenge. MBCC would like to know if there are any plans for testing PFAS chemicals beyond the 6 included in the newly proposed GW-1 standard. Other research studies have shown that sites impacted by firefighting foams have a mixture of many different PFAS chemicals. Testing for other PFAS chemicals is important so that we can understand the full range of PFAS chemicals that have entered Cape Cod groundwater and may end up in drinking water. This is also important to make sure that the remediation is addressing all the PFAS chemicals at the site.

MBCC is aware that PFAS, especially short-chain PFAS chemicals, are mobile in the environment and can move quickly through the sand and gravel aquifer on Cape Cod. Are there

PO BOX 202
Franklin, MA 02038
info@mbcc.org
www.mbcc.org

Toll free: 800-649-6222
Phone: 617-376-6222

any plans to monitor the movement of PFAS originating on airport property to other locations? How far have these chemicals spread?

We want to emphasize that while the water treatment systems at the Mary Dunn and Maher wellfields are an important step towards reducing exposure to PFAS in Hyannis, treating contaminated groundwater at its source must be the primary remediation strategy. MBCC would like to see more information in the final PIP about the decision-making process around the proposed remediation strategies. Specifically, who will be the primary decision makers, and will the public have an opportunity to be involved?

Thank you again for inviting public comments on the Draft PIP.

Sincerely,

Cheryl Osimo

Cheryl Osimo
Executive Director