Barnstable Municipal Airport

Airport Master Plan

Environmental Overview

McFarland Johnson

3. Environmental Overview

This section provides a review of the existing environmental setting at the Barnstable Municipal Airport (the Airport) and examines how future activities associated with the Master Plan may affect environmental conditions at the Airport and surrounding area. The review includes a discussion of Best Management Practices (BMPs) that have been incorporated by the Airport as part of its Environmental Stewardship Program as well as a detailed analysis of the environmental categories listed in the Federal Aviation Administration (FAA) Orders 5050.4B and 1050.1F (previously 1050.1E) and the National Environmental Policy Act (42 U.S.C. 4321-4347 or NEPA).

3.1. INTRODUCTION

The Airport is centrally located on Cape Cod in Barnstable, Massachusetts within the village of Hyannis. The Airport is owned by the Town of Barnstable and is managed by the Barnstable Municipal Airport Commission. The Airport began as a private airport consisting of a single grass runway before being given to the Town in the 1930s. 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 the town to function as 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 the third largest and busiest airport in Massachusetts.

The Airport encompasses 639 acres of land. The major 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 commercial aviation, general aviation and operations services. In addition, the Airport Rescue and Fire Fighting (ARFF) building is in the southeast corner of the property. The Airport is in an area of Hyannis that is zoned for Business and Industrial uses.

The Airport consists of developed areas for airport facilities and operations, as well as undeveloped areas that consist of upland forested areas, wetlands, and ponds. Developed areas include approximately 140 acres that are paved or impervious (e.g. paved areas such as vehicular parking lots, runways, taxiways, aircraft parking aprons, concrete walkways, and building rooftops) as well as facilities owned and used by the Airport or by Airport tenants for their commercial and/or private businesses located both within the secure airport fence and beyond. Several photographs in this chapter and throughout the document illustrate the Airport's general site characteristics.

The Airport serves as both a distinct commercial transportation hub and home to more than 40 local business tenants, which employ residents from the Town of Barnstable, Cape Cod and beyond. The Airport provides very convenient and affordable travel opportunities from Hyannis to other major destinations across the country. The airport also provides a much-needed mode of travel to and from New York, Boston and the Islands of Nantucket and Martha's Vineyard. This

includes travel for tourism, and for a large professional labor force that commutes to jobs. The Airport includes a vast array of commercial charter passenger services, and general aviation activities that include private and corporate passenger and freight services.

As documented in the Massachusetts Department of Transportation (MassDOT) Aeronautics Division CY2019 (FY2020) Economic Impact Analysis, the Barnstable Airport, in conjunction with its tenants and associated businesses, provide employment opportunities for 1,724 people, with an annual payroll in excess of $73.8 million and a regional economic output in excess of $157.2 million. The Airport is home to over 40 businesses/private users, with Cape Air, Rectrix (a Ross Aviation Company), Griffin Avionics, and the Federal Aviation Administration (FAA) making up the bulk of employees on the airfield.

Many small businesses are active at the Airport providing industry-related services. These include passenger airline services, general aviation services, maintenance and servicing of aircraft and associated aviation equipment, aviation fuel transfer, temporary aircraft parking and long term aircraft storage, light transportation warehousing, long and short term vehicle parking lots, overflow vehicle parking lots, rental car agencies, and general facility maintenance.

3.1.1. Environmental Setting at the Airport

The Airport is located above a sole source aquifer as designated by the U.S. Environmental Protection Agency (EPA). All of Cape Cod is considered a sole source aquifer, with groundwater being the primary source of drinking water for the area. There are public drinking water supply wells near the Airport and the Airport is located within their wellhead protection areas, or Zone IIs as defined by the Massachusetts Department of Environmental Protection (MassDEP). The wells are operated by the Town of Barnstable Water Supply Division and the wellhead protection areas represent the land area where rain soaks into the ground, enters groundwater, and flows to one of the wells. There are two ponds on Airport property and a series of wetlands and ponds in the immediate vicinity of the property. The Airport has a long history of managing activities to protect drinking water and other environment receptors. This has included the cleanup of historical releases of oil and/or hazardous materials (OHM) and ongoing practices to prevent new releases and respond to unexpected actions that might result in a release.

A summary of Airport activities is provided below, along with an overview of the ongoing environmental protection activities at the Airport. Further information on these issues is provided in the subsequent sections of this chapter.

3.1.2. Airport Activities

As with any transportation facility, a mix of both airside (within the secure fence) and landside operations (outside of the secure fence – the public side) are necessary to support the Airport. Airside operations include aircraft fueling, aircraft maintenance, and de-icing activities. General aircraft maintenance includes fluid and filter changes, electronics repair, hydraulic system repair, aircraft body repair, engine maintenance, and wheel and tire maintenance and repair. Landside operations include parking areas, access roads, and car service and rental facilities (Enterprise, Avis, Hertz, and Budget).

General airfield and landside maintenance also include debris removal from stormwater management systems (catch basins and Vortech units) cleaning and pumping of oil/water separators, pavement monitoring and repair (i.e., crack sealing) and landscape activities.

There are a variety of petroleum products and hazardous materials needed for many of these activities. OHM usage includes gasoline, diesel fuel, road salt, antifreeze, detergents, windshield washing fluids, and automotive detailing products. The Airport has standard protocols and procedures to manage these materials and prevent their release as explained further below. Note that the Airport does not use glycols or deicing fluids on runways, taxiways, aprons or roadways in efforts to further protect the sole source aquifer.

3.1.3. Airport Environmental Protection Practices and Protocols

The Airport's environmental stewardship is highlighted in the practices and actions described below that reduce the risk of a release of OHM that could impact groundwater, nearby ponds, and wetlands or other sensitive receptors. This includes ongoing work and the historical cleanup of past releases of OHM associated with activities in the 1960s-1990s.

All OHM usage at the Airport is managed under a Stormwater Pollution Prevention Plan (SWPPP) and a Spill Prevention Control and Countermeasures Plan (SPCCP). These plans are reviewed and updated annually and involve regular inspections of Airport and tenant facilities to quantify the use of hazardous material to minimize the potential for a release. Airport operations staff are readily available to respond in the unlikely event of a release of OHM to the environment. Additionally, the Airport has an on-call contract with a local environmental consulting company which can respond to a release within 30 minutes and provide Licensed Site Professional Services.

Other Best Management Practices (BMPs) include:

- Implementation of a designated aircraft deicing and washing facility (known as the South Ramp Deicing and Washing Pad) and program that established procedures for Airport and tenant personnel 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. MassDEP, Cape Cod Commission (CCC), Barnstable Department of Public Works (DPW), and Barnstable Water pollution Control Division (WPCD) reviewed and approved of the facility and construction plans.

- The purchase of an Ecologic Cart system in 2016 to prevent the discharge of firefighting foam (which contains Per- and Poly-Fluoroalkyl Substances (PFAS)) onto the ground surface during annual federally required 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, well before final Federal Aviation Administration (FAA) testing and approval for universal use at airports.

- Regular inspections of all Airport facilities to inventory all hazardous materials present at the Airport as well as the use of spill containment kits in all maintenance and operations vehicles and located within select areas of the Airport and tenant facilities for quick deployment in the event of a release of OHM.

- No pesticides are used at the Airport and no road salt or deicing fluids/chemicals are used to treat runways, aprons, or taxiways to reduce the potential for these materials to enter Lewis and Upper Gate Ponds and the sole source acquifer.

Over the past 20 plus years the Airport has made several changes to its infrastructure to reduce the potential for a release of OHM. The Airport has also implemented several green technologies to reduce greenhouse gas emissions and improve stormwater quality. Examples of these methods include:

- Closure of multiple hanger floor drains and eight leaching pits at the Cape Air Hanger, Griffin Hanger, Hanger 2, and the former Maintenance/Operations building consistent with EPA and MassDEP guidelines in the late 1990's. As part of the closure activities, floor drains were filled with a concrete slurry and contaminated soil, sludge, and liquids were removed, as necessary, from the leaching pits. Subsurface investigations were conducted in the vicinity of the floor drains and leaching pits to assess the nature and extent of the historic impact relating to their use. The investigations included the collection of hundreds of soil and groundwater samples for laboratory analysis. Active remediation was conducted in the vicinity of the leaching pits between 2000 and 2017. Regulatory closure associated with the historic release from the floor drains and leaching pits consistent with the Massachusetts Contingency Plan was achieved in 2020.

- Installation of an engineered cap over approximately 2.25 acres of land that the Airport historically used for the deployment of aqueous film forming foam (AFFF) during training exercises as required by the FAA in August 2020. The cap will prevent the further infiltration of PFAS compounds associated with AFFF from leaching into the underlying groundwater. The Airport stopped using AFFF in 2015 during all training and equipment testing exercises. AFFF will only be used in the event of an emergency.

- As part of a stormwater improvement initiative, the Airport installed five Vortech stormwater treatment units prior to stormwater discharge to the main parking lot infiltration basin and Upper Gate and Lewis Ponds. Since the addition of these units, 100% of the stormwater discharged to the ponds receive pre-treatment. These units trap and retain trash, debris, and sediment from stormwater runoff. They remove 81 to 87% of total suspended solid and 67% of total petroleum hydrocarbons (TPH).

- The Airport maintains seven bioretention basins that collect stormwater from the Rectrix Aerodrome Center, Inc. (Rectrix/Ross Aviation) site and its associated paved apron, the access road from Barnstable Road to the hangar, and several paved parking lots. The bioretention basins use plants, soil, and microbes to treat stormwater prior to discharge to an infiltration basin.

- Removal of five underground storage tanks and the construction of a new state of the art aboveground fuel farm with double wall containment systems and Interstitial monitoring, concrete secondary containment connected to an OW/S, and 24-hour spill containment monitoring

- Implementing Green Technologies:
    - Installing a seven megawatt solar array in 2015 to reduce the Airport's carbon footprint and lower the Airports annual electricity needs.

    - Installing, in coordination with Cape Air, roof mounted solar arrays on two airport hangars leased to Cape Air.
    - Upgrading airport street and parking lot lights to LED using Cape Light Compact's lighting program.

    - Implementing 8 electric vehicle charging stations in two parking lot locations.
    - Purchasing electric, solar, or propane operated mowing equipment.
    - 2019 paper reduction in the Airport Administration Office by moving to digital footprint in various processes and purchasing reusable plates, cups and cutlery for in-office staff use.

3.2. ENVIRONMENTAL CATEGORIES

Airports are required under federal law (FAA Orders 5050.4B and 1050.1F) to evaluate the impact of proposed airport improvements on the environment. These FAA Orders define 18 different impact categories (Environmental Categories) which must be addressed depending on

the type of project proposed at the Airport. The sections below identify environmental resources or other environmental considerations present within Airport property that could be impacted and/or affected by Airport development improvements.

The Airport Master Plan identifies sensitive resources as a means for planning so that the Airport and Airport Stakeholders can identify alternatives that employ measures to avoid, minimize, and mitigate damage to the environment or, to the extent damage to the environment cannot be avoided, to minimize and mitigate damage to the environment as much as feasibly practicable. The intent of this section is to identify those resources upfront so that they become part of the planning process so that proper evaluation can occur before airport development. This chapter is intended to develop an understanding of those potential impacts so that further study and analysis can occur as part of the National Environmental Policy Act (42 U.S.C. 4321-4347 or NEPA) review.

The NEPA review process is enacted when a federal agency develops a proposal to take a major federal action, and can involve three different levels of analyses:

1. Categorical Exclusion determination (CATEX);
2. Environmental Assessment/Finding of No Significant Impact (EA/FONSI); and/or
3. Environmental Impact Statement (EIS)

While some airport actions may be categorically exempt (e.g., CATEX), the Airport anticipates that the preparation of an EA may be necessary to allow the federal agencies, including the Federal Aviation Administration (FAA), as well as other agencies, to determine whether or not the federal action has the potential to cause significant environmental effects. Each federal agency has adopted its own NEPA procedures. Generally, an EA includes a discussion of the project purpose and need, alternatives considered, the environmental impacts of the proposed action and alternatives, and identifies a preferred alternative. If the agency determines that the action will not have significant environmental impacts, the agency will issue a Finding of No Significant Impact (FONSI). Alternatively, if the EA determines that the environmental impacts of a proposed Federal action would be significant, an EIS is prepared, which presents a more detailed and rigorous assessment of the proposed action. An EIS includes a public comment period, additional agency review, and concludes with the issuance of a Record of Decision (ROD).

As noted, several factors influence the nature and scope of planned projects at the Airport, including the environmental setting, the Airport's aviation operations, the local economy, and the management goals of the Airport Commission. The following sections discuss in detail the relevant environmental categories under the FAA and NEPA and the Airport's unique conditions that may influence future Airport projects. Further evaluation of any potential impact or mitigation needed will be evaluated at a later time as part of an EA or EIS. The future evaluation will take into consideration the planned Airport project and how impacts to the applicable category can be mitigated through Best Management Practices (BMPs), engineering control or other relevant methods. Details of the 18 impact categories are set forth below.

3.2.1. Air Quality

Air quality will be assessed at a later time as part of an EA on a project-specific basis.

3.2.2. Coastal Resources (Coastal Barriers, Coastal Zones and Coral Reefs)

Activities involving or affecting coastal resources are governed by the Coastal Barriers Resources Act (CBRA) the Coastal Zone Management Act (CZMA), and Executive Order (E.O.) 13089, Coral Reef Protection.

Coastal Barriers

The CBRA prohibits, with some exceptions, federal financial assistance for development within the Coastal Barrier Resources System that contains undeveloped coastal barriers along the Atlantic and Gulf coasts and Great Lakes.

Any proposed work associated with the Master Plan at the Airport would occur on land that is located outside of the identified CBRA system, as seen on the Coastal Barrier Resources System Map for Lewis Bay Unit C13/C13P (**Figure 3-1**) and thus this resource would not be impacted by proposed projects.

Coastal Zones

All of Cape Cod and the islands of Nantucket and Martha's Vineyard are included in the Massachusetts Coastal Zone Boundary, as described in the Massachusetts Office of Coastal Zone Management Policy Guide. The Airport is located within Barnstable, and therefore falls within the Massachusetts Coastal Zone Boundary (**Figure 3-2**).

The Massachusetts Office of Coastal Zone Management (CZM) implements the federal consistency review process for Massachusetts, as required by the Coastal Zone Management Act (16 U.S.C. Section 1456). Federal consistency review is required for projects with proposed activities that are located within or near the coastal zone and that require federal licenses or permits or receive federal funds. This review examines the project goals for consistency with enforceable policies of the federally approved coastal management program for Massachusetts.

As the Airport is located within the Massachusetts Coastal Zone, any proposed project would be required to undergo CZM consistency review under Section 307 of the Federal Coastal Zone Management Act of 1972. Projects requiring review under NEPA, such as those funded by the FAA would also require CZM consistency review.

Massachusetts Coastal Program Policies

The following applicable Massachusetts Coastal Program Policies may apply to the Airport Master Plan's proposed projects based on the type of future projects implemented.

Coastal Hazards Policy #1 *Preserve, protect, restore, and enhance the beneficial functions of storm damage prevention and flood control provided by natural coastal landforms, such as dunes, beaches, barrier beaches, coastal banks, land subject to coastal storm flowage, salt marshes, and land under the ocean.*

The Airport is not physically located near any of the coastal landforms cited under Coastal Hazards Policy #1 and thus this resource would not be impacted by proposed projects.

Coastal Hazards Policy #2 *Ensure that construction in water bodies and contiguous land areas will minimize interference with water circulation and sediment transport. Flood or erosion control projects must demonstrate no significant adverse effects on the project site or adjacent or downcoast areas.*

The Airport is not physically located in an area that could affect water circulation or sediment transport in coastal areas and thus this resource would not be impacted by proposed projects.

Coastal Hazards Policy #3 *Ensure that state and federally funded public works projects proposed for location within the coastal zone will:*

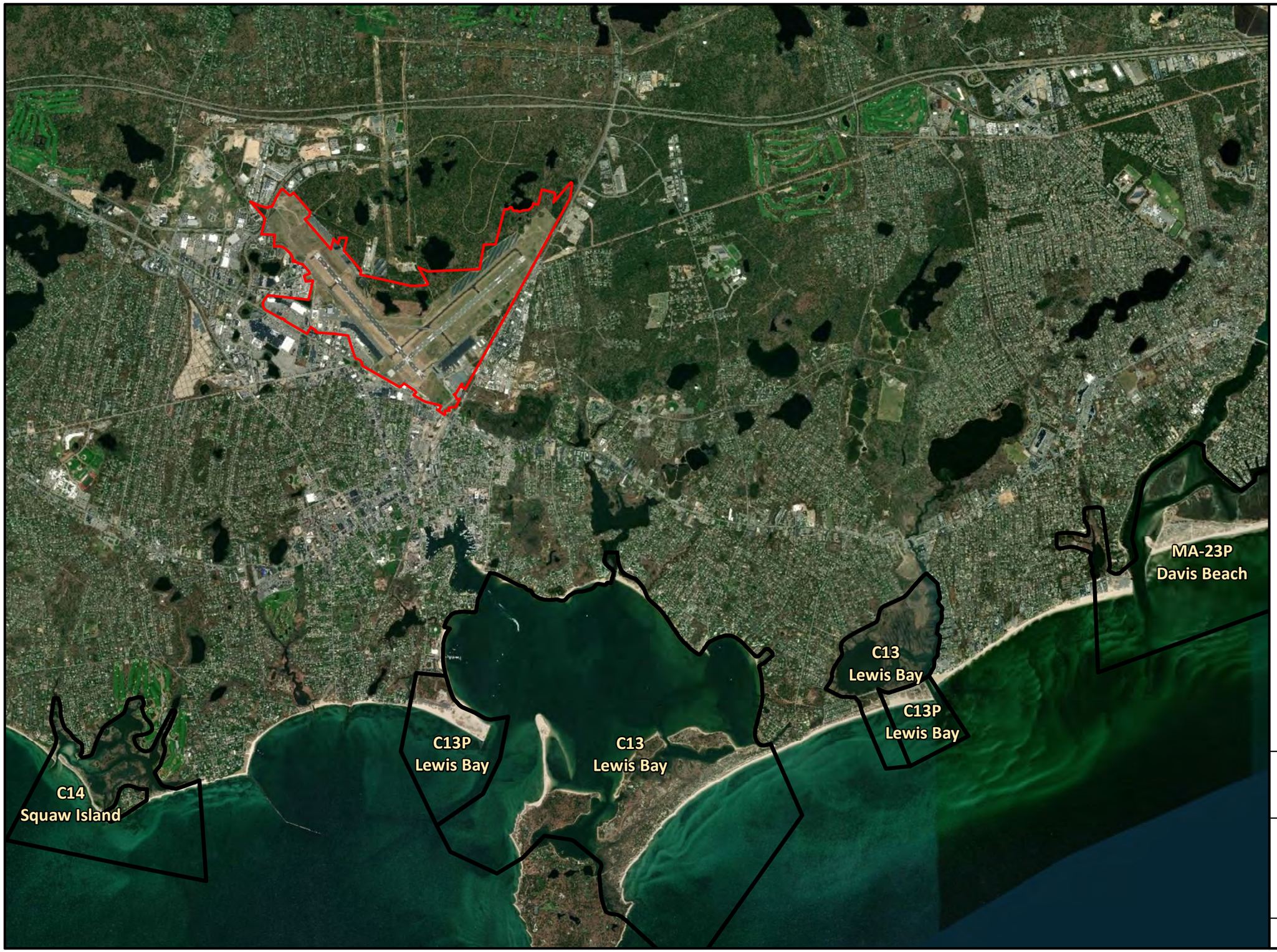
- *Not exacerbate existing hazards or damage natural buffers or other natural resources.*
- *Be reasonably safe from flood and erosion-related damage.*
- *Not promote growth and development in hazard-prone or buffer areas, especially in velocity zones and Areas of Critical Environmental Concern.*
- *Not be used on Coastal Barrier Resource Units for new or substantial reconstruction of structures in a manner inconsistent with the Coastal Barrier Resource/Improvement Acts.*

Generally, Coastal Hazards Policy #3 would not apply to the Airport. According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map, the Airport is within Zone X, an area of minimal flood hazard determined to be outside the 500-year flood (Figure 3-3). The Airport property is not at a high risk for flooding. A small amount of forested area near Mary Dunn Pond, within the Airport property boundary, is within an area with a 0.2% annual chance of flood hazard.

The Airport is not located within an Area of Critical Environmental Concern (ACEC). ACECs are designated areas across Massachusetts that receive special recognition because of the quality, uniqueness, and significance of their natural and cultural resources. These unique landscapes are identified and nominated at the community level and reviewed and designated by the state's Secretary of Energy and Environmental Affairs. This designation increases environmental oversight by increasing state permitting standards through elevated performance standards and lowering thresholds for review.

Likewise, the Airport is not located within a Coastal Barrier resource. Naturally occurring vegetated buffers around sensitive wetland areas exist to varying degrees around Mary Dunn Pond and Lamson Pond and the various isolated freshwater wetlands.

The Airport will take measures to avoid and/or minimize flood hazards. Appropriate mitigation measures will be evaluated once a specific project is identified.



Legend

Barnstable Municipal Airport Property

Coastal Barrier Resource System Boundaries

N

0 3,000

1" = 3,000 feet

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Coastal Barrier Resources Map
Barnstable Municipal Airport
Hyannis, MA

Date: 1/15/2020

Figure 3-1

**Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services*

**2016 NAIP imagery service*

**U.S. Fish and Wildlife Service (USFWS) Coastal Barrier Resources System (CBRS)*

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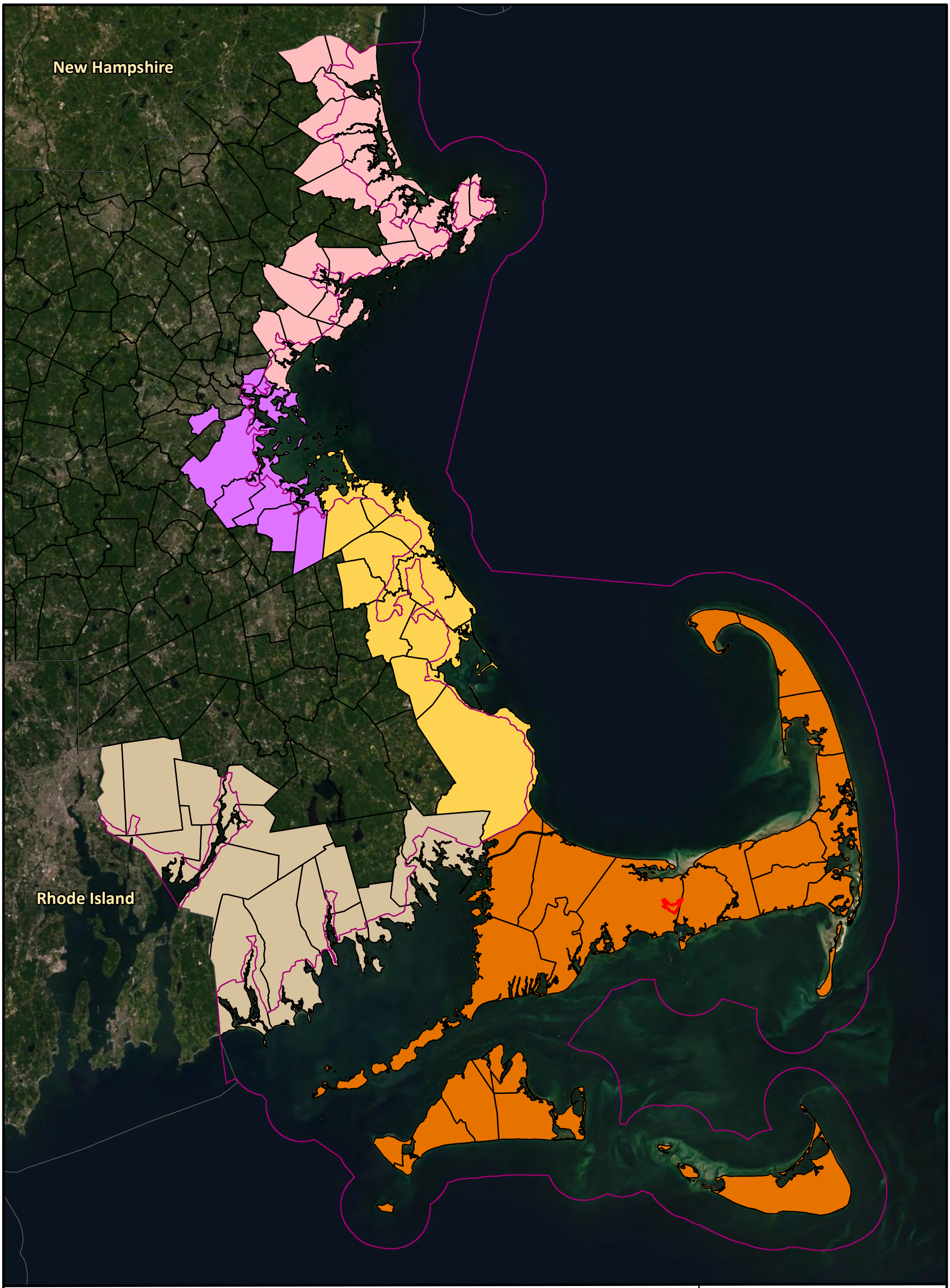

Legend

- Barnstable Municipal Airport Property
- Town Boundaries
- State Boundaries
- Massachusetts Costal Zone Boundary

CZM Regions:

- Boston Harbor Towns
- Cape and Islands Towns
- North Shore Towns
- South Coast Towns
- South Shore Towns

N

0 9

1" = 9 miles

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Coastal Zone Management Map
Barnstable Municipal Airport
Hyannis, MA

Date: 1/15/2020 Figure 3-2

**Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services*
**2016 NAIP imagery service*
**U.S. Fish and Wildlife Service (USFWS) Coastal Barrier Resources System (CBRS)*

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Legend

Barnstable Municipal Airport Property

FEMA Flood Zones

Zone AE - 1% Annual Chance Flood Hazard

0.2% Annual Chance Flood Hazard

Map Panel Number

N

0 800

1" = 800 feet

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FEMA's National Flood Hazard Layer
Barnstable Municipal Airport
Hyannis, MA

Date: 12/10/2019

Figure 3-3

*Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services

*2016 NAIP imagery service

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Energy Policy #2 *Encourage energy conservation and the use of renewable sources such as solar and wind power in order to assist in meeting the energy needs of the Commonwealth.*

The Airport is committed to energy conservation and currently maintains two solar fields (24,640 solar panels in total) on the northern side of the property, occupying approximately 20 acres of Airport property and the adjacent Fire District property. The solar fields generate approximately 6.7 megawatts (direct current or DC) of energy and are estimated to offset more than 5,000 metric tons of CO2 emissions annually. Additionally, the Airport has implemented electric vehicle charging stations in three parking lot locations; has worked with Cape Air to install roof mounted solar arrays on two leased hangers; and has purchased electric, solar or propane mowing equipment. As part of this Airport Master Plan process, the Airport will continue to seek projects that encourage energy conservation and the use of renewable sources.

Growth Management Policy #1 *Encourage sustainable development that is consistent with state, regional, and local plans and supports the quality and character of the community.*

Construction projects associated with the Airport Master Plan will be consistent with state, regional, and local plans to maintain a vital transportation link for the Cape Cod transportation system. These include adherence to the goals and objectives of the Cape Code Commission (CCC) Regional Policy Plan (RPP), and the Town of Barnstable Local Comprehensive Plan (2010).

Growth Management Policy #2 *Ensure that state and federally funded infrastructure projects in the coastal zone primarily serve existing developed areas, assigning highest priority to projects that meet the needs of urban and community development centers.*

Any planned construction projects associated with the Airport Master Plan will be designed to enhance safety operations and improve the economic impact of the community and Airport, such that the Airport will continue to provide a vital transportation link for the Cape Cod transportation system.

Growth Management Policy #3 *Encourage the revitalization and enhancement of existing development centers in the coastal zone through technical assistance and financial support for residential, commercial, and industrial development.*

Any planned construction projects associated with the Airport Master Plan will be designed to enhance commercial development within the existing commercial areas, including the Hyannis Gateway and Transportation Hub as part of the Downtown Hyannis Growth Incentive Zone to promote growth of existing commercial businesses. Residential dwellings in close proximity to airports are discouraged by the FAA.

Habitat Policy #1 *Protect coastal, estuarine, and marine habitats—including salt marshes, shellfish beds, submerged aquatic vegetation, dunes, beaches, barrier beaches, banks, salt ponds, eelgrass beds, tidal flats, rocky shores, bays, sounds, and other ocean habitats—and coastal freshwater streams, ponds, and wetlands to preserve critical wildlife habitat and other important functions and services including nutrient and sediment attenuation, wave and storm damage protection, and landform movement and processes.*

The Airport is not located specifically within or adjacent to coastal, estuarine, or marine habitats and thus this resource would not be impacted by proposed projects. The Airport will take measures to avoid and/or minimize impacts to the freshwater wetlands and critical wildlife habitat located within and immediately adjacent to the Airport. Appropriate mitigation measures will be evaluated once a specific project is identified. Further detail on habitat and endangered species is described in Section 3.2.7; further detail on wetlands is provided in Section 3.2.17.

Habitat Policy #2 *Advance the restoration of degraded or former habitats in coastal and marine areas.*

The Airport currently does not have any degraded or former habitats in coastal and marine areas and thus this resource would not be impacted by proposed projects. Efforts to preserve and maintain the natural vegetation communities surrounding the freshwater wetland habitats are incorporated within the Airport Master Plan.

Protected Areas Policy #1 *Preserve, restore, and enhance coastal Areas of Critical Environmental Concern, which are complexes of natural and cultural resources of regional or statewide significance.*

The Airport is not located within or adjacent to an ACEC and thus this resource would not be impacted by proposed projects. However, Mary Dunn Pond is identified as an exemplary Coastal Plain Pondshore Community, which can provide habitat for many state rare animal and plant species and is ranked as an S3 (Vulnerable in Massachusetts) type community. The Airport will take measures to avoid and/or minimize impacts to Mary Dunn Pond. Appropriate mitigation measures will be evaluated once a specific project is identified.

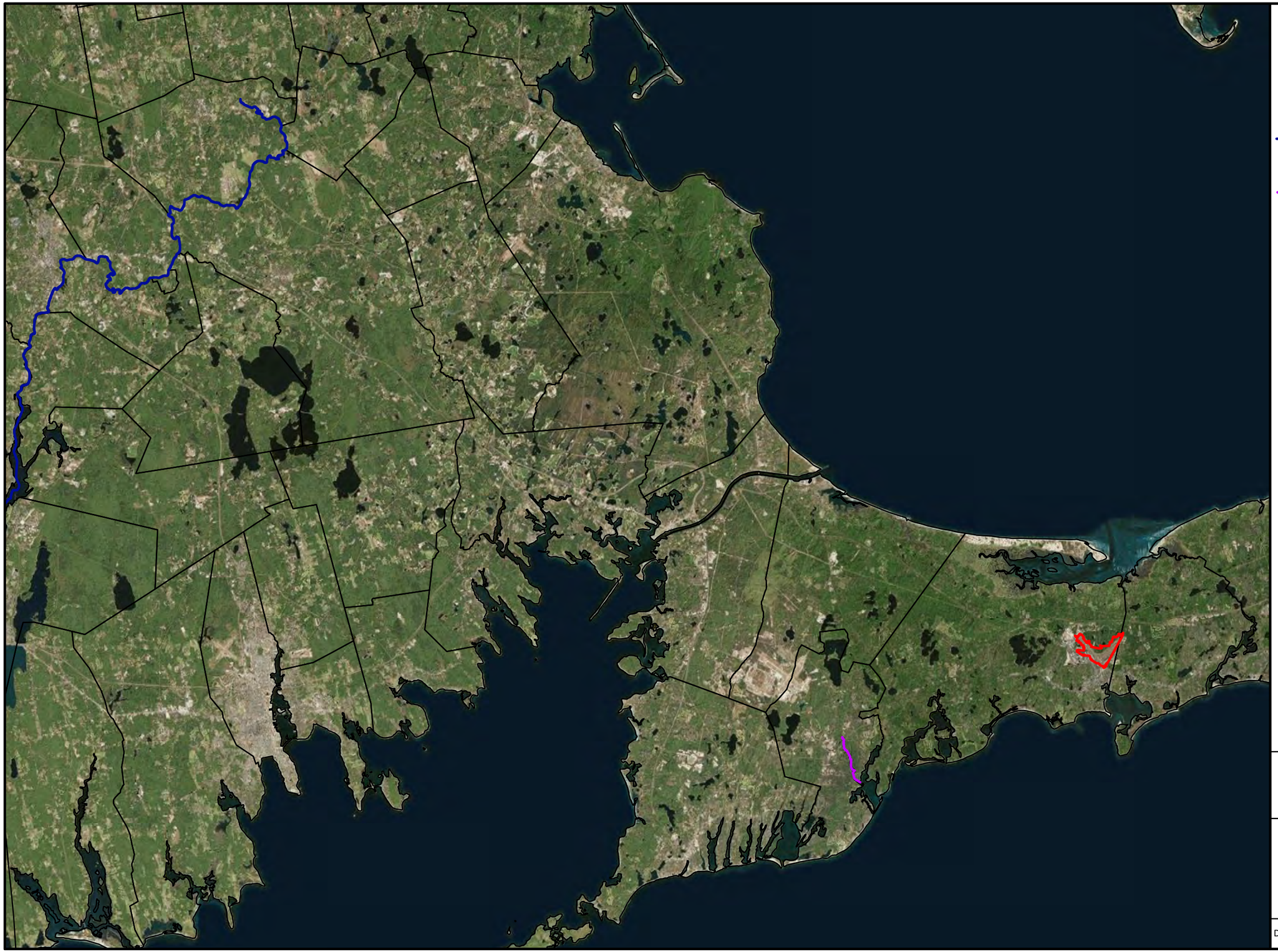
Additional details regarding the wetlands and plant communities at the Airport are provided under section 3.2.17.

Protected Areas Policy #2 *Protect state designated scenic rivers in the coastal zone.*

Any proposed work associated with the Master Plan at the Airport would occur on land that is located outside of the protected state designated scenic rivers, as seen on the National Wild and Scenic Rivers Map and thus this resource would not be impacted by proposed projects (Figure 3-4).

Protected Areas Policy #3 *Ensure that proposed developments in or near designated or registered historic places respect the preservation intent of the designation and that potential adverse effects are minimized.*

The Airport will take measures to avoid and/or minimize developments in or near *designated or registered historic places*. These measures will include a search of the National Register of Historic Places and the State Register of Historic Places to determine if any designated or historic places are within proximity to a proposed project. Through the NEPA process, federal agencies are required to consult with the State Historic Preservation Offices (SHPO) and with the Tribal Historic Preservations Offices (THPO) through the Section 106 process. Appropriate mitigation measures will be evaluated once a specific project is identified in consultation with these entities.



Legend

Barnstable Municipal Airport Property Boundary

National Wild and Scenic Rivers

Nationwide Rivers Inventory

N

0 20,000

1" = 20,000 feet

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National Wild and Scenic Rivers
Barnstable Municipal Airport
Hyannis, MA

Date: 1/10/2020

Figure 3-4

**Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services*

**2016 NAIP imagery service*

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Water Quality Policy #1 *Ensure that point-source discharges and withdrawals in or affecting the coastal zone do not compromise water quality standards and protect designated uses and other interests.*

The Airport will take measures to ensure that point-source discharges and withdrawals in or affecting the coastal zone do not compromise or provide only minimal reduction in water quality standards and protect designated uses and other interests. Appropriate mitigation measures will be evaluated once a specific project is identified.

Water Quality Policy #2 *Ensure the implementation of nonpoint source pollution controls to promote the attainment of water quality standards and protect designated uses and other interests.*

The Airport will take measures to implement nonpoint source pollution controls to promote the attainment of water quality standards and protect designated uses and other interests. Once a specific project is identified, appropriate mitigation measures will be evaluated.

Water Quality Policy #3 *Ensure that subsurface waste discharges conform to applicable standards, including the siting, construction, and maintenance requirements for on-site wastewater disposal systems, water quality standards, established Total Maximum Daily Load limits, and prohibitions on facilities in high-hazard areas.*

The Airport will continue to make sure subsurface waste discharges conform to applicable standards, including the siting, construction, and maintenance requirements for on-site wastewater disposal systems, water quality standards, established Total Maximum Daily Load limits, and prohibitions on facilities in high-hazard areas.

Executive Order 13089, Coral Reef Protection

Any proposed work associated with the Master Plan at the Airport would occur on land that is not located near any coral reef areas. Therefore, any proposed Master Plan project would not be subject to requirements under Executive Order 13089.

3.2.3. Compatible Land Use

As indicated in FAA Order 1050.1F, *"[t]he compatibility of existing and planned land uses with proposed aviation actions is usually determined in relation to the level of aircraft noise."* Details concerning Airport noise are set forth in Section 3.2.13, and details concerning existing land use and restrictions are set forth below.

Existing Land Use

Details concerning land use at the Airport is shown in the Inventory chapter that precedes the Environmental Overview. Details concerning general land use surrounding the Airport is set forth below.

The areas to the south, east, and west of the Airport are primarily urban. Evergreen and deciduous forest, along with several ponds, are located north of the Airport. Details of existing

land cover/land usage surrounding the Airport are shown on **Figure 3-5**. **Table 3-1** below provides definitions of each type of land use shown in **Figure 3-5**.

Table 3-1: Land Use Cover Descriptions

Land Use Code	Land Use Description
5	Developed Open Space
9	Deciduous Forest
10	Evergreen Forest
8	Grassland
12	Scrub/Shrub
20	Bare Land
13	Forested Wetland
14	Non-forested Wetland
21	Water
22/23	Aquatic Bed
11	Residential – Single Family
12	Residential – Multi Family
3	Commercial
4	Industrial
20	Mixed Use – Other
	Other Impervious
55	Right-of-way

Source: MassGIS – National Oceanic and Atmospheric Administration (NOAA)'s Coastal Change Analysis Program (C-CAP) High Resolution Land Cover Classification Scheme and the National Land Cover Database

The Airport will take measures to avoid and/or minimize significant land use changes. Appropriate mitigation measures will be evaluated once a specific project is identified.

Existing Land Use Restrictions

Local regulations have already been adopted by the Town of Barnstable to restrict the use of land adjacent to or in the immediate vicinity of the Airport to activities and purposes compatible with normal Airport operations, including landing and takeoff of aircraft. The Town of Barnstable adopted The Town of Barnstable Code Chapter 13: Airport on March 4, 1958, which was last updated on July 7, 2003. The Town of Barnstable has also worked with the Cape Cod Commission to encourage the revitalization of downtown Hyannis and to direct growth were public infrastructure exists under the Growth Incentive Zone initiative. The initiative offers a streamlined regulatory process that requires only local review and provides flexible tools for the permitting process.

Legend

- Barnstable Municipal Airport Property Boundary
- Residential - Single Family
- Residential - Multi-Family
- Commercial
- Industrial
- Mixed Use - Other
- Other Impervious
- Right-of- way
- Developed Open Space
- Deciduous Forest
- Evergreen
- Grassland
- Scrub/Shrub
- Bare Land
- Forested Wetland
- Non-forested Wetland
- Water
- Aquatic Bed

N

0 800

1" = 800 feet

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Land Cover/Land Use Map
Barnstable Municipal Airport
Hyannis, MA

Date: 12/16/2019

Figure 3-5

*Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services

*2016 NAIP imagery service

Document Path: H:\Projects\HYA\19122 HYA Master Plan Update\GIS\Maps\191216_Land Use.mxd

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3.2.4. Construction Impacts

Construction impacts will be assessed as part of a future EA once a project has been identified.

3.2.5. Department of Transportation Act, Section 4(f)

Section 4(f) of the Department of Transportation Act will be addressed under a future EA once a project has been identified.

3.2.6. Farmlands

While not utilized for active agriculture purposes, a portion of the Airport is designated as Farmland of Statewide Importance as indicated on **Figure 3-6**. This designation indicates that the soils at the Airport are important to produce food, fiber, forage, and oil seed crops. Once a project has been identified, the Airport will contact the United States Department of Agricultural Natural Resource Conservation Service Massachusetts Office to discuss measures that will be implemented to avoid and/or minimize impacts to Farmland of Statewide Importance.

3.2.7. Fish, Wildlife, and Plants (Biological Resources)

As indicated in the 1050.1F Desk Reference, "*biological resources are valued for their intrinsic, aesthetic, economic, and recreational qualities and include fish, wildlife, plants, and their respective habitats. Typical categories of biological resources include:*

- *Terrestrial and aquatic plant and animal species;*
- *Game and non-game species;*
- *Special status species (state or federally listed threatened or endangered species, marine mammals, or species of concern, such as species proposed for listing or migratory birds); and*
- *Environmentally-sensitive or critical habitats."*

According to the Information, Planning, and Consultation (IPaC) resource list, which is an automatically generated list of species and other natural resources under U.S. Fish and Wildlife Service (USFWS) jurisdiction, the Airport property is host to several species that are known to occur or would be expected to be on or near the Airport area. Included within the IPaC report are federally- Threatened or Endangered species as regulated under the Endangered Species Act; Migratory Birds; Facilities; and Wetlands in the National Wetlands Inventory (NWI), as discussed below. A copy of this resource is provided under **Appendix A.**

Terrestrial and Aquatic Plant and Animal Species

Vegetation at the Airport generally consists of maintained open grassy and forested areas, which include both upland and wetland plant communities (see **Figures 3-1** and **3-7** for aerial views of the Airport).

Existing maintained areas surrounding the active areas of the Airport consist largely of grasses, although other herbaceous and low-growing woody species are present. Species observed include, but are not limited to:

- Little bluestem (*Schizachyrium scoparius*)
- Broom sedge (*Andropogon virginicus*)
- Creeping juniper (*Juniperus horizontalis*)
- Common dewberry (*Rubus flaggellaris*)
- Pearly everlasting (*Anaphalis margaritacea*)
- Occasional pitch pine seedlings (*Pinus rigida*)
- Various lichens (*Cladonia* spp.)
- Common hawkweed (*Hieracium vulgatum*)
- Purple headed sneezeweed (*Hieracium nudiflorum*)
- Various asters (*Aster* spp.)
- Bearberry (*Arctostaphylos uva-ursi*)
- Wild indigo (*Baptista tinctoria*)
- Rabbit's foot clover (*Trifolium arvense*)
- Bush clover (*Lespedeza capitata*)
- Rockrose (*Crocanthemum* sp.)
- Pineweed (*Hypericum gentianoides*)
- Pennsylvania sedge (*Carex pensylvanica*)
- Little ladies' tresses (*Spiranthes tuberosa*)
- Tick trefoil (*Desmodium nudiflorum*)
- Wintergreen (*Gaultheria procumbens*)
- Spreading dogbane (*Apocynum androsaemifoliuim*)

Purple headed sneezeweed (Hieracium nudiflorum)

Bearberry (Arctostaphylos uva-ursi)

The forested communities are located north of the intersection between the two runways, with smaller patches of forested lands northwest of the runway 15 end and southeast of Runway 6-24. Upland forest areas typically consist of a mixed pine-oak community found on Cape Cod.

Legend

- Barnstable Municipal Airport Property Boundary
- Prime Farmland
- Farmland of Unique Importance
- Farmland of Statewide Importance

N

0 800

1" = 800 feet

Property = 645 acres

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Farmland
Barnstable Municipal Airport
Hyannis, MA

Date: 7/27/2020

Figure 3-6

**Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services*

**2016 NAIP imagery service*

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View of maintained grassland habitat at the Airport.

Tree species include:

- Pitch pine (*Pinus rigida*)
- White oak (*Quercus alba*)
- Scarlet oak (*Quercus coccinea*)
- Black oak (*Quercus velutina*)
- Eastern white pine (*Pinus strobus*)
- Sassafras (*Sassafras albidum*)
- Eastern red cedar (*Juniperus virginiana*)
- Black cherry (*Prunus serotina*)

Tree diameter at breast height (DBH) averages between nine and 14 inches, with a few larger trees and numerous saplings scattered throughout the area.

Shrub species: The community supports a relatively dense understory of black huckleberry (*Gaylussacia baccata*) and dangleberry (*Gaylussacia frondosa*). Taller shrubs within the understory include:

- Arrowwood (*Viburnum dentatum*)
- Highbush blueberry (*Vaccinium corymbosum*)
- Inkberry (*Ilex glabra*)
- Sweet pepperbush (*Clethra alnifolia*)
- Nannyberry (*Viburnum lentago*)
- Northern bayberry (*Morella pensylvanica*)
- Black chokeberry (*Aronia melanocarpa*)

- Scrub oak (*Quercus ilicifolia*)

Groundcover species encountered within the forested areas include:

- Wild sarsaparilla (*Aralia nudicaulis*)
- Bracken fern (*Pteridium aquilinum*)
- Wintergreen (*Gaultheria procumbens*)
- Pennsylvania sedge (*Carex pensylanica*)

Often dense entanglements of common greenbrier (*Smilax rotundifolia*) and/or cat greenbrier (*Smilax glauca*) are located throughout the upland plant communities.

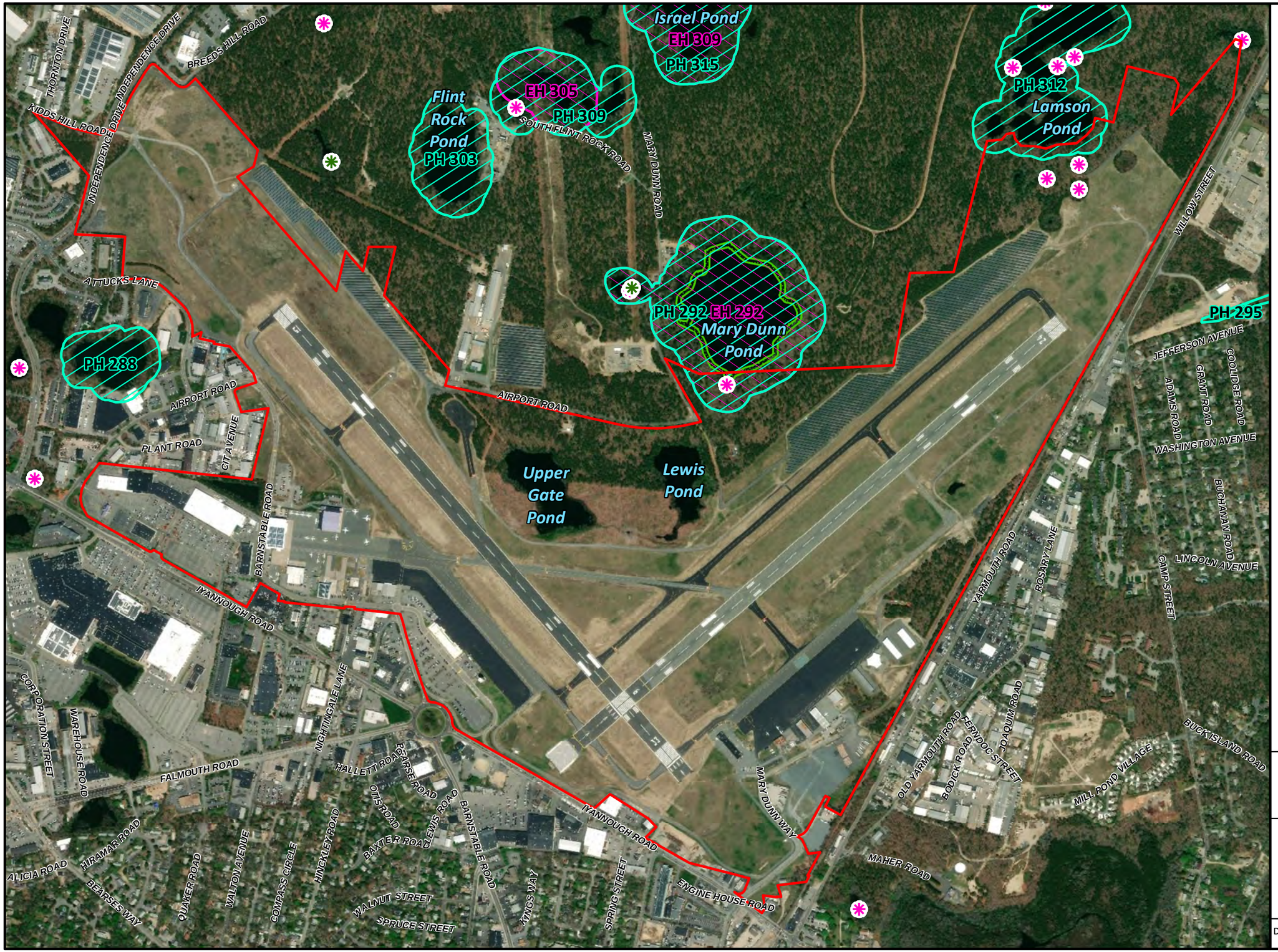
Located among the forested areas north of the runways and Taxiway C, lies the Runway Visibility Zone (RVZ), which is an area of maintained vegetation designed to facilitate runway line of sight between intersecting runways, which in turn facilitates coordination among aircraft and between aircraft and vehicles that are operating on active runways. The Airport permitted and implemented a major maintenance effort of the RVZ in 2015, cutting 20 acres of forest to bring the Airport into compliance with the FAA regulations. In order to remain in compliance, the RVZ must remain clear. As the topography in this area is generally lower than the plain of the airfield, the Airport is able to maintain the RVZ as a low growing shrub community.

View of maintained RVZ south of Lewis Pond.

Adjacent to the RVZ, there are areas dominated by non-native invasive plant species, including seedling Norway maple (*Acer platanoides*) multiflora rose (*Rosa multiflora*), honeysuckle (*Lonicera* spp.), raspberry (*Rubus* spp.), and dense entanglements of Oriental bittersweet (*Celastrus orbiculatus*) and occasional occurrences of Japanese honeysuckle (*Lonicera japonica*). A dense stand of tree-of-heaven (*Ailanthus altissima*) is located upgradient of the eastern central shoreline of Lewis Pond.

Wetland plant communities associated with Upper Gate, Lewis, Mary Dunn, and Lamson Ponds, as well as those observed within the several smaller isolated freshwater wetlands are discussed in Section 3.2.17.

The upland plant communities at the Airport provide habitat for many common wildlife species found in Massachusetts, including many forest dwelling avian species, and most of the common mammal species found throughout southeastern Massachusetts (Swain, 2020). This habitat can also provide habitat for some state-listed wildlife species, such as the Eastern Box Turtle (*Terrapene carolina*), although the Airport is not currently mapped as habitat for this species.



Legend

- Barnstable Municipal Airport Property Boundary
- NHESP Certified Vernal Pools
- Potential Vernal Pools
- NHESP Priority Habitats of Rare Species
- NHESP Estimated Habitats of Rare Wildlife
- NHESP Natural Communities

N

0 800

1" = 800 feet

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Rare Species Habitat
Barnstable Municipal Airport
Hyannis, MA

Date: 1/6/2020

Figure 3-7

**Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services*

**2016 NAIP imagery service*

Document Path: H:\Projects\HYA\19122 HYA Master Plan Update\GIS\Maps\191118_Existing Constraints.mxd

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Aerial view of RVZ with Upper Gate Pond on the left and Lewis Pond on the right. Mary Dunn Pond is the larger water body in the upper right.

Game and Non-Game Species

The Airport property is host to both game and non-game wildlife species, including known occurrences of Coyote (*Canis latrans*), Gray Fox (*Urocyon cinereoargenteus*), and or Red Fox (*Vulpes vulpes*), anecdotal evidence of White-tailed Deer (*Odocoileus virginianus*) (i.e., through observation of skat), as well as other small mammals common to Massachusetts, such as Virginia Opossum (*Didelphis virginiana*), Eastern Gray Squirrel (*Sciurus carolinensis*), Woodchuck (*Marmota monax*), Eastern Chipmunk (*Tamias striatus*), Meadow Vole (*Microtus pennsylvanicus*), Common Muskrat (*Ondatra zibethicus*), White-footed Deermouse (*Peromyscus leucopus*), Cottontail (*Sylvilagus* spp.), Shrew (*Sorex* spp.), Bat (*Eptesicus* sp.), Fisher (*Martes pennanti*), American Mink (*Neovison vison*), Striped Skunk (*Mephitis mephitis*), and Racoon (*Procyon lotor*), among other species.

The Airport also supports habitat for many bird species, both resident and migratory. The IPaC report (Appendix A) identifies several birds that are protected under the Migratory Birds Treaty Act of 1918 and/or the Bald Eagle and Golden Eagle Protection Act of 1940. Migratory bird species identified by the USFWS at the Airport that are of particular concern either because they are on the USFWS Birds of Conservation Concern (USFWS 2008) or otherwise warrant special attention in the region (New England/Mid-Atlantic Coast) and at this location. These include several shoreline or coastal bird species, as well as woodland species:

- American Oystercatcher (*Haematopus palliatus palliates*)
- Bald Eagle (*Haliaeetus leucocephalus*)*
- Black Skimmer (*Rynchops niger*)
- Black-Billed Cuckoo (*Coccyzus erythropthalmus*)
- Bobolink (*Dolichonyx oryzivorus*)
- Canada Warbler (*Wilsonia canadensis*)
- Clapper Rail (*Rallus crepitans*)

- Dunlin (*Calidris alpina arcticola*)
- Least Tern (*Sternula antillarum*)
- Lesser Yellowlegs (*Tringa flavipes*)
- Long-eared Owl (*Asio otus*)*
- Prairie Warbler (*Dendroica discolor*)
- Purple Sandpiper (*Calidris maritima maritima/belcheri*)
- Red-throated Loon (*Gavia stellate*)
- Ruddy Turnstone (*Arenaria interpres*)
- Rusty Blackbird (*Euphagus carolinus*)
- Seaside Sparrow (*Ammodramus maritimus*)
- Semipalmated Sandpiper (*Calidris pusilla*)
- Short-billed Dowitcher (*Limnodromus griseus*)
- Snowy Owl (*Bubo scandiacus*)
- Whimbrel (*Numenius phaeopus*)
- Willet (*Tringa semipalmata*)

*State-listed Species of Special Concern

Notably absent from the IPaC report is the Osprey (*Pandion haliaetus*), a regular resident at the Airport, as well as mallard duck (*Anas platyrhynchos*) and Canada goose (*Branta canadensis*) that are regularly observed at the Airport and in the ponds. Conversely, the IPaC report includes other avian species that are rare or may be only casual migrants to the region, that rarely nest on Cape Cod, such as the Black Skimmer.

State Listed Species

According to the most recent version of the *Massachusetts Natural Heritage Atlas* (14th Edition, August 1, 2017), the Airport contains areas mapped as Estimated Habitat of Rare Wildlife (EH) and Certified Vernal Pools and/or Priority Habitat of Rare Species (PH) as designated by the Massachusetts Natural Heritage and Endangered Species Program (NHESP) (Figure 3-7). These include areas around Mary Dunn Pond (EH 292, PH 292) and Lamson Pond (PH 312), located north and east of the Airport, respectively. These areas are outside of areas likely to be considered for future development. Several of the small, isolated freshwater wetlands located on or immediately adjacent to Airport property are also identified as Potential Vernal Pools (PVPs).

Previous records of state-listed species with known occurrences at the Airport include two odonates (dragonflies/damselflies), including the state Threatened Pine Barrens Bluet (*Enallagma recurvatum*) and the previously state-listed Species of Special Concern (SSC), Comet Darner (*Anax longipes*); a moth species, Barrens Buckmoth (*Hemileuca maia*)(SSC), and a vascular plant, Wright's Panic-grass (*Dichanthelium wrightianum*)(SSC). It is noted that the Comet Darner has been delisted by NHESP.

An updated list of species currently documented at the Airport is more extensive than previously listed, and includes several additional species that are typically associated with the Coastal Plain

Scientific name	Common Name	Taxonomic Group	State Status
Hemileuca maia	Buck Moth	Butterflies and Moths	Special Concern
Anax longipes	Comet Darner	Dragonfly	Not Listed
Enallagma recurvatum	Pine Barrens Bluet	Damselfly	Threatened
Enallagma laterale	New England Bluet	Damselfly	Not Listed
Dichanthelium wrightianum	Wright's Rosette -grass	Plant	Special Concern
Lachnanthes caroliniana	Redroot	Plant	Special Concern
Papaipema sulphurata	Water-Willow Borer Moth	Butterflies and Moths	Threatened
Rhynchospora nitens	Short-beaked Beak sedge	Plant	Threatened
Rhynchospora scirpoides	Long-beaked Beak sedge	Plant	Special Concern
Sabatia kennedyana	Plymouth Gentian	Plant	Special Concern
Sagittaria teres	Terete Arrowhead	Plant	Special Concern

Pond Shore community surrounding Mary Dunn Pond:

Pursuant to the Massachusetts Endangered Species Act (M.G.L. Ch. 131A; MESA), any proposed project that is located within EH or PH must undergo MESA Project Review with NHESP. Potential vernal pools identified do not automatically receive protection under MESA or under any other state or federal wetlands protection laws, such as the Massachusetts Wetlands Protection Act or the Federal Clean Water Act but may receive protections under local or regional regulations.

Federally Listed or Proposed, Threatened or Endangered Species

According to IPaC, the following endangered or threatened species have been identified at, or would be expected to be found on, or near the Airport:

Northern Long-Eared Bat

The Northern Long-Eared Bat (*Myotis septentrionalis*) is a Federally listed Threatened species.

The USFWS finalized a rule under authority of section 4(d) of the Federal Endangered Species Act of 1973 (ESA), as amended, that provides measures that are necessary and advisable to provide for the conservation of the Northern Long-Eared Bat. The 4(d) Rule affects projects that result in tree removal activities. Effective February16, 2016, the 4(d) Rule states the following:

> *Incidental take resulting from tree removal is prohibited if: 1) Occurs within 0.25 mile radius of known northern long-eared bat hibernacula or 2) cuts or destroys known occupied maternity roost trees, or any other trees within a 150-foot radius from the known maternity tree during the pup season (June 1 through July 31).*

The NHESP maintains a database of all state and federally listed rare species in Massachusetts. Specific to the Northern Long-Eared Bat, also a MA-Endangered species, NHESP has created an interactive map of known locations of winter hibernacula and maternity roost trees to assist project proponents with the 4(d) rule review processes. As of the most recent update of the NHESP database (June 12, 2019), there are no known winter hibernacula or maternity roost trees at the Barnstable Municipal Airport site and thus this resource would not be impacted by

proposed projects. The most proximal known habitat for this species includes two identified maternity roost trees in Sandwich, approximately 12 miles to the west; and three identified maternity roost trees in the Town of Eastham, approximately 18 miles to the east /northeast of the Airport. There are no winter hibernacula within 65 miles of the Airport.

Source: Massachusetts Natural Heritage and Endangered Species Program Long-eared Bat Locations (last updated June 4, 2019); https://www.mass.gov/service-details/the-northern-long-eared-bat

American Chaffseed

American Chaffseed (*Schwalbea americana*) is both a federally listed and state listed Endangered vascular plant species found in sandplain grasslands in open sunny plant communities. There is only one known population in one location in Barnstable County.

The Airport will take measures to prevent or minimize the impacts of future construction at the Airport to these threatened or endangered species.

Critical Habitats

According to IPaC, no federally identified critical habitats are located at the Airport. As noted above, the area surrounding Mary Dunn Pond, located at the northern extreme of the Airport property, is identified at the state level as a state-imperiled Coastal Plain Pond Shore community.

3.2.8. Floodplains

As indicated in the 1050.1F Desk Reference: *"[f]loodplains are lowland areas adjoining inland and coastal waters which are periodically inundated by flood waters, including flood-prone areas of offshore islands. Floodplains are often discussed in terms of the 100-year flood. The 100-year flood is a flood having a 1 percent chance of occurring in any given year. The 100-year flood is also known as the base flood. Floodplains are valued for their natural flood and erosion control, enhancement of biological productivity, and socioeconomic benefits and function."*

According to the FEMA Flood Insurance Rate Map, the Airport is within Zone X, an area of minimal flood hazard determined to be outside the 500-year flood (see **Figure 3-3**). The Airport property is not at a high risk for flooding. A small amount of forested area near Mary Dunn Pond, within the Airport property boundary, is within an area with a 0.2% annual chance of flood hazard. This area currently poses no risk of flooding to Airport facilities. The Airport will take measures to avoid and/or minimize construction within floodplains. Appropriate mitigation measures will be evaluated once a specific project is identified.

3.2.9. Hazardous Materials, Pollution Prevention, and Solid Waste

As indicated in Section 3.1, during its normal daily operations, the Airport accepts, stores, handles and transfers a variety of OHM, similar to most other airports and similar industries. The Airport is committed to environmental stewardship and has implemented several programs to minimize the environmental impact associated with Airport operations. These programs include the implementation of a SWPPP and SCPPC along with the multiple BMPs described in Section 3.1.3 to reduce the potential for a release of OHM to the environment. Details concerning OHM, Pollution Prevention, and solid waste management are set forth below.

Hazardous Materials

In order to minimize the risk associated with bulk storage and transfer of OHM, the Airport has maintained a SPCCP in accordance with Code of Federal Regulations 40, Subpart 112 (40 CFR 112). The Airport has also maintained a SWPPP in accordance with the U.S. EPA National Pollutant Discharge Elimination System (NPDES) Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity. The SPCCP is attached as **Appendix B** and the SWPPP is attached as **Appendix C**. The SPCCP and SWPPP will be updated by the Airport, as necessary. All hazardous waste management and disposal is conducted consistent with state, local, and Federal Regulations. Additionally, the Airport's On-Call Environmental Consultant performs third party inspections annually to document compliance with the SPCCP and SWPPP.

Existing OHM Storage Locations

OHM is stored at several locations at the Airport within storage tanks and 55-gallon drums. Details concerning these materials are provided in **Tables 3-2** through **3-4**, and current storage locations are included on **Figure 3-8**. The Airport is also subject to the requirements in FAA Advisory Circular 150/5230-4B, *Aircraft Fuel Storage, Handling, and Dispensing on Airports*.

Petroleum products are transported by Airport and tenant mobile refuelers for the purpose of refueling aircraft. Fuel delivery and transfer procedures are described in greater detail in the

SPCCP. Specific characteristics of each mobile refueler are provided in Table 3-3 and Table 3-4, below. All mobile refuelers are equipped with absorbents, drip pans, magnetic catch basin covers, and oil booms to respond to the most likely quantity of oil that could be discharged (<10 gallons) during refueling activities.

Table 3-3: Airport Virgin Petroleum Storage

Operator	Location	Product	Tank Type	Spill Protection	Volume (Gallons)
Rectrix / Air Cape Cod	Gate P fuel farm	Avgas / Jet A	AST	Overfill protection, steel secondary containment	10,000 / 10,000
Griffin Avionics	Griffin fuel island	Avgas	UST	Overfill protection, cathodic protected steel, interstitial monitoring	10,000 (2)
Cape Air	Inside Cape Air Hangar	Avgas	Portable AST	Spill containment pallet	100
Hertz Car Rental	Barnstable Road – Service Lot	Unleaded gasoline	UST	In tank monitor	10,000
Barnstable Municipal Airport	Gate F fuel farm	Unleaded gasoline	AST	Overfill protection, steel secondary containment, interstitial monitoring	4,000
		Diesel	AST		4,000
		Jet A	AST		20,000 (3)

Notes:

[1] Aboveground Storage Tank

[2] Underground Storage Tank

[3] Aviation Gas

Source: Barnstable Municipal Airport Spill Prevention, Control, and Countermeasure Plan, 2020.

Table 3-4: Airport and Tenant Mobile Refuelers

Operator	Product	Truck Designation	Storage Capacity (Gallons)
Barnstable Municipal Airport	Jet A	55931 / 55932 / 5251	5,000 / 5,000 / 3,000
Rectrix / Air Cape Cod	Avgas	44219	1,500
Rectrix Aerodrome	Jet A	5693	3,000
Cape Air	Avgas	4298	1,500
Griffin Avionics	Avgas	612 / 4134	620 / 1,200

Source: Barnstable Municipal Airport Spill Prevention, Control, and Countermeasure Plan, 2020.

Table 3-5: Other Airport OHM Storage Locations

Operator	Location	Product	Storage Vessel Type	Spill Protection	Volume (Gallons)
Barnstable Municipal Airport	Outside Airport ARFF/ Snow Removal Equipment (SRE) Building	Waste Oil / Anti-freeze	AST	Leak detection, double walled with reinforced concrete	350 / 150
	Inside Airport ARFF/SRE Building	antifreeze / 15W40 / grease / hydraulic oil / ATF / 5W30 SYN / waste oil	Drums	Spill Containment Pallet	55
Rectrix / Air Cape Cod	Gate P Fuel Farm	Waste absorbent material / waste Jet A / Avgas	Drums	Spill Containment Pallet with overhead cover	55 / 55
Rectrix Aerodrome	Inside Rectrix Hangar	Jet A / Reclaimable Jet A Fuel / waste oil / waste absorbent	AST / Drums	Double walled / Spill Containment Workstation with Lid	55 / 55
Griffin Avionics	Inside Griffin Hangar	Used Oil filters	Drums	Spill Containment Pallet	55
Cape Air	Inside Cape Air Hangar	Waste oil	AST	Overflow Detection, Double Walled	500
		Waste oil / hydraulic oil / used oil filters / anti-freeze	Drums	Spill Containment Pallet	55
Allies Air	Inside Allies Air Hangar	Waste Oil	Drums	Spill Containment Pallet	55
AMA Nantucket Inc.	Inside Hangar Nantucket Inc. Hangar	Waste Oil / mineral spirits	Drums / Drums	Spill Containment Pallet / Spill Containment Pallet	55 / 55
Cape Flight Instruction	Inside Hangar	Waste oil / antifreeze / used oil filters	Drums	Spill Containment Pallet	55
Avis Car Wash	Barnstable Road – Service Lot	Car Washer Fluid	AST	Oil/Water Separator (O/WS)	250
Hertz Car Wash	Barnstable Road – Service Lot	Car Washer Fluid	AST	O/WS	250

Source: Barnstable Municipal Airport SPCCP.

Past Spills of OHM

Over the last five years (January 2015 to July 2020), the Airport has safely dispensed 4,859,406 gallons of petroleum. Since 2015, three spills of OHM have occurred at the Airport totaling approximately 60 gallons; this is approximately 0.001 percent. The A+ safety record can be attributed to significant fuel delivery training that staff undergo. Details of the three releases are set forth below.

- In November 2019, a release of 51 gallons of Jet A fuel occurred at the Gate F Fuel Farm from a hand operated pump located within the concrete secondary containment structure. The hand pump was not fully closed after the previous use and was the source of the release. Due to a storm drainage valve being opened, the release drained from the secondary containment structure into an O/WS. Airport personnel responded to the spill and applied absorbents. Airport personnel notified the fire department and the Massachusetts Department of Environmental Protection (MassDEP) within two hours of identifying the release. Clean Harbors and a Licensed Site Professional responded to the release and pumped out and cleaned the O/WS, recovered absorbents, and cleaned the interior of the concrete secondary structure with a citrus based degreaser. The release was contained by the concrete secondary containment and the OW/S and there was no discharge of pollutants to stormwater and/or surface waters.
- On December 21, 2019, a release of one to two gallons of jet fuel occurred at the Rectrix Aerodrome Center Hanger while refueling a Hawker 827TX aircraft. The release occurred to the asphalt paved ground surface from venting of the right wing. Rectrix personnel responded to the spill immediately by placing granular absorbents and using pads to mop up the spilled jet fuel and notified the Airport. The absorbent and pads were placed into a 55-gallon drum for future off-site disposal. The release was contained to the asphalt pavement and there was no discharge of pollutants to stormwater and/or surface waters. Considering the nature of the release, no change to the fueling procedures or release response was necessary.
- On July 22, 2020, a release of approximately eight gallons of jet fuel occurred at the North Ramp at the Rectrix hanger while refueling a 224CX aircraft. The release occurred to the asphalt paved ground surface from the left wing and engine. Rectrix personnel responded to the spill immediately by placing granular absorbents and using pads to mop up the spilled jet fuel and notified the Airport. The absorbent and pads were placed into a 55-gallon drum for future off-site disposal. The release was contained to the asphalt pavement and there was no discharge of pollutants to stormwater and/or surface waters. Considering the nature of the release, no change to the fueling procedures or release response was necessary.

Active MassDEP Reported Releases at the Airport

Per- and Polyfluoroalkyl Substances

The Airport is currently investigating per- and polyfluoroalkyl substances (PFAS) in soil and groundwater consistent with the Massachusetts Contingency Plan (MCP). The PFAS detections


Israel Pond
Flint Rock Pond
Lamson Pond
Mary Dunn Pond
Upper Gate Pond
Lewis Pond
BREEDS HILL ROAD
INDEPENDENCE DRIVE
THORNTON DRIVE
KIDDS HILL ROAD
ATTUCKS LANE
SOUTH FLINT ROCK ROAD
MARY DUNN ROAD
AIRPORT ROAD
WILLOW STREET
JEFFERSON AVENUE
ADAMS ROAD
GRANT ROAD
COOLIDGE ROAD
WASHINGTON AVENUE
BUCHANAN ROAD
LINCOLN AVENUE
CAMP STREET
YARMOUTH ROAD
ROSARY LANE
BUCK ISLAND ROAD
MARY DUNN WAY
MAHER ROAD
ENGINE HOUSE ROAD
SPRUCE STREET
CORPORATION STREET
WAREHOUSE ROAD
ALICIA ROAD
HIRAMAR ROAD
BEARSES WAY
QUAKER ROAD
WALTON AVENUE
COMPASS CIRCLE
HINCKLEY ROAD
Cape Air
-500-gal. AST of waste oil
-100-gal. AST of Avgas
-55-gal. drums of waste oil
-55-gal. drum of hydraulic oil
-55-gal. drums used oil filters
-55-gal. drums of anti-freeze
Rectrix Aerodrome
-55-gal. AST of Jet A Fuel
-55-gal. drum of Reclaimable Jet A Fuel
-55-gal. drums of waste oil
-55-gal. drum of waste absorbent
-12/19 Spill of 1-2 gal. of Jet Fuel
Griffin Avionics
-55-gal. drums of waste oil
-55-gal. drum of avgas
-55-gal. drum used oil filters
Gate F Fuel Farm
- Three 20,000-gal. ASTs of Jet A fuel
- One 4,000-gal. AST of gasoline
- One 4,000-gal. AST of diesel
- 11/2019 Spill of 51-gal. of Jet A fuel
Griffin Fuel Island
- Two 10,000-gal. USTs of Avgas 100 LL Fuel
Allies Air
-55-gal. drums of waste oil
AMA Nantucket Inc.
-55-gal. drums of waste oil
-55-gal. drum of mineral spirits
Hertz
-10,000-gal. UST of gasoline-
-250-gal. container of car washer fluid (deicer)
Cape Flight Instruction
-55-gal. drums of waste oil
-55-gal. drums of anti-freeze
-55-gal. drum of used oil filters
Avis
-250-gal. container of car washer fluid (deicer)
Rectrix/Air Cape Cod Gate P Fuel Farm
- One 10,000-gal. AST of Jet A fuel
- One 10,000-gal. AST of Avgas 100 LL fuel
-55-gal. drum of Waste Jet A Fuel
-55-gal. drum of Avgas
-55-gal.drum waste absorbent
ARFF/SRE Building
-150-gal. anti-freeze and 350-gal. waste oil split double walled AST (outside)
-55-gal. drums of anti-freeze
-55-gal. drums of waste oil, hydraulic oil, grease, and other oils
and other oils

Legend

Barnstable Municipal Airport Property Boundary

Mobile Refueler Parking Areas

Note:
AST = Above ground storage tank
UST = Underground Storage Tank
Avgas = Aviation Gas
LL = Low Lead
ARFF/SRE = Aircraft Rescue and Fire Fighting/Snow Removal Equipment

N

0 800

1" = 800 feet

Property = 645 acres

Horsley Witten Group
Sustainable Environmental Solutions

Oil and Hazardous Materials (OHM) Storage Map
Barnstable Municipal Airport
Hyannis, MA

Date: 1/10/2020

Figure 3-8

*Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services *2016 NAIP imagery service

Document Path: H:\Projects\HYA\14105 BMA On-Call Eng Services\GIS\Maps\191230_SPCCP OHM Storage Map.mxd

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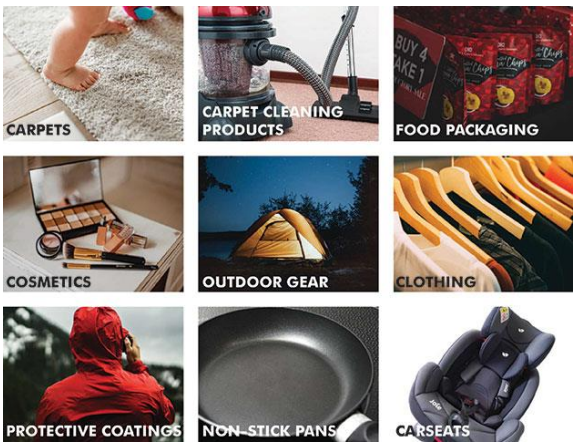
are related to the historic application of aqueous film forming foam (AFFF) at the Airport as well as from off-site sources that are migrating to the Airport. Per FAA regulations, annual testing of fire apparatus is required to ensure that there is the appropriate AFFF to water mixture. Historically, the test consists of essentially shooting the mixture of AFFF from fire apparatus at a small square target. In 2016, the Airport purchased an Ecologic Cart system to prevent the discharge of AFFF to the ground surface during testing. The Ecologic Cart allows the Airport to test the fire truck's ability to properly mix and dispense AFFF without ground dispensing as previously required. This unit was the first unit purchased for any Massachusetts airport, well before final FAA testing and approval for universal use at airports.

Of the 639-acres, two locations of AFFF released at the Airport were identified as the Deployment Area (**Figure 3-9**) and the ARFF Building Area (**Figure 3-10**); accounting for 2.25 acres and 0.35% of the total Airport landmass. PFAS are manmade chemicals that have been used widely since the 1950s 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

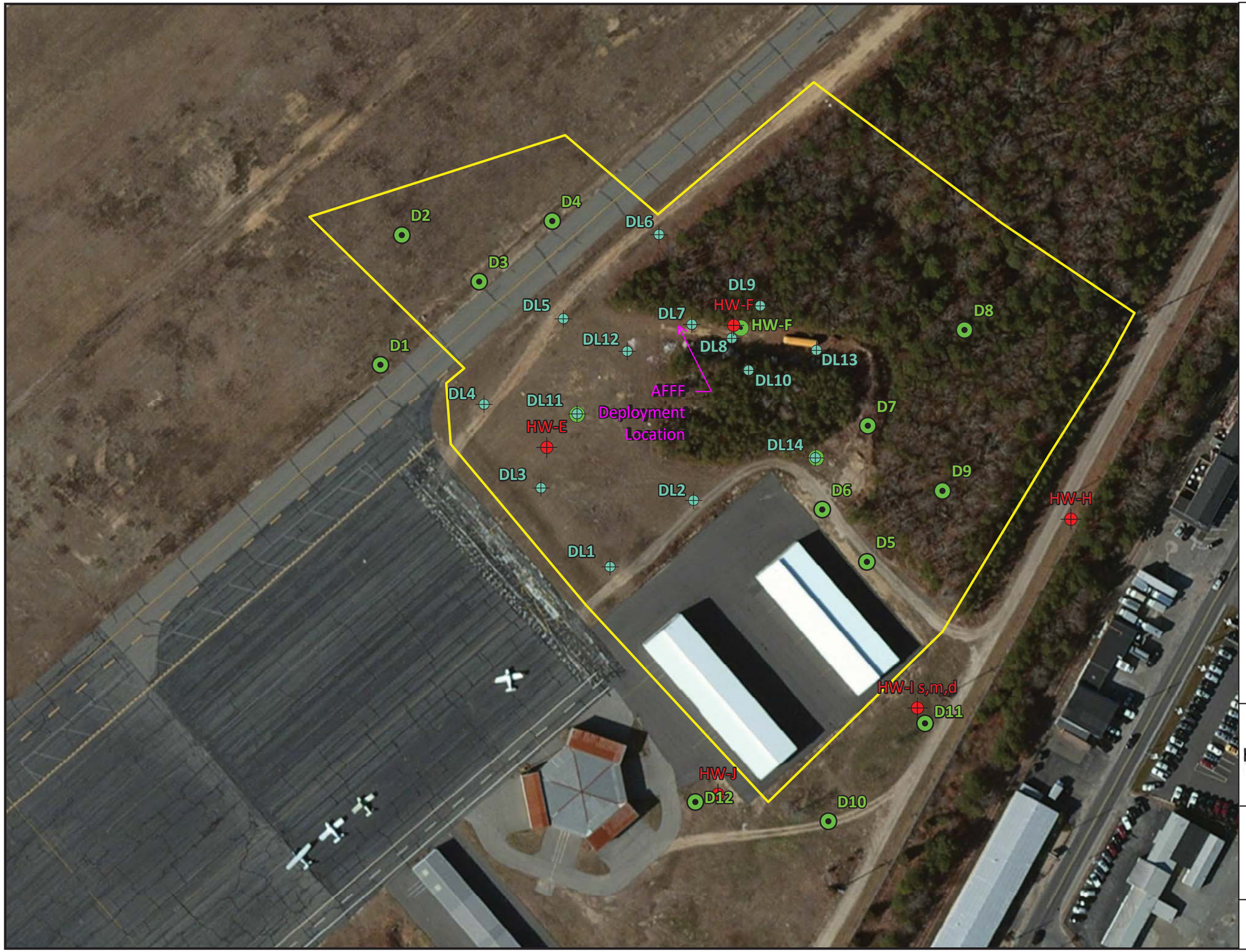
cleaner.

- 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 Scotchgard ®) 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.

- As indicated above, the Airport purchased an Ecologic Cart system to prevent the discharge of AFFF on the ground surface in 2016. 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, well before final FAA testing and approval for universal use at airports. The firefighting foam used at the



Legend

- 2017 PFAS Soil Samples
- 2018 PFAS Soil Samples
- Monitoring Wells
- Barnstable Municipal Airport Property Boundary
- Approximate Disposal Site Boundary for Deployment Area

N

0 100 Feet

1 inch = 100 feet

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PFAS Sampling Locations
Deployment Area
Barnstable Municipal
Airport Hyannis, MA

Date: 12/2/2019

Figure 3-9

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

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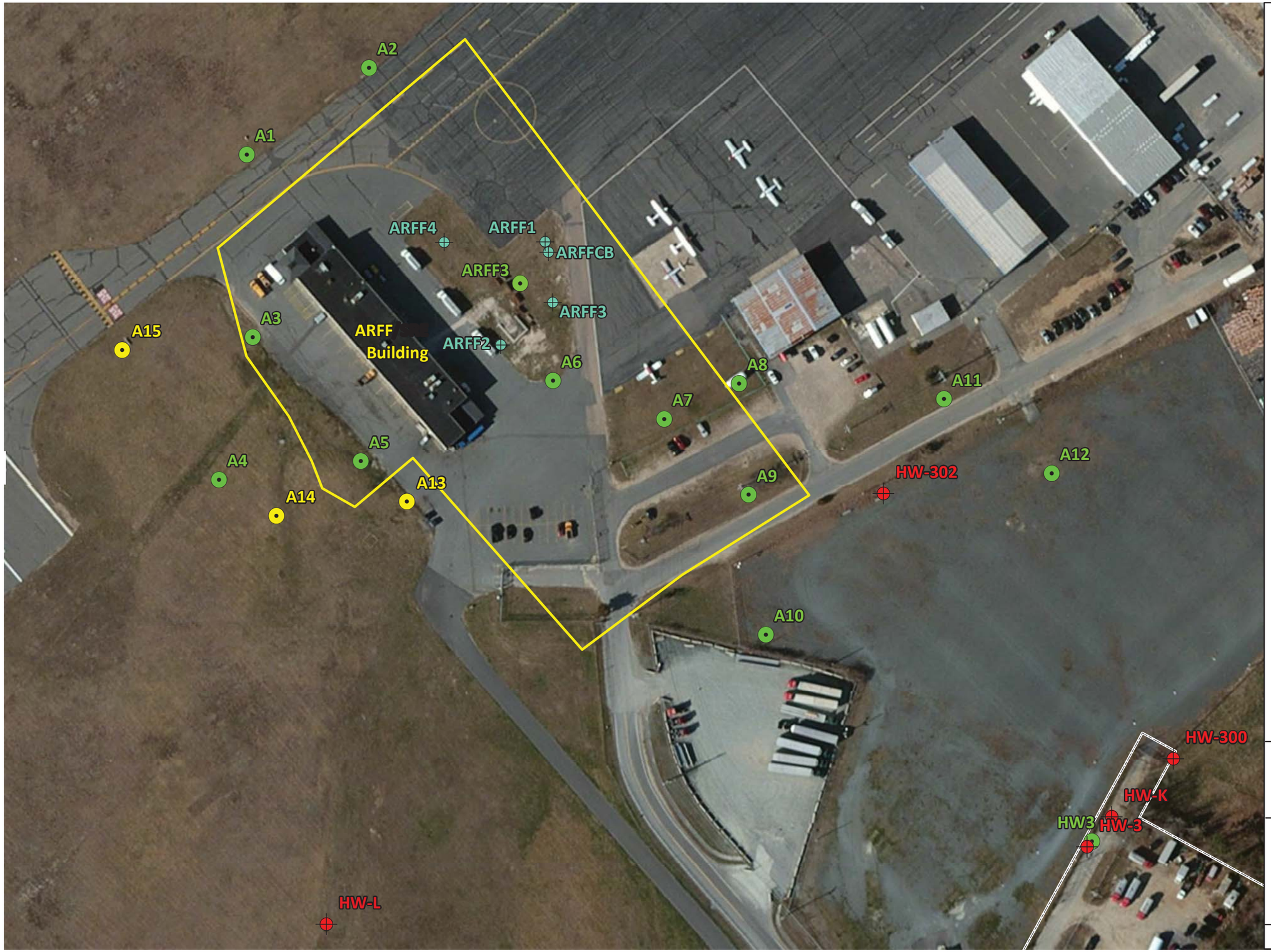

Legend

- 2017 PFAS Soil Samples
- 2018 PFAS Soil Samples
- 2019 PFAS Soil Samples
- Monitoring Wells
- Barnstable Municipal Airport Property Boundary
- Approximate Disposal Site Boundary for ARFF Building Area

N

0 100 Feet

1 inch = 100 feet

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PFAS Sampling Locations
ARFF Building Area
Barnstable Municipal Airport
Hyannis, MA

October 1, 2019 Figure 3-10

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

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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. The Airport has not used AFFF in any training exercises at the Airport since 2015. AFFF usage is only planned in the event of an emergency.

- In August 2020, the Airport implemented an Immediate Response Action to install a soil cap over an approximate 2.25-acre portion of the ARFF Building Area and the Deployment Area were AFFF was historically used. The caps will reduce infiltration in these areas to mitigate PFAS impacts to groundwater. In the ARFF Building Area, the cap consists of 4-inches of asphalt and in the Deployment Area the cap consists of a 30-mil geomembrane. Groundwater monitoring will be implemented after the cap completion to document the effectiveness.

- Continued assessment of the nature and extent of PFAS related to historic Airport operations is on-going. Assessment activities include the installation of soil borings and groundwater monitoring wells and the collection of samples for laboratory analysis.

1,4-Dioxane

- The Airport is currently investigating 1,4-dioxane in deep groundwater at the Airport. It is unclear if the detection of the 1,4-dioxane is related to historic Airport operations or from an off-site source. 1,4-dioxane has been detected in Airport monitoring well HW-L (Figure 3-11). 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 OHM from a historic floor drain (see below) 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 been closed or connected to a tight tank and/or directly to the sanitary sewer to meet EPA and MassDEP discharge requirements. According to the United States Environmental Protection Agency (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.

OHM Impacts on the North Ramp

- Previous environmental assessments at the Airport identified floor drain leaching pits associated with North Ramp (NRP) hangars and a leaking underground storage tank (UST) at the former Operations Building (OPS) as sources of soil and groundwater contamination with OHM on the North Ramp. Source area removal actions, including the removal of USTs at the former Operations Buildings, closure of leaching pits at the Cape Air Hangar, Hangar 2, and Griffin Hangar, and active soil and groundwater remediation have reduced or eliminated contaminants at these source areas. The release achieved closure consistent with the MCP in August 2020. The location of remaining OHM impacts is indicated on Figure 3-12.

The Airport will take measures for any future construction at the Airport to minimize/prevent preferential pathways for OHM to be discharged into the sub-surface.

HW-C
GP-2
Israel Pond
MD-4
Lamson Pond
Flint Rock Pond
Barnstable Fire Training Academy
GP-5
MD-3
MD-2
MD-1
Mary Dunn Pond
HW-N
HW-B (s,d)
HW-A (s,d)
1991 Drill location
HW-M
HW-D (m,d,dd)
HW-G (s,m,d)
Air-1
HW-O
SW-1
Upper Gate Pond
Lewis Pond
HW-401s
SW-2
SW-3
HW-1
HW-4 (m,d)
HW-5
HW-207d
HW-19d
HW-23
132
AFFF Deployment Location
HW-F
HW-E
HW-H
HW-J
HW-I (s,m,d)
Yarmouth Road
ARFF/SRE Building
HW-302
HW-301
HW-L
HW-3
HW-300
OW-18 (s,m,d)
HW-2
HW-K
OW-9 (s, m,d,dd)
OW-19d
ME-3
ME-1
ME-2
28
28
Barnstable Road

Legend

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

N

0 750

1 in = 750 feet

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Monitoring Well Locations
Barnstable Municipal Airport
Hyannis, MA

Date: 10/2/2019

Figure 3-11

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

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Path: K:\Projects\HYA\13039 North Ramp GW Remediation\GIS\Maps\Disposal Site Map.mxd

Legend

- Monitoring Wells
- Former Air Sparging Installation
- Former Soil Vapor Extraction Installation
- Former Remedial Additives Injection System and Air Sparging
- Approximate Area of Groundwater Contamination (above MCP GW-1 Standard)
- Groundwater Remediation System
- Groundwater Contour (from Phase II Report)
- Disposal Site Boundary
- Approximate Maximum Extent of Historic Groundwater Plumes

N

0 100

1" = 100 feet

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North Ramp
Disposal Site Map
Barnstable Municipal Airport
Hyannis, MA

Date: 6/23/2020 Figure 3-12

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Potential Contaminated Off-Site Locations

Based on information provided in an Environmental Database Report (**Appendix D**) dated December 17, 2019 for the Airport, potentially contaminated sites were identified within ASTM (formerly American Society for Testing and Materials)-1527-13 search distances as shown in **0.** The Airport will take measures to prevent/minimize impacts of future construction to off-site releases. Prior to construction, information regarding off-site releases of OHM in proximity to construction products will be reviewed to determine potential impacts. Impacts identified will be addressed prior to construction. The locations of potential off-site release areas are indicated on **Figure 3-13**.

Pollution Prevention

Spill Prevention, Control, and Countermeasure Plan (SPCCP)

The Airport's SPCCP identifies bulk fuel storage and transfer locations at Airport facilities and provides information critical to the prevention of, and response to, releases of OHM. The SPCCP was updated in January 2020. An Emergency Response Action Plan (ERAP) is attached to the Airport's SPCCP, and provides contact information for emergency personnel as well as local, state, and federal emergency response agencies. The SPCCP also includes release reporting information. The Airport's SPCCP also establishes personnel training requirements, outlines general spill response procedures, and contains standard operation procedures (SOPs) for Airport operations involving the transfer of OHM. Additionally, the Airport's On-Call Environmental consultant conducts yearly inspections to document compliance with the SPCCP.

Stormwater Pollution Prevention

The Airport filed a Notice of Intent (NOI) for stormwater discharges under the 2015 MSGP on August 28, 2015, designated as permit MAR053164. The SWPPP was updated in January 2020. In accordance with NPDES permit classifications, the Airport is designated as Standard Classification Code (SIC) 4581, "*Airports, flying fields, and Terminal Services*", Sector S "*Air Transportation Facilities.*" The SWPPP is designed to assist the Airport in identifying potential sources of stormwater pollutants on Airport property and minimizing or eliminating the potential for those pollutants to enter stormwater discharges from the airport. The SWPPP describes the existing stormwater drainage system, identifies potential pollutant sources and locations, and best management procedures (BMPs) and controls for the prevention of stormwater pollution, and establishes reporting and annual monitoring requirements.

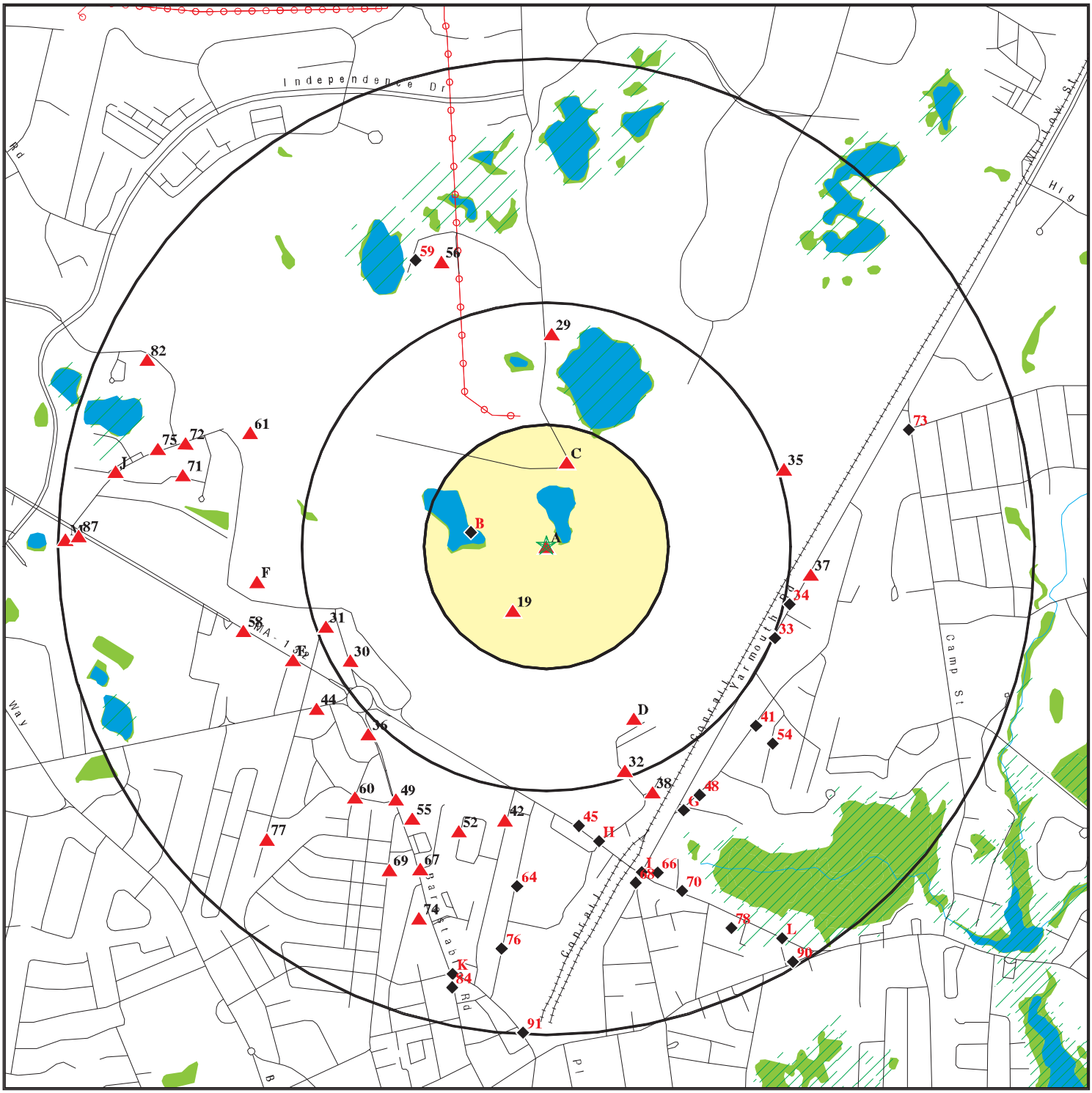
This SWPPP provides information critical to the prevention of stormwater pollution at the Airport, and includes discussions of both tenant and Airport operations, potential pollutants associated with those activities, and potential pollutant storage facilities. Additionally, the Airport's On-Call Environmental Consultant conducts yearly inspections to document compliance with the SWPPP. The Airport is responsible for maintaining approximately 300 catch basins which collect stormwater from various areas at the Airport. The majority of catch basins comprising the drainage system discharging to surface water also feature a sump to trap coarse solids and debris able to pass through the steel grate.

Table 3-6: Government Records Search

Standard Environmental Record Sources	ASTM-1527-13 Recommended Minimum Search Distance (mi)	Yes	No
Federal Delisted NPL Site List	0.5	☐	☒
Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) List	0.5	☐	☒
Federal CERCLIS No Further Remedial Action Planned (NFRAP) Site List	0.5	☐	☒
Federal Resource Conservation and Recovery Act (RCRA) Non- Corrective Action Sites (CORRACTS) Treatment, Storage and Disposal (TSD) Facilities List	0.5	☐	☒
State- and Tribal-Equivalent CERCLIS	0.5	☒	☐
State and Tribal Landfill and/or Solid Waste Disposal Site Lists	0.5	☐	☒
State and Tribal Leaking Storage Tank Lists	0.5	☒	☐
State and Tribal Voluntary Cleanup Sites	0.5	☐	☒
State and Tribal Brownfield Sites	0.5	☐	☒
Federal National Priorities List (NPL)	1	☐	☒
Federal RCRA Correction Action (CORRACTS) Facilities List	1	☐	☒
State- and Tribal-Equivalent NPL	1	☐	☒
Federal Institutional Control/Engineering Control Registries	Property Only	☐	☒
State and Tribal Institutional Control/Engineering Control Registries	Property Only	☐	☒
Federal Emergency Response and Notification System (ERNS) List	Property Only	☒	☐
Federal RCRA Generators List	Property/Adjoining Properties	☒	☐
State and Tribal Registered Storage Tank Lists	Property/Adjoining Properties	☒	☐

Source: Horsley Witten Group, Inc., 2019.

Overview Map of Release Sites and Facilities Using Oil and Hazardous Materials



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites

Indian Reservations BIA

Power transmission lines

Special Flood Hazard Area (1%)

0.2% Annual Chance Flood Hazard

National Wetland Inventory

State Wetlands

Areas of Critical Environmental Concern

FIGURE 3-13

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Barnstable Municipal Airport	CLIENT:	Horsley Witten Group, Inc.
ADDRESS:	480 Barnstable Road Hyannis MA 02601	CONTACT:	Josephine Ibanez
LAT/LONG:	41.669644 / 70.279965	INQUIRY #:	5908809.2s
		DATE:	December 17, 2019 3:25 pm

Most catch basins discharge to Vortechs hydrodynamic separators prior to discharging to either Upper Gate Pond or Lewis Pond (**Figure 3-14**). Stormwater not captured by the drainage structures generally infiltrates at the edge of the pavement surface.

Solid Waste

Solid waste is collected by Nauset Disposal and brought to the Barnstable Transfer Station located approximately 5.5 miles southwest of the Airport. Solid waste disposal is not a potential concern at the Airport.

3.2.10. Historical, Architectural, Archeological, and Cultural Resources

Historical, Architectural, Archeological, and Cultural Resources will be addressed under a future EA.

3.2.11. Light Emissions and Visual Impacts

Light Emissions and Visual Impacts will be addressed under a future EA.

3.2.12. Natural Resources and Energy Supply

Natural Resources and Energy Supply will be addressed under a future EA.

3.2.13. Noise

Noise will be addressed in the Airport Layout Plan as part of this Master Plan in Chapter 7, *Implementation Plan*.

3.2.14. Secondary (Induced) Impacts

Secondary impacts will be addressed under a future EA.

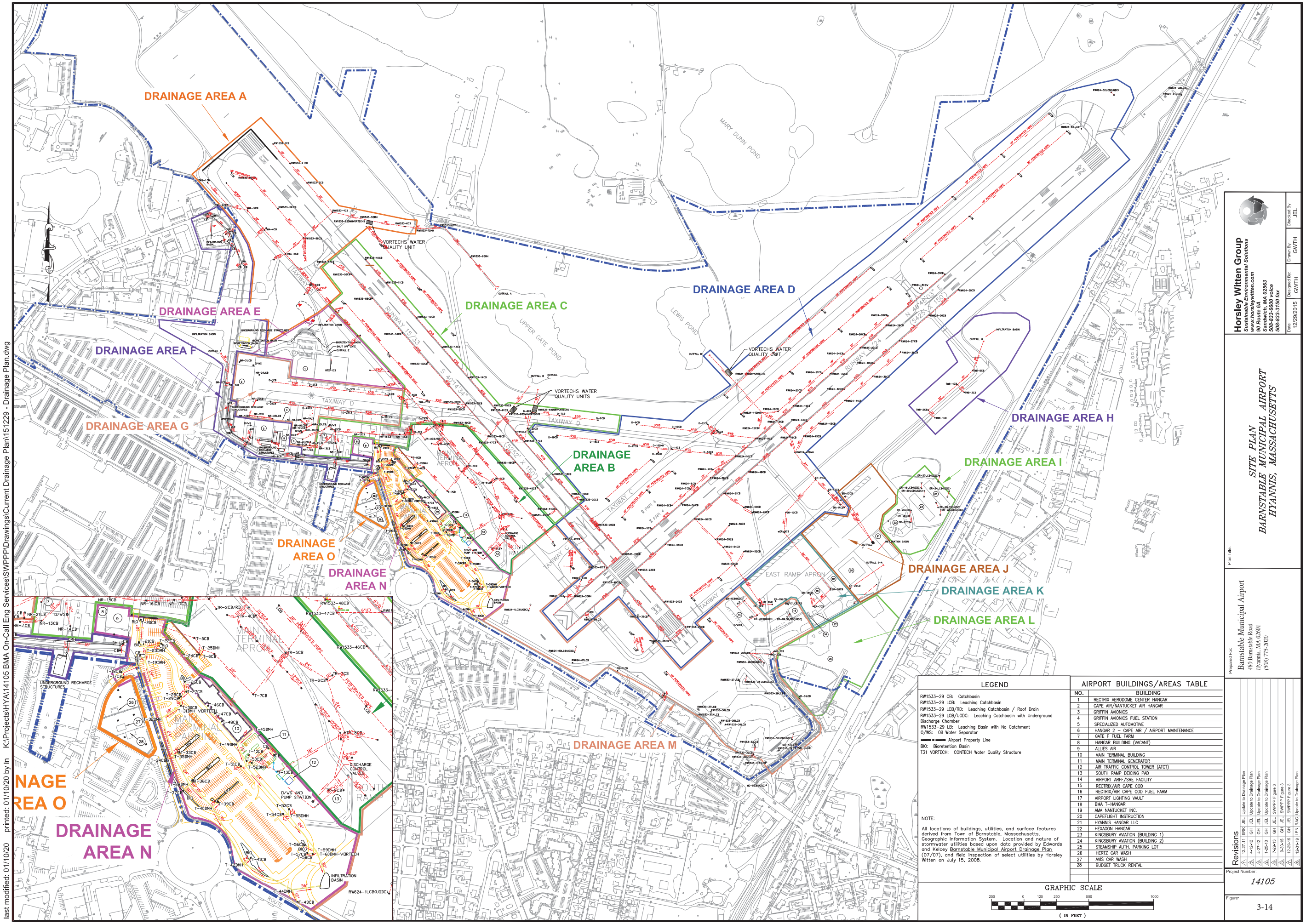
3.2.15. Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks

Socioeconomic impacts, environmental justice, and children's environmental health and safety risks will be addressed under a future EA.

3.2.16. Water Quality

Existing Conditions

All areas of Cape Cod are considered by the MCP as medium yield aquifers and by the EPA as sole source aquifers (**Figure 3-15**). All developed impervious areas and most developed open space areas within the Airport property are classified as medium yield non-potential drinking water source areas (see **Figure 3-15**).



LEGEND

RW1533-29 CB: Catchbasin
RW1533-29 LCB: Leaching Catchbasin
RW1533-29 LCB/RD: Leaching Catchbasin / Roof Drain
RW1533-29 LCB/UGDC: Leaching Catchbasin with Underground Discharge Chamber
RW1533-29 LB: Leaching Basin with No Catchment
O/WS: Oil Water Separator
Airport Property Line
BIO: Bioretention Basin
T31 VORTECH: CONTECH Water Quality Structure

NOTE:

All locations of buildings, utilities, and surface features derived from Town of Barnstable, Massachusetts, Geographic Information System. Location and nature of stormwater utilities based upon data provided by Edwards and Kelcey Barnstable Municipal Airport Drainage Plan (07/07), and field inspection of select utilities by Horsley Witten on July 15, 2008.

AIRPORT BUILDINGS/AREAS TABLE

NO.	BUILDING
1	RECTRIX AERODOME CENTER HANGAR
2	CAPE AIR/NANTUCKET AIR HANGAR
3	GRIFFIN AVIONICS
4	GRIFFIN AVIONICS FUEL STATION
5	SPECIALIZED AUTOMOTIVE
6	HANGAR 2 – CAPE AIR / AIRPORT MAINTENANCE
7	GATE F FUEL FARM
8	HANGAR BUILDING (VACANT)
9	ALLIES AIR
10	MAIN TERMINAL BUILDING
11	MAIN TERMINAL GENERATOR
12	AIR TRAFFIC CONTROL TOWER (ATCT)
13	SOUTH RAMP DEICING PAD
14	AIRPORT ARFF/SRE FACILITY
15	RECTRIX/AIR CAPE COD
16	RECTRIX/AIR CAPE COD FUEL FARM
17	AIRPORT LIGHTING VAULT
18	BMA T-HANGAR
19	AMA NANTUCKET INC.
20	CAPEFLIGHT INSTRUCTION
21	HYANNIS HANGAR LLC
22	HEXAGON HANGAR
23	KINGSBURY AVIATION (BUILDING 1)
24	KINGSBURY AVIATION (BUILDING 2)
25	STEAMSHIP AUTH. PARKING LOT
26	HERTZ CAR WASH
27	AVIS CAR WASH
28	BUDGET TRUCK RENTAL

GRAPHIC SCALE

250 0 125 250 500 1000

(IN FEET)

Horsley Witten Group
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Sandwich, MA 02563
508-833-6600 voice
508-833-3150 fax

Designed By: GWTH
Drawn By: GWTH
Checked By: JEL
Date: 12/29/2015

Plan Title:
SITE PLAN
BARNSTABLE MUNICIPAL AIRPORT
HYANNIS, MASSACHUSETTS

Prepared For:
Barnstable Municipal Airport
480 Barnstable Road
Hyannis, MA 02601
(508) 775-2020

Revisions

A	12-27-11	ERK	JEL Update to Drainage Plan
A	4-12-12	GH	JEL Update to Drainage Plan
A	4-27-12	GH	JEL Update to Drainage Plan
A	1-25-13	GH	JEL Update to Drainage Plan
A	7-29-13	GH	JEL SWPPP Figure 3
A	8-26-14	GH	JEL SWPPP Figure 3
A	12-29-15	GH	JEL SWPPP Figure 3
B	12-31-15	LEN	RAC Update to Drainage Plan

Project Number: 14105

Figure: 3-14

last modified: 01/10/20 printed: 01/10/20 by ln K:\Projects\HYA\14105 BMA On-Call Eng Services\SWPPP\Drawings\Current Drainage Plan\151229 - Drainage Plan.dwg

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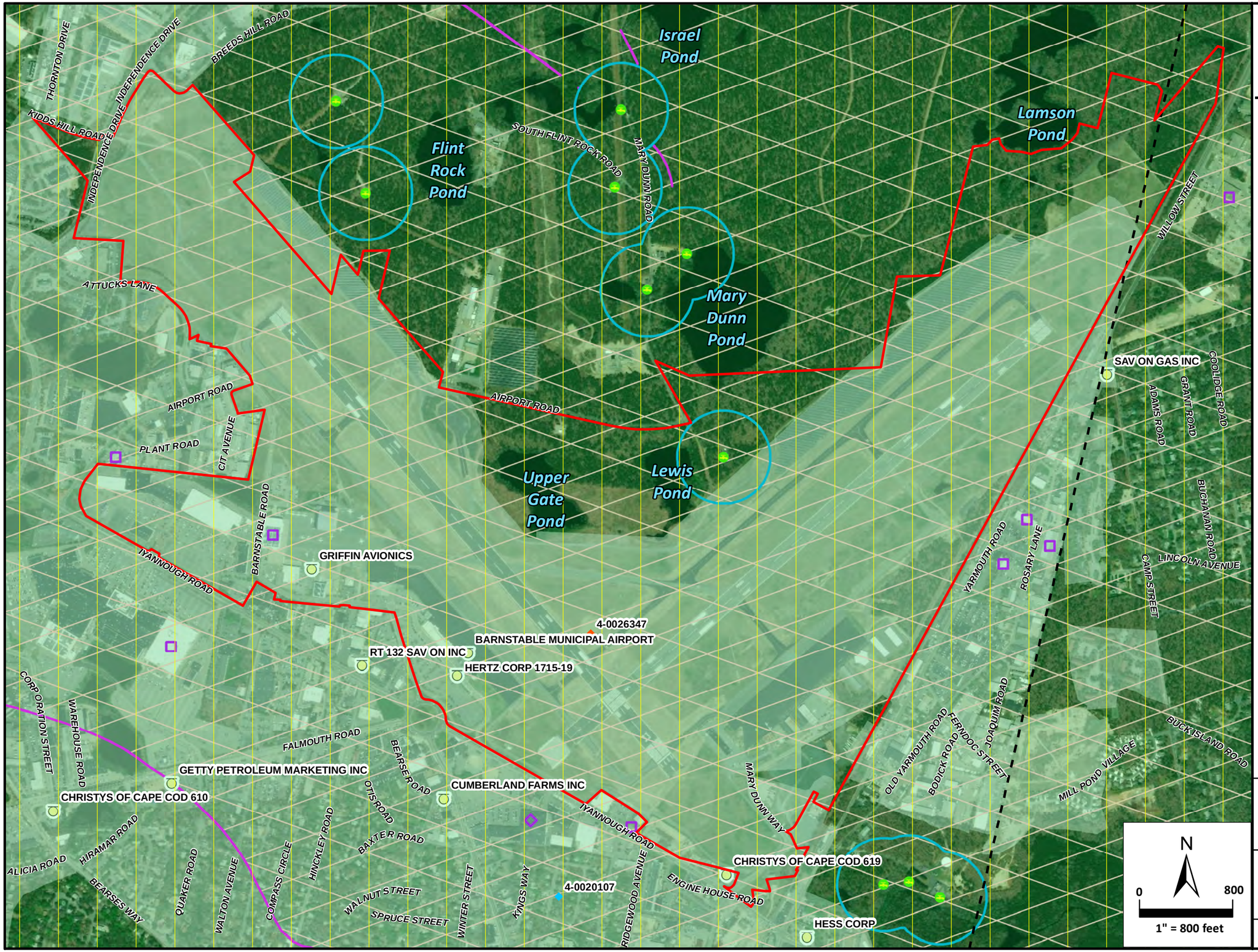

Legend

Barnstable Municipal Airport Property Boundary

Town Boundary

Community Groundwater Source

Chapter 21E Tier Classified Sites

TIER I

TIER II

TIER1D

Underground Storage Tanks

Underground Storage Tanks

Large Quantity Generators (LQG)

EPA/RCRA-regulated Hazard. Waste

MA-regulated Hazard. Waste

Aquifers

High Yield

Medium Yield

Sole Source Aquifers

Wellhead Protection Areas

DEP Approved Zone I

DEP Approved Zone II

Non Potential Drinking Water Source Area

High Yield

Medium Yield

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N

0 800

1" = 800 feet

Other Site Constraints
Barnstable Municipal Airport
Hyannis, MA

Date: 11/20/2019

Figure 3-15

*Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services

*2016 NAIP imagery service

Document Path: H:\Projects\HYA\19122 HYA Master Plan Update\GIS\Maps\191118_Regulated Areas.mxd

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Proposed Work

Pursuant to the Federal Clean Water Act (CWA), any project that would impact wetlands requires a Water Quality Certificate (WQC) to ensure that the project is in compliance with state water quality standards and regulations. The WQC is issued by MassDEP.

The NPDES Storm Water Program requires operators of large and small construction sites to obtain authorization to discharge storm water under an NPDES construction storm water permit.

Activities which may impact water quality include:

a. Wetland alteration
b. Soil disturbances
c. Increase of impervious area
d. Changes to existing drainage facilities
e. Impound, diverting, draining, controlling, or otherwise modifying the waters of any stream or other body of water

If any of the activities above, or other activities which may affect water quality, occur, appropriate measures must be taken in accordance with federal and state regulations to ensure negative impacts to water quality are minimized to meet regulatory standards.

The Airport will take measures to avoid and/or minimize activities which could impact water quality. Appropriate mitigation measures will be evaluated once a specific project is identified.

Massachusetts Integrated Waters list – 305(b)/303(d)

There are five waterbodies identified as impaired from the 2016 Massachusetts Integrated Waters List – 305(b)/303(d) near the Airport property (Figure 3-16). The data presented in Figure 3-16, available from MassGIS, is from the 2014 dataset, which has not yet been updated to reflect changes from the 2016 Massachusetts Integrated Waters List. The Massachusetts Year 2016 Integrated Waters List published in June 2017 was used in this review to determine water quality conditions at and surrounding the Airport. Nearby impaired waterbodies identified on the 2016 Massachusetts Integrated Waters List are detailed in Table 3-6.

Based on previous groundwater investigations, groundwater flows in a southeasterly direction from the Airport towards Lewis Bay.

The Maher Wellfield is located approximately 0.1-miles southeast from Airport property and consists of three production wells that supply 30 to 35 percent of the Town of Barnstable Water Supply Division service connections in Hyannis and Hyannis Port, in the town of Barnstable.

The Airport will take measures to avoid and/or minimize activities which could impact water quality. Appropriate mitigation measures will be evaluated once a specific project is identified.

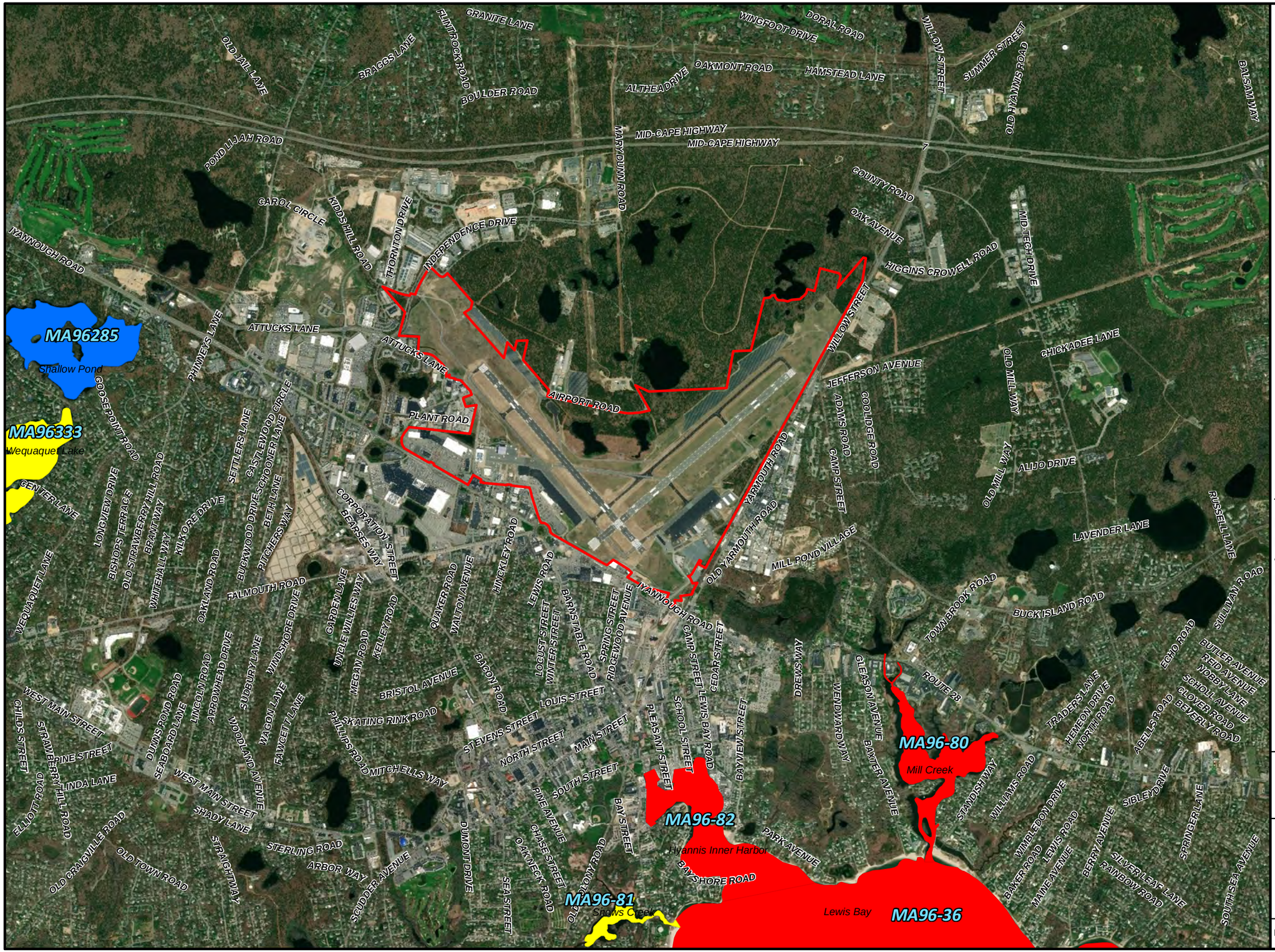
Table 3-7: Impaired Waterbodies Near the Barnstable Municipal Airport

Waterbody	Segment ID	Distance from Airport (miles)	Size	Category	Pollutants addressed by Total Maximum Daily Load (TMDL)	EPA TMDL No.
Wequaquet Lake	MA96333	1.4 West	576 acres	4A	(Non-native aquatic plants*)	N/A
					Mercury in Fish Tissue	33880
Mill Creek	MA96-80	0.8 Southeast	0.07 sq. miles	4A	Fecal Coliform	42365
					Nitrogen (Total)	64148
					Nitrogen (Total)	64149
Snows Creek	MA96-81	1.25 South	0.02 sq. miles	4A	Fecal Coliform	42361
Hyannis Inner Harbor	MA96-82	0.7 South	0.13 sq. miles	4A	Fecal Coliform	42357
					Nitrogen (Total)	64145
Lewis Bay	MA96-36	1.2 South/ Southeast	1.79 sq. miles	4A	Estuarine Bioassessments	64146
					Estuarine Bioassessments	64147
					Fecal Coliform	36771

Source: 2016 Massachusetts Integrated Waters List – 305(b)/303(d).

3.2.17. Wetlands

The northern portion of the Airport property supports four freshwater ponds and eleven isolated vegetated wetlands. The majority of these areas are shown on the compiled NWI Wetlands and MassDEP Wetlands Map (**Figure 3-17**), although additional isolated wetland areas were identified during the site survey. Wetland and aquatic resources are protected and regulated under several statutes, including the FCWA (33 U.S.C. 1251, *et seq.*), the Massachusetts Wetlands Protection Act (M.G.L. Ch. 131 § 40), the Town of Barnstable Wetlands Protection Bylaw (Chapter 237), and/or the CCC RPP. A brief description of these wetlands is provided below. A surveyed map of these areas is provided as **Appendix E**.



Legend

Barnstable Municipal Airport Property Boundary

2014 Integrated Waters List Data - 305(b)/303(d)

- 2 - Attaining some uses; other uses not assessed
- 3 - No uses assessed
- 4A -Impaired - TMDL is completed
- 4C - Impairment not caused by a pollutant
- 5 - Impaired - TMDL required

Note:
The data presented is from the 2014 Integrated Waters List dataset.The Massachusetts Integrated Waters list was updated in 2016. MA96-80, MA96-82, and MA96-36 have since been updated to be Category 4A - Impaired TMDL is complete.

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Integrated Waters
List Data - 305(b)/303(d)
Barnstable Municipal Airport
Hyannis, MA

Date: 1/6/2020

Figure 3-16

*Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services

*2016 NAIP imagery service

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Legend

- Barnstable Municipal Airport Property Boundary
- Field Delineated Wetlands
- Identified Wetlands
- NHESP Certified Vernal Pools
- Potential Vernal Pools
- NHESP Priority Habitats of Rare Species
- NHESP Estimated Habitats of Rare Wildlife
- Freshwater Wetlands
- Open Water

N

0 500 1,000 Feet

1 inch = 850 feet

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Wetlands
Barnstable Municipal Airport
Hyannis, MA

Date: 10/8/2020

Figure 3-17

*Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services

*2016 NAIP imagery service

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Ponds

The two ponds in closest proximity to the active Airport areas are Upper Gate Pond (to the west) and Lewis Pond (to the east), with surface areas of roughly 5.7 acres and 4.4 acres, respectively. Situated at the base of steep, densely forested embankments, the ponds are separated by a wide area of forested upland and are not hydrologically connected through any surface water features. A series of stormwater outfalls discharge into these ponds. The southern half of Upper Gate and Lewis Ponds fall within the Airport's RVZ, where the vegetation is maintained as a low-growing scrub shrub community.

Upper Gate Pond and Lewis Pond are heavily vegetated with submerged aquatic and emergent species that cover at least half, if not more, of the surface of the ponds during the growing season.

Wetland plant communities in Upper Gate Pond and Lewis Pond range from aquatic floating-leaved plants such as water lily (*Nuphar lutea*), water shield (*Brasenia schreberi*), and various pondweeds (*Potamogeton* spp.) in the central portions of the ponds bounded by narrow, steeply sloping vegetated banks. Neither pond exhibits characteristics of a classic coastal sandplain pond community.

Narrow, discontinuous bands of Bordering Vegetated Wetland (BVW)/Freshwater Wetland encircle the two ponds. Tree species along the banks and within these wetland areas are dominated by willow (*Salix* spp.) and red maple (*Acer rubrum*) with occasional tupelo (*Nyssa sylvatica*). Dominant shrub species include fetterbush (*Leucothoe racemosa*), sweet pepperbush, northern arrowwood (*Viburnum dentatum*), winterberry (*Ilex verticillata*), maleberry (*Lyonia ligustrina*) highbush blueberry, inkberry, nannyberry (*Viburnum lentago*), and European buckthorn (*Frangula alnus*). Poison Ivy (*Toxicodendron radicans*) is found in patches throughout the wetland areas, and common greenbrier is particularly dense along the ponds' edges, often forming near impenetrable thickets. Groundcover species include clumps and patches of sheep laurel (*Kalmia angustifolia*), and occasional clumps of sensitive fern (*Onoclea sensibilis*).

While situated within typically undisturbed forested areas, there are some existing impacts within the 100-foot buffer zones to these two ponds and within the ponds themselves: the remains of an aircraft can be found near the outfall at Lewis Pond, and concrete rubble is located along the southern and eastern shores of Upper Gate Pond and southern shore of Lewis Pond creating steep irregular embankments. Erosion and scouring of the areas beneath the outfalls are evident. It should also be noted that these two freshwater ponds have historically, and will continue to, serve as the receptors for stormwater discharge from the Airport property (in accordance with required permits).

In addition to Upper Gate and Lewis Ponds, portions of Mary Dunn Pond and Lamson Pond and/or their peripheral vegetated wetland plant communities extend onto Airport property. Mary Dunn Pond, the largest of the four ponds has a surface area of approximately 19.2 acres, and as noted above, supports a classic Coastal Plain Pondshore Community consisting of narrow

concentric bands of vegetation that can provide habitat for some of Massachusetts' rare plant species, some of which occur only on coastal plain ponds such as this (see Section 3.2.7 above). Lamson Pond, located to the northeast, is a somewhat irregularly shaped pond that also supports Coastal Plain Pondshore characteristics.

Isolated Vegetated Wetlands

Horsley Witten Group identified eleven isolated freshwater depressions located within the forested areas north of the airfield (near Runway 24 threshold), and south of Lamson Pond and Mary Dunn Pond. These isolated wetland areas range in size from a few hundred square feet to more than a quarter acre in size. One larger isolated wetland is located in the far northeastern corner of the Airport property and is greater than one half an acre; the smallest isolated wetland area encountered just south of Mary Dunn Pond, may not be jurisdictional regionally.

Generally, these freshwater wetlands are situated in a kettle hole-like depression supported by varying amounts of standing water at the time of the fall-winter 2019-2020 field evaluations. Vegetation within these freshwater wetlands is similar to that observed within the BVW/Freshwater wetlands around Upper Gate Pond and Lewis Pond, including a surrounding canopy of red maple and eastern white pine (*Pinus strobus*) along with gray birch (*Betula populifolia*). Open areas in the central portions of these wetlands also commonly support sphagnum moss (*Sphagnum* spp.).

One of the isolated wetlands located near the existing solar farm differs in plant species composition in that it is dominated instead by a patch of common reed (*Phragmites australis*), a non-native invasive wetland plant species. It appears that these isolated wetlands are located outside of the existing runway protection zone

Approximately one third of these isolated wetland areas are identified as potential vernal pools by the Massachusetts NHESP (see **Figure 3-7**), although most of these isolated wetlands exhibit similar characteristics and may also serve to provide potential vernal pool habitat.

The Airport will take measures to avoid and/or minimize activities which could impact water quality. Appropriate mitigation measures will be evaluated once a specific project is identified.

3.2.18. Wild and Scenic Rivers

As indicated in 1050.1F Desk Reference, Wild and Scenic Rivers are those rivers having remarkable scenic, recreational, geologic, fish, wildlife, historic, or cultural values as defined by the Wild and Scenic Rivers Act. If the FAA is taking an action that would physically impact resources covered by the Wild and Scenic Rivers Act, there may be consultation requirements under the Act.

Both the NWSR System and the NRI were reviewed for this environmental overview. The proposed work is not located within 5 miles of a designated Wild and Scenic River as determined by the NWSR System and/or of a river segment identified in the NRI (see **Figure 3-4**) and as such, there will be no impact to designated or potential Wild and Scenic Rivers.

3.3. REFERENCES

Swain, P.C. 2020. Classification of the Natural Communities of Massachusetts. Version 2.0. Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries and Wildlife. Westborough, MA.

Massachusetts Division of Fisheries & Wildlife, Massachusetts Natural Heritage and Endangered Species Program Fact Sheets (various).