Belfast Municipal Airport

Airport Master Plan Update

Phase I Report – Final

January 2026

McFARLAND JOHNSON

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Belfast Municipal Airport

Airport Master Plan Update

Chapter 1 – Inventory

McFARLAND JOHNSON

1. INVENTORY

1.1. INTRODUCTION

This inventory chapter provides an overview of the Belfast Municipal Airport (BST or the Airport), including its location and ownership, recent airport development, meteorological conditions, existing airport facilities, aviation activity, airspace and air traffic control, and land use and zoning. Please see the technical supplement in **Appendix A** for detailed definitions of FAA standards and a glossary of abbreviations and acronyms used throughout this document.

This information was obtained through on-site investigations of the Airport, interviews with Airport personnel, and a review of published information as of November 2024. Information was also obtained from available planning documents and studies concerning the Airport and surrounding areas. The information presented in this chapter serves as the basis for the development of aviation forecasts as well as the baseline data to be used in Chapter 4, *Facility Requirements*.

This chapter is organized into the following sections:

- Introduction
- Airport Background
- Recent Airport Development
- Meteorological Conditions and Climate
- Existing Airport Facilities
- Aviation Activity
- Airspace and Air Traffic Control
- Land Use and Zoning

1.2. AIRPORT BACKGROUND

1.2.1. Airport Location and Details

The Airport is located approximately two miles south of the city of Belfast. The City of Belfast owns and operates the Airport. The FAA ARP coordinates identify the geometric center of the Airport at 48° 24' 33.8" north latitude and 69° 0' 42.6" west longitude and the Airport encompasses approximately 218 acres.

1.2.2. Roadway Access

The Airport is accessible from the east and west via U.S. Route 1 which connects to Lower Congress Street and then to Wright Brothers Drive. Perkins and Herrick Road connect to Lower Congress Street from the south, and from the north, the Airport is accessible via Route 1 and Congress Street to Lower Congress Street.

1.2.3. Airport Classification and Level of Service

The NPIAS identifies nearly 3,000 public-use airports that are included in the national airport system. This includes the roles they serve, and the amounts and types of airport development eligible for federal funding under the AIP over the next five years. The FAA identifies BST as a local airport, which supplements local communities by providing access to markets within a state or immediate region. Local airports are most often located near larger population centers, but not necessarily in metropolitan or micropolitan areas.

1.3. RECENT AIRPORT DEVELOPMENT

The Airport's current list of AIP-funded projects is provided in **Table 1-1**.

Table 1-1: BST AIP Funded Projects

Fiscal Year	Project	AIP Federal Funds
2018	Construct Taxiway	$3,211,222
2021	Construct or Improve Fuel Farm	$575,761
2023	Seal Apron Pavement Surface/Pavement Joints	$20,000
2023	Seal Runway Pavement Surface/Pavement	$149,239
2023	Seal Taxiway Pavement Surface/Pavement	$5,000

Source: FAA, 2024.

1.4. METEOROLOGICAL CONDITIONS AND CLIMATE

1.4.1. Climate

Weather plays an important role in adequate planning for an airport. Temperature and wind are essential factors in determining runway length and orientation. The need for navigational aids and lighting is determined by the percentage of time that visibility is impaired due to cloud cover or other conditions. The hottest month of the year in Belfast is July, with an average high temperature of 81 degrees Fahrenheit[1] The month with the coldest average temperature of 10 degrees, and the most snow in Belfast is January with a monthly average of 18 inches of snow.[2]

1.4.2. Ceiling and Visibility

Chapter 3 of the *Aeronautical Information Manual* Table 3-1-1 identifies IFR and VFR minimums. Due to the unavailability of wind data from the AWOS-AV at BST, meteorological data was obtained through the NCDC consisting of 10 years of hourly observations and environmental conditions reported by the ASOS located at Bangor International Airport (BGR). This data was analyzed to explore the Airport's ceiling, visibility, and wind conditions. Over the last 10 years, the Airport was in VFR conditions approximately 74 percent of the time, and in IFR conditions approximately 26 percent of the time. VFR applies when the cloud ceiling is greater than 3,000 feet and the visibility is greater than five statute miles. IFR applies when ceilings are at 500 feet to less than 1,000 feet

[1] Reilly, W. (2021, November 30). DOT/FAA/TC-21/43, *Future Climate Scenarios for Runway Length: Assessment of Future Temperature and Precipitation Trends*.

[2] www.usclimatedata.com, accessed November 22, 2024.

and/or the visibility of less than three statute miles.

1.4.3. Wind Coverage

The orientation of runways is primarily a function of wind velocity and direction taken together with the ability of aircraft to operate under adverse conditions. The runway at an airport is aligned as closely as possible with the direction of the prevailing winds. The crosswind component is the vector of wind velocity and direction, which acts at an angle to the runway. Runway wind coverage refers to the percentage of time in which operations can safely occur given crosswind components. The FAA has established that the runway should provide acceptable crosswind conditions 95 percent of the time, based on different allowable crosswind components that are derived from the RDC for each runway. Wind coverage was not available for BST, and the closest airport in the vicinity was Bangor International Airport (BGR). Wind coverage can be seen in **Figure 1-1**, and **Figure 1-2**.

1.5. EXISTING AIRPORT FACILITIES

This section is divided into two subsections: airside and landside. The airside facilities include runways and taxiways, while the landside facilities are associated with the transition from air to land transportation. Existing conditions at the Airport are provided in **Figure 1-3.**

1.5.1. Airside Facilities

1.5.1.1. Runway

Per the Airport Master Record, BST has one primary runway, Runway 15-33. Runway data for the Airport can be found in **Table 1-2.** Per the 2019 MaineDOT System Plan, the Runway 15-33 PCI was reported to be between 85 and 70, or in "satisfactory" condition.

Table 1-2: BST Runway Data

Runway	15 / 33
Surface	Asphalt
Dimensions	4,000' x 100'
Runway Strength	30,000 lbs. Single Wheel
Pavement Condition	Good
Markings	Non-Precision / Non-Precision
Lighting	MIRL
End Elevation	197.5' / 158.5'
Approach Minimums	1 SM / 1 SM
Visual Approach Aids	REIL / REIL
Instrument Approach Aids	GPS, LPV / GPS, LPV
CFR Part 77 Category	NPI / NPI

Sources: FAA ADIP, effective October 31st, 2024, and McFarland Johnson analysis, 2024.

1.5.1.2. Taxiways

There are five taxiways at BST. Taxiways A, B, C, D1 and D2. Taxiway details can be found in the subsections below.

Taxiway A

Taxiway A is a partial-parallel taxiway providing access to the approach end of Runway 15. It measures 25 feet wide and is approximately 2,500 feet long. The majority of Taxiway A has an FAA standard separation from the Runway 15-33 centerline of 240 feet. A portion of Taxiway A between Taxiway B and C is only 200 feet from the Runway 15-33 centerline and is not lit. The remaining portion of Taxiway A that meets FAA standard separation is lit with MITL. In addition, Taxiway A has two instances of wide expanse of pavement at the runway-taxiway interface, which are a non-standard condition noted in FAA AC 150/5300-13B Change 1, *Airport Design*. The two locations are at the intersection of Taxiway C and Taxiway A, along with the intersection of Taxiway B and Taxiway A.

Taxiway B

Taxiway B is an entrance/exit taxiway measuring 40 feet wide and approximately 150 feet long and is lit with MITL. It is located approximately midway from each runway end and provides access to the Lowe Hangar and T-hangars. Taxiway B also has a non-standard condition of wide expanse of pavement at the runway-taxiway interface, as noted in FAA AC 150/5300-13B, Change 1.

Taxiway C

Taxiway C is an entrance/exit taxiway measuring 35 feet wide and approximately 400 feet long and is lit with MITL. Taxiway C provides direct apron to runway access which is noted as a non-standard condition identified in FAA AC 150/5300-13B, Change 1.

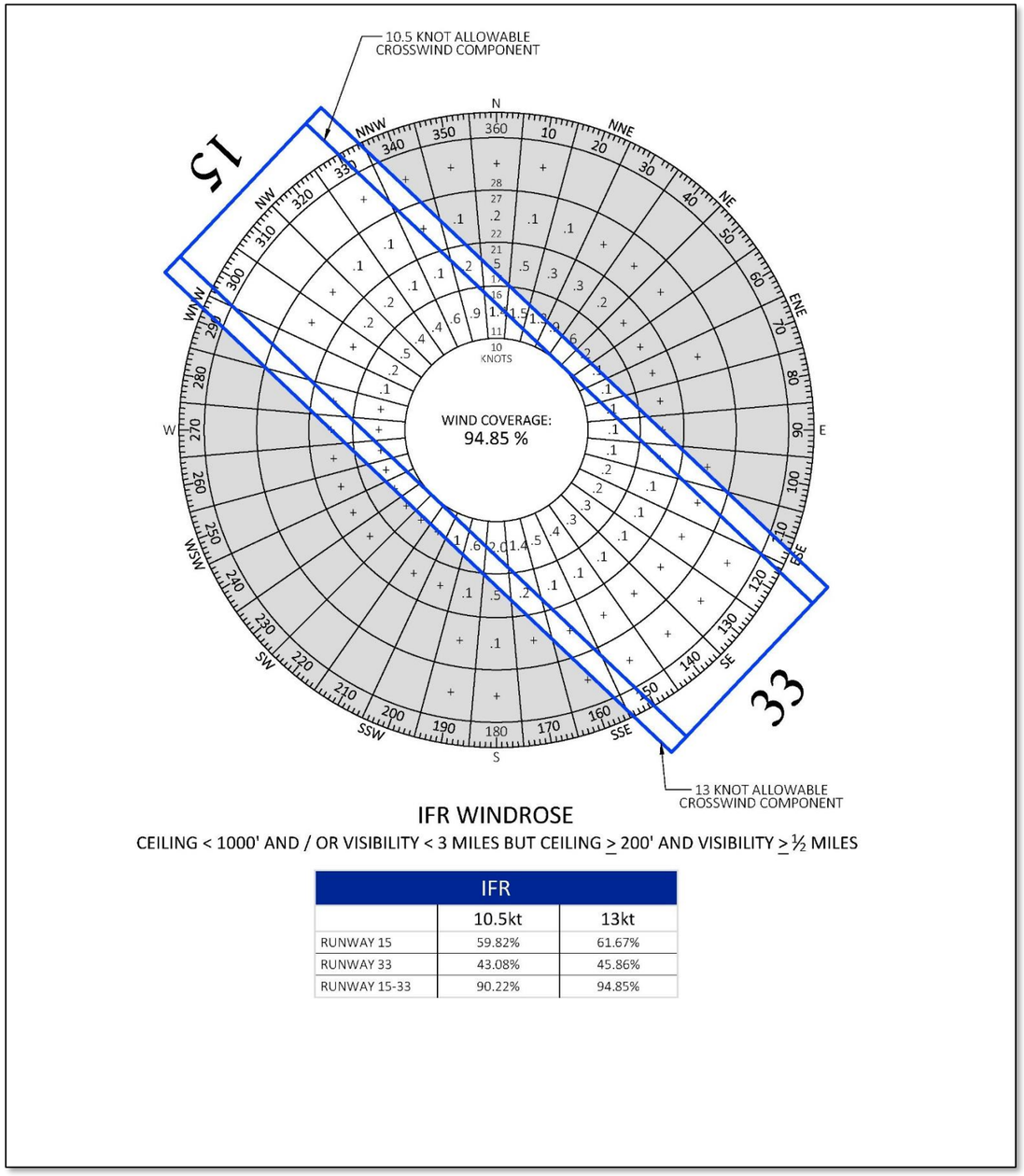
Taxiway D1/D2

Taxiway D1/D2 is a taxiway turnaround for aircraft departing from Runway 33 to exit the runway and perform their runup procedures while remaining clear of the runway. It measures 25 feet wide, approximately 460 feet long, is separated 240 feet from Runway 15-33, and is lit with MITL.

1.5.1.3. AWOS

BST has an AWOS-AV system that provides altimeter settings and visibility information to pilots. It is located near the center of Runway 15-33 toward the southwest of the runway. There are plans to upgrade the existing AWOS-AV to an AWOS-III which would add wind data, temperature, dew point, density altitude, and cloud/ceiling data. Per FAA JO 6550-20C, *Siting Criteria for Automated Weather Observing Systems,* wind sensors must be mounted 30 to 33 feet above the average ground height within the critical area's 500-foot radius. All obstructions (vegetation, buildings, etc.) must be at least 15 feet lower than the height of the wind sensor within the 500-foot radius, and at least 10 feet lower than the height of the wind sensor from 500 to 1,000-foot radius. Visibility sensors require that forward and backscatter-type sensors have no obstructions (buildings, etc.) within a horizontal distance of 50 feet that would cause the surrounding air mass to be non-uniform in nature. MaineDOT and the Airport are planning to re-locate the new AWOS-III to the location shown in **Figure 1-3.**

Figure 1-1: IFR Wind Coverage



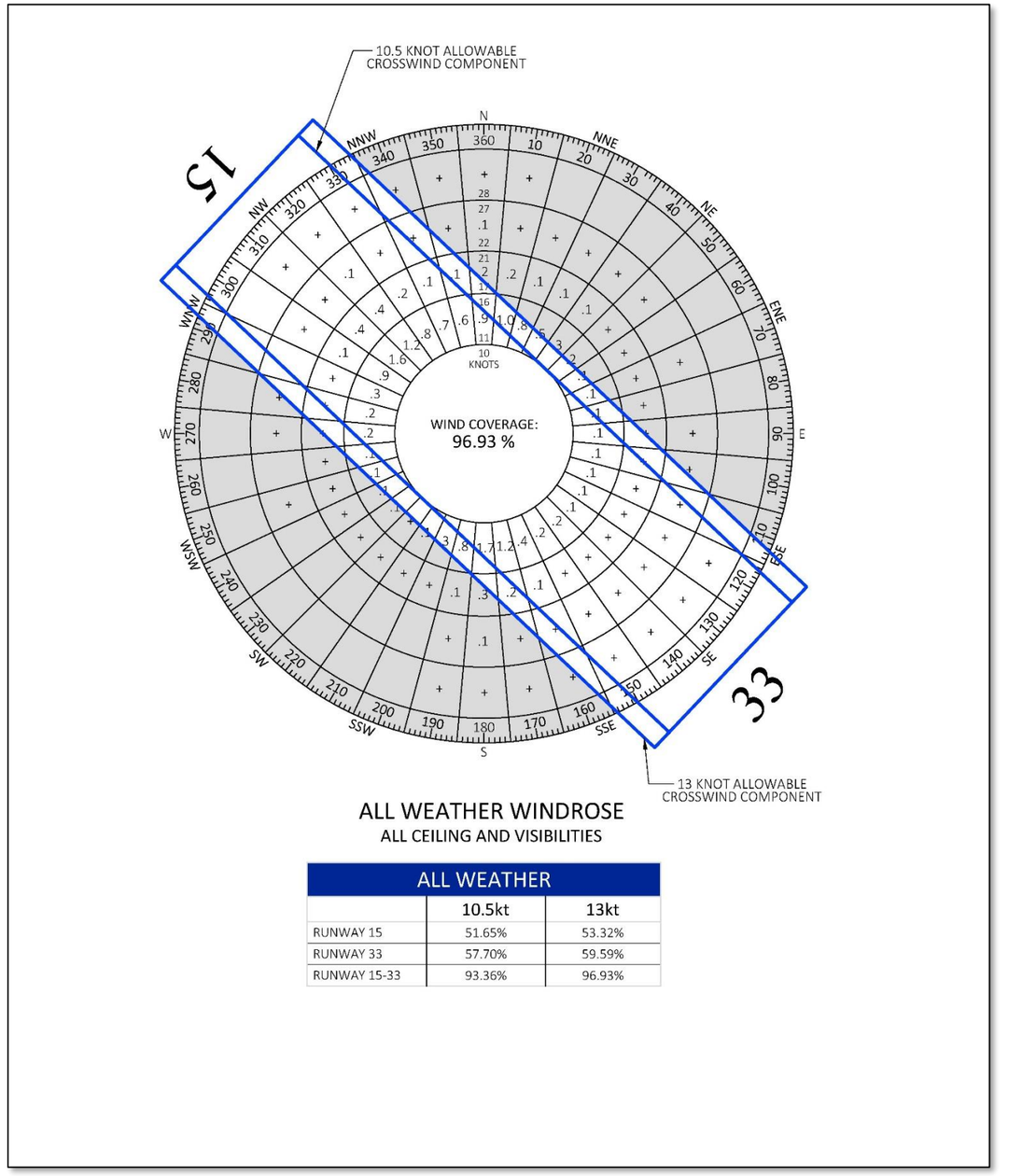
IFR WINDROSE

CEILING < 1000' AND / OR VISIBILITY < 3 MILES BUT CEILING ≥ 200' AND VISIBILITY ≥ ½ MILES

IFR		
	10.5kt	13kt
RUNWAY 15	59.82%	61.67%
RUNWAY 33	43.08%	45.86%
RUNWAY 15-33	90.22%	94.85%

Source: Bangor International Airport 2014-2023 (Station: 726070).

Figure 1-2: All-Weather Wind Coverage



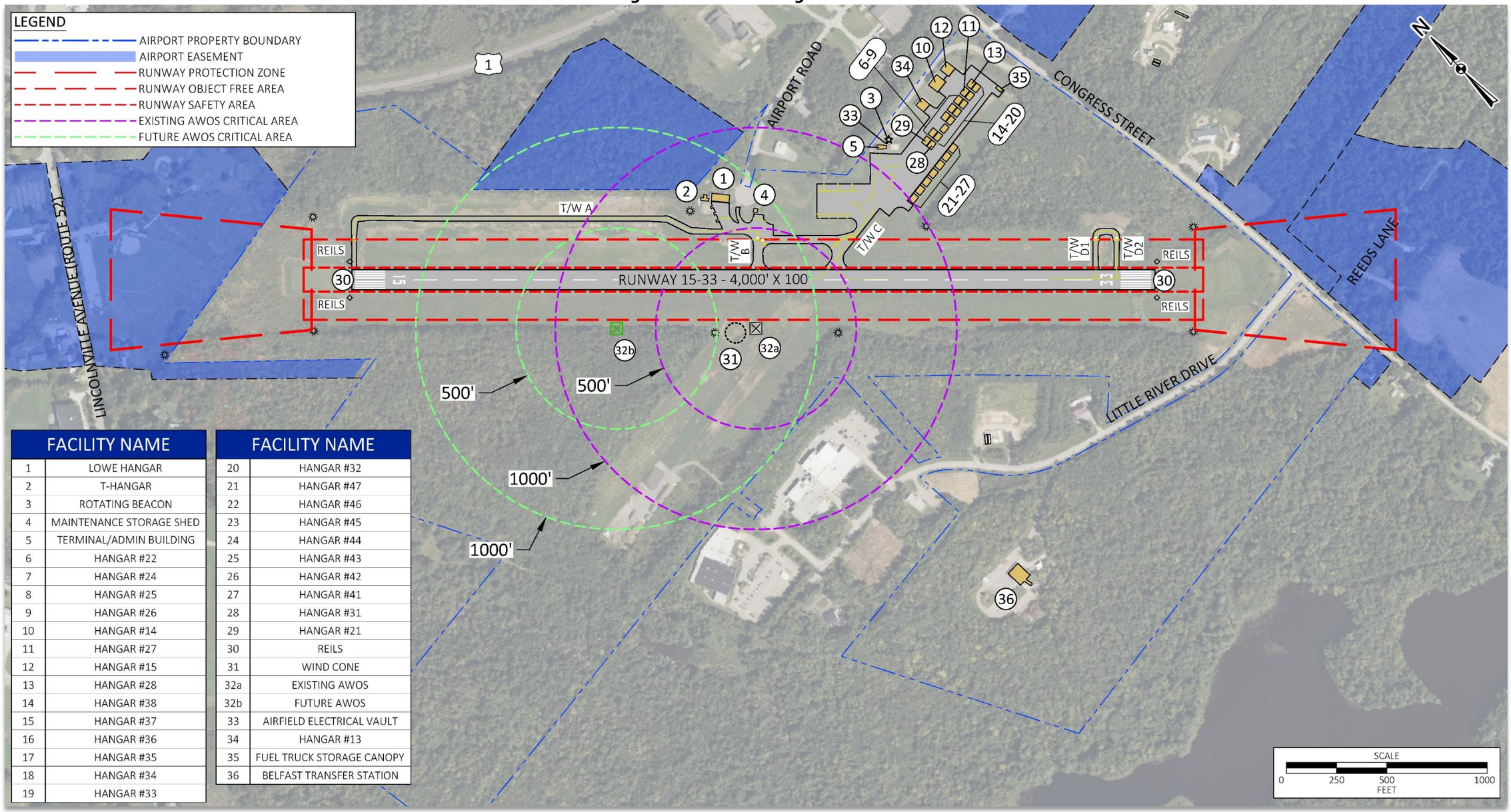
ALL WEATHER WINDROSE

ALL CEILING AND VISIBILITIES

ALL WEATHER		
	10.5kt	13kt
RUNWAY 15	51.65%	53.32%
RUNWAY 33	57.70%	59.59%
RUNWAY 15-33	93.36%	96.93%

Source: Bangor International Airport 2014-2023 (Station: 726070).

Figure 1-3: BST Existing Conditions



FACILITY NAME	
1	LOWE HANGAR
2	T-HANGAR
3	ROTATING BEACON
4	MAINTENANCE STORAGE SHED
5	TERMINAL/ADMIN BUILDING
6	HANGAR #22
7	HANGAR #24
8	HANGAR #25
9	HANGAR #26
10	HANGAR #14
11	HANGAR #27
12	HANGAR #15
13	HANGAR #28
14	HANGAR #38
15	HANGAR #37
16	HANGAR #36
17	HANGAR #35
18	HANGAR #34
19	HANGAR #33

FACILITY NAME	
20	HANGAR #32
21	HANGAR #47
22	HANGAR #46
23	HANGAR #45
24	HANGAR #44
25	HANGAR #43
26	HANGAR #42
27	HANGAR #41
28	HANGAR #31
29	HANGAR #21
30	REILS
31	WIND CONE
32a	EXISTING AWOS
32b	FUTURE AWOS
33	AIRFIELD ELECTRICAL VAULT
34	HANGAR #13
35	FUEL TRUCK STORAGE CANOPY
36	BELFAST TRANSFER STATION

Source: McFarland Johnson, 2024.

1.5.1.4. Visual and Navigation Aids

Both ends of Runway 15-33 are supported by REILS. There is one wind cone with a segmented circle located next to the AWOS-AV shown in **Figure 1-3.**

1.5.1.5. Instrument Approach Procedures

An instrument approach procedure is a set of predetermined maneuvers using electronic navigational or visual aids that assist pilots in locating and landing or departing from an airport, particularly in bad weather. BST has two published instrument approach procedures. The approaches available are RNAV approaches that utilize LPV, and Runway 15 has a ceiling minimum of 289 feet, while Runway 33 has a ceiling minimum of 250 feet. Both Runway 15 and Runway 33 have visibility minimums of one statute mile.

1.5.2. Landside Facilities

Landside facilities and services include the terminal, hangars, aircraft parking, and utilities. Hangars 13-15, 21-38, and 41-47 are privately owned, the Lowe Hangar, T-hangar, maintenance storage shed, and terminal/administration building are owned by the City of Belfast.

The Airport is working with the FAA to change the land use of the Belfast Transfer Station, as shown in **Figure 1-3,** from aeronautical to non-aeronautical use at the time of this Master Plan writing.

1.5.2.1. Terminal/Administration Building

The terminal/administration building is approximately 510 square feet and can be seen in **Figure 1-4.** The building offers administration space, a flight planning area, and a restroom. Airport management has indicated that the terminal building is constrained during peak periods and is not ADA compliant.

Figure 1-4: BST Terminal Building

Source: McFarland Johnson, 2024.

1.5.2.2. Aircraft Hangars

There are 27 aircraft hangars at BST, all of which are conventional, or box hangars. Four of the conventional hangars are larger box hangars capable of supporting larger aircraft, and the remaining 22 conventional hangars vary in size and can each support a single light piston-engine aircraft or possibly two ultralight aircraft. There is one T-hangar at the Airport. Airport management has indicated five privately owned hangars may be constructed at the Airport in the future. Dimensions for the existing hangars are shown in **Table 1-3.**

Table 1-3: Hangar Areas

Hangar	Aircraft Storage SF	Total SF
Building 13	2,700	2,700
Building 14	3,800	3,800
Building 15	3,000	3,000
Building 21-28	1,200	1,200
Building 31-38	1,120	1,120
Building 41-47	1,344	1,344
Lowe Hangar	4,000	4,000
T-Hangar	682	682

Source: Airport management and McFarland Johnson analysis, 2024.

1.5.2.3. Aircraft Aprons

The Airport has two aircraft aprons, located northeast of the runway and taxiways. The first apron is located southwest of the terminal/administration building, is 3,589 square yards, and has six marked tie-down locations.

The second apron is located west of the terminal/administration building and is 5,214 square yards. This apron has seven marked tie-downs, three of which are for larger aircraft. Both aprons were reported to be in satisfactory condition with a PCI value of 70 noted in the 2019 MaineDOT Pavement Study.

1.5.2.4. Vehicle Parking

There is one parking lot located east of the terminal/administration building which has 19 spaces, including one handicapped space.

1.5.2.5. Perimeter Fencing

BST has limited perimeter fencing around the Airport. Fencing is located around the terminal area, the parking lot, and fuel tanks.

1.5.2.6. Airport Utilities

The following utilities provide service to the Airport, there is no sanitary sewer service provided, and a septic tank and leach field is used for the terminal/administration building. Additionally, the building is heated with a heat pump.

- Electric: Central Maine Power
- Water: City of Belfast
- Internet: Lincolnville Communications

1.5.3. Support Facilities

Airport support facilities include fueling facilities, maintenance, and snow removal equipment.

1.5.3.1. Aviation Fueling Facilities

BST recently installed 100LL and Jet-A fuel tanks southeast of the terminal/administration building which includes one 10,000-gallon 100LL tank, and one 10,000-gallon Jet-A tank. The project was completed with a final inspection in August 2023. Fuel demand is shown in **Table 1-4.** The fuel tanks can be seen in **Figure 1-5**.

Table 1-4: BST Fuel Demand

	Jet A (Gallons)	100LL AvGas (Gallons)
Existing Storage Supply	10,000	10,000
2024 Peak 7-day Demand	57	316
2024 Peak 14-day Demand	115	631

Sources: BST airport management and McFarland Johnson analysis, 2024.

Figure 1-5: BST Fuel Tanks

Source: McFarland Johnson, 2024.

1.5.3.2. Maintenance and Snow Removal Equipment

BST has one small airfield maintenance storage shed measuring 400 square feet. The shed is used for storage by the Airport.

The City of Belfast provides personnel and equipment for snow removal throughout the winter season. Per FAA AC 150/5220-20A, *Airport Snow and Ice Control Equipment*, with less than 10,000 operations per year and greater than 30 inches of annual snowfall, it is recommended the Airport have one high-speed rotary plow supported by two snowplows. However, the AIP Handbook states the Airport is eligible for one snow removal carrier vehicle along with a 1,600-square-foot building to store the vehicle.

1.6. AVIATION ACTIVITY

Information on aviation activity was gathered from different sources, which include both FAA TFSMC, and GARD data, which provides a summary of total aircraft operations using sound recording equipment. Based aircraft information and operational data on record with the FAA was verified to be correct by Airport management.

1.6.1. Based Aircraft and Annual Operations

The Airport has 27 based single-engine aircraft, all stored in hangars. BST also reports 1,938 GARD operations from January-December 2023, which is the last full year of operations data. VFR operations are often not counted towards the FAA TFMSC, as these flights typically do not file flight plans.

1.6.1.1. Existing Lease Agreements

According to Airport management, the 27 hangars at the Airport have a private ground lease with the Airport. Ground leases occur when the Airport leases the space for hangar development, and the Airport collects revenue for each lease. Each ground lease agreement is with the City of Belfast.

1.6.1.2. Fixed Base Operator

There is no FBO at the Airport. The City of Belfast provides fueling, tie-down, and parking services at the Airport through the Airport manager. There are two specialized aviation service operators (SASO) that provide flight training at the Airport. The second SASO is schedule to start operating in spring 2025.

1.7. AIRSPACE AND AIR TRAFFIC CONTROL

There is no air traffic control tower at BST. Airspace in the U.S. is classified as controlled, uncontrolled, or special use. A detailed explanation of different airspace classes can be found in **Appendix A** Section A.2. The airspace surrounding BST is Class G airspace from the surface to 700 feet above the surface of the Airport, where Class E airspace starts. Class G airspace is uncontrolled. Class E airspace is controlled airspace up to 14,500 feet MSL. The closest Class C airport is Bangor International Airport (BGR). The closest Class D airport is Augusta Regional Airport (AUG.) The closest class B airport is Boston Logan International Airport (BOS). An MOA, referred to as Deepwoods, is located

northeast of BST. Deepwoods is used for training operations. To view the airspace surrounding the Airport, refer to **Figure 1-6.**

1.8. LAND USE AND ZONING

When considering improvement projects that meet airport development goals, it is important early in the planning process to identify potential impacts on existing land uses on and off Airport property, and in the surrounding area. This will help determine how potential airport projects will affect future land use and development patterns. This will enable a plan to integrate measures into future Airport development to avoid potential land use conflicts and zoning issues when feasible. Land use elements such as noise, height restrictions and obstructions, and safety of persons and property on the ground are examined to provide guidelines for the compatibility of airport operations with the surrounding locale.

Figure 1-7 shows the zoning map for the City of Belfast. The Airport is zoned as A-BP (Airport Business Park).

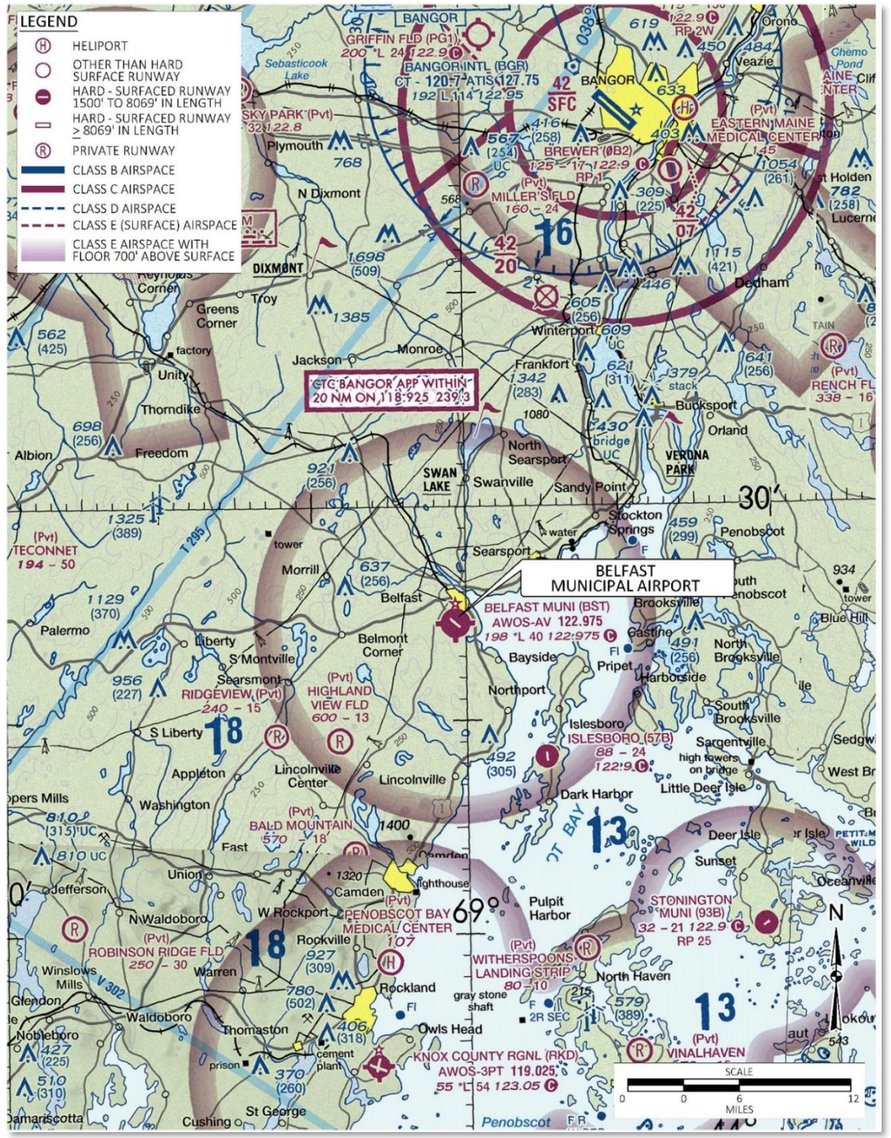
- Residential and Downtown Commercial are located to the north of the Airport.
- Rural Zoning is located to the south of the Airport.
- Airport Growth, Office Park, and Mixed-Use are located to the west of the Airport.
- Mixed-Use and Residential are located to the east of the Airport.

In 2023, the City of Belfast proposed an overlay district for the Airport to protect approaches to both runway ends, and the City Council enacted the Airport Overlay District on September 5th, 2023.

1.8.1. Developable Land

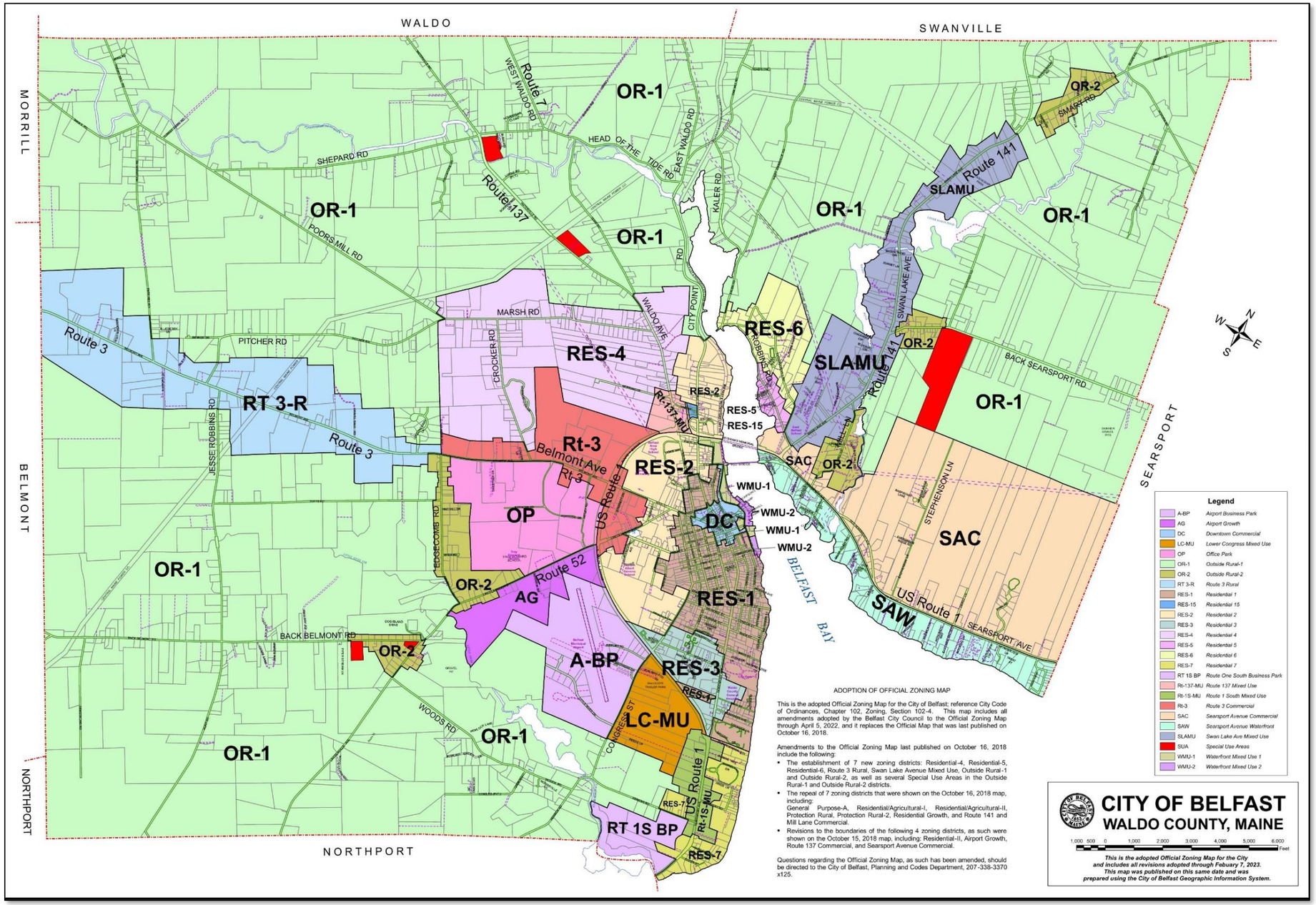
A review of potential aeronautical and non-aeronautical land uses is shown in **Figure 1-8**, which includes approximately six acres of potential aeronautical development on the northern portion of the Airport, and approximately 89 acres of non-aeronautical development located at the southern, eastern, and western portions of the Airport. Portions of potential non-aeronautical development are not included where the future AWOS will be located to keep buildings outside the 1,000-foot AWOS critical area.

Figure 1-6: BST Airspace Map



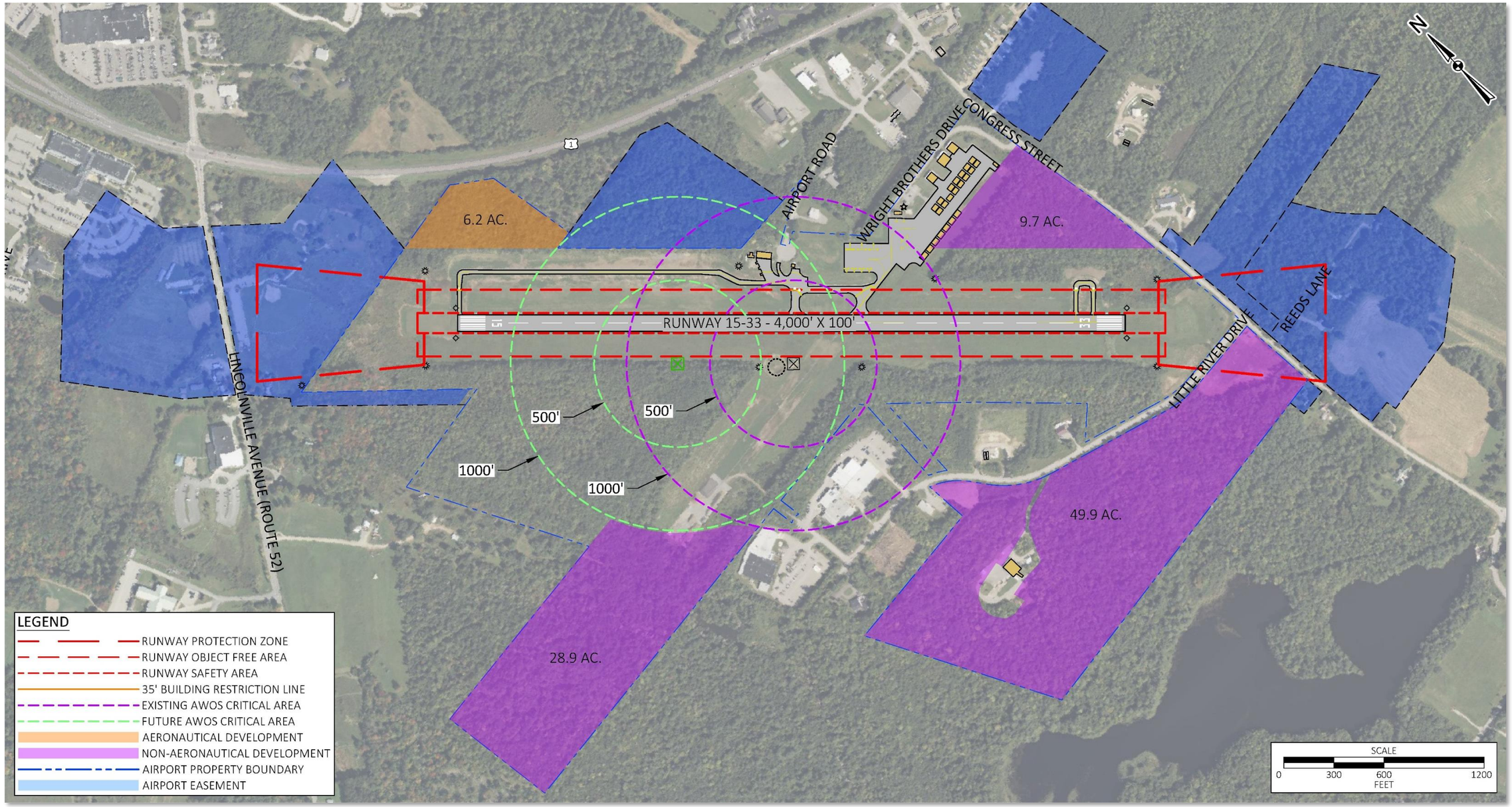
Source: SkyVector, 2024.

Figure 1-7 : City of Belfast Zoning Map



Source: City of Belfast, 2022.

Figure 1-8: Aeronautical and Non-Aeronautical Potential Land Uses



Source: McFarland Johnson, 2024.

Belfast Municipal Airport

Airport Master Plan Update

Chapter 2 – Environmental Overview

McFARLAND JOHNSON

2. ENVIRONMENTAL OVERVIEW

The operation and development of an airport have the potential to affect neighboring land uses and natural and human environments, which are of fundamental concern in the airport planning process. Therefore, it is imperative to identify the resources and potential impacts on the environment and the surrounding community during the initial stages of the planning process. This allows airport planners and engineers to incorporate measures in accordance with federal, state, and local rules and regulations to avoid, minimize, or mitigate potential impacts on the environment.

The National Environmental Policy Act (NEPA) of 1970 requires that all federal agencies consider their projects' and policies' potential impacts on the environment. To ensure airport development complies with NEPA, the FAA, an agency of the USDOT, developed FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*. The Order describes the environmental review process and identifies environmental categories that must be addressed prior to the implementation of a federal action at an airport, including the funding of a development project. The current version of FAA Order 5050.4B, dated April 28, 2006, in conjunction with FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, dated July 16, 2015, provides guidance for reviewing and documenting the effects airport development projects have on the environment. FAA Orders 5050.4B and 1050.1F identify specific environmental categories that must be considered in relation to a proposed action to determine whether a significant impact would result and, if so, determine what measures would be appropriate to avoid or minimize an impact's effect. FAA Order 1050.1F specifies the threshold of significance for each of the categories addressed. The following is a list of environmental impact categories, identified in Order 1050.1F, that may be relevant to FAA actions:

- Biotic Resources (including plants, fish, and wildlife)
- Water Resources (including wetlands, surface waters, wild and scenic rivers, floodplains, and groundwater)
- Coastal Resources
- Department of Transportation Act, Section 4(f) Resources
- Historic and Cultural Resources (including architectural, archaeological, and cultural resources)
- Farmlands
- Land Use
- Noise
- Visual Effects
- Air Quality
- Hazardous Materials and Solid Waste
- Energy
- Climate
- Socioeconomics and Environmental Justice (including children's environmental health and safety risks)

This chapter provides a summary of the environmental conditions and constraints at the Belfast Municipal Airport (BST or the Airport). The information provided in this chapter will be considered as part of the alternatives analysis that will be completed for this Master Plan Update. Future airport development proposed will be reviewed in further detail in the subsequent environmental documentation to satisfy the requirements of NEPA and required permit applications. The information provided in this chapter is based on information obtained from appropriate federal, state, and local agencies along with publicly available information. Agency coordination is documented in **Appendix B**.

2.1. BIOTIC RESOURCES

2.1.1. Plant Communities

A field review of the Airport was performed in January 2025, during which general habitat characteristics were documented. The Airport consists of managed grasslands, with more frequently mowed grass surrounding the runways, taxiways, and other paved surfaces, and taller grass areas mowed less frequently further from paved surfaces. There are multiple areas of upland forests throughout, dominated by big tooth aspen (*Populus grandidentata*), American beech (*Fagus grandifolia*), and white pine (*Pinus strobus*). Shrubby upland areas were dominated by honeysuckle (*Lonicera spp*), raspberry (*Rubus idaeus*), blackberry (*Rubus allegheniensis*), goldenrods (*Solidago spp)*, and asters.

The field review also identified potential wetlands on Airport property which are covered in more detail in Section 2.2. The majority of these wetlands were forested wetlands that exhibited microtopographic relief, had multiple dead standing trees (referred to as snags), and were dominated by red maple (*Acer rubrum*), gray birch (*Betula populifolia*), honeysuckle, cinnamon fern (*Osmundastrum cinnamomeum*), sensitive fern (*Onoclea sensibilis*), and sphagnum mosses.

The Airport property was reviewed by the Maine Natural Areas Program (MNAP) for the potential presence of rare and unique botanical features. According to the review, dated January 14, 2025, there were no rare or unique botanical features identified within the Airport.

2.1.2. Threatened and Endangered Species

2.1.2.1. State-Listed Species

The Airport property and surrounding areas were reviewed by the Maine Department of Inland Fisheries and Wildlife (MDIFW) on January 24, 2025, for state-listed rare species with the potential to occur on Airport property or in the vicinity and designated essential and significant wildlife habitat as defined by the Maine Natural Resources Protection Act (NRPA), which are listed below in **Table 2-1.** The review of state-listed species is preliminary, and additional consultation would be required prior to any future development to further refine potential impacts.

2.1.2.2. Federally Listed Species

The US Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) database query was completed to identify potential federally listed rare species on Airport property. According to the IPaC Resource List (**Appendix B**), the Airport is located within the documented range for two federally listed species, one proposed endangered species, and one proposed threatened species.

Table 2-1: Rare Species and Significant Wildlife Habitat

Species/Habitat	Status
Little brown bat (*Myotis lucifugus*)	Endangered
Northern long-eared bat (*Myotis septentrionalis*)	Endangered
Eastern small-footed bat (*Myotis leibii*)	Threatened
Tricolored Bat (*Perimyotis subflavus)*	Threatened
Big brown bat *(Eptesicus fuscus)*	Special concern
Red bat *(Borealis)*	Special concern
Hoary bat *(Lasiurus cinereus)*	Special concern
Silver-haired bat *(Lasionycteris noctivagans)*	Special concern
Deer wintering area	Significant Wildlife Habitat
Inland Waterfowl/Wading Bird Habitat (IWWH)	Significant Wildlife Habitat

Source: MDIFW response letter dated 01/24/2025.

The northern long-eared bat (*Myotis septentrionalis*) is a federally endangered bat species that occurs throughout forested regions of the eastern and north-central United States and all Canadian provinces from the Atlantic coast west to the southern Northwest Territories and eastern British Columbia. During the summer and portions of the fall and spring, northern long-eared bats may be found roosting singly or in colonies underneath bark, in cavities, or in crevices of both live trees and snags, or dead trees. Northern long-eared bats spend winter hibernating in caves and mines, called hibernacula. They use areas in various sized caves or mines with constant temperatures, high humidity, and no air currents. Consultation with USFWS would be required for any proposed impacts on northern long-eared bat habitat, and avoidance and minimization measures may need to be incorporated into the project.

The tricolored bat (*Perimyotis subflavus*) is a proposed federally endangered species that occurs throughout the eastern and central United States and portions of southern Canada, Mexico, and Central America. During the non-winter months, tricolored bats are found in forested habitats where they roost in trees, primarily among leaves of live or recently dead deciduous hardwood trees, but may also be found in Spanish moss, pine trees, and occasionally human structures. During the winter, tricolored bats are often found in caves and abandoned mines, although, where caves are sparse, tricolored bats are often found roosting in road-associated culverts where they exhibit shorter torpor bouts and forage during warm nights. If the tricolored bat is listed as endangered, consultation with USFWS would be required for any proposed impacts to the tricolored bat habitat. Avoidance and minimization measures may need to be incorporated into the project for the tricolored bat if it is listed under the ESA.

The monarch butterfly (*Danaus plexippus*) was proposed for listing as threatened under the Endangered Species Act in December 2024. Monarch butterflies are migratory pollinators that feed on the nectar of many flowers during breeding and migration, but they lay eggs on milkweed plants as that is the only food the caterpillars can eat. If the monarch is listed, consultation with USFWS would be required for any proposed impacts to its habitat. Avoidance and minimization measures may need to be incorporated into the project for the monarch if it is listed under the ESA.

2.2. WATER RESOURCES

2.2.1. Wetlands

The National Wetland Inventory (NWI) online Wetlands Mapper tool was used as a resource to identify mapped wetlands in the vicinity of the Airport. This is a preliminary tool, used prior to the development of any specific projects; a formal wetland delineation will be required prior to the construction of any future projects. Based on results from the NWI mapper, one palustrine emergent wetland (PEM) is north of Runway 15, a palustrine scrub-shrub wetland (PSS) is mapped to the east of Runway 15, a palustrine forested wetland (PFO) west of Runway 15 that is bisected by a linear pond and stream that flows south beyond the Airport boundary, and an intermittent stream running parallel to the Airport boundary along Lower Congress Street. PEMs are a type of freshwater wetland that is dominated by emergent vegetation, such as grasses, shrubs, trees, and sedges. PSS is a type of freshwater wetland dominated by woody vegetation less than 20 feet tall. Lastly, palustrine forested wetlands are dominated by woody vegetation that is 20 feet tall or higher.

A field survey of the Airport was performed in January 2025 by McFarland Johnson, during which potential wetlands were identified, and some previously delineated wetlands were reviewed. This effort did not constitute a jurisdictional wetland delineation per the 1987 United States Army Corps of Engineers *Wetlands Delineation Manual* (1987 USACE Manual) and 2012 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (2012 Regional Supplement). Potential wetlands identified during the field survey effort are listed in **Table 2-2** and shown on **Figure 2-1** and would need to go through a jurisdictional delineation for confirmation.

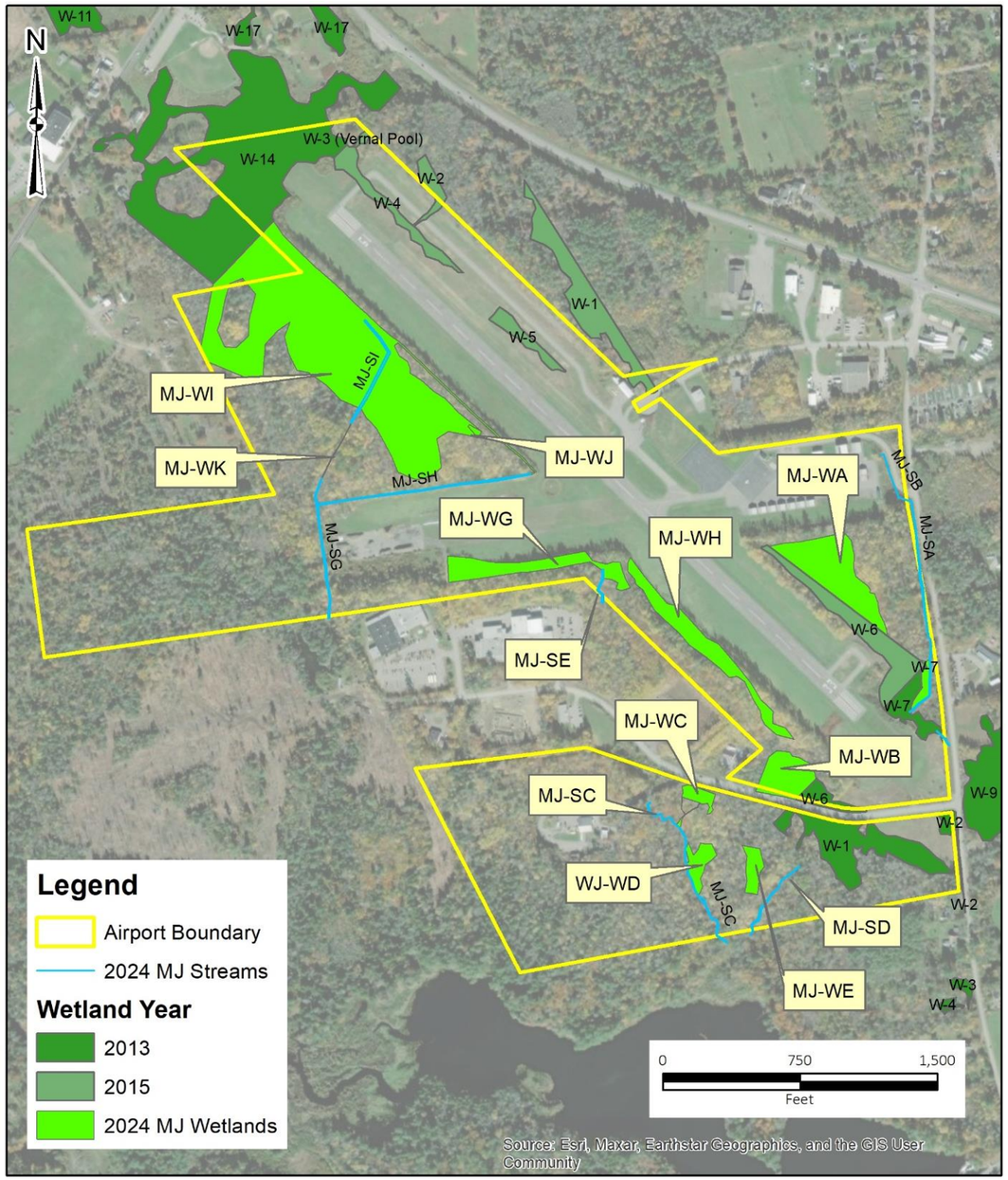
2.2.2. Surface Waters

Surface waters were also identified during the January 2025 field survey, as shown in **Table 2-3** and **Figure 2-1**. Perennial streams have water flowing year-round, intermittent streams have water flowing during certain times of the year, such as spring and fall but lack flow in dry seasons, and ephemeral streams only contain flow following rain events. There is a surface water immediately south of the Airport, known as Belfast Reservoir #1, which is subject to the Maine Shoreland Zoning Act, which applies a 250-foot buffer to the normal high-water line of any great pond or river. There are no surface waters in Belfast referenced in the Maine DEP Chapter 502: Direct Watersheds of Lakes Most at Risk from New Development and Urban Impaired Streams.

2.2.1. Wild and Scenic Rivers

There are no federally designated Wild and Scenic Rivers within the vicinity of the Airport.

Figure 2-1: Observed Potential Wetland Locations



Source: 2025 McFarland Johnson field survey, 2013 and 2015 wetland delineations.

Table 2-2: Identified Wetlands and Potential Wetlands

Wetland Identifier	Wetland Type	Acres
2013 W-1	PFO	3.17
2013 W-2	PEM	0.29
2013 W-3	PFO	0.17
2013 W-4	PFO	0.10
2013 W-5	PFO	0.02
2013 W-6	PFO	0.56
2013 W-7	PSS	0.89
2013 W-8	PFO	2.37
2013 W-9	PFO	4.84
2013 W-10	PFO	0.17
2013 W-11	PFO	3.09
2013 W-12	PSS	0.49
2013 W-13	PFO/PEM	7.35
2013 W-14	PEM/PSS/PFO	16.61
2013 W-15	PFO	1.33
2013 W-16	PFO	0.04
2013 W-17	PEM/PSS/PFO	2.82
2015 W-1	NP	2.90
2015 W-2	NP	0.53
2015 W-3	Vernal Pool	0.08
2015 W-4	NP	1.19
2015 W-5	NP	0.64
2015 W-6	NP	2.30
MJ-WA	PSS/PFO	6.32*
MJ-WB	PFO	1.90*
MJ-WC	PEM/PFO	0.35
MJ-WD	PFO	0.54
MJ-WE	PFO	0.46
MJ-WF	N/A	N/A
MJ-WG	PSS/PFO	1.76
MJ-WH	PSS	2.00
MJ-WI	PFO	17.00**
MJ-WJ	PUB/PVP	0.05
MJ-WK	PEM	0.03

PEM – Palustrine Emergent; PFO – Palustrine Forested; PSS - Palustrine Scrub Shrub, PUB – Palustrine Unconsolidated Bottom, PVP – Potential Vernal Pool, NP – Not Provided, * wetland overlaps with previously delineated wetland, ** wetland continues beyond Airport boundary.

Source: 2025 McFarland Johnson field survey, 2013 and 2015 wetland delineations.

Table 2-3: Identified Streams and Surface Waters

Stream Identifier	Stream Type	Length (ft)
MJ-SA	Perennial	1,329*
MJ-SB	Intermittent	338
MJ-SC	Perennial	1,022
MJ-SD	Perennial	488
MJ-SE	Intermittent	202
MJ-SG	Perennial	781
MJ-SH	Intermittent	1,173
MJ-SI	Perennial	664

Source: 2025 McFarland Johnson field survey.

** Length does not include portions of the stream with diffuse flow through wetlands*

2.2.2. Floodplains

According to the National Flood Hazard Layer produced by the Federal Emergency Management Agency (FEMA), which represents the current effective flood data for the country, the majority of the Airport is mapped within an area of minimal flood hazard (Zone X), with the northernmost portion of the area north of Runway 15 in flood zone A, which is a 1 percent annual chance flood hazard.

2.2.3. Groundwater

The Airport is not located over a state-mapped significant sand and gravel aquifer, or over an EPA-designated sole source aquifer.

2.3. COASTAL RESOURCES

The Airport, located in the City of Belfast, is located within the Maine Coastal Zone and is therefore subject to the Maine Coastal Program. The Coastal Zone Management Act (CZMA) of 1972 is administered by the NOAA Office of Coastal Management. The Maine Coastal Program was approved by NOAA in 1978 and grants Maine the authority to review federal activities, federal license or permit activities, and federally funded activities (aka federal actions) within the coastal zone to ensure the federal action meets the program's "enforceable policies". Therefore, any federal action that occurs on Airport property is subject to review by the Maine Coastal Program and will require a federal consistency review.

2.4. DEPARTMENT OF TRANSPORTATION ACT, SECTION 4(F) RESOURCES

Section 4(f) of the U.S. DOT Act of 1966 (now codified at 49 U.S.C. § 303) protects significant publicly owned parks, recreational areas, wildlife and waterfowl refuges, and public and private historic sites. There are no wildlife or waterfowl refuges in the vicinity of the Airport. The Walsh Field Recreation Area is a municipally owned park located adjacent to the Airport to the north. The park has a baseball field, a softball field, restroom facilities, and a dog park. The dog park has water, benches, a covered shelter in each enclosure, and separate areas for large and small dogs. The trailhead for the Little River Community Trail is located here. The Little River Community Trail is a 5-mile-long trail that spans from the Hutchinson Center to the north, connects to the Walsh Field Recreation Area, along the western boundary of the Airport and the Belfast Reservoir #2, continuing southeast and ending at the parking lot of Belfast Reservoir #1 off US Route 1 (Northport Avenue). Additionally, according to the MaineDOT Public Map Viewer's Historic Districts and Properties layer, the Belfast Armory (Maine Historic Preservation Commission (MHPC) inventory number 034-0076), a National Register of Historic Places eligible building, is located in the Airport Business Park. Any federal action that occurs on Airport property will need to consider potential impacts on these Section 4(f) resources.

2.5. HISTORIC AND CULTURAL RESOURCES

The MaineDOT Public Map Viewer's Historic Districts and Properties layer[1] was accessed on February 4, 2025. According to the map viewer, the Belfast Armory (MHPC inventory number 034-0076), a National Register of Historic Places eligible building, is located in the Airport Business Park. According to the information provided by the viewer, the eligible property consists of an early location of two Beverage wave antenna systems and a Radio Corporation of America shortwave relay station.

A request for project review of the Airport boundary was submitted to the MHPC on January 13, 2025. According to the response from MHPC, dated January 29, 2025, there are no concerns with historic properties (architectural or archaeological) at this time. Consultation with MHPC may be required prior to future development.

2.6. FARMLANDS

The Airport is situated on land that is relatively flat to gently sloping, with an airport elevation of 198 feet above mean sea level. According to the Natural Resources Conservation Service Soil Survey Geographic Database (SSURGO)-certified soils data accessed via the Web Soil Survey online tool, most soils on Airport property consist of a variety of loamy sands and sandy loams, and approximately three percent of the Airport soils are classified as prime farmland soils (Peru fine sandy loam, three to eight percent slopes); however, lands within the Airport boundaries are actively farmed for haying.

2.7. LAND USE

The Airport is located within the City's Airport-Business Park zone and is an allowed use of this zone. The Airport is bordered by US Route 1 with residential development, solar arrays, a Montessori school, and a propane bulk storage facility on Congress Street all to the east, Walsh Field Recreation Area and Lincolnville Avenue to the north, low-density mixed-use development and Lincolnville Avenue to the west, and the southern portion of the Airport Business Park and Belfast Reservoir #1 to the south. The Little River flows west to east approximately 1,600 feet south of the Airport, flowing

[1] https://www.maine.gov/mdot/mapviewer/?show=Historic%20Districts,Historic%20Properties,Roads%20General&hide=FFC,MEDOT%20Regions, Accessed February 7, 2025.

into Belfast Bay approximately one mile to the southeast. The surrounding land use by zoning classification is shown in **Figure 2-2**.

2.8. NOISE

Aircraft noise emissions, inherent to the operation of an airport, can adversely impact land use compatibility between an airport and surrounding properties, particularly in the presence of noise-sensitive receptors. Churches, hospitals, schools, amphitheaters, and residential districts are receptors that are sensitive to elevated noise levels. Therefore, it is important to estimate any change in noise levels associated with airport development, to determine the significance, if any, of the impact on noise-sensitive land uses. Then, abatement measures can be incorporated into airport development plans to avoid or minimize the impacts. The Airport is adjacent to two residential zoning districts and the Lower Congress mixed-use district to the east shown in **Figure 2-2**. There is a Montessori school adjacent to the Airport east of US Route 1, Troy A Howard Middle School approximately 2,280 feet to the west along Lincolnville Avenue, and Captain Albert Stevens School 1,750 feet to the north. There are multiple churches within one mile of the Airport including Cavalry Chapel along Lincolnville Avenue approximately 2,500 feet to the west, Emmanuel Baptist church approximately 1,275 feet to the north and St. Francis of Assisi and St. Margaret's Episcopal Churches approximately 4,000 feet to the north, Little River Church 4,800 feet to the southeast along US Route 1. There is one hospital, MaineHealth Waldo Hospital, located approximately 3,100 feet east of the Airport. There are no noise abatement measures currently in place at the Airport.

2.9. VISUAL EFFECTS

Light emissions are typically one of the greatest concerns for residents in neighborhoods, as well as users of other incompatible land uses, adjacent to an airport that could be directly impacted by a change in lighting. Given the Airport's size, location, history, and surrounding land use, an increase in light emissions is unlikely to be significant. However, future projects that may result in any lighting changes or other visual changes to the Airport or surrounding community may require additional analysis.

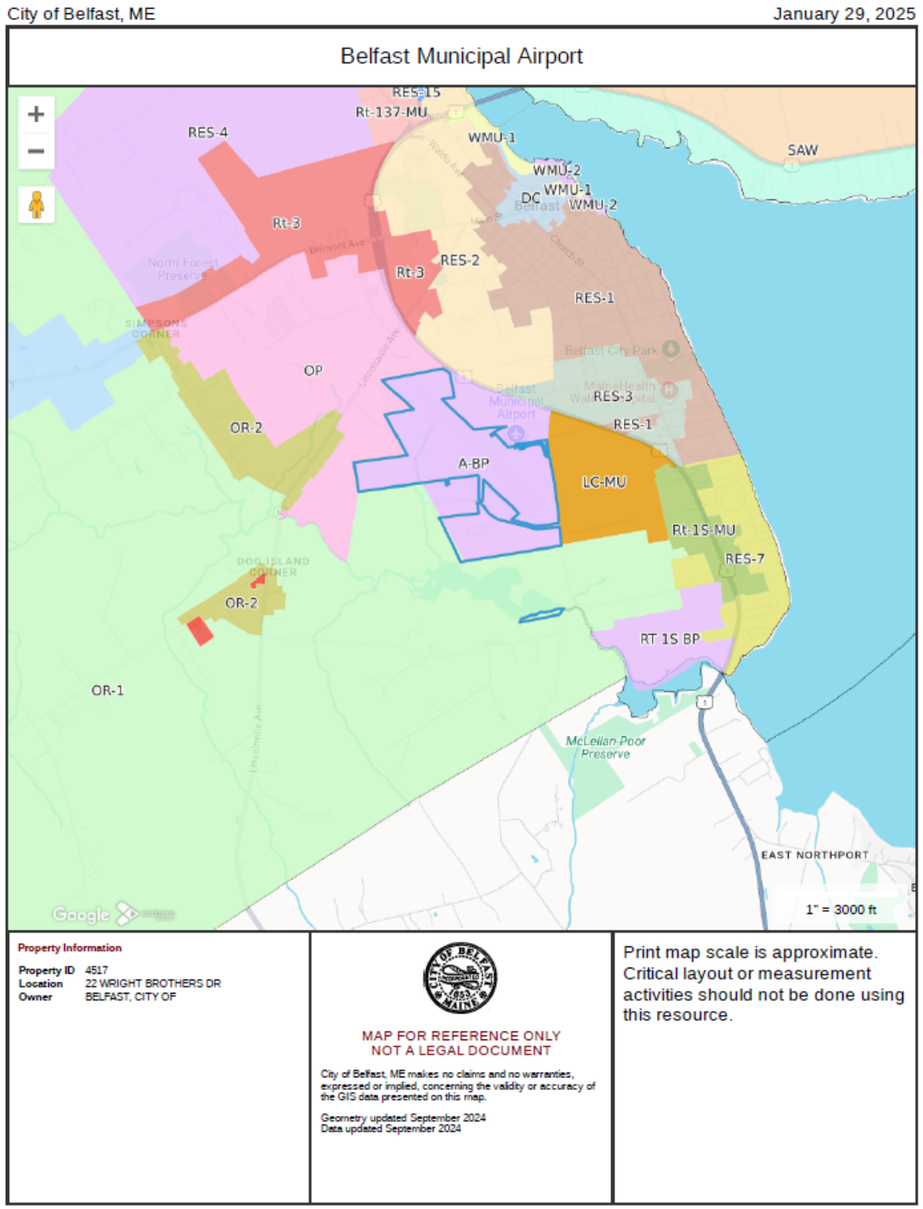
2.10. AIR QUALITY

The Airport is in Belfast, Waldo County, Maine, which is designated as a maintenance area for criteria pollutant 1-Hour Ozone (1979)-National Ambient Air Quality Standards (NAAQS) Revoked and 8-Hour Ozone (1997)-NAAQS Revoked. An air quality emissions analysis may be required for future projects depending on the nature of the development and applicable air quality regulations at the time of proposed development.

2.11. HAZARDOUS MATERIALS

The storage of petroleum at the Airport consists of two 10,000-gallon tanks, one for 100LL fuel and one for Jet-A fuel for aviation uses currently located southeast of the terminal/administration building. The fuel tanks were recently installed with the final inspection in August 2023.

Figure 2-2: Belfast, Maine Zoning



Source: City of Belfast aerial maps and property data viewer, 2025.

According to a NETROnline Environmental Radius Report, obtained January 14, 2025, the Airport is listed under the "Federal Facilities and Superfund" umbrella for the range (REM02731), which is currently under investigation. Ranges are managed by the US Department of Defense (DOD) under the military munitions response program, which is responsible for the investigation, cleanup, and funding efforts for closed military ranges. A review of the Maine DEP online document database did not yield any reports for REM02731. Belfast Airport Lot 3 is also listed under the Maine brownfields list (REM02342) and is currently under investigation. A Phase I Environmental Site Assessment (ESA) was performed by Ransom Consulting, Inc. in March 2020, which concluded that soil and groundwater are likely unimpacted at the lot given its history as an undeveloped lot.

2.11.1. Per- and Polyfluoroalkyl Substances (PFAS)

PFAS are anthropogenic chemicals that have commonly been used in a variety of commercial, household, and industrial products, including firefighting foams. In November 2016, the USEPA published a drinking water Health Advisory level for two components of PFAS, PFOS, and PFOA, at individual or a combined 70 parts per trillion (ppt) based on the level of science to test and identify these chemicals at that date. On April 10, 2024, EPA finalized the National Primary Drinking Water Regulation (NPDWR) legally enforceable Maximum Contaminant Levels (MCLs) for six PFAS in drinking water. PFOA, PFOS, PFHxS, PFNA, and HFPO-DA as contaminants with individual MCLs, and PFAS mixtures containing at least two or more of PFHxS, PFNA, HFPO-DA, and PFBS using a Hazard Index MCL to account for the combined and co-occurring levels of these PFAS in drinking water. EPA also finalized health-based, non-enforceable Maximum Contaminant Level Goals (MCLGs) for these PFAS.

The Maine DEP tests and monitors PFAS in wastewater effluent, fish, surface water, soil, and groundwater. According to the Maine DEP PFAS Investigation, the Airport is listed under EGAD ID 29791 as a sludge utilization site, as the City of Belfast received a license to apply lime-stabilized municipal wastewater treatment plant sludge on approximately 60 acres of grassed land adjacent to the two runways at the Airport. The license was issued on January 31, 1985, and remained in effect until January 31, 1990. A property investigation was completed in 2022 and 2023 and identified no PFAS located on the Airport.

2.12. ENERGY

Energy consumed at the Airport includes electricity and propane. Gasoline is consumed to power the Airport's maintenance equipment (e.g., mowers, snow blowing equipment, etc.). Diesel is also consumed through the public works department that assists in snow removal (graders, trucks, front-end loaders).

Electricity to the Airport is delivered by Central Maine Power and used primarily to power Airport-owned buildings and operations. Propane is used to heat many of the hangars, provided by aboveground tanks, and the terminal/administration building is heated via a heat pump. Potable water consumed at the Airport is provided through the Belfast Water District, from two gravel-packed groundwater wells located in the Goose River Aquifer. Wastewater is disposed of via a septic tank behind the terminal and pumped up to a leach field, which is located northwest of the terminal/administration building. Solid waste is transported from the Airport to the municipal transfer station by the airport manager.

2.13. CLIMATE

A variety of greenhouse gas (GHG) emission sources are associated with the operation of the Airport. GHG emissions are linked to equipment and energy use owned by the Airport and with equipment that is operated by its tenants and the general public. Airport-owned sources of emissions include ground service equipment, and vehicles utilizing parking lots. Tenant emissions are associated with the operation of aircraft, ground service equipment, and in a few cases, heating of hangars. Emissions associated with the general public include vehicle travel to and from the Airport.

Emissions from Airport buildings are associated with electricity consumption and fuel consumption. Lighting, plug loads, fans, and pumps are all examples of building equipment that consume electricity.

The FAA recently released the *2021 Aviation Climate Action Plan* to provide a government approach and policy framework for the aviation sector to help meet climate goals. Actions for airports identified by this plan include seeking grants for authorized emission reduction projects and developing a resilience framework.

The FAA has not identified a significance threshold for GHG emissions, as there is no current accepted method of determining the level of significance applicable to airport construction projects given the small percentage of emissions they contribute. Any increase in emissions of GHGs as the result of projects proposed in this Master Plan would be considered negligible in comparison with U.S. annual emissions and therefore would not have a significant impact on global climate change.

On November 28, 2021, the Maine Legislature passed into law the State Greenhouse Gas Emissions Regulation, which requires a 45 percent reduction from 1990 levels of gross emissions of GHGs from all sources in the State and all sectors of the State economy by the year 2030 and 80 percent by the year 2050. The statewide level of greenhouse gas emissions in 1990 was 32.02 million metric tons of carbon dioxide equivalent (MMTCO2e). There are currently no enforceable measures for sectors to limit GHG emissions, nor are there state standards for GHG emissions by sector.

2.14. SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

Proposed projects will be evaluated for the potential effects on the community's economy, social structure, and necessary health and safety services as specific alternatives are developed during the design process. Environmental justice evaluations consider the potential of federal actions, including those involving federally obligated airports, to cause a disproportionate and adverse effect on low-income or minority populations.

According to the US Census Bureau American Community Survey (ACS) 2023 5-year estimates Table DP05, the City of Belfast has a population of 6,985, 95.1 percent of which is "White," 2.1 percent "Black or African American," 1.0 percent "American Indian and Alaska Native," and 1.3 percent Asian. The median household income for the City of Belfast in 2023 was $61,322, which is lower than the state median household income of $73,733.

The USEPA defines Environmental Justice (EJ) as the just treatment and meaningful involvement of all people, regardless of income, race, color, national origin, Tribal affiliation, or disability, in agency

decision-making and other federal activities that affect human health and the environment so that people:

- are fully protected from disproportionate and adverse human health and environmental effects (including risks) and hazards, including those related to climate change, the cumulative impacts of environmental and other burdens, and the legacy of racism or other structural or systemic barriers; and
- have equitable access to a healthy, sustainable, and resilient environment in which to live, play, work, learn, grow, worship, and engage in cultural and subsistence practices.

The US EPA EJScreen combines environmental and demographic socioeconomic indicators into EJ Indexes. EJScreen includes 13 environmental indicators, seven socioeconomic indicators, 13 EJ indexes, and 13 supplemental indexes. For early applications of EJScreen, the EPA identified the 80th percentile filter as that initial starting point. In other words, an area with any of the 13 EJ Indexes at or above the 80th percentile nationally should be considered as a potential candidate for further review. The Airport is not located within an area above the 80th percentile for any of the 13 environmental indexes. As of the issuance of this document, the EJScreen tool is currently inaccessible, however, a copy of the EJScreen report that was obtained on January 17, 2025, is included in **Appendix B**.

In addition to the FAA's standard review, this master plan also reviewed new tools developed and/or utilized in conjunction with the USDOT Justice40 Initiative, which aims to have at least 40 percent of the benefits from many of their grants, programs, and initiatives flow to disadvantaged communities.

2.14.1. Climate and Economic Justice Screening Tool

The Climate and Economic Justice Screening Tool (CEJST) was developed by the White House Council on Environmental Quality to identify disadvantaged communities as part of the Biden-Harris Administration's Justice40 Initiative. According to the CEJST, reviewed on January 17, 2025, the Airport is in Tract 23027043000, which is not identified as a disadvantaged community. At the issuance of this document, this tool is no longer accessible.

2.14.2. Equitable Transportation Community Explorer

The USDOT Equitable Transportation Community (ETC) Explorer is an interactive map that shows how a community or project area is experiencing disadvantages related to transportation investments. Anything above the 65th percentile is considered disadvantaged for the respective category. According to the ETC, the Airport, located in Census tract 23027043000, is listed as within the 81st percentile for Health Vulnerability relative to the national scale, and the 93rd percentile for Climate & Disaster risk burden, 68th percentile for Health Vulnerability, and 80th percentile for Transportation Insecurity relative to Maine.

2.14.3. Areas of Persistent Poverty and Historically Disadvantaged Communities

Areas of persistent poverty & historically disadvantaged communities lists U.S. Census tracts that qualify as such according to Section 6702 of the Infrastructure Investment and Jobs Act (the RAISE program). The Airport is not located within a community identified as an area of persistent poverty or historically disadvantaged community. The ETC explorer was reviewed on January 17, 2025, however, at the issuance of this document, this tool is no longer accessible.

2.14.4. Environmental Justice Index

The Centers for Disease Control and Prevention (CDC) Environmental Justice Index (EJI) explorer combines a variety of aspects of social vulnerability and environmental burden into a ranking from 0 to 1. A domain ranking of 0.85 signifies that 85 percent of tracts in the nation likely experience less severe environmental burden or social vulnerability attributable to that domain than the tract(s) of interest, and that 15 percent of tracts in the nation likely experience more severe environmental burden or social vulnerability attributable to that domain. The Airport is in Census Tract 430, Waldo County, Maine, which has an EJI rank of 0.67 (moderate-high). The EJI explorer was reviewed on January 17, 2025, however, at the issuance of this document, this tool is no longer accessible.

Belfast Municipal Airport

Airport Master Plan Update

Chapter 3 – Basic Aeronautical Forecasts

McFARLAND JOHNSON

3. BASIC AERONAUTICAL FORECASTS

Basic aeronautical forecasts are a key element in airport planning. This chapter will provide details on the existing and forecast future critical aircraft that will utilize the Airport. This chapter will also review historical and future based aircraft and forecast operations throughout the planning period. Further analysis of how the forecast determines what facilities and services are needed at the Airport is presented in Chapter 4, *Facility Requirements*.

Forecasting future activity involves both quantitative and qualitative considerations. The forecasting approach outlines various methods to project future aviation demand while applying these methods to each area of interest and selecting a preferred forecast for based aircraft and operations at Belfast Municipal Airport (BST or the Airport).

This chapter provides basic aeronautical forecasts for the 10-year planning period from 2024 to 2034. The calendar year 2024 was used as the baseline year for operations and based aircraft, as these data points were the most recent and complete data sets received from the Airport. The projections of aviation activity provide a basis for insight into the type, size, and timing of aviation facility development in the future.

3.1. Existing and Future Critical Aircraft

This forecast chapter uses FAA AC 150/5000-17, *Critical Aircraft and Regular Use Determination*, to determine the current and future critical aircraft for the Airport. The critical aircraft represents the aircraft or group of aircraft with similar characteristics that regularly use the Airport, which the FAA defines as 500 or more annual operations. The critical aircraft determinations use one year of historical operations data from the GARD system installed at the Airport, which provides an annual summary of total operations. This system utilizes sound recording, coupled with the FAA ADS-B data, to identify aircraft operations and classify them by the make and model of the aircraft utilizing the airport. GARD captures all operations regardless of IFR or VFR flight, and is beneficial for the Airport, as many GA airport operations are not captured in the FAA TFMSC as they do not file IFR flight plans. From March 2024 to February 2025, the GARD system reported a total of 3,236 operations. The highest frequency of operations was conducted by A-I aircraft, accounting for 95 percent of the total operations during this period.

A review of operations revealed the highest concentration of A-I aircraft to be the Piper Cherokee, and as such is selected to be the existing critical aircraft. The forecast future critical aircraft is anticipated to remain an A-I and was determined to be the Daher TBM 910, which is a single-engine turboprop aircraft. With the recent installation of Jet A fuel in August 2023, it is expected that turbine operations will increase during the planning period, which is the basis for selecting this future critical aircraft. Both the existing and future critical aircraft weigh less than 12,500 pounds and are classified as "small" aircraft. However, Runway 15-33 is rated for single-wheel operations up to 30,000 pounds, which justifies the A-I classification. **Table 3-1** and **Table 3-2** provide details about the existing and future critical aircraft at BST. The existing critical aircraft can be seen in **Figure 3-1**, and the future critical aircraft can be seen in **Figure 3-2.**

Table 3-1: Existing Critical Aircraft

Characteristics	Piper Cherokee
Length	23.8'
Wingspan	35.0'
Tail Height	7.3'
MTOW	2,440 lbs.
Approach Speed	70 kt
AAC	A
ADG	I
TDG	1A

Source: FAA Aircraft Characteristics Database 2023.

Figure 3-1: Piper PA-28 Cherokee

Source: A Brief History of Piper Aircraft, https://www.piper.com/blog/piper-history/, 2022.

Table 3-2: Future Critical Aircraft

Characteristics	Daher TBM 910
Length	35.2’
Wingspan	42.1’
Tail Height	14.3’
MTOW	7,394 lbs.
Approach Speed	85 kt
AAC	A
ADG	I
TDG	1A

Source: FAA Aircraft Characteristics Database 2023.

Figure 3-2: Daher TBM 910

Source: Daher, https://www.tbm.aero/page/tbm910, accessed April 2, 2025.

The previous Master Plan, completed in 2016, identified the Beechcraft King Air 90 as the critical aircraft, which is a B-II aircraft, however a company that operated daily flights to the Airport using an ADG-II aircraft has ceased operations. This recent change at the Airport has led to a decline in ADG II operations since the last Master Plan was completed.

3.1.1. Runway Design Code

According to FAA AC 150/5300-13B, Change 1, the RDC relates to the AAC, ADG, and approach visibility minimums. The RDC identifies the design standards that apply to Runway 15-33, which includes the appropriate runway width. Absent any additional information, the RDC for Runway 15-33 is currently forecast to remain an A-I-5,000. This RDC is a designation for runways with approach minimums not lower than one statute mile.

3.1.2. Taxiway Design Group

The existing and future critical aircraft for BST were used to determine the Airport's existing and future TDG. The determination of the Airport’s TDG is an important step in the Master Plan, as this analysis determines the taxiway width that the FAA is able to fund at the Airport. The existing and future TDG for the Airport is anticipated to remain TDG 1A, as both the Piper Cherokee and Daher TBM 910 are classified as TDG 1A.

3.1.3. Review of 100LL and Jet A Fuel Sales

As noted in Chapter 1, *Inventory*, BST recently installed two 10,000-gallon fuel tanks, one for 100LL and one for Jet A. Both tanks were placed into service in August 2023. With only 18 months of fuel sales data available, it is difficult to assess whether fuel sales have positively affected airport operations. However, readily available fuel at an airport will typically mean more aircraft operations.

3.2. Based Aircraft

Forecasting the number and type of based aircraft is critical to planning future airport facilities, especially for the type and size of hangars, along with aircraft movement, and parking areas. The following sections will review historical and forecast based aircraft. For based aircraft, this forecast chapter reviewed the MaineDOT State System Plan, FAA TAF, and FAA *Aerospace Forecasts FY 2024-2044* as benchmarks for forecast based aircraft. The FAA *Aerospace Forecast FY 2024-2044* was used as a comparison to the based aircraft forecast, as the MaineDOT State System Plan and FAA TAF do not forecast any based aircraft growth at the Airport.

3.2.1. Historical Based Aircraft

A based aircraft is defined by the FAA as an aircraft that is operational and airworthy and is based at a particular airport. Based aircraft are major contributors to the economics of an airport as they generate revenue from tie-down leases, hangar rentals, and fuel sales. The FAA TAF was used for historical counts of based aircraft, and in the past ten years, the number of based aircraft at BST has grown from 15 to 28. As such, the 2014-2023 CAGR is 6.4 percent. The numbers of historical based aircraft are shown in **Table 3-3**.

3.2.2. Based Aircraft Forecast

In the baseline year at the Airport, all aircraft are single-engine piston. Local conditions for the based aircraft forecast were taken into consideration, with the addition of 100LL and Jet A fuel at the Airport. Two additional-based aircraft (one turboprop and one rotor) are forecast to be added in the 10-year planning period. Single and multi-engine-based aircraft are expected to remain the same throughout the planning period. The based aircraft forecast is shown in **Table 3-4**. The based aircraft

forecast CAGR over the 10-year planning period of 0.74 percent was compared to the FAA *Aerospace Forecast FY 2024-2044* total general aviation fleet CAGR of 0.4 percent over the 10-year period 2024-2034, and both forecast CAGRs align with each other.

Table 3-3: BST Historical Based Aircraft

Year	Total Based Aircraft
2014	15
2015	14
2016	12
2017	12
2018	15
2019	15
2020	16
2021	16
2022	28
2023	28
CAGR	6.4%

Source, FAA TAF, 2025.

Table 3-4: BST Based Aircraft Forecast

Year	Single	Multi	Turboprop	Turbojet	Rotor	Total
2024	27	0	0	0	0	27
2029	27	0	1	0	0	28
2034	27	0	1	0	1	29
CAGR						0.74%

Source: Airport management 2024, McFarland Johnson analysis, 2025.

For planning purposes only, an additional five based aircraft are listed in **Table 3-5**. According to reports from Airport management, the Maine Department of Environmental Protection has placed a limit on hangar development at the Airport due to higher than normal phosphorus soil levels. Airport management has indicated that there are parties interested in constructing more hangars once the phosphorus soil issue at the Airport is resolved. This issue currently limits the construction of additional hangars but artificially keeps the number of based aircraft lower than demand.

Table 3-5: BST Based Aircraft Forecast with Additional Based Aircraft

Year	Single	Multi	Turboprop	Turbojet	Rotor	Total
2024	27	0	0	0	0	27
2029	28	1	2	0	0	31
2034	30	1	2	0	1	34

Source: McFarland Johnson analysis, 2025.

3.3. Operations Forecast

Forecast operations for the planning period at BST are shown in **Table 3-6.** The operations forecast CAGR was determined with the Airport having total forecast operations in 2020 totaling 2,900 operations and growing to 3,100 operations in 2040, which is a 0.33 percent CAGR over 20 years. The forecast operations for 2020 and 2040 were obtained from the MaineDOT State System Plan in Chapter 4, *Aviation Activity & Forecasts*. The 0.33 percent CAGR was compared against the FAA *Aerospace Forecast FY 2024-2044,* which has a 0.4 percent CAGR for the general aviation fleet are close in comparison.

Table 3-6: BST Operations Forecast

Year	Total Operations
2024	3,236
2029	3,290
2034	3,344

Source: Airport management via GARD device 2025, and McFarland Johnson analysis, 2025.

Airport management has indicated that a flight school has initiated flight training recently, and a second flight school is gearing up to begin flight instruction in the summer of 2025. For planning purposes only, an additional scenario is presented in **Table 3-7** to include the operations of two flight training SASOs at the Airport conducting flight training operations.

Table 3-7: BST Operations Forecast with SASO

Year	Total Operations
2024	3,966
2029	4,020
2034	4,074

Source: McFarland Johnson analysis, 2025.

3.3.1. Peaking Characteristics

An operations forecast provides a good overview of activity at an airport but does not consider the facility's capacities. Facility requirements are not driven by annual demand but rather by the capacity shortfalls and delays experienced during times of peak operational activity. Therefore, this Master Plan provides forecasts for the peak month, ADPM, and the peak hour of the ADPM. The values for these metrics were calculated using the methodology in FAA AC 150/5360-13A, *Airport Terminal Planning*, except for the peak month calculation. Airport peaking characteristics were calculated using the following assumptions:

Peak Month

The peak month is defined as the month with the highest level of activity during the calendar year. GARD data for 2024 was used to identify the peak month. In the case of BST, the peak month is September.

ADPM

The ADPM is defined as the average day within the peak month, determined by dividing the peak month operations by the number of days within the peak month (in this case, 30). The ADPM is designated as the “design day.”

Peak Hour

This level of operation is defined as the peak hour within the design day. The peak hour occurs from 11:00 am to 11:59 am and has two peak hour operations.

Itinerant Spilt

The itinerant split is the percentage of itinerant operations compared to the TAF total Airport operations that occurred in the baseline year, which is 2024. In the baseline year, the percentage of itinerant operations was 37.5 percent.

The peaking characteristics for BST are shown in **Table 3-8**.

Table 3-8: BST Operations Peaking Characteristics

Year	Peak Month	ADPM	Peak Hour
2024	412	14	2
2029	419	14	2
2034	426	14	2

Source: McFarland Johnson analysis, 2025.

3.4. General Aviation Enplanement Forecast

General aviation enplanements help determine the number of individuals potentially using Airport facilities such as the terminal building. General aviation enplanements were calculated with a presumed 1.5 passengers per itinerant operation. The results are shown in **Table 3-9**.

Table 3-9: General Aviation Enplanement Forecast

Year	Itinerant Operations	Passengers Per Itinerant Operation	Total Enplanements
2024	1,214	1.5	1,820
2029	1,234	1.5	1,850
2034	1,254	1.5	1,881

Source: McFarland Johnson analysis, 2025.

3.5. Comparison to the FAA Terminal Area Forecast

To estimate future aviation demand, the analysis used a variety of analytical techniques to explore a range of potential realities, and a preferred forecast is determined after considering pertinent subjective considerations. As such, the forecast prepared herein is developed using several methodologies. Various methods of forecasting aviation demand exist and are widely used throughout the industry. Several standard methods have been reviewed to develop the forecast for BST, and the preferred forecast is shown in **Table 3-10** compared to the FAA's TAF.

Table 3-10: BST and TAF Forecasts Comparison

	Actual	Forecast	
	Baseline	**2029**	**2034**
		FAA TAF	
Total Operations	3,200	3,200	3,200
Based Aircraft	27	27	27
		Master Plan Forecast	
Total Operations	3,236	3,290	3,344
Based Aircraft	27	28	29
		Pct. Difference From TAF	
Total Operations	1.1%	2.8%	4.5%
Based Aircraft	0.0%	3.7%	7.4%

Sources: FAA TAF, 2025, and McFarland Johnson analysis, 2025.

The FAA TAF is a flat line (no growth) for general aviation airports and represents a top-down market share analysis. The forecast this Master Plan presents is a bottom-up forecast that takes into consideration the national growth, interest in building hangars, and the airport manager getting calls about aircraft space frequently. Private developers are not willing to put their money into hangars they are not certain they will fill. The Master Plan forecast is realistic and consistent with local conditions.

Belfast Municipal Airport

Airport Master Plan Update

Chapter 4 – Facility Requirements

McFARLAND JOHNSON

4. FACILITY REQUIREMENTS

4.1. Introduction

This chapter outlines the airside, landside, and support facility requirements necessary to accommodate existing and forecasted demand at Belfast Municipal Airport (BST, also known as the Airport) in accordance with FAA design criteria and safety standards. The facility requirements are based upon several sources, including Chapter 3, *Basic Aeronautical Forecasts,* FAA AC 150/5300-13B Change 1, *Airport Design,* and 14 CFR Part 77, *Objects Affecting Navigable Airspace*. The findings of this chapter serve as the basis for the formulation of Airport alternatives and development recommendations. This chapter is organized into the following sections:

- Airside Facility Requirements
- Landside Facility Requirements
- Support Facility Requirements

4.2. Airside Facility Requirements

Airside facility requirements focus on items essential for the arrival and departure of aircraft, primarily concerning runways, taxiways, and their associated safety areas. To ensure that all runway and taxiway systems are designed appropriately, the FAA has established criteria for use in the planning and design of airfield facilities. The selection of appropriate FAA design standards for the development of airfield facilities is based on the characteristics of a "critical aircraft" which is the most demanding aircraft expected to use an airport or that facility at an airport on a regular basis (500 operations or more per year). Correctly identifying the existing and future critical aircraft is particularly important because the design standards selected for those aircraft will impact airport development for years to come. Using the appropriate standards will ensure that the facilities can safely accommodate aircraft using the Airport today and those projected to use the Airport in the future.

The FAA-approved forecasts indicate that the existing critical aircraft is the Piper Cherokee 28, and the future critical aircraft is forecast to be the Daher TBM 910, which are both A-I aircraft. As such, the ARC is A-I. Additionally, Runway 15-33 has its own RDC based on the critical aircraft of the designated runway. Runway 15-33 has an RDC of A-I-5000, meaning it has an RVR of 5,000 feet and visibility minimums of not lower than one statute mile. See **Appendix A** for more details on RDCs, ADGs, and AACs.

The following elements are discussed as they relate to the airside facility requirements:

- Runway Length
- Runway Orientation
- Runway Width
- Runway Strength
- Runway Designation
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle-Free Zone (ROFZ)
- Runway Protection Zone (RPZ)
- Obstruction Clearances
- Taxiway/Taxilanes
- Airport Marking and Lighting
- Instrument Approaches and NAVAIDs
- Summary of Airside Facility Requirements

4.2.1. Runway Length

A wide variety of aircraft use the Airport daily. These aircraft, both large and small, have different runway requirements. For example, in some cases, smaller or older aircraft may require more runway length than larger or newer and more efficient aircraft. Several factors go into determining aircraft performance and runway requirements that must be met for an aircraft to use a particular runway. These factors include (but are not limited to):

Airport elevation: The higher the airport elevation, the lower the air density. This means there is less air circulating through the engine and across aircraft lifting and control surfaces, resulting in less power and less lift. As such, the higher the airport elevation, the longer a runway needs to be to safely accommodate aircraft.

Aircraft weight: The heavier an aircraft is, the longer it takes to achieve lift or slow down after touchdown. This means heavier aircraft (with more passengers, luggage, cargo, and/or fuel – also known as payload) need a longer runway. Aircraft flying longer distances (stage lengths) require more fuel, which results in heavier aircraft weight and longer runway needs.

Temperature: Like airport elevation, the higher the temperature, the lower the air density, which means less engine power and decreased lifting power by the wings. This means the higher the temperature, the more runway length is needed. The FAA recently published a report on the global trend of increasing temperatures, which results in lower air density and reduced aircraft lift. The predicted future temperature of 83°F was utilized for this runway length analysis.

Longitudinal slope of the runway: If the runway slopes up, it takes longer for an aircraft to achieve take-off speed. Similarly, if a runway slopes down, it takes longer for an aircraft to stop after touchdown.

Runway condition (dry/wet/icy/contaminated): A dry, clean runway is the best for takeoff and landing. During rain, snow, ice, or other contamination events, there is less traction between the wheels and the runway pavement, which results in a longer runway length needed for takeoff and landing.

The following inputs are used for calculating the appropriate runway length at BST using FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*:

- Airport elevation: 197.6 feet MSL

- Mean maximum temperature of the hottest month: 83°F[1]
- Difference between high and low points of runway elevations: 39 feet

4.2.1.1. Runway 15-33

Runway 15-33 is 4,000 feet long. In 2023, there were more than 500 A-I-Small aircraft operations, as detailed in Chapter 3. Given that both existing and future critical aircraft have an approach speed of 50 knots or more, Figure 2-1 from FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, was used for the Runway 15-33 analysis. 95 percent of the fleet was used for the runway length calculation, accurately reflecting the relevant populations for the City of Belfast. As noted in Chapter 1, *Inventory* Runway 15-33 has approach minimums of one SM. Each runway end has a HAT of greater than or equal to 250 feet along with an LPV approach. Per FAA AC 150/5300-13B Change 1, the minimum runway length recommended is 3,200 feet for a runway with an LPV approach. The analysis for the existing and future runway length from the AC is shown in **Figure 4-1**.

In addition to the existing and future runway length recommendation above, the Airport and MaineDOT should work together to satisfy the minimum standards recommended in the December 2024 *Maine State Aviation System Plan Phase II-Technical Report* for the LifeFlight of Maine to operate at the Airport. A minimum runway length of at least 3,600 feet is recommended for the King Air 200. However, maintaining Runway 15-33 at its existing length of 4,000 feet would positively impact operations for LifeFlight of Maine, especially given the likelihood of contaminated runways during the winter months.

Recommendation: Runway 15-33 should be maintained at the existing 4,000 feet to support existing and future critical aircraft operations, and the Airport should conduct a cost-benefit analysis to maintain the additional 800 feet at the next reconstruction. Additional funding sources may be required to maintain the additional 800 feet during Runway 15-33's next reconstruction.

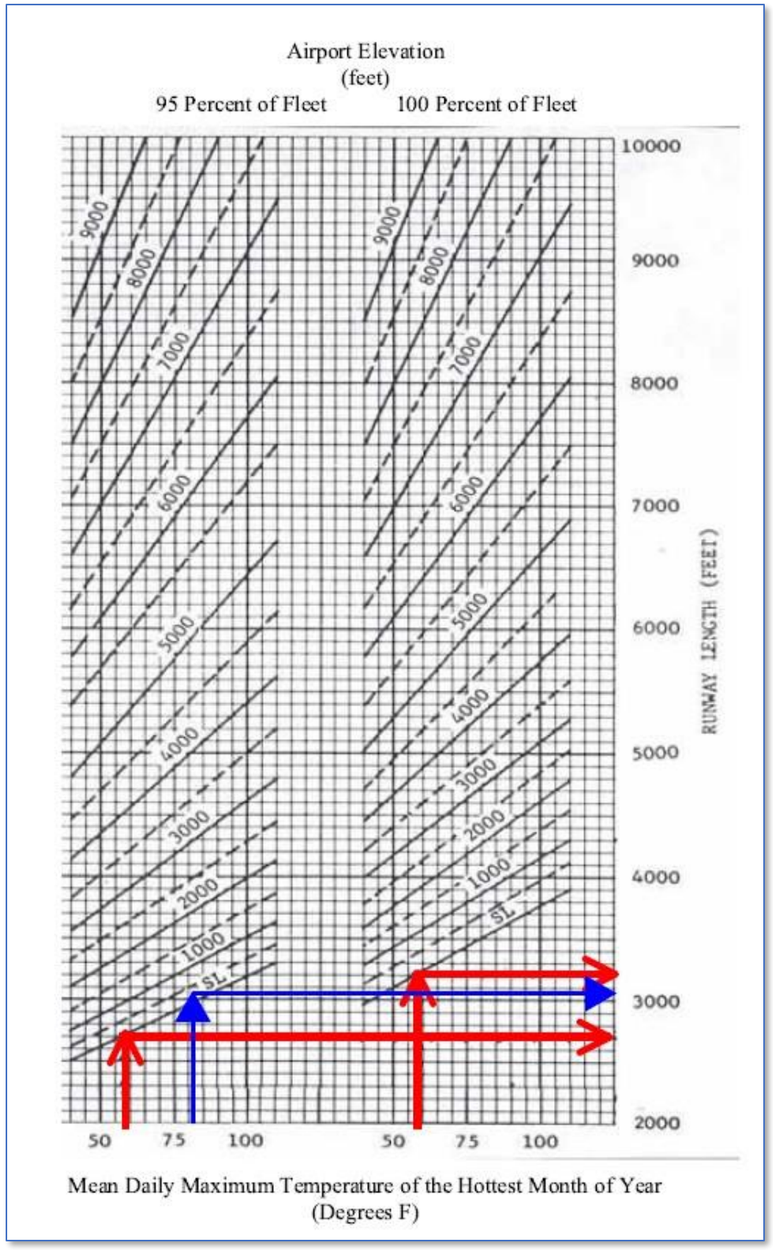
4.2.2. Runway Orientation

A significant factor in evaluating runway orientation is the direction and speed of the prevailing winds. Ideally, aircraft takeoff and land into the wind. A runway alignment that does not allow an aircraft to fly directly into the wind creates a crosswind component (i.e., winds at an angle to the runway in use), which makes it more difficult for a pilot to guide the airplane along the intended path. The commonly used measure of the degree to which a runway is aligned with the prevailing wind conditions is the wind coverage percentage.

To meet FAA standards, a primary runway should have a minimum all-weather wind coverage of 95 percent at 10.5 knots for A/B-I type aircraft. As mentioned in Chapter 1, wind data was not available for BST, and the closest airport in the vicinity is Bangor International Airport (BGR). As such, the wind data from BGR was utilized with the true heading of BST, and the resulting wind coverage for BST can be seen in **Table 4-1**.

[1] Report DOT/FAA/TC-21/43: *Future Climate Scenarios for Runway Length: Assessment of Future Temperature and Precipitation Trends*, by Annick Dewald and John Hansman

Figure 4-1: BST Runway Length Analysis



Source: FAA AC 150/5325-4B, 2025.

Table 4-1: BST Runway 15-33 Wind Analysis

Runway	IFR		All-Weather	
	10.5 kts	13 kts	10.5 kts	13 kts
15-33	**90.22%**	**94.85%**	**93.36%**	96.93%

Source: McFarland Johnson analysis, 2025.

Recommendation: The next section will discuss runway width, which can help mitigate the lack of 95 percent wind coverage at 10.5 knots.

4.2.3. Runway Width

Runway 15-33 is 100 feet wide. A-I standards for runway width with visibility minimums not lower than one mile are 60 feet. As Runway 15-33 does not meet the 95 percent coverage in all-weather or IFR conditions, and since BST has no crosswind runway, and the addition of one would not be feasible, the standard width of Runway 15-33 is 75 feet without a crosswind runway. For planning purposes, rehabilitation of widths that exceed the design standards can be justified if the marginal cost is reasonable and sufficient users are benefiting from this extra width to justify the expense.

In addition to FAA standards, the MaineDOT Statewide Aviation System Plan (SASP) recommends runways be at least 75 feet wide to meet the runway width needs of LifeFlight of Maine.

Recommendation: Maintaining a 75-foot-wide runway is recommended to compensate for insufficient wind coverage and to meet MaineDOT SASP recommendations. A cost-benefit analysis should be conducted during the next runway reconstruction to explore retaining the current 100-foot width versus reducing it to the FAA standard of 60 feet or the MaineDOT standard of 75 feet**.**

4.2.4. Runway Strength

Pavement strength requirements are driven by three primary factors: 1) the weight of aircraft anticipated to use the runway, 2) the landing gear type and geometry, and 3) the volume of aircraft operations.

The current pavement strength for Runway 15-33 is shown in **Table 4-2.**

Table 4-2: BST Runway Strength

Runway	Weight-Bearing Capacity	Critical Aircraft
15-33	Single Wheel: 30,000 lbs.	Existing Piper Cherokee 28 Single Wheel: 2,440 lbs. Future Daher TMB 910 Single Wheel: 7,394 lbs.

Sources: FAA ADIP 2025, FAA AC 150-5300-13B Change 1, 2024, and FAA Aircraft Characteristics Database, 2024.

Recommendation: There is no recommendation for the runway strength at BST. Runway strength for Runway 15-33 appears to be adequate for the volume and types of aircraft utilizing the Airport.

4.2.5. Runway Designation

Runway designations are based on the magnetic heading of the runway. A shifting magnetic field requires a periodic examination of the runway designations to ensure that they are within ten degrees of the current and future magnetic heading. As shown in **Table 4-3**, the magnetic bearing of Runway 15-33 is not anticipated to change throughout the planning period.

Table 4-3: Magnetic Bearing Calculations

	Runway 15-33
Current True Bearing	133.42°/313.43°
Existing Magnetic Declination	15.17° W
Existing Magnetic Bearing	148.7°
Change per Year	0.1°E
10-Year Magnetic Declination	1.0°E
10-Year Magnetic Bearing	147.7°

Sources: BST AVN Datasheet, 2024; National Centers for Environmental Information (NCEI), 2024; and McFarland Johnson analysis, 2025.

Recommendation: The runway designation will be within 10 degrees of the current runway bearing of 150 degrees. Therefore, there are no recommendations for changes to the runway designations.

4.2.6. Runway Safety Area (RSA)

The FAA defines an RSA as a surface surrounding a runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway, as well as supporting the occasional passage of rescue equipment. RSAs consist of a relatively flat, graded area free of objects and vegetation that could damage aircraft. The RSA is shown in **Figure 4-2**.

RSA design standards and dimensions are shown in **Table 4-4** and **Figure 4-2**.

Table 4-4: BST Runway 15-33 RSA

Runway	Standards	Dimensions	Non-Standard Conditions
15-33	A-I-5000	Length Beyond: 240 feet Length Prior: 240 feet Width: 120 feet	None

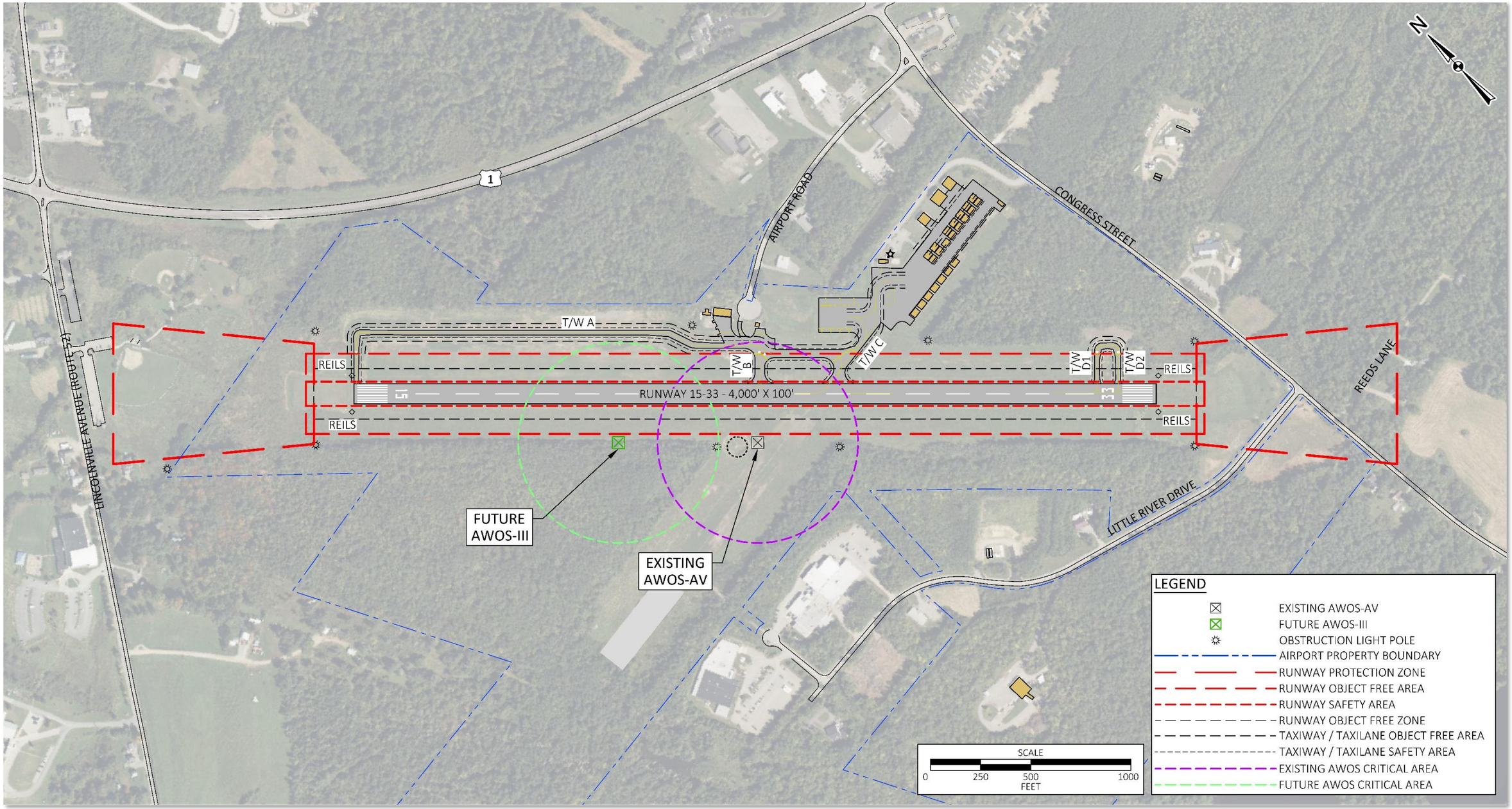
Sources: FAA AC 150/5300-13B Change 1, 2024. McFarland Johnson analysis, 2025.

Recommendation: There are no recommendations for the RSA as it meets FAA standards.

4.2.7. Runway Object-Free Area (ROFA)

In addition to the RSA, a ROFA is also defined around runways to enhance the safety of aircraft operations. The FAA defines ROFAs as an area cleared of all objects except those that are related to navigational aids and aircraft ground maneuvering. However, unlike the RSA, there is no grading component to the ROFA. The ROFA is designed to preclude above-ground objects and to ensure objects required to be within the ROFA are frangibly mounted. ROFA dimensions and non-standard conditions are listed in **Table 4-5** and shown in **Figure 4-2**.

Figure 4-2: Existing and Future Conditions



Source: McFarland Johnson, 2025.

Table 4-5: BST Runway 15-33 ROFA

Runway	Standards	Dimensions	Non-Standard Conditions
15-33	A-I-5000	Length Beyond: 240 feet Length Prior: 240 feet Width: 400 feet	None

Sources: FAA AC 150/5300-13B Change 1, 2024. McFarland Johnson analysis, 2025.

Recommendation: There are no recommendations for the ROFA as it meets existing and future critical aircraft requirements. The Airport should maintain a clear ROFA.

4.2.8. Runway Obstacle-Free Zone (ROFZ)

The ROFZ is a defined volume of airspace centered on the runway centerline, whose base elevation is the highest runway elevation at that particular location. The ROFZ is intended to remain clear during aircraft operations. It extends 200 feet beyond each end of the runway. ROFZ dimensions are shown in **Table 4-6** and **Figure 4-2**. ROFZ standards for large aircraft apply at BST, with the existing runway strength being greater than 12,500 pounds.

Table 4-6: ROFZ Dimensions

Runway	Standards	Dimensions	Non-Standard Conditions
15-33	Large	200' beyond the end of the runway 400' wide	None

Sources: FAA AC 150/5300-13B Change 1, 2024. McFarland Johnson analysis, 2025.

Recommendation: There are no recommendations with respect to the ROFZ. It is recommended that the Airport continue to maintain a clear ROFZ.

4.2.9. Runway Protection Zone (RPZ)

The RPZ is a large trapezoidal area off each runway end. The RPZs begin 200 feet beyond the end of the runway, and the dimensions of the RPZ for each runway end are dependent on the type of aircraft and the approach visibility minimums associated with operations on that runway. **Table 4-7** and **Figure 4-2** show the RPZ dimensions for BST. The Airport does have full control of both RPZs through ownership in fee or through avigation easements. Incompatible land uses, as defined in FAA AC 150/5190-4B *Land Use Compatibility,* are noted below, such as Walsh Field, Little River Drive, Congress Street, and Reed Lane.

Table 4-7: BST Runway 15-33 RPZs

Runway	Standards	Dimensions	Non-Standard Conditions
15 Approach/ 33 Departure	A-I-5000	Length: 1,000 feet Inner Width: 500 feet Outer Width: 700 feet	Walsh Field 672 feet
33 Approach/ 15 Departure			Little River Drive 257 feet Congress Street 212 feet Reed Lane 689 feet

Sources: FAA AC 150/5300-13B Change 1, 2024. McFarland Johnson analysis, 2025.

Chapter 5, *Alternatives,* will review ways to resolve incompatible land uses adjacent to the Airport.

Recommendation: Wherever possible, the Airport should explore ways to resolve incompatible land uses within the RPZs.

4.2.10. Obstruction Clearances

To protect the safety of aircraft operations, the FAA defines and regulates the airspace surrounding airports utilizing numerous metrics, including Title 14 CFR Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*, and Chapter 3 of FAA AC 150/5300-13B Change 1, which includes Approach/Departure Standards Tables. The airspace is defined and delineated by a set of geometric surfaces referred to as "imaginary surfaces" that extend outward and upward from airport runways. An object that protrudes through an imaginary surface is an obstruction. Obstructions may be hazards, and an FAA analysis may result in a recommendation to remove, light, and/or mark the object. The height and dimensions of the imaginary surfaces for a runway are determined by each runway end, airfield elevation, the type of aircraft the runway can support, the existing instrument approaches, and visibility minimums.

When an object penetrates an imaginary surface, it is considered an obstruction to air navigation. Obstructions can include man-made objects (buildings, towers), objects of natural growth (trees), and terrain.

Not all obstructions are hazards, although they are generally presumed to be hazards in the absence of further FAA study. The FAA determines if obstructions are hazards through an aeronautical study conducted in accordance with CFR Part 77 procedures.

In accordance with FAA Airport Safety and Standards Engineering Brief #91, *Management of Vegetation in the Airport Environment,* FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, and FAA Order 5050.4, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, airports must maintain land use compatibility and protect surfaces associated with flight operations. The FAA and MaineDOT SASP recommend protecting terminal airspace by clearing bushes and trees that penetrate or have the potential to penetrate any applicable navigable surfaces. It is recommended that Airport operators seek protection for these operations by removing, lowering, relocating, marking, lighting, or otherwise mitigating existing objects and preventing the creation of new obstacles surrounding the Airport that could impair future operations. Title 14 CFR Part 77 establishes the requirements to notify the FAA of certain construction or alterations and obstruction standards for proposed construction or alteration of existing structures.

4.2.10.1. CFR Part 77 Primary Surface

The primary surface is longitudinally centered on the runway. When the runway has a paved surface, the primary surface extends 200 feet beyond each runway end. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline. The width of the primary surface depends upon the type of approach provided to the runway, the aircraft using the approach, and the associated visibility minimums. If these variables differ by runway end, the width of the primary surface will be that width for the most precise approach existing or planned for either end.

The width of the existing primary surface for Runway 15-33 is 500 feet, centered on the centerline, due to Runway 15-33's non-precision approaches having visibility minimums greater than ¾ statute mile, along with having a pavement strength greater than 12,500 pounds, which classifies the runway as other than utility.

4.2.10.2. CFR Part 77 Horizontal Surface

The horizontal surface is a horizontal plane 150 feet above the established Airport elevation, which is 197.6 feet. Therefore, the elevation of the horizontal surface is 347.6 feet. For Runway 15-33, the existing and future edges of this surface are defined by swinging 10,000-foot radial arcs from the center of each end of the primary surface and connecting the adjacent arcs by lines tangent to those arcs.

4.2.10.3. CFR Part 77 Conical Surface

The conical surface extends outward and upward from the perimeter of the horizontal surface at a slope of 20:1 for a horizontal distance of 4,000 feet.

4.2.10.4. CFR Part 77 Approach Surface

The approach surface is an inclined, trapezoidal plane longitudinally centered on the extended runway centerline, extending outward and upward from the primary surface. Therefore, for paved runways, this surface begins 200 feet off the edge of the runway-end pavement. The surface does not consider the presence of displaced thresholds and is based on the physical end of the runway. The dimensions and slope of this surface are based on the category of approach (visual, non-precision, or precision), the visibility minimums of the published approach, and the type of aircraft that will use the approach.

The inner edge of the approach surface for each end of Runway 15-33 is 3,500 feet because the runway has a non-precision approach, along with having visibility minimums greater than ¾ statute mile, and is classified as other than a utility runway. The Runway 15-33 approach surface extends out to 10,000 feet at a slope of 34 to 1.

4.2.10.5. CFR Part 77 Transitional Surface

The transitional surface extends outward and upward at right angles to the runway centerline and the extended runway centerline at a slope of 7 to 1 from the sides of the primary and approach surfaces. Transitional surfaces for those portions of the precision approach surface which project through and beyond the limits of the conical surface extend 5,000 feet measured horizontally from the edge of the approach surface and at right angles to the runway centerline.

4.2.10.6. Design Surfaces: Table 3-4 APV and PA Instrument Runway Approach Surfaces

The surfaces in Table 3-4 from FAA AC 150/5300-13B Change 1 are surfaces used for APV and PA approaches. These surfaces include approaches with vertical guidance. **Table 4-8** highlights the surfaces that are applicable to Runway 15-33.

Table 4-8: APV and PA Instrument Runway Approach Surfaces

Surface	Runway Type	Vis. Mins.	A Distance Beyond Runway (FT)	B Inner Width (FT)	C Outer Width (FT)	D Length (FT)	Slope
Surface 5	Approach end of runways providing ILS, MMLS, PAR, and localizer type directional aid with glidepath, LPV, LNAV/VAN, RNP, or GLS.	**≥ ¾ SM**	**200**	**400**	**3,400**	**10,000**	**20:1**
		< ¾ SM	200	400	3,400	10,000	34:1
Surface 6	Approach end of runways providing ILS, MMLS, PAR, and localizer type directional aid with glidepath, LPV, LNAV/VNAV, RNP, or GLS.	**All**	**0**	**Runway Width +200**	**1,520**	**10,200**	**30:1**

Source: FAA AC 150/5300-13B Change 1, 2024.

Bolded values indicate surfaces that apply to Runway 15-33 at BST.

4.2.10.7. Design Surfaces: Table 3-5 Instrument Departure Surfaces

Surface 7 is shown in FAA AC 150/5300-13B Change 1 on Figures 3-9, 3-10, and 3-11. Dimensions are shown in Table 3-5. A clear departure surface allows pilots to follow standard instrument departure procedures, and this surface is used to identify obstacles that may impact a pilot's climb. In accordance with FAA Airport Safety and Standards Engineering Brief #91, *Management of Vegetation in the Airport Environment*, FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, and FAA Order 5050.4, NEPA *Implementing Instructions for Airport Actions*, airports must maintain land use compatibility and protect surfaces associated with flight operations. The FAA recommends protecting terminal airspace by clearing bushes and trees that penetrate or have the potential to penetrate any applicable navigable surfaces. FAA also recommends that airport operators ensure protection of these operations by removing, lowering, relocating, marking, lighting, or otherwise mitigating existing objects and preventing the creation of new obstacles surrounding the airport that could impair future operations. Title 14 CFR Part 77 establishes the requirements to notify the FAA of certain construction of new structures or alterations of existing structures.

Recommendation: The Airport should clear or mitigate any known obstructions. Additionally, it is recommended that the Airport actively update and maintain data in the FAA's ADIP and develop and maintain a vegetative and/or obstacle management plan for a safe and sustainable Airport.

4.2.11. Taxiways/Taxilanes

Planning standards for taxiways include taxiway width, TSA, TLOFA/TOFA, taxiway shoulders, taxiway gradient, and for parallel taxiways, the distance between the runway and taxiway centerlines. The dimensions of each standard vary based on the identified ADG and TDG for each taxiway. The ADG is based on the wingspan and tail height of an aircraft, while the TDG is based on the distance between the aircraft cockpit to main gear, as well as the width of the main gear. There are six ADGs and eight TDGs. For the review of BST, only TDGs 1 and 2 standards, and ADG I and ADG II will be shown. Details regarding the various dimensions as they apply to the Airport are shown in **Table 4-9** and **Table 4-10.**

Table 4-9: Taxiway Requirements for Taxiway Design Groups 1-2

Design Standard	TDG-1 A&B	TDG 2 A&B
Taxiway/Taxilane Width	25′	35′
Taxiway/Taxilane Shoulder Width	10′	10′

Source: FAA AC 150/5300-13B, Change 1, 2024.

Table 4-10: Taxiway/Taxilane Design Standards for ADG I-II

ADG	I	II
TSA	49′	79′
TOFA	89′	124′
TLOFA	79′	110′
Runway to Taxiway Centerline Separation	150-400*	240-400*
Taxiway Centerline to Fixed or Moveable Object	44.5′	62′
Taxilane Centerline to Parallel Taxilane Centerline	64′	94.5′
Taxiway Centerline to Fixed or Moveable Object	44.5′	62′
Taxilane Centerline to Fixed or Moveable Object	39.5′	55′
Taxiway Wingtip Clearance	20′	22.5′
Taxilane Wingtip Clearance	15′	15.5′

*Runway/taxiway separation varies based on aircraft size, AAC, and approach visibility minimums.

Source: FAA AC 150/5300-13B, Change 1, 2024.

As taxiways are constructed or rehabilitated, design should consider current guidance for taxiway design. The dimensions of intersection fillets and taxiway curves are based on the associated TDG for each taxiway. **Table 4-11** shows the details of the four named taxiways at BST and notes any non-standard conditions. All taxiways at the Airport are ADG-I taxiways. Chapter 5 will review correcting non-standard conditions, where possible.

Table 4-11: BST Taxiways

Taxi-way	Existing /Future TDG	Future Standard Width	Actual Width	Type of Taxiway	Runway Separation	Non-Standard Condition
A	1A	25′	25′	Partial Parallel Runway 4-22	240-200′	Non-standard runway to taxiway separation between the portion from Taxiway B to and C Wide expanse of pavement
B	1A	25′	40′	Entrance/Exit	N/A	Wide expanse of pavement
C	1A	25′	35′	Entrance/Exit	N/A	Direct apron to runway access
D1/D2	1A	25′	25′	Taxiway Turnaround	240′	None

Source: McFarland Johnson analysis, 2025.

There are unnamed taxilanes throughout the Airport. Taxilanes have smaller separations and wingtip clearance due to slower taxi speeds.

In the AIP-Handbook-Order-5100-38D-Change 1, FAA participation in taxiways is limited to the requirements of the current version of the AC 150/5320-6G, *Airport Pavement Design and Evaluation*, and the current version of AC 150/5300-13B, Change 1. The FAA's funding participation for taxiway projects is determined by the critical aircraft in accordance with FAA AC 150/5320-6G, which provides the design criteria for taxiway width. In certain, though infrequent, circumstances, if taxiway construction, rehabilitation, or overlay projects propose a taxiway wider than is justified by the critical aircraft, a portion or all the additional width may be eligible for funding, as determined by the FAA's ADO. The MaineDOT SASP recommends having at least one path for larger aircraft to exit the runway safely, which is at least one class higher than the designated TDG width. This portion of pavement may not be eligible for FAA funding, and the Airport may need to seek alternate funding sources.

FAA AC 150/5300-13B Change 1 recommends providing a full-length taxiway for all runways with instrument approaches, which applies to BST. In addition, the MaineDOT SASP recommends a full-length taxiway to meet the standards for LifeFlight of Maine.

This section also reviews separation, wingtip clearance, and recommendations. Ultimately, it is up to the pilot of each aircraft to confirm safe operations and clearances. There are areas by buildings 21-28, 31-38 where the TLOFA is below ADG I standards.

The following taxilane was reviewed:

- The taxilane between buildings 31 and 46, along with 32 and 47, has approximately 64 feet between buildings. Applying a standard FAA 15-foot wingspan for ADG I aircraft, this limits this taxilane to a wingspan of 34 feet or less.

Recommendation: The Airport should maintain standard taxiway geometry and wingtip clearances. A full-length parallel taxiway should be considered to meet FAA, MaineDOT SASP, and LifeFlight of Maine requirements. Additionally, at least one runway exit path should accommodate TDG 2 aircraft.

4.2.12. Airport Marking and Lighting

Runway 15-33 is marked with NPI markings, which are in excellent condition, and has MIRL. All taxiways at BST are equipped with MITL, except a segment of Taxiway A between Taxiways B and C. This mix of lighting types is non-standard per FAA AC 150/5340-30J, *Design and Installation Details for Airport Visual Aids*. The portion of Taxiway A between Taxiways B and C should match all taxiway lighting at the Airport.

Recommendation: The Airport should properly light the non-standard section of Taxiway A between Taxiways B and C. Markings should continue to be maintained in good (or better) condition and meet FAA standards during the planning period.

4.2.13. Instrument Approaches and NAVAIDs

As mentioned in Chapter 1, BST has two published instrument approach procedures. The approaches available are RNAV approaches that utilize LPV. Runway 15 has a ceiling minimum of 289 feet, while Runway 33 has a ceiling minimum of 250 feet. Both Runway 15 and Runway 33 have visibility minimums of one statute mile.

The Airport is also equipped with the following equipment/NAVAIDs:

- REILs on Runway 15 and 33 ends
- AWOS-AV
- Wind cone with segmented circle

Chapter 1 also mentioned that the Airport is planning to relocate and replace the AWOS-AV with an AWOS-III, as shown in **Figure 4-2.**

BST is planning the installation of PAPIs on Runway 15 and 33 in FY 2026, per the Airport's most recent CIP. This will satisfy the recommendation of the MaineDOT SASP and would benefit the aeromedical operations of LifeFlight of Maine.

Additionally, FAA AC 150/5340-30H *Design and Installation for Airport Visual Aids* recommends the installation of ODALS for runways greater than 3,200 feet in length, having approach minimums of one statute mile or greater, and the runway having MIRL. The installation of this lighting system would be recommended on Runway 15, as it may be easier to install due to the lack of residences adjacent to that runway end.

Recommendation: The Airport should continue to maintain existing approaches and NAVAIDs throughout the planning period and should install PAPIs on Runway 15-33. ODALS are recommended to be installed on Runway 15, as this would satisfy MaineDOT SASP and LifeFlight of Maine recommendations.

4.2.14. Summary of Airside Facility Requirements

Table 4-12 highlights the airside facility requirements summary.

Table 4-12: Airside Facility Requirements Summary

Existing Area	Existing Provision	Future Requirements	Recommendation
Runway Length (Section 4.2.1)	Runway 15-33: 4,000'	Runway 15-33: 4,000'	Conduct a cost-benefit analysis at the next reconstruction to maintain Runway 15-33 at 4,000'
Runway Orientation (Section 4.2.2)	Runway 15-33: < 95% wind coverage	Same	Eligible for a 75-foot-wide Runway 15-33
Runway Width (Section 4.2.3)	Runway 15-33: 100'	Runway 15-33: 75'	Review maintaining Runway at 100' during next reconstruction
Runway Safety Areas (RSA) (Section 4.2.6)	Non-standard RSA	Provide standard RSA	Provide standard RSA on all runways or submit for an MOS for non-standard grading
Runway Object Free Areas (ROFA) (Section 4.2.7)	Standard ROFA	Standard ROFA	Provide standard ROFA
Runway Obstacle-Free Zones (ROFZ) (Section 4.2.8)	Standard ROFZ	Standard ROFZ	Provide standard ROFZ
Runway Protection Zones (RPZ) (Section 4.2.9)	Non-standard	Provide standard RPZs	Ensure continued land use compatibility
Obstruction Clearances (Section 4.2.10)	Identified obstructions	Maintain clear surfaces	Airport to actively monitor and continue to maintain clear surfaces
Taxiways/ Taxilanes (Section 4.2.11)	Partial parallel taxiway Non-standard conditions	Full parallel taxiway Standard conditions	Construct full parallel taxiway. Correct non-standard geometry

Existing Area	Existing Provision	Future Requirements	Recommendation
Airport Marking and Lighting (Section 4.2.12)	Non-standard lighting portion of Taxiway A Markings: Good	Provide standard lighting throughout the Airport Paint markings as needed	Update taxiway lighting throughout the Airport, paint markings as needed
Instrument Approaches and NAVAIDs (Section 4.2.13)	Runways 15/33: LPV, REILs Windcone	Runways 15/33: LPV, REILs, PAPIs Windcone	Maintain existing approaches and NAVAIDs, install PAPIs, ODALS

Sources: Airport management and McFarland Johnson analysis, 2025.

4.3. Landside Facility Requirements

Landside facilities must be able to support a range of aircraft from small privately-owned propeller aircraft used for recreation to turbine or jet aircraft for business travel. The following airport facilities are covered in this section:

- Terminal/Administration Building
- General Aviation Auto Parking
- Based and Itinerant Aircraft Aprons and Tiedowns
- Hangars
- Non-Aviation Use Areas
- Electric Aircraft and Vehicle Charging
- Summary of Landside Facility Requirements

4.3.1. Terminal/Administration Building

As mentioned in Chapter 1, the existing terminal/administration building is 510 SF. Approximately 100 SF is excluded from the facility's footprint as the Airport manager's office is not available for public use. Chapter 3 indicated two peak hour operations in 2023 and 2033. However, 50 percent of these operations will be conducted by based aircraft, which may not use the terminal/administration building at all. As such, itinerant operations are used to calculate the required space in the terminal/administration building. To calculate the appropriate building size, one peak hour itinerant operation was used for both 2024 and 2034.

As noted in the ACRP *Guidebook on General Aviation Facility Planning* (ACRP Report 113), it is recommended to assume 2.5 passengers per itinerant peak hour operation. An average square footage per person of 100 to 150 SF per itinerant peak hour passenger is recommended in the Guidebook. The terminal/administration building sizing is shown in **Table 4-13**.

Both the City of Belfast and the Airport have expressed a need to make the existing structure compliant with ADA standards, and should plan to meet ADA standards by installing ramps, widening doorways where necessary, and adding applicable accessibility signage.

In addition, the Airport is planning a new terminal building for construction in FY 2028, per the Airport's CIP.

Terminal projects are often large in scale and implemented over multiple years, which typically results in lower rankings for AIP entitlement funding. However, the Airport should prioritize upgrading the existing terminal/administration building.

Table 4-13: Terminal/Administration Building Requirements

Year	Itinerant Peak Hour Operations	Passengers Per Peak Hour Operation	Square Footage Per Person	Requirement	Need
2024	1	2.5	100-150 SF	250-375 SF	-
2034	1	2.5	100-150 SF	250-375 SF	-

Source: McFarland Johnson analysis, 2025.

Recommendation: The size of the terminal/administration building is adequate for the planning period, however the Airport should explore options to make the building more accessible and in compliance with ADA standards. This could be accomplished through the construction of a new single-story facility to satisfy MaineDOT SASP recommendations or by retrofitting the existing facility. However, a retrofit would present challenges, as the handicap-accessible restrooms would consume a large portion of the existing building, and access to the basement would be difficult.

4.3.2. General Aviation Auto Parking

There is one parking lot next to the terminal/administration building, which has 19 parking spaces, including one handicap-accessible space.

The methodology used below is an analysis of real-world vehicle parking needs at the Airport and is shown in **Table 4-14.**

- Parking for the four existing box hangars is accounted for in the parking analysis, but aircraft owners may park their vehicles inside the hangar when flying.
- One parking spot is accounted for the Airport manager's vehicle.
- The existing terminal/administration building in 2024 and 2034 has one itinerant peak hour operation.
- One parking space for every two of the box hangars is assumed, as not all of the tenants would be out flying at the same time.

Recommendation: Vehicle parking needs are met throughout the planning period, however, the lot should be monitored to see if more passengers and based aircraft users utilize the existing facility, and expand the lot if demand warrants.

Table 4-14: General Aviation Auto Parking Requirements

Year	Box Hangars	GA Terminal	Administration	Based Aircraft	Total Required
2024	14	3	1	1	19
2034	14	3	1	1	19

Source: McFarland Johnson analysis, 2025.

4.3.3. Based and Itinerant Aircraft Aprons and Tie-Downs

As mentioned in Chapter 1, there are two aprons at BST totaling 8,803 square yards. Both aprons are reported to have a PCI value of 70, noted in the 2019 MaineDOT Pavement Study.

The condition and maintenance of the pavements at the Airport are essential to ensure the safety and reliability of the Airport. Both BST and MaineDOT have a vested interest in ensuring the pavement is maintained in good condition and does not fall into disrepair. BST will actively maintain its airfield in accordance with its PMP and make an effort to follow the recommended timeframe (20 years) to maintain the serviceable life of the Airport's pavement to the maximum extent. In addition, BST will use its PMP to inform its CIP request and maintain the Airport.

The MaineDOT SASP also recommended that Maine airports regularly assess and maintain their airfield pavements to extend their service life and minimize the need for costly rehabilitation projects. In 2025, MaineDOT is beginning a statewide PCI study. BST will benefit greatly from this detailed pavement inspection, and the information gleaned from this study can be used to better manage the pavements at the Airport.

As of November 2024, Airport management has indicated that there are no based aircraft parked outside on the apron. In total, there are 11 tie downs available for Airport parking, and parking needs are met throughout the planning period.

Recommendation: Based on the MaineDOT SASP recommendations, BST should continue to monitor and maintain airfield pavements. Utilizing the Statewide PCI study will provide important pavement health information that can be used to schedule maintenance activities and plan major rehabilitation of aging pavements. With based and itinerant aircraft parking needs being met throughout the planning period, there are no additional recommendations.

4.3.4. Hangars

As mentioned in Chapter 1, the Airport has 27 hangars, one is a T-hangar, 23 are smaller box hangars, and the remaining four are conventional hangars that support larger or multiple smaller aircraft. The T-hangar and one of the conventional hangars are owned by the city, and the remainder are privately owned. The following section will discuss the based aircraft hangar demand at BST.

4.3.4.1. Based Aircraft Hangar Demand

Hangars at an airport are planned for both based and itinerant aircraft. Requirements are calculated based on the size and quantity of aircraft based at the Airport. While each aircraft will vary in size, the following planning factors were used to calculate the approximate hangar space requirements for aircraft based at the Airport:

- 1,200 SF for each single-engine and helicopter aircraft
- 1,600 SF for each multi-engine aircraft
- 3,000 SF for each turboprop aircraft

When calculating hangar demand, it is assumed that 84 percent of single-engine aircraft will be stored in box hangars. This value represents all box hangars being full, which was indicated by Airport management. It is also assumed that 16 percent of single-engine aircraft, 100 percent of turboprop aircraft, and 100 percent of rotorcraft will be stored in conventional hangars. During the winter months, based aircraft owners prefer to store their aircraft indoors to protect them from the harsh Maine winters. Total hangar requirements are shown in **Table 4-15.** Since Chapter 3 was written, Airport management has indicated that there are now 28 based aircraft at BST.

Table 4-15: Based Aircraft Hangar Demand

Year	Facility Demand	Current Provision	Additional Need
2024			
Box Hangars	23	23	-
Conventional Hangars	5,184 SF	13,500 SF	-
2029			
Box Hangars	23	23	-
Conventional Hangars	8,184 SF	13,500 SF	-
2034			
Box Hangars	23	23	-
Conventional Hangars	9,384 SF	13,500 SF	-

Source: McFarland Johnson analysis, 2025.

For planning purposes only, hangar demand for an additional five based aircraft is shown in **Table 4-16**. As identified in Chapter 3, the Maine Department of Environmental Protection has placed a limit on hangar development at the Airport due to higher than normal phosphorus soil levels. Airport management has indicated that there are parties interested in constructing more hangars once the phosphorus soil issue at the Airport is resolved. This issue currently limits the construction of additional hangars but artificially keeps the number of based aircraft lower than demand.

Table 4-16: Additional Based Aircraft Scenario

Year	Facility Demand	Current Provision	Additional Need
2024			
Box Hangars	23	23	-
Conventional Hangars	5,184 SF	13,500 SF	-
2029			
Box Hangars	24	23	1
Conventional Hangars	12,976 SF	13,500 SF	-
2034			
Box Hangars	25	23	2
Conventional Hangars	14,560 SF	13,500 SF	1,060 SF

Source: McFarland Johnson analysis, 2025.

Recommendation: Additional hangar space should be built as demand warrants, once the phosphorus issue is resolved.

4.3.5. Non-Aviation Use Areas

Existing non-aviation use areas at the Airport include the Belfast Transfer Station, shown in **Figure 4-2.** This area is in the process of being changed from aeronautical use to non-aeronautical use at the time of this Master Plan writing. The ALP update will reflect this change when the Master Plan is completed.

Chapter 1 identified approximately 89 acres available for non-aeronautical development on the southern, eastern, and northern portions of the Airport. Chapter 5 will review potential layouts for non-aeronautical developments.

Recommendation: The Airport should explore non-aeronautical development throughout the planning period for revenue-generating purposes.

4.3.6. Electric Aircraft and Vehicle Charging

Electric aircraft charging is important for the Airport to plan for throughout the planning period. Beta Technologies received FAA approval to operate EVTOL and ECTOL aircraft in the summer of 2024, and Beta Technologies and other manufacturers may operate EVTOL and ECTOL aircraft at the Airport in the future.

Charging requirements for EVTOL and ECTOL aircraft may be based on the type of aircraft using the Airport in the future. For planning purposes only, the Beta Power Cube requires 350 kW of continuous power and is an example of what power may be required to offer charging services at the Airport in the future. Beta Technologies reports that with this continuous power source, aircraft can be fully charged in 50 minutes.

In addition, electric vehicle charging should be planned at the Airport in the future, if demand warrants. Also, a combination of solar-generated power and battery storage may be an option to consider in the future if demand warrants. Power requirements for Level 2 and 3 chargers are shown in **Table 4-17.**

Table 4-17: Vehicle Charging Requirements

Charging Level	Power Source	Hours to Full Charge
Level 2	240V	4-8 hours
Level 3	480V	~30 minutes

Source: McFarland Johnson analysis, 2025.

Recommendation: Electric aircraft and vehicle charging should be implemented as demand warrants.

4.3.7. Summary of Landside Facility Requirements

The landside facility requirements summary is shown in **Table 4-18**.

4.4. Support Facility Requirements

The Airport provides a variety of supporting infrastructure and equipment to maintain safe, efficient, and reliable aircraft operations. The following section will further discuss each of these facilities.

- Aviation Fueling Facilities
- Airfield Maintenance Facilities
- Snow Removal Equipment Storage
- FBO Functions
- Summary of Support Facility Requirements

Table 4-18: Landside Facility Requirements

Existing Area	Existing Provision	Future Requirements	Recommendation
Terminal/Administration Building (Section 4.3.1)	510 SF Not ADA compliant	510 SF Fully ADA compliant	Upgrade or replace the terminal building to meet ADA compliance
General Aviation Auto Parking (Section 4.3.2)	19 spaces	19 spaces	Expand vehicle parking if demand warrants
Based and Itinerant Aircraft Aprons and Tiedowns (Section 4.3.3)	Based aircraft: 7 tiedowns Itinerant aircraft: 6 tiedowns	Based aircraft: 7 tiedowns Itinerant aircraft: 6 tiedowns	Maintain airfield pavements
Hangars (Section 4.3.4)	23 box hangars 13,500 SF conventional hangar space	23 box hangars 13,500 SF conventional hangar space	Construct additional hangar space as demand warrants, once the phosphorus issue is resolved
Non-Aviation Use Areas (Section 4.3.5)	89 acres available for development Belfast Transfer Station: existing aeronautical use, changing to non-aeronautical use on ALP Verizon cell tower: Future non-aeronautical use	Utilize available areas for non-aeronautical use Belfast Transfer Station and Verizon Cell tower: non-aeronautical uses	Explore potential non-aeronautical uses
Electric Aircraft and Vehicle Charging (Section 4.3.6)	No existing infrastructure	Aircraft charging, vehicle charging	Construct infrastructure if demand warrants

Sources: Airport management, 2024, and McFarland Johnson analysis, 2025.

4.4.1. Aviation Fueling Facilities

As mentioned in Chapter 1, the Airport recently installed one 10,000-gallon 100LL and one 10,000-gallon Jet-A fuel tank in August 2023. Fuel demand is shown in **Table 4-19.**

BST should adequately plan for and manage the upkeep of its fuel system by strategizing cost recovery efforts and/or a business plan.

Table 4-19: BST Fuel Demand

	Jet-A (Gallons)	100LL AvGas (Gallons)
Existing Storage Supply	10,000	10,000
2024 Peak 7-Day Demand	57	316
2024 Peak 14-Day Demand	115	631

Source: BST airport management and McFarland Johnson analysis, 2024.

Recommendation: The Airport has sufficient capacity for both aviation fuel types. The Airport should continue to perform the required maintenance and condition assessments on all its fuel facilities. These efforts aim to maintain the serviceable life of the Airport's facilities to the maximum extent possible.

4.4.2. Airfield Maintenance Facilities

As mentioned in Chapter 1, BST has one maintenance storage shed measuring 400 SF, however it has no electrical service. This structure should be maintained throughout the planning period.

Recommendation: With a location already in place for storing maintenance equipment, there are no additional recommendations, other than providing electrical service to the shed.

4.4.3. Snow Removal Equipment Storage

As mentioned in Chapter 1, the City of Belfast provides personnel and equipment for snow removal at the Airport. Per FAA AC 150/5220-20A, *Airport Snow and Ice Control Equipment,* with less than 10,000 operations per year, and greater than 30 inches of annual snowfall, it is recommended that the Airport have one high-speed rotary plow supported by two snowplows. However, the AIP Handbook states the Airport is eligible for one snow carrier vehicle stored in a 1,600-square-foot building.

Recommendation: If the Airport chooses to do so, it is recommended to purchase one SRE carrier vehicle and construct a 1,600-square-foot building to store the vehicle.

4.4.4. FBO Functions

As the City of Belfast currently operates as the de facto FBO at the Airport, some FBO functions should be considered for future facility requirements.

4.4.4.1. Deicing/Anti-icing Capability

Aircraft deicing and anti-icing are critical safety procedures that ensure the removal and prevention of ice, snow, and frost accumulation on aircraft surfaces—especially wings, control surfaces, and engines. These operations are essential for maintaining aerodynamic integrity and preventing control issues during takeoff. Deicing is the removal or mitigation of existing icing conditions, and anti-icing involves the application of fluids to temporarily prevent ice accumulation, usually directly before takeoff.

Application methods at GA airports typically involve a specialized vehicle that can apply the (usually heated) deicing fluid directly onto aircraft control surfaces. Alternatively, a heated hangar can be used for non-chemical deicing.

There are also environmental considerations, including glycol recovery systems and stormwater protection, and coordination with the Maine Department of Environmental Protection (MaineDEP) and the US Environmental Protection Agency (USEPA).

Operational considerations include calculations for departure timing, real-time weather monitoring, holdover time calculations, staff training, and Standard Operating Procedures (SOPs) for fluid application and safety.

4.4.4.2. Ground Auxiliary Power Unit (GPU) Capability

A mobile GPU provides electrical and sometimes even pre-conditioned air to aircraft parked at a gate or hardstand. GPUs allow for continuous power delivery without the need to run aircraft engines or use bleed air for turbine-engine aircraft. These units serve as a cleaner, quieter, more environmentally-friendly alternative to running aircraft engines, supporting aircraft systems during turnaround without burning fuel.

4.4.4.3. Aircraft Tug

An aircraft tug capable of towing up to a light jet would be beneficial for repositioning aircraft. This capability would forego the need to run aircraft engines for aircraft repositioning and for getting aircraft into itinerant hangars. Some GA airports utilize multi-purpose tugs, such as small tractors that can also be utilized for airfield maintenance.

4.4.4.4. Mobile Refuelers

Lastly, a mobile refueling vehicle can be very useful for refueling aircraft that would not normally utilize the self-fueling that is available at the Airport today. Some jet operators are forbidden from self-fueling due to insurance reasons, and a mobile fueler provides a level of customer service that many charter aircraft operators are accustomed to and are willing to pay a premium for.

Recommendation: It is recommended that the Airport pursue the equipment necessary to expand the FBO functions at the Airport to increase revenue and increase the likelihood that aircraft operators will utilize BST for their technical stops and passenger pickups, and drop-offs.

4.4.5. Summary of Support Facility Requirements

Table 4-20 shows the support facility requirements for the Airport.

Table 4-20: Support Facility Requirements Summary

Existing Area	Existing Provision	Future Requirements	Recommendation
Aviation Fueling Facilities (Section 4.4.1)	Jet-A: 10,000 gallons 100LL: 10,000 gallons	Same	Perform required maintenance and condition assessments
Snow Removal Equipment (Section 4.4.3)	No existing equipment	One snow carrier vehicle 1,600 SF building	Purchase SRE carrier vehicle, construct SRE storage building
FBO Functions	Self-serve fuel	Deicing/anti-icing GPU capability Aircraft tug Mobile refueler(s)	Acquire FBO functional equipment as necessary and available

Sources: Airport management, 2024, and McFarland Johnson analysis, 2025.

Belfast Municipal Airport

Airport Master Plan Update

Appendix A – Technical Supplement

McFARLAND JOHNSON

A. TECHNICAL SUPPLEMENT

A.1. Purpose and Introduction

In addition to the chapters of the Master Plan, the objective of the Technical Supplement is to define more complex elements of airport design, steps of the master plan process, and planning considerations that affect the Belfast Municipal Airport.

Airport Planning looks at the fundamentals of how airports are planned and constructed, with a focus on runway design, terminal design, environmental requirements of airport projects, and the basic understanding of many features and functions of the airport. The last objective of airport planning is where this supplement aims to provide additional technical detail. The supplement is organized into the following subsections:

The technical supplement is informed by various forms of guidance including the project team's experience, Advisory Circulars (ACs) issued by the Federal Aviation Administration, including AC 150/5300-13B Change 1, Airport Design, and various other state and federal laws that pertain to the design of airport facilities.

This supplement includes numerous subjects organized into the following sections:

Section	Title
A.1	Purpose and Introduction
A.2	Airspace
A.3	Runway/Taxiway Design Group Classification
A.4	Glossary of Terminology

A.2. Airspace

Airspace in the United States is classified as controlled, uncontrolled, or special use. Controlled airspace is a generic term that covers the different classifications of airspace (Class A, Class B, Class C, Class D, and Class E) and defined dimensions within which air traffic control (ATC) service is provided to IFR and VFR flights in accordance the with the airspace classification. Uncontrolled airspace includes areas where ATC has neither authority nor responsibility to control aircraft. According to the Aeronautical Information Manual (AIM), special use airspace consists of airspace where activities must be confined because of their nature, or where limitations are imposed upon aircraft operations that are not part of the confined activities. Special use or restricted airspace is depicted on aeronautical charts unless it is the result of a controlled-firing area. Special use areas are typically due to military training facilities. Descriptions of the airspace classifications can be seen in **Table A-1**.

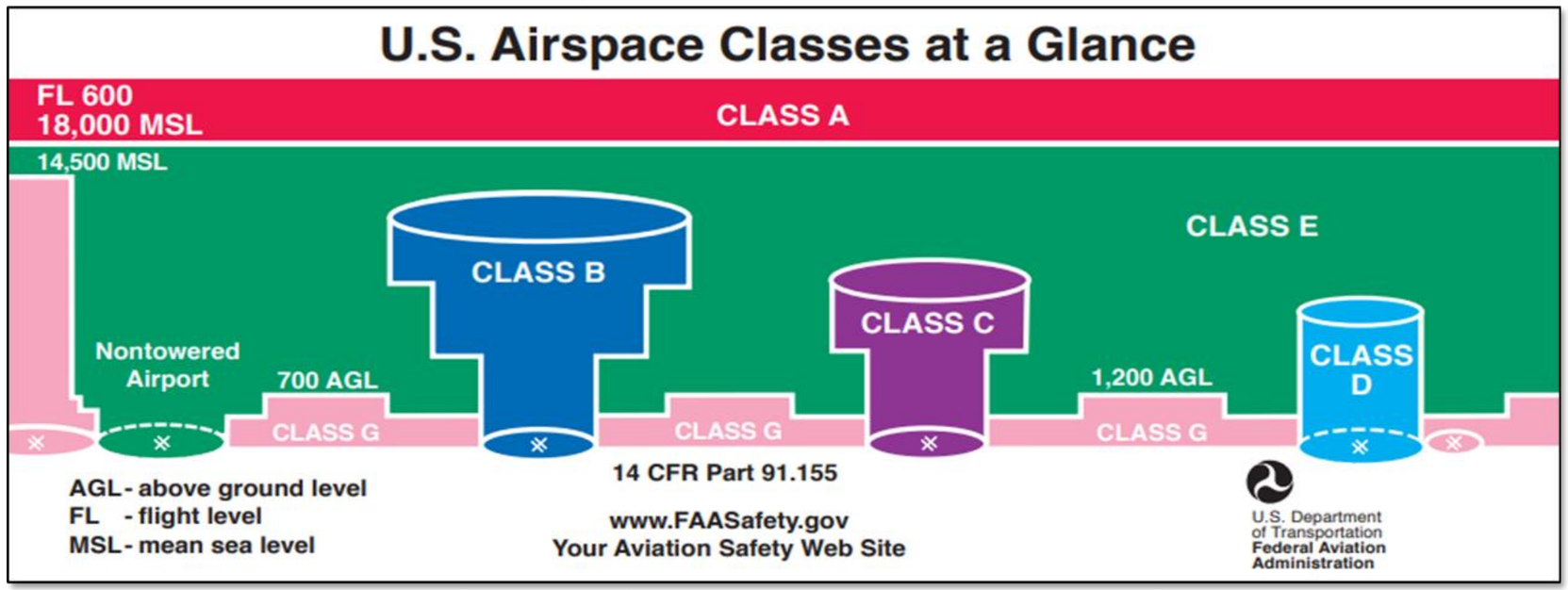
Figure A-1 provides a graphical and tabular explanation of FAA airspace classes.

Table A-1: Airspace Classifications

Airspace Class	Description
Controlled	
A	Class A airspace covers the entire United States and encompasses all airspace from 18,000 feet to 60,000 feet above mean sea level (AMSL). Aircraft flying in Class A airspace must operate under IFR, including filing flight plans.
B	Requires ATC clearance before operating an aircraft within this airspace. All aircraft are subject to IFR or Controlled Visual Flight Rules (CVFR). Class B airspace surrounds the nation's busiest airports and has the appearance of an upside-down multi-tier cake that funnels aircraft traffic toward the airport. Generally, the airspace is within a 20 nautical mile (NM) radius and up to 10,000 feet MSL. Boston Logan International Airport (BOS) is the closest airport to BST surrounded by Class B airspace (approximately 153 NM SSW).
C	The FAA has established Class C airspace at approximately 120 airports around the country that have significant levels of IFR traffic. Class C airspace is designed to regulate the flow of uncontrolled traffic above, around, and below the arrival and departure airspace required for high-performance, passenger-carrying aircraft at major airports. To fly inside Class C airspace, an aircraft must have a two-way radio, an encoding transponder, and established communication with the ATC facility. Aircraft may fly below the floor of the Class C airspace or above the Class C airspace ceiling without establishing communication with ATC. The Bangor International Airport is the closest airport to BST surrounded by Class C airspace (approximately 25NM N)
D	Class D airspace extends upward to an altitude of 2,500 feet above the airport elevation (charted in MSL) and is within a five-statute mile radius. Aircraft must maintain two-way radio communication with the control facility while operating in this airspace. Augusta State Airport (AUG) is the closest airport to BST surrounded by Class D airspace (approximately 34NM SW)
E	Class E airspace includes all the controlled airspace that is not classified as A, B, C, or D. Class E airspace has no special restrictions with regard to pilot qualifications or aircraft equipment rules. Nevertheless, it is still controlled airspace, implying that aircraft can be provided with ATC services.
Uncontrolled	
G	Covers all uncontrolled airspace. VFR minimums apply in this airspace. This includes all low-level airspace below 700 feet or 1,200 feet AGL and it extends up to 14,500 feet MSL in remote areas without airport traffic.

Source: FAA, Pilots Handbook of Aeronautical Knowledge, Chapter 15.

Figure A-1: FAA Airspace Classifications



Airspace Class	Entry Requirement	Pilot Certificate or Rating	Two-Way Communication	Altitude Decoding Transponder	VFR Min. Visibility Below 10,000 MSL	VFR Min. Visibility 10,000 MSL and Above	VFR Cloud Clearance Below 10,000 MSL	VFR Cloud Clearance 10,000 MSL and Above
A	ATC Clearance	Instrument	Yes	Yes	N/A	N/A	N/A	N/A
B	ATC Clearance	Private Certificate or student with endorsement	Yes	Yes within 30 nm of the class B primary airport[1]	3 miles	3 miles	Clear of Clouds	Clear of Clouds
C	VFR: Radio Contact IFR: Clearance	Student Certificate	Yes	Yes within C space and above lateral limits of C space[1]	3 miles	3 miles	500 below 1,000 above 2,000 horizontal	500 below 1,000 above 2,000 horizontal
D	VFR: Radio Contact IFR: Clearance	Student Certificate	Yes	No unless required by other airspace	3 miles	3 miles	500 below 1,000 above 2,000 horizontal	500 below 1,000 above 2,000 horizontal
E	VFR: None IFR: Clearance	Student Certificate	IFR only	No unless required by other airspace	3 miles	5 miles	500 below 1,000 above 2,000 horizontal	1,000 below 1,000 above 1 mile horizontal
G	None	Student Certificate	No	No unless required by other airspace	Day: 1 mile Night: 3 miles	5 miles[2]	500 below 1,000 above 2,000 horizontal [2]	1,000 below 1,000 above 1 mile horizontal [2]

[1] An altitude decoding transponder is required above 10,000 MSL.
[2] When flying 1,200 AGL or below: DAY: 1 mile visibility clear of clouds; NIGHT: 3 miles visibility, 500 below, 1,000 above, 2,000 horizontal.

02/11

Source: FAA Safety Website, www.FAASafety.gov.

A.3. Runway/Taxiway Design Group Classification

A.3.1. Runway Design Code (RDC)

The RDC signifies the design standards to which a runway will be built. Airport design first requires selecting the Runway Design Code and then applying the airport design criteria associated with the RDC, which is predicated on the design aircraft (typically the largest aircraft to utilize a runway). This code then enables airport designers to design a runway that will satisfy the operational requirements of the selected critical aircraft and ensure that all separation and safety requirements are satisfied.

This document provides criteria for grouping of aircraft into runway design codes. The RDC consists of a letter representing an AAC which is based on approach speed, a number representing an ADG which is based on tail height and/or wingspan, and a number representing the visibility minimums associated with the runway (based on corresponding runway visual range (RVR) values in feet). RDC components are classified as seen in **Table A-2**.

Table A-2: RDC Components

Aircraft Approach Category (AAC)	
Category	**Approach Speed**
A	Approach speed less than 91 knots
B	Approach speed 91 knots or more but less than 121 knots
C	Approach speed 121 knots or more but less than 141 knots
D	Approach speed 141 knots or more but less than 166 knots
E	Approach speed 166 knots or more
Airplane Design Group (ADG)	
Group	**Tail Height (and/or) Wingspan**
I	< 20′ // < 49′
II	20′ - < 30′ // 49′ - < 79′
III	30′ - < 45′ // 79′ - < 118′
IV	45′ - < 60′ // 118′ - < 171′
V	60′ - < 66′ // 171′ - < 214′
VI	66′ - < 80′ // 214′ - < 262′
Visibility Minimums (VIS)	
RVR (FT)	**Flight Visibility Category (statute mile)**
VIS	Visual Approaches
4000	Lower than 1 mile but not lower than ¾ mile (APV ≥ 3/4 but < 1 mile)
2400	Lower than 3/4 mile but not lower than 1/2 mile (CAT-I PA)
1600	Lower than 1/2 mile but not lower than 1/4 mile (CAT-II PA)
1200	Lower than 1/4 mile (CAT-III PA)

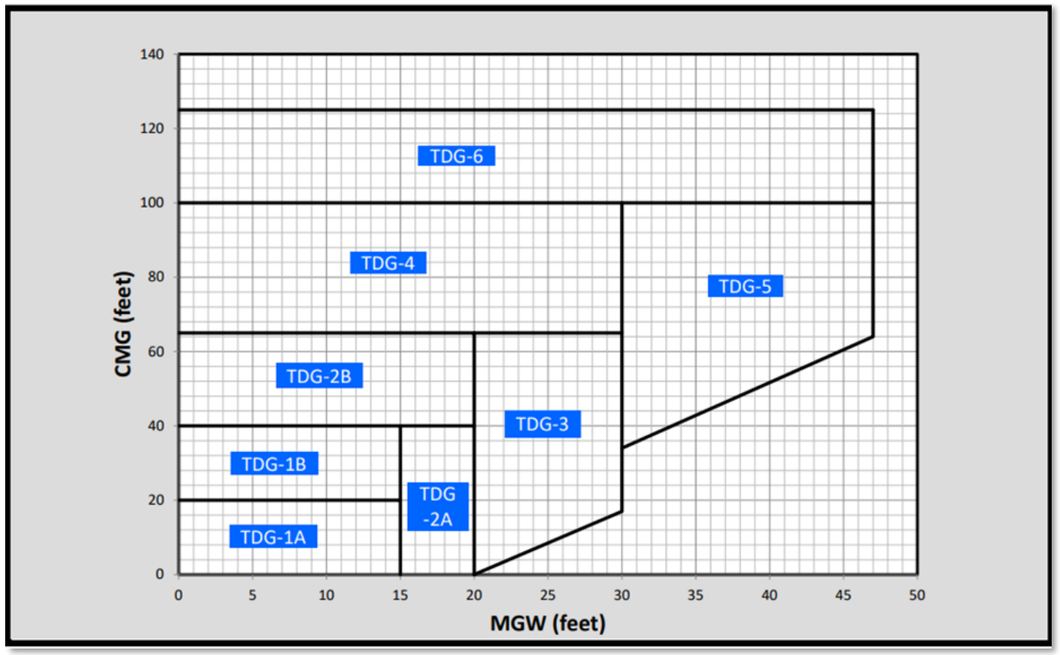
Source: FAA AC 150/5300-13B, Change 1, 2024.

A.3.2. Taxiway Design Group (TDG)

A taxiway is a defined path located in the Movement Area[1] and is used for aircraft to move from one point on the airport to another. Unlike the RDC, which is based on an airport's critical aircraft's approach speed, wingspan, and tail height, taxiway design is dictated based on another code that dictates taxiway design, known as the TDG. TDG guidance is based on several factors including aircraft width, the dimensions of the aircraft undercarriage (which includes the aircraft's overall Main Gear Width, MGW, and the Cockpit to Main Gear Distance, CMG), and runway to taxiway and taxiway/taxilane separation requirements. TDGs can be seen graphically in **Figure A-2**.

Planning standards for taxiways include taxiway width, taxiway safety areas, taxiway object free areas, taxiway shoulders, taxiway gradient, and for parallel taxiways, the distance between the runway and taxiway centerlines. The dimensions of each standard vary based on the identified ADG and taxiway design group for each taxiway. The ADG is based on the wingspan and tail height of an aircraft, while the TDG is based on the distance between an aircraft's cockpit to main gear, as well as the width of the main gear. There are six ADG groups and seven TDG groups.

Figure A-2: Taxiway Design Groups



Note: Values in the graph are rounded to the nearest foot. One foot = 0.305 meters.
Source: FAA AC 150/5300-13B, Change 1, 2024.

[1] Movement Area: Areas used for air carrier operations and regulated under Title 14 CFR Part 139. Includes runways, taxiways, and the other areas of the airport used for taxiing, takeoff, and landing of aircraft.

Table A-3 and **Table A-4** depict FAA taxiway standards.

Table A-3: Taxiway Standards – Airplane Design Group

Design Standard	ADG I	ADG II	ADG III	ADG IV	ADG V	ADG VI
Taxiway Safety Area (ft)	49	79	118	171	214	262
Taxiway Object Free Area (ft)	89	124	171	243	285	335
Runway/Taxiway Separation (ft)	150–400*	240–400*	300-400*	400	400-500*	500

Source: FAA AC 150/5300-13B Change 1, 2024.

* Runway/taxiway separations vary based on approach visibility minimums and/or airport elevation.

Table A-4: Taxiway Standards – Taxiway Design Group

Design Standard	TDG 1A/1B	TDG 2A/2B	TDG 3	TDG 4	TDG 5	TDG 6
Taxiway Width (ft)	25	35	50	50	75	75
Taxiway Shoulder Width (ft)	10	15	20	20	30	30

Source: FAA AC 150/5300-13B Change 1, 2024.

A.4. Glossary of Terminology

100LL Specialized fuel used to power piston engine aircraft

AAC Aircraft Approach Category

A grouping of aircraft based on landing speed (see **Table A-2**).

AAGR Average Annual Growth Rate

AC Advisory Circular

An AC is an FAA publication that provides guidance for compliance with any rules within Title 14 of the CFR, *Aeronautics and Space*, including, airworthiness regulations, pilot certification, operations standards, and training standards.

ACN Aircraft Classification Number

The ACN is a number that expresses the relative effect of an aircraft at a given configuration on a pavement structure for a specified standard subgrade strength.

ACRP Airport Cooperative Research Program

ACRP is an applied research program authorized by Congress, sponsored by the FAA, and managed by the Transportation Research Board (TRB). This industry-driven program develops practical solutions to near-term challenges facing airports.

ACS American Community Survey

ADG Airplane Design Group

A classification of aircraft based on wingspan and tail height. When the aircraft wingspan and tail height fall into different groups, the higher group is used (see **Table A-2**).

ADIP Airport Data and Information Portal

ADO Airports District Office

The FAA ADO for Belfast is in Burlington, MA.

ADPM Average Day of the Peak Month

ADS-B Automatic Dependent Surveillance-Broadcast

ADS-B is part of FAA's Next Generation Air Transportation System (NextGen) designed to enhance the situational awareness of pilots and aircraft controllers.

ADG Airplane Design Group

AGL Above Ground Level

AIM Aeronautical Information Manual

AIP Airport Improvement Program

The AIP provides grants for the planning and development of public-use airports that are part of the NPIAS.

Air Quality

Under Section 176(c) of the Clean Air Act (CAA) Amendments of 1977, the FAA is responsible for ensuring that federal airport actions conform to the State Implementation Plan (SIP), which protects against regional air pollution impacts. The criteria and procedures for implementing this conformity are detailed in Title 40 CFR Part 93, Determining Conformity of Federal Actions to State or Federal Implementation Plans. Many federal actions on an airport are considered to be general conformity actions. Presently, the general conformity rules only apply in areas that have been determined by the EPA to be in nonattainment or maintenance for the CAA's National Ambient Air Quality Standards (NAAQS) of the six priority pollutants (ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, and lead). Under NEPA, the FAA may be required to prepare detailed air quality analysis for proposed projects whose air quality emissions have the potential to cause violations of the NAAQS for the six criteria pollutants.

ALP Airport Layout Plan

A set of drawings of current and future airport facilities that provides a graphic representation of the existing and long-term development plans for the airport.

ALS Approach Lighting System

Approach lighting systems are designed to facilitate the pilot's transition from instrument flying to visual identification of the landing runway. Depending on the system installed, the ALS generally consists of sequence flashing lights, approach lights, crossbar lights.

AMPU Airport Master Plan Update

AOA Air Operations Area

The AOA is not an FAA defined term, but rather is a term specified in the airport security program that includes portions of the airport designed and used for landing, taking off, or surface maneuvering of aircraft. In this sense, the AOA encompasses both movement and non-movement areas.

AOPA Aircraft Owners and Pilots Association

APV Approach with Vertical Guidance

According to the FAA, an APV is a type of instrument approach procedures that provides pilots with vertical guidance during landing.

APRC Approach Reference Code

ARFF Aircraft Rescue and Fire Fighting

According to 14 CFR Paragraph 139.315, Aircraft Rescue and Firefighting: Index Determination, the Index of an airport is determined by a combination of the length of air carrier aircraft and average daily departures of air carrier operations (generally five or more average daily departures of air carrier aircraft in a single Index group).

ARTCC Air Route Traffic Control Centers

ARTCCs help to control aircraft operating under IFR rules within controlled airspace and while enroute. The ARTCCs designate specific routes/altitudes for aircraft to maintain separation along federal airways.

ASOS Automated Surface Observing System

An ASOS collects weather data on a continual basis, 24 hours a day.

AWOS Automated Weather Observing System

An AWOS is a 24-hour real-time weather data collection and display system that transmits computer-generated voice reports about conditions at the location of the installation. The reports can also be accessed by telephone. A basic AWOS system measures cloud cover and ceiling, visibility, wind speed and direction, temperature, dew point, precipitation accumulation, icing (freezing rain), sea level pressure for altimeter setting, and detects lightning.

Based Aircraft

Defined by the FAA as being based at a particular airport and is operational and airworthy.

Biotic Resources

Biotic resources refer to the various types of flora (plants) and fauna (fish, birds, reptiles, amphibians, mammals, etc.), including state and federally-listed threatened and endangered species, in a particular area. It also encompasses the habitats supporting the various flora and fauna including rivers, lakes, wetlands, forests, and other ecological communities. Airport projects can affect these ecological communities and thereby affect vegetation and wildlife populations.

BRL Building Restriction Line

A line identifying where buildings can and cannot be built on an airport.

CAGR Compound Annual Growth Rate

CDC Centers for Disease Control and Prevention

CEJST Climate and Economic Justice Screening Tool

CFR Code of Federal Regulations

CFR is the codification of the general and permanent rules and regulations published in the Federal Register by the executive departments and agencies of the federal government of the United States.

CIP Capital Improvement Program

CJEST Climate and Economic Justice Screening Tool

CWA Clean Water Act

CZMA Coastal Zone Management Act

DEP Department of Environmental Protection (Maine)

DME Distance Measuring Equipment

DOD Department of Defense

EO Executive Order

EJI Environmental Justice Index

EPA Environmental Protection Agency

ESA Endangered Species Act

ETC Equitable Transportation Community

FAA Federal Aviation Administration

FAR Federal Aviation Regulation

The FAR falls under CFR Title 14: *Aeronautics and Space*.

FEMA Federal Emergency Management Agency

FIRM Flood Insurance Rate Map

FBO Fixed Base Operator

An FBO is an organization that provides aviation services, with permission from the airport, such as fueling, hangars, tie-downs, aircraft rental, aircraft maintenance, flight instruction, and other aeronautical services. In the case of Belfast, there is no operating FBO at the Airport.

Floodplains

Floodplains are land areas associated with bodies of water (lakes, rivers, and wetlands) that are likely to become inundated during a flooding event. The area or magnitude of a flood will vary according to the magnitude of the storm event as determined by the storm interval occurrences. For example, a five-year storm has a magnitude that can be expected once every five years. Typically, FEMA utilizes a 100-year storm interval for flood preparation. Flooding related to a 100-year storm statistically has a one percent chance of occurring during any given year. The 100-year period has been selected as having special significance for floodplain management because it is the maximum level of flooding that can reasonably be expected and planned for during a project's expected life span.

FPPA Farmland Protection Policy Act

FT Feet

FY Fiscal Year

GA General Aviation

All flights conducted by non-commercial aircraft, that are not scheduled, except for military operations.

GARD General Audio Recording Device

The GARD system is utilized to record and calculate the numbers of aircraft operations utilizing a system of microphones.

GHG Greenhouse Gas

GLS Acronym for Ground Based Augmentation (GBAS) Landing System

Provides corrections to aircraft in the vicinity of an airport in order to improve the accuracy of, and provide integrity for, an aircrafts' GPS navigational position.

GPS Global Positioning System

Groundwater

The EPA Sole Source Aquifer (SSA) program was established under the Safe Drinking Water Act (SDWA). According to the EPA, an SSA is defined as one that supplies at least 50 percent of the drinking water for its service area, and wherein there are no reasonably available alternative drinking water sources should the aquifer become contaminated. The SSA program allows for EPA review of federally funded projects that have the potential to affect designated SSAs and their source areas. According to the EPA, Airport property is not located over an SSA and therefore potential projects are not subject to EPA Section 1424(e) of the SDWA.

The United States Geologic Survey (USGS) tracks Principal Aquifers, defined as "a regionally extensive aquifer or aquifer system that has the potential to be used as a source of potable water." According to the Ground Water Atlas of the United States: Segment 12, Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, Vermont report published in 1995, the Airport is located over the New England crystalline-rock aquifers. Future proposed projects will take measures in design and construction to avoid, minimize, or mitigate any possible adverse impacts on groundwater.

Historic Resources

According to 36 CFR Part 800, historic property is "any prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in the NHRP." NHPA Section 106 requires that federal agencies, such as the FAA, consider the effects of their actions on historic properties via consultation with SHPO.

HIRL High Intensity Runway Lights

HITL High Intensity Taxiway Lights

HITL is not an FAA-defined term but often refers to the taxiway variant of high-intensity airfield lighting. HITLs are differentiated from HIRLs by the color of their lens. Taxiway edge lights have solid blue lenses, or in the case when lights are not utilized, taxiways are sometimes marked with blue rod-shaped reflectors. Taxiway centerline lights are green in color.

HWCM Hazardous Waste/Contaminated Material

IFR Instrument Flight Rules

IFR conditions occur when the reported cloud ceiling is at least 500 feet but less than 1,000 feet AGL and/or visibility is at least one statute mile but less than three statute miles.

ILS Instrument Landing System

IMC Instrument Meteorological Conditions (see also IFR)

IPaC Information for Planning and Consultation

ISA International Standard Atmosphere

The standard atmospheric conditions by which to compare the actual atmospheric conditions at a certain time and location. ISA is based on a standard temperature (59° F, 15° C), pressure (29.92 in. Hg), and density at mean sea level (MSL).

Jet-A Specialized fuel used to power turbine engine aircraft

LNAV Lateral Navigation Approach

LNAV approaches are non-precision approaches that provide lateral guidance.

LPV Localizer Performance with Vertical Guidance

An LPV approach allows pilots to fly precisions approaches in adverse weather conditions, without an ILS.

LSA Light Sport Aircraft

A MALSR is a 2,400-foot medium-intensity ALS with light stations positioned every 200 feet. This system includes sequenced flashing Runway Alignment Indicator Lights (RAILs).

MaineDOT Maine Department of Transportation

Maine DEP Maine Department of Environmental Protection

MCL Maximum Contaminant Levels

MCLG Maximum Containment Level Goals

MDIFW Maine Department of Inland Fisheries and Wildlife

MESASP Maine State Aviation System Plan

MHPC Maine Historic Preservation Commission

MNAP Maine Natural Areas Program

MOA Military Operations Area

MIRL Medium Intensity Runway Lighting

MITL Medium Intensity Taxiway Edge Lighting

MLW Maximum Landing Weight

MMLS Mobile Microwave Landing System

A precision approach and landing guidance system which provides position information and various ground-to-air data.

MSL Mean Sea Level

MMTCO2e Million Metric Tons of Carbon Dioxide Equivalent

MTOW Maximum Takeoff Weight

NAAQS National Ambient Air Quality Standards

NAVAID Navigational Aids

NAVAIDS are all equipment, lights, signs, and charts associated with the navigation of an aircraft both in the air and on the ground. NAVAIDs are depicted on various aeronautical charts. VFR Sectional Charts are referenced by pilots of slow to medium speed aircraft for cross-country navigation under VMC. NAVAIDs also include land-based navigational aids like the NDB, VOR, Satellite-based systems, and landing guidance systems.

NCDC National Climactic Data Center

NDB Non-Directional Beacon

A non-directional beacon is a radio beacon that aids the pilot of an aircraft equipped with direction-finding equipment. Non-directional refers to the type of radio signal transmitted. The signal sent out from an NDB is omnidirectional and can be received by an aircraft instrument detection finder. An NDB located along a final approach to an airport is also commonly referred to as a compass locator. NDBs are being rapidly replaced by GPS systems that offer more accuracy but are

still in wide use in areas of hazardous terrain, such as Alaska, and in mountainous geographies.

NEPA National Environmental Protection Act

NHPA National Historic Preservation Act

NHRP National Register of Historic Places

NLEB Northern Long-eared Bat

NOAA National Oceanic and Atmospheric Administration

NPDES National Pollutant Discharge Elimination System

NRCS U.S. Natural Resource Conservation Service

NPDWR National Primary Drinking Water Regulation

NPIAS National Plan of Integrated Airport Systems

NPI Non-Precision Instrument

NRHP National Register of Historic Places

NRI Nationwide Rivers Inventory

NRPA National Recreation and Park Association

NRPA Natural Resources Protection Act

NWI National Wetlands Inventory

OFA Object Free Area

An area centered on a runway, taxiway, or taxilane centerline to increase the safety of aircraft operations. This area is to remain clear of all non-air navigation and non-ground maneuvering related objects.

PA Precision Approach

PAR Precision Approach Radar

Per the FAA, PAR is designed for use as a landing aid rather than an aid for sequencing and spacing of aircraft.

PCI Pavement Condition Index

The PCI is a rating of the pavement condition based on the distresses observed on the pavement surface by type and severity. The PCI values range from 0 (worst) to 100 (best).

PCN Pavement Classification Number

The PCN is a numerical value that expresses the load-carrying capacity of a pavement for unrestricted operations.

PEM Palustrine Emergent Wetland

PFAS Per- and Polyfluoroalkyl Substances

PFOA Perfluorooctanoic Acid

PFO Palustrine Forested Wetland

PFOS Perfluorooctane Sulfonate

PVC Poor Visibility and Ceiling

PVC conditions exist when the cloud ceiling is less than 500 feet and/or the visibility is less than one statute mile.

RCRA Resource Conservation and Recovery Act

RDC Runway Design Code

The RDC dictates the standards to which a runway must be designed and built. It is made up of the AAC, the ADG, and visibility (see **Table A-2**).

REILs Runway End Identifier Lights

A REIL system allows pilots to quickly and certainly identify the end of the runway. Specifications for REIL systems vary but are typically a set of sequence flashers that exist at the end of the runway to help pilots identify the runway beginning or landing threshold.

RHA Rivers and Harbors Appropriation Act

RNAV Area Navigation Approach

An RNAV approach is an instrument approach procedure that relies on the aircraft's area navigation equipment for navigational purposes. This approach allows an aircraft to choose any course within a network of navigation beacons.

RNP Required Navigation Performance

A specification that defines the navigation accuracy necessary for aircraft operations in designated airspace.

ROFA Runway Object Free Area

An area centered on a runway centerline to increase the safety of aircraft operations. This area is to remain clear of all non-air navigation and non-ground maneuvering related objects.

RPZ Runway Protection Zone

The RPZ is the area located beyond or prior to the runway threshold, at ground level, to increase the safety of people and property around the airport.

RVR Runway Visual Range

RVR measures the atmospheric transmissivity along runways and translates this visibility value to the air traffic user.

RVZ Runway Visibility Zone

The RVZ is the area of visibility that connects two runway lines of sight by imaginary lines.

RSA Runway Safety Area

A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft in the event of an undershoot, overshoot, or excursion from the runway.

SF Square Feet

SHPO State Historic Preservation Office

SPCC Spill Prevention, Control, and Countermeasure

SRE Snow Removal Equipment

SSURGO Service Soil Survey Geographic Database

Surface Waters

The USACE regulates surface waters under Section 10 of the Rivers and Harbors Appropriation Act (RHA) that are considered to be a TNW as defined in the Act. The USACE also regulates surface water bodies through Section 404 of the CWA that have a significant nexus to a TNW as defined in either Section 10 of the RHA or Section 404 of the CWA. A significant nexus is generally defined as having more than an insubstantial or speculative effect on the chemical, physical, or biological integrity of a downstream TNW. Surficial open waterbodies, including streams, ponds, and lakes, are delineated by their Ordinary High Water Mark as defined in Title 33, Code of Federal Regulations, Part 328 (33 CFR Part 328).

The USACE also regulates wetlands and waterbodies within the state under Chapter 310 of the NRPA. Coastal wetlands and great ponds are included as wetlands of special significance.

SWPPP Storm Water Pollution Prevention Plan

TAF FAA's Terminal Area Forecast

The official FAA forecast of aviation activity for U.S. airports.

TDG Taxiway Design Group

A classification of airplanes based on outer-to-outer Main Gear Width (MGW) and Cockpit to Main Gear distance (CMG) (see **Table A-4**).

TFMSC Traffic Flow Management System Counts

TNW Traditional Navigable Waters of the United States

TOFA/TLOFA Taxiway Object Free Area/Taxilane Object Free Area

An area centered on a taxiway centerline to increase the safety of aircraft operations. This area is to remain clear of all non-air navigation and non-ground maneuvering related objects.

TSA Taxiway Safety Area

The TSA is a defined surface centered on the taxiway centerline and prepared or suitable for reducing the risk of damage to an aircraft deviating from the taxiway.

TWY Taxiway

USACE United States Army Corps of Engineers

USFWS United States Fish and Wildlife Service

USDOT United States Department of Transportation

VFR Visual Flight Rules

VFR conditions generally occur whenever the cloud ceiling is at least 1,000 feet above ground level (AGL) and the visibility is at least three statute miles.

VMC Visual Meteorological Conditions (see also VFR)

VOR Very-High Frequency Omnidirectional Range

Wetlands

The USACE regulates activities in wetlands that have a significant nexus to TNWs under Section 404 of the CWA. The USACE requires that an area have

predominately hydrophytic vegetation, hydric soils, and wetland hydrology present in order to be considered a wetland. In addition, EO 11990 - *Protection of Wetlands*, states that federal agencies shall provide leadership and shall act to "minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance natural and beneficial values of wetlands" in carrying out the agency's responsibilities. Under EO 11990, wetlands are defined as those areas that are inundated by surface or ground water with a frequency sufficient to support, and under normal circumstances do or would support, a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction.

The Maine DEP also regulates wetlands within the state under chapter 310 of the NRPA. There are three tiers of the review process for alterations of wetlands, with Tier 1 applying to any activity that involves a freshwater wetland alteration of up to 15,000 square feet; Tier 2 applying to any activity that involves a freshwater wetland alteration of 15,000 square feet up to one acre; and Tier 3 applies to any activity that involves freshwater wetland alteration of one acre or more, or an alteration of a freshwater wetland listed in subsection 4 or 5 (wetlands of special significance).

Wild and Scenic Rivers

The Wild and Scenic Rivers Act (Public Law 90-542) describes river areas eligible to be included in a system afforded protection under the Act as free-flowing and possessing "…outstanding remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or similar values."

Belfast Municipal Airport

Airport Master Plan Update

Appendix B – Environmental Documentation

McFARLAND JOHNSON

STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY
177 STATE HOUSE STATION
AUGUSTA, MAINE 04333

JANET T. MILLS
GOVERNOR

AMANDA E. BEAL
COMMISSIONER

January 14, 2025

Jordan Tate
McFarland Johnson
5 Depot Street, Suite 25
Freeport, ME 04032

Via email: jtate@jminc.com

Re: Rare and exemplary botanical features in proximity to: Belfast Municipal Airport, Belfast, Maine

Dear Jordan Tate:

I have searched the Maine Natural Areas Program's Biological and Conservation Data System files in response to your request received January 13, 2025 for information on the presence of rare or unique botanical features documented from the vicinity of the project in Belfast, Maine. Rare and unique botanical features include the habitat of rare, threatened, or endangered plant and unique or exemplary natural communities. Our review involves examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

Our official response covers only botanical features. For authoritative information and official response for zoological features you must make a similar request to the Maine Department of Inland Fisheries and Wildlife, 284 State Street, Augusta, Maine 04333.

According to the information currently in our Biological and Conservation Data System files, there are no rare botanical features documented specifically within the project area. This lack of data may indicate minimal survey efforts rather than confirm the absence of rare botanical features. You may want to have the site inventoried by a qualified field biologist to ensure that no undocumented rare features are inadvertently harmed.

If a field survey of the project area is conducted, please refer to the enclosed supplemental information regarding rare and exemplary botanical features documented to occur in the vicinity of the project site. The list may include information on features that have been known to occur historically in the area as well as recently field-verified information. While historic records have not been documented in several years, they may persist in the area if suitable habitat exists. The enclosed list identifies features with potential to occur in the area, and it should be considered if you choose to conduct field surveys.

This finding is available and appropriate for preparation and review of environmental assessments, but it is not a substitute for on-site surveys. Comprehensive field surveys do not exist for all natural areas in Maine, and in the absence of a specific field investigation, the Maine Natural Areas Program cannot provide a definitive statement on the presence or absence of unusual natural features at this site.

MOLLY DOCHERTY, DIRECTOR
MAINE NATURAL AREAS PROGRAM
90 BLOSSOM LANE, DEERING BUILDING

maine DEPARTMENT OF Agriculture Conservation & Forestry

PHONE: (207) 287-8044
WWW.MAINE.GOV/DACF/MNAP

The Maine Natural Areas Program (MNAP) is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. MNAP welcomes coordination with individuals or organizations proposing environmental alteration or conducting environmental assessments. If, however, data provided by MNAP are to be published in any form, the Program should be informed at the outset and credited as the source.

The Maine Natural Areas Program has instituted a fee structure of $75.00 an hour to recover the actual cost of processing your request for information. You will receive an invoice for $150.00 for two hours of our services.

Thank you for using MNAP in the environmental review process. Please do not hesitate to contact me if you have further questions about the Natural Areas Program or about rare or unique botanical features on this site.

Sincerely,

Lisa St. Hilaire

Lisa St. Hilaire | Information Manager | Maine Natural Areas Program
207-287-8044 | lisa.st.hilaire@maine.gov

Rare and Exemplary Botanical Features within 4 miles of Project: Belfast Municipal Airport, Belfast, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
American Chestnut						
	SC	S4	G3	2001-02-13	3	Hardwood to mixed forest (forest, upland)
Bog Bedstraw						
	SC	S2	G5	1940-07-23	3	Conifer forest (forest, upland)
	SC	S2	G5	1964-08-30	4	Conifer forest (forest, upland)

Date Exported: 2025-01-14 11:05

Conservation Status Ranks

State and Global Ranks: This ranking system facilitates a quick assessment of a species' or habitat type's rarity and is the primary tool used to develop conservation, protection, and restoration priorities for individual species and natural habitat types. Each species or habitat is assigned both a state (S) and global (G) rank on a scale of critically imperiled (1) to secure (5). Factors such as range extent, the number of occurrences, intensity of threats, etc., contribute to the assignment of state and global ranks. The definitions for state and global ranks are comparable but applied at different geographic scales; something that is state imperiled may be globally secure.

The information supporting these ranks is developed and maintained by the Maine Natural Areas Program (state ranks) and NatureServe (global ranks).

Rank	Definition
S1 **G1**	**Critically Imperiled** – At very high risk of extinction or elimination due to very restricted range, very few populations or occurrences, very steep declines, very severe threats, or other factors.
S2 **G2**	**Imperiled** – At high risk of extinction or elimination due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
S3 **G3**	**Vulnerable** – At moderate risk of extinction or elimination due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.
S4 **G4**	**Apparently Secure** – At fairly low risk of extinction or elimination due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.
S5 **G5**	**Secure** – At very low risk of extinction or elimination due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats.
SX **GX**	**Presumed Extinct** – Not located despite intensive searches and virtually no likelihood of rediscovery.
SH **GH**	**Possibly Extinct** – Known from only historical occurrences but still some hope of rediscovery.
S#S# **G#G#**	**Range Rank** – A numeric range rank (e.g., S2S3 or S1S3) is used to indicate any range of uncertainty about the status of the species or ecosystem.
SU **GU**	**Unrankable** – Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
GNR **SNR**	**Unranked** – Global or subnational conservation status not yet assessed.
SNA **GNA**	**Not Applicable** – A conservation status rank is not applicable because the species or ecosystem is not a suitable target for conservation activities (e.g., non-native species or ecosystems.
Qualifier	**Definition**
S#? **G#?**	**Inexact Numeric Rank** – Denotes inexact numeric rank.
Q	**Questionable taxonomy that may reduce conservation priority** – Distinctiveness of this entity as a taxon or ecosystem type at the current level is questionable. The "Q" modifier is only used at a global level.
T#	**Infraspecific Taxon (trinomial)** – The status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' global rank.

State Status: Endangered and Threatened are legal status designations authorized by statute. Please refer to MRSA Title 12, §544 and §544-B.

Status	Definition
E	**Endangered** – Any native plant species in danger of extinction throughout all or a significant portion of its range within the State or Federally listed as Endangered.
T	**Threatened** – Any native plant species likely to become endangered within the foreseeable future throughout all or a significant portion of its range in the State or Federally listed as Threatened.
SC	**Special Concern** – A native plant species that is rare in the State, but not rare enough to be considered Threatened or Endangered.
PE	**Potentially Extirpated** – A native plant species that has not been documented in the State in over 20 years, or loss of the last known occurrence.

Element Occurrence (EO) Ranks: Quality assessments that designate viability of a population or integrity of habitat. These ranks are based on size, condition, and landscape context. Range ranks (e.g., AB, BC) and uncertainty ranks (e.g., B?) are allowed. The Maine Natural Areas Program tracks all occurrences of rare plants and natural communities/ecosystems (S1-S3) as well as exemplary common natural community types (S4-S5 with EO ranks A/B).

Rank	Definition
A	**Excellent** – Excellent estimated viability/ecological integrity.
B	**Good** – Good estimated viability/ecological integrity.
C	**Fair** – Fair estimated viability/ecological integrity.
D	**Poor** – Poor estimated viability/ecological integrity.
E	**Extant** – Verified extant, but viability/ecological integrity not assessed.
H	**Historical** – Lack of field information within past 20 years verifying continued existence of the occurrence, but not enough to document extirpation.
X	**Extirpated** – Documented loss of population/destruction of habitat.
U	**Unrankable** – Occurrence unable to be ranked due to lack of sufficient information (e.g., possible mistaken identification).
NR	**Not Ranked** – An occurrence rank has not been assigned.

Visit the Maine Natural Areas Program website for more information
http://www.maine.gov/dacf/mnap

maine DEPARTMENT OF Agriculture Conservation & Forestry
NATURAL AREAS

JANET T. MILLS
GOVERNOR

STATE OF MAINE
DEPARTMENT OF
INLAND FISHERIES & WILDLIFE
353 WATER STREET
41 STATE HOUSE STATION
AUGUSTA ME 04333-0041

JUDITH CAMUSO
COMMISSIONER

January 24, 2025

Jordan Tate
McFarland Johnson
5 Depot Street
Freeport, ME 04032

RE: Information Request - Belfast Municipal Airport, Resource Inventory, Belfast Project ID 8844-10217

Dear Jordan:

Per your request received on January 13, 2025, we have reviewed current Maine Department of Inland Fisheries and Wildlife (MDIFW) information sources for known locations of Endangered, Threatened, and Special Concern (Rare) species; designated Essential and Significant Wildlife Habitats; inland fisheries and aquatic habitats; and other protected natural resource concerns within the vicinity of the ***Belfast Municipal Airport, Resource Inventory, Belfast*** project, pursuant to MDIFW's authority. MDIFW understands the project entails a master plan update with an associated environmental inventory. Please note that as project details are lacking, our comments should be considered preliminary.

Our Department has not mapped any Essential Habitats that would be affected by this project.

ENDANGERED, THREATENED, AND SPECIAL CONCERN SPECIES

Bat Species
Of the eight species of bats that occur in Maine, four species are afforded protection under Maines Endangered Species Act (MESA, 12 M.R.S 12801 et. seq.): little brown bat (State Endangered), northern long-eared bat (State Endangered), eastern small-footed bat (State Threatened), and tri-colored bat (State Threatened). The four remaining bat species are designated as Species of Special Concern: big brown bat, red bat, hoary bat, and silver-haired bat. While a comprehensive statewide inventory for bats has not been completed, based on historical evidence it is likely that several of these species occur within the project area during spring/fall migration, the summer breeding season, and/or for overwintering. However, our Department does not anticipate significant impacts to any of the bat species as a result of this project.

SIGNIFICANT WILDLIFE HABITAT

Deer Wintering Area
The project area intersects with a Deer Wintering Area (DWA). DWAs contain habitat cover components that provide conditions for protection from deep snow and cold wind, which is important for overwinter survival of white-tailed deer. DWA Travel Corridors contain similar

habitat qualities and provide the means for DWA ingress and egress. MDIFW generally recommends that development projects be designed to avoid impacts to the continued availability of coniferous winter shelter within important DWAs and Travel Corridors. Any removal of vegetation should be conducted in such a way that improves the quality and vigor of the coniferous species providing this winter shelter. If the project will involve the removal of trees important to overwintering deer, we recommend that you contact our regional wildlife staff for additional guidance. Project-related alterations within designated DWAs and Travel Corridors are considered as impacts to be avoided or minimized to the extent practicable and, if determined reasonable, appropriately mitigated.

Inland Waterfowl/Wading Bird Habitat

This project intersects with an Inland Waterfowl and Wading Bird Habitat (IWWH), a Significant Wildlife Habitat under Maine's Natural Resources Protection Act. These habitats provide important breeding, feeding, migration, and staging habitat for waterfowl and wading bird species. High and moderate value IWWHs include both the wetland complex and a 250-foot upland zone. MDIFW recommends that these resources be avoided entirely, including no clearing within the 250-foot upland zone extending from the wetland edge.

Significant Vernal Pools

At this time MDIFW Significant Wildlife Habitat (SWH) maps indicate no known presence of Significant Vernal Pools (SVPs) in the project search area. However, a comprehensive statewide inventory for Significant Vernal Pools has not been completed. SVPs are not included on MDIFW maps until project areas have been surveyed using approved methods and the survey results confirmed. Therefore, their absence from resource maps is not necessarily indicative of an absence on the ground. We recommend that surveys for vernal pools be conducted within the project boundary by qualified wetland scientists prior to final project design to determine whether there are Significant Vernal Pools present in the area. These surveys should extend up to 250 feet beyond the anticipated project footprint because of potential performance standard requirements for off-site Significant Vernal Pools, assuming such pools are located on land owned or controlled by the applicant. Once surveys are completed, survey forms should be submitted to our Department for review well before the submission of any necessary permits. Our Department will need to review and verify any vernal pool data prior to final determination of significance.

AQUATIC RESOURCES

Fish Habitat

Except for removal of vegetative obstructions (trees) that penetrate FAA navigable airspace, MDIFW recommends that 100-foot undisturbed vegetated buffers be maintained along streams. Buffers should be measured from the edge of stream or associated fringe and floodplain wetlands. Maintaining and enhancing buffers along streams is critical to the protection of water temperatures, water quality, natural inputs of coarse woody debris, and various forms of aquatic life necessary to support conditions required by many fish species. Stream crossings should be avoided, but if a stream crossing is necessary, or an existing crossing needs to be modified, it should be designed to provide full fish passage. Small streams, including intermittent streams,

can provide crucial rearing habitat, cold water for thermal refugia, and abundant food for juvenile salmonids on a seasonal basis and undersized crossings may inhibit these functions. Generally, MDIFW recommends that all new, modified, and replacement stream crossings be sized to span at least 1.2 times the bankfull width of the stream. In addition, we generally recommend that stream crossings be open bottomed (i.e., natural bottom), although embedded structures which are backfilled with representative streambed material have been shown to be effective in not only providing habitat connectivity for fish but also for other aquatic organisms. Construction Best Management Practices should be closely followed to avoid erosion, sedimentation, alteration of stream flow, and other impacts as eroding soils from construction activities can travel significant distances as well as transport other pollutants resulting in direct impacts to fisheries and aquatic habitat. In addition, we recommend that any necessary instream work occur between July 15 and October 1.

This consultation review has been conducted specifically for known MDIFW jurisdictional features and should not be interpreted as a comprehensive review for the presence of other regulated features that may occur in this area. Prior to the start of any future site disturbance, we recommend additional consultation with the municipality, and other state resource and regulatory agencies including the Maine Natural Areas Program and the Maine Department of Environmental Protection in order to avoid unintended protected resource disturbance. For information on federally listed species, contact the U.S. Fish and Wildlife Service's Maine Field Office (207-469-7300, mainefieldoffice@fws.gov).

Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

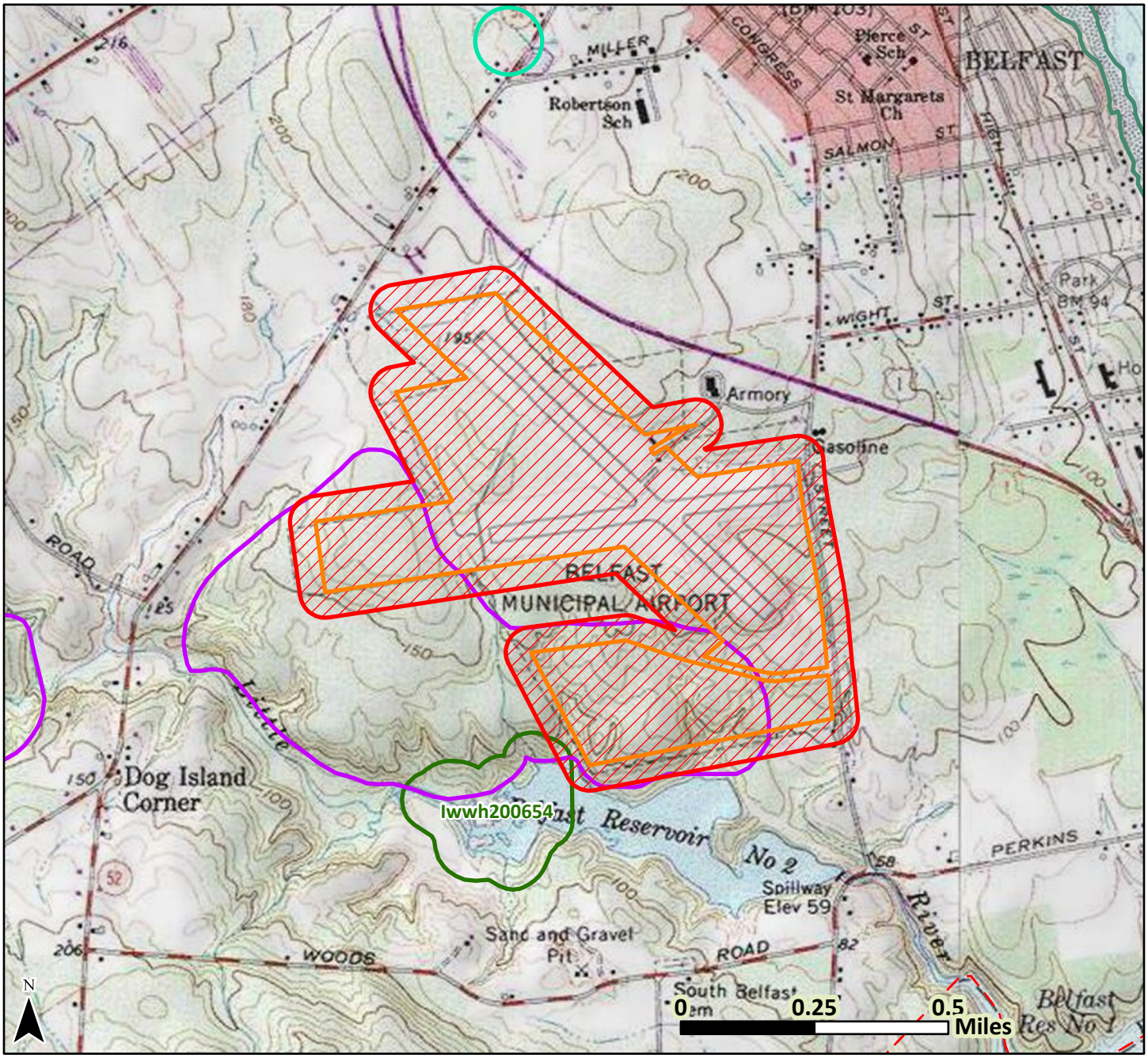
Best regards,

Andrew Wood
Environmental Review Coordinator

Maine Department of Inland Fisheries and Wildlife
Project Area Review of Fish and Wildlife Observations and Priority Habitats

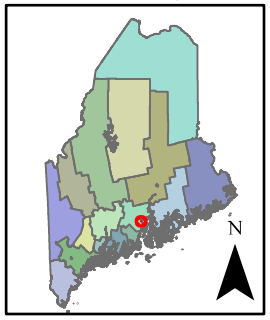
Belfast Municipal Airport, Resource Inventory, Belfast

Project ID 8844, Version ID 10217



- County Boundary
- Township Boundary
- Project Footprint
- Search Area
- Deer Wintering Area
- Inland Waterfowl/Wading Bird
- Significant Vernal Pool
- Tidal Waterfowl/Wading Bird

Date: 1/21/2025
Projection:
UTM Zone 19N, NAD83



Legend only lists resources visible in the map; see response letter for all resources that were evaluated.

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Project information

NAME

Belfast Municipal Airport - Master Plan Update

LOCATION

Waldo County, Maine

DESCRIPTION

Some(The project consists of preparing a master plan update for Belfast Municipal Airport, located in Belfast, Maine. Work consists of providing an inventory of environmental resources within and in the immediate vicinity of airport property.)

Local office

Maine Ecological Services Field Office

(207) 469-7300
(207) 902-1588

MAILING ADDRESS

P. O. Box A
East Orland, ME 04431

PHYSICAL ADDRESS

306 Hatchery Road
East Orland, ME 04431

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of

Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat Perimyotis subflavus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

Fishes

NAME	STATUS
Atlantic Salmon Salmo salar There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/2097	Endangered

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (▪)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (▪)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

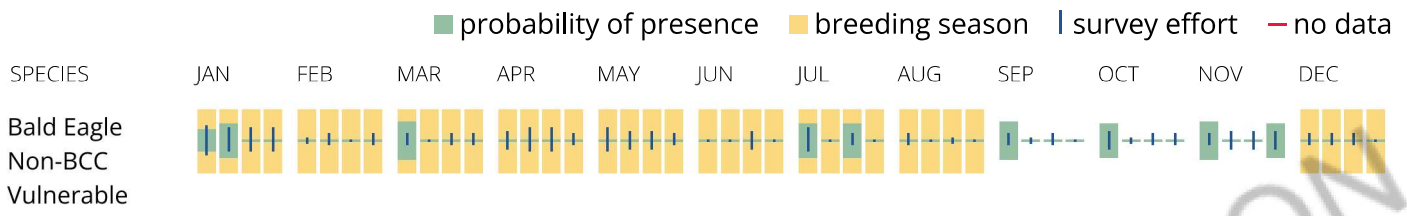
Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply). To see a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON

Bald Eagle Haliaeetus leucocephalus — Breeds Dec 1 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1626

Bay-breasted Warbler Setophaga castanea — Breeds May 25 to Aug 1
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Black-billed Cuckoo Coccyzus erythropthalmus — Breeds May 15 to Oct 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9399

Bobolink Dolichonyx oryzivorus — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Canada Warbler Cardellina canadensis — Breeds May 20 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Cape May Warbler Setophaga tigrina — Breeds Jun 1 to Jul 31
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Chimney Swift Chaetura pelagica — Breeds Mar 15 to Aug 25
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Evening Grosbeak Coccothraustes vespertinus — Breeds May 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Olive-sided Flycatcher Contopus cooperi — Breeds May 20 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3914

Prairie Warbler Setophaga discolor — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Rose-breasted Grosbeak Pheucticus ludovicianus — Breeds May 15 to Jul 31
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Veery Catharus fuscescens fuscescens — Breeds May 15 to Jul 15
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

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Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

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Breeding Season (▬)
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Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

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Survey Timeframe
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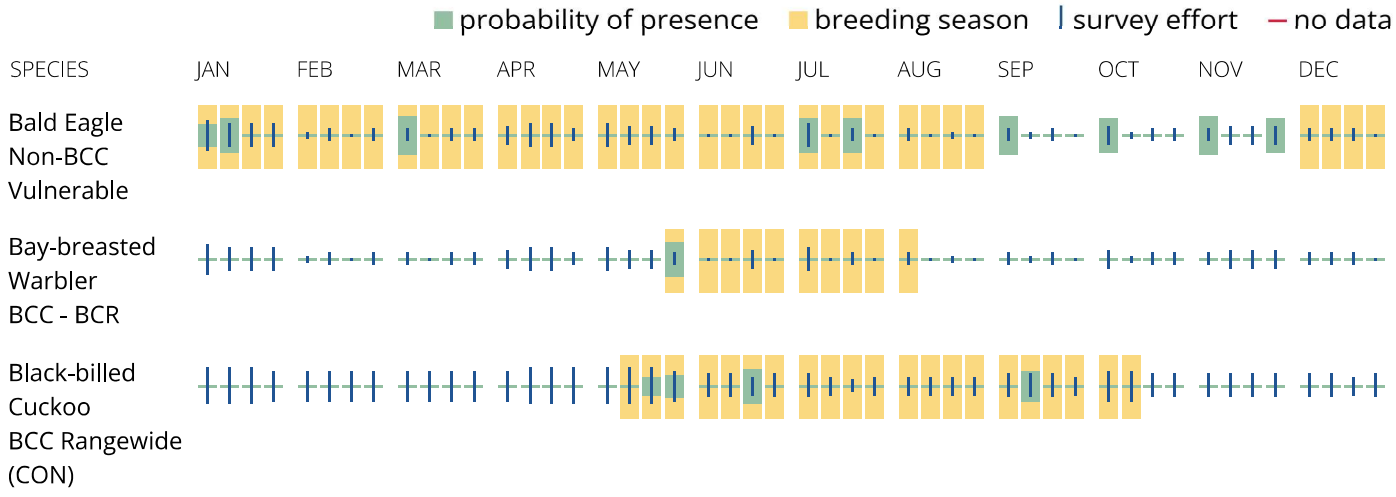

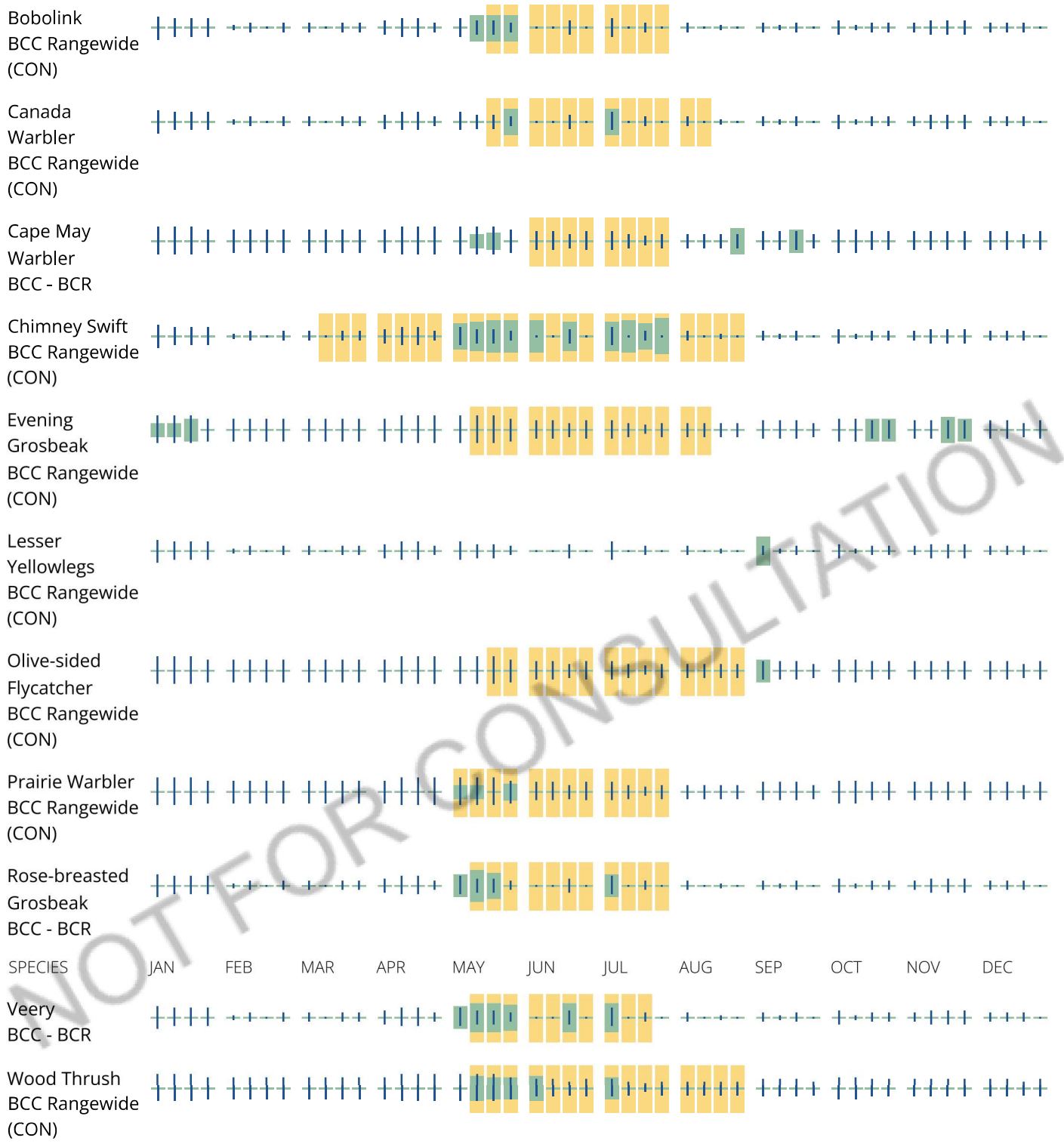

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

MAINE HISTORIC PRESERVATION COMMISSION
55 CAPITOL STREET
65 STATE HOUSE STATION
AUGUSTA, MAINE
04333

JANET T. MILLS
GOVERNOR

KIRK F. MOHNEY
DIRECTOR

January 29, 2025

Ms. Jordan Tate
McFarland Johnson
5 Depot St
Suite 25
Freeport, ME 04032

Project: MHPC# 0066-25 Belfast Municipal Airport Master Plan Update

Town: Belfast, ME

Dear Ms. Tate:

In response to your recent request, I have reviewed the information received January 13, 2025 to initiate consultation on the above referenced project in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA).

Based on the information submitted, I have concluded that there will be no historic properties (architectural or archaeological) affected by this proposed undertaking, as defined by Section 106.

Please contact Megan Rideout at (207) 287-2992 or megan.m.rideout@maine.gov if we can be of further assistance in this matter.

Sincerely,

Kirk F. Mohney

Kirk F. Mohney
State Historic Preservation Officer

PHONE: (207) 287-2132

FAX: (207) 287-2335

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Waldo County, Maine

Belfast Municipal Airport

January 2, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

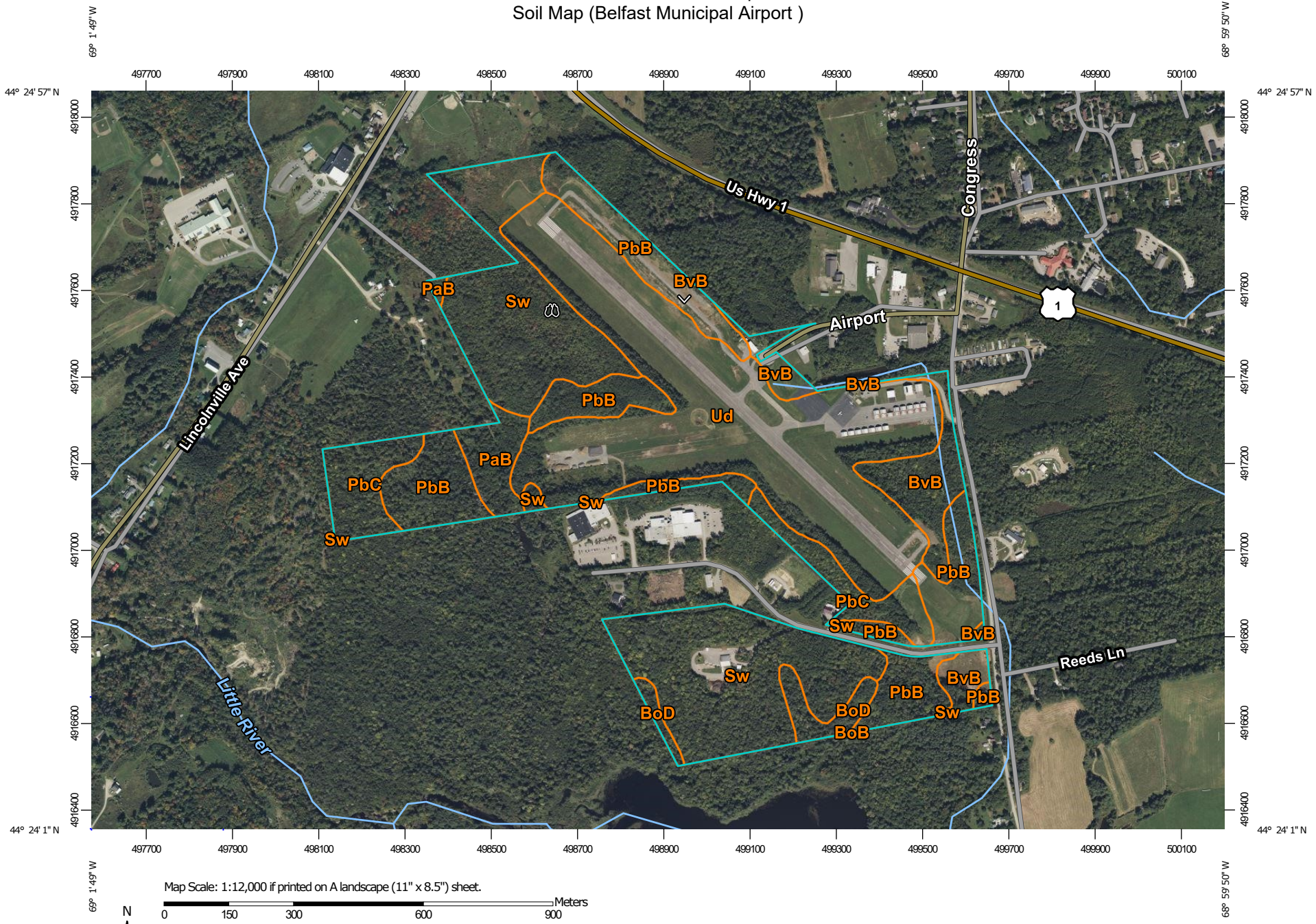
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map (Belfast Municipal Airport)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Waldo County, Maine
Survey Area Data: Version 24, Aug 26, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 11, 2021—Oct 29, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (Belfast Municipal Airport)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BoB	Boothbay silt loam, 3 to 8 percent slopes	0.0	0.0%
BoD	Boothbay silt loam, 15 to 25 percent slopes	5.3	2.2%
BvB	Brayton fine sandy loam, 0 to 8 percent slopes, very stony	16.2	6.7%
PaB	Peru fine sandy loam, 3 to 8 percent slopes	6.8	2.8%
PbB	Peru fine sandy loam, 0 to 8 percent slopes, very stony	43.9	18.3%
PbC	Peru fine sandy loam, 8 to 15 percent slopes, very stony	16.1	6.7%
Sw	Swanville silt loam, 0 to 3 percent slopes	66.3	27.5%
Ud	Udorthents-Urbanland complex	86.0	35.7%
Totals for Area of Interest		**240.7**	**100.0%**

Map Unit Descriptions (Belfast Municipal Airport)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They

generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Waldo County, Maine

BoB—Boothbay silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9k28
Elevation: 10 to 2,500 feet
Mean annual precipitation: 34 to 50 inches
Mean annual air temperature: 37 to 46 degrees F
Frost-free period: 60 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Boothbay and similar soils: 86 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boothbay

Setting

Landform: Marine terraces
Parent material: Fine-silty glaciolacustrine deposits and/or fine-silty marine deposits

Typical profile

H1 - 0 to 5 inches: silt loam
H2 - 5 to 22 inches: silt loam
H3 - 22 to 60 inches: silty clay loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.03 to 0.60 in/hr)
Depth to water table: About 7 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F144BY401ME - Clay Flat
Hydric soil rating: No

Minor Components

Swanville

Percent of map unit: 4 percent
Landform: Coastal plains
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Biddeford
Percent of map unit: 3 percent
Landform: Coastal plains
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Boothbay, slopes < 3 percent
Percent of map unit: 3 percent
Landform: Marine terraces
Hydric soil rating: No

Lyman
Percent of map unit: 2 percent
Landform: Drumlinoid ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Tunbridge
Percent of map unit: 2 percent
Landform: Till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

BoD—Boothbay silt loam, 15 to 25 percent slopes

Map Unit Setting
National map unit symbol: 9k2b
Elevation: 10 to 2,500 feet
Mean annual precipitation: 30 to 55 inches
Mean annual air temperature: 37 to 54 degrees F
Frost-free period: 60 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition
Boothbay and similar soils: 84 percent
Minor components: 16 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boothbay

Setting
Landform: Marine terraces

Parent material: Fine-silty glaciolacustrine deposits and/or fine-silty marine deposits

Typical profile

H1 - 0 to 5 inches: silt loam
H2 - 5 to 22 inches: silt loam
H3 - 22 to 60 inches: silty clay loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C/D
Ecological site: F144BY402ME - Clay Hills
Hydric soil rating: No

Minor Components

Lyman

Percent of map unit: 4 percent
Landform: Drumlinoid ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Swanville

Percent of map unit: 3 percent
Landform: Coastal plains
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Eldridge

Percent of map unit: 3 percent
Landform: Outwash plains
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Tunbridge

Percent of map unit: 3 percent
Landform: Till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex

Hydric soil rating: No

Boothbay, slopes > 25 percent

Percent of map unit: 3 percent
Landform: Marine terraces
Hydric soil rating: No

BvB—Brayton fine sandy loam, 0 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2t0jk
Elevation: 10 to 2,500 feet
Mean annual precipitation: 30 to 60 inches
Mean annual air temperature: 37 to 46 degrees F
Frost-free period: 70 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Brayton and similar soils: 82 percent
Minor components: 18 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brayton

Setting

Landform: Ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Lodgment till

Typical profile

Oa - 0 to 5 inches: highly decomposed plant material
A - 5 to 10 inches: fine sandy loam
Bg - 10 to 23 inches: fine sandy loam
Cd - 23 to 65 inches: fine sandy loam

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 10 to 27 inches to densic material
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.40 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F144BY305ME - Wet Loamy Flat
Hydric soil rating: Yes

Minor Components

Colonel
Percent of map unit: 8 percent
Landform: Ground moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Peru
Percent of map unit: 5 percent
Landform: Ground moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Peacham
Percent of map unit: 3 percent
Landform: Ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Tunbridge
Percent of map unit: 2 percent
Landform: Drumlinoid ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

PaB—Peru fine sandy loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 2ty5x
Elevation: 0 to 720 feet
Mean annual precipitation: 36 to 65 inches
Mean annual air temperature: 36 to 52 degrees F
Frost-free period: 90 to 160 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Peru and similar soils: 88 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Peru

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainbase, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite

Typical profile

Ap - 0 to 6 inches: fine sandy loam
Bhs - 6 to 8 inches: fine sandy loam
Bs1 - 8 to 12 inches: fine sandy loam
Bs2 - 12 to 18 inches: fine sandy loam
Bs3 - 18 to 21 inches: fine sandy loam
BC - 21 to 24 inches: fine sandy loam
Cd - 24 to 65 inches: sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: About 16 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F144BY501ME - Loamy Slope (Northern Hardwoods)
Hydric soil rating: No

Minor Components

Brayton

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Mountainbase, interfluve
Microfeatures of landform position: Closed depressions, closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Marlow

Percent of map unit: 3 percent
Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountainbase, interfluve
Microfeatures of landform position: Rises, rises
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Sunapee

Percent of map unit: 3 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainbase, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Colonel

Percent of map unit: 1 percent
Landform: Hills, mountains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Mountainbase, interfluve
Microfeatures of landform position: Closed depressions, closed depressions
Down-slope shape: Concave, linear
Across-slope shape: Concave
Hydric soil rating: No

PbB—Peru fine sandy loam, 0 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2ty62
Elevation: 0 to 590 feet
Mean annual precipitation: 36 to 65 inches
Mean annual air temperature: 36 to 52 degrees F
Frost-free period: 90 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Peru, very stony, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Peru, Very Stony

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainbase, interfluve

Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 5 inches: fine sandy loam
E - 5 to 6 inches: fine sandy loam
Bs1 - 6 to 7 inches: fine sandy loam
Bs2 - 7 to 13 inches: fine sandy loam
Bs3 - 13 to 18 inches: fine sandy loam
BC - 18 to 21 inches: fine sandy loam
Cd1 - 21 to 37 inches: fine sandy loam
Cd2 - 37 to 65 inches: fine sandy loam

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.1 percent
Depth to restrictive feature: 21 to 43 inches to densic material
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: About 17 to 34 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C/D
Ecological site: F144BY501ME - Loamy Slope (Northern Hardwoods)
Hydric soil rating: No

Minor Components

Brayton, very stony

Percent of map unit: 6 percent
Landform: Hills, mountains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Mountainbase, interfluve
Microfeatures of landform position: Closed depressions, closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Marlow, very stony

Percent of map unit: 2 percent
Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountainbase, interfluve
Microfeatures of landform position: Rises, rises
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Tunbridge, very stony

Percent of map unit: 1 percent
Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountainbase, interfluve
Microfeatures of landform position: Rises, rises
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Berkshire, very stony

Percent of map unit: 1 percent
Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountainbase, interfluve
Microfeatures of landform position: Rises, rises
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

PbC—Peru fine sandy loam, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2ty64
Elevation: 0 to 720 feet
Mean annual precipitation: 36 to 65 inches
Mean annual air temperature: 36 to 52 degrees F
Frost-free period: 90 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Peru, very stony, and similar soils: 91 percent
Minor components: 9 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Peru, Very Stony

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainflank, mountainbase, interfluve, nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 5 inches: fine sandy loam

E - 5 to 6 inches: fine sandy loam
Bs1 - 6 to 7 inches: fine sandy loam
Bs2 - 7 to 13 inches: fine sandy loam
Bs3 - 13 to 18 inches: fine sandy loam
BC - 18 to 21 inches: fine sandy loam
Cd1 - 21 to 37 inches: fine sandy loam
Cd2 - 37 to 65 inches: fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.1 percent
Depth to restrictive feature: 21 to 43 inches to densic material
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: About 17 to 34 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C/D
Ecological site: F144BY501ME - Loamy Slope (Northern Hardwoods)
Hydric soil rating: No

Minor Components

Brayton, very stony

Percent of map unit: 4 percent
Landform: Hills, mountains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Mountainflank, mountainbase, interfluve, nose slope, side slope
Microfeatures of landform position: Closed depressions, closed depressions, open depressions, open depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Marlow, very stony

Percent of map unit: 3 percent
Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountainflank, mountainbase, interfluve, nose slope, side slope
Microfeatures of landform position: Rises, rises
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Colonel, very stony

Percent of map unit: 1 percent
Landform: Hills, mountains
Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Mountainflank, mountainbase, interfluve, nose slope, side slope
Microfeatures of landform position: Closed depressions, closed depressions, open depressions, open depressions
Down-slope shape: Linear, concave
Across-slope shape: Concave
Hydric soil rating: No

Lyman, very stony

Percent of map unit: 1 percent
Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountainflank, mountainbase, interfluve, nose slope, side slope
Microfeatures of landform position: Rises, rises
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Sw—Swanville silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2slv8
Elevation: 10 to 1,200 feet
Mean annual precipitation: 33 to 60 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 80 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Swanville and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Swanville

Setting

Landform: Marine terraces, lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits

Typical profile

Ap - 0 to 9 inches: silt loam
Bg - 9 to 22 inches: silt loam
C - 22 to 65 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: F144BY304ME - Wet Clay Flat, F144BY305ME - Wet Loamy Flat
Hydric soil rating: Yes

Minor Components

Pushaw

Percent of map unit: 8 percent
Landform: Marine terraces, lake plains
Landform position (three-dimensional): Riser, rise
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Biddeford

Percent of map unit: 3 percent
Landform: Marine terraces, river valleys
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave, linear
Ecological site: F144BY002ME - Marine Terrace Depression
Hydric soil rating: Yes

Monarda

Percent of map unit: 2 percent
Landform: Ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Boothbay

Percent of map unit: 2 percent
Landform: Lake plains, marine terraces
Landform position (three-dimensional): Riser, rise
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Ud—Udorthents-Urbanland complex

Map Unit Setting

National map unit symbol: 9k4j
Elevation: 0 to 2,500 feet
Mean annual precipitation: 34 to 48 inches
Mean annual air temperature: 37 to 46 degrees F
Frost-free period: 160 to 165 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 65 percent
Urban land: 21 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Typical profile

H1 - 0 to 60 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.06 to 20.00 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Hydrologic Soil Group: A
Ecological site: F144BY501ME - Loamy Slope (Northern Hardwoods)
Hydric soil rating: No

Description of Urban Land

Typical profile

H1 - 0 to 6 inches: variable

Properties and qualities

Slope: 0 to 1 percent
Drainage class: Moderately well drained
Depth to water table: About 24 to 42 inches
Available water supply, 0 to 60 inches: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Minor Components

Peru

Percent of map unit: 8 percent
Landform: Drumlinoid ridges
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Swanville

Percent of map unit: 2 percent
Landform: Coastal plains
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Boothbay

Percent of map unit: 2 percent
Landform: Marine terraces
Hydric soil rating: No

Brayton

Percent of map unit: 2 percent
Landform: Till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

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Site Name: Belfast Municipal Airport
Location: 22 Wright Brothers Dr, Belfast, ME 04915
Prepared for: McFarland Johnson
Ref: Master Plan Update
Center Coordinates: 44.409513,-69.008361
Prepared Date: Tue Jan 14 2025 19:29:25 GMT+0000 (Coordinated Universal Time)

ENVIRONMENTAL RADIUS REPORT

ASTM E1527-21

NETROnline

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Summary

Federal	< 1/4	1/4 - 1/2	1/2 - 1
Lists of Federal NPL (Superfund) sites	0	0	0
Lists of Federal Delisted NPL sites	0	0	0
Lists of Federal sites subject to CERCLA removals and CERCLA orders	0	0	0
Lists of Federal CERCLA sites with NFRAP	0	0	0
Lists of Federal RCRA facilities undergoing Corrective Action	0	0	0
Lists of Federal RCRA TSD facilities	0	0	0
Lists of Federal RCRA generators	0	0	0
Federal institutional control/engineering control registries	0	0	0
Federal ERNS list	0	0	0

State	< 1/4	1/4 - 1/2	1/2 - 1
Lists of state and tribal Superfund equivalent sites	0	0	1
Lists of state and tribal hazardous waste facilities	0	0	0
Lists of state and tribal landfills and solid waste disposal facilities	0	0	0
Lists of state and tribal leaking storage tanks	0	0	0
Lists of state and tribal registered storage tanks	1	0	0
State and tribal institutional control/engineering control registries	0	0	0
Lists of state and tribal brownfields sites	1	2	0
Lists of state and tribal voluntary cleanup sites	1	1	0

Other	< 1/4	1/4 - 1/2	1/2 - 1
State and/or tribal lists of sites requiring further investigation / remediation	0	0	0
State list of Significant Environmental Hazards (SEH)	0	0	0
Lists of state and tribal mine sites requiring further investigation and/or remediation	0	0	0
State and/or tribal lists of spills and spill responses	0	2	0
State and/or tribal lists of emergency responses	0	0	0
State and/or tribal lists of dry cleaners	0	0	0
State and/or tribal lists of clandestine laboratory cleanups	0	0	0
State and/or tribal lists of scrap/used tire processing facilities	0	0	0
State and/or tribal lists of underground injection control sites	0	0	0
State and/or tribal listings of permitted drywells	0	0	0
Automobile salvage yards	0	0	0
Livestock Waste Control sites	0	0	0
Controlled Animal Feeding Operations (CAFOs)	0	0	0
State and/or tribal lists of registered aboveground storage tanks (ASTs)	1	0	0
C.A.A. Permitted Facilities	0	0	0
NPDES Permitted Facilities	0	0	0
Onsite Wastewater Treatment sites	0	0	0
State and/or tribal lists of permitted facilities	0	0	0
U.S. EPA Enforcement, Compliance History Online (ECHO)	0	0	0
Resource Conservation and Recovery Act Information (RCRAInfo)	0	0	0
U.S. EPA Underground Storage Tanks (UST)	0	0	0
U.S. EPA Toxic Substances Control Act (TSCA) database	0	0	0
U.S. EPA Toxic Release Inventory System (TRIS)	0	0	0

Lists of Federal NPL (Superfund) sites

The National Priorities List (NPL) is the list of sites of national priority among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is intended primarily to guide the EPA in determining which sites warrant further investigation. The NPL is updated periodically, as mandated by CERCLA.
There were no Federal NPL sites found within a one-mile radius of the target property.

Lists of Federal Delisted NPL sites

The EPA may delete a final NPL site if it determines that no further response is required to protect human health or the environment. Under Section 300.425(e) of the NCP (55 FR 8845, March 8, 1990), a site may be deleted when no further response is appropriate if EPA determines that one of the following criteria has been met: 1) EPA, in conjunction with the state, has determined that responsible parties have implemented all appropriate response action required, 2) EPA, in consultation with the state, has determined that all appropriate Superfund-financed responses under CERCLA have been implemented and that no further response by responsible parties is appropriate, 3) A remedial investigation/feasibility study (RI/FS) has shown that the release poses no significant threat to public health or the environment and, therefore, remedial measures are not appropriate.

There were no Federal Delisted NPL sites found within a half-mile radius of the target property.

Lists of Federal sites subject to CERCLA removals and CERCLA orders

CERCLA identifies the classes of parties liable under CERCLA for the cost of responding to releases of hazardous substances. In addition, CERCLA contains provisions specifying when Federal installations must report releases of hazardous substances and the cleanup procedures they must follow. Executive Order No. 12580, Superfund Implementation, delegates response authorities to EPA and the Coast Guard. Generally, the head of the Federal agency has the delegated authority to address releases at the Federal facilities in its jurisdiction.

There were no Federal sites subject to CERCLA removals and/or orders found within a half-mile radius of the target property.

Lists of Federal CERCLA sites with NFRAP

No Further Remedial Action Planned (NFRAP) is a decision made as part of the Superfund remedial site evaluation process to denote that further remedial assessment activities are not required and that the facility/site does not pose a threat to public health or the environment sufficient to qualify for placement on the National Priorities List (NPL) based on currently available information. These facilities/sites may be re-evaluated if EPA receives new information or learns that site conditions have changed. A NFRAP decision does not mean the facility/site is free of contamination and does not preclude the facility/site from being addressed under another federal, state or tribal cleanup program.

There were no Federal CERCLA sites with No Further Remedial Action Planned (NFRAP) decisions found within a half-mile radius of the target property.

Lists of Federal RCRA facilities undergoing Corrective Action

Corrective action is a requirement under the Resource Conservation and Recovery Act (RCRA) that facilities that treat, store or dispose of hazardous wastes investigate and cleanup hazardous releases into soil, ground water, surface water and air. Corrective action is principally implemented through RCRA permits and orders. RCRA permits issued to TSDFs must include provisions for corrective action as well as financial assurance to cover the costs of implementing those cleanup measures. In addition to the EPA, 44 states and territories are authorized to run the Corrective Action program.

There were no Federal RCRA facilities undergoing corrective action(s) found within a one-mile radius of the target property.

Lists of Federal RCRA TSD facilities

The final link in RCRA's cradle-to-grave concept is the treatment, storage, and disposal facility (TSDF) that follows the generator and transporter in the chain of waste management activities. The regulations pertaining to TSDFs are more stringent than those that apply to generators or transporters. They include general facility standards as well as unit-specific design and operating criteria.
There were no Federal RCRA treatment, storage and disposal facilities (TSDFs) found within a half-mile radius of target property.

Lists of Federal RCRA generators

A generator is any person who produces a hazardous waste as listed or characterized in part 261 of title 40 of the Code of Federal Regulations (CFR). Recognizing that generators also produce waste in different quantities, EPA established three categories of generators in the regulations: very small quantity generators, small quantity generators, and large quantity generators. EPA regulates hazardous waste under the Resource Conservation and Recovery Act (RCRA) to ensure that these wastes are managed in ways that protet human health and the environment. Generators of hazardous waste are regulated based on the amount of hazardous waste they generate in a calendar month, not the size of their business or facility.

There were no Federal RCRA generators found at the target property and/or adjoining properties.

Federal institutional control/engineering control registries

Institutional Controls (IC) are defined as non-engineered and/or legal controls that minimize the potential human exposure to contamination by limiting land or resource use. Whereas, Engineering Controls (EC) consist of engineering measures (e.g, caps, treatment systems, etc.) designed to minimize the potential for human exposure to contamination by either limiting direct contact with contaminated areas or controlling migration of contaminants through environmental media.

There were no Federal institutional or engineering controls found at the target property.

Federal ERNS list

The Emergency Response Notification System (ERNS) is a database used to store information on notification of oil discharges and hazardous substances releases. The ERNS program is a cooperative data sharing effort encompassing the National Response Center (NRC), operated by the US Coast Guard, EPA HQ and EPA regional offices. ERNS data is used to analyze release notifications, track EPA responses and compliance to environmental laws, support emergency planning efforts, and assist decision-makers in developing spill prevention programs.

There were no Federally recorded releases of oil and/or hazardous substances at the target property.

Lists of state and tribal Superfund equivalent sites

MEDEP - STATE SUPERFUND PROGRAM

The federal government oversees all sites that fall under the Federal Facilities and Superfund Program. In some cases, the lead regulator for sites on the National Priorities List (NPL) is the U.S. Environmental Protection Agency (EPA). In other instances, a component of the Department of Defense (DOD) acts as the representative, typically when the issues at the site stem from past military activities. The Maine Department of Environmental Protection (DEP) maintains a listing of federal facilities and Superfund sites, which was searched to return all records located within a mile of the target property.

center: 44.409513,-69.008361

0.5 Miles 1.0 Miles

1

BELFAST RANGE

Site Address Not Available

Site Number: REM02731
Name: BELFAST RANGE
Address:
City: BELFAST
Program: FEDERAL FACILITIES
Institutional Controls: FALSE
Status: INVESTIGATION STAGE
Sub-Status: NEED (AWAITING RESOURCES)
Acreage: 27.8
Status Date: 2012-06-30
Distance From Center (Miles): 0.9101
Site Source: last updated 03-10-2022 from MEDEP-REMO

Lists of state and tribal hazardous waste facilities

EPA established basic hazardous waste management standards for businesses who produce hazardous waste and categorized three businesses based on the volume of hazardous waste produced in a calendar month. On the federal level, there are three generator categories: large quantity generator, small quantity generator, and conditionally exempt small quantity generator. Some states are authorized to establish generator categories that are different from those that federal EPA set up. State regulatory requirements for generators of hazardous waste may be more stringent than the federal program.

There were no State and/or tribal hazardous waste facilities found within a half-mile radius of the target property.

Lists of state and tribal landfills and solid waste disposal facilities

Title 40 of the CFR parts 239 through 259 contain the regulations for non-hazardous solid waste programs set up by the states. EPA has requirements for state solid waste permit programs, guidelines for the processing of solid waste, guidelines for storage and collection of commercial, residential and institutional solid waste, and the criteria for municipal solid waste landfills. State solid waste programs may be more stringent than the federal code requires.

There were no State and/or tribal landfills or solid waste disposal facilities found within a half-mile radius of the target property.

Lists of state and tribal leaking storage tanks

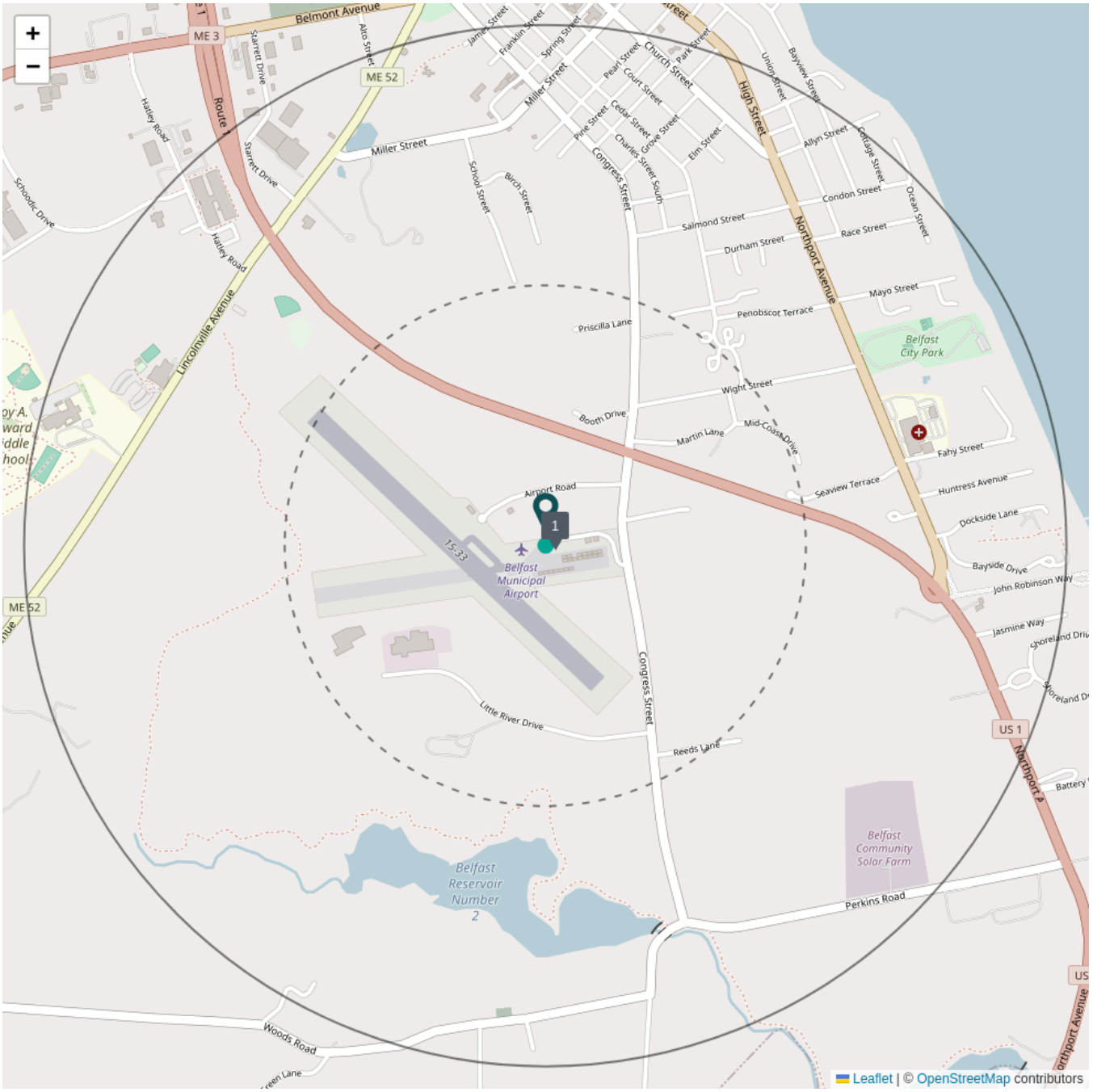
A typical leaking underground storage tank (LUST) scenario involves the release of a fuel product from an underground storage tank (UST) that can contaminate surrounding soil, groundwater, or surface waters, or affect indoor air spaces. Once a leak is confirmed, immediate response actions must be taken to minimize or eliminate the source of the release and to reduce potential harm to human health, safety, and the environment. Each state has unique requirements for initiating responses to a release, and it is up to the UST owner or operator to conduct actions in compliance with his/her local rules.

There were no State and/or tribal leaking storage tanks found within a half-mile radius of the target property.

Lists of state and tribal registered storage tanks

MEDEP - UNDERGROUND STORAGE TANK PROGRAM

The Underground Storage Tank (UST) Program of the Main Department of Environmental Protection is dedicated to safeguarding public health and the environment, especially groundwater, by minimizing oil discharges as much as possible. The staff of the UST Program offers technical expertise, training, and outreach to owners and operators of UST facilities.



center: 44.409513,-69.008361

0.5 Miles 1.0 Miles

1

MAINE SCENIC AIRWAYS INC

BELFAST MUNICIPAL AIRPORT

Registration Number: 21048
Master Tank ID: 21048001
Facility Name: MAINE SCENIC AIRWAYS INC
Address: BELFAST MUNICIPAL AIRPORT
City: BELFAST
Near Public Water: No
Near Private Water: No
Near Other Water: No
On Aquifer: No
Tank Number: 1
Tank Material: STEEL_ASPHALT_COATED
Tank Installation Date: 2005-09-07
Tank Status: ACTIVE
Status Date: 2006-03-16
Distance From Center (Miles): 0.0174
Site Source: last updated 12-15-2021 from MEDEP-TANKS

State and tribal institutional control/engineering control registries

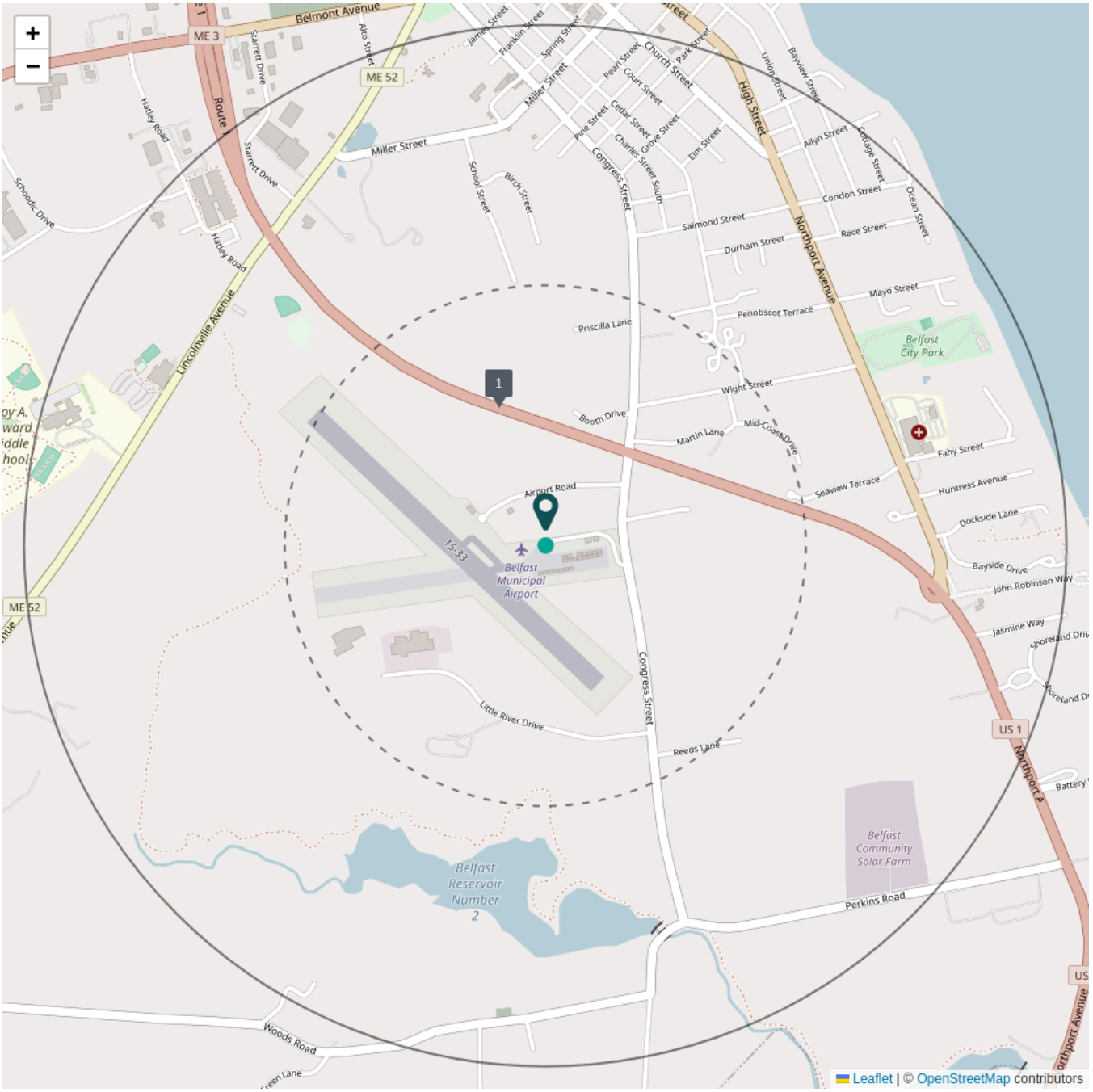
Institutional controls are non-engineered instruments such as administrative and legal controls that help minimize the potential for human exposure to contamination and/or protect the integrity of the remedy. Engineering controls consist of engineering measures (e.g, caps, treatment systems, etc.) designed to minimize the potential for human exposure to contamination by either limiting direct contact with contaminated areas or controlling migration of contaminants through environmental media. It is EPA's expectation that treatment or engineering controls will be used to address principal threat wastes and that groundwater will be returned to its beneficial use whenever practicable.

There were no State and/or tribal institutional and/or engineering controls found filed against the target property.

Lists of state and tribal brownfields sites

ASSESSMENT, CLEANUP AND REDEVELOPMENT EXCHANGE SYSTEM

ACRES is a web-based database that catalogs data submitted by EPA Brownfields grant recipients about brownfield sites that have been assessed or revitalized using grant funds, along with details on Targeted Brownfields Assessments (TBA) conducted by EPA regional offices.



center: 44.409513,-69.008361

0.5 Miles 1.0 Miles

1

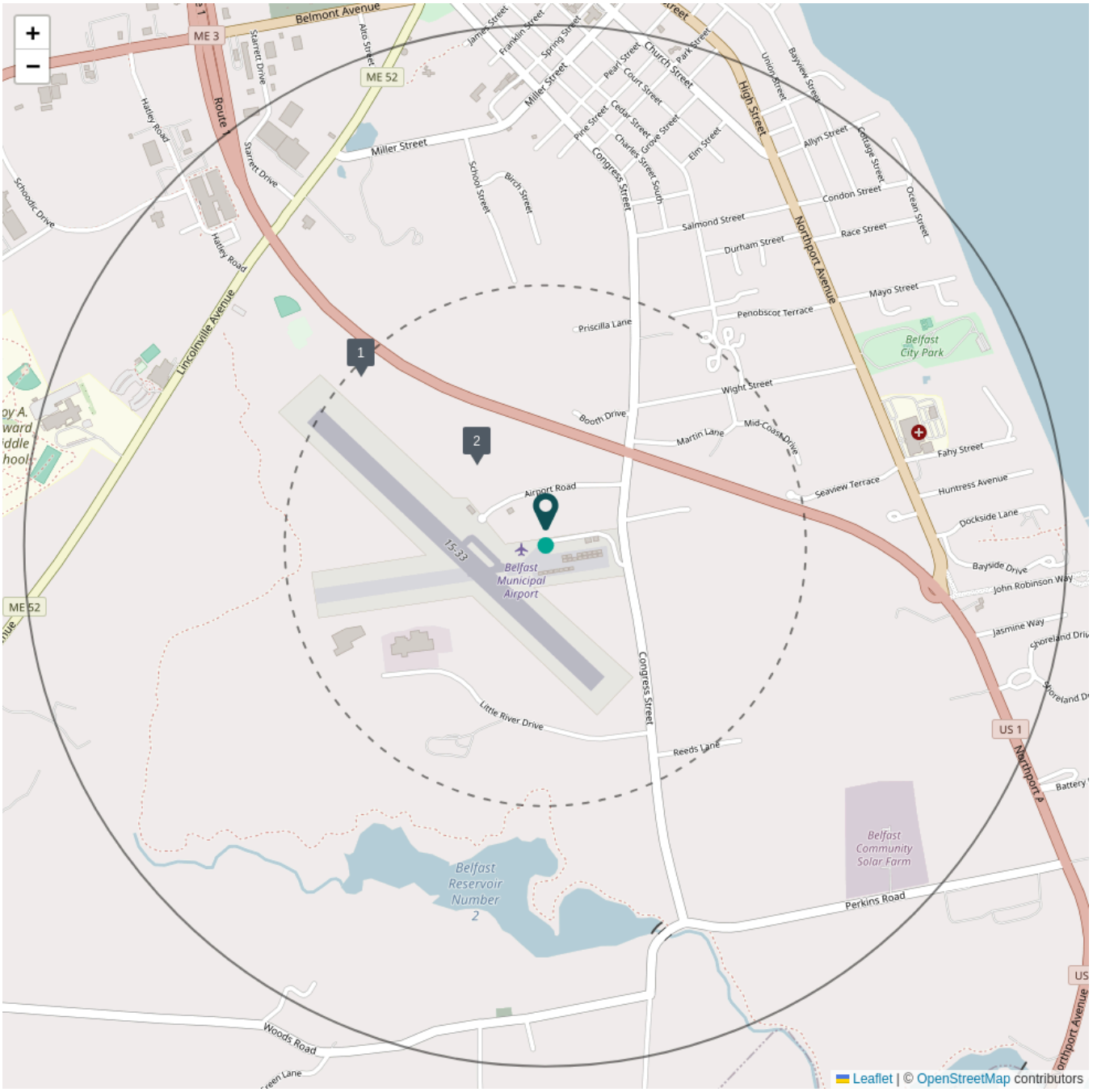
MEARNG PARCEL, BELFAST AIRPORT

42 ROUTE 1 BYPASS

Registry ID: 110063009818
Name: MEARNG PARCEL, BELFAST AIRPORT
Address: 42 ROUTE 1 BYPASS
City: BELFAST
Site Type: BROWNFIELDS SITE
Program Acronyms: ACRES:177505
Interest Type: BROWNFIELDS PROPERTY
Point of Reference Description: CENTER OF A FACILITY OR STATION
Date Created: 05-DEC-14
Date Updated:
FRS Facility Detail Report URL: Link
Distance From Center (Miles): 0.2805
Site Source: last updated from FACILITY REGISTRY SERVICE

MEDEP - BROWNFIELDS PROGRAM

The Maine Department of Environmental Protection (MEDEP) Brownfields Program is responsible for overseeing the redevelopment of contaminated properties within the state. A search of the DEP's list of brownfield sites was conducted to identify all records located within half a mile of the target property.



center: 44.409513,-69.008361

0.5 Miles 1.0 Miles

1

BELFAST AIRPORT LOT 3

2 WRIGHT BROTHERS DRIVE

Site Number: REM02342
Name: BELFAST AIRPORT LOT 3
Address: 2 WRIGHT BROTHERS DRIVE
City: BELFAST
Program: BROWNFIELDS-104K
Institutional Controls: FALSE
Status: INVESTIGATION STAGE
Sub-Status: NEED (AWAITING RESOURCES)
Acreage: 5.79
Status Date: 2020-04-23
Distance From Center (Miles): 0.4808
Site Source: last updated 03-10-2022 from MEDEP-REMO

2

BELFAST MEANG LOT 3A

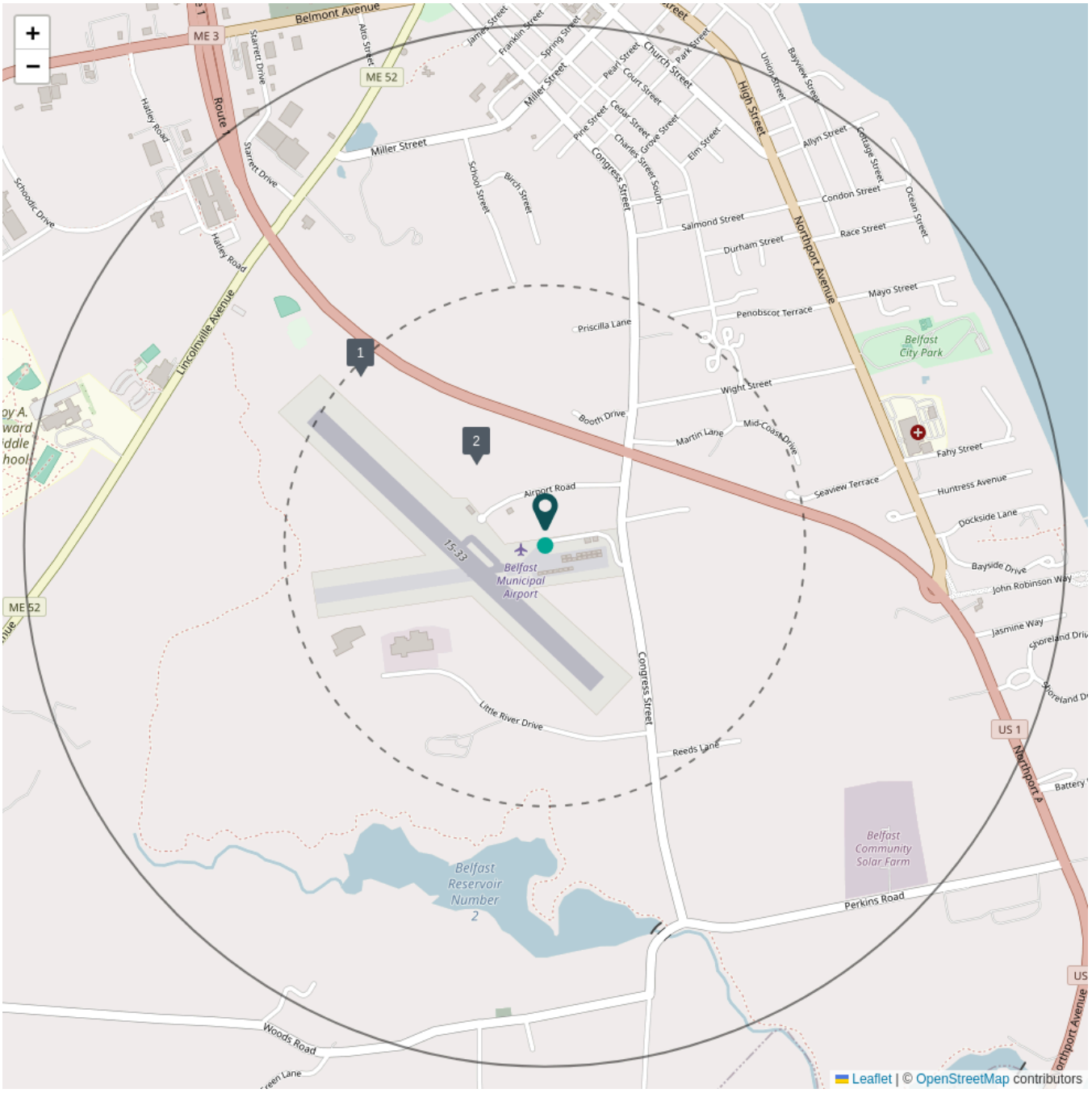
42 ROUTE 1 BYPASS

Site Number: REM02343
Name: BELFAST MEANG LOT 3A
Address: 42 ROUTE 1 BYPASS
City: BELFAST
Program: BROWNFIELDS-104K
Institutional Controls: FALSE
Status: INVESTIGATION STAGE
Sub-Status: NEED (AWAITING RESOURCES)
Acreage: 20.2
Status Date: 2020-04-23
Distance From Center (Miles): 0.2053
Site Source: last updated 03-10-2022 from MEDEP-REMO

Lists of state and tribal voluntary cleanup sites

MEDEP - VOLUNTARY REMEDIAL ACTION PROGRAM

The Voluntary Response Action Program (VRAP) allows applicants to voluntarily investigate and clean up properties to the satisfaction of the Maine Department of Environmental Protection (MEDEP). In return for their efforts, participants receive protection from enforcement actions by the department. The goal of VRAP is to promote the cleanup and redevelopment of contaminated properties throughout the state.



center: 44.409513,-69.008361

0.5 Miles 1.0 Miles

1

BELFAST AIRPORT LOT 3

2 WRIGHT BROTHERS DRIVE

Site Number: REM02342
Name: BELFAST AIRPORT LOT 3
Address: 2 WRIGHT BROTHERS DRIVE
City: BELFAST
Program: BROWNFIELDS-104K
Institutional Controls: FALSE
Status: INVESTIGATION STAGE
Sub-Status: NEED (AWAITING RESOURCES)
Acreage: 5.79
Status Date: 2020-04-23
Distance From Center (Miles): 0.4808
Site Source: last updated 03-10-2022 from MEDEP-REMO

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BELFAST MEANG LOT 3A

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Institutional Controls: FALSE
Status: INVESTIGATION STAGE
Sub-Status: NEED (AWAITING RESOURCES)
Acreage: 20.2
Status Date: 2020-04-23
Distance From Center (Miles): 0.2053
Site Source: last updated 03-10-2022 from MEDEP-REMO

State and/or tribal lists of sites requiring further investigation / remediation

No records found

State list of Significant Environmental Hazards (SEH)

No records found

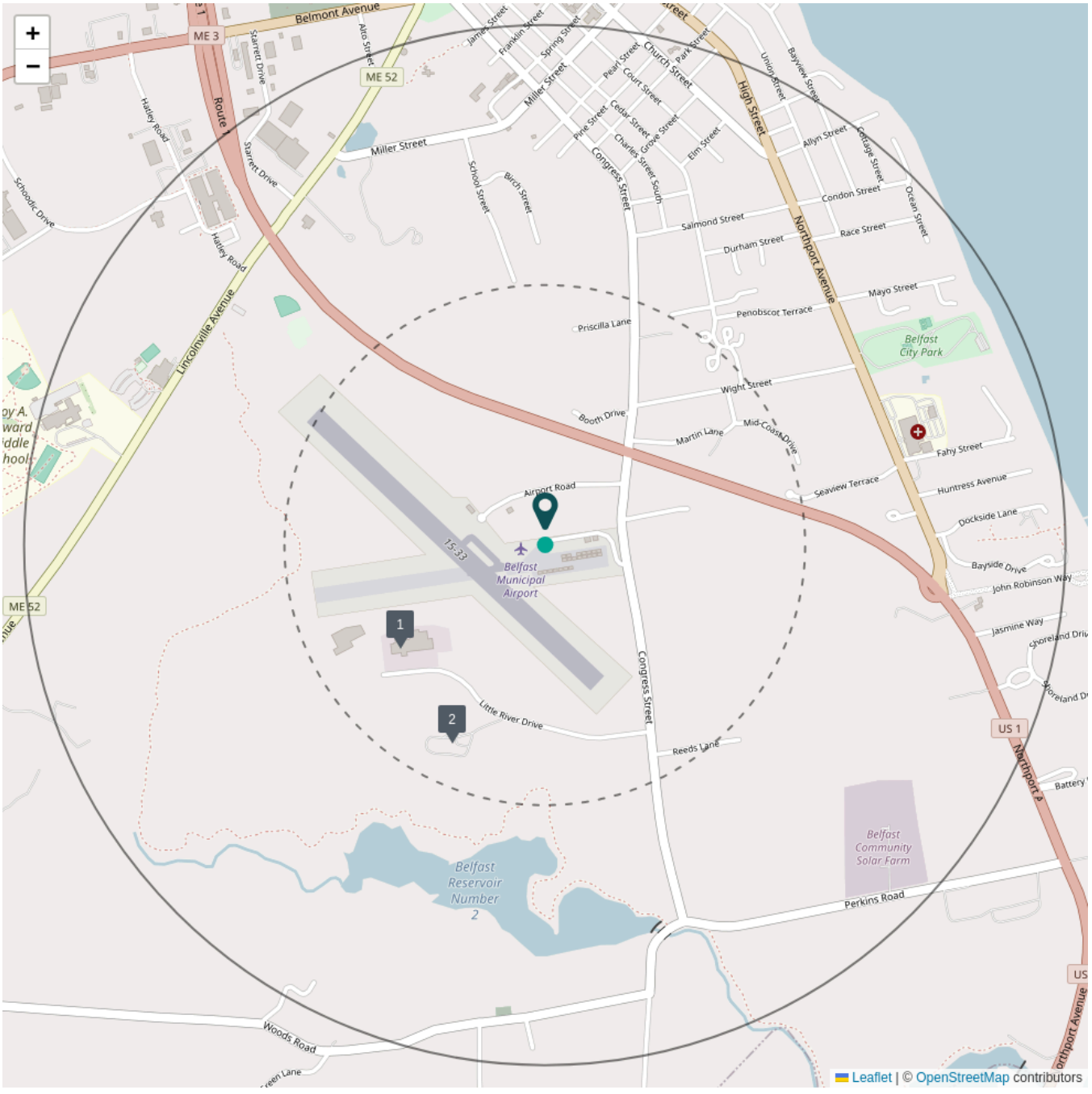
Lists of state and tribal mine sites requiring further investigation and/or remediation

No records found

State and/or tribal lists of spills and spill responses

CT-DEEP - SPILL INCIDENT TRACKING SYSTEM DATABASE

This dataset contains information reported to DEEP about releases of substances into the environment, typically due to accidental spills. According to Connecticut General Statutes (CGS) Section 22a-450, anyone responsible for discharges, spills, uncontrolled losses, seepage, or filtration of oil, petroleum, chemical liquids, solid liquids, gaseous products, or hazardous wastes that might endanger human health or the environment is required to notify DEEP. The dataset was searched to retrieve all records located within a half-mile radius of the target property.



center: 44.409513,-69.008361

0.5 Miles 1.0 Miles

1

Site Title Not Available

57 LITTLE CITY ROAD

Case No.: 200605273
Location of Reported Release: 57 LITTLE CITY ROAD
Town of Release: HADDAM
Release Date: 08/22/2006 12:00:00 AM
Date Reported: 08/22/2006 01:48:00 PM
Year: 2006
Reported By: VALLEY SHORE 911 DISPATCH
Assigned: THIGPEN, DONNELL
Responsible Party: HADDAM KILLINGWORTH MIDDLE SCHOOL
Release Type: chemical
Release Substance: URETHANE
Total Qty. (Gallons): 0.00
Emergency Measures: REPORTED ODOR COMPLAINT DURING REPAIR TO GYM FLOOR. RESPONSE REQUESTED FOR METERING PURPOSES.
Waterbodies Affected:
Cause Info.: Seepage
Media Info.: Inside Building
Distance From Center (Miles): 0.3443
Site Source: last updated 03-22-2022 from CTDEEP-SITS

2

Site Title Not Available

32 LITTLE FOX RUN

Case No.: 9808641
Location of Reported Release: 32 LITTLE FOX RUN
Town of Release: SHELTON
Release Date: 12/17/1998 03:45:00 PM
Date Reported: 12/18/1998 11:04:00 AM
Year: 1998
Reported By: TINA OSTROWSKI
Assigned: NO Response
Responsible Party: MARY ALVES
Release Type: petroleum
Release Substance: #2 FUEL OIL
Total Qty. (Gallons): 0.00
Emergency Measures: ZURICH INS. INSPECTED- 550 UNDER DECK
Waterbodies Affected:
Cause Info.: Inground Tank Failure, and Other (NOT A LINE PROBLEM)
Media Info.: Other (SOIL)
Distance From Center (Miles): 0.4214
Site Source: last updated 03-22-2022 from CTDEEP-SITS

State and/or tribal lists of emergency responses

No records found

State and/or tribal lists of dry cleaners

No records found

State and/or tribal lists of clandestine laboratory cleanups

No records found

State and/or tribal lists of scrap/used tire processing facilities

No records found

State and/or tribal lists of underground injection control sites

No records found

State and/or tribal listings of permitted drywells

No state and/or tribal permitted drywells were found within a half-mile radius of the target property.

Automobile salvage yards

No records found

Livestock Waste Control sites

No records found

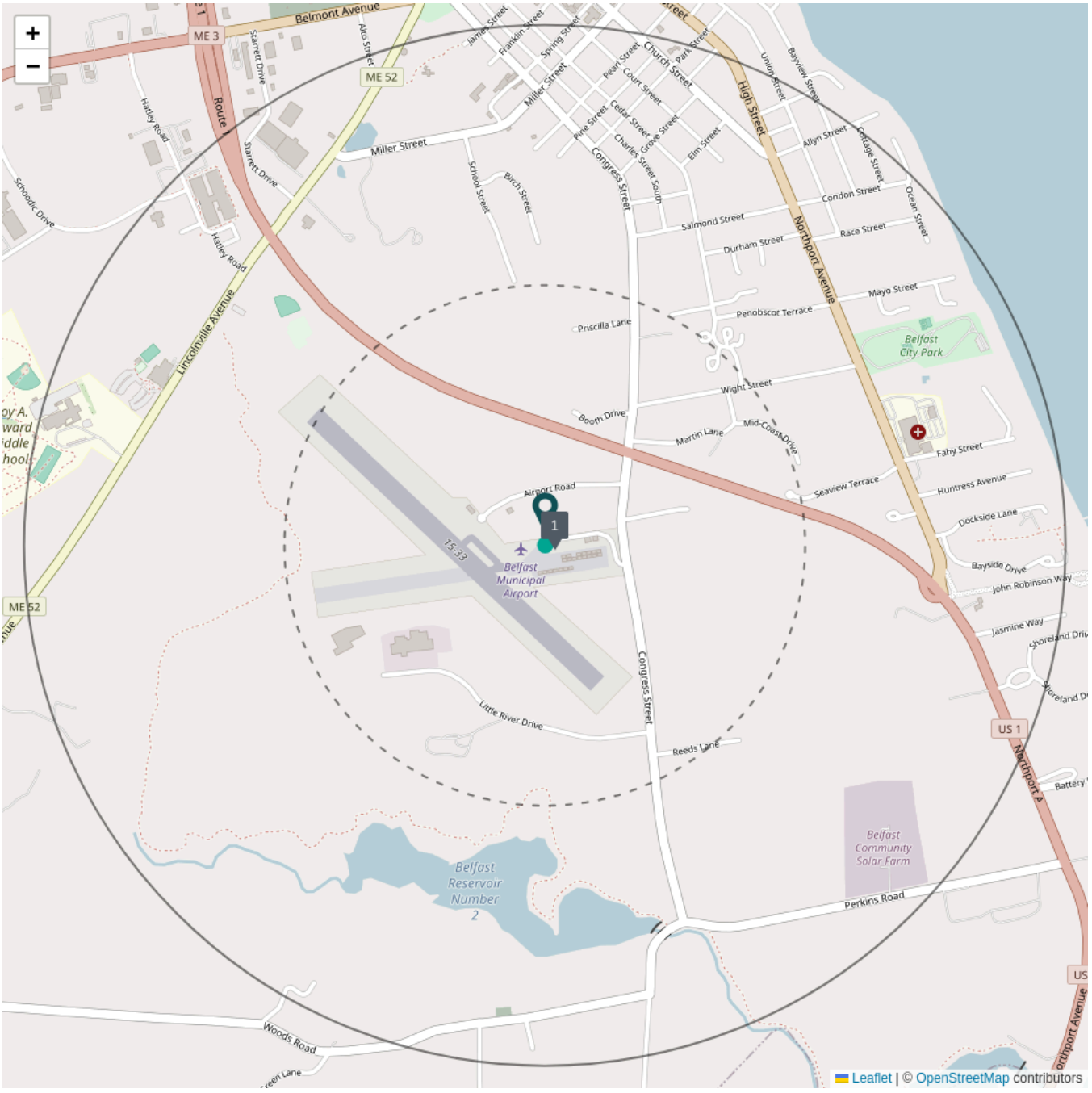
Controlled Animal Feeding Operations (CAFOs)

No records found

State and/or tribal lists of registered aboveground storage tanks (ASTs)

MEDEP - ABOVEGROUND OIL STORAGE TANK PROGRAM

The Aboveground Oil Storage Tank Program staff are responsible for managing the technical aspects of the Department of Environmental Protection's (DEP) Spill Prevention, Control, and Countermeasure (SPCC) program and the Home Heating Oil Tank Replacement Program. Additionally, the staff provides technical assistance to the Underground Storage Tank (UST) Program and offers general guidance to the public, the UST and AST communities, and other bureaus within the DEP regarding the proper storage and handling of hazardous materials. The DEP conducted a search of its Aboveground Storage Tank (AST) systems and returned all records within a half-mile radius of the target property.



center: 44.409513,-69.008361

0.5 Miles — 1.0 Miles

1

MAINE SCENIC AIRWAYS INC

BELFAST MUNICIPAL AIRPORT

Registration Number: 21048
Master Tank ID: 21048001
Facility Name: MAINE SCENIC AIRWAYS INC
Address: BELFAST MUNICIPAL AIRPORT
City: BELFAST
Near Public Water: No
Near Private Water: No
Near Other Water: No
On Aquifer: No
Tank Number: 1
Tank Material: STEEL_ASPHALT_COATED
Tank Installation Date: 2005-09-07
Tank Status: ACTIVE
Status Date: 2006-03-16
Distance From Center (Miles): 0.0174
Site Source: last updated 12-15-2021 from MEDEP-TANKS

C.A.A. Permitted Facilities

No records found

NPDES Permitted Facilities

No records found

Onsite Wastewater Treatment sites

No records found

State and/or tribal lists of permitted facilities

No State and/or tribal permitted facilities found within a half-mile of the target property.

U.S. EPA Enforcement, Compliance History Online (ECHO)

No records found

Resource Conservation and Recovery Act Information (RCRAInfo)

No records found

U.S. EPA Underground Storage Tanks (UST)

No records found

U.S. EPA Toxic Substances Control Act (TSCA) database

No records found

U.S. EPA Toxic Release Inventory System (TRIS)

No records found

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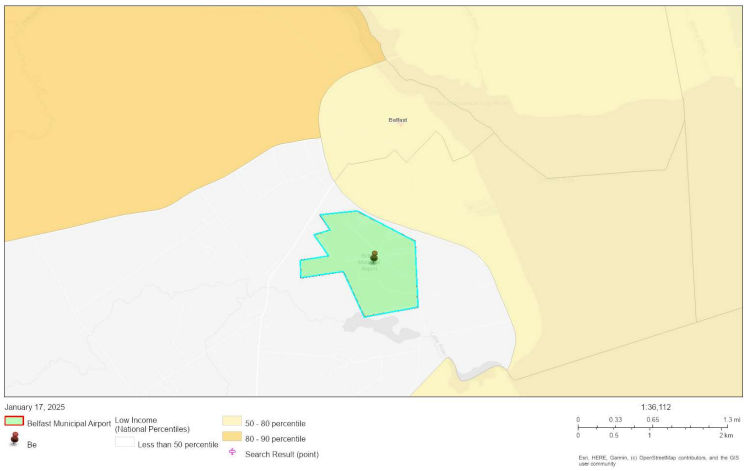
EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Belfast Municipal Airport

the User Specified Area
Population: 27
Area in square miles: 0.58



LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
No language data available.	

COMMUNITY INFORMATION

- Low income: 22 percent
- People of color: 27 percent
- Less than high school education: 11 percent
- Limited English households: 0 percent
- Unemployment: 8 percent
- Persons with disabilities: 20 percent
- Male: 42 percent
- Female: 58 percent
- 78 years — Average life expectancy
- $34,535 — Per capita income
- Number of households: 14
- Owner occupied: 100 percent

BREAKDOWN BY RACE

- White: 73%
- Black: 0%
- American Indian: 0%
- Asian: 0%
- Hawaiian/Pacific Islander: 0%
- Other race: 0%
- Two or more races: 26%
- Hispanic: 0%

BREAKDOWN BY AGE

From Ages 1 to 4	16%
From Ages 1 to 18	21%
From Ages 18 and up	79%
From Ages 65 and up	21%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	0%
Speak Other Indo-European Languages	0%
Speak Asian-Pacific Island Languages	0%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race.
Source: U.S. Census Bureau, American Community Survey (ACS) 2018-2022. Life expectancy data comes from the Centers for Disease Control.

Report for the User Specified Area
Report produced January 17, 2025 using EJScreen Version 2.3

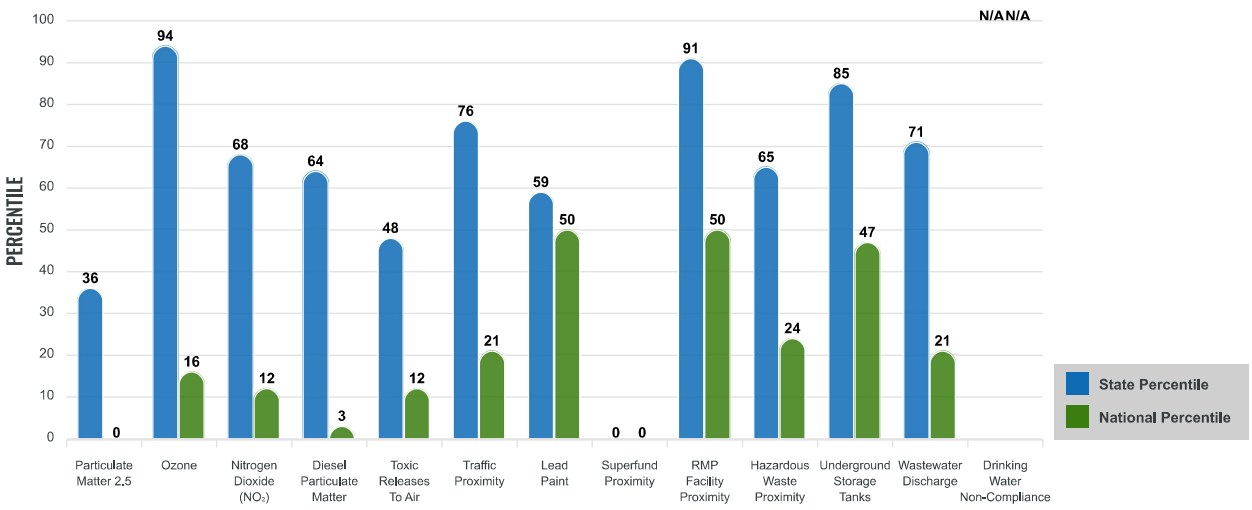
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

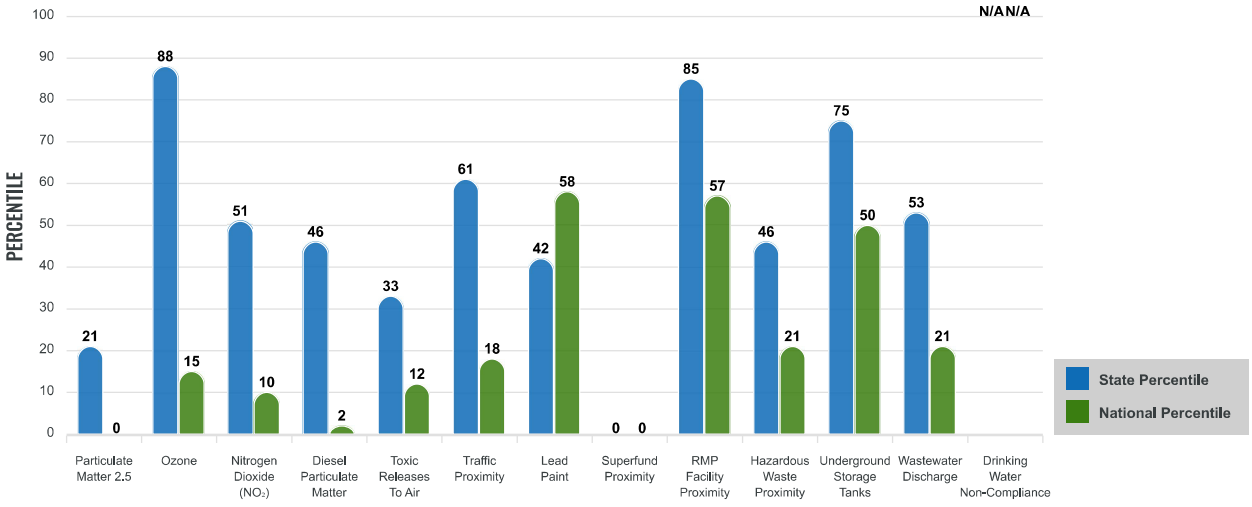
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low income, percent persons with disabilities, percent less than high school education, percent limited English speaking, and percent low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



Report for the User Specified Area

Report produced January 17, 2025 using EJScreen Version 2.3

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
ENVIRONMENTAL BURDEN INDICATORS					
Particulate Matter 2.5 ($\mu g/m^3$)	4.48	5.38	17	8.45	0
Ozone (ppb)	53.2	52.1	69	61.8	13
Nitrogen Dioxide (NO_2) (ppbv)	3.3	4.6	36	7.8	8
Diesel Particulate Matter ($\mu g/m^3$)	0.0305	0.0567	30	0.191	2
Toxic Releases to Air (toxicity-weighted concentration)	16	370	23	4,600	10
Traffic Proximity (daily traffic count/distance to road)	75,000	420,000	42	1,700,000	15
Lead Paint (% Pre-1960 Housing)	0.22	0.36	30	0.3	51
Superfund Proximity (site count/km distance)	0	0.083	0	0.39	0
RMP Facility Proximity (facility count/km distance)	0.24	0.23	74	0.57	47
Hazardous Waste Proximity (facility count/km distance)	0.08	1.5	31	3.5	16
Underground Storage Tanks (count/km^2)	0.3	0.67	64	3.6	40
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.28	150	39	700000	17
Drinking Water Non-Compliance (points)	N/A	1.3	N/A	2.2	N/A
SOCIOECONOMIC INDICATORS					
Demographic Index USA	0.94	N/A	N/A	1.34	39
Supplemental Demographic Index USA	1.7	N/A	N/A	1.64	59
Demographic Index State	2.18	1.32	89	N/A	N/A
Supplemental Demographic Index State	1.73	1.53	67	N/A	N/A
People of Color	27%	8%	96	40%	45
Low Income	22%	28%	40	30%	42
Unemployment Rate	8%	4%	82	6%	74
Limited English Speaking Households	0%	1%	0	5%	0
Less Than High School Education	11%	6%	84	11%	62
Under Age 5	16%	4%	98	5%	96
Over Age 64	21%	23%	50	18%	69

*Diesel particulate matter index is from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund 0
Hazardous Waste, Treatment, Storage, and Disposal Facilities 0
Water Dischargers 1
Air Pollution 0
Brownfields 0
Toxic Release Inventory 0

Other community features within defined area:

Schools 0
Hospitals 0
Places of Worship 0

Other environmental data:

Air Non-attainment ..... No
Impaired Waters ..... No

Selected location contains American Indian Reservation Lands* ..... No
Selected location contains a "Justice40 (CEJST)" disadvantaged community ..... No
Selected location contains an EPA IRA disadvantaged community ..... No

Report for the User Specified Area
Report produced January 17, 2025 using EJScreen Version 2.3

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	20%	19%	62	20%	58
Heart Disease	7.3	6.8	67	5.8	80
Asthma	11.2	11.8	25	10.3	77
Cancer	9.2	7.6	88	6.4	95
Persons with Disabilities	19.8%	16.4%	73	13.7%	84

CLIMATE INDICATORS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	3%	11%	15	12%	31
Wildfire Risk	0%	0%	0	14%	0

CRITICAL SERVICE GAPS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	12%	13%	53	13%	58
Lack of Health Insurance	5%	7%	33	9%	41
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access Burden	No	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Report for the User Specified Area

Report produced January 17, 2025 using EJScreen Version 2.3